



2011

# Bicycle Transportation Plan for Holly Springs



Town of Holly Springs, North Carolina  
North Carolina Department of Transportation  
Division of Bicycle and Pedestrian Transportation  
*Officially Adopted on June 21, 2011*

# Acknowledgements

## Citizen Involvement

A special thanks to the more than 300 local residents who participated in this planning process through comment forms, public workshops, and meetings.

## Project Steering Committee and Town Staff

Gina Clapp  
Chester Cooke  
Scott Evenson  
Stephanie Ferguson  
Scoop Green  
Melanie Humphries  
Jeff Jones  
David Mallard  
Luncie McNeil  
Jackie Miller  
Stephen Moss  
Kendra Parrish  
Tim Sack  
Chris Singletary  
Stephanie Sudano  
Glen Walker  
Daniel Weeks  
Kenneth Withrow  
Linda Hunt Williams

## North Carolina Department of Transportation

John Vine-Hodge, Bicycle and Pedestrian Division

## Project Consultants

Alta/Greenways  
M/A/B



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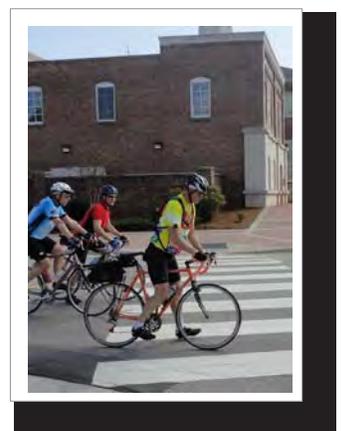
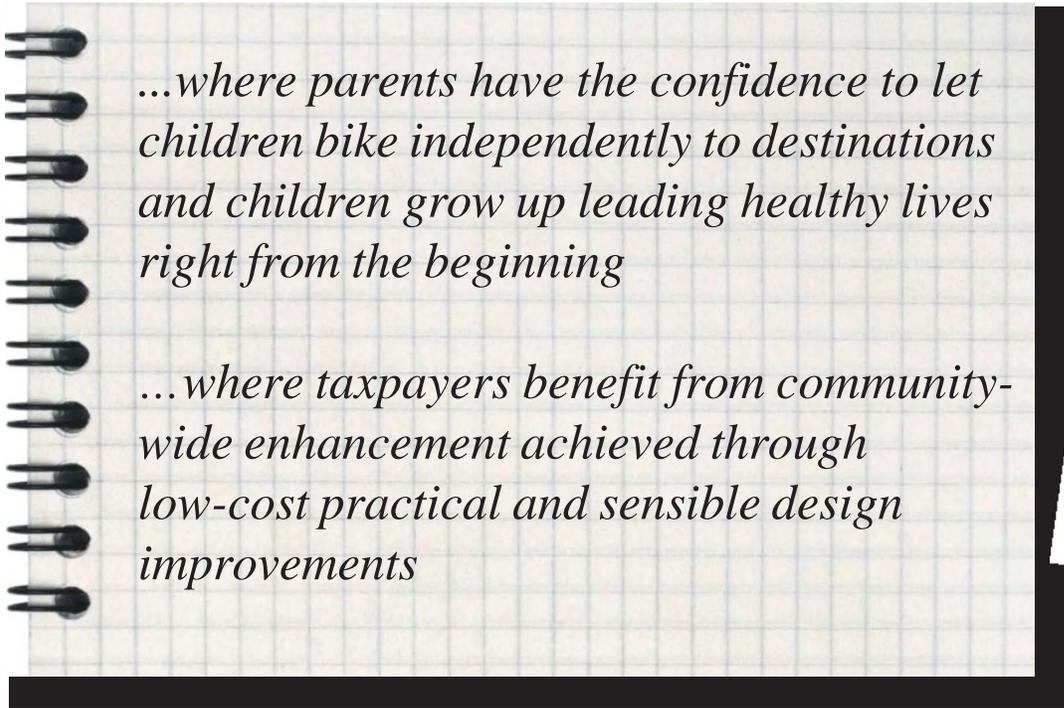
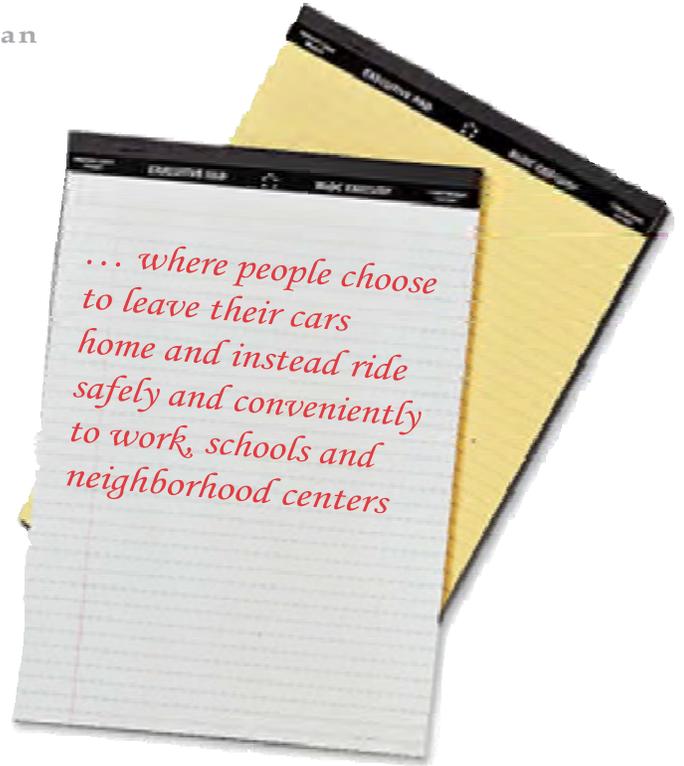
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# Vision Statements

*The Town of Holly Springs will become a place where residents of all ages and abilities can enjoy bicycling facilities that are well-designed and meet their local riding needs.....*



Above: Photos from Holly Springs



www.pedbikeimages.org / Dan Burden

# 1. Project Overview & Purpose

## Overview

### Background

In 2010, the Town of Holly Springs was awarded a matching grant from the North Carolina Department of Transportation (NCDOT) Bicycle and Pedestrian Planning Grant Initiative. The purpose of the grant is to encourage municipalities to develop comprehensive bicycle plans and pedestrian plans. This program has assisted more than 100 North Carolina communities and is administered through NCDOT's Division of Bicycle and Pedestrian Transportation (DBPT).

### Vision Statement

In late 2010, Holly Springs' Bicycle Plan Steering Committee met for the first of four meetings to confirm project visions and goals, identify desired outcomes of the Plan, and determine areas of need for bicyclists. The vision statements formulated from the committee were displayed and refined during subsequent meetings, and can be found on page iv of this Plan. The key statement is as follows:

*“The Town of Holly Springs will become a bicycle-friendly community by developing a combination of infrastructure, education programs, and policies that support and encourage bicycling.”*

### Plan Components

This Plan is designed to guide the Town of Holly Springs in fulfilling this vision by providing a clear purpose (Chapter 1), an assessment of where things stand today (Chapter 2), detailed recommendations for bicycle facilities (Chapter 3), and implementation strategies for bicycle-related policies, programs, and infrastructure (Chapter 4). Also included in this plan are appendices that are designed to be used as implementation resources. They cover topics such as design guidelines, program ideas, state and federal policies, trail development resources, plus a summary of comments from more than 200 local residents.

## The Planning Process and Public Involvement

### Project Consultants and Steering Committee

The planning process was led by consultants Alta/Greenways and Henderson Consulting. The consultants started by listening to the expressed needs and desires of the Steering Committee, which helped to form the Plan's vision statements. Steering Committee members were selected by the Town of Holly Springs, representing multiple town departments, health organizations, transportation agencies, and citizen advocates. They are listed in the Acknowledgements section of this Plan on page ii.



Left: example project newsletter

### Data Collection and Analysis

After collecting baseline information about the study area from the Steering Committee, the consultants began generating an existing conditions report, most of which can now be found in Chapter 2 of this Plan. Consultants used aerial photography and geographic information systems (GIS) data, to identify opportunities and constraints for bicycle facility development. These preliminary findings were then tested for applicability and appropriateness through on-the-ground field research. Field research also included measuring road widths, studying lane configurations, and a photographic inventory. The existing conditions report and the preliminary findings were presented at the first public workshop and the second Steering Committee meeting.

### Public Involvement

During the spring of 2011, the Town of Holly Springs began aggressively pursuing public input and involvement through both an online campaign and public comment forms. Links to the project web site, project newsletter, and the online comment form were mass e-mailed through all channels available to the Steering Committee. Hard copies of the comment form were also distributed at various public facilities. Finally, this push for public involvement was also accompanied by a second public input opportunity held during Turtlefest in May 2011. Altogether, more than 200 local residents submitted comment forms, and approximately 75 people have provided face-to-face feedback during public workshops.

### Draft Plan Development and Review

While analyzing public input, project consultants began developing and refining plan recommendations. The full draft plan was presented to the Steering Committee in April 2011, followed by a public review period and further presentations to the Planning Board and Town Council.

### Final Plan and Presentations

Completion and official adoption of the final plan took place in June 2011.



*Right and Below: The Bicycle Plan Steering Committee identifies major opportunities and constraints at the first meeting.*



*Below: Public input was received at the Town's bicycle rodeo*





## Benefits of a Bicycle-Friendly Community

A bicycle-friendly Holly Springs will help to improve the health and fitness of residents, enhance environmental conditions, decrease traffic congestion, and contribute to a greater sense of community. Scores of studies from experts in the fields of public health, urban planning, urban ecology, real estate, transportation, and economics consistently back-up such claims and affirm the value of supporting bicycling as it relates to active living and alternative transportation. Communities across the United States and throughout the world are implementing strategies for serving the bicycle needs of their residents, and have been doing so for many years. They do this because of their obligations to promote health, safety and welfare, and also because of the growing awareness of the many benefits of bicycling.



Bicycle rodeo in Downtown Holly Springs.

*“Individuals must choose to exercise, but communities can make that choice easier.”*

-Rails-to-Trails Conservancy

*“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.”*

-U.S. Department of Health and Human Services, Centers for Disease Control and Prevention

### 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 people’s ability to reach the recommended daily 30 minutes of moderately intense physical activity (60 minutes for youth). According to the Centers for Disease Control and Prevention (CDC), “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.”<sup>1</sup> The increased rate of disease associated with inactivity reduces quality of life for individuals and increases medical costs for families, companies, and local governments.

The CDC determined that creating and improving places to be active could result in a 25% increase in the number of people who exercise at least three times a week.<sup>2</sup> This is significant considering that for people who are inactive, even small increases in physical activity can bring measurable health benefits. Establishing a safe and reliable bicycle network in Holly Springs will positively impact the health of local residents. The Rails-to-Trails Conservancy puts it simply: “Individuals must choose to exercise, but communities can make that choice easier.”<sup>3</sup>

### Economic Benefits

Bicycling is an affordable form of transportation. According to the Pedestrian and Bicycle Information Center (PBIC), of Chapel Hill, NC, the cost of operating a bicycle for a year is approximately \$120, compared to \$7,800 for operating a car over the same time period.<sup>4</sup> Bicycling becomes even more attractive from an economic standpoint when the unstable price of oil is factored into the equation (e.g., in spring 2010, gasoline prices approached \$4 a gallon).<sup>5</sup> The fluctuating cost of fuel reinforces the idea that local communities should be built to accommodate people-powered transportation, such as walking and biking. Holly Springs’ current mixed-use downtown area and surrounding land development patterns, combined with new strategies for improving bicycle transportation, could facilitate a substantial local reduction in auto- and oil-dependency.

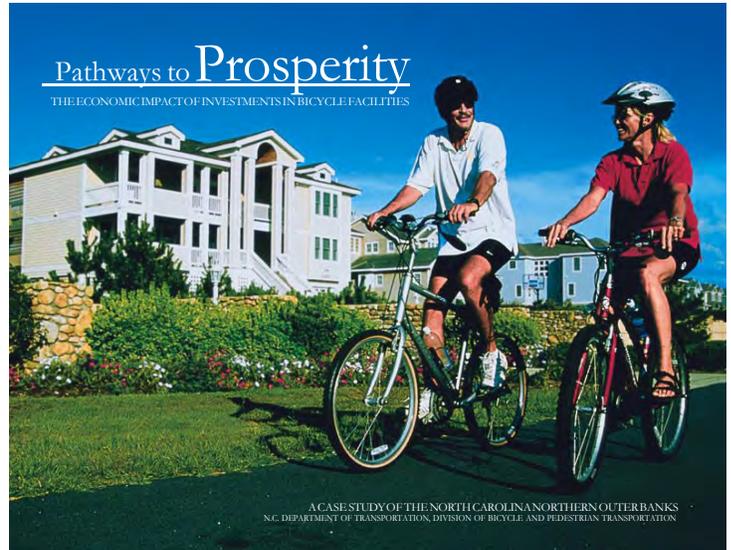
From a real estate standpoint, consider the positive impact of trails and greenways, which are essential components of a complete bicycle network. According to a 2002 survey of homebuyers by the National Association of Home Realtors and the National Association of Home Builders, trails ranked as the second most important community amenity out of a list of 18 choices.<sup>6</sup> Additionally, the study found that ‘trail availability’ outranked 16 other options including security, ball fields, golf courses, parks, and access to shopping or business centers. 81% of residents believed that the Town of Holly Springs should expand upon its existing network of bicycle and pedestrian trails (Beyond the Green: A Parks and Recreation Master Plan for the Town of Holly Springs, NC). Findings from the American Planning Association (How Cities Use Parks for Economic Development, 2002), the Rails-to-Trails Conservancy (Economic Benefits of Trails and Greenways, 2005), and the Trust for Public Land (Economic Benefits of Parks and Open Space, 1999) further substantiate the positive connection between trails and property values across the country.

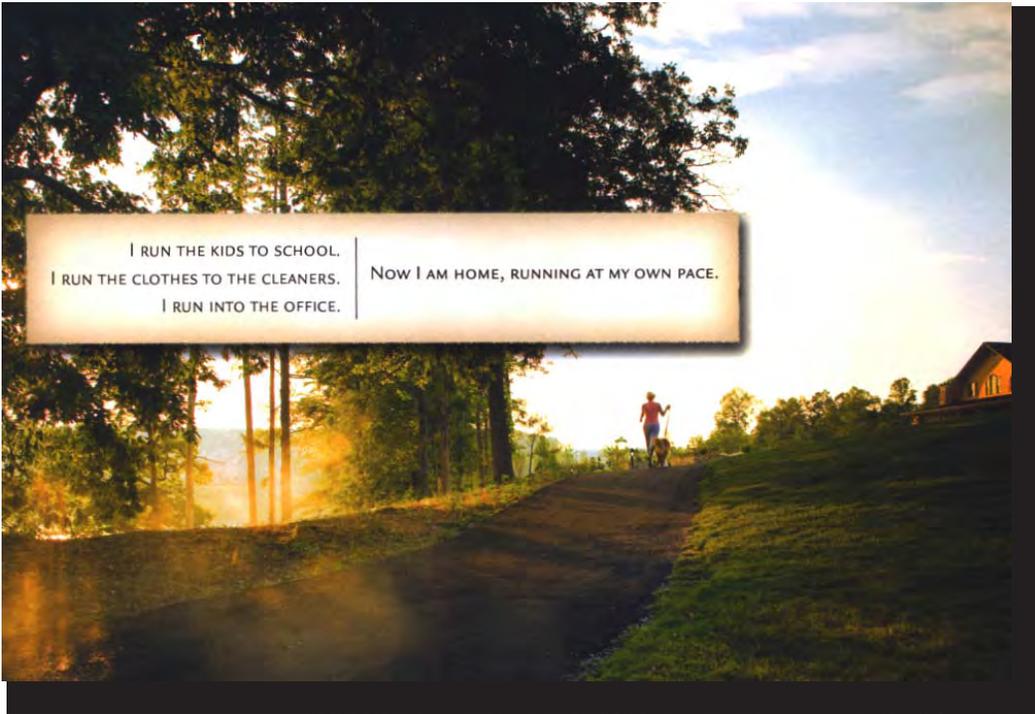
Finally, from a tourism perspective, cyclists can add real value to local economies. For example, in the Outer Banks, NC, bicycling is estimated to have an annual economic impact of \$60 million; 1,407 jobs are supported by the 40,800 visitors for whom bicycling was an important reason for choosing to vacation in the area. The annual return on bicycle facility development in the Outer Banks is approximately nine times higher than the initial investment.<sup>7</sup> Similarly, Damascus, VA, the self-proclaimed ‘Friendliest Trail Town’, features 34-miles of trail where approximately \$2.5 million is spent annually related to recreation visits. Of this amount, non-local visitors spend about \$1.2 million directly into the economies of Washington and Grayson counties.<sup>8</sup> While these examples feature beach and mountain destinations, the Town of Holly Springs also has key advantages, such as its parks system, Cultural Art Center, Downtown core, and proximity to Raleigh, Apex, and Cary.

*Left: Apex, NC: A residential development added \$5,000 to the price of 40 homes adjacent to the greenway – and those homes were still the first to sell. (Rails to Trails Conservancy, 2005)*



*Far left: Download “Pathways to Prosperity” [www.ncdot.gov/bikeped/researchreports](http://www.ncdot.gov/bikeped/researchreports)*





I RUN THE KIDS TO SCHOOL.  
 I RUN THE CLOTHES TO THE CLEANERS.  
 I RUN INTO THE OFFICE.

NOW I AM HOME, RUNNING AT MY OWN PACE.

*Developers are taking advantage of the positive impact of trails on property values by marketing their greenways; left and below are examples of two magazine advertisements from developers that focus their marketing on greenways.*



**I WANT**  
 top schools nearby  
 my kids to get fresh air  
 my kids to have lots of friends  
 our TV to be ignored

A place where video games get lonely from lack of use. A place where people are always going somewhere—families hiking on the miles of trails, or kids biking to our onsite top-rated schools. A place with best-in-class amenities, including a huge Aquatic Club. A place with a natural setting and tight-knit neighbors that always seem to be doing something together. All this and beautiful homes to match? That's FishHawk Ranch.



## Environmental Improvements

As demonstrated by the Southern Resource Center of the Federal Highway Administration, when people get out of their cars and onto their bicycles, they reduce measurable volumes of pollutants.<sup>9</sup> Other environmental impacts include a reduction in overall neighborhood noise levels and improvements in local water quality as fewer automobile-related discharges wind up in the local rivers, streams, and lakes.

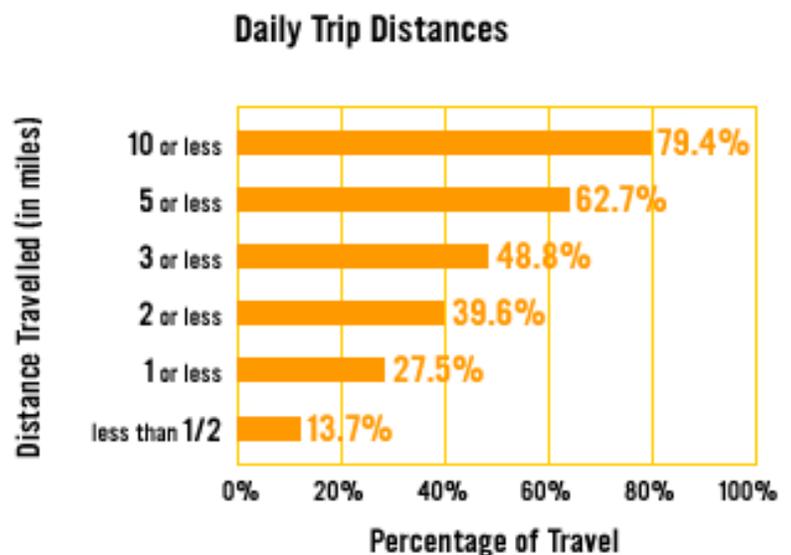
Trails and greenways are also part of any bicycle network, conveying unique environmental benefits. Greenways protect and link fragmented habitat and provide opportunities for protecting plant and animal species. Aside from connecting places without the use of air-polluting automobiles, trails and greenways also reduce air pollution by protecting large areas of plants that create oxygen and filter air pollutants such as ozone, sulfur dioxide, carbon monoxide and airborne particles of heavy metal. 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.

## Transportation Benefits

In 2001, the National Household Travel Survey found that roughly 40% of all trips taken by car are less than 2 miles (see chart at bottom right). By taking these short trips on a bicycle, rather than in a car, citizens can substantially impact local traffic and congestion. Traffic congestion reduces mobility, increases auto-operating costs, adds to air pollution, and causes stress. Bicycle users can help alleviate overall congestion because each cyclist is one less car on the road. Incidentally, cyclists take up significantly less space on the road (see image below).



Additionally, many people do not have access to a vehicle or are not able to drive. According to the National Household Travel Survey (NHTS), one in 12 U.S. households does not own an automobile and approximately 12 percent of persons 15 or older do not drive.<sup>10</sup> An improved bicycle network provides greater and safer mobility for these residents.



Source: *The Association for the Advancement of Sustainability in Higher Education, 2007.*

Above: 'Daily Trip Distances' chart from the *Bicycle and Pedestrian Information Center* website, [www.pedbikeinfo.org](http://www.pedbikeinfo.org)



## 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 claim that access to alternative means of transportation and access to quality recreational opportunities such as parks, trails, greenways, and bicycle routes, are important factors for them in determining their overall pleasure within their community. Communities with such amenities can attract new businesses, industries, and in turn, new residents. Furthermore, quality of life is positively impacted by bicycling through the increased social connections that take place by residents being active, talking to one another and spending more time outdoors and in their communities.

According to the Brookings Institution, the number of older Americans is expected to double over the next 25 years.<sup>11</sup> All but the most fortunate seniors will confront an array of medical and other constraints on their mobility even as they continue to seek both an active community life, and the ability to age in place. Trails built as part of the bicycle transportation network generally do not allow for motor vehicles; however, they do accommodate motorized wheelchairs, which is an important asset for the growing number of senior citizens who deserve access to independent mobility.

Children under 16 are another important subset of our society who deserve access to safe mobility and a higher quality of life. According to the U.S. Environmental Protection Agency, fewer children walk or bicycle to school than did so a generation ago. In 1969, 48% of students walked or bicycled to school, but by 2001, less than 16% of students between 5 and 15 walked or bicycled to or from school.<sup>12</sup>

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.”<sup>13</sup> In a 2004 CDC survey, 1,588 adults answered questions about barriers to walking to school for their youngest child aged 5 to 18 years.<sup>14</sup> The main reasons cited by parents included distance to school, at 62%, and traffic-related danger, at 30%. Strategic additions to Holly Springs’ bicycle and trail system could shorten the distance from and homes to schools, overall bicycle improvements can improve the safety of our roadways.



*Utility bicycle for everyday trips, like grocery shopping (image from [www.yubabike.com](http://www.yubabike.com))*



Footnotes from, “*The Value of Bicycle Transportation*”:

1. 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*.
2. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2002). *Guide to Community Preventive Services*.
3. Rails-to-Trails Conservancy. (2006) *Health and Wellness Benefits*.
4. Pedestrian and Bicycle Information Center. (2008). *Economic Benefits: Money Facts*. Retrieved 8/8/2008 from [www.bicyclinginfo.org/why/benefits\\_economic.cfm](http://www.bicyclinginfo.org/why/benefits_economic.cfm)
5. King, Neil. *The Wall Street Journal: Another Peek at the Plateau*. (2/27/08): In February 2008, the Wall Street Journal quoted industry experts, stating, “supply constraints could push the price of oil to \$150 a barrel by 2010”.
6. National Association of Realtors and National Association of Home Builders. (2002). *Consumer’s Survey on Smart Choices for Home Buyers*.
7. NCDOT and ITRE. (2006). *Bikeways to Prosperity: Assessing the Economic Impact of Bicycle Facilities*.
8. Virginia Department of Conservation. (2004). *The Virginia Creeper Trail: An Assessment of User Demographics, Preferences, and Economics*.
9. Federal Highway Administration, Southern Resource Center. (1999). *Off-Mode Air Quality Analysis: A Compendium of Practice*. To calculate air quality benefits of bicycling, first calculate the Daily VMT reduction.  $VMT\ Reduction = PD * Area * L * BMS$ , where  $PD = Population\ density, persons/mile$ ;  $Area = Project\ length * 1\ mile\ radius, mile$ ;  $L = Round\ trip\ length, one-half\ of\ the\ project\ length\ times\ 2\ daily\ trips, miles$ ;  $BMS = Bike\ mode\ share, \%$ . Last, calculate the Daily Emission reductions for a pollutant.  $Ed = EFx * VMT\ Reduction$ , where  $Ed = Daily\ Emissions, grams/day$ ;  $EFx = Emission\ factor\ for\ pollutant\ x, grams/mile$ ;  $VMT = vehicle\ mile/day$ .
10. U.S. Department of Transportation (DOT), Bureau of Transportation Statistics (BTS) and the Federal Highway Administration (FHWA). (2002). *National Household Travel Survey*.
11. Brookings Institution. 2003. *The Mobility Needs of Older Americans: Implications for Transportation Reauthorization*.
12. US EPA. (2003). *Travel and Environmental Implications of School Siting*.
13. National Center for Safe Routes to School. (2006). *National Center for Safe Routes to School Talking Points*.
14. Centers for Disease Control and Prevention. *The Importance of Regular Physical Activity for Children*. Accessed 9/16/05 at [http://www.cdc.gov/nccdphp/dnpa/kidswalk/health\\_benefits.htm](http://www.cdc.gov/nccdphp/dnpa/kidswalk/health_benefits.htm).



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## 2. Current Conditions

### Overview

In order to propose a comprehensive bicycle system for Holly Springs, it is critical to examine the existing environment. The area's geographic characteristics, existing roadway configurations, and existing bicycle facilities significantly affect bicycle transportation and the everyday decisions by bicyclists and motorists. This chapter covers the following:

- *Field Inventory and Observations*
- *Geographic Information Systems (GIS) Analysis*
- *Public Comments Regarding Current Conditions*
- *Summary of Related Town Plans and Ordinances*

### Field Inventory and Observations

There are great opportunities to transform Holly Springs into a bicycle friendly community. In Downtown Holly Springs, where traffic speed is generally slower, experienced bicyclists can ride with automobile traffic. Many neighborhood collector roads feature low speed limits and traffic calming elements, making it generally safe to bicycle. There are a few miles of recreational paved trails scattered throughout Holly Springs, but because of their relatively short lengths, they are better suited for pedestrians than bicyclists.

Some roads in the study area pose dangers to bicyclists that are unfortunately typical for most municipalities in North Carolina. Examples include commercial corridors that are designed primarily for motorized transportation, multiple-lane higher-speed roadways, narrow roadways with little or no shoulder space, and potentially dangerous driveway crossings. See Table 2.2 on page 2-15 for a detailed inventory.

#### STRENGTHS OF EXISTING BICYCLE FACILITIES:

- **Narrow paved shoulder:** Existing 1-2 foot paved shoulder on several two-lane roadways throughout is a starting point for separated space (4 feet is the desired minimum standard).
- **Neighborhood roads:** Many neighborhood collector roads such as Linksland Drive, Crossway Lane, Salem Ridge Road, and Oakhall Drive are wide with slow traffic speeds.
- **Greenway trails:** Some greenway trails provide bicycling opportunities for both recreation and transportation.
- **Bicycle racks:** There are several bicycle racks at key destinations throughout Town including Womble Park, Veterans Park, Town Hall, Cultural Center, and Sunset Lake Commons
- **Existing State bike route** - The Cape Fear Run bike route comes through the region.



*Calm, wide Salem Ridge Road.*



### DEFICIENCIES OF EXISTING BICYCLE FACILITIES:

- **Lack of connectivity:** There are no on-road bicycle facilities within Holly Springs. There are short greenways that are not connected.
- **Design issues:** There is one existing wide sidewalk and one planned wide sidewalk that do not meet multi-use standards and are not adequate for bicyclists. For example, the Avent Ferry sidewalk is eight feet, which is just short of the minimum 10 foot standard for a multi-use sidepath. The planned wide sidewalk width along Bass Lake Road is also eight feet.
- **Bicycle parking needed:** Additional adequate and secure bicycle parking facilities need to be located throughout the study area through the usage of inverted U-racks.
- **Bicyclist behavior:** Bicyclists were not observed during fieldwork. However, the project Steering Committee noted that while many recreational bicyclists wear helmets and obey traffic laws, there are some bicyclists who ride in the wrong direction and do not wear helmets.

### STRENGTHS OF EXISTING ROAD NETWORK:

- **Residential street network:** Many residential collector roadways generally connect to destinations and to more than one arterial roadway.
- **Roadway/lane widths:** Several roadways throughout town, including Main Street, Holly Springs Road, and key neighborhood circulators are wide enough to offer bicycle lanes or other bicycle facilities through striping.
- **Shoulders:** Several of the roadways throughout Town have clear and level shoulders offering opportunity to add bicycle lanes, paved shoulders, or multi-use trails.

### DEFICIENCIES OF EXISTING ROAD NETWORK:

- **Connectivity issues:** There is a lack of connectivity between existing facilities and destinations with the NC 55 Bypass corridor barrier to mobility.
- **High-volume, high-speed roadways:** There are several high-volume commercial roadways and rural two-lane roadways throughout town with higher speeds and/or little shoulder where bicyclists are not safe. Some of these roads include the NC 55 Bypass, Sunset Lake Road, Holly Springs Road, and Bass Lake Road.
- **Narrow roadways and lanes:** There are also many roadways throughout the town that are too narrow for bicyclists to travel safely on them. These roads have little or no shoulder and have relatively high vehicle travel speeds which pose multiple hazards for bicyclists (such as Sunset Lake Road).
- **Roadways currently designed for automobile only:** Many roads were designed around the automobile and need to be redesigned or re-striped to become more bicycle friendly. Narrowing existing lanes and adding planted medians, sidewalks, and shade trees could also help reduce speeding and the hazards that speeding presents to cyclists, pedestrians, and drivers.
- **Future I-540 corridor:** At the time of this study, planning is underway with right-of-way and construction unfunded. However, there is potential for this freeway to create a real and perceived barrier to connectivity northbound from Holly Springs.



*The trail at the end of Anchor Creek is better suited for pedestrians.*



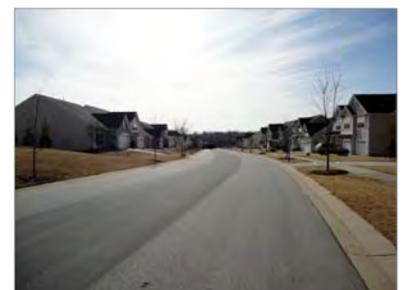
*Greenway trail in Springstone area.*



*Sunset Lake, like many two-lane roadways, features 1-2 foot paved shoulders, not enough space for bicyclists.*

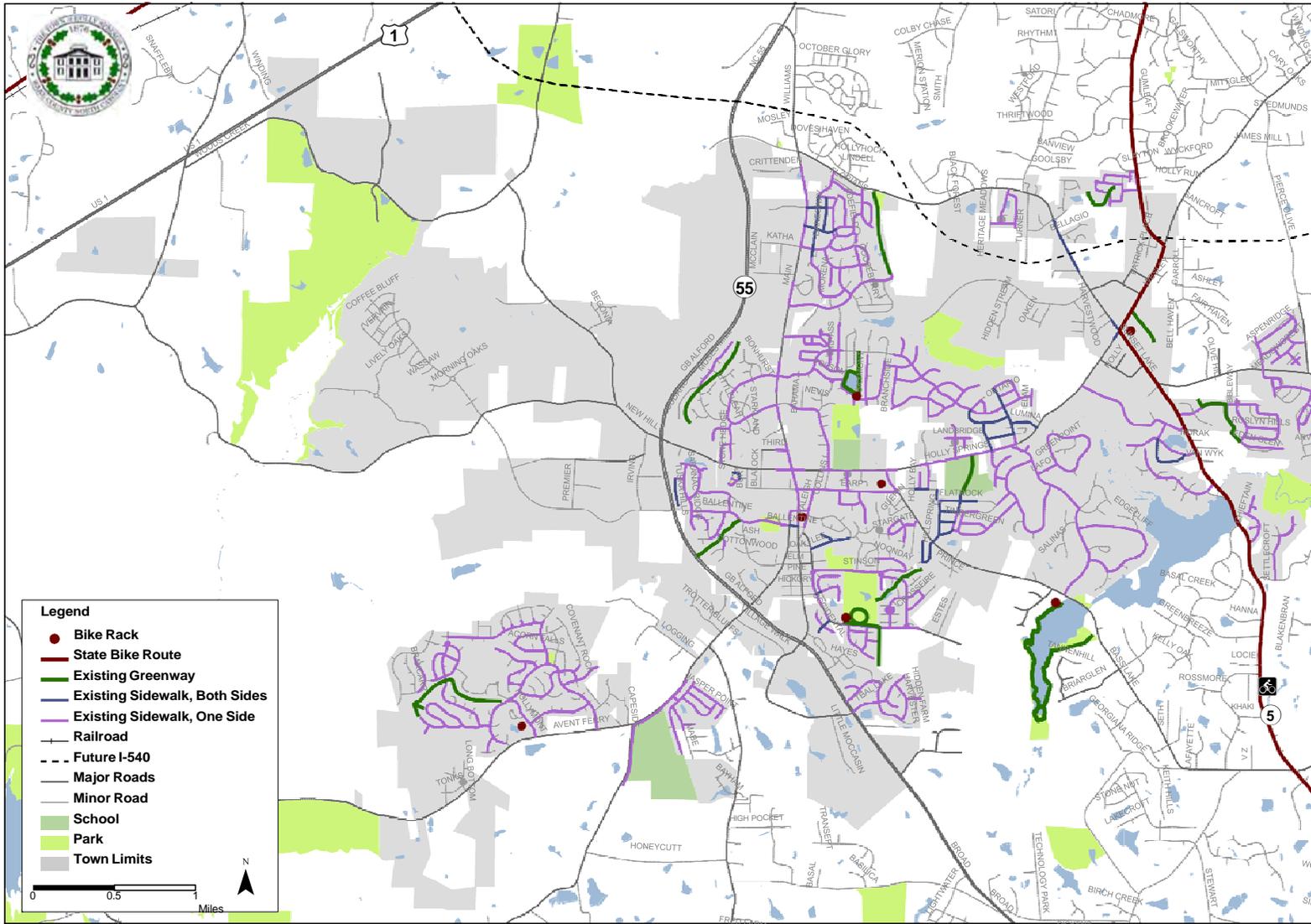


*Potential room on Main Street for a restripe to include bicycle lanes.*

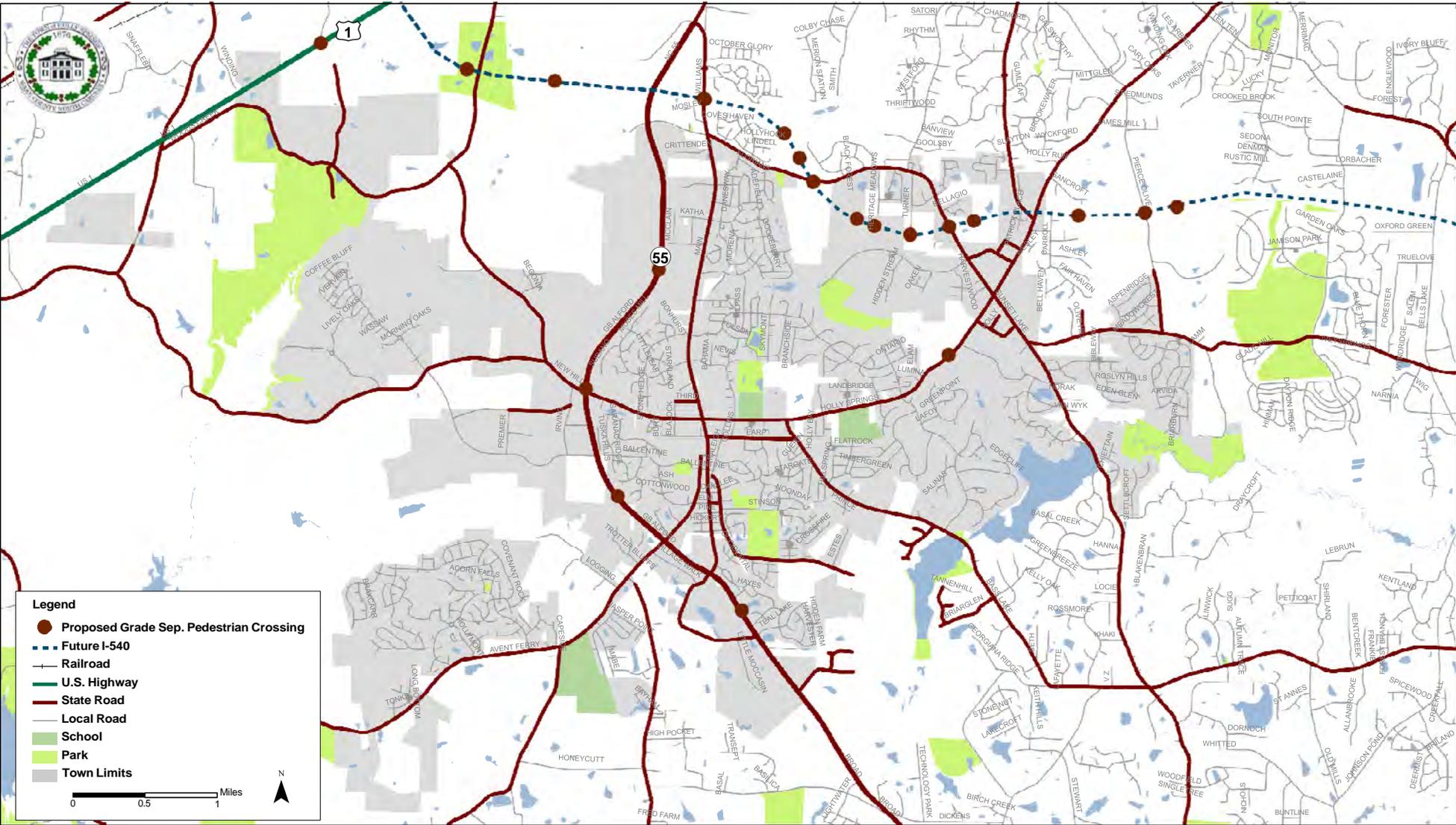


*Potential for bicycle lanes through striping on Anchor Creek Road.*

# MAP 2.1 EXISTING CONDITIONS



MAP 2.2 NCDOT OWNED & MAINTAINED ROADWAYS IN HOLLY SPRINGS





## Geographic Information Systems (GIS) Analysis

Geographic Information Systems (GIS) data was received from the Town of Holly Springs and Wake County during the development of this Plan. GIS data was also collected from Kimley Horn, the consultant working on the Holly Springs Comprehensive Transportation Plan during this study. The analysis included information about past bicycle-related accidents, popular destinations, land use, and demographic patterns that may be useful in assessing need for future bicycle facilities.

### BICYCLE CRASHES (MAP 2.3)

Bicycle crash data from 2000-2010 was provided by NCDOT and geocoded by Alta/Greenways. Twelve accidents were mapped and can be seen in the following bicycle crash map. The majority of crashes took place along arterial roadways with a few crashes in other locations.

TABLE 2.1 BICYCLE CRASHES IN Holly Springs, 2000-2010 (NCDOT)

<i>Bicycle Accident Location</i>	<i># of Accidents</i>
Sunset Lake Road	4
Holly Springs Road	3
Avent Ferry Road	2
NC 55	1
Cayman Avenue	1
Oakhall Drive	1
Trilake Drive	1

According to recent data from the National Highway Traffic Safety Administration ([www.nhtsa.gov](http://www.nhtsa.gov)), there has been a 14% reduction in fatalities among cyclists nationwide, between 1997 and 2007. However, a significant number of bicycle crashes requiring emergency room treatment are not included in these reported fatalities and injuries. Studies indicate that as few as 10% of injury crashes are reported to the police as they do not involve a motor vehicle, and/or do not happen on the roadway (League of American Bicyclists: Facts and Figures, 2010, [www.bikeleague.org](http://www.bikeleague.org)).

### TRIP ATTRACTORS (MAP 2.4)

People currently drive, walk, or bicycle to a variety of destinations across Holly Springs for various purposes. These potential destinations and points of origin for bicyclists are referred to in this document as ‘trip attractors’. Examples include:

- Downtown Holly Springs
- Parks and trails (Womble Park, Bass Lake Park, Veterans Park, Jones Park)
- Hunt Community Center, Cultural Center
- Public destinations (schools, library, etc.)
- Shopping locations (grocery stores, shopping centers, restaurants, drug stores, banks, etc.)
- Regional bicycling routes
- Places of employment (office centers, industrial park, retail areas, downtown)

Each of these categories of bicycle trip attractors will be considered when determining locations for recommended bicycle improvements. They represent important starting and ending points for bicycle travel and provide a good basis for planning ideal routes.

### LAND USE (MAP 2.5)

The Holly Springs Land Use map displays the current land use patterns within the Town. As shown, most of the Town is comprised of residential areas surrounding commercial, mixed use, public, and industrial areas. This pattern is typical of most small towns, with the downtown and arterial roadways being the main commercial areas. A significant industrial component of the Town is found west of the NC 55 Bypass. One challenge in the overall layout of the Town is the way in which the NC 55 Bypass bisects the western portion of Town, leaving many residents in close proximity to Downtown, but with very few options for direct access to Downtown. Also, the future I-540 corridor threatens bicycle and pedestrian connectivity to Apex and Holly Springs. The Town has several proposed grade-separated pedestrian crossings to help bicycle and pedestrian connectivity when I-540 is constructed (See Map 2.2).

### DEMOGRAPHIC ANALYSIS (MAP 2.6)

Needs and demands related to bicycling can be better understood through an analyses of demographic information. US Census demographic data provide geographic information such as the means of transportation to work and the percent of population not owning a vehicle. However this data is only available for the year 2000. In 2000, there was 0% bicycle mode share (compared to 0.2% for the State of North Carolina). Since Holly Springs has seen rapid development and change during this time, it is not helpful to analyze this information at this time. ***This demographic data should be analyzed when the 2010 Census results are available (scheduled for release in 2011).*** The following 2000 Census map of population density, though outdated, still provides a framework for analysis.

Map 2.6 (page 2-12) presents population density per square mile as recorded in the 2000 census. This map reveals that the more dense areas of Holly Springs were located within Downtown and areas to the north and east. Dense areas will be important to connect with the bicycle network, serving a greater numbers of residents.



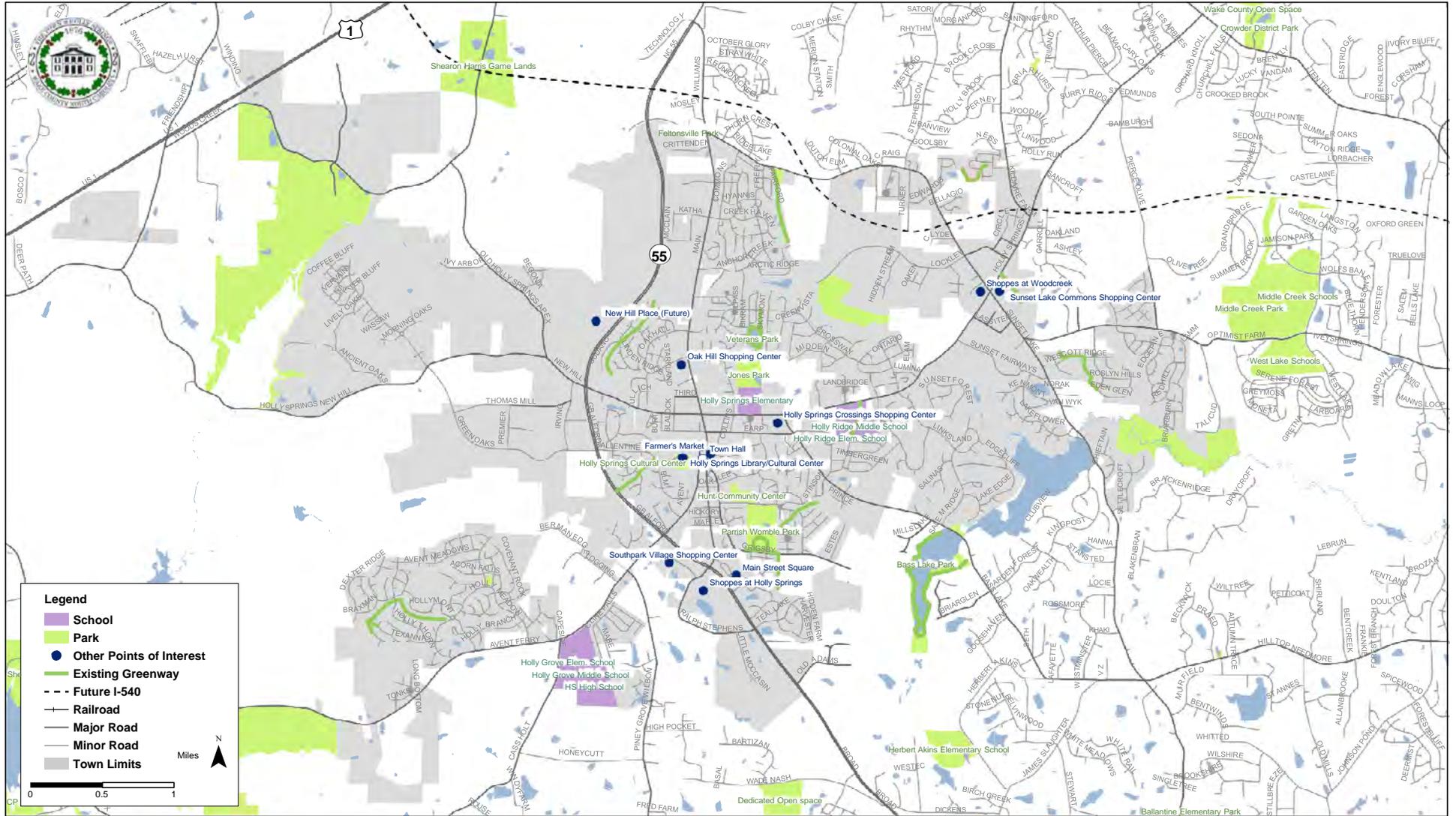
*Trip attractor examples:  
Downtown Holly Springs, schools, and Bass Lake Park*



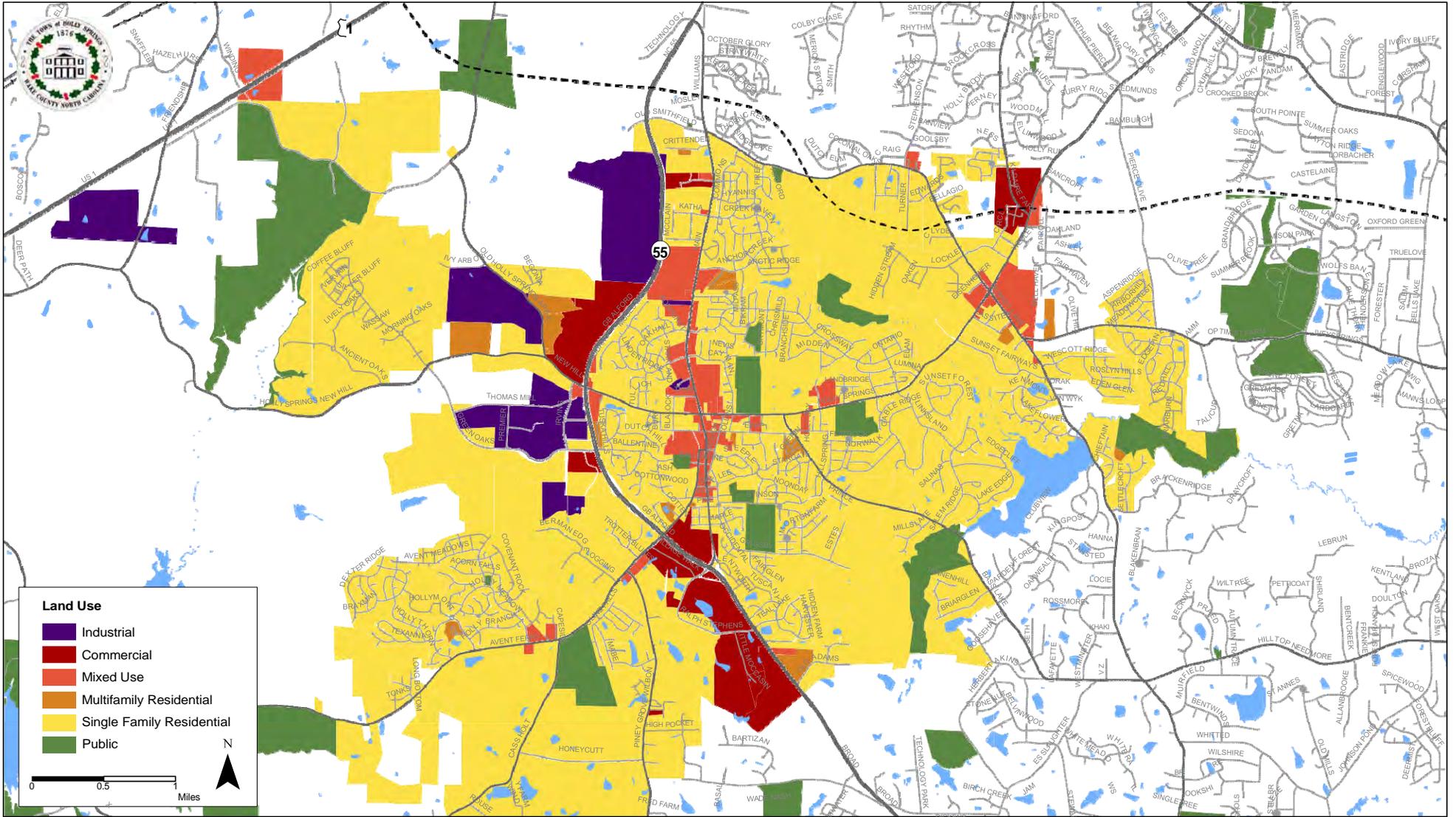
MAP 2.3 BICYCLE CRASHES WITHIN HOLLY SPRINGS



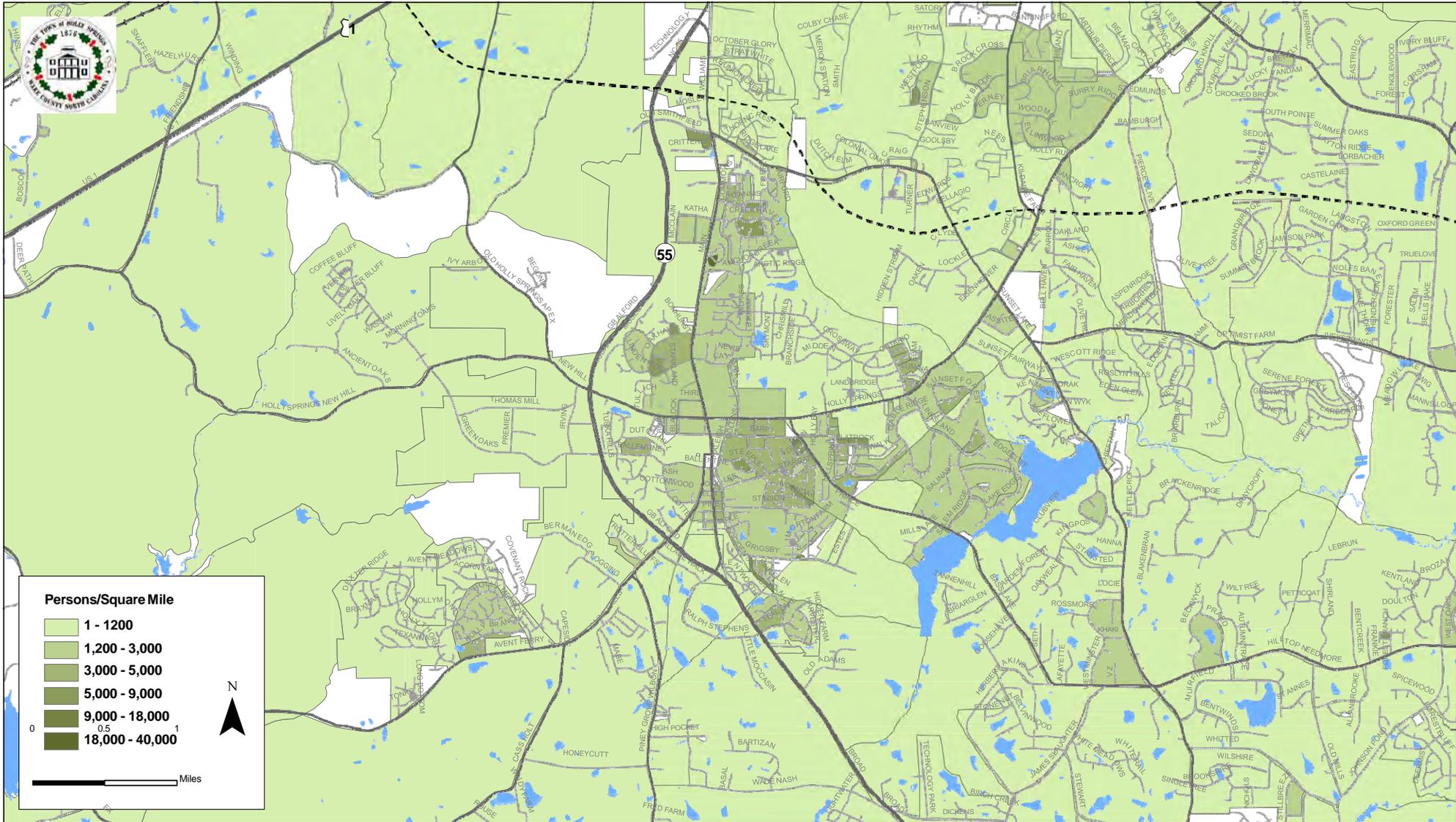
# MAP 2.4 TRIP ATTRACTORS



# MAP 2.5 LAND USE



MAP 2.6 POPULATION DENSITY PER SQUARE MILE, 2000 (BY CENSUS BLOCK)



## Public Comments Regarding Current Conditions

Below are a couple example graphs and tables that show the responses to several questions from the comment forms collected for the Holly Springs Bicycle Transportation Plan. Please refer to Appendix D for a full summary of public involvement.

### 4. Do you feel, in general, bicycling for daily needs (commuting to work, errands, etc.) in Holly Springs is:

		Response Percent	Response Count
Very Safe		1.3%	3
Somewhat Safe		15.7%	36
Neutral		14.0%	32
<b>Somewhat Dangerous</b>		<b>42.4%</b>	<b>97</b>
Very Dangerous		26.6%	61

### 9. Which of the following changes would encourage you to bike more often? (choose all that apply)

		Response Percent	Response Count
Increased enforcement on speeding		15.5%	35
Commute-by-bike programs or incentives		11.9%	27
Bicycle racks at destination		44.2%	100
<b>Improved off-road paths and greenways</b>		<b>80.5%</b>	<b>182</b>
Showers or locker rooms at workplace		8.4%	19
Map of bicycle routes		48.7%	110
More bicycle lanes		66.8%	151
More off road bike paths or greenways		76.5%	173
More programs and events for new cyclists		16.4%	37
Safety education		11.1%	25
Lower speed limits		6.2%	14
NOTHING		5.8%	13

## Summary of Related Plans

### Vision Holly Springs Comprehensive Plan

#### 1. Future Land Use

New Hill Road and GB Alford Highway are designated mixed-use corridors centers. Uses in this area should provide walkability and new development should be interconnected with sidewalks and greenways.

#### 2. Transportation

The transportation objectives for the Town of Holly Springs include:

- To develop and maintain a multi-modal transportation plan including bicycleway and greenway elements among others.
- Develop an interconnected system of sidewalks, greenways, bicycleways and trails to create more opportunities for physical activity.
- Plan and provide a safe bicycle route network throughout Town and connected to regional bicycle routes.

The existing bicycle and pedestrian circulation system of Holly Springs is limited. For example, there are approximately 8 miles of greenway corridors throughout the Town. The Town's Capital Improvement Plan prioritizes in linkage projects for sidewalks and greenways. The Town should focus on undertaking new sidewalks and greenway projects, and on modifying development requirements to get the needed connections build as new development is added.

#### 3. Parks, Recreation and Open Space

The Town of Holly Springs should seek to establish connections to the sidewalks, bicycle lanes, greenways and other recreation thoroughfares in surrounding communities. The Circulation Plan shows the proposed improvements to increase the connectivity of the greenways across town. The greenway corridor plan for the Town of Holly Springs is comprise of several elements, including parks, parkway systems and greenways. The proposed greenway system includes the following projects:

- A Primary Greenway Trail system, intended to be the major organizing corridors of the system that links each area of the Town.
- The Central "Loop" Greenway Trail runs through the downtown of Holly Springs.
- The Western Greenway Trail will accommodate the proposed future residential developments on the west side of the Town and provide access to the potential future waterfront of Harris Lake. It will connect with the "Loop" (the main greenway trail, circling the core of downtown)
- The Southern Greenway Trail will act as a link to the existing Harris Lake waterfront.
- A Secondary Greenway Trail system to complete minor Town connections.
- Connections with the proposed Bicycle Lanes and Trails of surrounding municipalities.

### Village District Area Plan

The center of Holly Springs is considered the Village District. The purpose of this Plan is to describe the community's vision for this District. Among the goals for the Plan is to provide bicycle and pedestrian connection within the District.

The Transportation, Access and Circulation chapter provides the recommendations listed below, to improve the Town's bicycle network.

- Provide better collector street connections between neighborhoods and the Village District by incorporating bicycle and pedestrian design elements.
- Require that new developments create a circulation plan that illustrates pedestrian connections to paths, bicycle facilities and transit if applicable.

- Include bicycle and pedestrian facilities that provide comfortable and safe options to travel through the Village District.
- Extend greenways and multi-use connections beyond the core of the Village District.
- Connect Lakeside community to existing Womble Park Greenway.
- Provide greenway connection between Avent Ferry Road and the Cultural Center.

Streetscape recommendations to include amenities that enhance the bicycle network include allocation of bicycle racks in public plazas and various locations across the Village District, as illustrated in the map ‘Streetscape Elements’ included in the Plan.

As part of the implementation program for this Plan, the document suggests to incorporate the greenway, and bicycle facilities ideas into the Town’s Bicycle and Pedestrian Master Plan.

### Northeast Gateway Plan

The Northeast Gateway Plan is a supplement to the Comprehensive Plan’s Future Land Use Plan and Thoroughfare Plans. The eastern entrance or ‘gateway’ to Holly Springs is located at the intersection of Sunset Lake Road and Holly Springs Road. The boundaries of these two corridors within the Town of Holly Springs demark the Northeast Gateway planning area. In order to promote the livability and community character of the corridor as an urban village, the Plan identified the following policies:

(2) Provide a pedestrian friendly environment: ... Greenways shall also be constructed to provide a natural connection between the residential subdivisions and the commercial center in accordance with the Northeast Gateway Land Use Plan.

- Transportation:
  - The greenway system will traverse the area and will connect to the sidewalk network.

### Capital Area Metropolitan planning organization - 2035 Long range Transportation Plan

The Town of Holly Springs is part of the North Carolina Capital Area. Based on transportation forecast models and the current congestion challenges in the planning area the Long Range Transportation Plan is set to meet the following transportation investments, among others:

- Bicycle and pedestrian facilities, both in independent projects and in concert with road projects.
- Transportation Demand Management: market and outreach efforts that increase the use of alternatives to driving alone.

In addition, the Plan also proposes the adoption of ‘complete streets’ polices to be part of the decision making process for regional transportation investments.

Some of the proposed Bicycle/Pedestrian projects located within the Holly Springs Town boundary include :

- Avent Ferry Road, from NC 55 Bypass to Cass Holt.
- Avent Ferry Road from Cass Holt to New Hill Holleman Road.
- Holly Springs New Hill Road, from Old Holly Springs Apex to New Hill Holleman.
- New Hill Holleman Road, from Old US 1 to Avent Ferry Road.

### Holly Springs Comprehensive Transportation Plan (2011)

The Town of Holly Springs developed the Comprehensive Transportation Plan (CTP) in concert with the Bicycle Transportation Plan. As these processes occurred during the same time, information and data was



shared to ensure the final products were not in conflict with each other. The CTP focuses on the overall transportation picture in Holly Springs, including all transportation modes. The Bicycle Network Map in the CTP was derived from this planning process.

### Holly Springs Pedestrian Transportation Plan (2007)

Through funding from the NCDOT Bicycle and Pedestrian Planning Grant Initiative, the Town of Holly Springs developed a Pedestrian Transportation Plan to address pedestrian needs. The plan recommended sidewalks, greenways, and roadway crossing improvements as part of a complete pedestrian network. Many of the greenways recommended in this Plan were multi-use and served as a starting point for greenway recommendations in this Bicycle Plan. The Plan also addresses programs, policies, implementation, and funding strategies.

### Beyond the Green: A Parks and Recreation Master Plan for the Town of Holly Springs, NC (2007)

Part of the Vision Statement for this Plan includes the development of a greenway system that connects parks, points of interest, and surrounding municipalities. A comprehensive greenway network was recommended with the vision and concept of connecting public places and neighborhoods in an effort to retain a Village-like atmosphere. A community survey was conducted during this study with 81% in agreement that the Town should expand its network of multi-use trails.

### Holly Springs Unified Development Ordinance

The Unified Development Ordinance (UDO) is analyzed in detail in Appendix C. Key UDO requirements as they impact this Plan are:

- Greenway construction is required with all projects, both residential and non-residential.
- Bicycle racks are required with new development.

## Conclusion

The Town of Holly Springs has many opportunities for improving bicycling conditions, and many great resources to develop such improvements. Below are the key findings of this chapter:

- Many potential on-road improvements for bicycling in Holly Springs are on NCDOT-owned and maintained roadways, and will therefore require close coordination with both the local division offices and the other regional transportation agencies, such as CAMPO.
- There are some opportunities for simple striping, restriping, and/or signage to install bicycle facilities. A network of neighborhood collector, low-speed roads offer effective alternatives for reaching destinations by bicycle in Holly Springs.
- Most bicycle accidents in Holly Springs have occurred along major roadway arterials.
- According to respondents from the public comment form, the most important improvement to encourage bicycling is more off-road trails/greenways and more bicycle lanes.
- Barriers to bicycle travel include the NC 55 Bypass and the future I-540 corridor. Grade-separated crossings or enhanced pedestrian crossing features will be necessary to maintain connectivity across the Town.
- In previous planning work, the Town has identified bicycle and pedestrian facilities, especially greenways, as key recommendations to occur during future growth.
- The Downtown (or Village District core) has become a major destination with the Town Hall, Historic Mims House, Cultural Center, and Library with many residents within biking and walking distance. There are opportunities to improve bicycle connectivity within and away from the Downtown core.
- There is significant interest from commuter and recreational bicyclists to have additional shoulder space or bicycle lanes on roadways leading into and away from Holly Springs.



**TABLE 2.2 EXISTING ROADWAY INVENTORY**

Road	From	To	Predominant Configuration	Appx. Lane Widths (Ft)*	Total Width	Curb & Gutter (yes / no / some)	Shoulder Type*	ROW Observations	2009 AADT*	Crash History	Ownership & Maintenance	Notes	Destinations	Speed Limit
Williams/Main	NC 55	Crossway	2LU (with many sections of 2LT)	11 11	Varies 24-70 (depending on subdivision entrance)	no (except at some subdivision entrances)	1	mostly flat, sidewalks for lot of it	15,000	no	NCDOT	This varies quite a bit again between two lane and with turn lane and at subdivision entrances, gets very wide again for right-hand turns, etc.	Residential areas; some commercial	35
Main	Crossway	Holly Springs Road	2LU/2LT	11 11 (dead median space and shoulder too); 10 10 10 on 2LT section	Varies depending on section (30-42)	some	1	sidewalk in places, varying ditches/width of ROW		yes	NCDOT	Bike lane restripe, but won't be same type of restripe all the way through; some places you get rid of dead median space, sometimes rid of dead shoulder; sometimes dealing with right-turn lanes; may need to reduce sp from 35 to 25	Downtown;	35
Main	Holly Springs Road	Rogers Road	2LT	12 12 12	36 (40 curb to curb)	yes	n/a	some sidewalks; large lot residential	13,000	no	NCDOT	3 lane, Town Hall, Downtown; lots of traffic, would really like to get bike lanes here-with 40ft curb to curb, bike lane restripe could work	Town Hall; library, commercial; residential	25
Main/Ralph Stephens	Rogers Road	NC 55 Bypass	2LU	11 11	24	no (until close to 55 Bypass)	2ft paved; 1,2,4	mostly large lot residential, varying ditches, utilities		no	??	Mostly no C&G; w lane, minor ditches; considerable traffic; can this be bike lane/new construction or paved shoulder new construction	Main Street Square; SouthPark Village towards Downtown	35
Ralph Stephens	NC 55 Bypass	NC 55 Bypass	2LU	10 10	20	no (until close to 55 Bypass)	1,2	mostly rural, open		no	NCDOT	Shopping centers at 55 Bypass; could be bike lane or paved shoulder-new construction (need to see development plans for this corridor)	Wal-Mart shopping center;	35
Holly Springs	NC 55 Bypass	N Main Street	2LU	9.5 9.5	22	no (except near NC 55 Bypass)	1,2; 1-2ft paved shoulder	varying ditches, some sections of space for shoulder widening	3,800	no	NCDOT	2 lane, becomes more rural, some home lots along; possibly do a wider paved shoulder	Downtown; Main Street commercial, residential	35
Holly Springs	N Main Street	Bass Lake Road	2LT, 2LU	Varies	22-70	some	1	some sidewalk; some residential driveways	14,000	yes	NCDOT	Inconsistent cross section again; very wide to very narrow (wide sections could be restripe); went down to 2LU nearer Main St.	school, park, commercial, residential	35



Road	From	To	Predominant Configuration	Appx. Lane Widths (Ft) *	Total Width	Curb & Gutter (yes / no / some)	Shoulder Type*	ROW Observations	2009 AADT*	Crash History	Ownership & Maintenance	Notes	Destinations	Speed Limit
Holly Springs	Bass Lake Road	Linksland	2LT with significant extra shoulder space up to curb with lots of turn-in lanes		46-70 (depending on size of that shoulder space)	yes	n/a	sidewalk, foot trails, utilities	13,000	yes	NCDOT	Width of entire road varies quite a bit with inconsistently sized wide "shoulders" that are not for traffic or parking, sometimes turn-in lanes are provided; recommend bike lane restripe; restripe will require significant attention to proper striping for right-turn lanes and bike lanes	school, shopping center; residential; apts at Linksland	35
Holly Springs	Linksland	Sunset Lake	2LU with some center turn at times	10.5 10.5	24	no (except at some subdivision entrances)	1, 2; 1-2ft paved	varying ditches, some utilities, wooded in stretches	13,000	yes	NCDOT	very narrow bridge; maybe do bike lane or PS new construction	residential areas; shopping centers at Holly Springs and Sunset lake	35
Holly Springs	Sunset Lake	Town Boundary	2LU	10.5 10.5	24	no (except near Sunset Lake shopping center area)	1, 2; 1-2ft paved	varying ditches, some utilities	6,600	yes	NCDOT	heading to a rural setting; maybe do PSnew construction	shopping center at Sunset Lake	45
Sunset Lake	Williams	Holly Springs Road	2LU with some center turn at times	9 9	24 (varies to much wider at new development)	no (except at some subdivision entrances)	1,2; 1-3ft paved	varying ditches, some utilities	5,400	yes	NCDOT	more of a rural; same characteristic with coming up on subdivisions - suddenly curb, turn lane, and wide right-turn lane setting; could do BL or PS new construction; really need to see thoroughfare plan on all these b/c new development will impact this	shopping center at Sunset Lake; residential areas	45
Sunset Lake	Lassiter	Holy Springs Road	4LD	11 11	22	Yes	n/a	sidewalks with buffer		yes	NCDOT	Characteristic changes with 4 lane divided median at Sunset Lake Commons	Sunset Lake Commons-grocery; neighborhoods; traffic picks up	35
Sunset Lake	Lassiter	Bass Lake Road	2LU (occasional center turn for subdivision entrance)	10 10	23 (some subdivision entrances with turn lanes and wider roads)	no	1,2	some open, some forested; drainage varies, mailboxes	12,000	no	NCDOT	Mostly rural with subdivisions coming into it; probably should recommend paved shoulder here or bike lane new construction	Neighborhoods; commercial at Holly Springs Road	35



Road	From	To	Predominant Configuration	Appx. Lane Widths (Ft) *	Total Width	Curb & Gutter (yes / no / some)	Shoulder Type*	ROW Observations	2009 AADT*	Crash History	Ownership & Maintenance	Notes	Destinations	Speed Limit
Optimist Farm	Sunset Lake Road	Town Boundary	2LU (occasional center turn for subdivision entrance)	10 10	20	no	1-ft paved; 1,2,3	some open, some forested, drainage varies	5,700	no	NCDOT	relatively forested roadway with subdivisions coming into it; bike lane or paved shoulder new construction probably best solution	Neighborhoods; to near Sunset Lake Commons-grocery	45
Bass Lake	Holly Springs Road	Bass Lake Park	2LU; short section of center turn wider	9 9	19	No (brief in wider section)	1,2	mostly trees, some open; drainage varies some utilities	5,000	no	NCDOT	2 lane rural roadway; would have to widen to get PS or BL	Bass Lake Park; commercial at Holly Springs Rd.	35
Bass Lake	Bass Lake Park	Sunset Lake Road	2LU	9 9	19	No	1,2	Ditches vary, some utilities; mailboxes in way some; short sections of 1-2 degraded paved shoulder		no	NCDOT	2 lane rural; some subdivisions, no C&G; drainage ditches, mailboxes; would recommended paved shoulder	Bass lake Park, many neighborhoods	35-45
Oakhall	Main	Main	2LU	unmarked	26.5 (29.5 with gutter pan)	gutter pan (no curb)	n/a	sidewalk one side		yes	Local	2 lane unmarked residential road; so close to a bike lane stripe, but might look small utilizing gutter pan; could so sharrow or signed bike route	Neighborhoods; neighborhood park	20
Springstone/Crossway	Main	Linksland	2LU	unmarked	24 (with gutter pan)	gutter pan (no curb)	n/a	sidewalk one side		no	Local	Similar to Oakhall but narrower, so maybe needs to be signed bike route (can't fit bike lanes) - maybe do sharrow marking	neighborhoods, park	20
Anchor Creek	Main	End of road	2LU	unmarked	30	gutter pan (no curb)	n/a	sidewalk one side		no	Local	30 without gutter pan so easy bike lane stripe	neighborhoods, proposed greenway	20
Linksland	Crossway	Holly Springs Road	2LU	unmarked	30	gutter pan (no curb)	n/a	sidewalk both sides and trees		no	Local	OSP for townhomes; 30 ft without c&g so striping would work; however, may need to do sharrows if many cars are parked on street; traffic circle here; lots of OSP closer to Holly Springs so sharrow may fit here	neighborhoods to mixed use, pizza place, and schools	20



Road	From	To	Predominant Configuration	Appx. Lane Widths (Ft)*	Total Width	Curb & Gutter (yes / no / some)	Shoulder Type*	ROW Observations	2009 AADT*	Crash History	Ownership & Maintenance	Notes	Destinations	Speed Limit
Linksland	Holly Springs Road	Salem Ridge	2LU	unmarked	29.5 (with gutter pan)	gutter pan (no curb)	n/a	sidewalk one side; driveways, mailboxes, etc		no	Local	Could probably fit bike lane stripe with narrowing to 9 foot travel lanes	neighborhoods, school; golf course	20
Salem Ridge	Linksland	Bass Lake	2LU	unmarked	29 (with gutter pan)	gutter pan (no curb)	n/a	sidewalk on one side, driveways, etc.		no	Local	Could probably fit bike lane stripe with narrowing to 9 foot travel lanes	neighborhoods, Bass Lake Park	20
Gable Ridge	Linksland	Linksland	2LU	unmarked	28.5 (with gutter pan)	gutter pan (no curb)	n/a	sidewalk on one side, driveways, etc.		no	Local	Could probably fit bike lane stripe with narrowing to 9 foot travel lanes; could also be just fine as signed bike route	neighborhoods, potentially part of e-w route across town	20
Stinson	Grigsby	Bass Lake	2LU	unmarked	26.5	yes-some sections with curb on one side	1, 2, 3, 4	sidewalk on one side, driveways, etc.		no	Local	Speed humps on this road to slow traffic; some OSP near center; maybe sharrow here; could be part of recreation bike loop - serves as collector in a way	park; community center, neighborhoods	15-20
Raleigh	Holly Springs Road	Grigsby	2LU	unmarked	19-20	no	1,2,3	some driveways, varying drainage		no	Local?	Narrow residential roadway; could serve as signed route with sharrow?	Downtown, vicinity of parks and Holly Springs Elementary	20
Grigsby	Raleigh	Estes	2LU	unmarked	23.5-25	some; usually on one side but switches sides	1, 2	drainage varies; some utility	1,900	no	Local	Residential, pretty calm road; road widens in some areas with C&G on one residential side from Fair Glen-25feet (wish we could do bike lanes but not quite wide enough); could add enough width to do 30 feet and fit bike lanes - most of stretch has one side with wide curb	Park, neighborhoods, Downtown	25
Earp	Burt	Raleigh	2LU	unmarked	20	no	1,2,3,4	drainage varies; some utility		no	Local	narrow, quiet road; nothing needed except maybe signed route (possibly with sharrow)	cemetery, Downtown, residential	25



Road	From	To	Predominant Configuration	Appx. Lane Widths (Ft)*	Total Width	Curb & Gutter (yes / no / some)	Shoulder Type*	ROW Observations	2009 AADT*	Crash History	Ownership & Maintenance	Notes	Destinations	Speed Limit
Earp	Raleigh	Bass Lake	2LU	8 8 8	20ft to Raleigh; 26ft with gutter	some (north side only)	2,3	sidewalk on one side, ditches, some utilities		no	Local	this is stretch with random parking marked on the north side; could be striped paved shoulder here with signed route (so it doesn't have to be 5 feet for bike lanes); OR keep 8 foot lanes and do 5' bike lanes	Downtown, schools, residential; shopping center at Bass lake - Lowes foods	25
Burt	Holly Springs Road	Earp	2LU	unmarked	20	no	1,2,3	drainage varies, some vegetation		no	Local	narrow quiet road; extension of Earp to Holly Spring Road	residential	
Avent Ferry	Ballentine	Center	2L-OSP	10 10	28	Yes	n/a	parking, limited;		no	NCDOT	For this stretch, Town Hall is here; C&G, OSP on north side; Oppty for sharrow marking here	Town Hall; Library	25
Avent Ferry	Ballentine	NC 55 Bypass	2LU	10 10	22.5	No	2-some ditches; 1-2ft paved shoulder	Appears to be wide, flat ROW on east side but not good near 55 Bypass		yes	NCDOT	Great sidepath oppty from Downtown to Elm; However, not good from Elm to 55	55Bypass area and Town Hall/Downtown	35
Avent Ferry	Jasper Point	Cass Holt	2LT	11 12 11 (in front of school); wide shoulder on south side in front of schools	50 (west of schools to beyond schools);	Some	2 ft paved and 8 ft SW; 1-relatively clear and level	big lots/ farms north side; schools/residential south side		yes	NCDOT	Farmland and suburban; Possible to slightly widen wide sidewalk to 10 ft sidepath	Schools; subdivisions	35
Avent Ferry	Jasper Point	NC 55 Bypass	2LT		40	No	1 (1-2 ft paved now)	utility one side; forested and open at times	14,000	yes	NCDOT	Probably should continue sidepath, but width opportunity for bike lanes in future	Schools; Holly Springs Fire Dept., NC 55 - Southpark Village - grocery/pharmacy	35
Avent Ferry	Cass Holt	Town Boundary	2LU		25	NO; until near Cass Holt	2 ft paved; 1, 2, and 3	space on north side	8,200	yes	NCDOT	Forested, generally undeveloped; drainage ditches but several feet from pavement; infrequent driveways; Possible for paved shoulder or sidepath on north side; approaching Cass Holt, turn lane comes in, some curb and gutter	Subdivisions and schools at Cass Holt	

Road	From	To	Predominant Configuration	Appx. Lane Widths (Ft)*	Total Width	Curb & Gutter (yes / no / some)	Shoulder Type*	ROW Observations	2009 AADT*	Crash History	Ownership & Maintenance	Notes	Destinations	Speed Limit
Cass Holt	Avent Ferry	Honeycutt	2LU		23	no (some near Avent Ferry)	1ft-paved; 1, 2	open and forested at times; varying ditches; sidewalk adjacent to school property	6,000	no	NCDOT	Generally rural; some drainage ditches but paved shoulder is possibility; likely paved shoulder - new construction recommendation unless much future development is expected	Schools at Avent Ferry/Cass Holt	45
Piney Grove Wilbon	Avent Ferry	Honeycutt	2LU		23	no	1-2ft paved; 1,2	mostly open; forested at times; varying ditches	6,500	no	NCDOT	Generally rural; some drainage ditches but paved shoulder is possibility; likely paved shoulder - new construction recommendation unless much future development is expected	Towards NC 55 Bypass and near schools	45
Ballentine	Raleigh St.	Traffic Circle behind library	2LU	Unmarked	22-26	yes	n/a	sidewalk on one or both sides; on-street parking for substantial length of segment		no	Local??	Downtown Holly Springs area; with onstreet parking, narrow roadway width, sharrow markings would be best recommendation	Town Hall; Downtown; Library, neighborhoods	20
Ballentine	Traffic Circle behind library	NC 55 Bypass	2LU	Unmarked	29-30 with gutter pan	gutter pan (no curb)	n/a	sidewalk on one side; driveways and mailboxes		no	Local?	Connects residential with Downtown; wide enough to probably incorporate bike lanes by striping, or signed route	Library; neighborhoods; towards Industrial Park (NC 55 Bypass)	20
Elm	Ballentine	Grigsby	2LU	Unmarked	22-32	Some; C&G from Avent Ferry to Ballentine	n/a	yards		no	Local	Mostly residential; range of small to big lots; oppty for bike lane stripe in C&G section (some OSP is happening)	Neighborhoods; park	25
Green Oaks	NC 55 Bypass	New Hill Rd	4LD	12 12 median 12 12	24; 26.5 with gutter pan	yes	n/a	railing; sidewalk on one side		no	NCDOT?	Industrial, wide open, forest too; opportunity for bike lane restripe as the two lanes each side of median is 24 without gutter; gutter pan is smooth so with 26.5, restripe is definitely feasible	Industrial locations (HOLLY SPRINGS BUSINESS PARK), brewery, recreational riding towards countryside	35





Road	From	To	Predominant Configuration	Appx. Lane Widths (Ft) *	Total Width	Curb & Gutter (yes / no / some)	Shoulder Type*	ROW Observations	2009 AADT*	Crash History	Ownership & Maintenance	Notes	Destinations	Speed Limit
New Hill Rd	NC 55 Bypass	Town Boundary	2LU	9.5-10 9.5-10	20.5-22	no (except right at Green Oaks)	1,2	some utilities, varying ditches	1,600	no	NCDOT?	more rural character; some sections that have flat shoulder that could be widened fairly easily	recreational riding; countryside - connecting into Town	35 briefly until Old Holly Springs Apex, then 55
Old Holly Springs Apex	New Hill Rd	Woods Creek	2LU	9.5-10 9.5-10	22	no	1,2	mostly forested; varying ditches	2,000	no	NCDOT	Rural, forested character; likely a paved shoulder new construction recommendation unless known new development is coming (then it could be bike lane new construction)	recreational riding - connecting into and out of town	35/45
Woods Creek	Old Holly Springs Apex	Town Boundary	2LU	9.5-10 9.5-10	22	no	1,2	mostly forested; varying ditches	320	no	NCDOT	Rural, forested character; likely a paved shoulder new construction recommendation unless known new development is coming (then it could be bike lane new construction)	recreational riding - connecting into and out of town	45





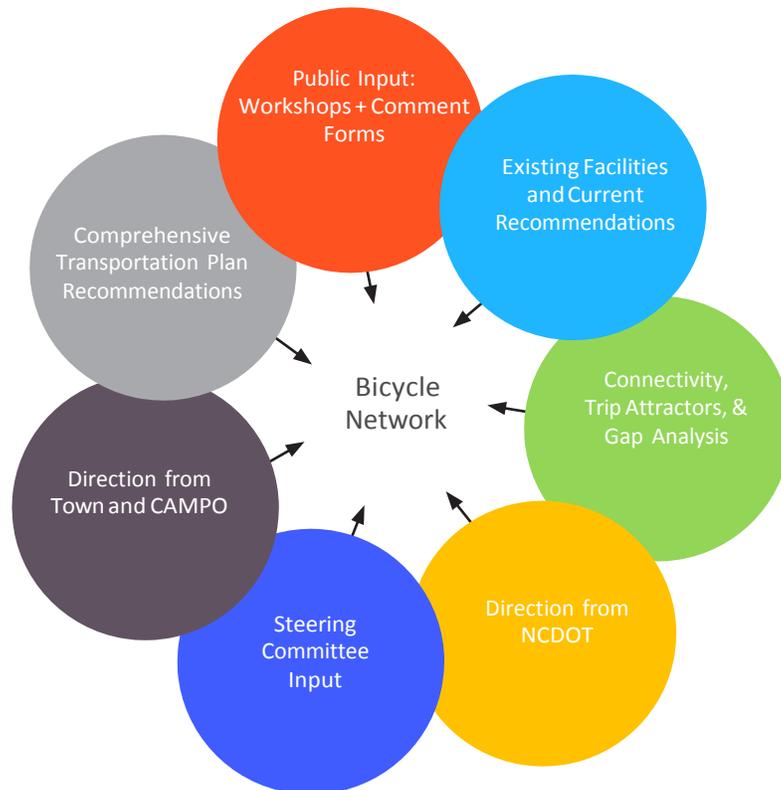
# 3. Recommendations

## Overview

The recommended bicycle network (page 3-3) represents a connected system that will allow transportation and recreation-based bicycle travel throughout Holly Springs. The recommended network is composed of numerous types of on-street and off-street bicycle facilities that serve to connect people and neighborhoods to local destinations. This chapter contains descriptions of the bicycle facility types, an overall map, and individual cutsheets that describe priority segments of the overall network.

The Top 20 bicycle network cutsheets in this chapter were determined through this planning process largely based on Committee, Staff, and public input. These projects have been divided into two groups: 1) low-cost, near-term solutions, and 2) longer-term solutions to coincide with roadway reconstruction/widening. The Town can begin work on the first group of projects as many are on local roads and are low-cost. However, it is highly unlikely that the bicycle network will be built in the order presented in this chapter. Bicycle facility construction will also be opportunity-based as bicycle lanes should be added during future arterial and collector roadway widenings and as shown on Map 3.1.

*This diagram illustrates the many inputs and levels of analysis used to design the Bicycle Facility Network.*





## Recommended Bicycle Facilities

Bicyclists have the same rights and responsibilities as motorists and are allowed to ride on all roads in Holly Springs. Modifications to roadways in Holly Springs, as well as the addition of off-street pathways, will make bicycling a safer and more viable form of transportation. Below are brief descriptions of six types of bicycle facilities recommended in Holly Springs. **For a comprehensive guide to bicycle facilities, see Appendix A.**

Colors correspond to Map 3.1



**Bicycle Lanes** A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicyclists. The minimum width for a bicycle lane is four feet; five- and six-foot bicycle lanes are typical for collector and arterial roads. Bicycle lanes can be striped on existing roadways, sometimes with modifications to travel lane widths and configuration. There are some opportunities for bicycle lanes in Holly Springs in the short term. As a general practice, any local arterial or collector that is widened should incorporate bicycle lanes with speed limit reduction considerations.



**Multi-Use Trails/Greenways** Multi-use trails are completely separated from motorized vehicular traffic and are constructed in their own corridor, often within parks, open spaces, or alongside utility corridors. Multi-use paths include bicycle paths, rail-trails or other facilities built for bicycle and pedestrian traffic.



**Side Paths** Multi-use trails located within the roadway corridor right-of-way, or adjacent to roads, are called 'side paths'. Side paths are most appropriate in corridors with few driveways and intersections and should be at least 10' wide. Bicycle routes where side paths are recommended should also have adequate on-road bicycle facilities (such as paved shoulders or bicycle lanes) wherever possible. Many times, sidepaths are used in place of a sidewalk and can be used by bicyclists and pedestrians.



**Paved Shoulders** Paved shoulders are the part of a roadway which is contiguous and on the same level as the regularly traveled portion of the roadway. There is no minimum width for paved shoulders; however a width of at least four feet is preferred. Ideally, paved shoulders should be included in the construction of new roadways and/or the upgrade of existing roadways, especially where there is a need to more safely accommodate bicycles. In this plan, paved shoulders should also be implemented as the short-term solution during resurfacing in all locations where bike lanes are recommended in Map 3.1 before curb and gutter is added.

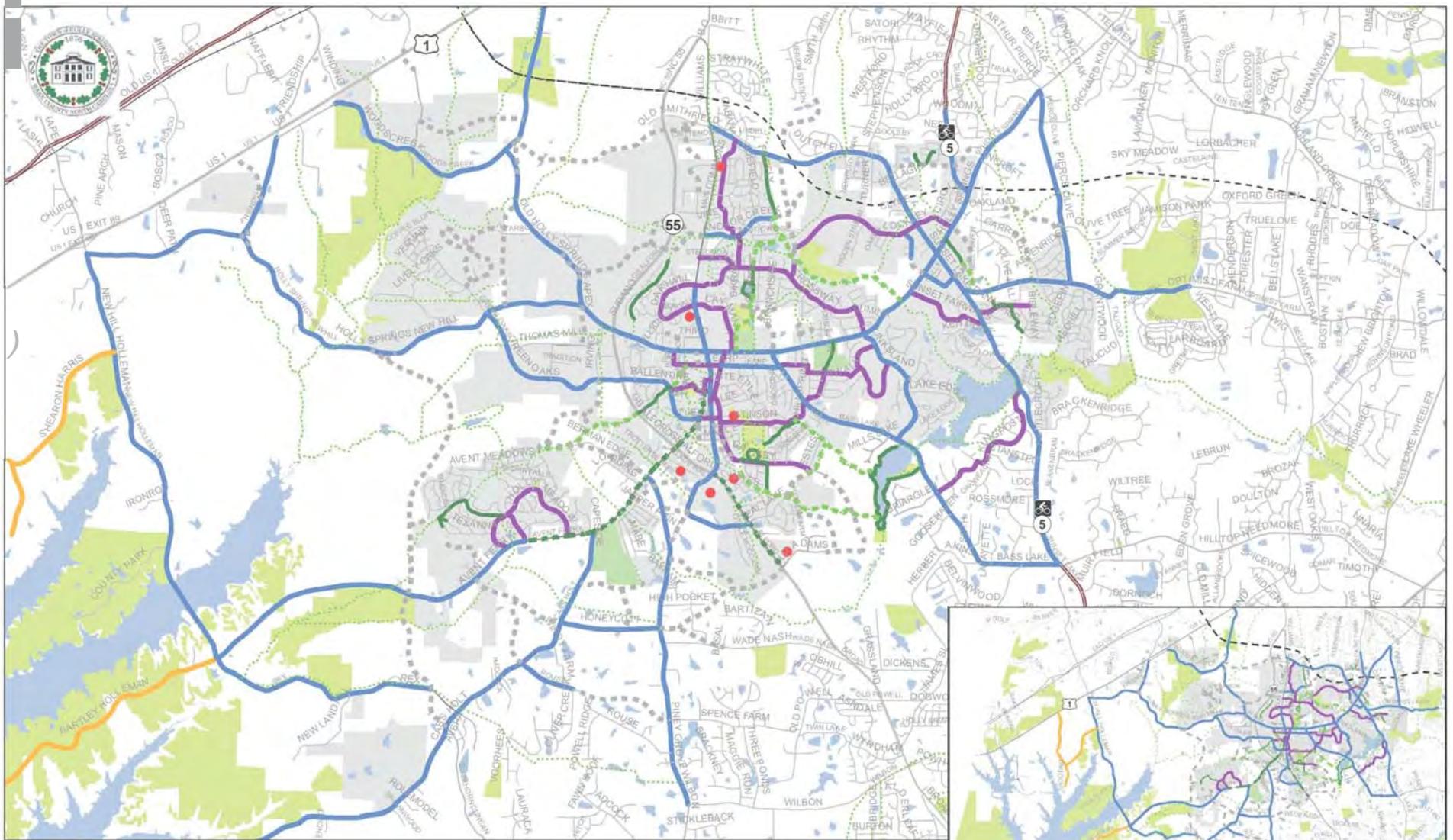


**Signed Bicycle Routes** Rather than a specific bicycle facility type, these routes contain combinations of facilities, if any. This Plan recommends several signed routes that connect destinations in areas where no special bicycle facilities are needed (due to lower traffic speeds and volumes). A loop of these routes is recommended in Map 3.1. A more comprehensive signed bicycle route system is recommended as the bicycle facility network develops.

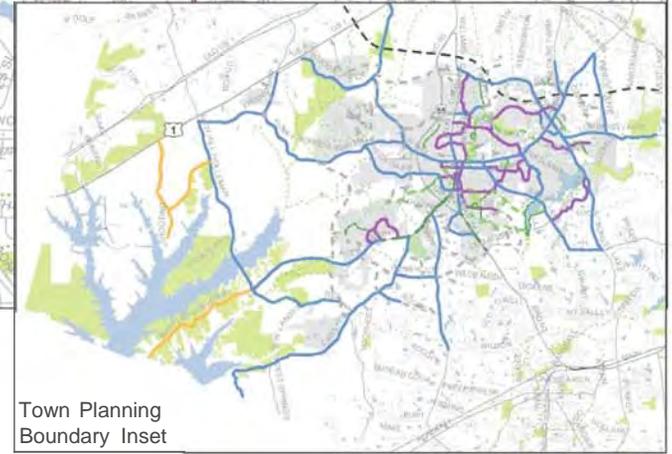


**Bicycle Shared-Lane Markings (Sharrows)** Shared lane markings, or "sharrows," are placed in a linear pattern along a corridor, typically every 100-250 feet and after intersections. They make motorists more aware of the potential presence of cyclists; direct cyclists to ride in the proper direction; and remind cyclists to ride further from parked cars to avoid 'dooring' collisions.

# Map 3.1 Overall Bicycle Facility Network



- Legend
- Proposed Bike Rack
  - Existing Greenway
  - - - Key Recommended Greenways
  - · - · - Recommended Greenway Network
  - Bike Lane
  - - - Paved Shoulder
  - - - Sharrow or Signed Route
  - · - · - Sidepath
  - - - Streets
  - - - Future Road (From CTP) - Bike Lane
  - - - State Bike Route
  - - - Railroad
  - - - Future 1-540
  - Major Roads
  - - - Minor Road
  - - - School
  - - - Park
  - - - Town Limits

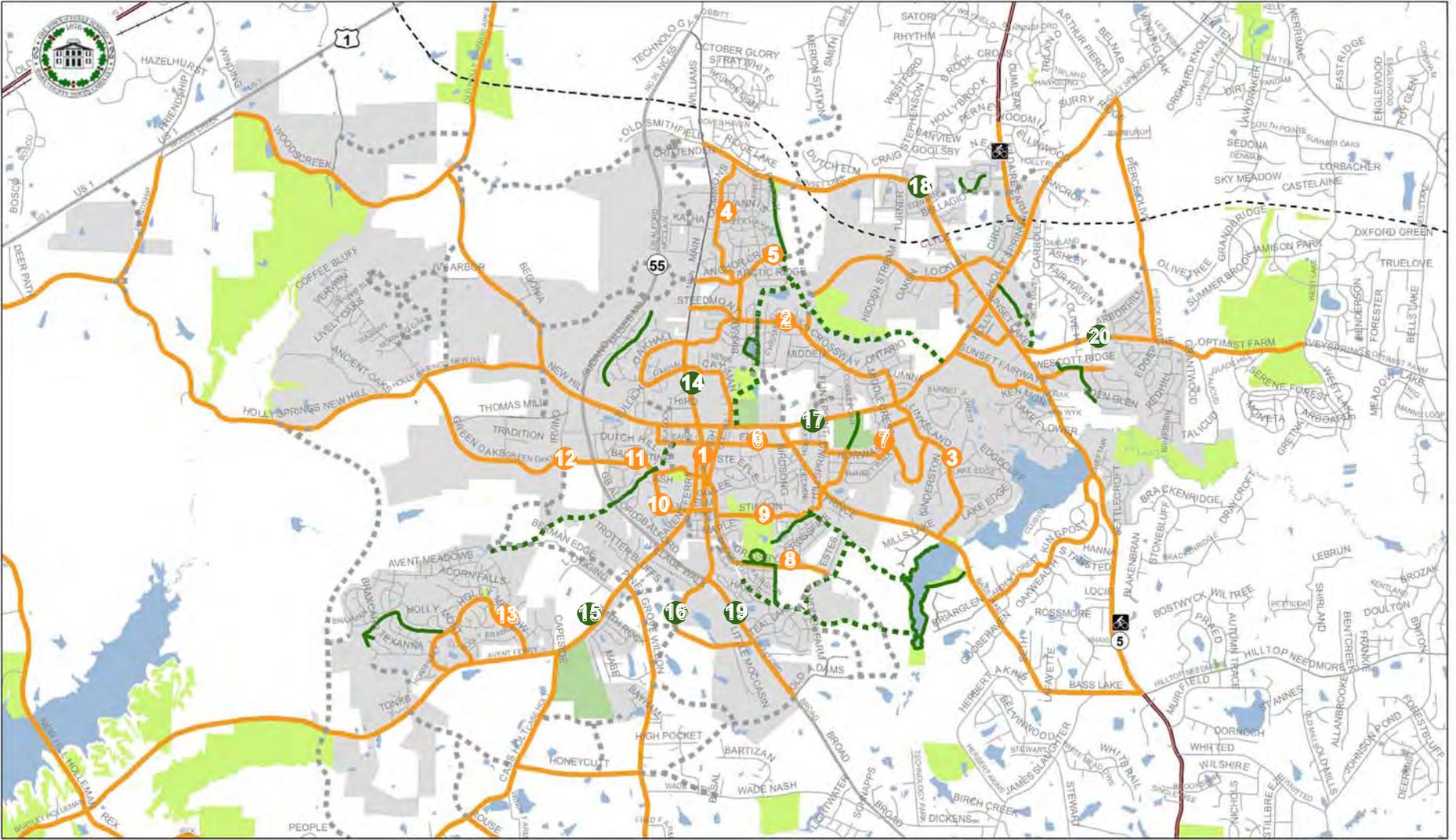


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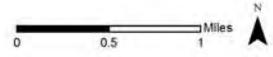
# Map 3.2 Project Cutsheet Key

The following pages offer details for bicycle facility recommendations on Holly Springs roadways. The numbers on the map below represent key portions of the recommended network and correspond to the following table and project cutsheets, providing Town staff, NCDOT staff, and related transportation agencies with a clear picture of this Plan’s recommendations. The orange numbers represent near-term, low-cost solutions while the green numbers represent longer-term solutions to be constructed primarily during future roadway widenings.



- Existing Greenway
- Key Greenway Recommendations
- On-road Recommendations (includes sidepaths)
- Streets
- Future Road (From CTP) - Bike Lane
- State Bike Route
- Railroad
- Future I-540
- Major Roads
- Minor Road
- School
- Park
- Town Limits

Project ID # (for planning purposes, not in order of priority)





**Table 3.1 Summary of Recommended Facilities\***

ID #	Road/Corridor	Facility Type	Feet	Miles	Description
<b>Short-term (Low Cost) Projects</b>					
1	Main Street (from Holly Springs Road to Rogers Road)	Bicycle Lanes	2,300	0.44	A restriping of Main Street is recommended to fit bicycle lanes. This will require narrowing of existing travel lanes in the 3-lane cross section. <i>Comprehensive Transportation Plan (CTP): 3 lane widening</i>
2	Crossway Lane (from Main Street to Linksland Drive)	Signed Bicycle Route	8,600	1.6	A signed bicycle route is recommended for this neighborhood collector. Wayfinding signage should be provided. <i>Comprehensive Transportation Plan (CTP): 2 lane collector existing</i>
3	Linksland Drive/ Salem Ridge Road (from Crossway Lane to Bass Lake Road)	Bicycle Lanes/ Sharrows	7,500	1.4	Sharrows are recommended on segment between Crossway and Holly Springs Road (where on-street parking is present). Bicycle lanes, through simple striping, are recommended from Holly Springs Road to Bass Lake Road where there is adequate roadway width. <i>Comprehensive Transportation Plan (CTP): 2 lane collector existing</i>
4	Milpass/Arbor Crest/Commons (from Crossway Lane to Sunset Lake Road)	Signed Bicycle Route	6,600	1.25	A signed bicycle route is recommended for this neighborhood collector. Wayfinding signage should be provided. <i>Comprehensive Transportation Plan (CTP): Nothing</i>
5	Anchor Creek Way (from N. Main Street to greenway)	Bicycle Lanes	3,650	0.69	Bicycle lanes, through simple striping, are recommended due to adequate roadway width. <i>Comprehensive Transportation Plan (CTP): 2 lane collector existing</i>
6	Earp Street/Burt Street (from Holly Springs Road to Bass Lake Road)	Signed Bicycle Route, Bicycle Lanes	5,450	1.03	A signed bicycle route is recommended on the narrow, unmarked two lane portion of Earp from Burt to Raleigh. Bicycle lanes, through restriping, are recommended on Earp from Raleigh to Bass Lake so that bicycle lanes are on both sides of the road. Bicycle lanes should be added with any future roadway widening (which is recommended in CTP).
7	Earp Street/Flat Rock Lane/Gable Ridge Lane/Holly Park Drive	Signed Bicycle Route	10,750	2.04	A signed bicycle route is recommended on these neighborhood roads. Wayfinding signage should be provided. <i>Comprehensive Transportation Plan (CTP): Nothing</i>
8	Raleigh Street/ Grigsby Avenue (from Holly Springs Road to Estes Drive)	Signed Bicycle Route	8,800	1.67	A signed bicycle route is recommended on these neighborhood collector roads. Wayfinding signage should be provided. Bicycle lanes should be considered with any future roadway widening (which is recommended in CTP). <i>Comprehensive Transportation Plan (CTP): 3 lane widening (Raleigh) and 2 lane</i>
9	Stinson Avenue (from Grigsby Avenue to Bass Lake Road)	Sharrows/ Signed Bicycle Route	4,500	0.85	Sharrows are recommended from Grigsby to Indian Hill, where on-street parking is present at the park. A signed bicycle route is recommended from Indian Hill to Bass Lake. <i>Comprehensive Transportation Plan (CTP): Nothing</i>
10	Elm Avenue (from Grigsby Avenue to Ballentine Street)	Bicycle Lanes/ Signed Bicycle Route	3,300	0.63	Bicycle lanes, through simple striping, are recommended where the roadway is of adequate width between Ballentine and Avent Ferry). A signed bicycle route is recommended on the narrower portion from Avent Ferry to Grigsby. <i>Comprehensive Transportation Plan (CTP): No change.</i>

\*Cost estimates are provided in project cutsheets on the following pages.



ID #	Road/Corridor	Facility Type	Feet	Miles	Description
11	Ballentine Street (from NC 55 Bypass to Raleigh Street)	Bicycle Lanes/ Sharrows	4,400	0.83	Bicycle lanes, through simple striping, are recommended where the roadway is of adequate width between NC 55 Bypass and the traffic circle. Sharrows are recommended from the Traffic circle to Raleigh Street (where on-street parking is present). <i>Comprehensive Transportation Plan (CTP): 2 lane collector existing</i>
12	Green Oaks Parkway (from NC 55 Bypass to Holly Springs New Hill Road)	Bicycle Lanes	8,000	1.5	Bicycle lanes, through restriping, are recommended. This will require narrowing of existing travel lanes to accommodate bicycle lanes. <i>Comprehensive Transportation Plan (CTP): 4 lane median divided existing</i>
13	Holly Meadow Drive/Hollymont Drive	Signed Bicycle Routes	8,300	1.6	A signed bicycle route is recommended on these neighborhood roads. <i>Comprehensive Transportation Plan (CTP): No change.</i>
<b>Longer-term (Opportunity-based) Projects</b>					
14	Main Street (from Holly Springs Road to Oakhall Drive)	Bicycle Lanes	3,150	0.59	A restriping of Main Street is recommended to fit bicycle lanes. This will require narrowing of existing travel lanes in the 3-lane cross section. <i>Comprehensive Transportation Plan (CTP): 3 lane widening</i>
15	Avent Ferry Road (from Hollymont Road to Ballentine)	Sidepath	11,700	2.2	Sidepath is recommended along Avent Ferry Road. This may require some right-of-way acquisition for portions. Highly-visible crosswalks should be provided where sidepath crosses roadways. Bicycle lanes should be considered as alternative with roadway widening (which is recommended in CTP). <i>Comprehensive Transportation Plan (CTP): 4 lane median divided widening</i>
16	Main Street/Ralph Stephens Road (from Rogers to NC 55 Bypass)	Bicycle Lanes	8,500	1.6	Bicycle lanes should be added when roadway is widened or reconstructed in future to be coincident with new development. <i>Comprehensive Transportation Plan (CTP): 3 lane widening (Main Street) and 4 lane divided median (Ralph Stephens).</i>
17	Holly Springs Road (from Burt Road to Linksland Drive)	Bicycle Lanes	8,550	1.6	This section features a wide variety of lane configurations and roadway widths. In general, bicycle lanes, through restriping and future widening, should be provided. Speed limit reduction should be considered as well. <i>Comprehensive Transportation Plan (CTP): 4 lane median divided widening</i>
18	Sunset Lake Road (from Williams Street to Lockley Road)	Bicycle Lanes	11,800	2.2	Bicycle lanes or paved shoulder should be added along Sunset Lake Road to be coincident with development/widening. Where new development does not occur, additional paved shoulder width should be added. <i>Comprehensive Transportation Plan (CTP): 4 lane median divided widening</i>
19	NC 55 Bypass (from Main Street to southern town boundary)	Sidepath	5,300	1.0	This section of NC 55 Bypass is not controlled. With new development anticipated, a sidepath should be provided along the east side of the NC 55 Bypass. This may require some right-of-way acquisition for portions. Highly-visible crosswalks should be provided where sidepath crosses roadways. <i>Comprehensive Transportation Plan (CTP): 6 lane median divided widening</i>
20	Optimist Farm Road (from Sunset Lake Road to Town boundary)	Paved Shoulders or Bicycle Lanes	5,500	1.04	Bicycle lanes or paved shoulder should be added along Optimist Farm Road to be coincident with development/widening. Where new development does not occur, additional paved shoulder width should be added. <i>Comprehensive Transportation Plan (CTP): 4 lane median divided widening</i>



## *Other Facilities*

In addition to the detailed recommendations found through the rest of the chapter, there are other key components of the overall network. These are share-the-road signage, other signed routes, intersection improvements, rural-roadway paved shoulders, greenways, and the inclusion of bicycle facilities on future roadways.

### Share the Road Signage

A short-term solution is to ensure Share the Road signage (see page A-52) is placed along commonly used bicycle routes. This is not a complete solution but does alert motorists to the potential presence of bicyclists. Major roadways and routes identified by the public in the comment form that would be ideal for this signage include:

- Holly Springs Road
- Avent Ferry Road
- Main Street
- Bass Lake Road
- Sunset Lake Road
- Optimist Farm Road
- Pierce-Olive Road
- New Hill - New Hill-Holleman

### Signed Routes

A number of important signed routes were identified as Top 20 projects in the previous table and following pages. The additional roads below would serve as ideal bicycle signed routes as part of an overall system that get bicyclists to/from destinations. These include:

- Oakhall Drive
- Steedmont Drive
- Sunset Fairways Road
- Cypress Ford Drive/Kingpost Drive/Arden Forest Road
- Cayman Drive
- Lockley Road
- Creekvista Drive connection

### Intersection Improvements

Intersection improvements are a part of a complete bicycle network. In the public comment form, there were several key intersection crossings identified as barriers that need improvement. Implementing pedestrian crossing improvements are an effective way to make it safer for bicyclists who are more comfortable with dismounting and walking. In the long term, the Town should also consider advanced bicycle intersection treatments discussed in Appendix A. The intersections below should be improved (as also detailed in the Holly Springs Pedestrian Transportation Plan). These intersections are found along recommended bicycle corridors.



Intersection	High-visibility marked cross-walks (page A-25)	Countdown signal (see page A-29)	Median refuge island (see page A-27)	Other
Avent Ferry & NC 55	Yes	Yes	Yes	No
Holly Springs & Main	Yes	Yes	Yes	No
Holly Springs & Sunset Lake	Yes	Yes	Yes	No
Main & NC 55	Yes	Yes	Yes	No
Holly Springs & Bass Lake	Yes	Yes	No	No
Holly Springs & Linksland	Yes	No	No	Consider signalization, HAWK signal, or flashing lights (see page A-53)

### Rural Roadway Paved Shoulders

Recreational bicycling is very common across this region of the Triangle. During this planning process, it was identified that many bicyclists ride westward and southward to and from Holly Springs into rural two-lane road settings. Most rural roadways in their existing configuration, only feature a 1-2 foot paved shoulder which is not adequate for bicyclists. Roadways in which paved shoulders should be added or widened to a minimum of five feet are shown on Map 3.1. Also, for those roadways in which bicycle lanes are recommended in Map 3.1, paved shoulders should be the short-term solution advanced during resurfacing (before curb and gutter are added). In many cases, the CTP recommends that the existing, common two-lane arterials be widened to four lanes with curb and gutter. In these cases, bicycle lanes should be developed as shown in Map 3.1. Current two-lane roads that would still benefit from short-term paved shoulder widening include:

- Sunset Lake Road
- New Hill Road
- Old Holly Springs Apex Road
- Cass Holt Road
- Bass Lake Road
- Holly Springs Road
- Optimist Farm Road
- Rex Road
- Avent Ferry Road
- Holly Springs New Hill Road
- Piney Grove Wilbon Road
- Honeycutt Road
- Kildaire Farm Road
- Pierce Olive Road
- Buckhorn Duncan Road

### Greenways

Off-road bicycle options are the most highly desired facility types identified during this planning process. Families and novice bicyclists are most comfortable in an off-road situation. Therefore, the greenway network is a very integral part of the overall bicycle network. The construction of greenways should be a priority of the Town of Holly Springs Parks & Recreation. A comprehensive greenway system was identified through the Holly Springs pedestrian planning process in 2007, the Parks and Recreation Master Plan (“Beyond the Green”) in 2007, through general Wake County planning, and has been modified slightly during the CTP planning process. Key multi-use paved greenways were selected from the overall greenway network during this process as being important for bicycle connectivity and transportation. These greenways and the overall recommended greenway network are displayed in Map 3.1 and described below:



- *Anchor Creek Way greenway* - The greenway that can be accessed at the end of Anchor Creek Way should be extended southward to both Crossway (existing greenway) and to Holly Springs Road
- *Crossway -Veterans Park - Holly Springs Elementary greenway* - This greenway should be formalized and extended through Holly Springs Elementary to Holly Springs Road.
- *Ballentine-NC 55 greenway* - The existing greenway that extends from near NC 55 Bypass to Ballentine should be extended northward to Earp and southward to the Holly Glen subdivision (utilizing the NC 55 Bypass underpass).
- *Stinson connection to Bass Lake Park greenway* - This would connect Bass Lake Park directly to neighborhoods to the north and west allowing for travel to/from park without having to follow a roadway.
- *Grigsby connection to Bass Lake Park greenway* - This would connect Bass Lake Park directly to neighborhoods to the south and west and to existing Womble Park trails.
- *Optimist Farm connection to Sunset Lake shopping center* - This would connect existing greenway at Sunset Lake shopping center to Optimist Farm allowing off-road travel as an alternative to travel along Sunset Lake Road.

### Bicycle Facilities on New Roadways

Bicycle lanes, paved shoulders, or sidepaths should be included in all new roadway design in the Town of Holly Springs, especially as it connects to the recommended bicycle network of this Plan. The approximate alignment of future roadways are shown in Map 3.1 and are shown in detail in the 2011 Comprehensive Transportation Plan.

### Bicycle Parking

Bicycle parking is an important component of a comprehensive bicycle network. A considerable amount of bicycle parking exists as shown in Chapter 2. However, bicycle racks should be provided at all commercial centers, parks, and multi-family housing communities. Bicycle parking is recommended to be retrofitted at the following locations and shown in Map 3.1:

- Oak Hill Shopping Center
- Hunt Center
- Shoppes at Holly Springs
- Southpark Village Shopping Center
- Main Street Square
- Southern Roast Coffee (N. Main Street)
- Pecan Grove Apartments

# Project Cutsheet 1:

## Main Street

To/From: Holly Springs/Rogers

Distance (feet): 2,300

Facility Type: Bicycle Lane

### Construction Method:

The existing three-lane cross section would be retained with narrower travel lanes and bicycle lanes added. This will only require restriping of the existing roadway. The Town will need to coordinate with NCDOT to ensure that bike lane widths meet state guidelines.

**Trip Generators:** Downtown Holly Springs, Library, Cultural Center, Town Hall, Farmers Market, Parks, residential areas

### Development/Funding

#### Mechanism:

Encroachment Agreement from Local NCDOT. Local CIP funding for bicycle lane markings and signage

### Road/Land Ownership:

NCDOT, transferring to Town

### Existing Lane

#### Configuration:

2 Lane w/ Center Turn:  
12' | 12' | 12' (40' curb to curb)

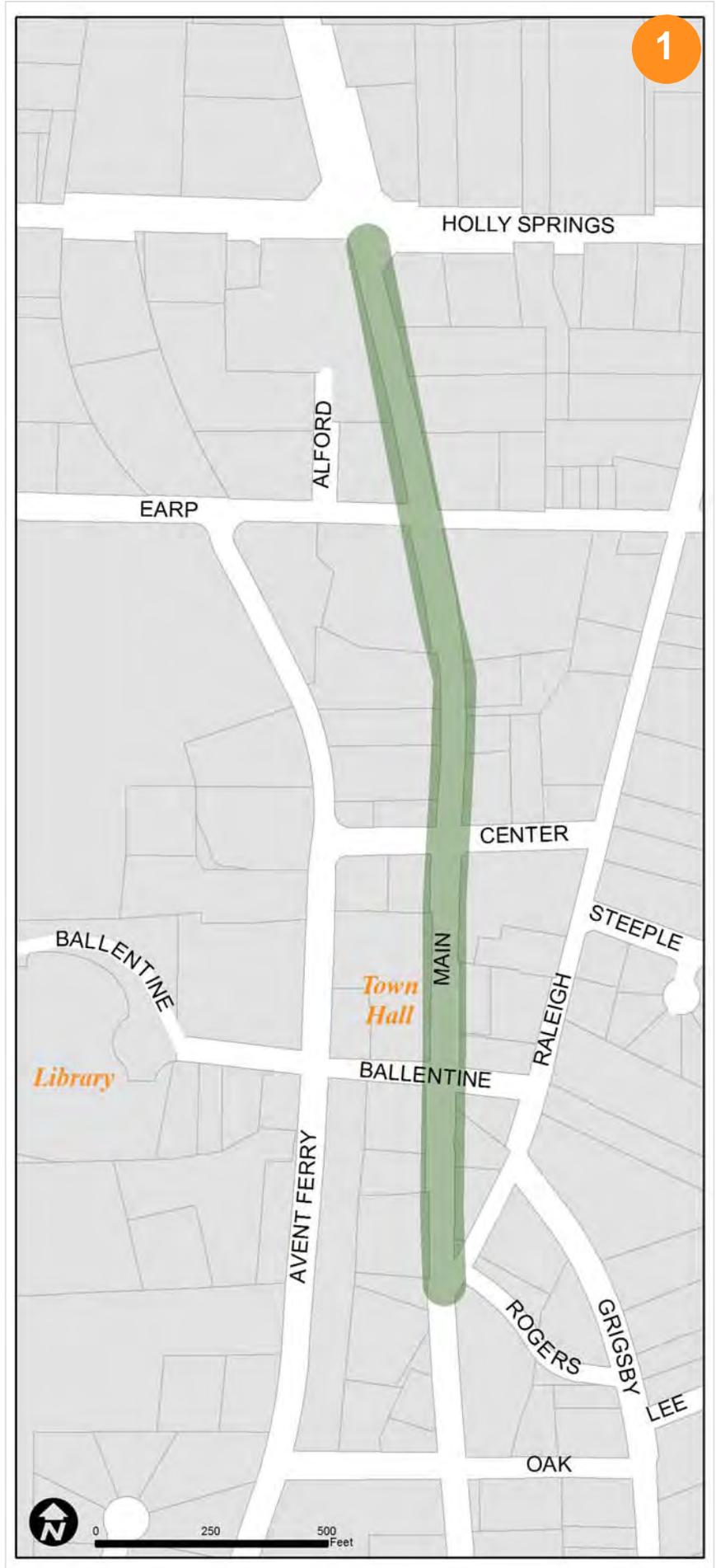
### Proposed Lane

#### Configuration:

2 Lane w/ Center Turn  
and Bicycle Lanes:  
5' | 10' | 10' | 10' | 5'

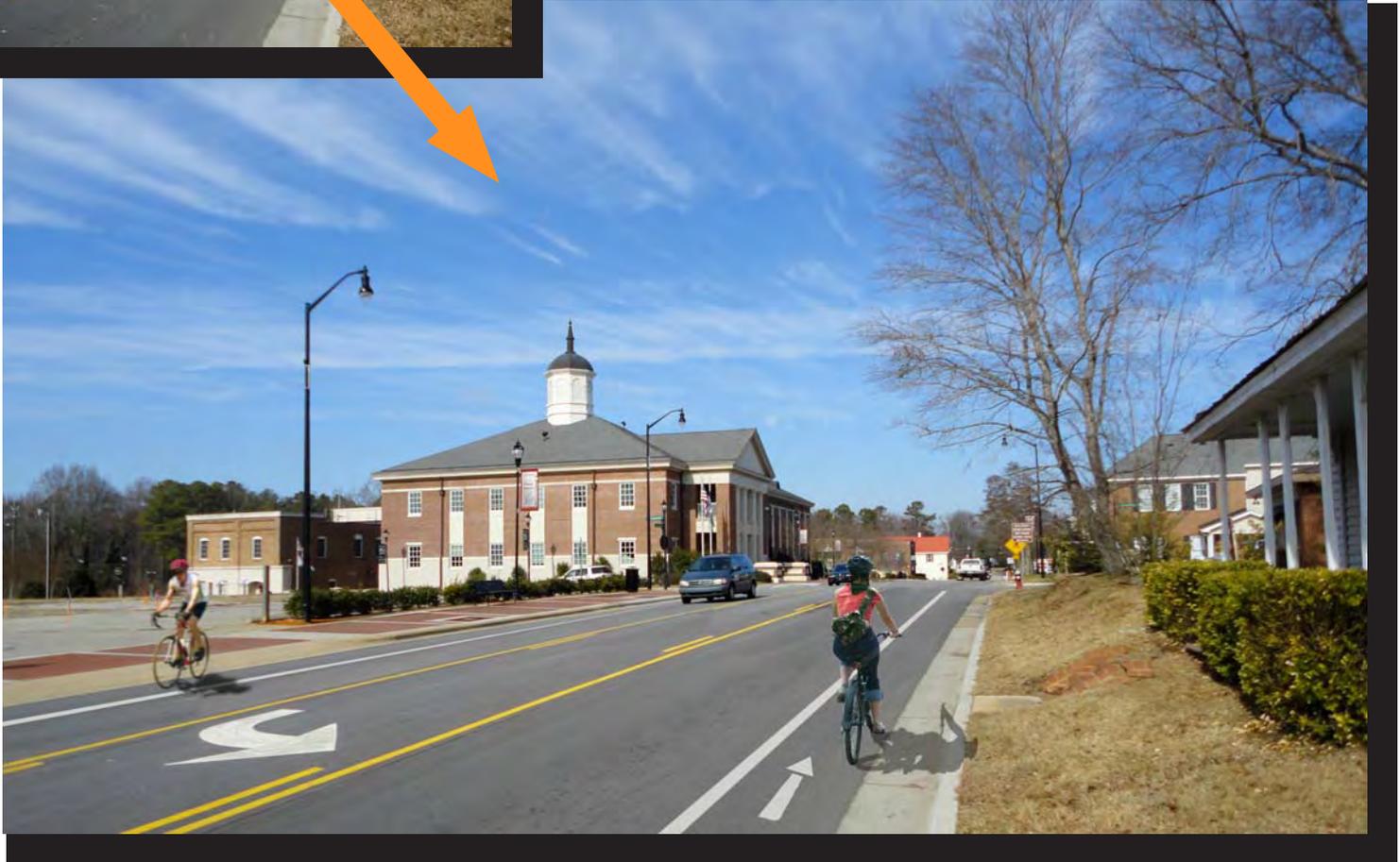
**Notes/Comments:** This is a low cost opportunity, through restriping, to create the first major segment of the proposed bicycle network for Holly Springs. As the central roadway through the Downtown, the goal of the Town is to enhance multi-modal access and to slow automobile traffic. With the Highway 55 Bypass looping around town, this roadway should maintain less through car travel and slower travel. Establishing bicycle lanes on Main Street would bring significant visibility to the goals of the Town and this planning process. Shared-lane markings may be used as an alternative if necessary.

**Holly Springs Comprehensive Transportation Plan (CTP):** 3 lane widening.





*Left: Existing Conditions along Main Street, near Rogers  
Below: Photo rendering showing the addition of bicycle lanes through restriping.*



*Project Cost - \$10,879.00\* (Removal of two stripes, restripe four stripes, pavement markings, signs).  
Project cost eliminated if done during resurfacing.  
\*This cost is only a planning-level estimate.*

## Project Cutsheet 2:

### Crossway Lane

To/From: Main/Linksland

Distance (feet): 8,600

Facility Type: Signed Bicycle Route

#### Construction Method:

The existing unmarked, 2-lane, neighborhood cross section would be retained. This will only require signage. Pavement markings may be considered but are not necessary.

**Trip Generators:** Veterans Park, residential areas, Linksland mixed-use

#### Development/Funding Mechanism:

Local CIP funding for wayfinding signage and pavement markings.

**Road/Land Ownership:**  
Town

#### Existing Lane Configuration:

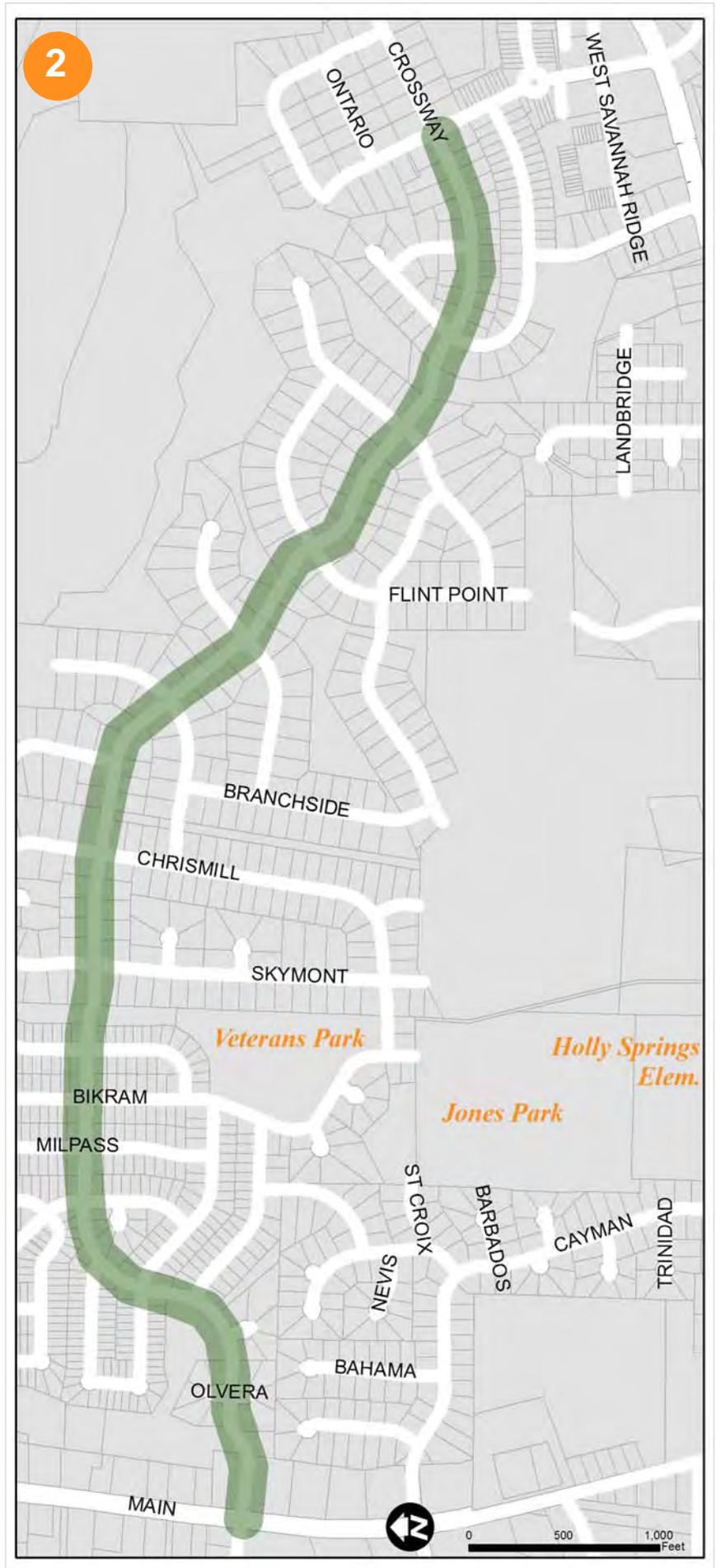
Unmarked 2 lane  
24' curb to curb (with gutter pan)

#### Proposed Lane Configuration:

No change

**Notes/Comments:** This is a low cost opportunity, through bicycle route and wayfinding signage, to create a long distance, neighborhood route. Crossway provides a low-traffic, low-speed east-west connection through Holly Springs. Wayfinding signage along the route should be provided giving information to bicyclists about the locations of key destinations.

CTP: 2 lane collector existing.





*Above: Existing Conditions along Crossway. As a neighborhood collector roadway, conditions are already safe for bicyclists. The addition of wayfinding signage will enhance the community and provide information for reaching key destinations.*

**Project Cost - \$7,912.00\*** (Addition of bicycle route signage and wayfinding signage).

*\*This cost is only a planning-level estimate.*

### Project Cutsheet 3:

#### Linksland Drive / Salem Ridge Road

To/From: Crossway/Bass Lake

Distance (feet): 7,500

Facility Type: Bicycle Lane/Sharrow

**Construction Method:**

The existing unmarked, 2-lane, neighborhood cross section is wide enough for the addition of bicycle lanes from Holly Springs Road to Bass Lake Road. Sharrows are recommended along Linksland from Crossway to Holly Springs (where on-street parking is present).

**Trip Generators:** Linksland multi-use area, Bass Lake Park, residential areas

**Development/Funding Mechanism:**

Local CIP funding for bicycle lane markings, striping, and signage.

**Road/Land Ownership:**

Town

**Existing Lane Configuration:**

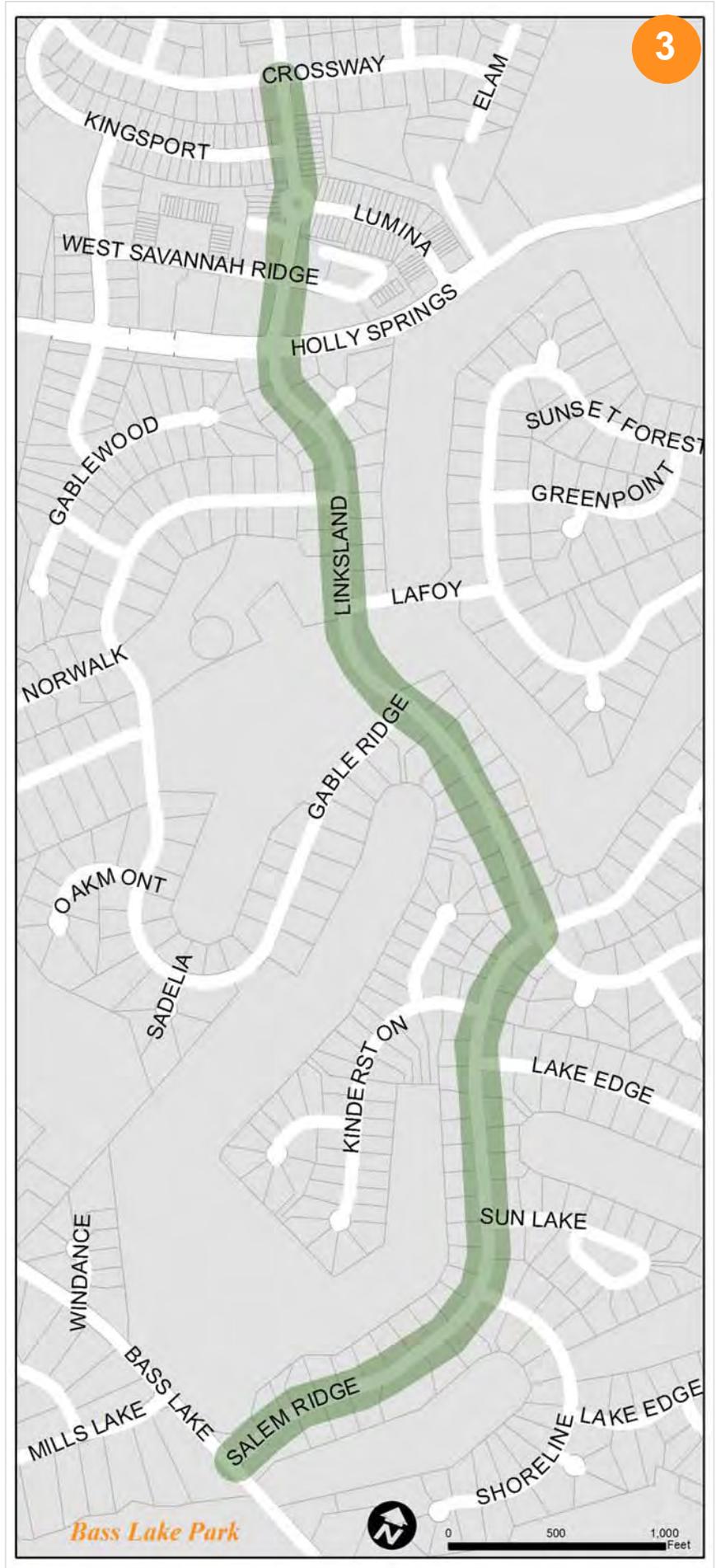
Unmarked 2 lane  
29' - 29.5' curb to curb (with gutter pan)

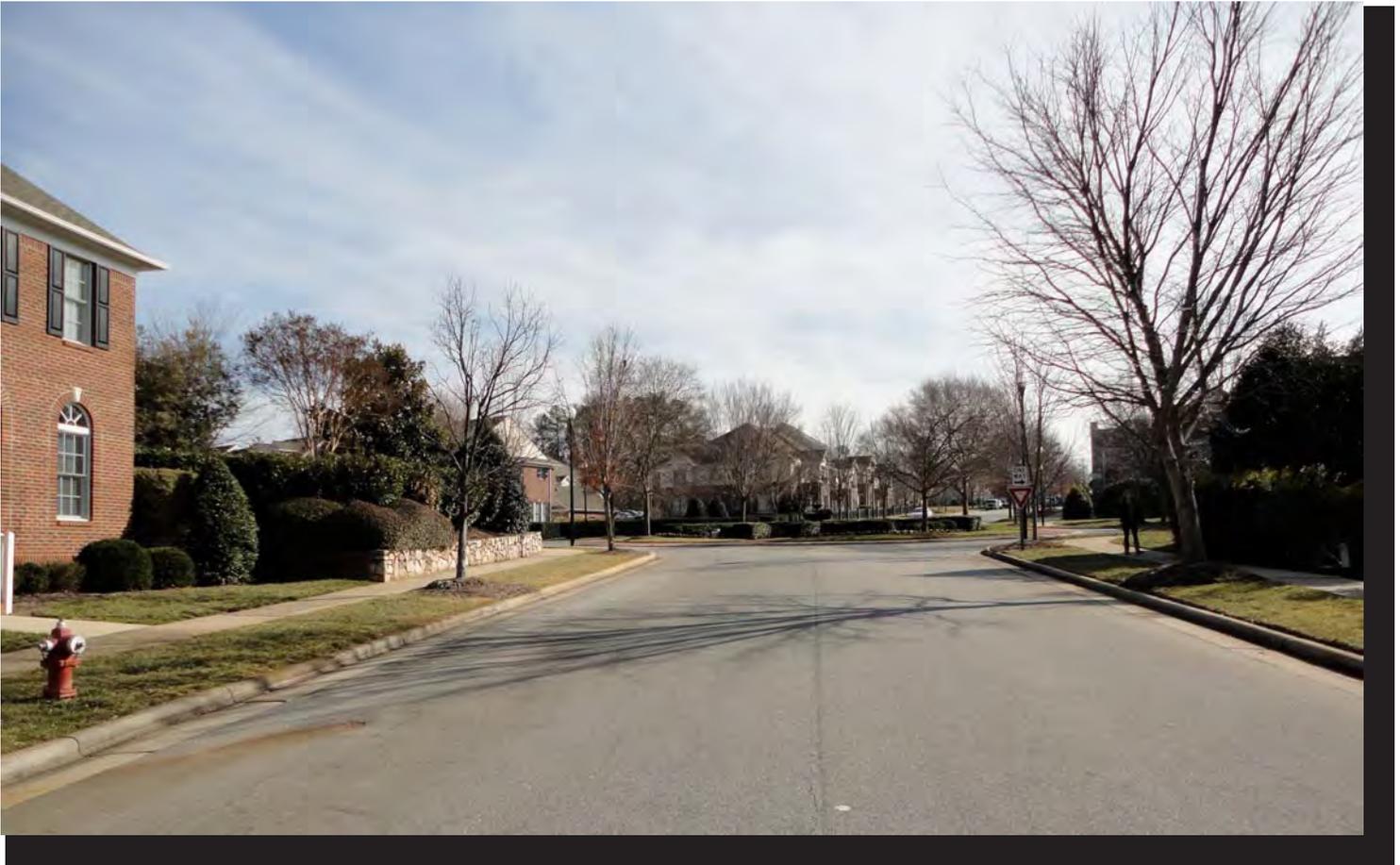
**Proposed Lane Configuration:**

Unmarked 2 Lane w/ Bicycle Lanes:  
5' | 9.75' | 9.75' | 5'

**Notes/Comments:** This is a low cost opportunity, through simple striping and signage to create an important connection to Bass Lake Park. Linksland and Salem Ridge provide a low-traffic, low-speed north-south connection through eastern Holly Springs. Wayfinding signage along the route should be provided giving information to bicyclists about the locations of key destinations.

CTP: 2 lane collector existing.





*Above: Existing Conditions along Linksland, near traffic circle, just north of Holly Springs Road. Sharrows are recommended along this brief segment due to the presence of on-street parking.*

*Project Cost - \$14,282.08\** (Addition of sharrow pavement markings, bicycle lane stripes, bicycle lane pavement markings, and signage).

*\*This cost is only a planning-level estimate.*

## Project Cutsheet 4:

### Milpass Drive / Arbor Crest Road / Commons Drive

To/From: Crossway/Sunset Lake

Distance (feet): 6,600

Facility Type: Signed Bicycle Route

#### Construction Method:

The existing unmarked, 2-lane, neighborhood cross section would be retained. This will only require signage. Pavement markings may be considered but are not necessary.

**Trip Generators:** Veterans Park, residential areas

#### Development/Funding Mechanism:

Local CIP funding for signage.

#### Road/Land Ownership:

Town

#### Existing Lane Configuration:

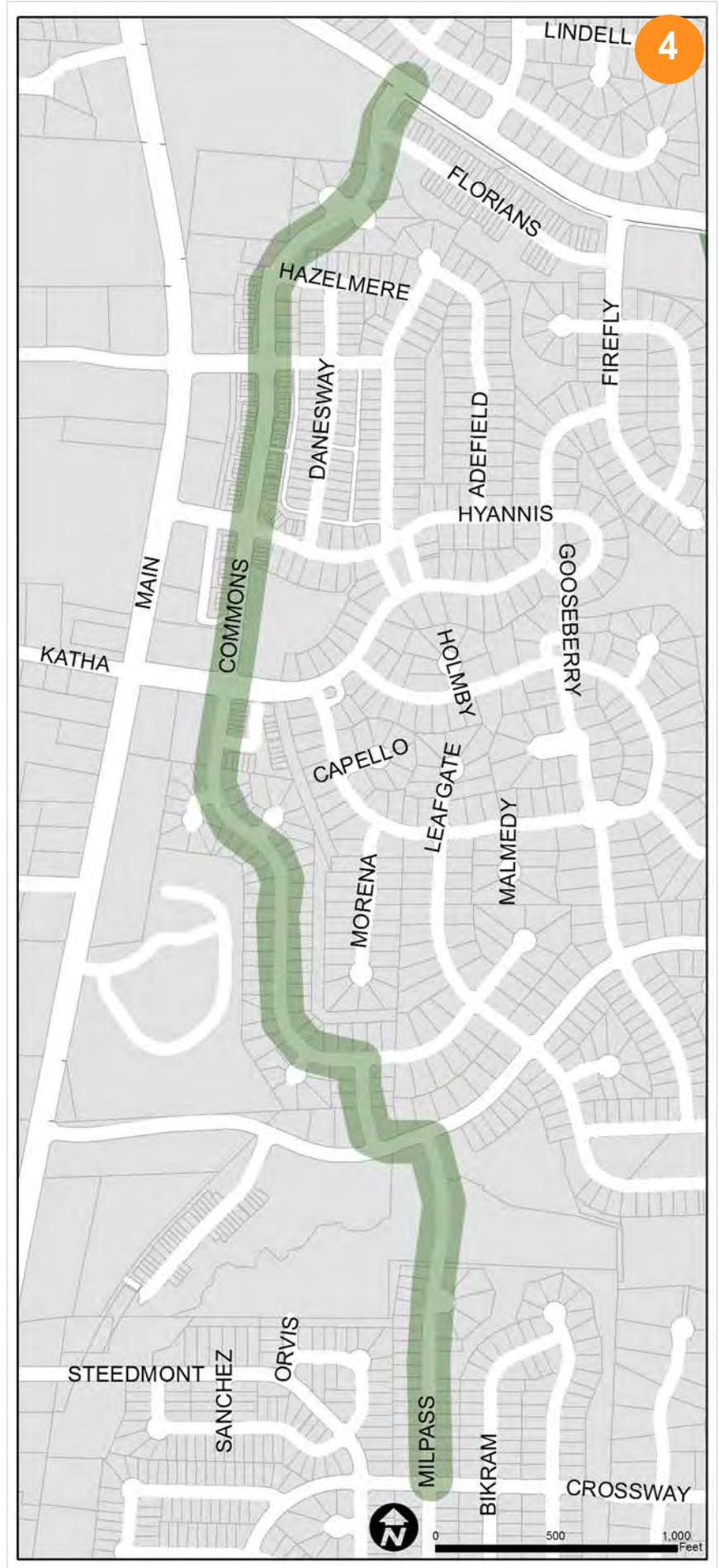
Unmarked 2 lane  
Ranges from 20' - 29' curb to curb (with gutter pan)

#### Proposed Lane Configuration:

No change

**Notes/Comments:** This is a low cost opportunity, through bicycle route and wayfinding signage, to create a long distance, neighborhood route. Milpass/Arbor Crest and Commons provide a low-traffic, low-speed north-south alternative to Main Street. Wayfinding signage along the route should be provided giving information to bicyclists about the locations of key destinations.

CTP: No change.





*Above: Existing Conditions along Commons Drive. Already, this is a pleasant neighborhood road for bicycle riding.*

*Project Cost - \$6,072.00\** (Addition of bicycle route signage and wayfinding signage).

*\*This cost is only a planning-level estimate.*



## Project Cutsheet 5:

### Anchor Creek Way

To/From: N. Main/Existing Greenway

Distance (feet): 3,650

Facility Type: Bicycle Lane

**Construction Method:**

The existing unmarked, 2-lane, neighborhood cross section is wide enough for the addition of bicycle lanes through simple striping.

**Trip Generators:** Existing greenway, residential areas

**Development/Funding Mechanism:**

Local CIP funding for bicycle lane markings, striping, and signage

**Road/Land Ownership:**

Town

**Existing Lane Configuration:**

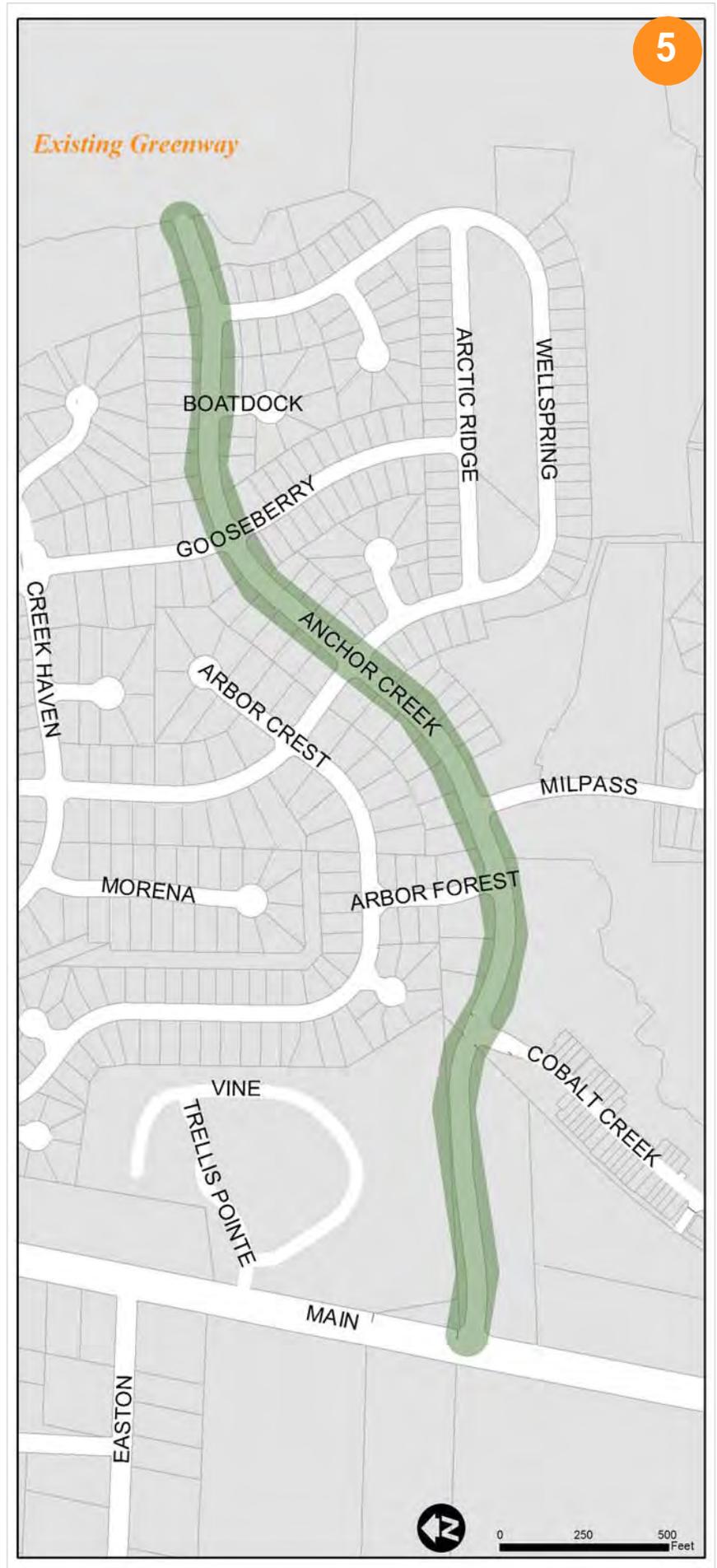
Unmarked 2 lane  
30' (with gutter pan)

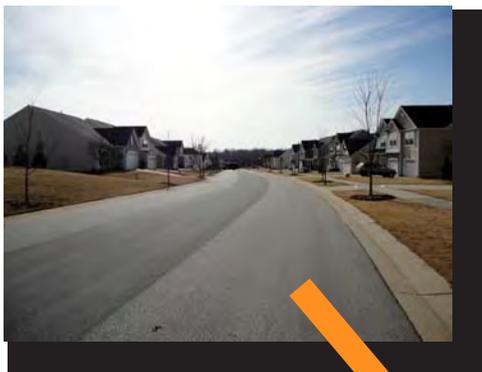
**Proposed Lane Configuration:**

Unmarked 2 Lane w/ Bicycle Lanes:  
5' | 10' | 10' | 5'

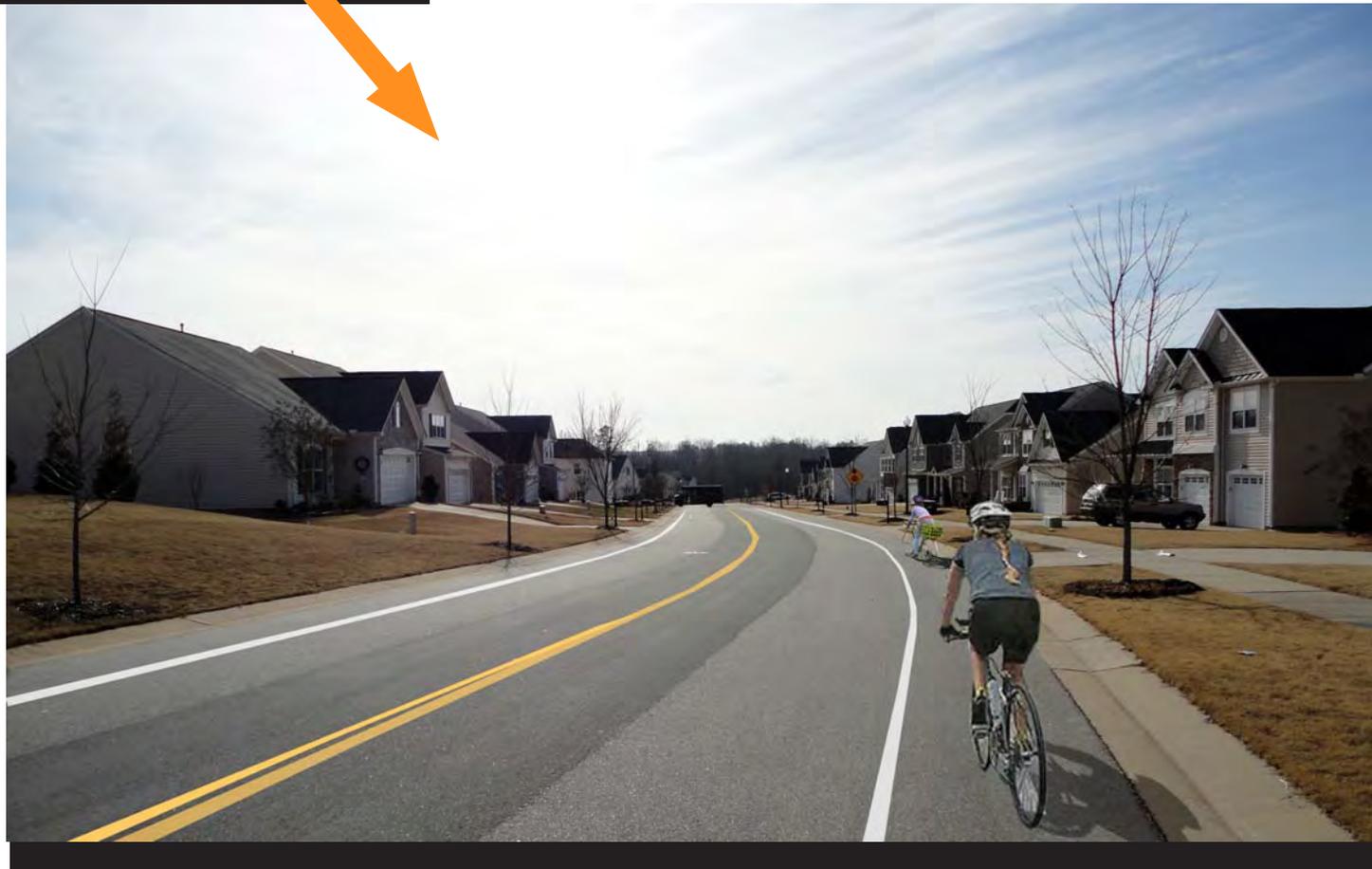
**Notes/Comments:** This is a low cost opportunity, through simple striping and signage to create an important connection to the existing greenway. Anchor Creek provides a low-traffic, low-speed east-west connection. Wayfinding signage along the route should be provided giving information to bicyclists about the locations of key destinations.

CTP: 2 lane collector existing.





*Left: Existing Conditions along Anchor Creek Way.  
Below: Photo rendering showing the addition of bicycle lanes through simple striping.*



*Project Cost - \$7,814.25\* (Addition of stripes, pavement markings, and signage).*

*\*This cost is only a planning-level estimate.*

## Project Cutsheet 6:

### Burt Street/Earp Street

To/From: Holly Springs/Bass Lake

Distance (feet): 5,450

Facility Type: Signed Bicycle Route/Bicycle Lane

#### Construction Method:

The cross section has two main configurations (2 lane undivided and 2 lane undivided with additional wide lane). There is opportunity to restripe in the latter section to add bicycle lane with a signed bicycle route being adequate from Raleigh westward. The Town will need to coordinate with NCDOT to ensure that bike lane widths meet state guidelines.

**Trip Generators:** Downtown Holly Springs, Holly Springs Crossings, residential areas.

#### Development/Funding

##### Mechanism:

Local CIP funding for bicycle lane markings, restriping, and signage

#### Road/Land Ownership:

NCDOT

#### Existing Lane

##### Configuration:

- Unmarked 2-lane from Burt to Raleigh
- 20' total width
- 2-lane with wide additional lane from Raleigh to Bass Lake
- 8' | 8' | 8' (26' to curb)

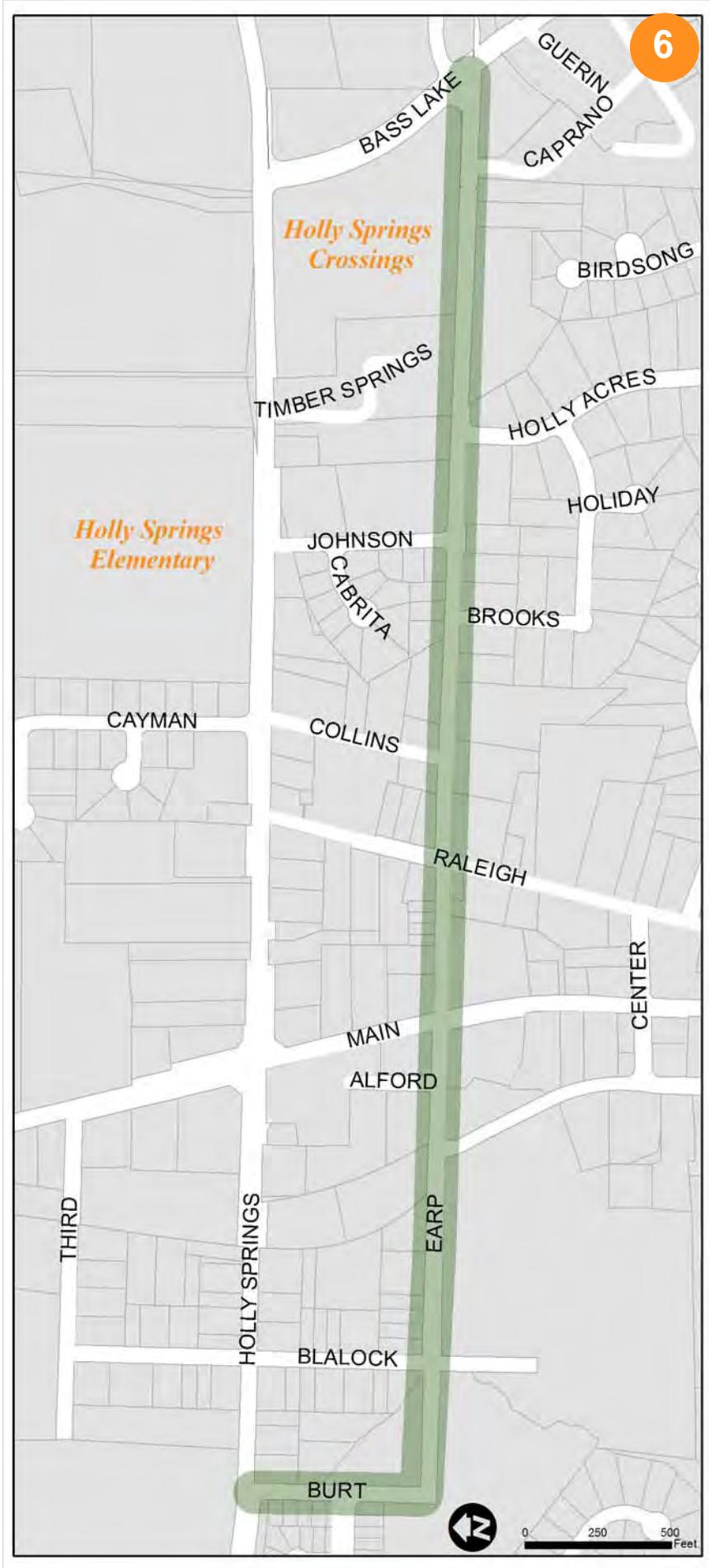
#### Proposed Lane

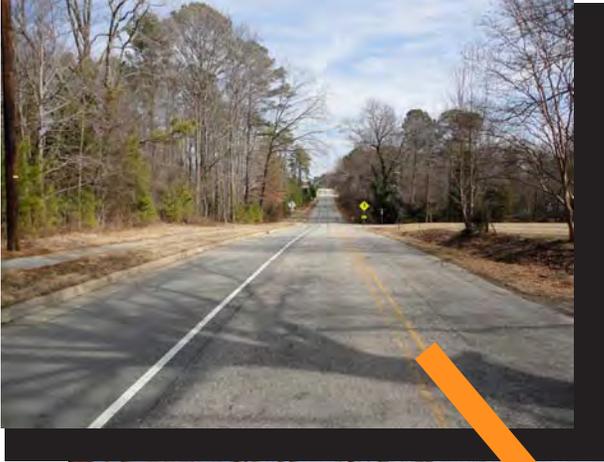
##### Configuration:

- No change from Burt to Raleigh
- 2 Lane w/ Bicycle Lanes:
- 5' | 8' | 8' | 5'

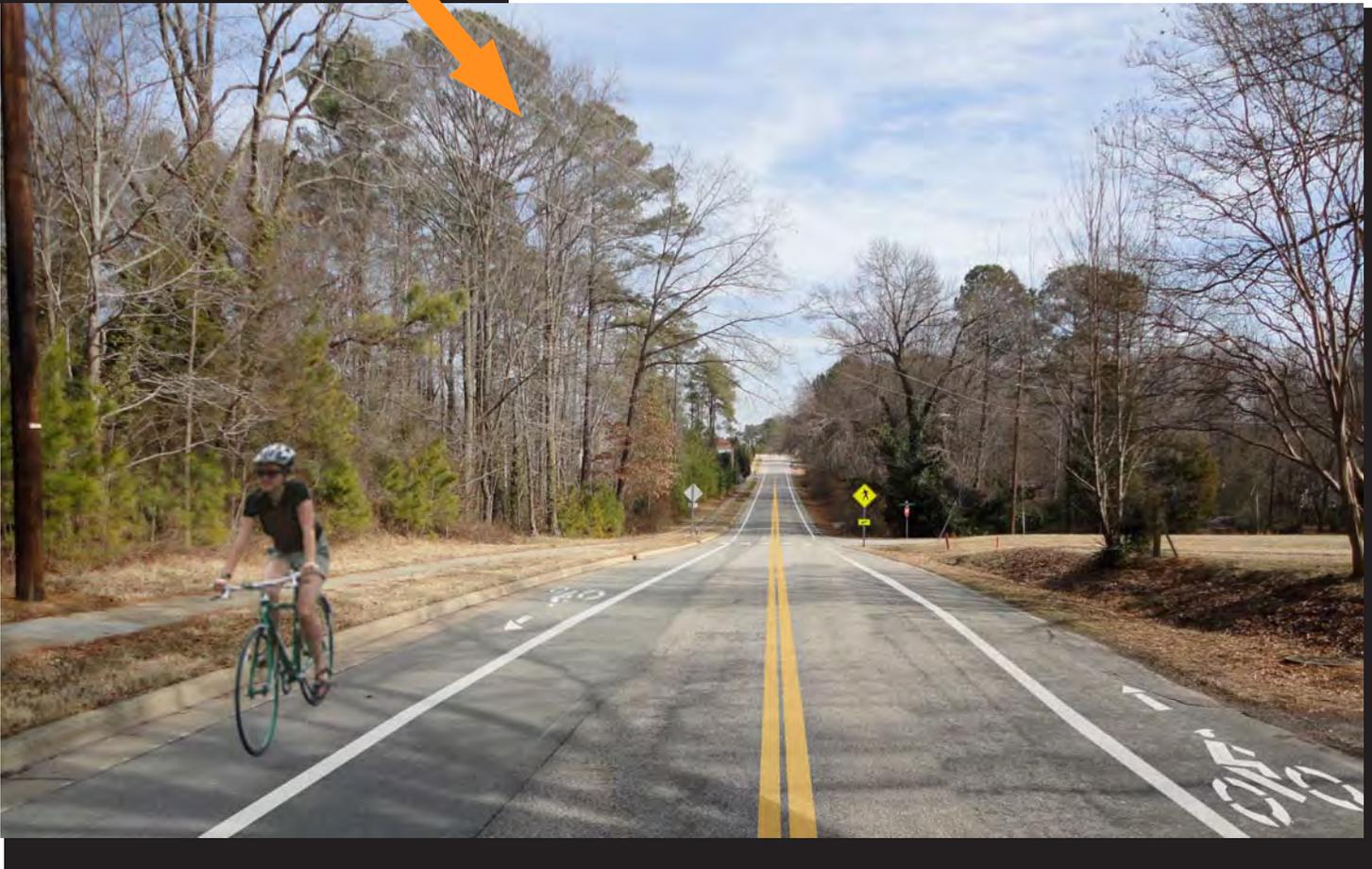
**Notes/Comments:** This is a low cost opportunity, through signage and restriping to create an east-west alternative to Holly Springs Road on a lower-traffic volume roadway. The additional, unused wide lane provides a low-cost bicycle lane restriping opportunity. The Town will have to work with NCDOT to resolve bike lane widths.

CTP: 3 lane widening. Bicycle lanes should be considered in future widening situation and in place of signed bicycle route from Holly Springs to Raleigh.





*Left: Existing Conditions along Earp Street, east of Raleigh.  
Below: Photo rendering showing the addition of bicycle lanes through restriping.*



*Project Cost - \$14,562.45\* (Addition of signage; Removal of four stripes, restripe four stripes, pavement markings, signs).  
Project cost lessened if done during resurfacing or during future widening (CTP recommends 3 lane widening).  
\*This cost is only a planning-level estimate.*

## Project Cutsheet 7:

**Earp Street/Flat Rock Lane/Gable Ridge Lane/Holly Park Drive**

To/From: Bass Lake/Linksland

Distance (feet): 10,750

Facility Type: Signed Bicycle Route

**Construction Method:**

The existing unmarked, 2-lane, neighborhood cross sections would be retained. This will only require signage. Pavement markings may be considered but are not necessary.

**Trip Generators:** Holly Ridge Elementary School, Holly Ridge Middle School, Holly Springs Crossings, residential areas

**Development/Funding Mechanism:**

Local CIP funding for signage

**Road/Land Ownership:**

Town

**Existing Lane Configuration:**

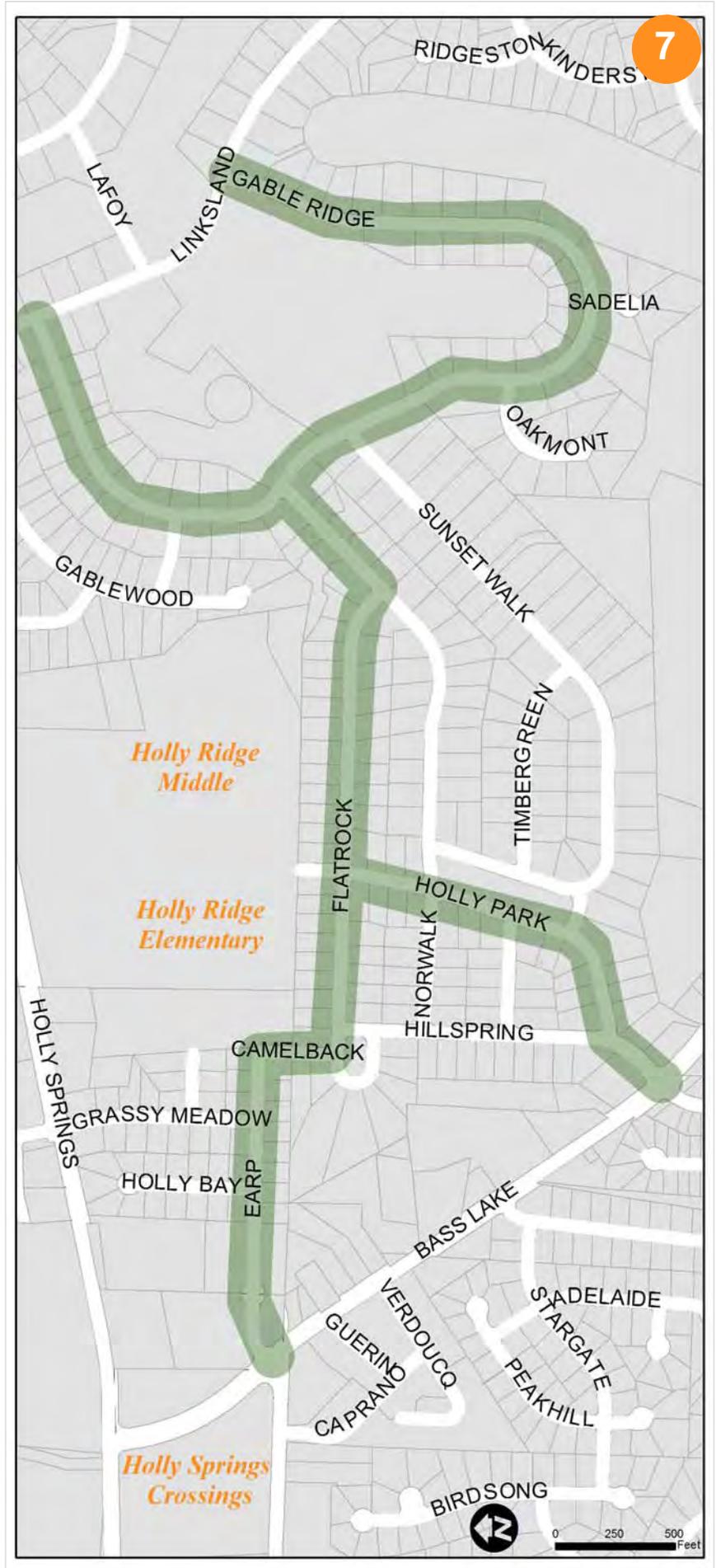
Varying, typical:  
Unmarked 2 lane

**Proposed Lane Configuration:**

No change

**Notes/Comments:** This is a low cost opportunity, through bicycle route and wayfinding signage, to provide system-wide connectivity. These roads provide a low-traffic, low-speed east-west alternative to Holly Springs Road. Wayfinding signage along the route should be provided giving information to bicyclists about the locations of key destinations.

CTP: No change.





*Above: Existing Conditions along Flatrock Lane. Conditions are ideal for a signed bicycle route on this tree-lined section.*

*Project Cost - \$9,890.00\** (Addition of bicycle route signage and wayfinding signage).

*\*This cost is only a planning-level estimate.*

## Project Cutsheet 8:

### Raleigh Street / Grigsby avenue

To/From: Holly Springs/Estes

Distance (feet): 8,800

Facility Type: Signed Bicycle Route

#### Construction Method:

The existing unmarked, 2-lane, neighborhood cross sections would be retained. This will only require signage. Pavement markings may be considered but are not necessary.

**Trip Generators:** Downtown Holly Springs, Womble Park, Hunt Center, Town Hall, Farmers Market, residential areas

#### Development/Funding Mechanism:

Local CIP funding for signage

#### Road/Land Ownership:

Town

#### Existing Lane Configuration:

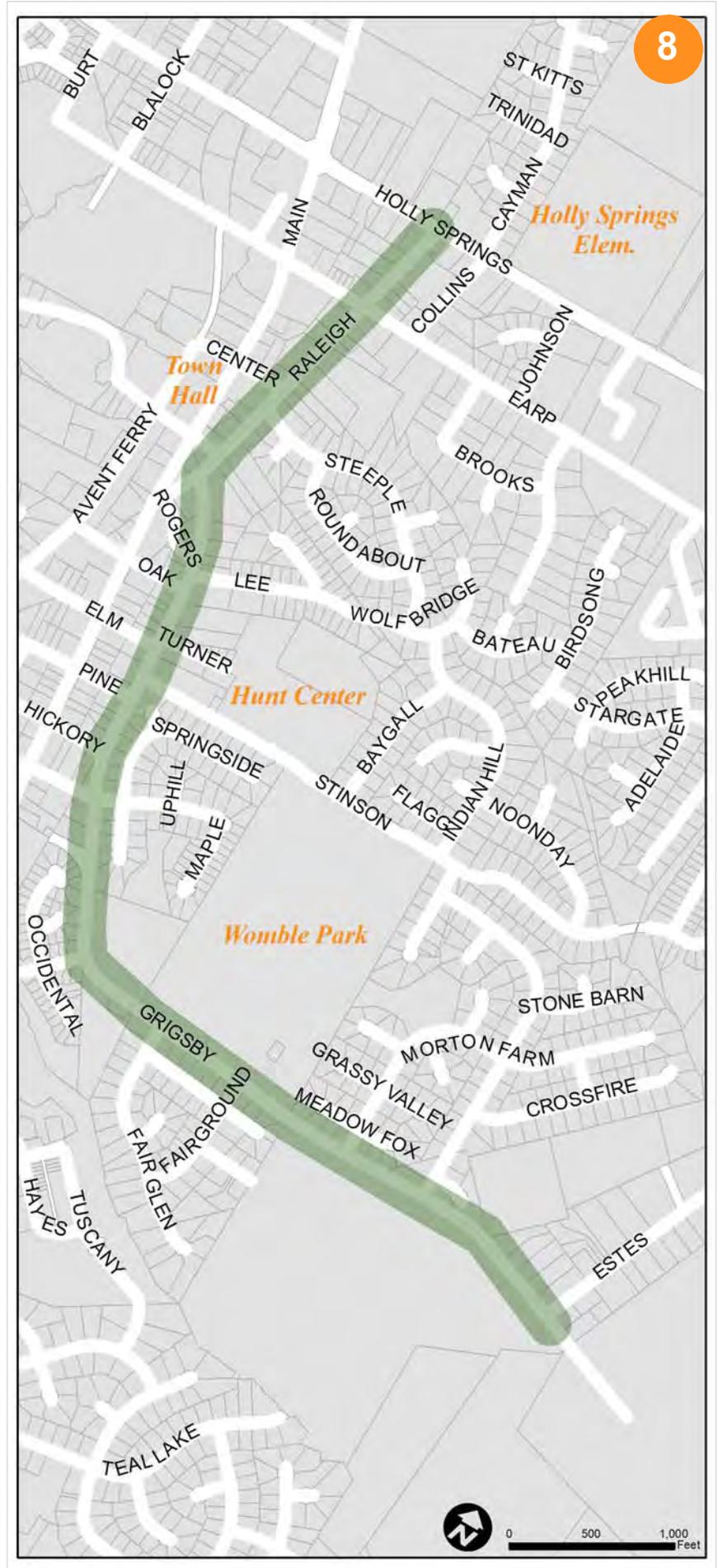
Unmarked 2 lane  
 Ranges from 19' - 25' total width  
 Cur b and gutter alternates roadway side

#### Proposed Lane Configuration:

No change

**Notes/Comments:** This is a low cost opportunity, through bicycle route and wayfinding signage, to provide system-wide connectivity, These roads provide a low-traffic, low-speed north-south alternative to Main Street. Wayfinding signage along the route should be provided giving information to bicyclists about the locations of key destinations.

CTP: 3 lane widening (Raleigh) and 2 lane with turning pockets (Grigsby). Bicycle lanes should be considered in place of signed bicycle route in future widening situation.



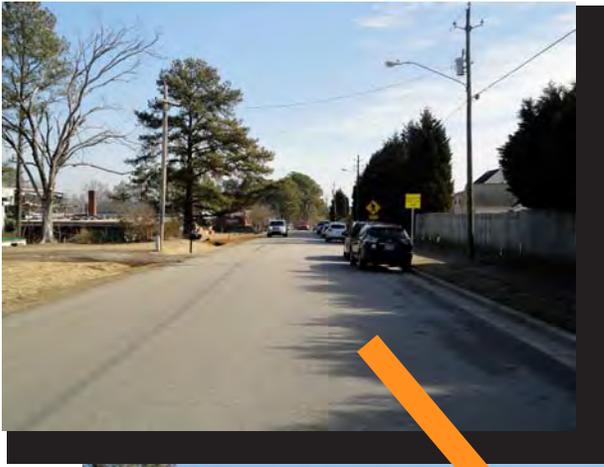


*Above: Grigsby, adjacent to the south end of Womble Park, is a quiet, bikable roadway. A trail within Womble Park starts on the right side of the picture.*

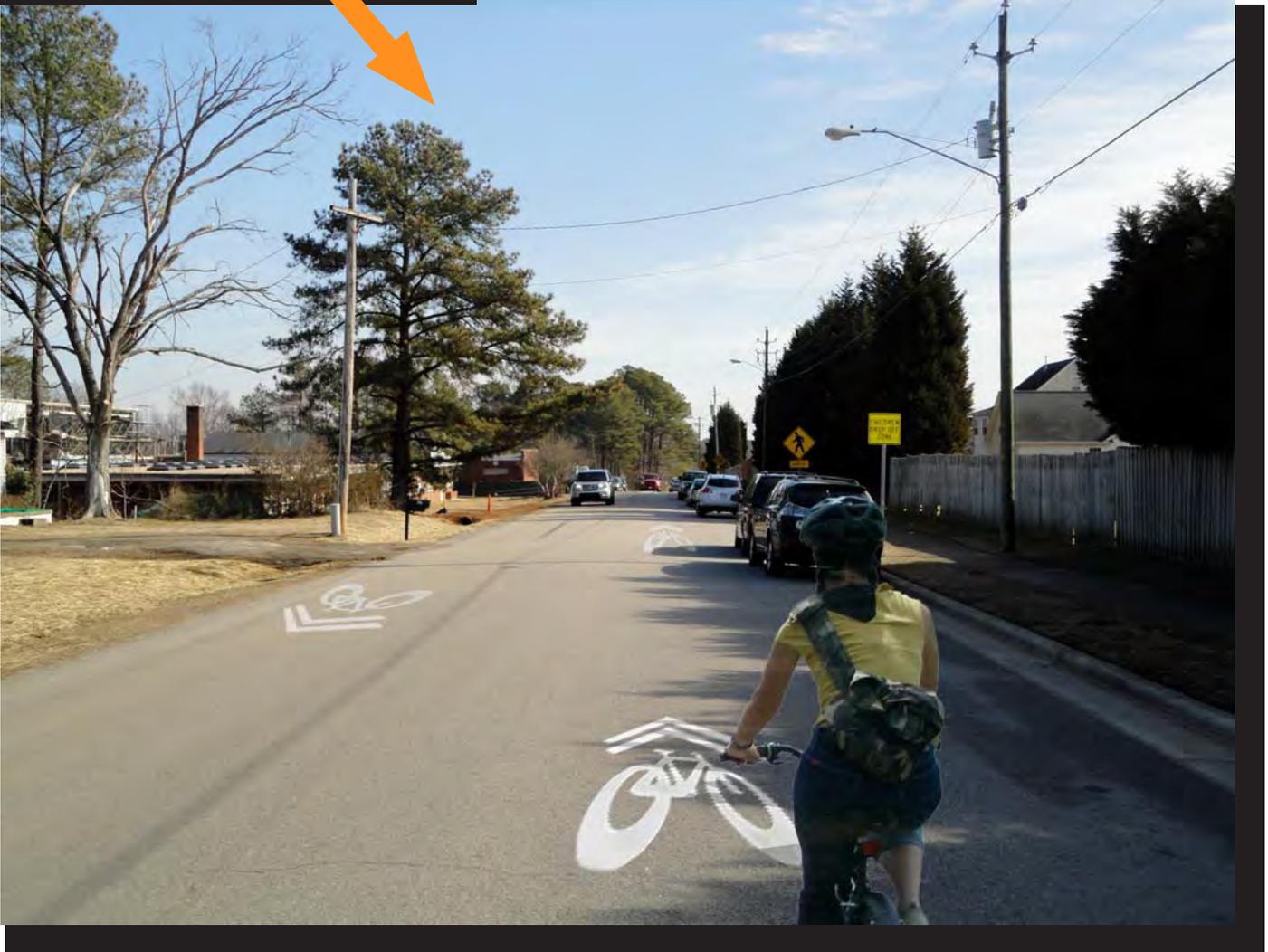
*Project Cost - \$8,096.00\** (Addition of bicycle route signage and wayfinding signage). In long term, bicycle lanes should be considered if roadways are widened.

*\*This cost is only a planning-level estimate.*





*Left: Existing Conditions along Stinson, near the Hunt Center  
Below: Photo rendering showing the addition of sharrows that provide a clear message to motorists.*



*Project Cost - \$7,549.75\* (Addition of sharrow pavement markings, bicycle route signage and wayfinding signage).*

*\*This cost is only a planning-level estimate.*

## Project Cutsheet 10:

### Elm Avenue

To/From: Grigsby/Ballentine

Distance (feet): 3,300

Facility Type: Bicycle Lane/Signed Bicycle Route

#### Construction Method:

The existing, unmarked two-lane cross section is wide from Avent Ferry to Ballentine, offering the opportunity for simple bicycle lane striping. A signed bicycle route is recommended on Elm from Avent Ferry to Grigsby where the road is much narrower.

Trip Generators: Downtown Holly Springs, residential areas, HuntCenter

#### Development/Funding Mechanism:

Local CIP funding for bicycle lane markings, striping, and signage.

#### Road/Land Ownership:

Town

#### Existing Lane Configuration:

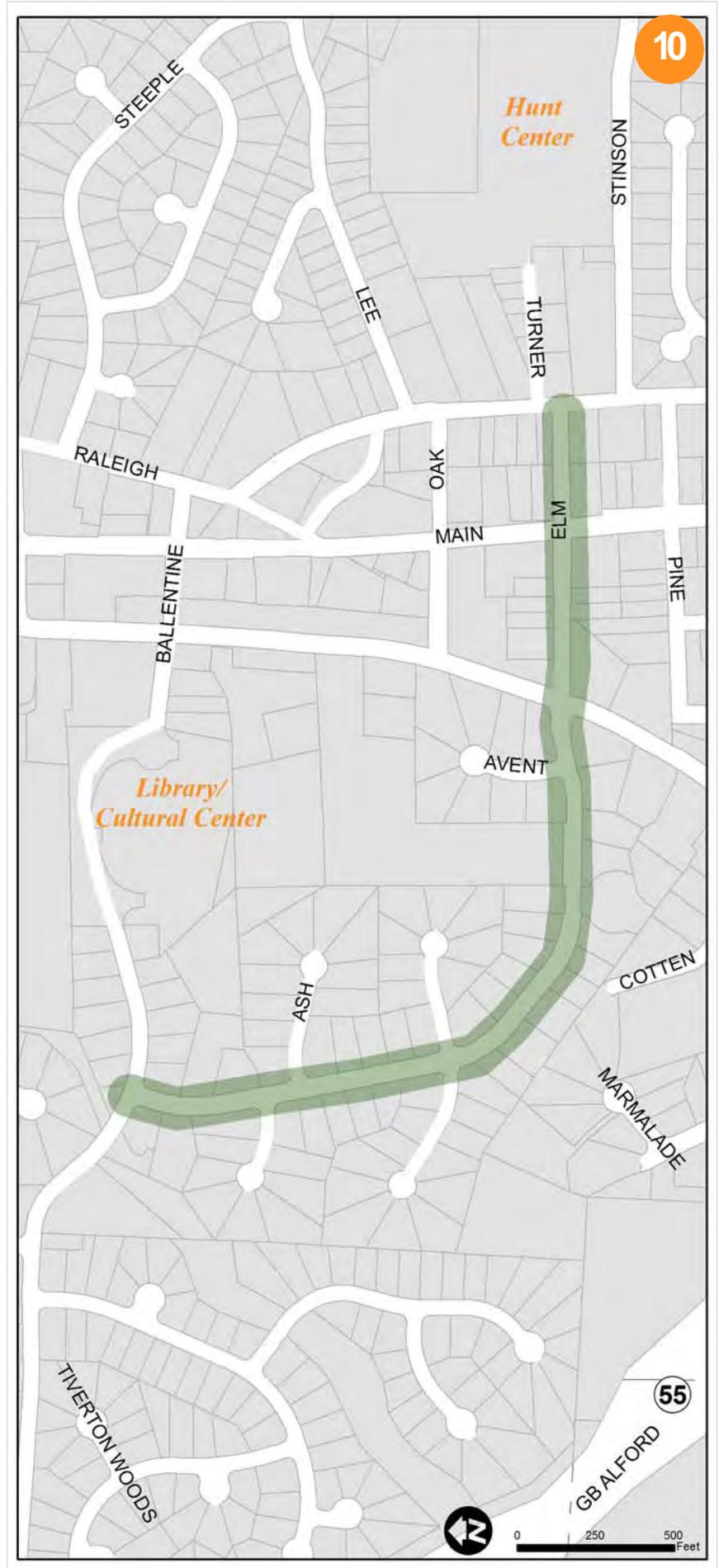
Unmarked two lane;  
 --22' total width from Avent Ferry to Grigsby  
 --32' (curb to curb) from Avent Ferry to Ballentine

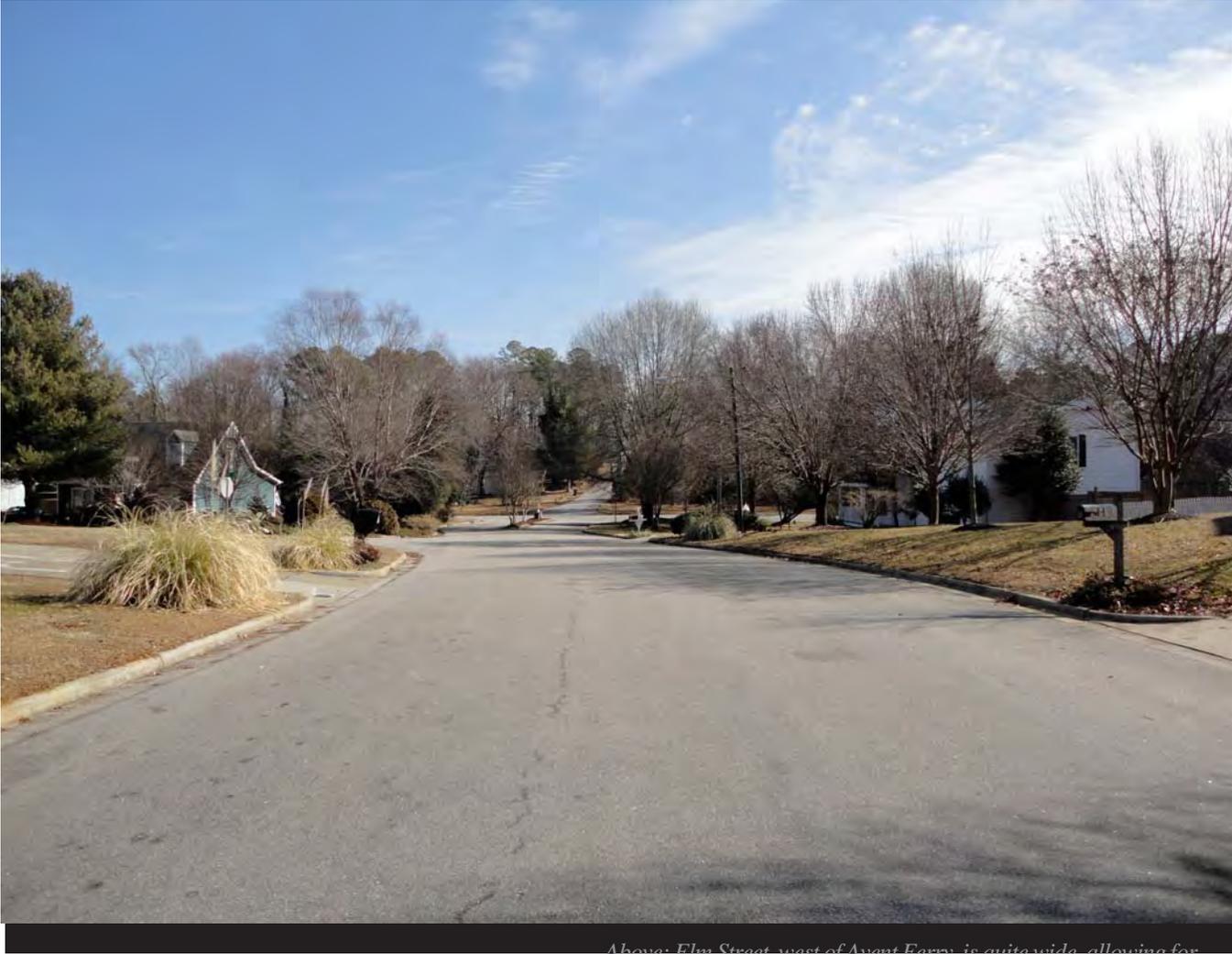
#### Proposed Lane Configuration:

No change from Avent Ferry to Grigsby  
 6' | 10' | 10' | 6'

Notes/Comments: This is a low cost opportunity, through striping and signage, to provide east-west connectivity.

CTP: No change.





*Above: Elm Street, west of Avent Ferry, is quite wide, allowing for the simple addition of bicycle lanes through striping.*

*Project Cost - \$6,602.15\** (Addition of bicycle route signage/wayfinding signage; addition of bicycle lanes with pavement markings and signage).

*\*This cost is only a planning-level estimate.*

## Project Cutsheet 11:

### Ballentine Street

To/From: NC 55 Bypass/Raleigh

Distance (feet): 4,400

Facility Type: Bicycle Lane/Sharrow

#### Construction Method:

The existing, unmarked two-lane cross section would be retained with sharrows and bicycle lanes added. This will only require striping of the existing roadway.

Trip Generators: Downtown Holly Springs, Library, Cultural Center, Town Hall, residential areas

#### Development/Funding Mechanism:

Local CIP funding for bicycle lane markings, signage, and relocation of parking

#### Road/Land Ownership:

Town

#### Existing Lane Configuration:

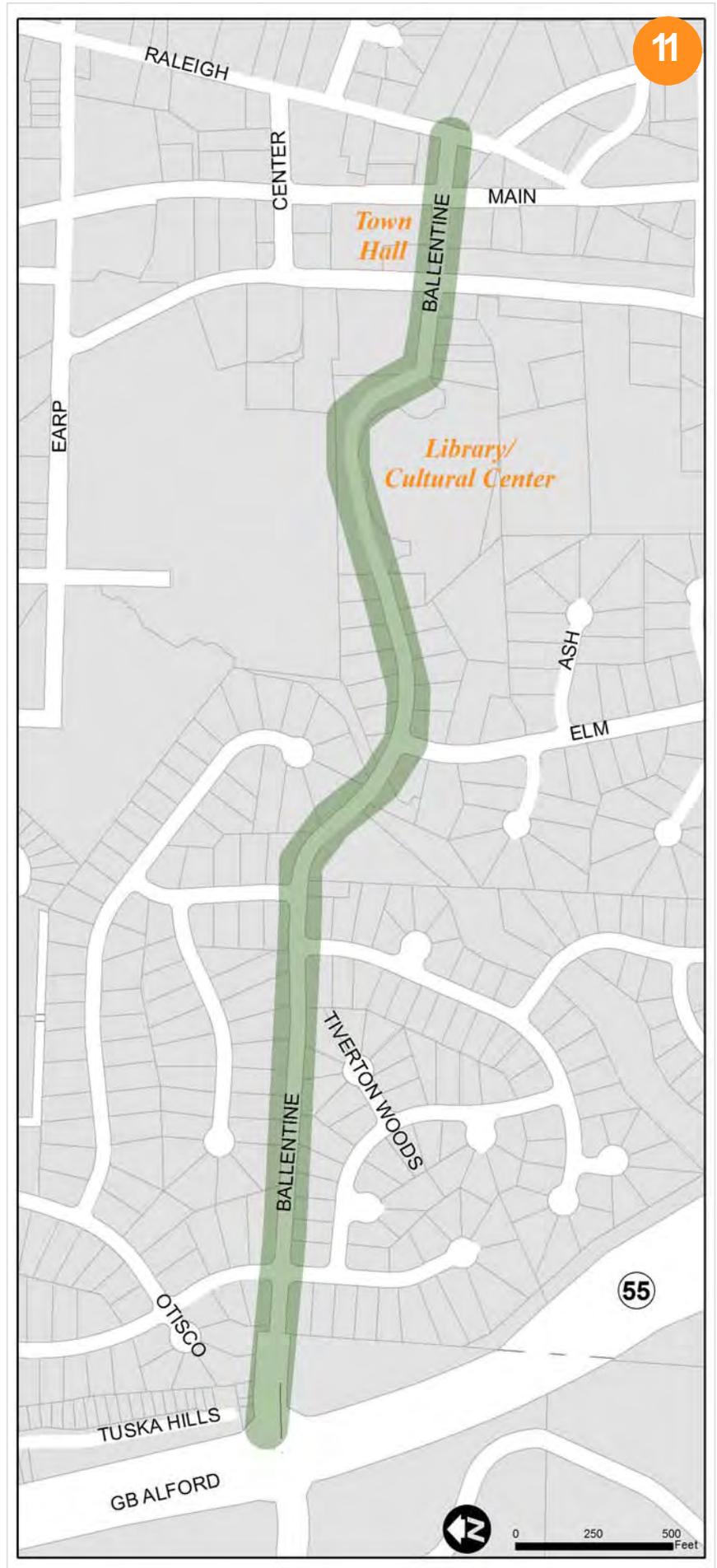
Unmarked 2 lane;  
 22' - 26' (curb to curb) from Traffic circle to Raleigh; on-street parking present at Town Hall  
 29' - 30' (including gutter pan) from Traffic circle to NC 55 Bypass

#### Proposed Lane Configuration:

--No change from Traffic circle to Raleigh;  
 --5' | 10' | 10' | 5' (from Traffic circle to NC 55 Bypass)

Notes/Comments: This is a low cost opportunity, through striping and pavement markings to define a bicycle route that connects western neighborhoods to the Downtown, Town Hall, and the Library. These roadways have low traffic volumes and speeds, creating a good bicycling environment.

CTP: 2 lane collector existing.





*Above: Bicyclists on Avent Ferry, crossing Ballentine at Town Hall/Police Station.*

*Project Cost - \$8,389.25\* (Addition of stripes, pavement markings, and signage).*

*\*This cost is only a planning-level estimate.*



## Project Cutsheet 12:

### Green Oaks Parkway

To/From: NC 55 Bypass/Holly Springs New Hill

Distance (feet): 8,000

Facility Type: Bicycle Lane

#### Construction Method:

The existing four-lane divided cross section provides opportunity for the addition of bicycle lanes through restriping. The Town will need to coordinate with NCDOT to ensure that bike lane widths meet state guidelines.

**Trip Generators:** Downtown Holly Springs, Business Park, residential areas

#### Development/Funding Mechanism:

Encroachment Agreement from Local NCDOT. Local CIP funding for bicycle lane markings, striping, and signage.

**Road/Land Ownership:**  
NCDOT

#### Existing Lane Configuration:

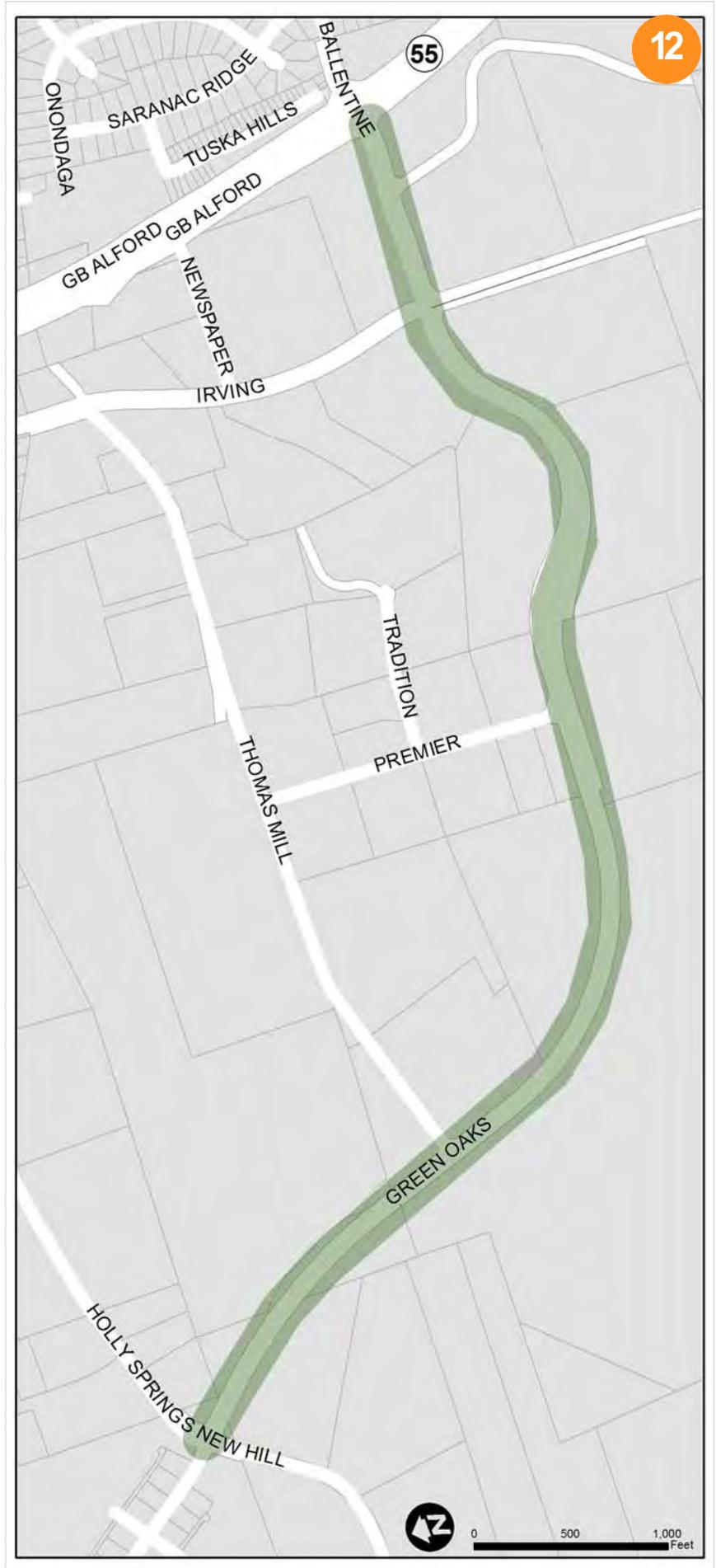
4 Lane w/ center median  
12' | 12' | median | 12' | 12' (26.5' each side curb to curb)

#### Proposed Lane Configuration:

4 Lane w/ center median and Bicycle Lanes:  
5.5' | 10.5' | 10.5' | median | 10.5' | 10.5' | 5.5'

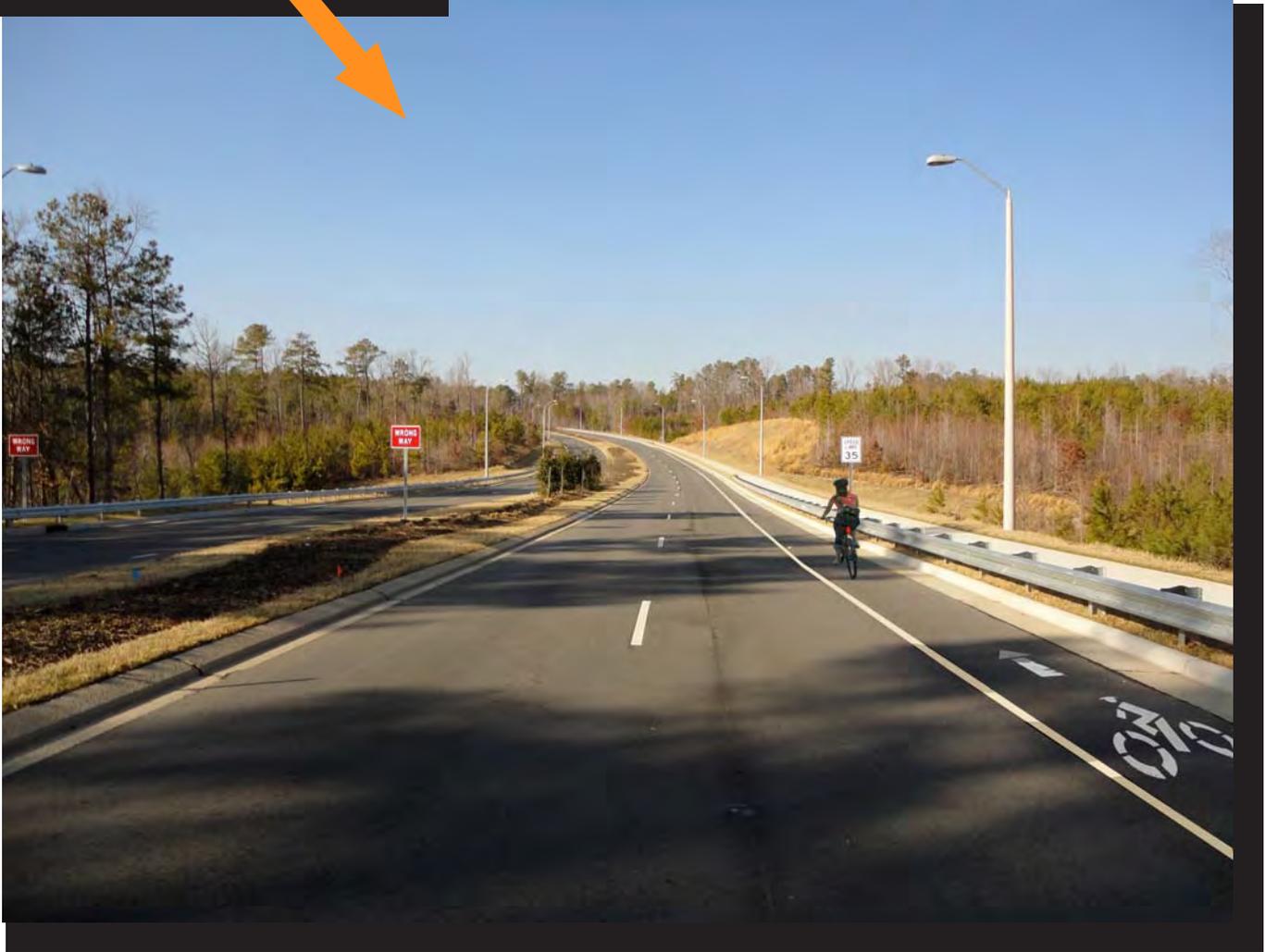
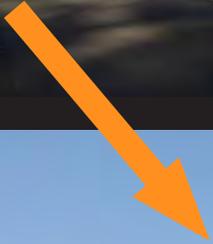
**Notes/Comments:** This is a low cost opportunity, through restriping, to create the an east-west connection from Holly Springs to common rural, recreational riding routes. Wide outside lanes may be an alternative with restriping.

CTP: 4 lane median divided existing.





*Left: Existing Conditions along Green Oaks.  
Below: Photo rendering showing the narrowing of travel lanes (restriping) to add bicycle lanes.*



*Project Cost - \$34,833.50\* (Removal of two stripes, restripe four stripes, pavement markings, signs).*

*Project cost eliminated if done during resurfacing.*

*\*This cost is only a planning-level estimate.*

## Project Cutsheet 13:

### Holly Meadow Drive/ Hollymont Drive

To/From: Avent Ferry/Avent Ferry

Distance (feet): 8,300

Facility Type: Signed Bicycle Route

#### Construction Method:

The existing, unmarked two-lane cross section would be retained with the simple addition of signage. Pavement markings may be considered but are not necessary.

Trip Generators: Residential areas, Avent Ferry

#### Development/Funding Mechanism:

Local CIP funding for signage

#### Road/Land Ownership:

Town

#### Existing Lane Configuration:

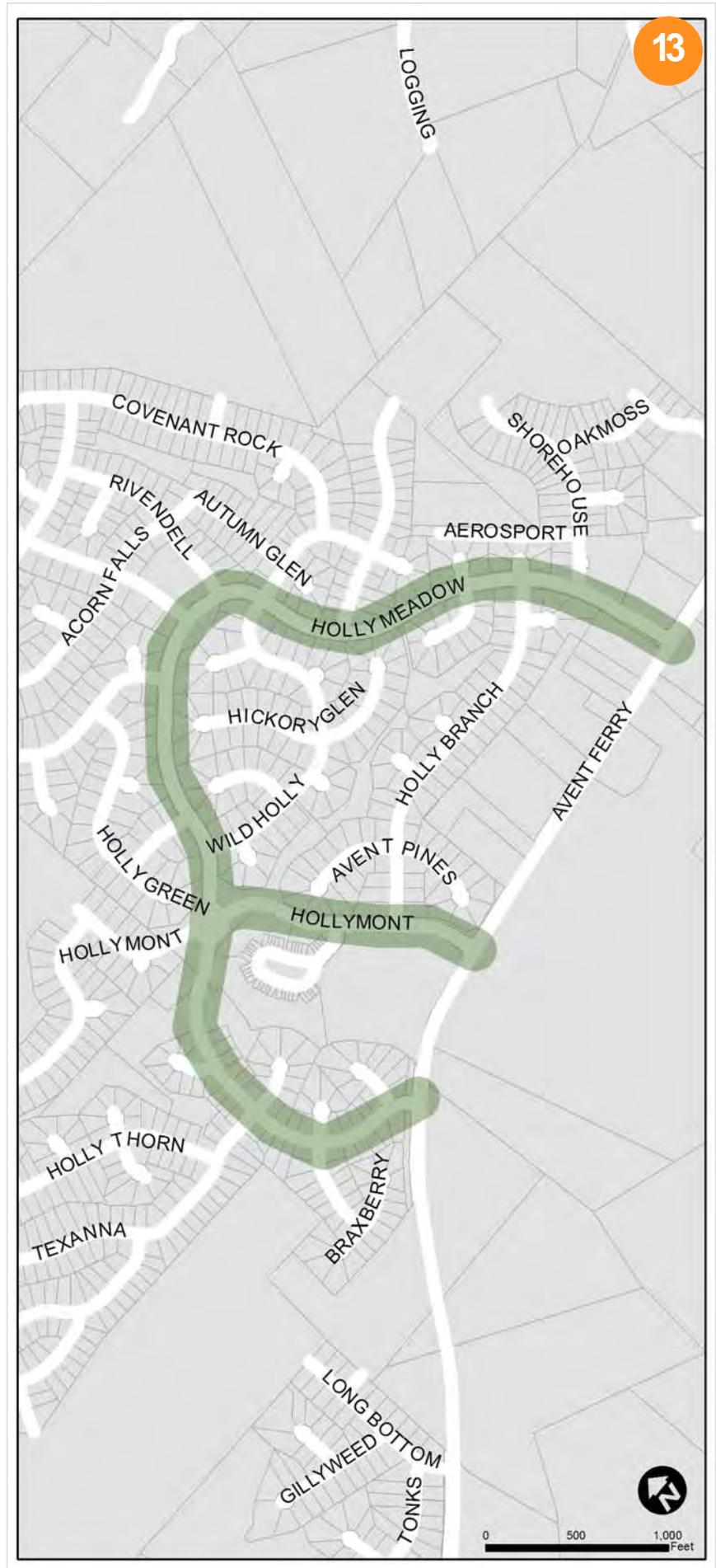
Unmarked 2 lane

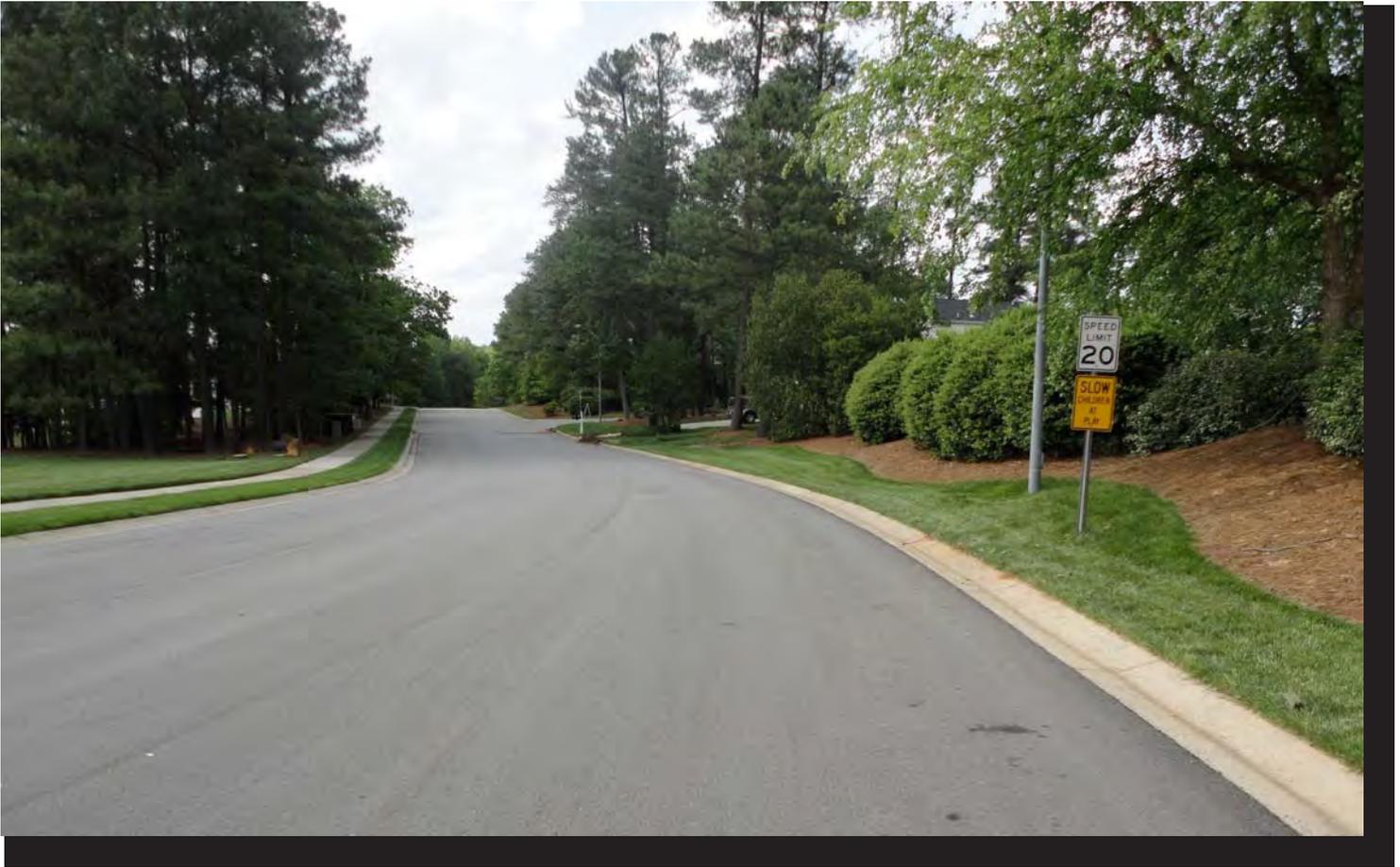
#### Proposed Lane Configuration:

No change

Notes/Comments: This is a low cost opportunity, through signage to bring residents along major neighborhood roadways in this neighborhood.

CTP: No change.





*Above: Hollymont Drive, near the intersection with Avent Ferry Road. This road is quite wide and could incorporate bicycle lanes through striping if deemed important.*

*Project Cost - \$7,636.00\* (Addition of bicycle route signage and wayfinding signage).*

*\*This cost is only a planning-level estimate.*

# Project Cutsheet 14:

## Main Street

To/From: Holly Springs/Oakhall

Distance (feet): 3,150

Facility Type: Bicycle Lane

### Construction Method:

The cross section varies between three-lane, two-lane, and two-lane divided. There is opportunity to add bicycle lanes through restripe in sections with sections likely needing widening.

Trip Generators: Downtown, Oak Hall shopping center, residential areas

### Development/Funding

#### Mechanism:

Encroachment Agreement from Local NCDOT. Local CIP funding for bicycle lane markings, signage, and minor widening if necessary.

### Road/Land Ownership:

NCDOT

### Existing Lane

#### Configuration:

Largely inconsistent, predominant configurations:

2 Lane w/ Center Turn:

10' | 10' | 10' (30'-42')

2 Lane (30'-42')

11' | 11' (2-3 feet dead median space and shoulder)

### Proposed Lane

#### Configuration:

2 Lane w/ Center Turn

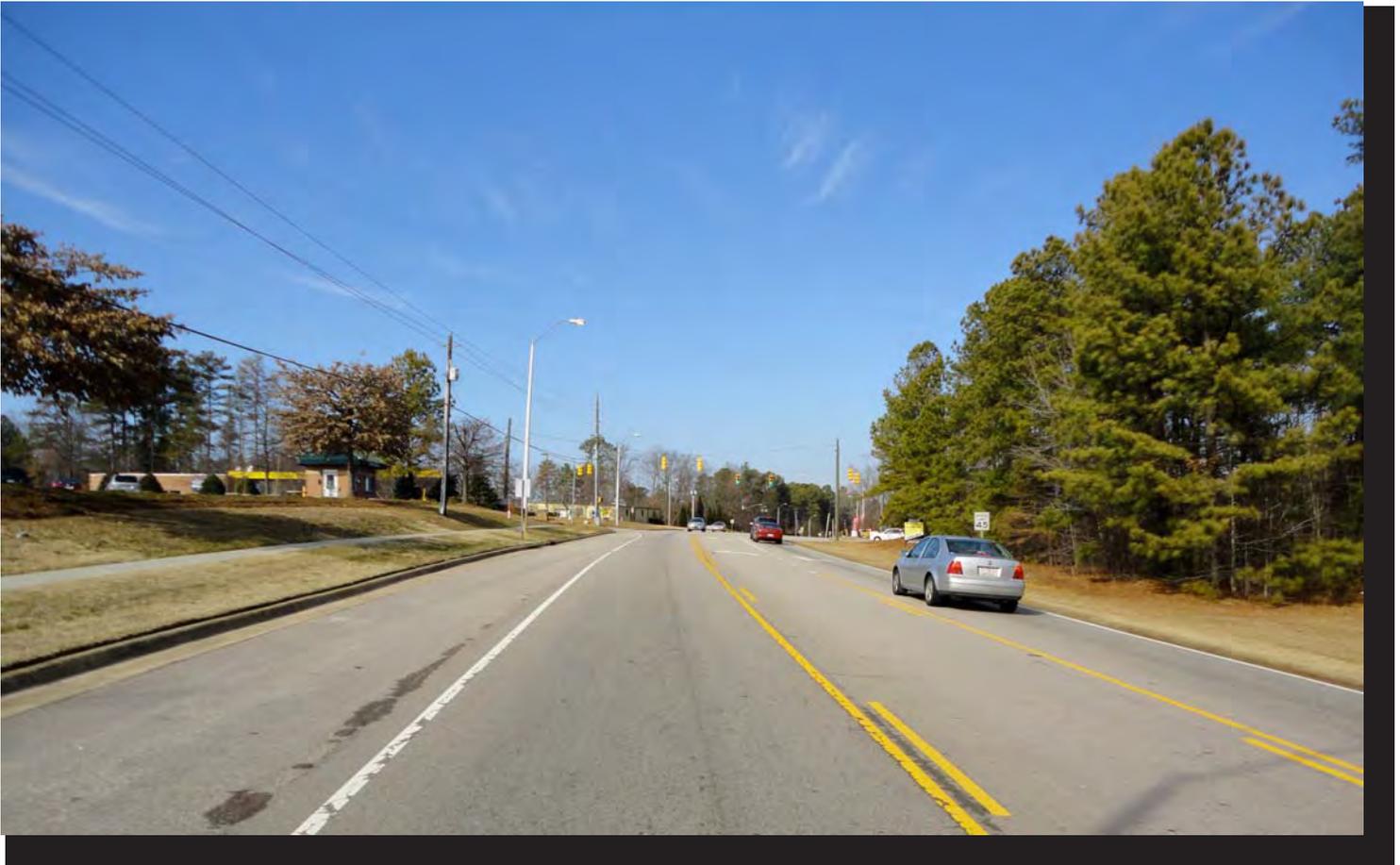
and Bicycle Lanes:

5' | 10' | 10' | 10' | 5'

Notes/Comments: With varying roadway widths, lane configurations, shoulder space, and dead median space, a combination of restriping and new construction would be required to add bicycle lanes. The Town and NCDOT should consider a speed limit reduction from 35mph to 25mph when bicycle lanes are added as this section connects many residential areas to the Downtown.

CTP: 4 lane divided median widening. Bicycle lanes should be added with widening.





*Above: Existing Conditions along Main Street, south of Oakhall. This 3 lane section is 42' with the wide shoulder. There is ample opportunity to restripe and include bicycle lanes while retaining the 3-lane configuration.*

**Project Cost - Unknown** (Bicycle lanes should be added with new construction and resurfacing only).

Project cost eliminated if done during resurfacing or during future widening (CTP recommends 4 lane median divided roadway).

# Project Cutsheet 15:

## Avent Ferry Road

To/From: Hollymont/Ballentine

Distance (feet): 11,700

Facility Type: Sidepath

### Construction Method:

The existing roadway cross section would be unchanged with the addition of a 10' sidepath in the roadway ROW. Signage and adequate crosswalk facilities will be required across all roadway crossings, especially the NC 55 Bypass where a count-down signal and median refuge island are warranted.

**Trip Generators:** Downtown Holly Springs, Holly Grove schools, Southpark Village, residential areas, Rex Urgent Care/Healthcare

### Development/Funding Mechanism:

Encroachment Agreement from Local NCDOT. Local CIP funding for sidepath. Requirement for developers to add sidepath with development.

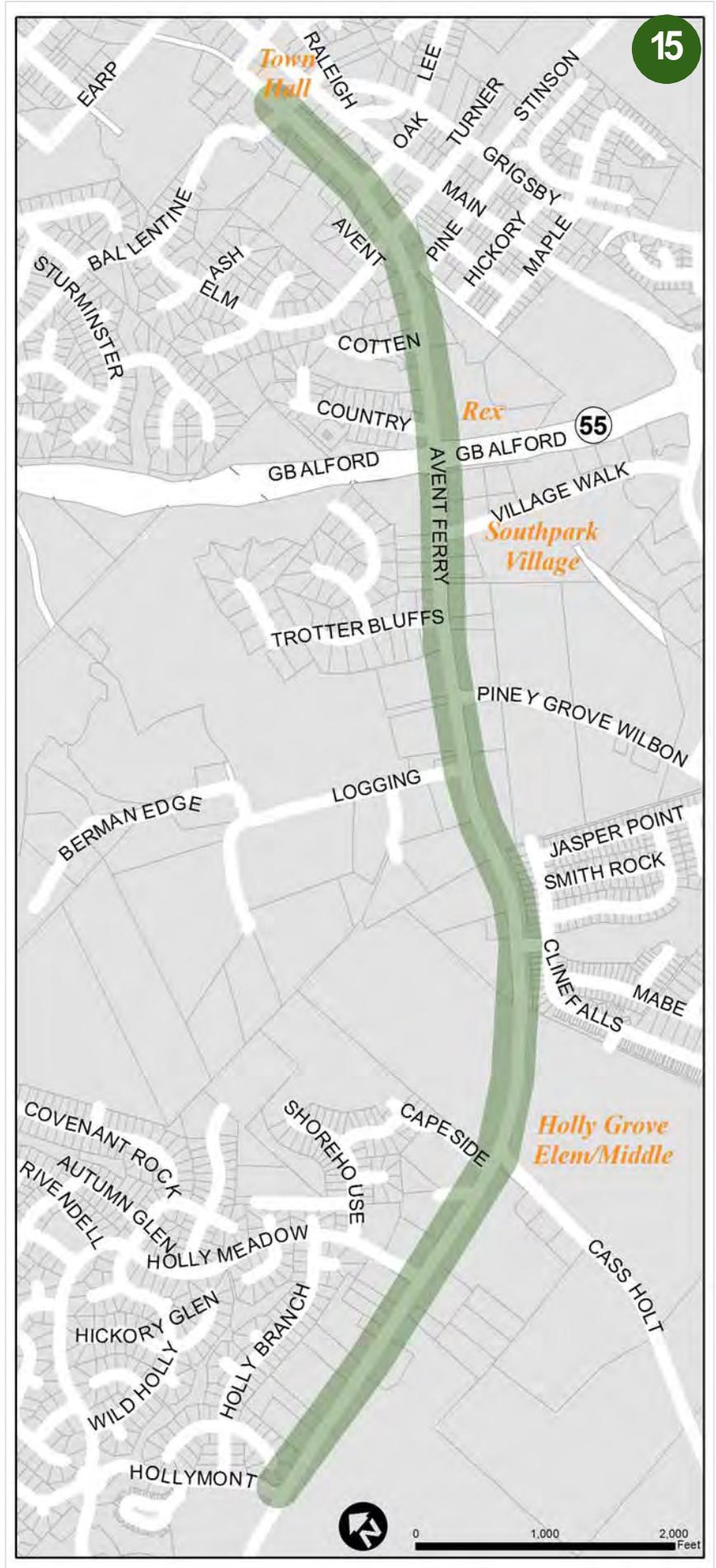
**Road/Land Ownership:**  
NCDOT

**Existing Lane Configuration:** 2 lane

**Proposed Lane Configuration:**  
No change.

**Notes/Comments:** This is a higher cost facility that would provide legitimate access for families from neighborhoods in southwest Holly Springs to schools, shopping, and the Downtown. It is possible that right-of-way may need to be acquired along segments. Further study and analysis will be needed to determine appropriate side. Constraints include ditches, mailboxes, and residential development. Sidewalks are recommended in the Pedestrian Plan and should be widened for this sidepath to accommodate bicyclists and pedestrians.

CTP: 4 lane median divided widening. Bicycle lanes should be considered with future roadway widening.





Left: Existing Conditions along Avent Ferry  
Below: Photo rendering showing the addition of a sidepath in the roadway right-of-way.



*Project Cost - \$878,700.00 (Addition of 10 foot sidepath).  
Project cost reduced if constructed by developer during future development.  
\*This cost is only a planning-level estimate.*

# Project Cutsheet 16:

## Main Street/Ralph Stephens Road

To/From: Rogers/NC 55 Bypass

Distance (feet): 8,500

Facility Type: Bicycle Lane

### Construction Method:

The existing two-lane cross section would need to be widened in order to add bicycle lanes. This will require new construction. It is recommended that bicycle lanes be added to be coincident with future development.

**Trip Generators:** Downtown Holly Springs, Shoppes at Holly Springs, Main Street Square, Southpark Village, residential areas

### Development/Funding Mechanism:

Encroachment Agreement from Local NCDOT. Local CIP funding for widening and bicycle lanes. Bicycle lanes to be added with future development/roadway widening.

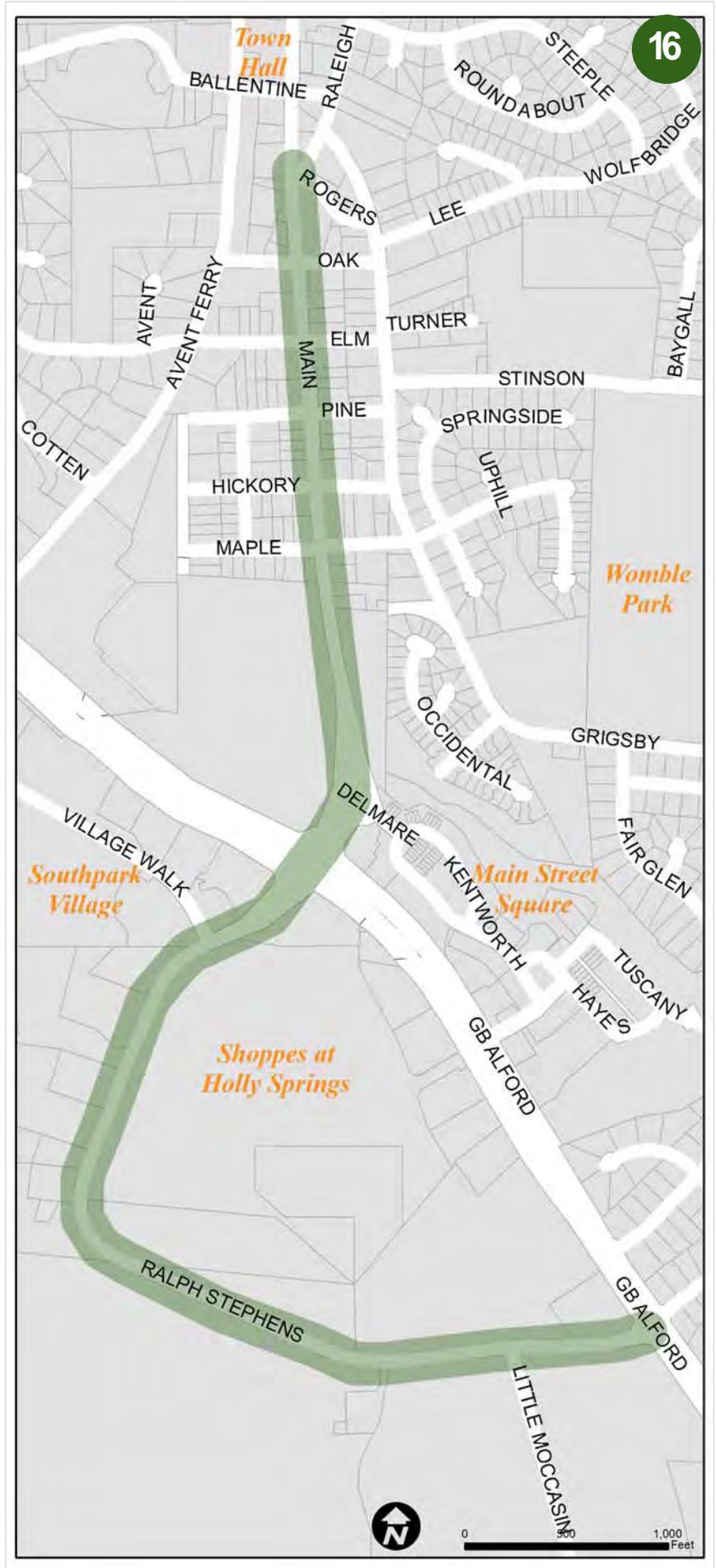
**Road/Land Ownership:**  
NCDOT

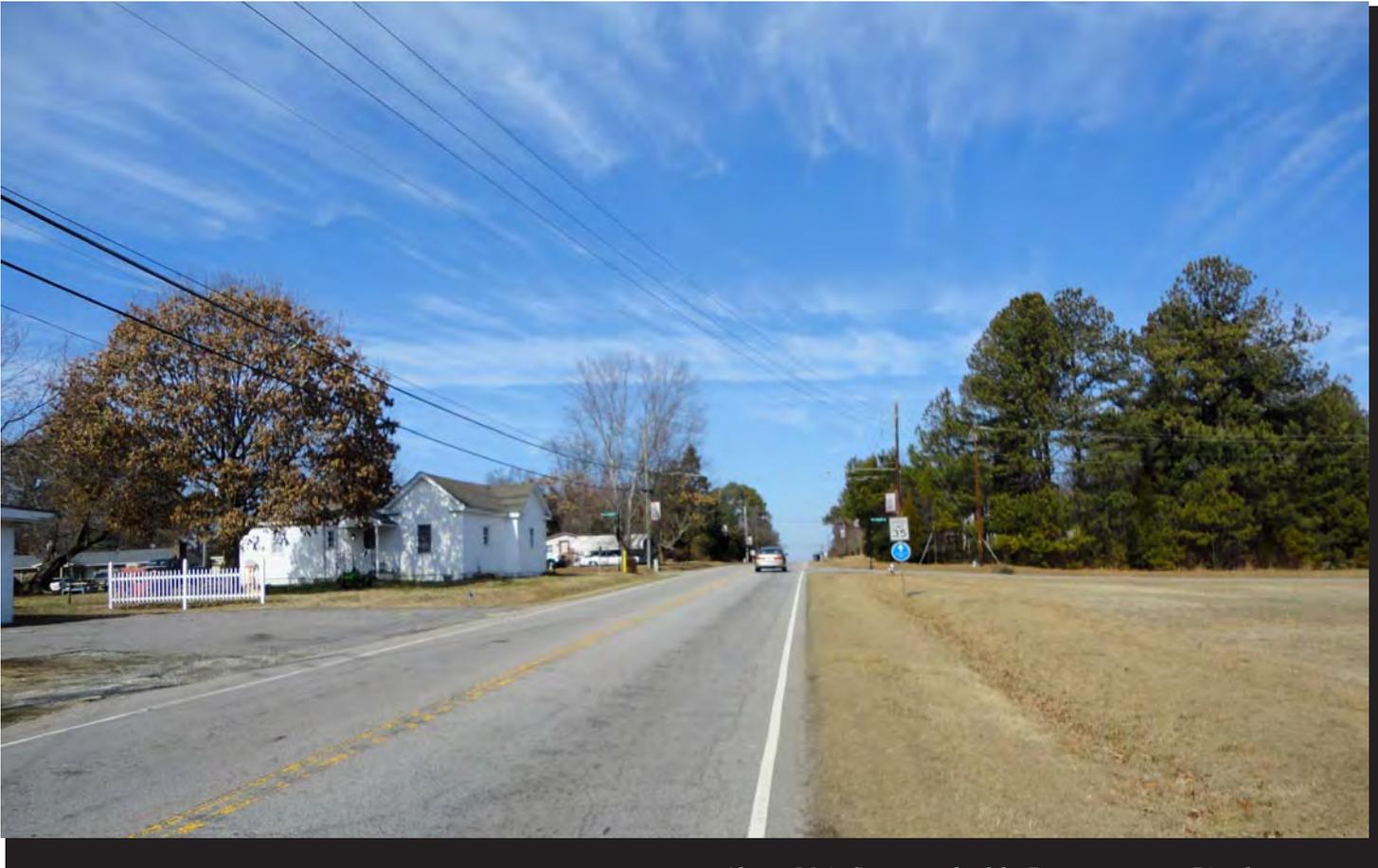
**Existing Lane Configuration:**  
2 lane

**Proposed Lane Configuration:**  
2 lane (or wider) with bicycle lanes

**Notes/Comments:** It is recommended to add bicycle lanes to be coincident with future projects along these roadways. With future development likely along Ralph Stephens, bicycle lanes are recommended to be added with future reconstruction, widening, and/or development. In order to add bicycle lanes along Main Street to connect to Downtown, the road will need to be widened with curb added. A short-term solution would be to widen the paved shoulder during a resurfacing project.

CTP: 3 lane widening (Main Street) and 4 lane median divided widening (Ralph Stephens Road). Bicycle lanes should be added with future roadway widening.



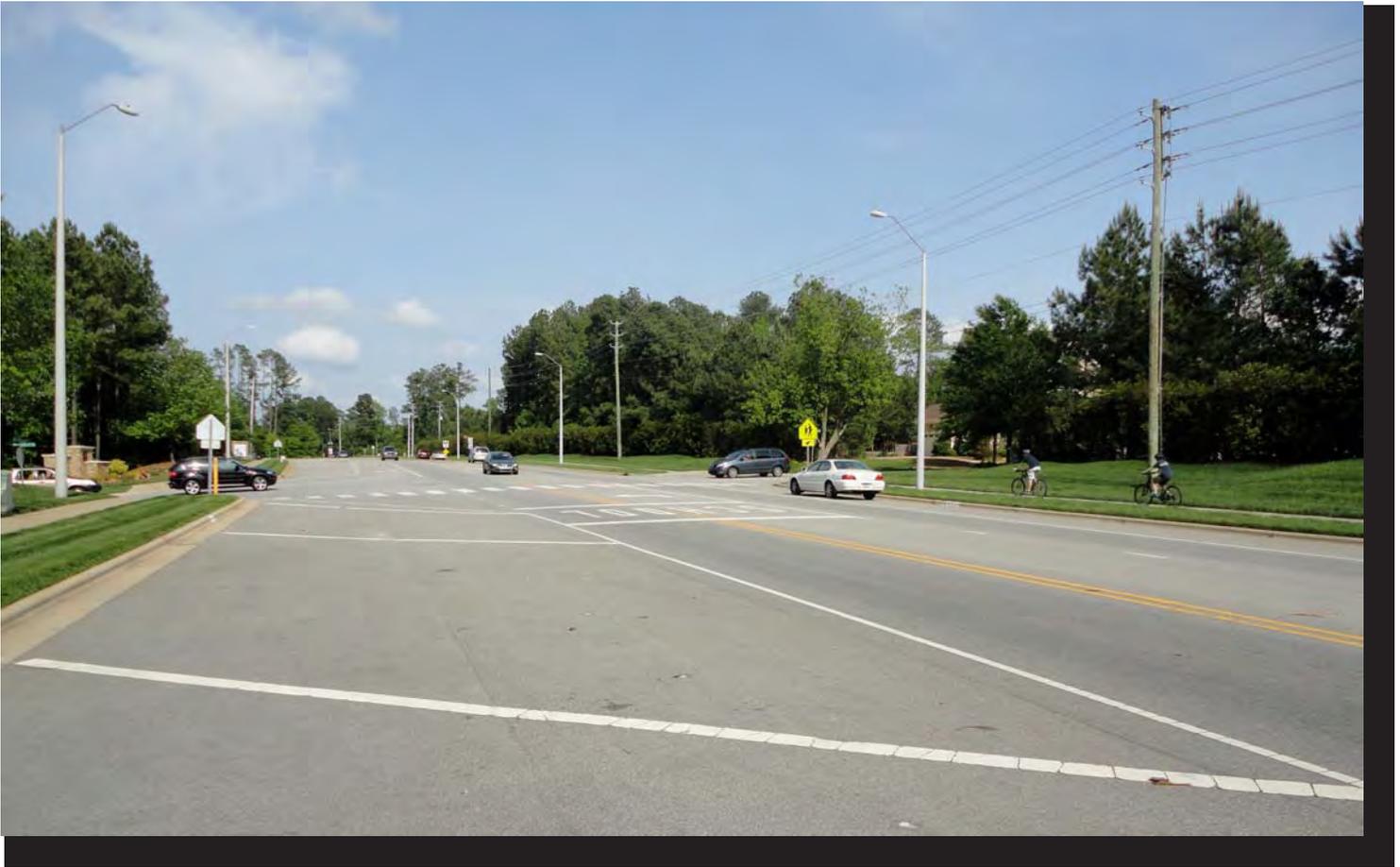


*Above: Main Street, south of the Downtown core. Bicycle lanes should be added when this roadway is widened and/or development occurs in the future.*

*Project Cost - Unknown* (Bicycle lanes should be added with new construction).

Project cost eliminated if done during resurfacing or during future widening (CTP recommends 3 lane widening and 4 lane divided median for these segments).





*Above: Holly Springs Road, near Holly Springs Middle School is quite wide in its existing roadway cross section. Restriping this section of roadway would provide plentiful width for bicycle lanes. Because the CTP calls for a four lane divided median roadway, bicycle lanes should be incorporated at that time with those changes.*

**Project Cost - Unknown** (Bicycle lanes should be added with new construction and resurfacing only).

Project cost eliminated if done during resurfacing or during future widening (CTP recommends 4 lane median divided roadway).

## Project Cutsheet 18:

### Sunset Lake Road

To/From: N. Main/Lockley

Distance (feet): 11,800

Facility Type: Bicycle Lane/Paved Shoulder

#### Construction Method:

Bicycle lanes or paved shoulders should be added to this two-lane cross section with any future roadway reconstruction/widening and/or development projects. If development or widening does not occur along sections, paved shoulder should be added to the existing roadway.

Trip Generators: Northern portions of Holly Springs, residential areas

#### Development/Funding Mechanism:

Encroachment Agreement from Local NCDOT. Local CIP funding for bicycle roadway widening/addition of bicycle lanes. In general, bicycle lanes to be added with future development/roadway widening.

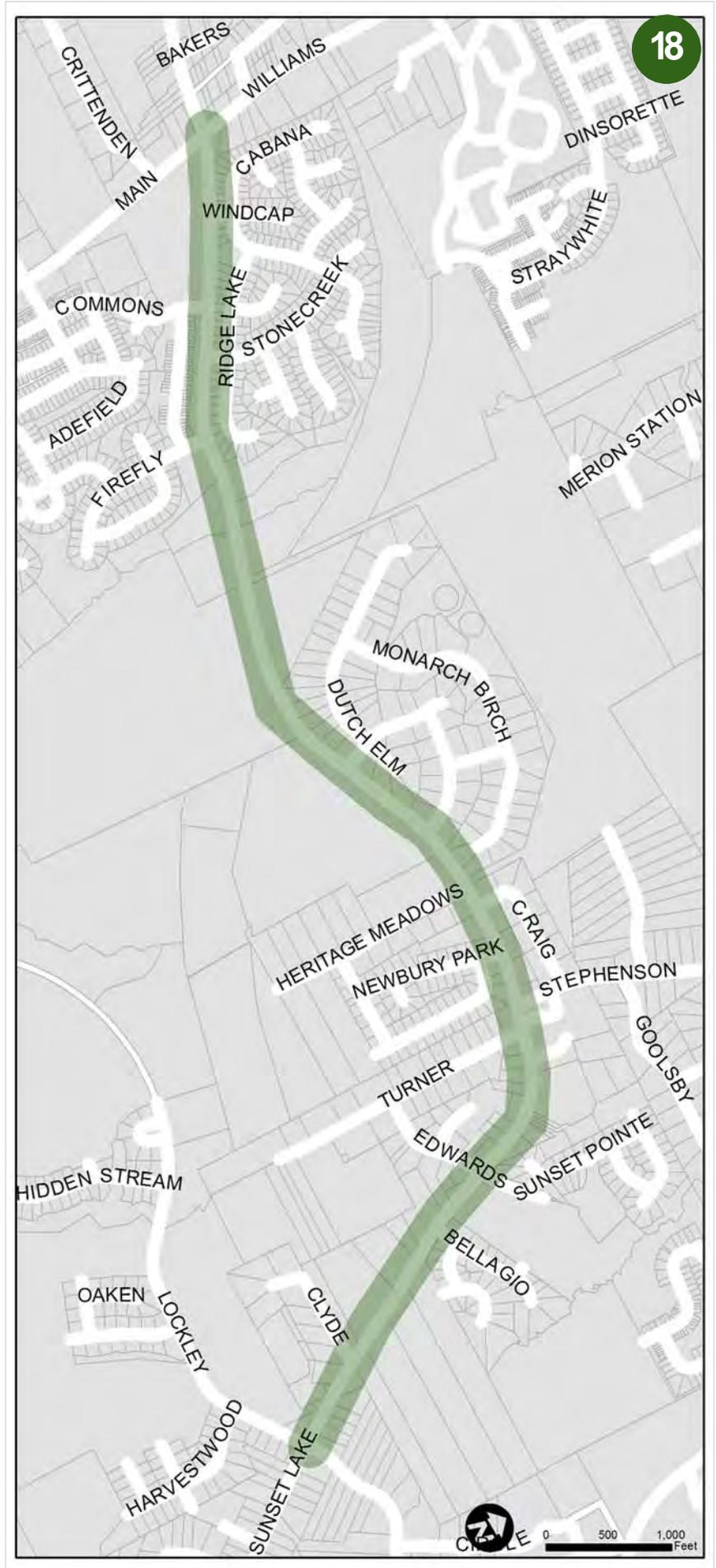
Road/Land Ownership: NCDOT

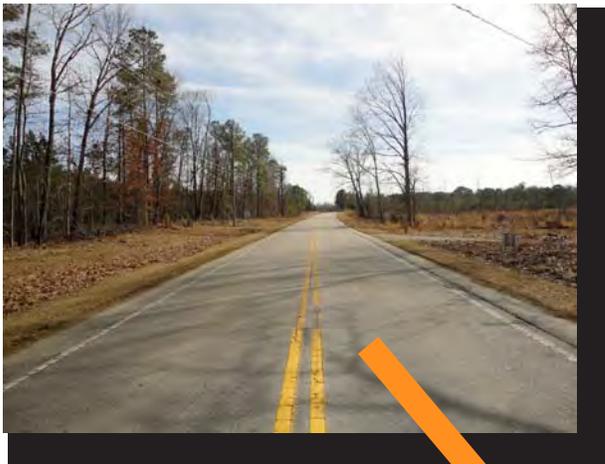
Existing Lane Configuration: 2 Lane (some 3 lane)

Proposed Lane Configuration: 2-4 lanes with bicycle lanes

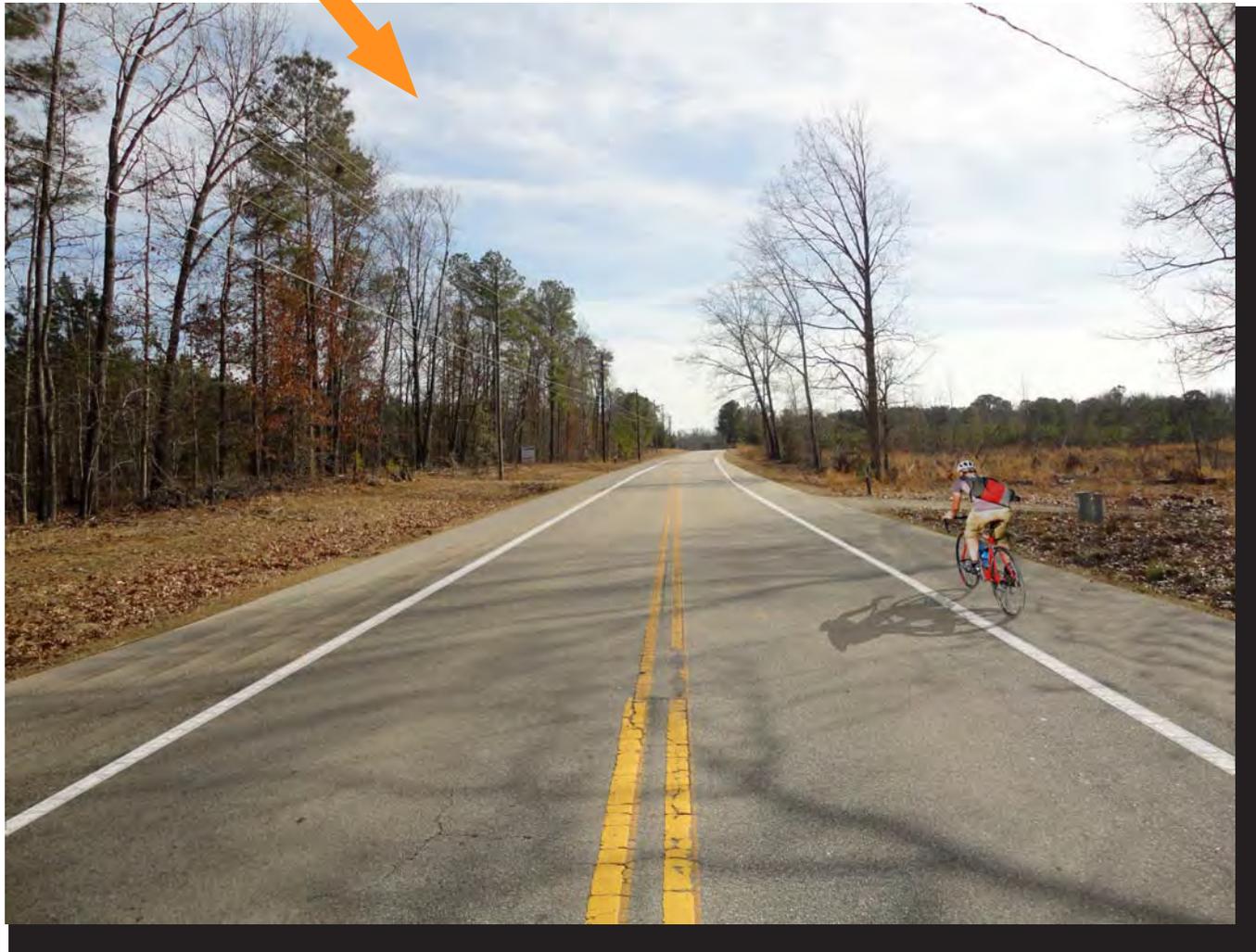
Notes/Comments: It is recommended to add bicycle lanes to be coincident with future projects along this roadway. With future development likely along Sunset Lake, bicycle lanes are recommended to be added with future reconstruction, widening, and/or development. Paved shoulder may be considered if curb-and-gutter is not added to roadway sections.

CTP: 4 lane median divided widening. Bicycle lanes should be added with future roadway widening.





*Left: Existing Conditions along Sunset Lake.  
Below: Photo rendering showing the addition of paved shoulders. Many rural roadway cross sections feature 1-2 foot paved shoulder currently. The addition of 4-5 foot paved shoulders or bicycle lanes will create a separated, safe space for bicyclists. Because the future CTP recommendation is for four lanes here, it is recommended that bike lanes be added at that time.*



*Project Cost - Unknown* (Bicycle lanes or paved shoulders should be added with new construction and resurfacing only).  
Project cost eliminated if done during resurfacing or during future widening (CTP recommends 4 lane median divided roadway).



# Project Cutsheet 19:

## NC 55 Bypass (GB Alford Hwy)

To/From: Main/Town Boundary

Distance (feet): 5,300

Facility Type: Sidepath

### Construction Method:

The existing four-lane divided highway cross section features non-controlled access south of Main Street. With relatively few driveways and crossings and future multi-family housing planned, a sidepath on the east side would provide a separated bicycle facility connecting areas along NC 55 towards the Downtown. Sidepath crossings of roadways and major driveways should be highly-visible with crosswalks and signage.

**Trip Generators:** Shopping centers, residential areas

### Development/Funding Mechanism:

Encroachment Agreement from Local NCDOT. Local CIP funding and/or development funding for sidepath.

### Road/Land Ownership:

NCDOT

### Existing Lane Configuration:

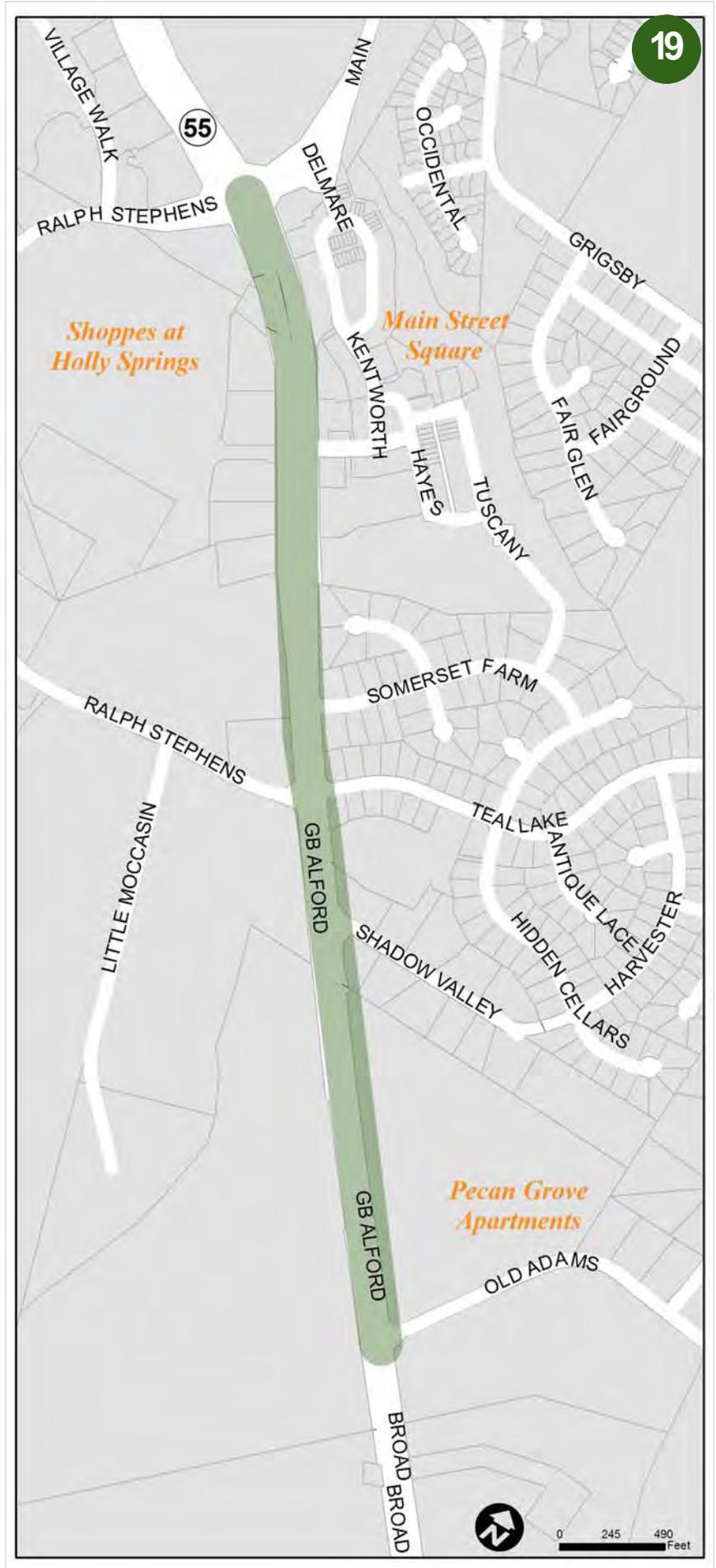
4 lane with divided median

### Proposed Lane Configuration:

No change

**Notes/Comments:** This is a higher cost opportunity to provide a legitimate, safe, and separated facility for families to access shopping centers and the Downtown. Constraints include potential right-of-way issues. The Town will need to control access. A sidewalk is recommended in the Pedestrian Plan. This sidepath should be wider than a sidewalk to accommodate both bicyclists and pedestrians.

CTP: 6 lane median divided widening.





*Above: The east side of the NC 55 Bypass, looking north at Old Adams Road. There is adequate space for a sidepath leading from this location of future apartments to Main Street Square.*

*Project Cost - \$398,700.00 (Addition of 10 foot sidepath).  
Project cost reduced if constructed by developer during future development.*

*\*This cost is only a planning-level estimate.*

## Project Cutsheet 20:

### Optimist Farm Road

To/From: Sunset Lake/Town Boundary

Distance (feet): 5,500

Facility Type: Bicycle Lane

#### Construction Method:

Bicycle lanes or paved shoulders should be added to this two-lane cross section with any future roadway reconstruction/widening and/or development projects. If development does not occur along sections, paved shoulder should be added to the existing roadway.

**Trip Generators:** Eastern residential portions of Holly Springs, Sunset Lake Commons

#### Development/Funding Mechanism:

Encroachment Agreement from Local NCDOT. Local CIP funding for bicycle roadway widening/addition of bicycle lanes. In general, bicycle lanes to be added with future development/roadway widening.

#### Road/Land Ownership:

NCDOT

#### Existing Lane

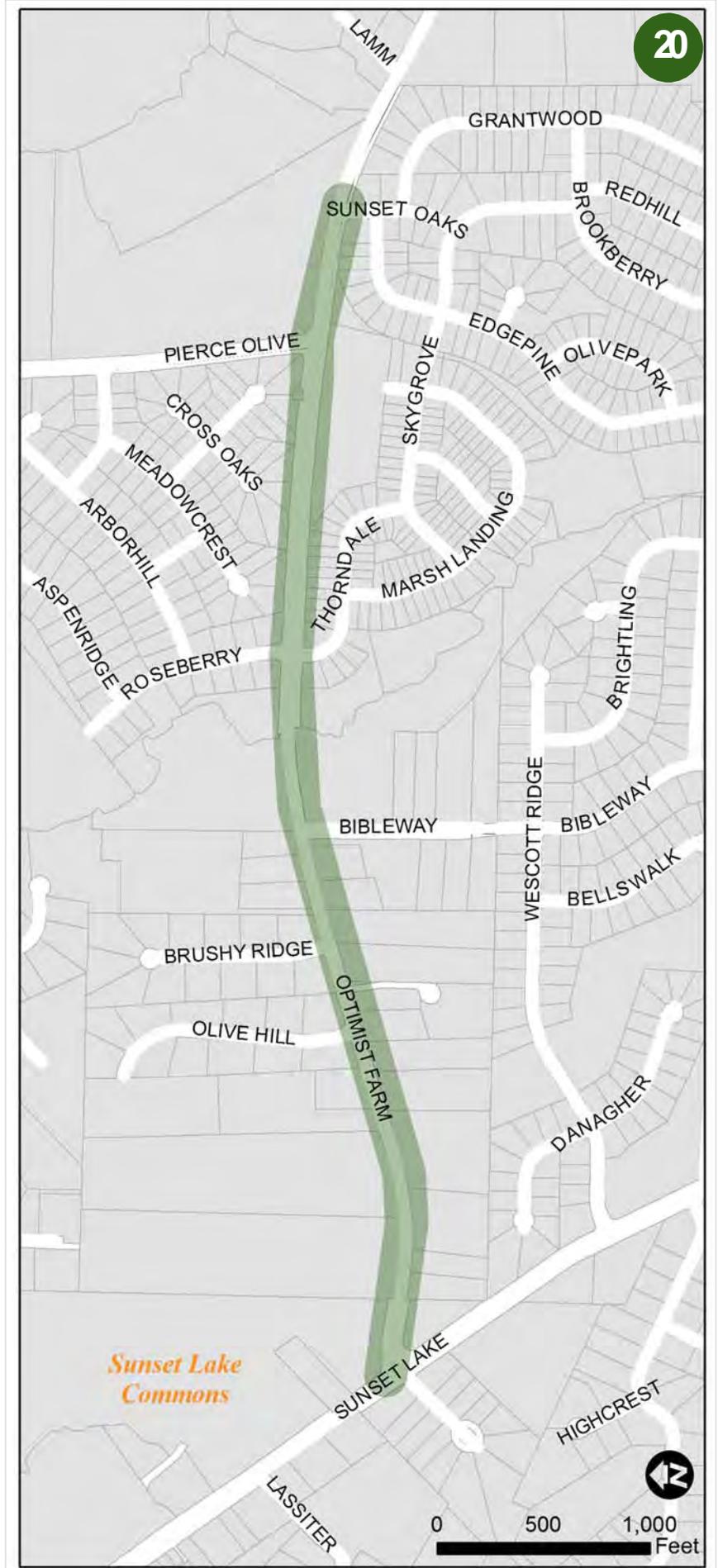
Configuration: 2 lane

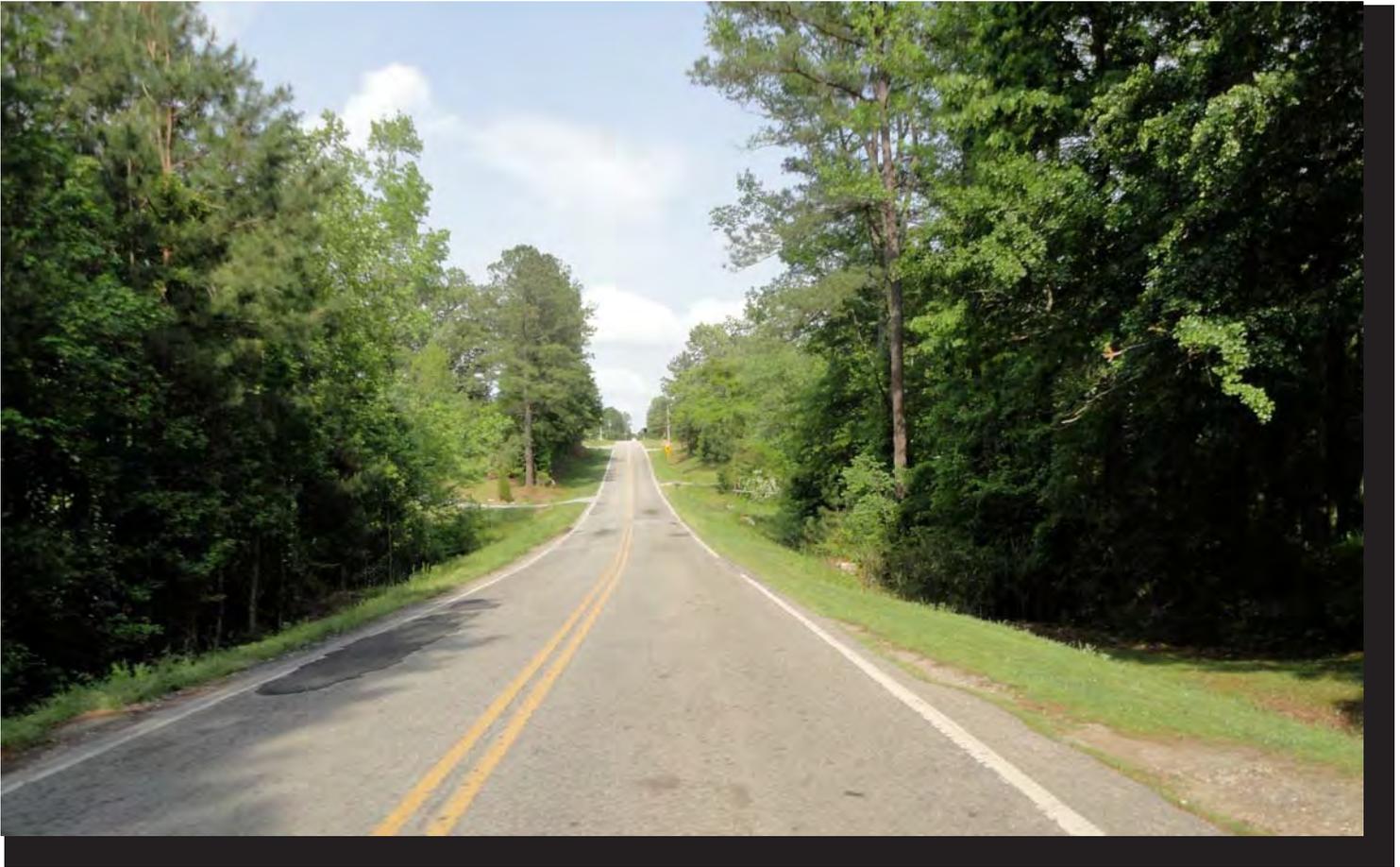
#### Proposed Lane

Configuration: No change

**Notes/Comments:** It is recommended to add bicycle lanes to be coincident with future projects along this roadway. With future development likely along Optimist Farm, bicycle lanes are recommended to be added with future reconstruction, widening, and/or development. Paved shoulder may be considered if curb-and-gutter is not added to roadway sections.

CTP: 4 lane median divided widening. Bicycle lanes should be added with future roadway widening.





*Above: Optimist Farm Road, facing east, is a standard two-lane cross section with very little shoulder space for bicyclists. With future development or reconstruction, paved shoulders or bicycle lanes should be added.*

*Project Cost - Unknown* (Bicycle lanes or paved shoulders should be added with new construction and resurfacing only).  
Project cost eliminated if done during resurfacing or during future widening (CTP recommends 4 lane median divided roadway).



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## 4. IMPLEMENTATION

### *Overview*

The challenge to implementing bicycle facilities in a growing community like Holly Springs is to integrate bicycle planning and expectations with a myriad of ongoing implementation programs and projects. The three main ways to improve bicycling conditions in Holly Springs are through facility construction, program implementation and policy enforcement. This chapter outlines the implementation priorities, key partners in implementation, facility development methods, and nearly 40 specific action steps.

### *Implementation Priorities*

The following action steps are integral to achieving the goals and vision of this Plan. As guiding recommendations and the clearest representation of specific items to accomplish, they should be referred to often. Table 4.1 summarizes these action steps, along with all other recommendations made throughout the plan, and defines recommended actions, responsible agency, resources, keys to success and listing of stakeholders. Finally, this Plan's appendices provide a variety of in-depth resources for assisting in carrying out these tasks.

#### 1. Adopt this Plan

The Town adopted the Bicycle Plan on June 21, 2011. This is considered the first step in implementation. Through adoption, the Bicycle Plan is recognized as a legitimate planning document for the Town. Adoption demonstrates that the Town has undergone a successful, supporting planning process that engaged citizens, stakeholders, interest groups, advocates, Town staff and elected decision-makers. The Town is better able to shape transportation and development decisions so that they fit with the goals of this Plan. Most importantly, having an adopted plan is extremely helpful in securing funding from state, federal, and private agencies. Adopting this Plan does not commit the Town to dedicate or allocate funds, but rather indicates the intent of the Town to implement this Plan over time, starting with these action steps.

The Town Council, Planning Board, and Recreation Advisory Committee and staff should become knowledgeable of this Plan and support ordinance amendments and policy changes contained in the recommendations. Efforts have been undertaken to coordinate the recommendations with the concurrent update of the Town's Comprehensive Transportation Plan. The salient elements of the adopted Bicycle Plan should be included in the next update of the Unified Development Ordinance, Comprehensive Plan, CIP, and the Engineering Design and Construction Manual.

#### 2. Designate Staff

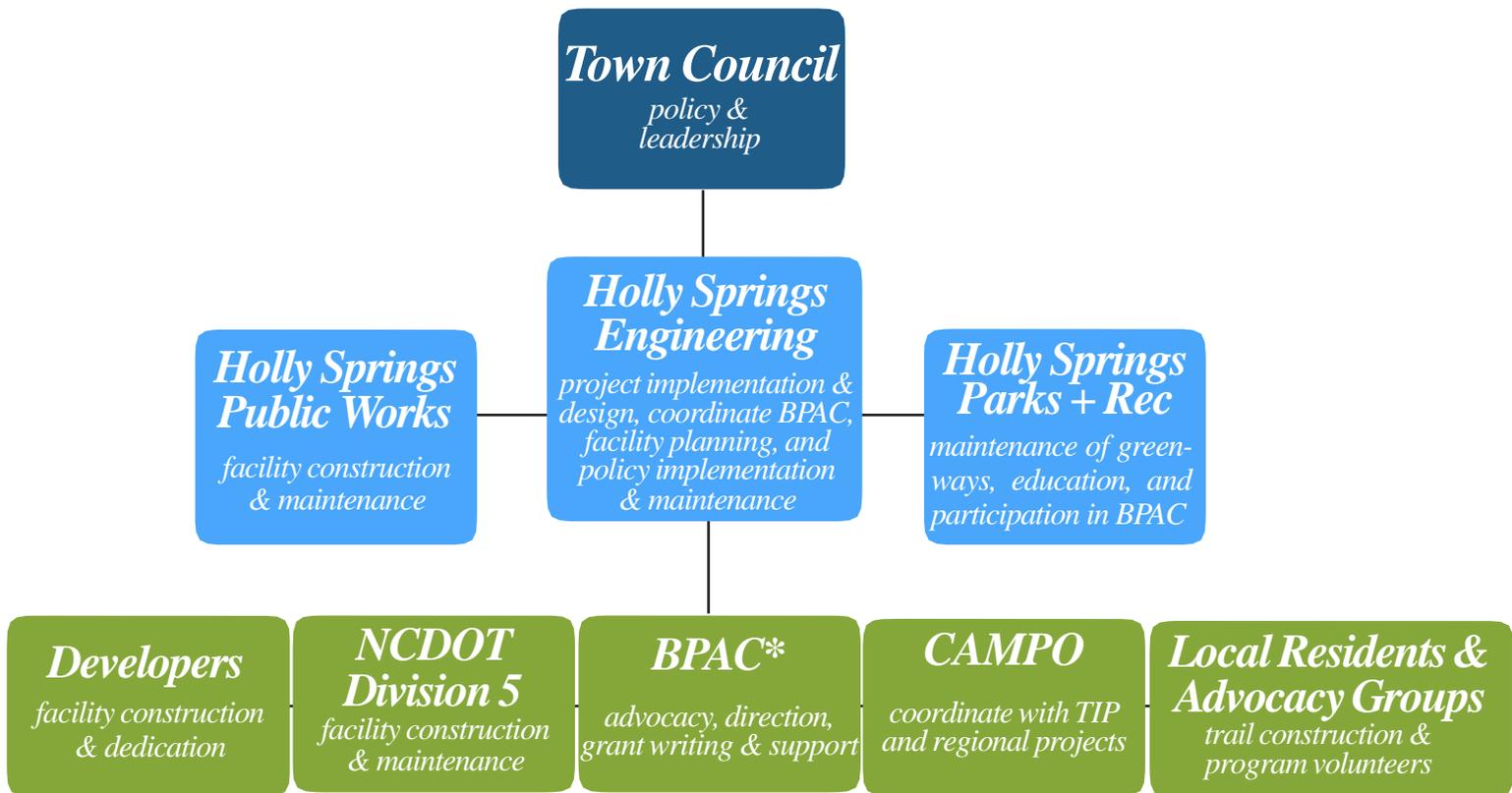
Designate staff to oversee the implementation of this plan and the proper maintenance of the facilities that are developed. It is recommended that a combination of existing Engineering, Public Works, Planning and Zoning, and Parks and Recreation staff oversees the day-to-day implementation of this Plan. In many municipalities this task is covered by a full-time bicycle and pedestrian coordinator, but in smaller towns, such as Holly Springs, it makes more sense to fold these responsibilities into current staff responsibilities.

### 3. Establish a Bicycle and Pedestrian Advisory Commission (BPAC)

The Town of Holly Springs should establish a Bicycle and Pedestrian Advisory Commission (BPAC) to assist in the implementation of this Plan. The Town of Holly Springs Engineering Department would oversee this group. The BPAC would be comprised of both commuting and recreational cyclists and pedestrian advocates, and should champion the recommendations of this Plan and the existing Pedestrian Plan. Formation of BPAC will also represent a significant step in becoming a Bicycle Friendly Community. The BPAC’s role would be to provide a communications link between the citizens of the community and Town government. The BPAC should meet periodically, be tasked with assisting the Town staff in community outreach, marketing and educational activities recommended by this Plan.

Models for BPAC exist throughout North Carolina. Durham, NC, has had in place their own BPAC ([www.bikewalkdurham.org](http://www.bikewalkdurham.org)) for many years. In Raleigh, a BPAC was recently formed in response to the adoption of their 2009 Bicycle Transportation Plan. These organizations, and others like them, traditionally focus on education, advocacy, partnerships, events and community service. Each BPAC member could represent one key functional area: planning, design, safety, maintenance, education, health, recreation, etc. Holly Springs would greatly benefit by supporting the creation of such an organization.

#### ORGANIZATIONAL FRAMEWORK FOR IMPLEMENTATION



\*BPAC = Bicycle and Pedestrian Advisory Committee, to be formed after adoption of this plan

#### 4. Begin Semiannual Meeting With Key Project Partners

Coordination between key project partners will establish a system of checks and balances, provide a level of accountability, and ensure that recommendations are implemented. This meeting should be organized by the designated Town staff, and should include representatives from the Organizational Chart shown on page 4-2. The purpose of the meeting should be to ensure that this Plan's bicycle recommendations are integrated with other transportation planning efforts in the region, local roadway design, the Holly Springs Comprehensive Transportation Plan (CTP), as well as long-range and current land use planning, economic development planning, and environmental planning. Attendees should work together to identify and secure funding necessary to immediately begin the first year's work, and start working on a funding strategy that will allow the Town to incrementally complete each of the suggested physical improvements, policy changes and programs over a 5-10 year period. A brief progress benchmark report should be a product of these meetings, and goals for the year should be reconfirmed by participants. The meetings could also feature special training sessions on bicycle, pedestrian, and trail issues.

#### 5. Seek Multiple Funding Sources and Facility Development Options

Multiple approaches should be taken to support bicycle and trail facility development and programming. It is important to secure the funding necessary to undertake priority projects but also to develop a long-term funding strategy to allow continued development of the overall system. A priority action is to immediately evaluate the recommendations against transportation projects that are currently programmed in the Transportation Improvement Program (TIP) to see where projects overlap, compliment, or conflict with each other. The Town should also evaluate which of the proposed projects could be added to future TIP updates.

Capital and local funds for bicycle facilities and trail construction should be set aside every year, even if only for a small amount (small amounts of local funding can be matched to outside funding sources). A variety of local, state, and federal options and sources exist and should be pursued. These funding options are described in Appendix E: Funding. Other methods of trail and bicycle facility development that are efficient and cost-effective are described in the 'Facility Development Methods' section of this chapter.

#### 6. Improve Bicycle Policies

While the Holly Springs Comprehensive Plan and Unified Development Ordinance address non-motorized transportation in a number of important ways, some policy updates are recommended to ensure future development provides pedestrian and bicycle facilities and improves bicycle/pedestrian friendliness. A table of suggested policy changes for the UDO and the Engineering Department Standard Specifications is included in Appendix C: Desk Reference for Bicycle Policies.

Top Policy Recommendations (see Appendix C for more on bicycle-related policies)

**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." By adopting a "Complete Streets" policy, the Town of Holly Springs commits to developing new roadways and reconstructing existing roadways to accommodate all users.

**Coordinated Development:** Ensure that adopted bicycle and multi-use path recommendations from this plan are part of future residential and commercial developments that connect with such proposed facilities.

**Driveway Access Management:** Refer to the NCDOT policy on 'Street and Driveway Access to North Carolina Highways' for examples on how to reduce conflict points between motor vehicles and pedestrians and bicyclists. Consider access management for both future development and retrofits to existing development: [www.ncdot.org/doh/preconstruct/altern/value/manuals/pos.pdf](http://www.ncdot.org/doh/preconstruct/altern/value/manuals/pos.pdf)



## 7. Develop Trail Construction Documents and Striping Plans

Town engineers could prepare these in-house to save money, using the design guidelines of this plan and the project cut-sheets as starting points. Specifically, the resources listed on page A-3 will be very useful in drafting such documents. The public should have an opportunity to comment on the design of new facilities.

## 8. Launch Programs as New Projects are Built

Through cooperation with the Town of Holly Springs, the BPAC, and local advocacy groups, strong education, encouragement, and enforcement campaigns could occur as new facilities are built. When an improvement has been made, the roadway environment has changed and proper interaction between motorists and bicyclists is critical for the safety of all users. A campaign through local television, on-site enforcement, education events, and other methods will bring attention to the new facility, and educate, encourage, and enforce proper use and behavior. Because residents identified issues with motorists passing too closely and driving too fast and with multiple bicyclists riding abreast in a travel lane (see comment form results pages D-11 and D-12), there is a need for enhanced education/enforcement for these issues. Appendix B: Bicycle Program Toolbox, provides program ideas for the Town and BPAC to choose from, many of which are also included in the action steps table at the end of this chapter.

### Top Program Recommendations (see Appendix B for more on bicycle-related programs)

- Offer joint adult and youth bicycle classes, to be provided in partnership between a locally certified League of American Bicyclists (LAB) instructor, BPAC, and Holly Springs Parks and Recreation Department. The actual curriculum would be developed by these groups, and could focus on personal trip coaching/promotion for non-car modes.
- Parks and Recreation and/or Police could lead a monthly family ride during the months of April through October as part of their regular programming schedule (similar to other programs listed in their seasonal publication); citizens (or BPAC members) might be willing to coordinate and lead such rides.

## 9. Offer Training for Enforcement

Law enforcement officers have many things to worry about, yet bicyclists and pedestrians remain the most vulnerable forms of traffic. The Holly Springs Police Department has been an active participant in this planning process, and should continue to be involved in implementation. In many cases, officers and citizens do not fully understand state and local laws related to bicyclists and pedestrians. Training on this topic can lead to additional education and enforcement programs that promote safety. Training for Holly Springs' officers could be done through free online resources available from the National Highway Traffic Safety Administration (NHTSA) (see links at [www.bicyclinginfo.org/enforcement/training.cfm](http://www.bicyclinginfo.org/enforcement/training.cfm)). If the Town is able to find and secure grants for education, the Town could also seek instructor-led courses offered by the NHTSA or groups such as the League of American Bicyclists (LAB).

## 10. Become Designated as a Bicycle Friendly Community

One of the goals for this Bicycle Plan is to transform Holly Springs into a "Bicycle Friendly Community" (BFC). The Bicycle Friendly Community Campaign is an awards program that recognizes municipalities that actively support bicycling. A Bicycle Friendly Community provides safe accommodation for cycling and encourages its residents to bike for transportation and recreation. The League of American Bicyclists (LAB) administers the Bicycle Friendly Community Campaign and represents the interests of the nation's 57 million cyclists.

A committee of the LAB reviews and scores the BFC application and consults with local cyclists in the community. An award of platinum, gold, silver or bronze status is designated for a period of four years. The LAB and technical assistance staff continue to work with awardees and those communities that do

not yet meet the criteria to encourage continual improvements. The LAB recognizes newly designated Bicycle Friendly Communities with an awards ceremony, a Bicycle-Friendly Community road sign, and a formal press announcement.

The development and implementation of this Plan is an essential first step in eventually becoming a Bicycle Friendly Community. In North Carolina, several communities are designated as “bicycle friendly,” including Cary, Carrboro, Greensboro, Durham, and Charlotte. Holly Springs should make progress in accomplishing the goals of this Plan, and then apply for BFC status. If the short term work program is accomplished, the Town should be in a position to apply for and receive BFC status within three years.

## 11. Ensure Planning Efforts are Integrated Regionally

Regional efforts by the Capital Area Metropolitan Planning Organization (CAMPO) are worthwhile opportunities for the Town of Holly Springs. The Locally Administered Projects Program (LAPP) established in 2010 is the most logical and organized method to secure state and federal transportation program funds to implement bicycle projects in Holly Springs. The program will be used by CAMPO to prioritize and program all projects in the region that will utilize federal funding that is the responsibility of the MPO, including but not limited to Surface Transportation Program – Direct Allocation (STP-DA), Congestion Mitigation for Air Quality (CMAQ), and perhaps Transportation Enhancement once that program is re-invigorated by the next NCDOT Manager of the Division of Bicycle and Pedestrian Transportation. The LAPP process will involve a once-a-year call for all local highway, bicycle and pedestrian projects, and will result in an annual program of projects in the MTIP (Metropolitan Transportation Improvement Program). The first call for projects was due October 2010.

### *Key Partners in Implementation*

#### Role of Holly Springs Town Council

The Town Council adopted this Plan on June 21, 2011. Through adoption, the Town’s leadership is recognizing the value of bicycle transportation and is putting forth a well-thought out set of recommendations for improving public safety and overall quality of life (see pages 1-4 to 1-9: The Benefits of a Bicycle-Friendly Community). By adopting this Plan, the Town 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 it’s own departments and the local NCDOT, Division 5.

Adoption of this Plan was in line with public support. The Holly Springs’ online comment form (which yielded 234 responses showed strong support for improving bicycling conditions. The comment form asked, “How important to you is improving bicycling conditions in Holly Springs?” Sixty-three percent responded “Very important”, 29% responded “important,” while only 7.6 percent responded “Not important”. See Appendix D: Public Involvement for more information.

#### Role of the Town of Holly Springs Planning Board

The Town of Holly Springs Planning Board serves as an advisory board to the Town Council on some matters of planning and zoning. The Planning Board should be prepared to:

- Become familiar with the recommendations of this Plan, and support its implementation.
- Learn about bicycle-related policy in Appendix C of this Plan.

#### Role of the Town of Holly Springs Engineering Department

The Engineering Department will take primary responsibility for the design and construction of bicycle facilities on town-owned and maintained roadways, as well as on NCDOT roadways, where encroachment agreements are secured. For example, the department should be prepared to:

- Meet with the BPAC; provide progress updates for plan implementation and gather input regarding bicycle and trail-related issues.



- Become familiar with the standards set forth in Appendix A of this Plan, as well as state and national standards for bicycle facility design.
- Design and construct bicycle facilities using the standards set forth in Appendix A of this Plan. Secure encroachment agreements before work on any NCDOT-owned and maintained roadways.
- Communicate and coordinate with the Town of Holly Springs Parks and Recreation Director on priority projects for town-maintained roadways and trail corridors/easements.
- Communicate and coordinate with Wake County, CAMPO, and neighboring municipalities on regional bicycle facilities and trails; partner for joint-funding opportunities.
- Keep track of all upcoming roadway reconstruction or resurfacing/restriping projects in Holly Springs, as they relate to the recommendations in this Plan and the CTP.
- Communicate and coordinate with NCDOT Division 5 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. Ensure these recommendations are part of the CAMPO CTP.
- Work with Division 5 to ensure that when NCDOT-owned and maintained roadways in Holly Springs are resurfaced or reconstructed, that this Plan's adopted recommendations for bicycle facilities are included on those streets. The Town should initiate early consultation with NCDOT to add incidental bicycle-related projects into the annual resurfacing program before NCDOT prepares pavement marking plans. If a compromise to the original recommendation is needed, then contact NCDOT Division of Bicycle and Pedestrian Transportation for guidance on appropriate alternatives.

### Role of the Town of Holly Springs Public Works Department

The Public Works Department and Streets Division will take primary responsibility for the maintenance of bicycle facilities on town-owned and maintained roadways, as well as on NCDOT roadways, where encroachment agreements are secured. For example, the department should be prepared to:

- Become familiar with the standards set forth in Appendix A of this Plan, as well as state and national standards for bicycle facility design.
- Maintain bicycle facilities by street sweeping and removing debris. Enforce the removal of obstructions in bicycle lanes.
- Communicate and coordinate with the Town of Holly Springs Parks and Recreation Director on greenway trail maintenance.
- Keep track of all upcoming roadway reconstruction or resurfacing/restriping projects in Holly Springs, as they relate to the recommendations in this Plan.

### Role of the Town of Holly Springs Parks & Recreation Department

The Town of Holly Springs Parks and Recreation Department operates the recreation, athletic, and special event programs for the citizens of Holly Springs. They also lead implementation and maintain a variety of community, neighborhood, greenway, and natural park areas. The Parks and Recreation Department should be prepared to:

- Meet with the BPAC; provide progress updates for plan implementation and gather input regarding bicycle and trail-related issues.
- Pursue grants for funding priority projects and priority programs.



- Select and carry out bicycle-related programs; Work with locale advocacy groups and the BPAC to assist in organizing bicycle-related events, educational activities, and enforcement programs.
- Communicate and coordinate with the Town of Holly Springs Engineering, Wake County, and neighboring municipalities on regional trails facilities; partner for joint-funding opportunities.

### Role of the Town of Holly Springs Department of Planning and Zoning

The Department of Planning and Zoning will take primary responsibility for the contact with new development to implement the plan (with support from the Parks and Recreation and Engineering Departments). For example, the department should be prepared to:

- Communicate and coordinate with local developers on adopted recommendations for bicycle facilities, including paved multi-use trails.
- Make recommended revisions to local ordinances and policies.

### Role of the Bicycle & Pedestrian Advisory Committee (BPAC)

See pages 4-1 and 4-3 for information about forming a BPAC. The BPAC should be prepared to:

- Meet with staff from the Engineering Department; evaluate progress of the plan's implementation and offer input regarding bicycle and trail-related issues; assist Town staff in applying for grants and organizing bicycle-related events and educational activities.
- Build upon current levels of local support for bicycling issues and advocate for local project funding.

### Role of the Local NCDOT, Division 5

Division 5 of the NCDOT is responsible for the construction and maintenance of bicycle facilities on NCDOT-owned and maintained roadways in the Town of Holly Springs, OR is expected to allow for the Town to do so with encroachment agreements. Division 5 should be prepared to:

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

### Role of the Town of Holly Springs Police Department

The Town of Holly Springs Police Department is responsible for making Holly Springs a safe place to live, work, and raise a family. The Police Department should be prepared to:



- Become experts on bicycling-related laws in North Carolina (see [www.ncdot.gov/bikeped/lawspolicies/laws/](http://www.ncdot.gov/bikeped/lawspolicies/laws/))
- Continue to enforce not only bicycling-related laws, but also motorist laws that affect bicycling, such as speeding, running red lights, aggressive driving, etc.
- Participate in bicycle-related education programs such as ongoing bicycle rodeos.
- Set up a telephone hotline or online reporting mechanism for reporting bicycling- and pedestrian-related violations, then target those areas for enforcement.
- Review safety considerations with the Engineering Department as projects are implemented.
- Maintain a separate, mapped bicycle and pedestrian crash database.

### Role of Developers

Developers in Holly Springs can play an important role in facility development whenever a project requires the enhancement of transportation facilities or the dedication and development of trails or sidepaths. Developers should be prepared to:

- Become familiar with the benefits, both financial and otherwise, of providing amenities for walking and biking (including trails) in residential and commercial developments.
- Become familiar with the standards set forth in Appendix A of this Plan, as well as state and national standards for bicycle facility design.
- Become familiar with the Town Unified Development Ordinance revisions related to bicycle facilities.

### Role of Local Residents, Clubs and Advocacy Groups

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

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

## Facility Development Methods

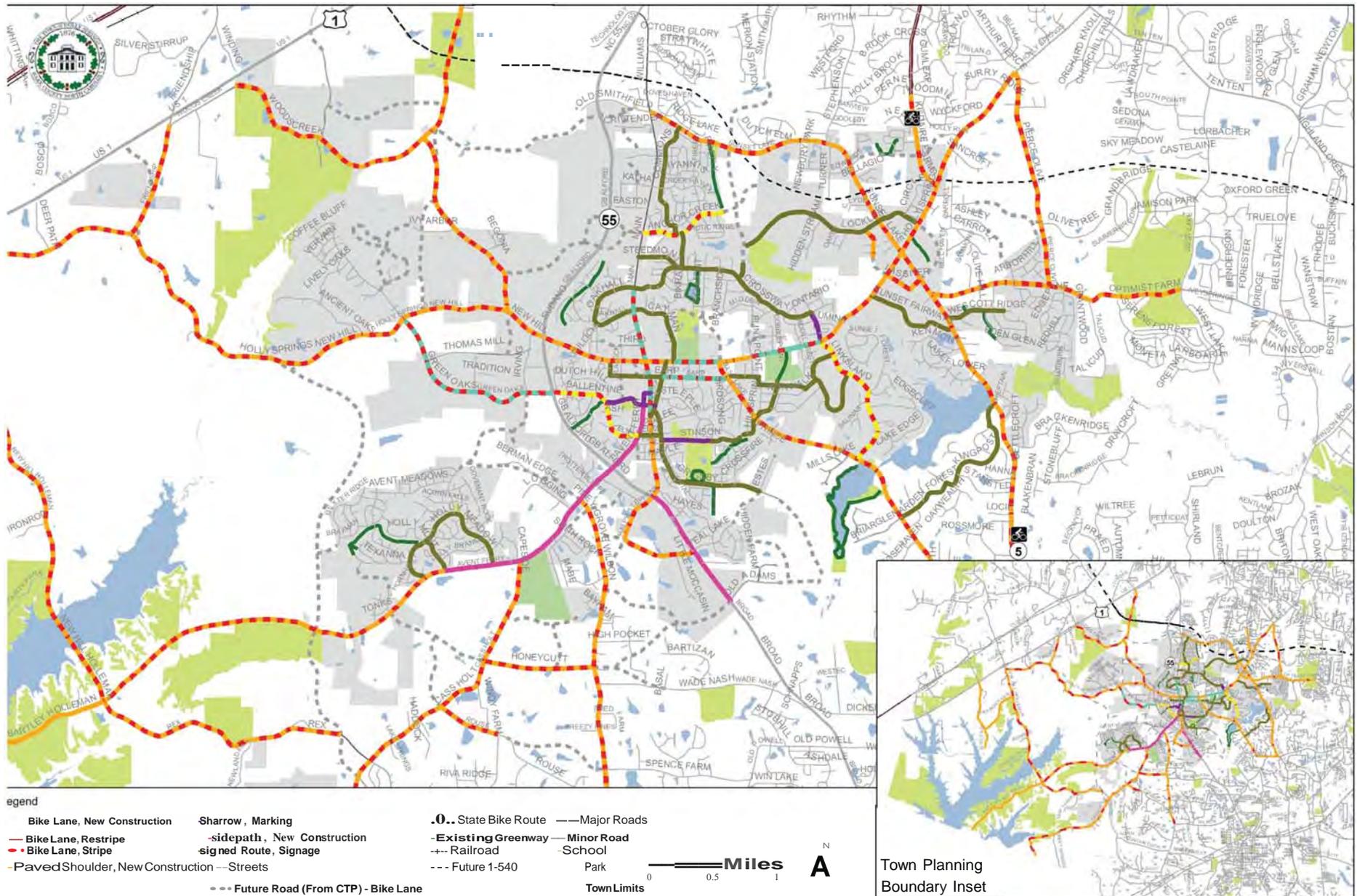
### Construction Method Definitions

As indicated in the legend of Map 4.1, some facilities are broken down into sub-categories for method of development. Shared-lane markings simply require pavement markings while bike routes simply require signage. Repaving projects provide a clean slate for revising pavement markings. When a road is repaved, the roadway should be restriped to create narrower lanes and provide space for bike lanes and shoulders, where feasible. In addition, if the spaces on the sides of non-curb and gutter streets have relatively level grades and few obstructions, the total pavement width can be widened to include paved shoulders.

These types of projects are explained more below:

- **Bicycle Lane - Road Diet:** Road diets typically involve reducing the number of travel lanes (from a four-lane road to a two-lane road with center turn lane, for example) allowing adequate space for bicycle lanes. Road diets also have traffic calming benefits. There were no

MAP 4.1 RECOMMENDED ON-ROAD BICYCLE FACILITIES BY CONSTRUCTION METHOD





road diet opportunities identified in this Plan (See page A-8 for example diagram).

- **Bicycle Lane - *Stripe***: Refers to projects that require only the striping of a bicycle lane, with no other changes needed to the roadway or existing roadway striping.
- **Bicycle Lane - *Restripe***: Refers to projects that require restriping travel lanes (often to a more narrow width) allowing adequate space for bicycle lanes. Narrowing the widths of travel lanes has been demonstrated to have no affect on overall roadway capacity (for more on this topic, refer to the following section).
- **Bicycle Lane & Paved Shoulder - *New Construction***: Refers to projects that require adding additional pavement width to the roadway to allow adequate space for bicycle lanes. These were determined based on future roadway reconstruction schedules and/or lack of opportunity with the current roadway environment.

Other facilities also have sub categories shown on Map 4.1, indicating whether they are existing, planned, or proposed. These are defined as follows:

- Trails labeled as '*recommended*' are recommendations that were made for this Bicycle Plan.
- Trails labeled as '*town proposed*' already appear in previously adopted Town plans.
- Trails labeled as '*existing*' are already constructed and in use.

### Ncdot Transportation Improvement Program (TIP) Process

The Transportation Improvement Program (TIP) is an ongoing program at NCDOT which includes a process asking localities to present their transportation needs to state government. Bicycle facility and safety needs are an important part of this process. The primary NCDOT source for developing pedestrian and bike facilities is securing identification of a project in the State Transportation Improvement Program (STIP). Every two years projects are submitted by regional planning organizations (metropolitan planning organizations (MPO) and rural planning organizations (RPO)) throughout the state. Submitted bike and pedestrian projects are prioritized by the Division of Bike and Pedestrian Transportation staff. High priority projects will be used to populate the 5-Year Work Program and the delivery STIP. Please see this site – <http://www.ncdot.gov/performance/reform/> – for further information.

There are two types of projects in the TIP: incidental and independent. Incidental projects are those that can be incorporated into a scheduled roadway improvement project. Independent are those that can stand-alone such as a greenway, not related to a particular roadway.

The Town of Holly Springs, guided by the priority projects within this plan, should present bicycle projects along State roads to the Capital Area Metropolitan Planning Organization (CAMPO) and State. Local requests for small bike/pedestrian projects, such as crosswalks, signage, and shared-lane markings, can be directed to the CAMPO or the local NCDOT Division 5 office.

### Local Roadway Construction and Reconstruction

Bicyclists should be accommodated any time a new road is constructed or an existing road is reconstructed. All new roads with moderate to heavy motor vehicle traffic should have bicycle accommodations (see various types and applications in Appendix A). The Town of Holly Springs should take advantage of any upcoming construction projects, including roadway projects outlined in local comprehensive and transportation plans. Also, as far as pedestrian planning is concerned, case law surrounding the ADA has found that roadway resurfacing constitutes an alteration, which requires the addition of curb ramps at intersections where they do not yet exist.



## Residential and Commercial Development

The construction of bicycle facilities that are part of an adopted plan should be required during development. Construction of bicycle facilities that corresponds with site construction is more cost-effective than retro-fitting. In commercial development, emphasis should also be focused on driveway access management, reducing potential conflict points in and out of parking lots.

## Bicycle Lane Development Through Travel Lane Narrowing

One means of developing bicycle lanes is through restriping or travel lane narrowing. In laying out the bicycle network facility recommendations and methods, it was determined that 10' travel lanes were acceptable in order to fit bicycle lanes into the existing roadway environment. *In fact, some existing State roadways in Holly Springs feature lane widths less than 9'*. For example, an existing two lane cross section with 15' lanes (Total roadway width of 30') could be altered to 10' lanes with 5' bicycle lanes (Total roadway width of 30'). This methodology used in developing recommendations is supported by research in both automobile traffic safety and bicycle level of service improvements.

Current AASHTO literature, research, and precedent examples support the notion of reducing 12' travel lanes to 10' lanes. The 2004 AASHTO Green Book states that travel lanes between 10 and 12 feet are adequate for urban collectors and urban arterials. (1) "On interrupted-flow operating conditions at low speeds (45 mph or less), narrow lane widths are normally adequate and have some advantages." At the 2007 TRB Annual Meeting, a research paper using advanced statistical analysis, supported the AASHTO Green Book in providing flexibility for use of lane widths narrower than 12 feet on urban and suburban arterials. The paper indicates there is no difference in safety on streets with lanes ranging from 10 to 12 feet. "The research found no general indication that the use of lanes narrower than 12 feet on urban and suburban arterials increases crash frequencies. This finding suggests that geometric design policies should provide substantial flexibility for use of lane widths narrower than 12 feet." The research paper goes on to say "There are situations in which use of narrower lanes may provide benefits in traffic operations, pedestrian safety, and/or reduced interference with surrounding development, and may provide space for geometric features that enhance safety such as medians or turn lanes. The analysis results indicate narrow lanes can generally be used to obtain these benefits without compromising safety" and "Use of narrower lanes in appropriate locations can provide other benefits to users and the surrounding community including shorter pedestrian crossing distances and space for additional through lanes, auxiliary and turning lanes, bicycle lanes, buffer areas between travel lanes and sidewalks, and placement of roadside hardware." (2)

Precedent examples also show the large number of communities around the United States that have narrowed travel lanes to enable the development of bicycle lanes. The Missoula Institute for Sustainable Transportation accumulated a list of these communities by asking members of the Association of Pedestrian and Bicycle Professionals. The webpage titled "Accommodating Bike Lanes in Constrained Rights-of-Way (<http://www.strans.org/travellanessurvey.htm>) lists the community, their methods, and contact information. Cities such as Arlington, VA, Cincinnati, OH, Charlotte, NC, Houston, TX, and Portland, OR have regularly narrowed travel lanes to 10' or even commonly use them in new roadway development. Arlington, VA has been installing bicycle lanes on streets when they are repaved and have a number of streets with 10' lanes and bicycle lanes that have been functioning well without operational issues and complaints. Cincinnati, OH uses a policy that 10 foot lanes on collectors and arterials are always permitted. New installations of 10 foot lanes with bicycle lanes require a speed limit of 35 mph or under. By restriping 12 foot lanes to 10 feet, the City of Houston, TX has converted 30 miles of arterial streets.

Lane narrowing and the addition of bicycle lanes will require further analysis beyond this planning effort. Changing the roadway design may also require a reduction in speed limit and consideration of traffic calming designs such as median islands. For roadways with higher speed limits and traffic volumes, wider bicycle lanes may be warranted. Further analysis of bicycle lane restriping projects is warranted to determine appropriateness of lane narrowing, bicycle lane widths, and speed limits that impact both motorists and bicyclists.



## Action Steps Table

Table 4.1 Policy, Program, and Administrative Action Steps Table

Task	Lead Agency	Support	Details	Phase	Page Reference
Present Plan to Town Council	Holly Springs Engineering	Project Consultants	Presentation to Town Council in Summer 2011	COMPLETE	n/a
Approve this Plan	NCDOT Bike/Ped Division	Project Consultant	Official letter of approval expected by Summer 2011	COMPLETE	n/a
Adopt this plan	Holly Springs Town Council	Holly Springs Engineering Department	Through adoption, the Plan becomes an official planning document of the Town. Adoption shows that the Town of Holly Springs has undergone a successful, supported planning process.	COMPLETE	n/a
Adopt this plan as component of updated 2011 Holly Springs Transportation Plan	Holly Springs Town Council	Holly Springs Engineering Department	The planning processes for the Bicycle Plan and the Transportation Plan occurred simultaneously. The Bicycle Plan should be harmonious with the Transportation Plan and be an adopted component of the Transportation Plan.	Summer 2011	n/a
Adopt this plan as component of Vision Holly Springs Comprehensive Plan	Holly Springs Town Council	Planning & Zoning	Recommendations from this Plan should be incorporated in an update to the Vision Holly Springs Comprehensive Plan	Short Term (2012)	n/a
Designate Staff	Holly Springs Town Council	Holly Springs Town Manager	Designate staff to oversee the implementation of this plan and the proper maintenance of the facilities that are developed. It is recommended that a combination of existing Engineering Staff, Planning staff and Parks and Recreation staff oversees the day-to-day implementation of this plan.	Fall 2011	4-1
Establish a Bicycle and Pedestrian Advisory Commission (BPAC)	Holly Springs Town Council	Bicycle Plan Steering Committee	The Town of Holly Springs should establish a Bicycle and Pedestrian Advisory Commission (BPAC) to assist in the implementation of this Plan.	Short Term (2011)	4-1 and 4-3
Begin Semiannual Meeting With Key Project Partners	Holly Springs Engineering Department	BPAC	BPAC should meet at least on a quarterly basis, and one of their meetings should be reserved to evaluate the implementation of this Plan. The Town Council, staff and members of the BPAC should meet on an annual basis to tour bicycle facilities and discuss bicycle and pedestrian issues.	Short Term (2011) /Ongoing	4-3
Seek Multiple Funding Sources and Facility Development Options	Holly Springs Engineering Department	Town Manager, other Town departments, BPAC	Chapter 3 contains project cost estimates and Appendix F contains potential funding opportunities.	Short Term (2011)/ Ongoing	Appendix E
Improve Bicycle Policies	Holly Springs Town Council	Holly Springs Department of Planning & Zoning and Engineering Departments, BPAC	Suggested policy revisions to the Town of Holly Springs Code of Ordinances are outlined in Appendix C. The changes suggested clarify some basic policy positions regarding future development and the provision of bicycle facilities. Some edits are also suggested for consistency in terminology.	Short Term (2012)	Appendix C
Develop Bicycle Facility Striping Plans and Trail Construction Documents	Holly Springs Engineering	NCDOT Division 5, NCDOT Bike/Ped Division, Town of Holly Springs Planning and Public Works	Town engineers could prepare these in-house to save money, using the design guidelines of this plan and the project cut-sheets as starting points. Specifically, the resources listed on page A-3 will be very useful in drafting such documents. The public should have an opportunity to comment on the design of new facilities.	Short Term (2012)/ ongoing	Chapter 3 Cutsheets and Appendix A



Task	Lead Agency	Support	Details	Phase	Page Reference
Launch Programs as New Projects are Built	Holly Springs Parks and Recreation, Engineering, and Planning Departments	BPAC & League of American Bicyclists	Assist in the coordination of joint adult and kids bicycle classes, to be provided in partnership between a locally certified League of American Bicyclists (LAB) instructor, BPAC, and Holly Springs Parks and Recreation Department. The actual curriculum would be developed by these groups, and could focus on personal trip coaching/promotion for non-car modes.	Short Term (2012) / Ongoing	Appendix B
Offer Training for Enforcement	Holly Springs Police Department	National Highway Traffic Safety Administration (NHTSA) or League of American Bicyclists	Training for Holly Springs' officers could be done through free online resources available from the National Highway Traffic Safety Administration (NHTSA). If the Town is able to find and secure grants for education, the Town could also seek instructor-led courses offered by the NHTSA or groups such as the League of American Bicyclists (LAB).	Short Term (2012)	4-4
Complete top priority, phase 1 projects	Holly Springs Engineering + NCDOT Division 5	NCDOT Bike/Ped Division	Table 3.1 provides a list of the projects with phases noted. Immediate attention to the Phase 1 projects will instantly have a large impact on bicycling conditions in Holly Springs. Aim to complete this plan's Phase 1 bicycle projects by the end of 2012.	Short Term (2012)	Chapter 3; Table 3.1 on page 3-4
Present this Plan to other local and regional bodies and agencies.	Holly Springs Engineering, Planning, and Parks and Recreation Departments	BPAC	This Plan should be presented to other local and regional bodies and agencies. Possible groups to receive a presentation might include: the Capital Area Metropolitan Planning Organization, local bike store owners, regional transportation planners, Wake County park planners, health clubs and fitness facilities, schools and youth organizations, riding clubs, major employers, and large neighborhood groups.	Short Term (2012)	Primarily Chapter 3
Develop a long term funding strategy	Holly Springs Engineering, Planning, Public Works, and Recreation and Parks departments	Holly Springs Town Council, Town Manager, other Town departments, BPAC	To allow continued development of the overall system, capital and Powell Bill funds for bicycle facility construction should be set aside every year, even if only for a small amount (small amounts of local funding can be matched to outside funding sources). Funding for an ongoing maintenance program should also be included in the Town's operating budget.	Short Term (2012)	Appendix E
Maintain bicycle facilities	Holly Springs Public Works + Holly Springs Parks and Recreation Department + NCDOT Division 5	BPAC + General Public (for reporting maintenance needs)	Pay special attention to sweeping to the face of the curb where bike lanes are added; Town should plan to take over sweeping of bicycle lanes on NCDOT-owned roadways. The Town of Holly Springs Public Works Department and NCDOT should make immediate repairs to any on-road bicycle facilities that are damaged or have hazardous conditions.	Continuous/Ongoing	3-3 (for location of proposed bicycle lanes)
Provide bicycle parking in key locations throughout Town by mid-2012.	Holly Springs Engineering and Planning Departments	Holly Springs Parks and Recreation, and BPAC	Provide bicycle racks in Downtown Holly Springs at key locations and at locations identified in Map 3.1. Work with BPAC and business organizations to determine additional, specific locations.	Short Term (2012)	3-7, A-20 and A-21
Communicate and coordinate with NCDOT Division 5 on priority projects for NCDOT-maintained roadways. Take advantage by completing "incidental" projects.	Holly Springs Engineering + Planning departments	NCDOT Division 5, NCDOT Bike/Ped Division	Ensure that when NCDOT-maintained roadways in Holly Springs are built, resurfaced or reconstructed, that this Plan's adopted recommendations for bicycle facilities are included on those streets. The Town should communicate bicycle accommodations early in the process, as part of the design. In a fast-growing community like Holly Springs, it is essential to take advantage of opportunities to provide bicycle facilities.	Continuous/Ongoing	4-10



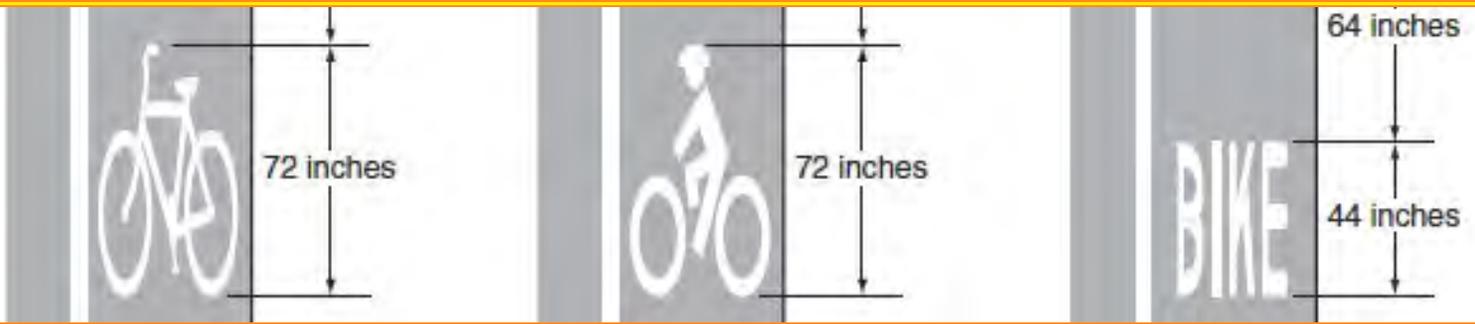
Task	Lead Agency	Support	Details	Phase	Page Reference
Notify the Town of Holly Springs Engineering Department of all upcoming roadway reconstruction or resurfacing/restriping projects, no later than the design phase.	NCDOT Division 5	Holly Springs Planning Department, NCDOT Bike/Ped Division	Provide sufficient time for comments; Incorporate bicycle recommendations from this Plan. If a compromise to the original recommendation is needed, then contact NCDOT Division of Bicycle and Pedestrian Transportation for guidance on appropriate alternatives.	Continuous/ Ongoing	4-10
Ensure this Bicycle Plan becomes integrated into the CAMPO Comprehensive Transportation Plan (CTP)	CAMPO, Holly Springs Engineering Department.	NCDOT Bike/Ped Division	NCDOT only recognizes bicycle and pedestrian facility recommendations that are found in the MPO's CTP (it is the mutually adopted transportation document). It is critical to ensure this Bicycle Plan become integrated into the CAMPO CTP.	Short-term	Chapter 4
Ensure planning efforts are integrated regionally	Holly Springs Engineering and Planning Departments	CAMPO, Wake County, neighboring municipalities	Combining resources and efforts with surrounding municipalities, regional entities, and stakeholders is mutually beneficial. Communicate and coordinate with CAMPO, Wake County, neighboring municipalities on regional trails and bicycle facilities; partner for joint-funding opportunities. After adoption by the Town, this document should also be recognized in regional transportation plans	Continuous/ Ongoing	4-10
Apply for Safe Routes to School Grants	Holly Springs Engineering, Parks and Recreation, and Police Departments	Local schools, BPAC, SRTS Program	Establish 'bike-to-school' groups, 'walking school buses' or other similar activities for children through the Safe Routes to School Program. Apply for infrastructure, programming, and workshop funding from North Carolina SRTS program.	Continuous/ Ongoing	Appendix B
Coordinate Family Rides	Holly Springs Parks and Recreation and Police Departments	BPAC	Parks and Recreation/Police could lead a monthly family ride during the months of April through October as part of their regular programming schedule (similar to other programs listed in their seasonal publication); citizens (or BPAC members) might be willing to coordinate and lead such rides.	Continuous/ Ongoing	Appendix B
Coordinate Special Events	Holly Springs Parks and Recreation Department	BPAC, Engineering Department	Use bicycle facilities, particularly trails, to promote causes and hold special events for causes	Continuous/ Ongoing	Appendix B
Utilize greenways for the display of public art	Holly Springs Parks and Recreation Department	Local Arts Organizations	See examples in Appendix A.	Continuous/ Ongoing	A-46
Strengthen overall maintenance program	Holly Springs Public Works + Holly Springs Parks and Recreation Department	BPAC + General Public (for reporting maintenance needs)	A Holly Springs staff member should be designated as the main contact for the maintenance of pedestrian and bicycle facilities in the roadway right-of-way. This staff member should coordinate with the appropriate departments to set up a free maintenance hotline and conduct maintenance activities in the field.	Continuous/ Ongoing	-
Policy Orientation	Holly Springs Town Council, Planning Board, Planning Staff, Public Works Director, and NCDOT Division 5	NCDOT Bike/Ped Division	Become familiar with State and Federal bicycle policy, as outlined in Appendix C.	Short Term (2012)	Appendix C
Design Orientation	Town Planning Board, Engineering Department, and NCDOT Division 5	NCDOT Bike/Ped Division	Become familiar with the standards set forth in Appendix A of this Plan, as well as state and national standards for bicycle facility design.	Short Term (2012)	Appendix A



Task	Lead Agency	Support	Details	Phase	Page Reference
Become familiar with the bicycle facility recommendations for NCDOT roadways in this Plan (Chapter 3); take initiative in incorporating this plan's recommendations into the Division's schedule of improvements.	NCDOT Division 5	Holly Springs Engineering, NCDOT Bike/Ped Division	Construct and maintain bicycle facilities using the highest standards allowed by the State (including the possibility of using innovative treatments on a trial-basis). Seek guidance and direction from the NCDOT Division of Bicycle and Pedestrian Transportation on issues related to this Plan and its implementation.	Short Term (2012)	Chapter 3
Initiate a local bicycle safety and courtesy educational campaign by 2013	Holly Springs Parks and Recreation Department and Police Department	Local, regional, state, and national bicycle advocacy groups	Appendix B contains several lists of resources for more information on such educational campaigns.	Mid-Term (2012-2014)	Appendix B
Launch three new programs in three years that aim to increase bicycling among a) children, b) commuter/ utilitarian cyclists, and c) recreational/fitness cyclists.	Holly Springs Parks and Recreation Department, and Police Department	BPAC	Sustain such programs with a partnership between the Town, local businesses, and non-profit organizations. See education, encouragement, and enforcement action steps for example programs.	Mid-Term (2012-2014)	Appendix B
If the Town determines that there are streets where speeds need to be lowered for safety purposes, contact NCDOT to lower them.	Holly Springs Engineering	NCDOT Division 5, NCDOT Bike/Ped Division	The authority to lower speeds is set out in NC General Statute 20-141(f) - Whenever local authorities within their respective jurisdictions determine upon the basis of an engineering and traffic investigation that a higher maximum speed than those set forth in subsection (b) is reasonable and safe, or that any speed hereinbefore set forth is greater than is reasonable and safe, under the conditions found to exist upon any part of a street within the corporate limits of a municipality and which street is a part of the State highway system (except those highways designated as part of the interstate highway system or other controlled access highway) said local authorities shall determine and declare a safe and reasonable speed limit. A speed limit set pursuant to this subsection may not exceed 55 miles per hour. Limits set pursuant to this subsection shall become effective when the Department of Transportation has passed a concurring ordinance and signs are erected giving notice of the authorized speed limit.	Mid-Term (2012-2014)	-
Produce and distribute a user-friendly bicycle map	Holly Springs Engineering/Planning (GIS Manager) and Parks and Recreation Department	NCDOT Bike/Ped Division	Once more facilities are in place, produce and distribute a user-friendly bicycle map of Holly Springs, and consider the advantages of doing so in conjunction with neighboring communities. Provide basic safety information, commuting information, trail etiquette, transit information, and a list of local resources on the back side of the map. The map should include the bicycle route neighborhood loops identified in Map 3.1.	Mid-Term (2012-2014)	-
Provide police officers with educational material to hand out with warnings	Holly Springs Police Department	NCDOT Bike/Ped Division	Provide officers with a handout to be used during bicycle-related citations and warnings. See laws and considerations listed on page B-13.	Mid-Term (2012-2014)	B-13



Task	Lead Agency	Support	Details	Phase	Page Reference
Work together to create a connected greenway system.	Holly Springs Parks and Recreation Department	Holly Springs Engineering and Planning Departments	Because there is clear desire by residents for off-road greenway options, the Town should focus funding and efforts towards connecting greenways throughout Town. The investment will prove its worth with increased home values and increased livability.	Long Term (2014-)	3-14
Become Designated as a Bicycle Friendly Community	BPAC	Holly Springs Planning and Engineering Departments	Holly Springs should make progress in accomplishing the goals of this Plan, and then apply for BFC status. Download and review the application for a Bicycle Friendly Community designation. Determine which action steps of this plan would be the most strategic in terms of applying for the desired designation. Place emphasis on completing those steps, then apply.	Long Term (2014)	4-4 and 4-5
Reassess projects and reevaluate priorities and phases	Holly Springs Engineering	NCDOT Division 5, NCDOT Bike/Ped Division, BPAC	In 2014, reassess projects and reevaluate priorities and phases. Consider updating key sections of the plan such as design standards and programs/policies.	Long Term (2014-)	-
Attend a bicycle planning and design training session	Holly Springs Engineering Department, Parks and Recreation Dept., and Planning Dept.	NCDOT Bike/Ped Division	Sponsor at least one planner, one engineer, and one parks staff from the Town of Holly Springs to attend a bicycle planning and design training session. NCDOT, in partnership with the Institute for Transportation Research and Education (ITRE), offers bicycle planning and design workshops for practicing professionals.	Opportunity-Based	-



# A. Design Toolbox

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## Overview

This appendix provides design guidelines for bicycle, pedestrian and trail-related facilities that are used in various locations across the United States. These guidelines can be used to determine a comprehensive bike-ped network throughout Holly Springs, while still providing for flexibility on a project by-project basis. Although this is a bicycle plan, pedestrian and trail-related facilities are also included here because there are circumstances where these types of facilities overlap, and where quality design integration will be desired.

The guidelines should be used with the understanding that design adjustments will be necessary in certain situations in order to achieve the best results. Facility installation and improvements should be evaluated on a case-by-case basis, in consultation with local or state bicycle coordinators, and/or a qualified engineer and landscape architect. Some new treatments may require formal applications to the North Carolina Department of Transportation (NCDOT) and the Federal Highway Administration (FHWA) for approval as experimental uses. Should national standards be revised in the future and result in discrepancies with this report, the national standards should prevail for design decisions.

On facilities maintained by NCDOT, the State’s design guidelines will apply. The Town of Holly Springs has the potential to exceed minimum guidelines where conditions warrant (within their jurisdiction).

These resources (and those listed on A-3) can be consulted for more information on design standards.





## Design Resources:

Greenways: A Guide to Planning, Design and Development.  
Island Press, 1993. Authors: Charles A. Flink and Robert Searns

Trails for the Twenty-First Century  
Island Press, 2nd ed. 2001. Authors: Charles A. Flink, Robert Searns, Kristine Olka

Engineer Bicycle Facilities  
Bicycle and Pedestrian Information Center, 2008  
[www.bicyclinginfo.org/engineering/](http://www.bicyclinginfo.org/engineering/)

Bicycle Parking Design Guidelines  
<http://www.bicyclinginfo.org/engineering/parking.cfm>

Guide for the Development of Bicycle Facilities\*  
American Association of State Highway Transportation Officials , 1999  
<http://www.transportation.org>

Manual on Uniform Traffic Control Devices (MUTCD)  
U. S. Department of Transportation, Washington, DC, 2009  
<http://mutcd.fhwa.dot.gov>

Policy on Geometric Design of Streets and Highways.  
American Association of State Highway Transportation Officials , 2001  
<http://transportation.org>

Universal Access to Outdoor Recreation: A Design Guide. PLAE, Inc., Berkeley, CA, 1993.

Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities:  
An ITE Proposed Recommended Practice.  
[www.ite.org/css](http://www.ite.org/css)

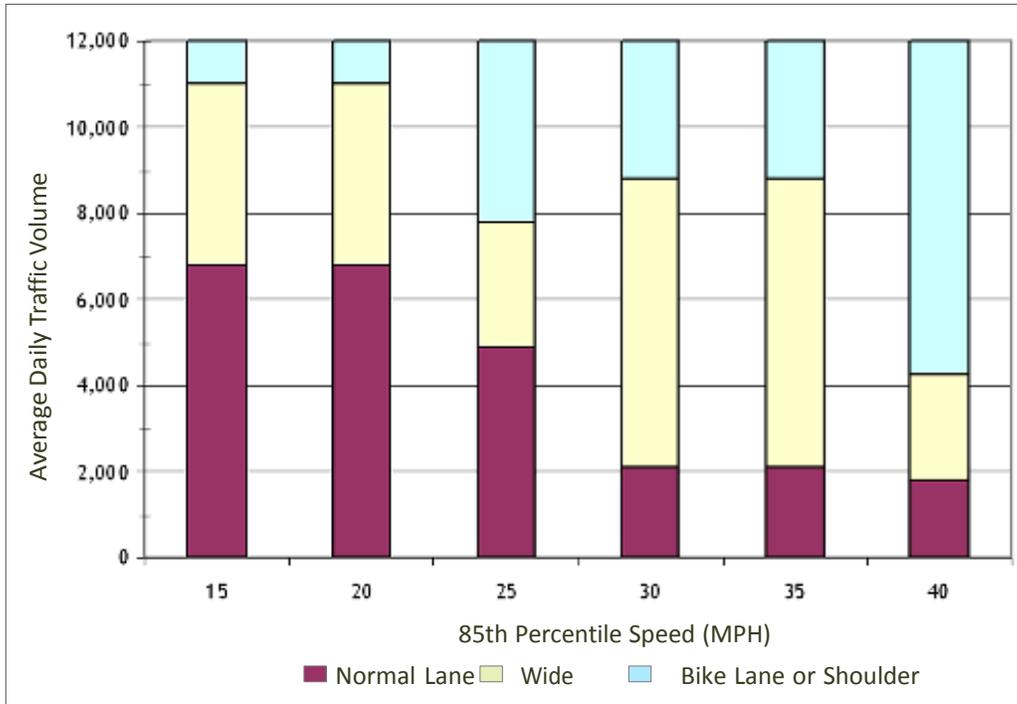
Cities for Cycling Urban Bikeway Design Guide. National Association of City Transportation Officials.  
[www.nacto.org/citiesforcycling.html](http://www.nacto.org/citiesforcycling.html)

\*Once available, Holly Springs should use the updated AASHTO Bicycle Guides scheduled for release in 2011.

## Bicycle Facilities and Related Streetscape Improvements

A wide variety of on-road bicycle facilities are recommended to meet different transportation needs in different roadway situations. The appropriate bicycle facility for any particular roadway, whether new or existing, should be dictated primarily by vehicle volume and speed of the roadway. The figure below provides a matrix for evaluating bicycle facilities. The speed of the travel lane is shown along the x-axis and total traffic volumes per day are shown along the y-axis. The different colors represent the type of bikeway facility prescribed given the volume and speed of the travel lane. This chart represents a broad guideline, rather than a hard standard.

North American Speed-Volume Chart



Source: M. King: Bicycle Facility Selection: A Comparison of Approaches

## Neighborhood Streets

Many bicyclists can safely share the road with vehicles on low volume (less than 3,000 cars per day), low speed roadways (e.g., a residential or neighborhood street).



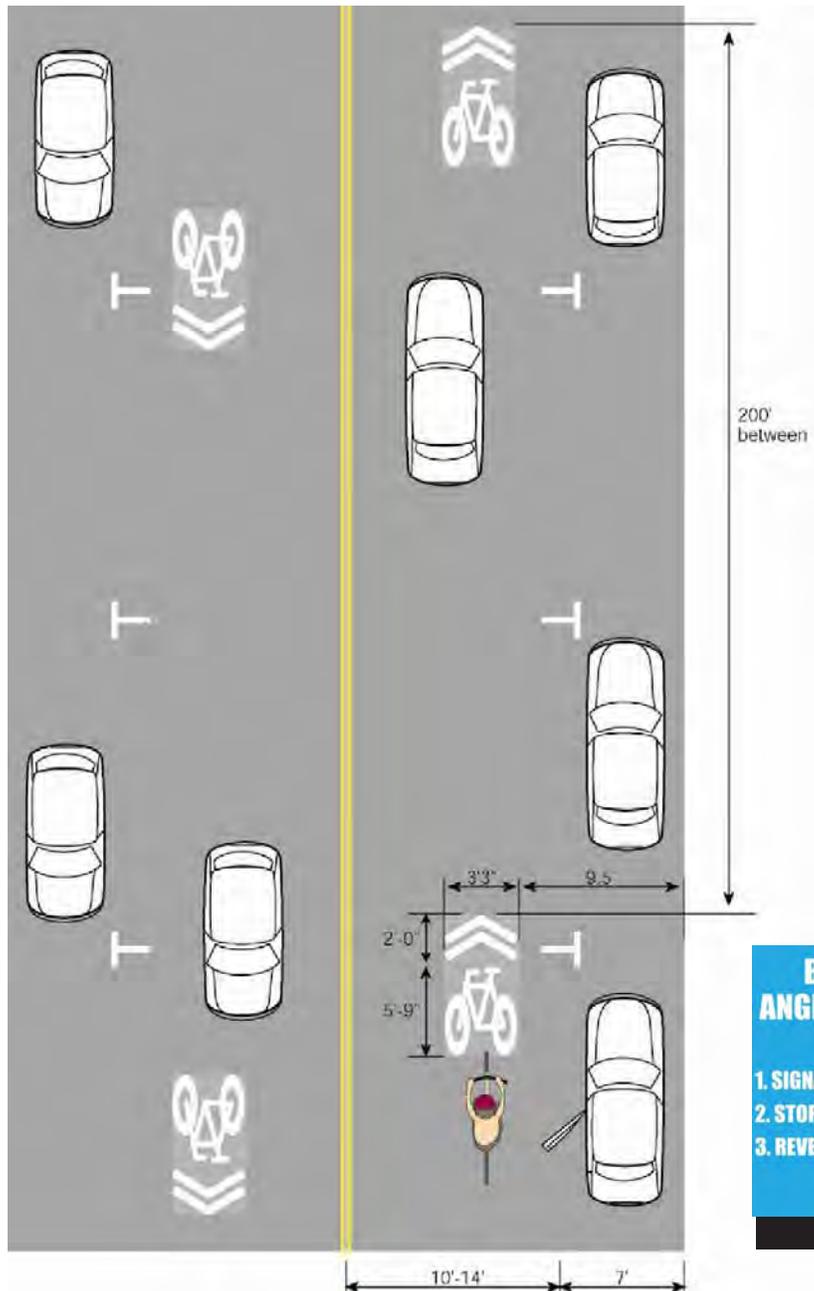
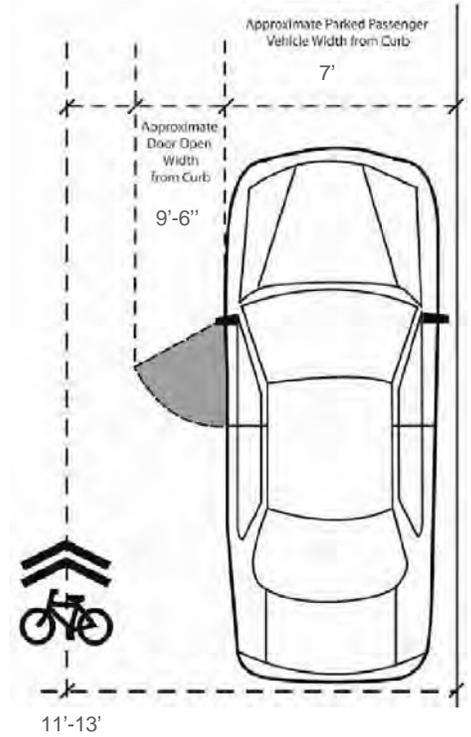
Left: Neighborhood street examples.

## Shared Lane Marking

A bicycle shared lane marking (or ‘sharrow’) can serve a number of purposes, such as making motorists aware of bicycles potentially traveling in their lane, showing bicyclists the appropriate direction of travel, and, with proper placement, reminding bicyclists to bike further from parked cars to prevent “dooring” collisions. The shared lane marking stencil is used:

- Where lanes are too narrow for striping bike lanes
- Where the speed limit does not exceed 35 MPH
- With or without on-street parking (with on-street parking, the sharrow should be placed a minimum of 11 feet from the curb face; without on-street parking, the sharrow shall be placed 4 feet from the curb face or edge of pavement)

Cities throughout the United States have effectively used this treatment for many years; it is now officially part of the 2009 Manual for Uniform Traffic Control Devices (MUTCD). Additional guidance will also be available in the update of the AASHTO Bike Guide.



### Sharrows with Back-in Angle Parking

Back-in/head-out diagonal parking and conventional head-in/back-out diagonal parking have common dimensions, but the back-in/headout is superior for safety reasons due to better visibility when leaving. This is particularly important on busy streets or where drivers find their views blocked by large vehicles, tinted windows, etc. (drivers do not back blindly into an active traffic lane). Furthermore, with back-in/head-out parking, drivers can see bicyclists as they prepare to pull out. See the “Back-in/Head-out Angle Parking” study by Nelson\Nygaard Consulting Associates for more information: [www.bicyclinginfo.org/library/details.cfm?id=4413](http://www.bicyclinginfo.org/library/details.cfm?id=4413)



**BACK-IN ANGLE PARKING**

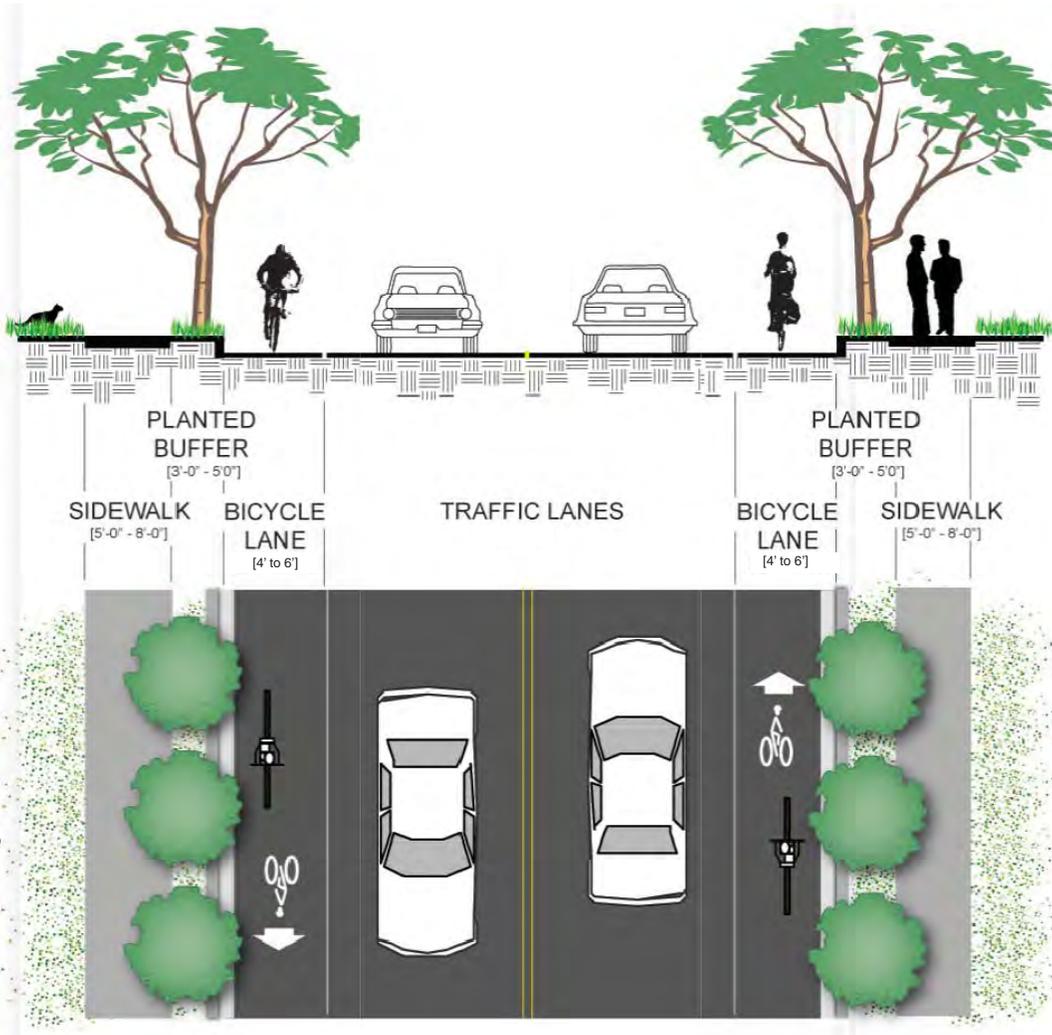
1. SIGNAL
2. STOP
3. REVERSE

## Bicycle Lanes

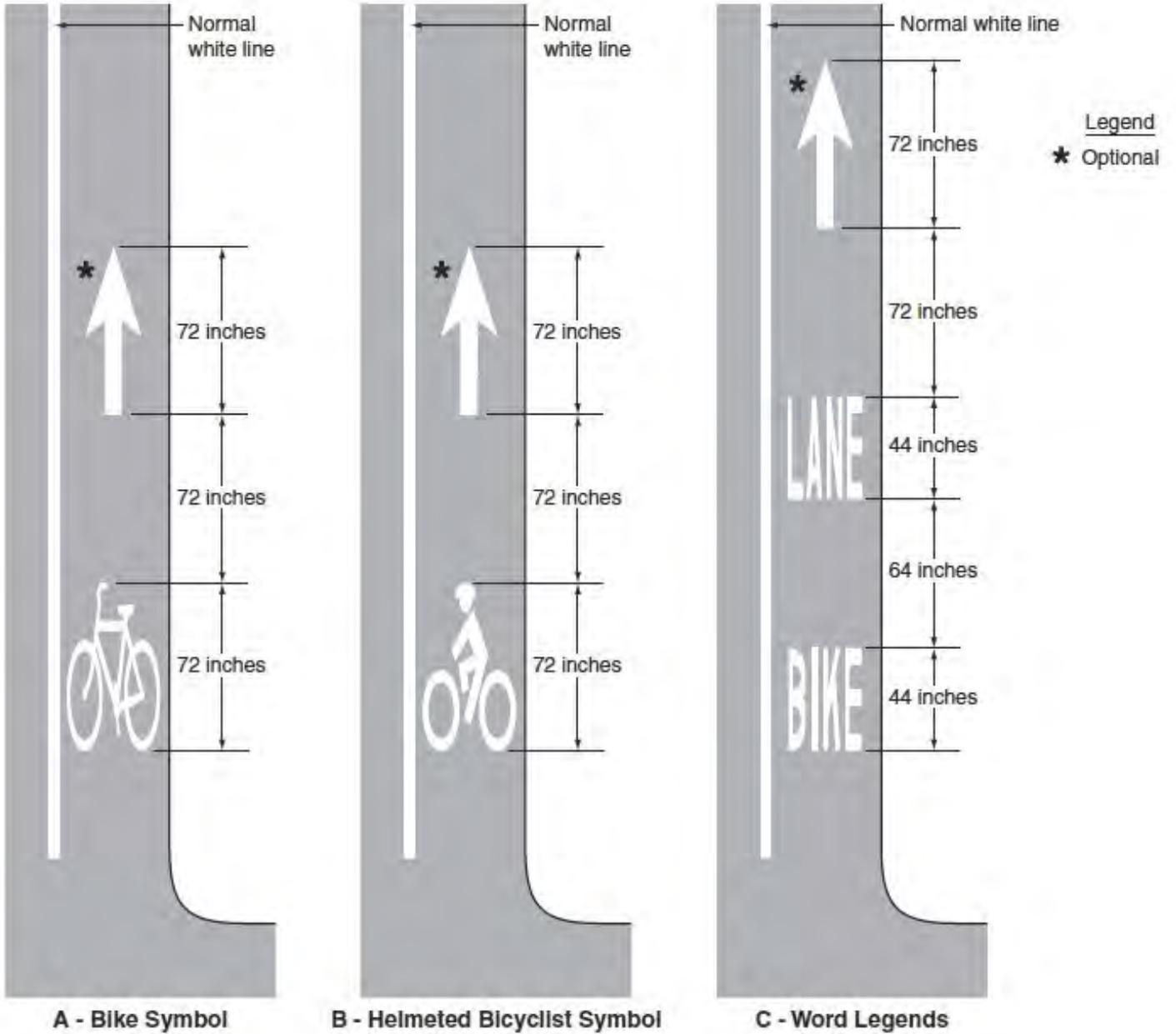
A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicyclists. Bicycle lanes are located on both sides of the road, except one way streets, and carry bicyclists in the same direction as adjacent motor vehicle traffic. In some communities, local cyclists may prefer to use striped shoulders as an alternative to bicycle lanes (see guidelines for ‘Striped/Paved Shoulders’).

Recommended bicycle lane width:

- 6’ from the curb face when a gutter pan is present (or 4’ from the edge of the gutter pan)
- 4’ from the curb face when no gutter pan is present
- Should be used on roadways with average daily traffic (ADT) counts of 3,000 or more
- Not suitable where there are a high number of commercial driveways
- Suitable for 2-lane facilities and 4-lane divided facilities



Below: 2009 MUTCD examples of word, symbol, and pavement markings for bicycle lanes.



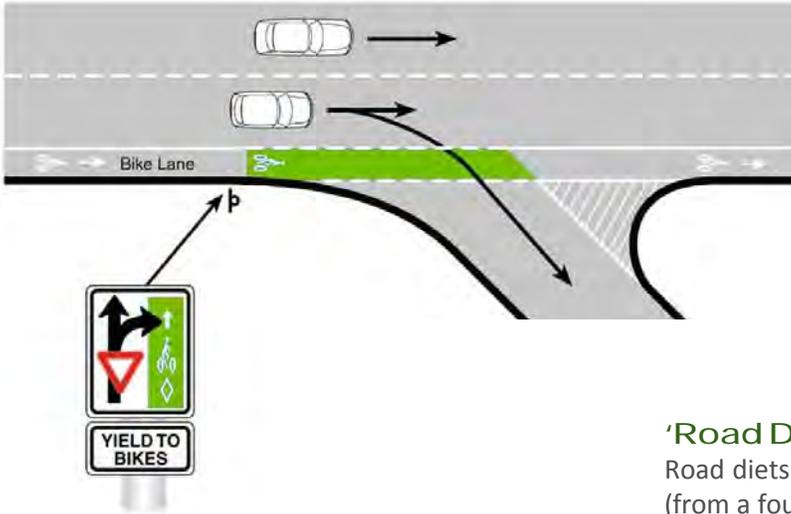
### Colorized Bike Lanes

In 2011, the MUTCD gave interim approval for colorized bike lanes. Colored pavement is used for bicycle lanes in areas that tend to have a higher likelihood for vehicle conflicts. Examples of such locations are freeway on- and off-ramps and where a motorist may cross a bicycle lane to move into a right turn pocket. In the United States, the City of Portland and New York City have colored bike lanes and supportive signing with favorable results. Studies after implementation showed more motorists slowing or stopping at colored lanes and more motorists using their turn signals near colored lanes. Green is the recommended color (some cities that have used blue are changing to green, since blue is associated with handicapped facilities).

Consideration:

- Colorized bike lanes are not currently included in the MUTCD but there are provisions for jurisdictions to request permission to experiment with innovative treatments (and thus with successful application, future inclusion of colorized bike lanes in the MUTCD could occur).

Below: Henry Street in Brooklyn, NY.



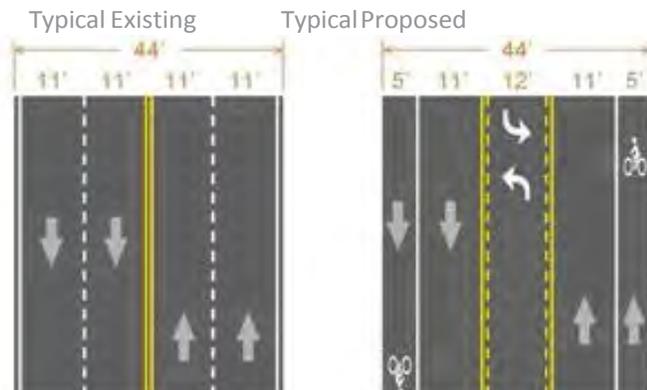
Left: colorized bicycle lane application at a potential conflict area.

### Bike Lanes with On-Street Parking

Where on-street parking is permitted, and a bike lane is provided, the bike lane must be between parking and the travel lane. Appropriate space must be allocated to allow passing cyclists room to avoid open car doors. The distance between the curb face and the outer marking of the bicycle lane is typically 13 to 15 feet (parking stall of 8 to 10 feet and bike lane of 5 feet).

### 'Road Diets' for Bicycle Lanes

Road diets typically involve reducing the number of travel lanes (from a four-lane road to a two-lane road with center turn lane, for example) allowing adequate space for bicycle lanes. These are generally recommended only in situations where the vehicular traffic count can be safely and efficiently accommodated with a reduced number of travel lanes. Study may be necessary for recommended road diet to ensure that capacity and level-of-service needs are balanced against bicycle level of service needs.





## Striped/Paved Shoulder

Paved shoulders are the part of a roadway which is contiguous and on the same level as the regularly traveled portion of the roadway. There is no minimum width for paved shoulders, however a width of at least four feet is preferred. Ideally, paved shoulders should be include in the construction of new roadways and/or the upgrade of existing roadways, especially where there is a need to more safely accommodate bicycles.

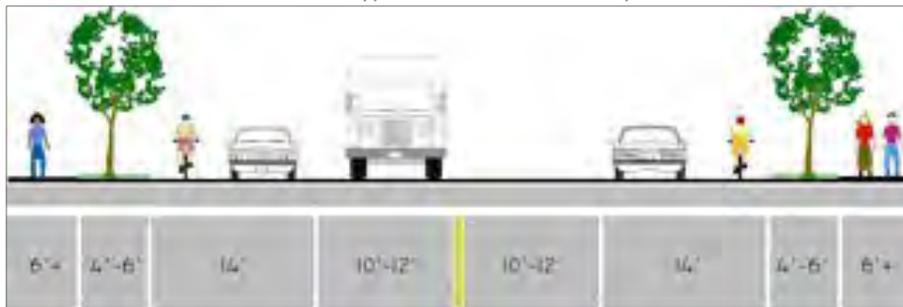
- Most often used in rural environments, although not confined to any particular setting
- Should be delineated by a solid white line, and provided on both sides of the road
- Should be contiguous and on the same level as the regularly traveled portion of the roadway
- 4' minimum width; however, if site conditions are constrained, then the option of a smaller shoulder should be weighed against simply having a wider outside lane.
- For roads with speeds higher than 40 MPH with high ADT, a shoulder width of more than 4' is recommended.
- Rumble strips should be avoided, but if used, then a width of more than 4' is needed.
- Paved shoulders should not be so wide as to be confused with a full automobile travel lane.



## Wide Outside Lanes

Even without a bicycle facility or marking, the conditions for bicycling are improved when the outside travel lane in either direction is widened to provide enough roadway space so that bicyclists and motor vehicles can share the roadway without putting either in danger (e.g., higher volume roadways with wide (14') outside lanes). For outside lanes wider than 14', striping a bicycle lane should be considered.

Below: Wide Outside Lane on a Typical Two Lane Roadway



## Cycle Tracks

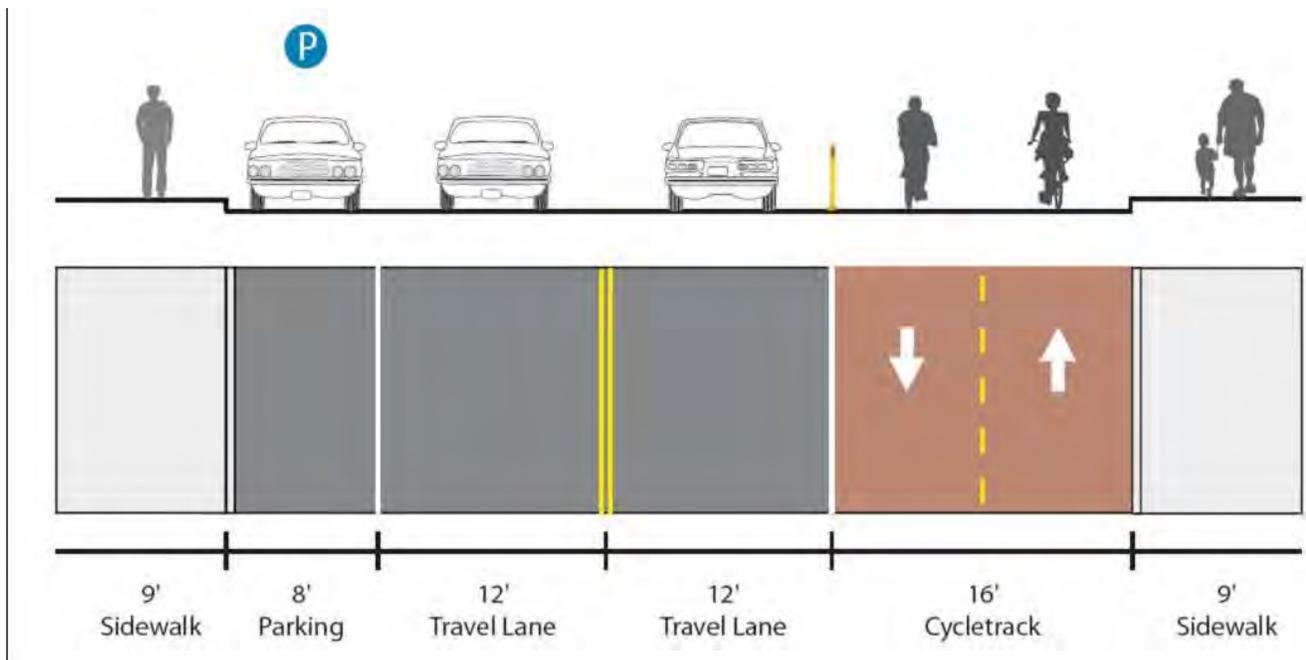
Cycle tracks are a hybrid type of bicycle facility that combines the experience of a separated path with the on-street infrastructure of a conventional bike lane. This type of facility is widely used in European cities and was recently introduced on 9th Ave. in New York City. The cycle track can provide for either one- or two-way traffic depending on the road conditions. This facility is generally used under certain conditions, such as along a waterfront, as part of an urban “road diet,” and in limited locations where cross traffic and turning movement can be controlled.



The cycle track concept has been used to form a core urban bikeway loop in Montreal. Crossings at roadways include pedestrian priority markings and bicyclist actuated signals.



A small section of cycle track was provided by Arlington County, Virginia, as a connector to Gateway Park in Rosslyn.



Cycle track on a road with 66-foot right-of-way section.

## Bicycle Boulevards

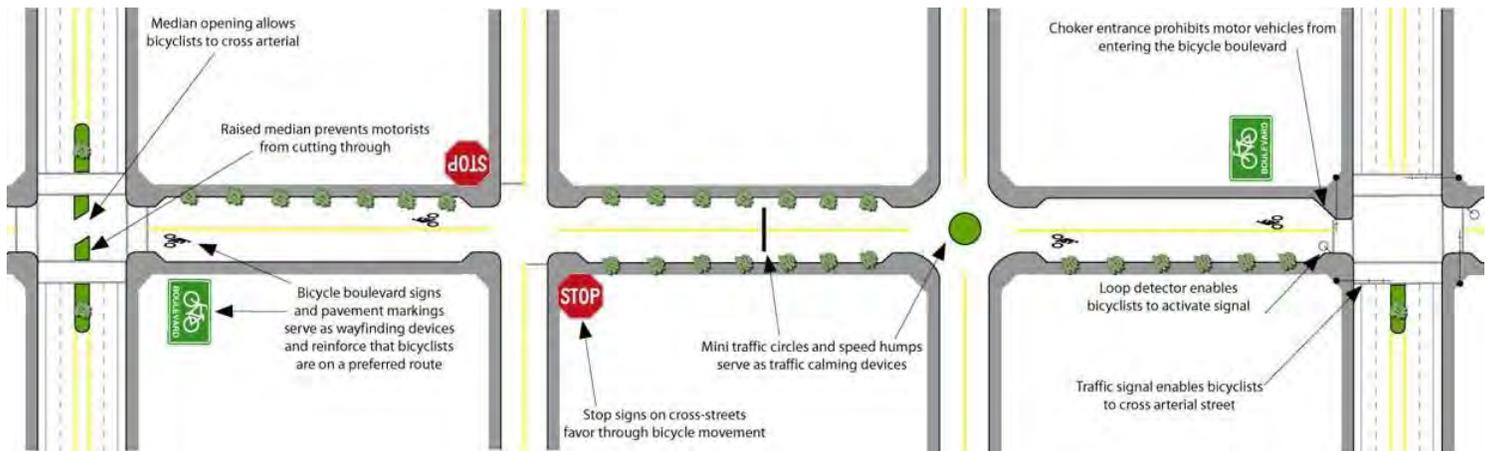
To further identify preferred routes for bicyclists, the operation of lower volume roadways may be modified to function as a through street for bicycles while maintaining local access for automobiles. Traffic calming devices reduce traffic speeds and through trips while limiting conflicts between motorists and bicyclists, as well as give priority to through bicycle movement.

For a complete overview, see [www.ibpi.usp.pdx.edu/guidebook.php](http://www.ibpi.usp.pdx.edu/guidebook.php)



Above: Bike boulevard route pavement markings and signs direct bicyclists.

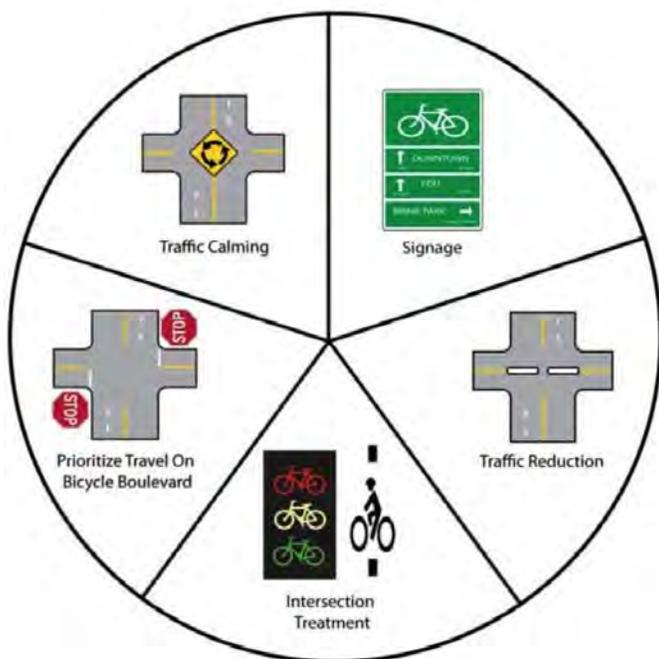
Below: A bicycle boulevard.



Bikeway planners and engineers may pick and choose the appropriate mix of design elements needed for bicycle boulevard development along a particular corridor. Mix and match design elements to:

- Reduce or maintain low motor vehicle volumes;
- Reduce or maintain low motor vehicle speeds;
- Create a logical, direct, and continuous route;
- Create access to desired destinations ;
- Create comfortable and safe intersection crossings;
- Reduce cyclist delay.

Image and text source: Fundamentals of Bicycle Boulevard Planning and Design, [www.ibpi.usp.pdx.edu/guidebook.php](http://www.ibpi.usp.pdx.edu/guidebook.php)





# Bicycle Facilities at Intersections

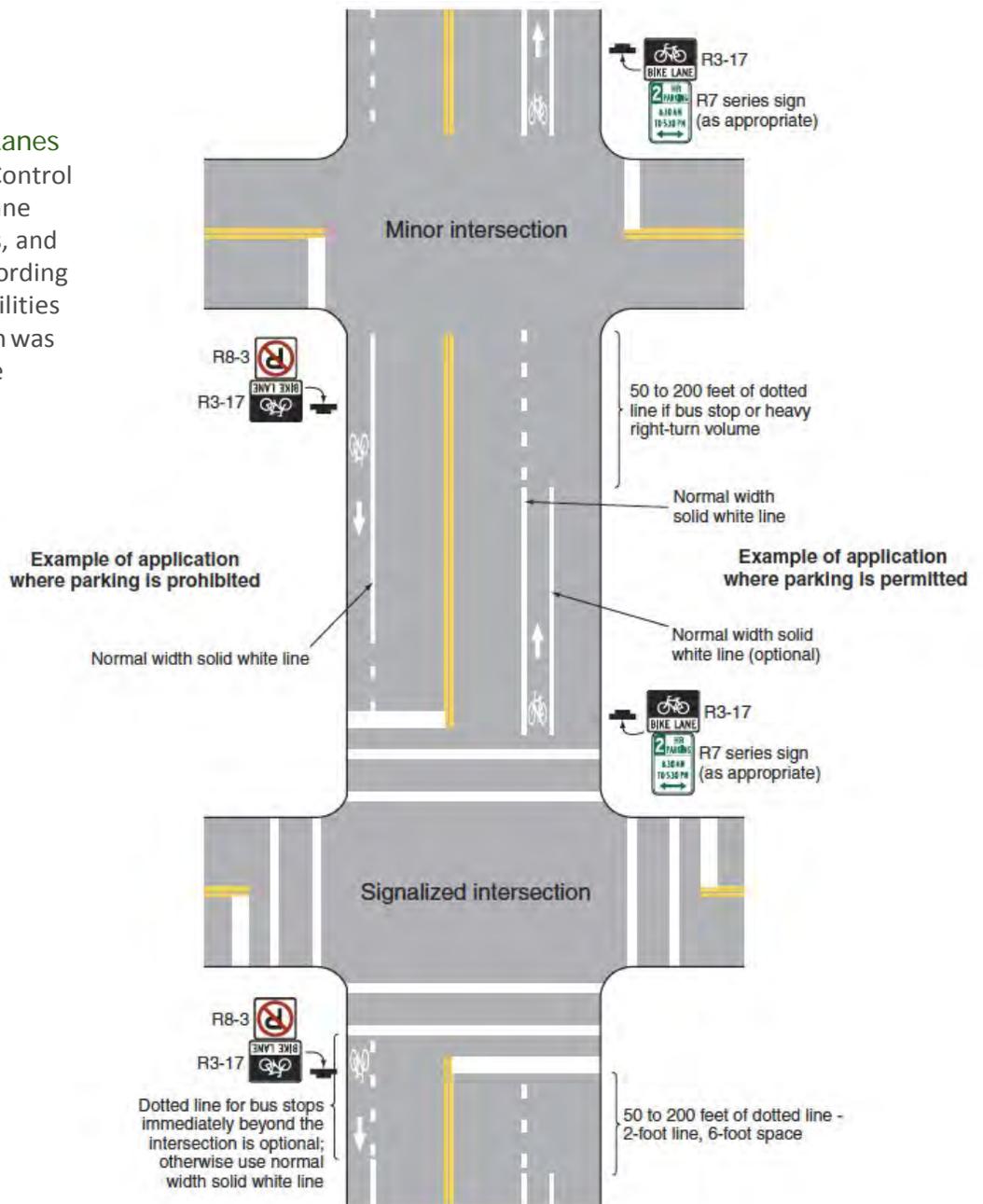
Intersections represent one of the primary collision points for bicyclists, with many factors involved:

- Larger intersections are more difficult for bicyclists to cross.
- On-coming vehicles from multiple directions and increased turning movements make it more difficult for motorists to notice non-motorized travelers.
- Most intersections do not provide a designated place for bicyclists.
- Loop and other traffic signal detectors, such as video, often do not detect bicycles.
- Bicyclists making a left turn must either cross travel lanes to a left-turn lane, or dismount and cross as a pedestrian.
- Bicyclists traveling straight may have difficulty maneuvering from the far right lane, across a right turn lane, to a through lane of travel.

Solutions to some these issues are illustrated at right and in the following pages, including intersection configurations for bicycle lanes, signage, and bicycle-activated detector loops.

## Typical Intersection Configuration for Bike Lanes

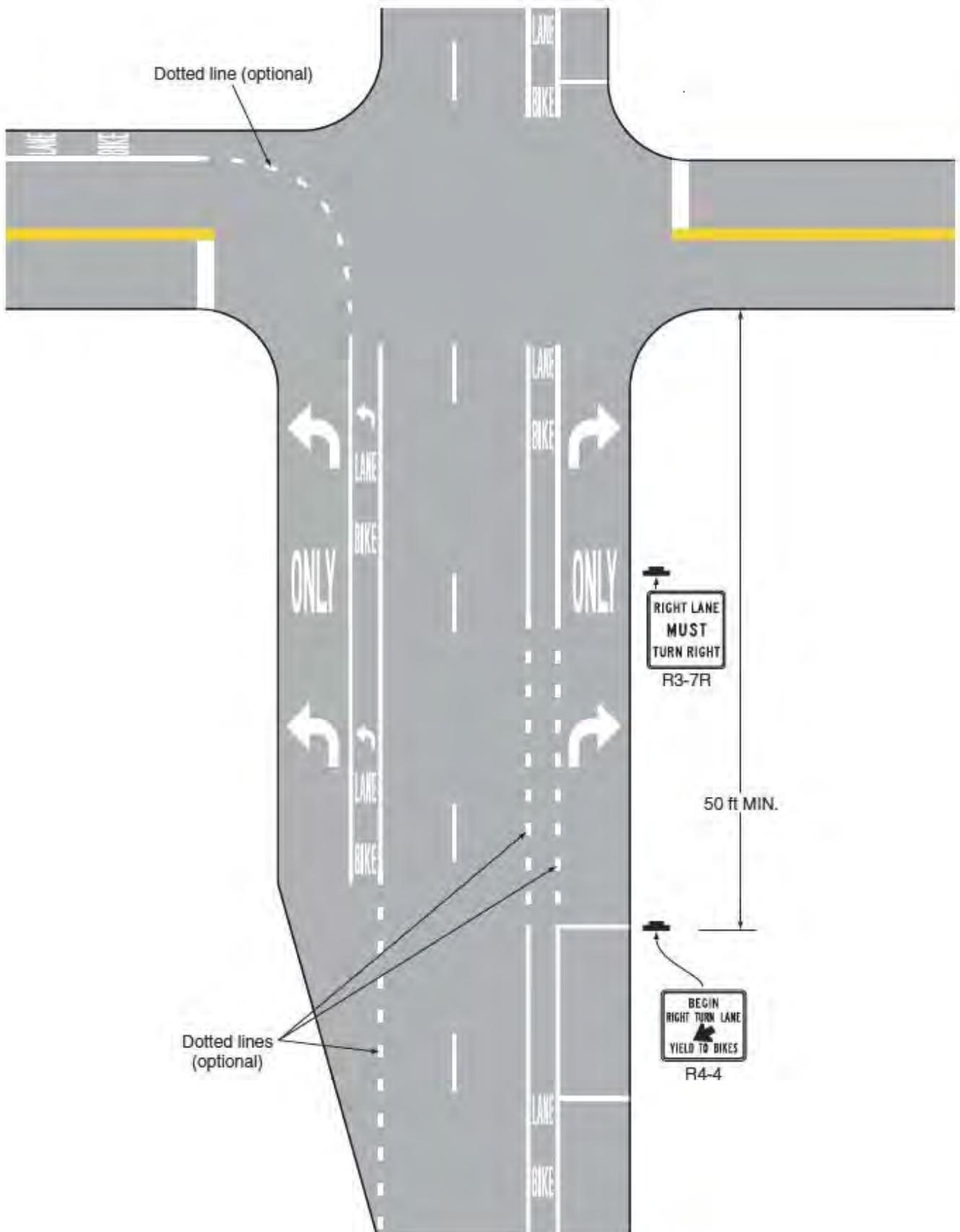
See the Manual on Uniform Traffic Control Devices (MUTCD) for guidance on lane delineation, intersection treatments, and general application of pavement wording and symbols for on-road bicycle facilities and off-road paths (updated version was released in 2009); example from the MUTCD at right.





### Example of Intersection Pavement Marking-Designated Bicycle Lane with Left-Turn Area, Heavy Turn Volumes, Parking, One-Way Traffic, or Divided Highway

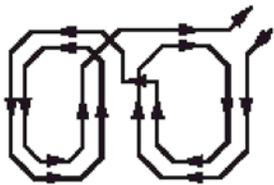
(Image below from the 2009 MUTCD, Figure 9C-1).



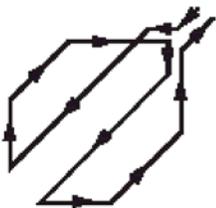
### Bicycle-Activated Detector Loop

Changing how intersections operate can help make them more “friendly” to bicyclists. Improved traffic signal timing for bicyclists, bicycle-activated loop detectors, and camera detection make it easier and safer for cyclists to cross intersections. Bicycle-activated loop detectors are installed within the roadway to allow the weight of a bicycle to trigger a change in the traffic signal. This allows the cyclist to stay within the lane of travel and avoid maneuvering to the side of the road to trigger a push button, which ultimately provides extra green time before the light turns yellow to make it through the light. Current and future loops that are sensitive enough to detect bicycles should have pavement markings to instruct cyclists on how to trip them. These common loop detector types are recommended:

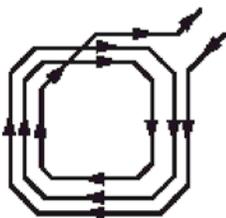
Use pavement marking to aid bicyclists in locating loop detectors at intersections.



- Quadruple Loop**  
(Recommended for bike lanes)
- Detects most strongly in center
  - Sharp cut-off sensitivity

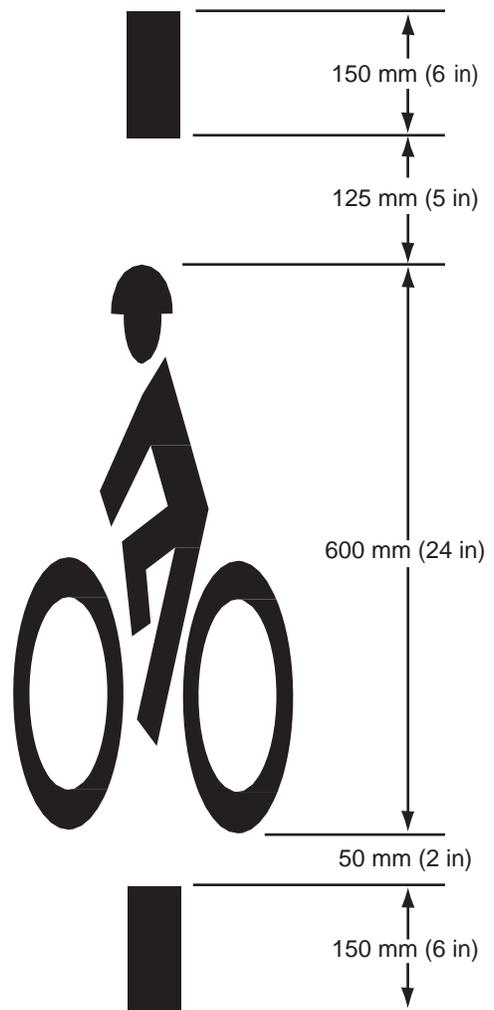


- Diagonal Quadruple Loop**  
(Recommended for shared lanes)
- Sensitive over whole area
  - Sharp cut-off sensitivity



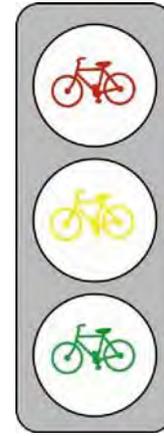
- Standard Loop**  
(Recommended for advanced detection)
- Detects most strongly over wires
  - Gradual cut-off

(See: Implementing Bicycle Improvements at the Local Level, FHWA, 1998, p. 70)



### Bicycle Specific Traffic Control Signals

A bicycle signal is an electrically-powered traffic control device that may only be used in combination with an existing traffic signal. Bicycle signals direct bicyclists to take specific actions and may be used to address an identified safety or operational problem involving bicycles. A separate signal phase for bicycle movement will be used. Alternative means of handling conflicts between bicycles and motor vehicles shall be considered first. When bicycle traffic is controlled, green, yellow or red bicycle symbols are used to direct bicycle movement at a signalized intersection. Bicycle signals shall only be used at locations that meet MUTCD warrants. A bicycle signal may be considered for use only when the volume and collision, or volume and geometric warrants have been met:



1. Volume. When  $W = B \times V$  and  $W > 50,000$  and  $B > 50$ .

Where:

W is the volume warrant.

B is the number of bicycles at the peak hour entering the intersection.

V is the number of vehicles at the peak hour entering the intersection.

B and V shall use the same peak hour.

2. Collision. When 2 or more bicycle/vehicle collisions of types susceptible to correction by a bicycle signal have occurred over a 12-month period and the responsible public works official determines that a bicycle signal will reduce the number of collisions.

3. Geometric.

(a) Where a separate bicycle/multi use path intersects a roadway.

(b) At other locations to facilitate a bicycle movement that is not permitted for a motor vehicle.



Bicycle traffic signal used to bring bicycles leaving the UC Davis campus back into the road network.

See: MUTCD 2003 and MUTCD 2003 California Supplement (May 20, 2004), Sections 4C.103 and 4D.104 - [www.dot.ca.gov/hq/traffopps/signtech/mutcdsupp/](http://www.dot.ca.gov/hq/traffopps/signtech/mutcdsupp/)



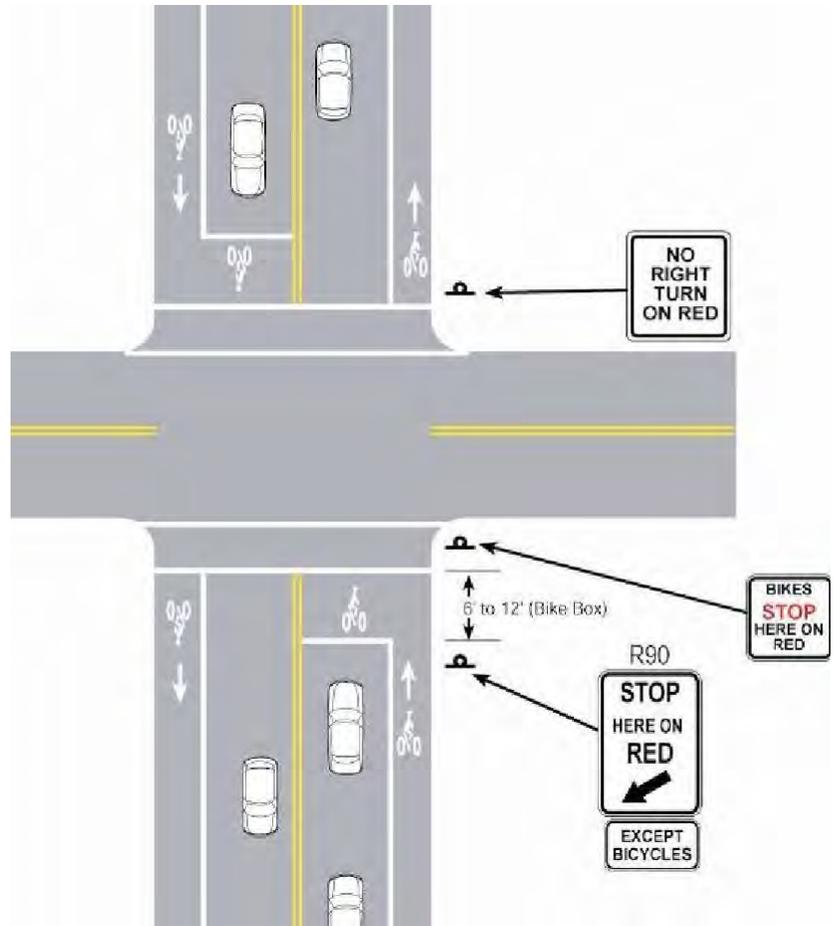


### Bike Box / Advance Stop Line

A bike box is a relatively simple innovation to improve turning movements for bicyclists without requiring cyclists to merge into traffic to reach the turn lane or use crosswalks as a pedestrian. The bike box is formed by pulling the stop line for vehicles back from the intersection, and adding a stop line for bicyclists immediately behind the crosswalk. When a traffic signal is red, bicyclists can move into this “box” ahead of the cars to make themselves more visible, or to move into a more comfortable position to make a turn. Bike boxes have been used in Cambridge, MA; Eugene, OR; and European cities.

#### Potential Applications:

- At intersections with a high volume of bicycles and motor vehicles
- Where there are frequent turning conflict and/or intersections with a high percentage of turning movements by both bicyclists and motorists
- At intersections with no right turn on red (RTOR)
- At intersections with high bicycle crash rates
- On roads with bicycle lanes
- Can be combined with a bicycle signal (optional)



Plan view of a bike box.

#### Considerations:

- Bike boxes are not currently included in the MUTCD but there are provisions for jurisdictions to request permission to experiment with innovative treatments (and thus with successful application, future inclusion of bike boxes in the MUTCD could occur).
- If a signal turns green as a cyclist is approaching an intersection, they should not use the bike box.
- Motorists will need to be educated to not encroach into the bike box.



Above and below: Bike boxes filled in with color to emphasize allocation of space to bicycle traffic.



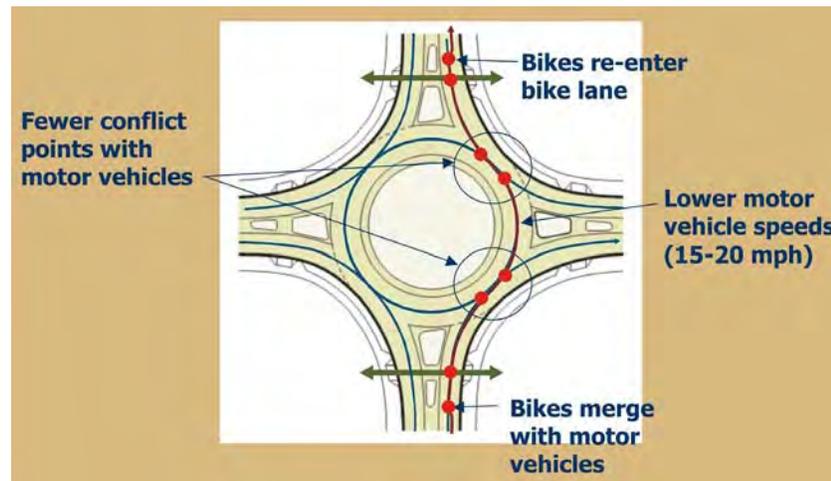
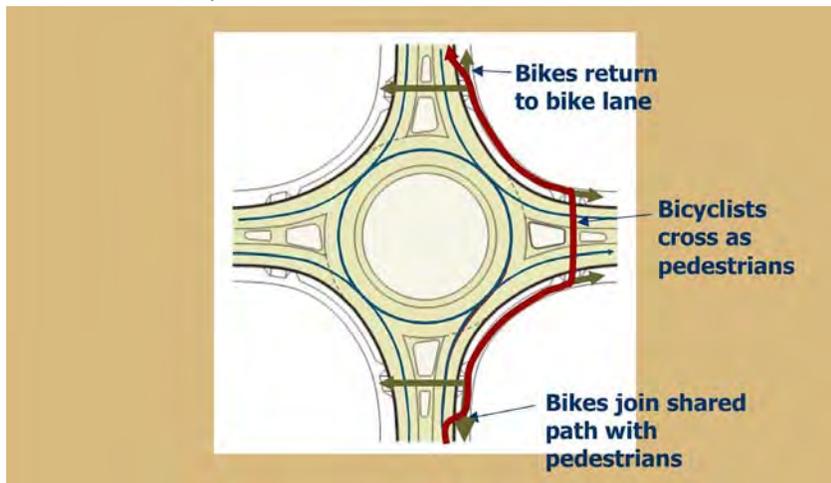
## Roundabouts/Traffic Circles

Roundabouts are one-way circular intersections in which traffic flows around a center island without stop signs or signals. Because roundabout traffic enters and exits through right turns only and speeds are reduced, the occurrence of severe crashes is substantially less than in many traditional four-way intersections. The lower speeds within roundabouts also allow entering traffic to access smaller gaps between circulating vehicles, increasing traffic volume and decreasing delays, congestion, fuel consumption and air pollution.

Modern roundabouts greatly reduce the potential for high-speed, right-angle, rear-end and left turn/head-on collisions. In traditional four-way traffic intersections, there are 32 points of conflict in which two vehicles may collide. Modern roundabouts have only eight conflict areas, greatly reducing potential crashes.

- For bicyclists, roundabouts with only one circulating lane are much safer to navigate than are multi-lane roundabouts.
- Diagrams at right show two ways for bicyclists to navigate roundabouts, depending on comfort and skill level.

Below: Circulating as a Pedestrian: If a cyclist is uncomfortable riding with traffic, a cyclist can choose to travel instead as a pedestrian.



Above: Circulating as a Vehicle: Bike lanes are not recommended within a roundabout. Instead, cyclists merge with traffic before entering the roundabout, circulate with traffic, and then re-enter the bike lane after exiting.



## Bicycle Facilities at Railroad Crossings

Railroad crossings are particularly hazardous to those who rely on wheeled devices for mobility (railroad crossings have flangeway gaps that allow passage of the wheels of the train, but also have the potential to catch wheelchair casters and bicycle tires). In addition, rails or ties that are not embedded in the travel surface create a tripping hazard. Recommendations:

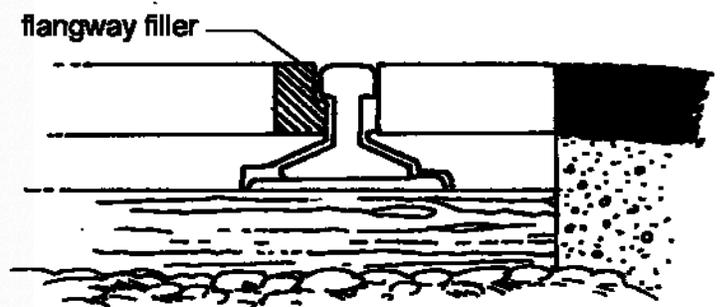
- **Make the Crossing Level:** Raise approaches to the tracks and the area between the tracks to the level of the top of the rail.
- **Bikes Should Cross RR at Right Angle**
- **When bikeways or roadways cross railroad tracks at grade, the roadway should ideally be at a right angle to the rails. When the angle of the roadway to the rails is increasingly severe, the approach recommended by Caltrans (Highway Design Manual, Section 1003.6) and AASHTO (Guide for the Development of Bicycle Facilities, 1999, p.60) is to widen the approach roadway shoulder or bicycle facility, allowing bicycles to cross the tracks at a right angle without veering into the path of passing motor vehicle traffic.**



- **Use Multiple Forms of Warning:** Provide railroad crossing information in multiple formats, including signs, flashing lights, and audible sounds.
- **Clear Debris Regularly:** Perform regular maintenance to clear debris from shoulder areas at railroad crossings.
- **Fill Flangeway with Rubberized Material or Concrete Slab:** Normal use of rail facilities causes buckling of paved-and-timbered rail crossings. Pavement buckling can be reduced or eliminated by filling the flangeway with rubberized material, concrete slab, or other treatments. A beneficial effect of this is a decrease in long-term maintenance costs.



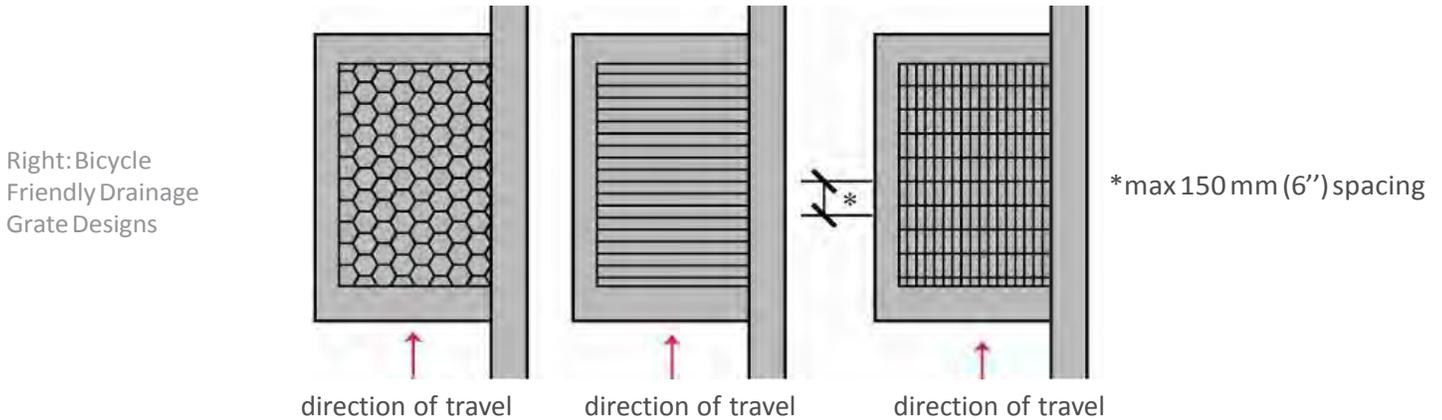
Installing a rubber surface rather than asphalt around railroad flangeways reduces changes in level and other maintenance problems.



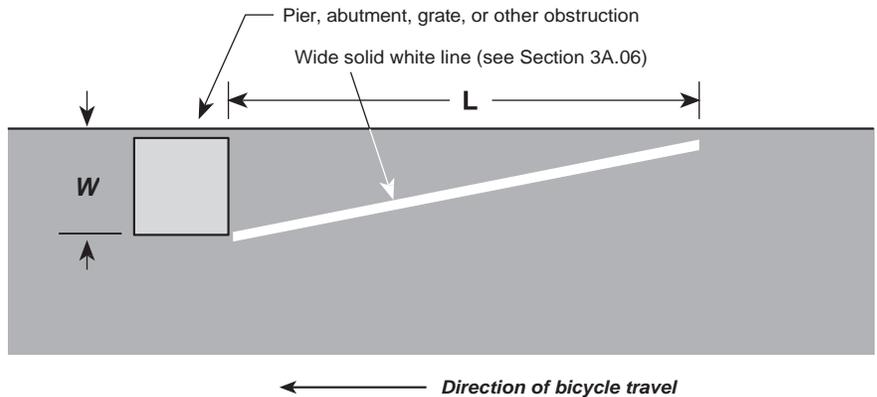
The "flangeway filler" eliminates the gap in the path of travel for pedestrians crossing railroad tracks. The filler, consisting of a rubber insert, will deflect downward with the weight of a train and does not affect railway function.

## Bicycle Friendly Drainage Grates

Drainage grates usually occupy portions of roadways, such as bicycle lanes, where bicycles frequently travel. Often drainage grates are poorly maintained or are of a design that can damage a bicycle wheel or in severe circumstances, cause a bicyclist to crash. Improper drainage grates create an unfriendly obstacle a cyclist must navigate around, often forcing entrance into a motor vehicle lane in severe cases. Bicycle friendly drainage grates should be installed in all new roadway projects and problem grates should be identified and replaced.



Right: MUTCD example of obstruction pavement marking; if dangerous drainage grates (or other obstructions) are not to be fixed in the short term, then this pavement marking should direct cyclists away from the obstruction.



Dangerous Drainage Grate Condition; this example is dangerous due to the grate running parallel to the roadway, creating a trap for bicycle tires.



Dangerous Drainage Grate Condition; this example is dangerous due to the surrounding paving condition (when the road was resurfaced the drainage grate remained at the same height).



Bicycle-Friendly Drainage Grate



## Bicycle Parking and Bicycle Stations

### Bicycle Parking

As more bikeways are constructed and bicycle usage grows, the need for bike parking will climb. Long-term bicycle parking at transit stations and work sites, as well as short-term parking at shopping centers and similar sites, can support bicycling. Bicyclists have a significant need for secure long-term parking because bicycles parked for longer periods are more exposed to weather and theft, although adequate long-term parking rarely meets demand. These bicycle parking standards should also be shared with local colleges.

When choosing bike racks, there are a number of things to keep in mind:

- The rack element (part of the rack that supports the bike) should keep the bike upright by supporting the frame in two places allowing one or both wheels to be secured.
- Install racks so there is enough room between adjacent parked bicycles. If it becomes too difficult for a bicyclist to easily lock their bicycle, they may park it elsewhere and the bicycle capacity is lowered. A row of inverted “U” racks should be installed with 15” minimum between racks.
- Empty racks should not pose a tripping hazard for visually impaired pedestrians. Position racks out of the walkway’s clear zone.
- When possible, racks should be in a covered area protected from the elements. Long-term parking should always be protected.

The table below provides basic guidelines on ideal locations for parking at several key activity centers as well as an optimum number of parking spaces.

### Bicycle Parking Locations and Quantities

Use Category	Specific Use	Required Long-term Parking Spaces	Required Short-term Parking Spaces
Residential	Boarding houses	2, or 1 per ten sleeping rooms	None
	Hotels, motels	2, or 1 per 50 employees	None
Commercial / Industrial	Retail sales, service operations *	2, or 1 per 50,000 square feet of gross floor area	2, or 1 per 25,000 square feet of gross floor area
	Office buildings **	2, or 1 per 50,000 square feet of gross floor area	2, or 1 per 50,000 square feet of gross floor area
	Museums, libraries	2, or 1 per 50 employees	4, or 1 per 25,000 square feet of gross floor area
	Movie theaters	2, or 1 per 50 employees	4, or 1 per 50 seats
	Restaurants, ice cream shops, coffee shops	2, or 1 per 50 employees	4, or 1 per 50 seats
	Recreation centers	2, or 1 per 50 employees	4, or 1 per 25,000 square feet of gross floor area
	Major event entertainment (e.g., stadiums, arenas)	2, or 1 per 50 employees	8, or 1 per 500 seats
	Manufacturing	2, or 1 per 50 employees	None
	Warehousing	2, or 1 per 50 employees	None
Institutional	Medical centers	2, or 1 per 50 employees	2, or 1 per 25,000 square feet of gross floor area
	Transit park and ride lots	1 per 50 daily boardings	None

\* Retail businesses below 3,000 square feet of gross floor area are exempt from bicycle parking requirements

\*\* Office buildings below 10,000 square feet of gross floor area are exempt from bicycle parking requirements

## Bicycle Rack Standards

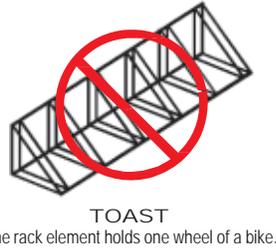
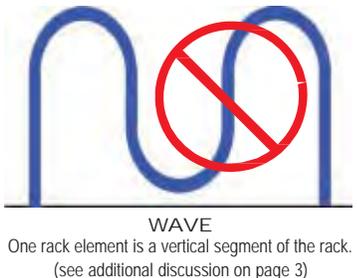
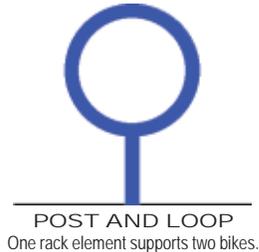
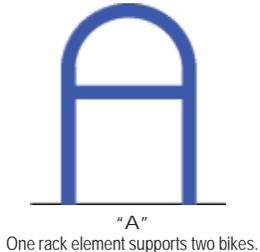
The rack element should:

- Support the bicycle upright by its frame in two places
- Prevent the wheel of the bicycle from tipping over
- Enable the frame and one or both wheels to be secured
- Support bicycles without a diamond-shaped frame with a horizontal top tube (e.g. a mixte frame)
- Allow front-in parking: a U-lock should be able to lock the front wheel and the down tube of an upright bicycle
- Allow back-in parking: a U-lock should be able to lock the rear wheel and seat tube of the bicycle



Comb, toast, school-yard, and other wheel-bending racks that provide no support for the bicycle frame are NOT recommended.

The rack element should resist being cut or detached using common hand tools, especially those that can be concealed in a backpack. Such tools include bolt cutters, pipe cutters, wrenches, and pry bars.



Bicycle racks that incorporate advertising can be sponsored by local merchants.



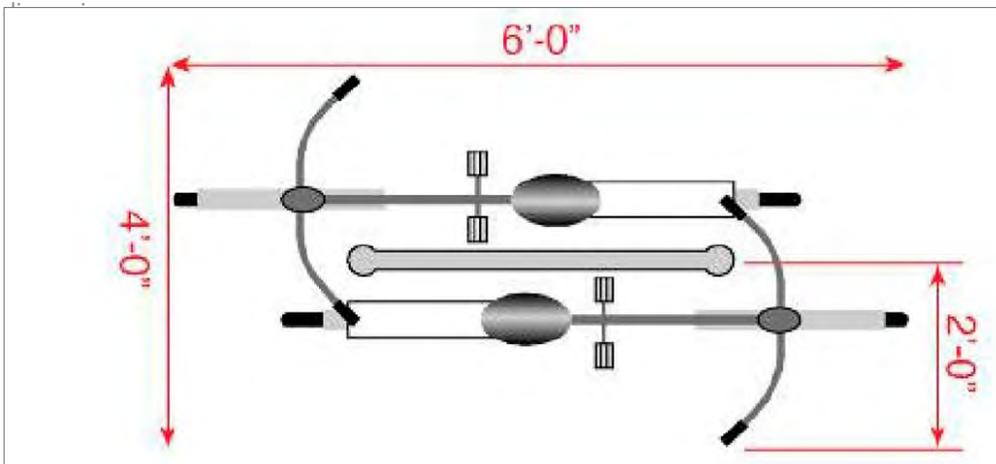
Provision of shelter from rain greatly increases usefulness of this bicycle parking facility during inclement weather.



A single inverted "U" rack can accommodate two bicycles.

Recommended guidelines for bicycle parking from the Association of Pedestrian and Bicycle Professionals, 2002, [www.apbp.org](http://www.apbp.org).

Recommended guidelines for bicycle parking spacing





## Bicycle Parking and the Public vs. Private Right-of-Way

Bicycle parking can be located either in the public right of way or on private property, depending on the adjacent land uses and streetscape. For example, an office park may provide short-term bicycle parking racks near building entrances, and may also provide secure indoor parking for employees. For on street bike parking, the following example from the Portland, OR offers guidelines for city policy.

### Example On-Street Bicycle Parking Requirements (City of Portland, OR, Administrative Rule for On-Street Bicycle Parking)

- Sidewalk racks are at capacity on a recurring basis.
- City staff and applicant jointly determine time of day and day of week for highest bicycle use. This assessment must be independent of any special event that may inflate the average daily use.
- City staff visits site to assess bicycle use, based on the formula listed below, and whether or not it can be met by normal sidewalk rack installations. Due to seasonal variations and weather dependence, determination of bicycle use may need to be delayed pending suitable conditions to assess actual needs.
- Formula used to determine supply and demand for the areas:
  1. Bicycles parked within 50 feet of proposed site multiplied by 1.5
  2. Bicycles parked more than 50 feet, but less than 150 feet, of proposed site multiplied by 1.0
  3. Bicycles parked more than 150 feet, but less than 200 feet, of proposed site multiplied by 0.5
- City staff inventories parked bicycles and available bicycle racks within 200 feet of the site, measured using marked and unmarked crosswalks, including street crossing distances. City staff also will assess the possibilities for additional sidewalk racks.
- If sidewalk bicycle parking cannot be installed to meet 80 percent of inventoried, parked bicycles, then a bicycle corral is warranted. City staff will determine this.
- At a minimum there must be 100 percent agreement with adjacent property owners, established through petition.
- A Maintenance Agreement must be signed by the requestors and the City and kept on file with the City.
- If the business owner that originally requested the bicycle parking closes, sells or transfers ownership the new owner must give written approval of the bicycle parking to the City within 30 days of taking ownership.

Below: An example of replacing on-street vehicular parking with a 'bicycle corral' (in Portland, OR).





### Attended Bike Parking and Bike Lockers

Attended bike parking is analogous to a coat check – your bike is securely stored in a supervised location. An organization called The Bikestation Coalition is promoting enhanced attended parking at transit stations.

The Bikestation concept is now in use in Palo Alto, Berkeley and San Francisco and Seattle. Bikestations offer secured valet bicycle parking near transit centers. What makes Bikestations distinctive are the other amenities that may be offered at the location – bicycle repair, cafes, showers and changing facilities, bicycle rentals, licensing, etc. Bikestations become a virtual one-stop-shop for bicycle commuters.



A bicycle station with attended parking in Long Beach, CA.

Attended bicycle parking can be offered at some special events. For example, the Marin County Bicycle Coalition sponsors valet parking at many festivals in the county, the Sonoma County Bicycle Coalition sponsors valley parking at the downtown Santa Rosa Farmer’s Market, and secured bicycle parking is offered at Pac Bell Park in San Francisco.

Bike lockers should be constructed of opaque materials and be clearly labelled as bicycle parking. Rental management can be either under contract or provided as a service by transit operators or other agencies. (photos from [www.cyclesafe.com/LockerPhotos.tab.aspx](http://www.cyclesafe.com/LockerPhotos.tab.aspx)).



Bicycle lockers are a crucial component of the bicycle system. They offer safe and secure storage at transit centers and destinations. Parking rates are reasonable at about 3-5 cents per hour ([www.bikelink.org](http://www.bikelink.org)).



## Bike Sharing Programs

Many cities including Washington, DC, Montreal and Louisville are implementing innovative bike-sharing programs using a variety of revenue generating and fee-for service programs. Copenhagen, Denmark, pioneered the concept of providing a fleet of bicycles for free public use throughout the urban center. Paris has made this concept popular with the development of the city-wide Velib system of credit-card operated bike rentals. The Danish free bikes are subsidized by advertising sales on the bicycles, and they require a coin or credit card deposit for use. The bicycles are single speed, durable and suitable only for short trips. Their design makes them less likely to be stolen. They can be picked up and dropped off at a variety of destinations – making them an easy choice for in-town travel by residents and visitors. A variety of similar programs utilize recycled bicycles or bicycles painted in a common color for free public use.



Louisville's "Freewheelin" bike sharing system is supported by Humana Healthcare. The City is working with public private partnerships to provide a fleet of shared bicycles.

## Bicycle Stations and Repair Stands

Bicycle repair stands and bicycle stations are fixtures in highly successful bicycle-friendly communities. Popular locations include farmer's markets or public areas that are centers for activity, easily accessible by foot or bicycle. Local bike shops and local events could provide similar services. The presence of smaller scale operations that primarily provide maintenance and repair functions within semi-permanent structures like the tent and tarp shown below allow for a lower cost operation, thereby passing on savings to the customer in terms of lower repair and maintenance costs.

In North Carolina communities (Durham and Carborro, for example), local, volunteer-run bicycle non-profit organizations offer maintenance training and space for local residents to work on their bikes. The City of Durham, for example, granted funding to their local bicycle co-op for their provision of this important bicycle support facility.



Far left: A bicycle stand in Copenhagen, Denmark.

Left: A bicycle maintenance stand at a farmers' market in Durham, NC.

## NCDOT "Typical" Highway Cross Sections (2010)

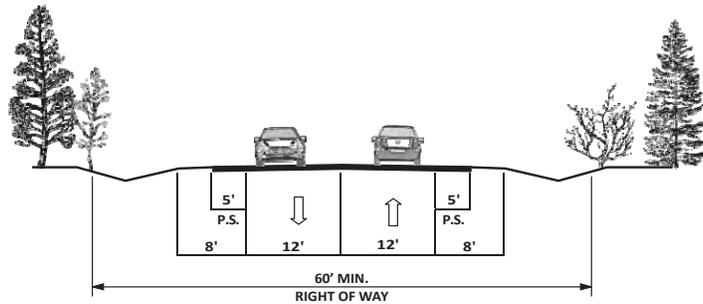
The following are updated "typical" highway cross sections to support NCDOT's ongoing "Complete Streets" initiative. These standards will need to be followed on State-owned roadways (in most cases).

# TYPICAL HIGHWAY CROSS SECTIONS

## 2 LANES

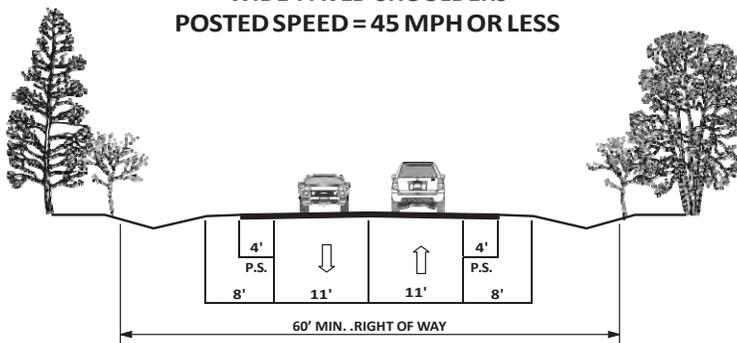
2 A

**WIDE PAVED SHOULDERS**  
**POSTED SPEED = 55 MPH**



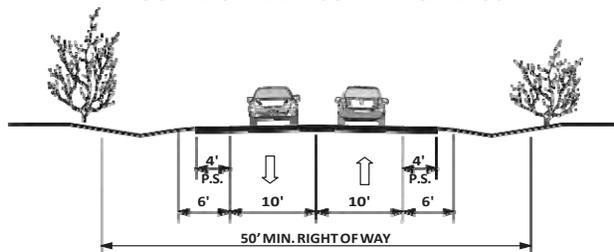
2 B

**WIDE PAVED SHOULDERS**  
**POSTED SPEED = 45 MPH OR LESS**



2 C

**WIDE PAVED SHOULDERS**  
**POSTED SPEED = 35 MPH OR LESS**

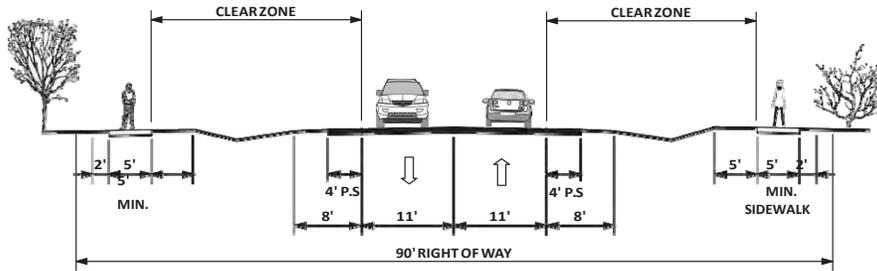


# TYPICAL HIGHWAY CROSS SECTIONS

## 2 LANES

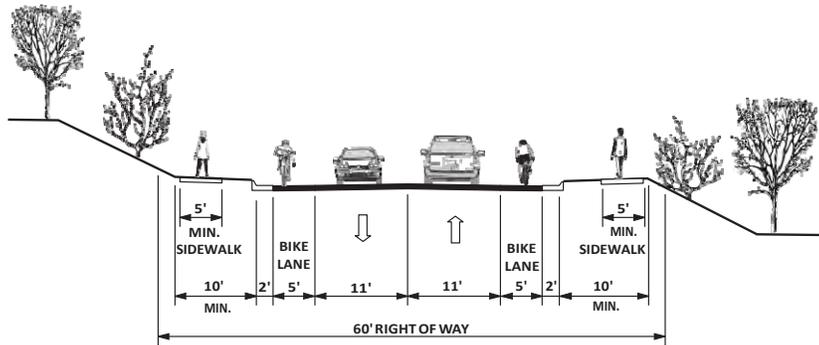
### 2 D

**SIDEWALK PLACEMENT BEHIND A ROADWAY DITCH**



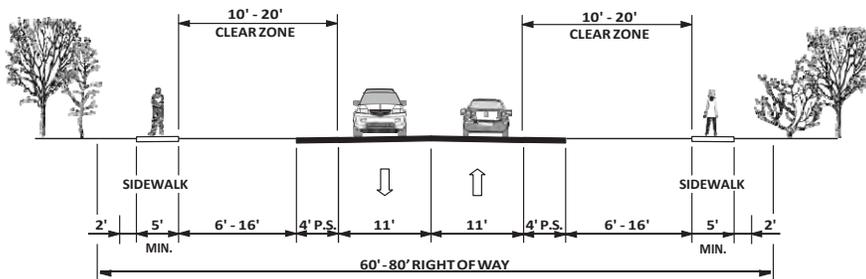
### 2 E

**CURB AND GUTTER WITH BIKE LANES AND SIDEWALKS**



### 2 F

**BUFFERS AND SIDEWALKS WITHOUT A ROADWAY DITCH  
(20 MPH TO 45 MPH)  
(TYPICALLY COASTAL AREA MANAGEMENT ACT COUNTIES)**



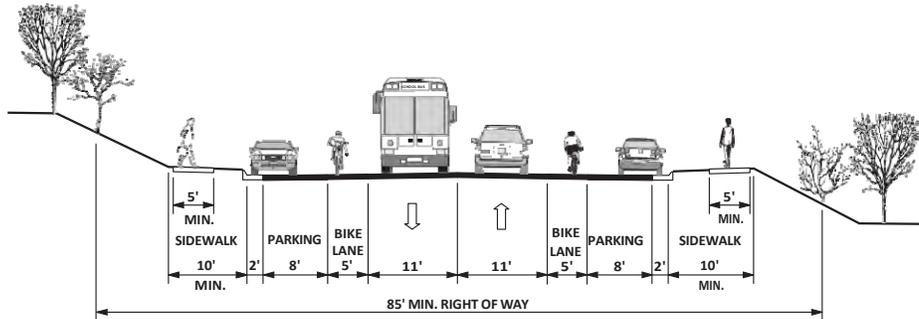


# TYPICAL HIGHWAY CROSS SECTIONS

## 2 LANES

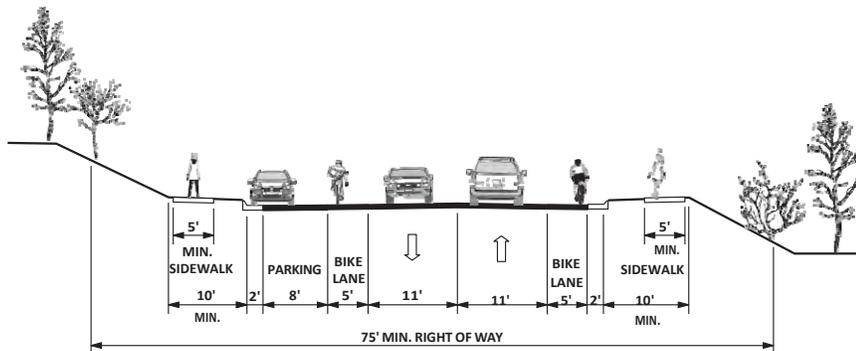
### 2 G

**CURB & GUTTER - PARKING ON EACH SIDE**



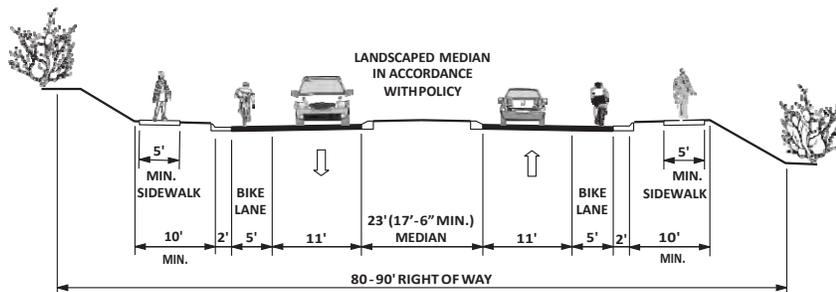
### 2 H

**CURB & GUTTER - PARKING ON ONE SIDE**



### 2 I

**RAISED MEDIAN WITH CURB & GUTTER**

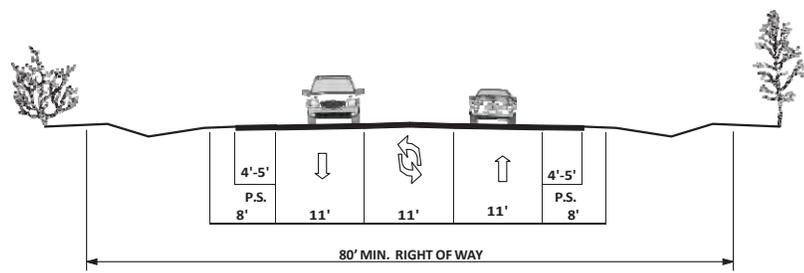


# TYPICAL HIGHWAY CROSS SECTIONS

## 3 LANES

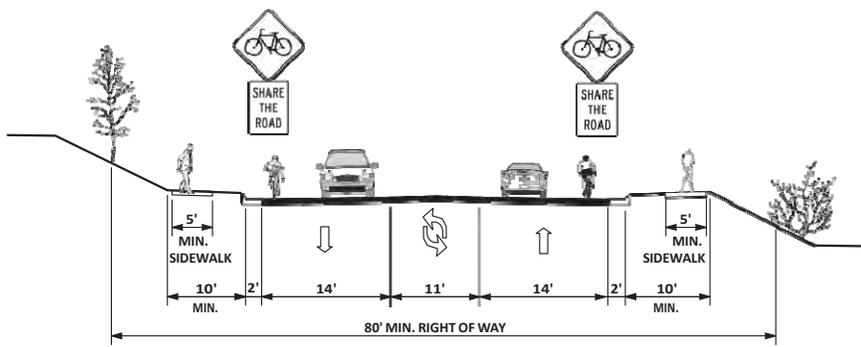
### 3 A

WIDE PAVED SHOULDERS



### 3 B

CURB & GUTTER WITH WIDE OUTSIDE LANES AND SIDEWALKS

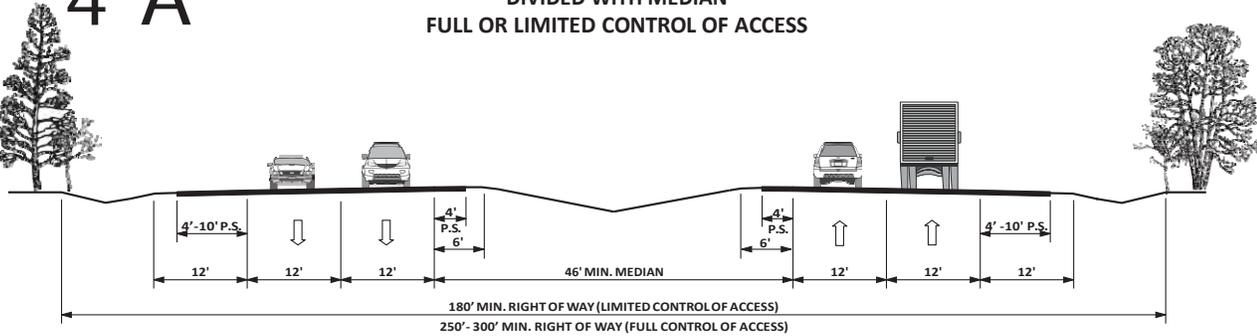


# TYPICAL HIGHWAY CROSS SECTIONS

## 4 LANES

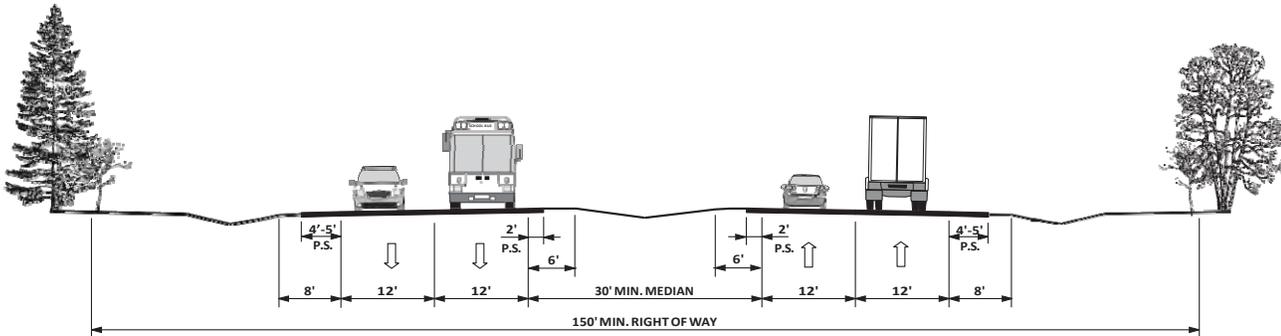
4 A

**DIVIDED WITH MEDIAN  
FULL OR LIMITED CONTROL OF ACCESS**



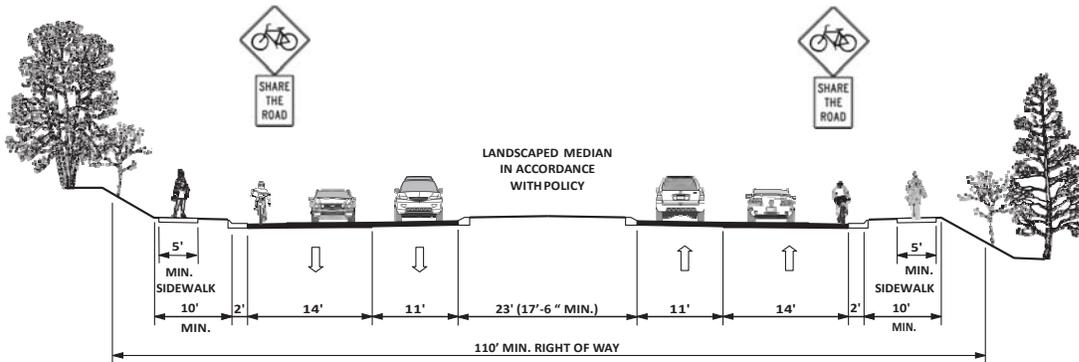
4 B

**DIVIDED WITH MEDIAN - NO CURB & GUTTER  
PARTIAL CONTROL OF ACCESS**



4 C

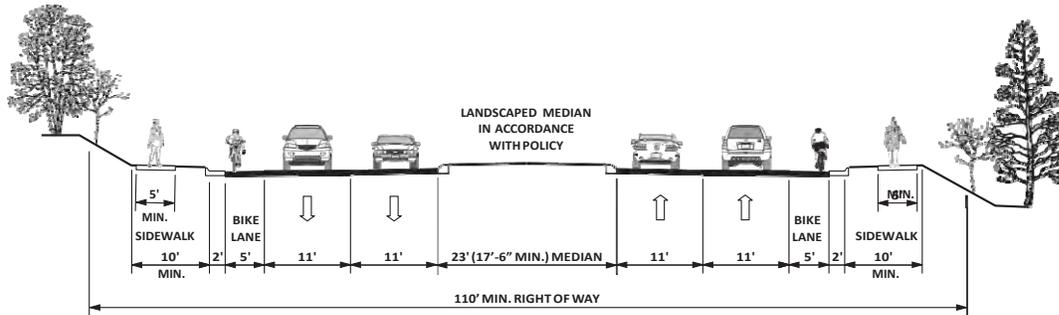
**RAISED MEDIAN WITH WIDE OUTSIDE LANES AND SIDEWALKS**



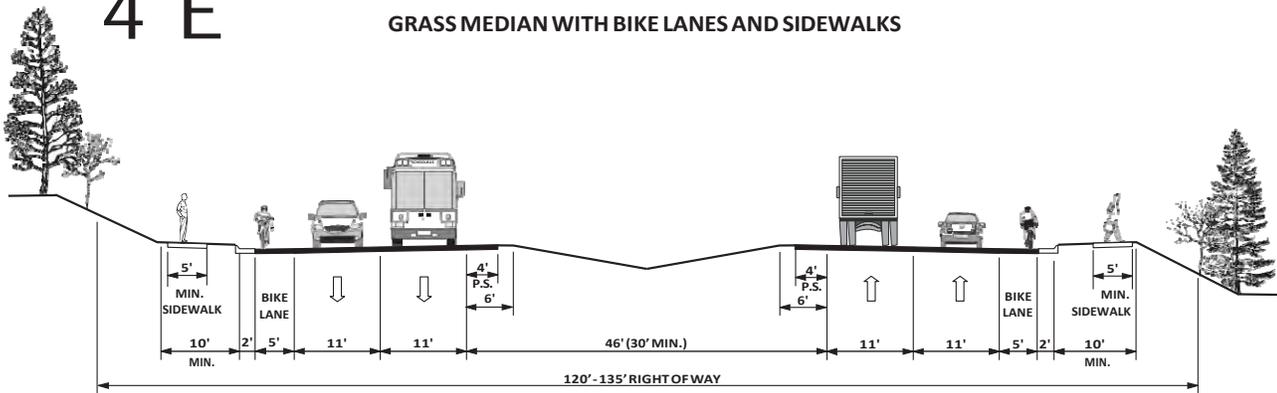
# TYPICAL HIGHWAY CROSS SECTIONS

## 4 LANES

### 4 D RAISED MEDIAN - CURB & GUTTER WITH BIKE LANES AND SIDEWALKS

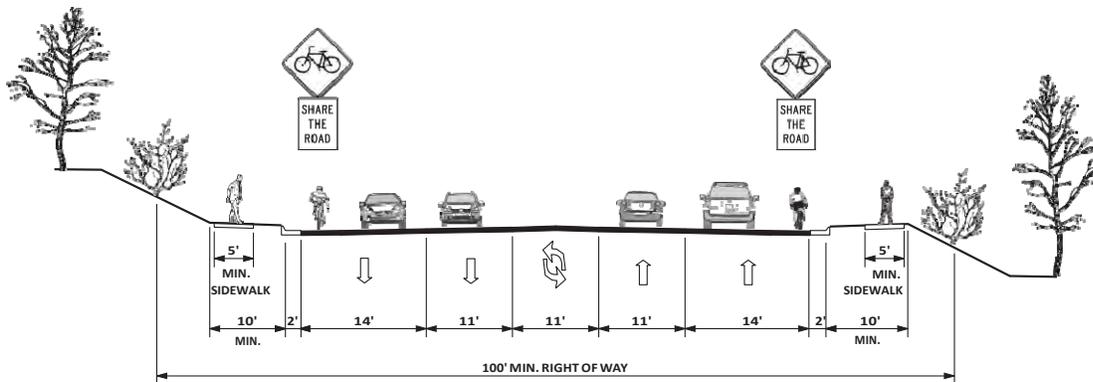


### 4 E GRASS MEDIAN WITH BIKE LANES AND SIDEWALKS



## 5 LANES

### 5 A WIDE OUTSIDE LANES

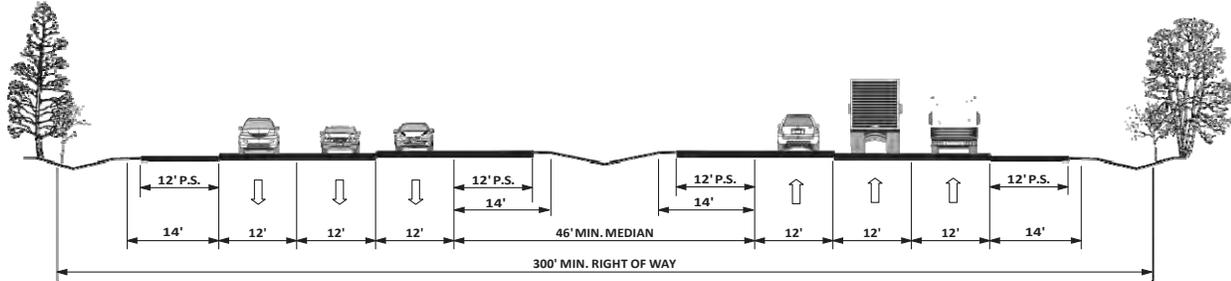


# TYPICAL HIGHWAY CROSS SECTIONS

## 6 LANES

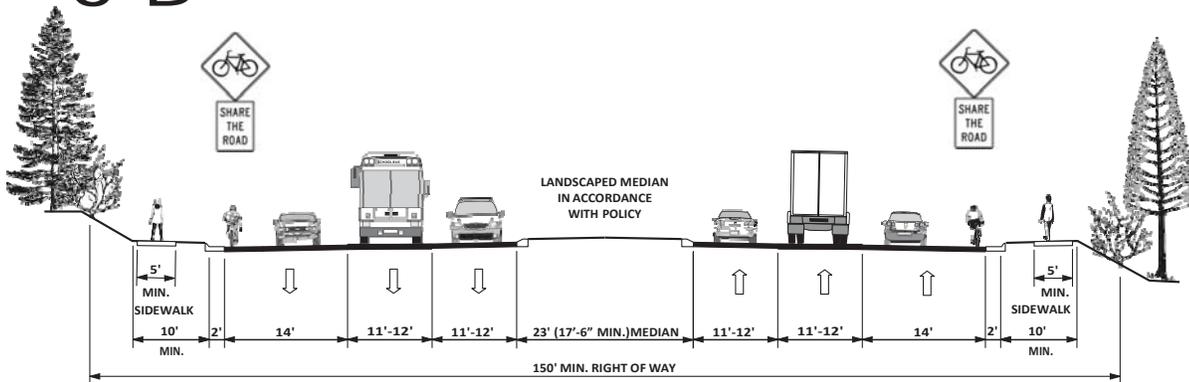
### 6 A

DIVIDED WITH GRASS MEDIAN



### 6 B

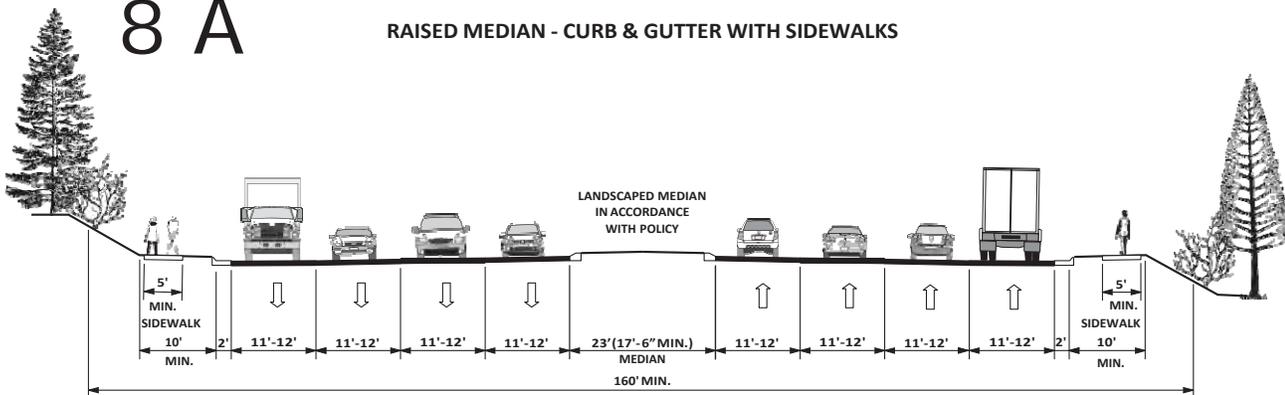
RAISED MEDIAN - CURB & GUTTER WITH WIDE OUTSIDE LANES AND SIDEWALKS



## 8 LANES

### 8 A

RAISED MEDIAN - CURB & GUTTER WITH SIDEWALKS

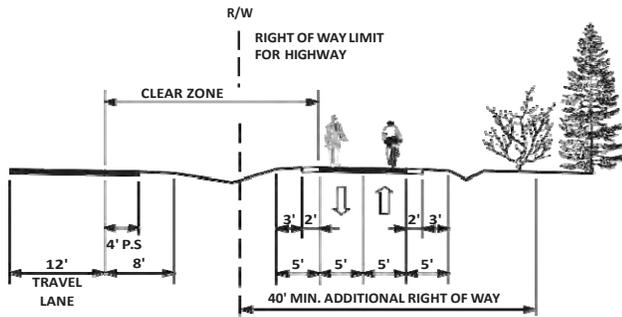




# TYPICAL MULTI - USE PATH

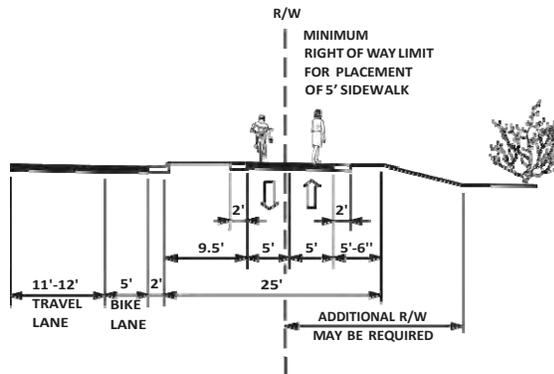
MULTI-USE PATH  
ADJACENT TO RIGHT OF WAY OR SEPARATE PATHWAY

## M A

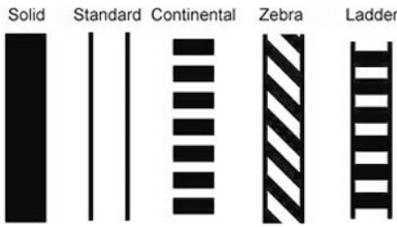


MULTI-USE PATH ADJACENT TO CURB AND GUTTER

## M B



## Marked Crosswalks



A variety of patterns are possible in designating a crosswalk; an example of a 'continental' design is shown above.

A marked crosswalk designates a pedestrian right-of-way across a street. It is often installed at controlled intersections or at key locations along the street (a.k.a. mid-block crossings). Every attempt should be made to install crossings at the specific point at which pedestrians are most likely to cross: a well-designed traffic calming location is not effective if pedestrians are instead using more seemingly convenient and potentially dangerous locations to cross the street. Marked pedestrian crosswalks may be used under the following conditions: 1) At locations with stop signs or traffic signals, 2) At non-signalized street crossing locations in designated school zones, and 3) At non-signalized locations where engineering judgment dictates that the use of specifically designated crosswalks are desirable.

There is a variety of form, pattern, and materials to choose from when creating a marked crosswalk. It is important however to provide crosswalks that are not slippery, are free of tripping hazards, or are otherwise difficult to maneuver by any person including those with physical mobility or vision impairments. Although attractive materials such as inlaid stone or certain types of brick may provide character and aesthetic value, the crosswalk can become slippery. Potential materials can be vetted by requesting case studies from suppliers regarding where the materials have been successfully applied. Also, as some materials degrade from use or if they are improperly installed, they may become a hazard for the mobility or vision impaired.

### Crosswalk Guidelines:

#### Crosswalk Guideline Sources:

American Association of State Highway and Transportation Officials. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Metro Regional Government. (2005). Portland, Oregon: Transportation Information Center. <http://www.oregonmetro.gov>

- Should not be installed in an uncontrolled environment [at intersections without traffic signals] where speeds exceed 40 mph. (AASHTO, 2004)
- Crosswalks alone may not be enough and should be used in conjunction with other measures to improve pedestrian crossing safety, particularly on roads with average daily traffic (ADT) above 10,000
- Width of marked crosswalk should be at least six feet; ideally ten feet or wider in downtown areas.
- Curb ramps and other sloped areas should be fully contained within the markings.
- Crosswalk markings should extend the full length of the crossings.
- Crosswalk markings should be white per MUTCD.
- Either the 'continental' or 'ladder' patterns are recommended for intersection improvements for aesthetic and visibility purposes. Lines should be one to two feet wide and spaced one to five feet apart.



## Curb Ramps

Curb ramps are critical features that provide access between the sidewalk and roadway for wheelchair users, people using walkers, crutches, or handcars, people pushing bicycles or strollers, and pedestrians with mobility or other physical impairments. In accordance with the 1973 Federal Rehabilitation Act and to comply with the 1990 Federal ADA requirements, curb ramps must be installed at all intersections and mid-block locations where pedestrian crossings exist (Pedestrian and Bicycle Information Center: [www.walkinginfo.org/engineering/roadway-ramps.cfm](http://www.walkinginfo.org/engineering/roadway-ramps.cfm)). In addition, these federal regulations require that all new constructed or altered roadways include curb ramps.

Two separate curb ramps should be provided at each intersection (see image below). With only one large curb ramp serving the entire corner, there is not safe connectivity for the pedestrian. Dangerous conditions exist when the single, large curb ramp inadvertently directs a pedestrian into the center of the intersection, or in front of an unsuspecting, turning vehicle.

### Curb Ramp Guidelines:

- Two separate curb ramps, one for each crosswalk, should be provided at corner of an intersection.
- Curb ramp should have a slope no greater than 1:12 (8.33%). Side flares should not exceed 1:10 (10%); it is recommended that much less steep slopes be used whenever possible.

### Curb Ramp Guideline Sources:

Metro Regional Government. (2005). Portland, Oregon: Transportation Information Center. <http://www.oregonmetro.gov>



Left: The curb ramps shown have two separate ramps at the intersection (visible across the street) (Image from <http://www.walkinginfo.org>).

For additional information on curb ramps see Accessible Rights-of-Way: A Design Guide, by the U.S. Access Board and the Federal Highway Administration, and Designing Sidewalks and Trails for Access, Parts I and II, by the Federal Highway Administration. Visit:

[www.access-board.gov](http://www.access-board.gov) for the Access board's right-of-way report.



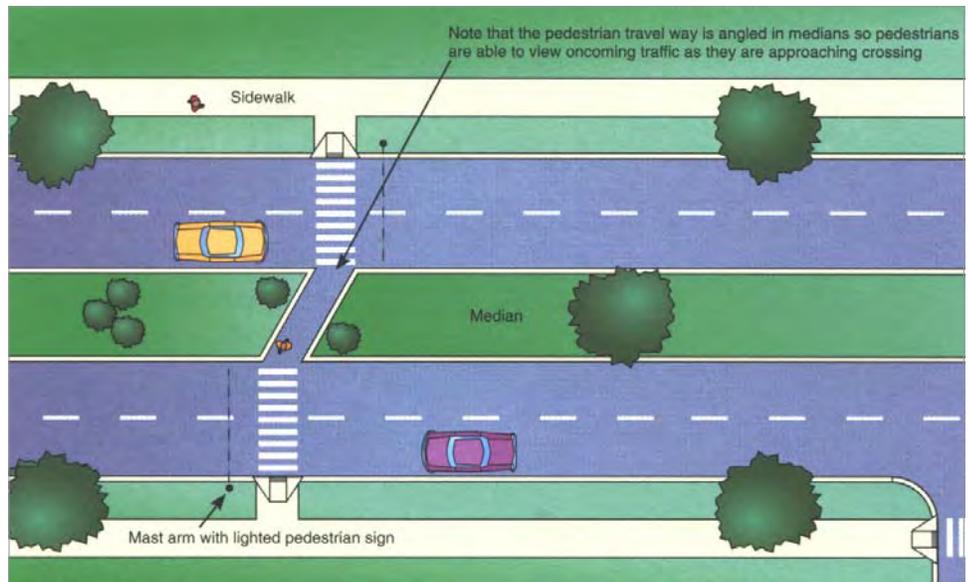
## Raised or Lowered Medians

Medians are barriers in the center portion of a street or roadway. When used in conjunction with mid-block or intersection crossings, they can be used as a crossing island to provide a place of refuge for pedestrians. They also provide opportunities for landscaping that in turn can help to slow traffic. A center turn lane can be converted into a raised or lowered median thus increasing motorist safety.

A continuous median can present several problems when used inappropriately. If all left-turn opportunities are removed, there runs a possibility for increased traffic speeds and unsafe U-turns at intersections. Additionally, the space occupied may be taking up room that could be used for bike lanes or other treatments. An alternative to the continuous median is to create a segmented median with left turn opportunities.

Raised or lowered medians are best suited for high-volume, high-speed roads, and they should provide ample cues for people with visual impairments to identify the boundary between the crossing island and the roadway.

Right: A median used in conjunction with mid-block crossing, serving as a refuge for pedestrians. (Image from AASHTO).



Right: an attractive lowered and landscaped median that collects stormwater, yet appears to be raised. (Image from AASHTO)





## Median Guidelines:

- Median pedestrian refuge islands should be provided as a place of refuge for pedestrians crossing busy or wide roadways at either mid-block locations or intersections. They should be utilized on high speed and high volume roadways.
- Medians should incorporate trees and planting to change the character of the street and reduce motor vehicle speed.
- Landscaping should not obstruct the visibility between motorists and pedestrians.
- Median crossings should provide ramps or cut-throughs for ease of accessibility for all pedestrians.
- Median crossings should be at least 6 feet wide in order to accommodate more than one pedestrian, while a width of 8 feet (where feasible) should be provided for bicycles, wheelchairs, and groups of pedestrians.
- Median crossings should possess a minimum of a 4 foot square level landing to provide a rest point for wheelchair users.
- Pedestrian push-buttons should be located in the median of all signalized mid-block crossings, where the roadway width is in excess of 60 feet.

### Median Guideline Sources:

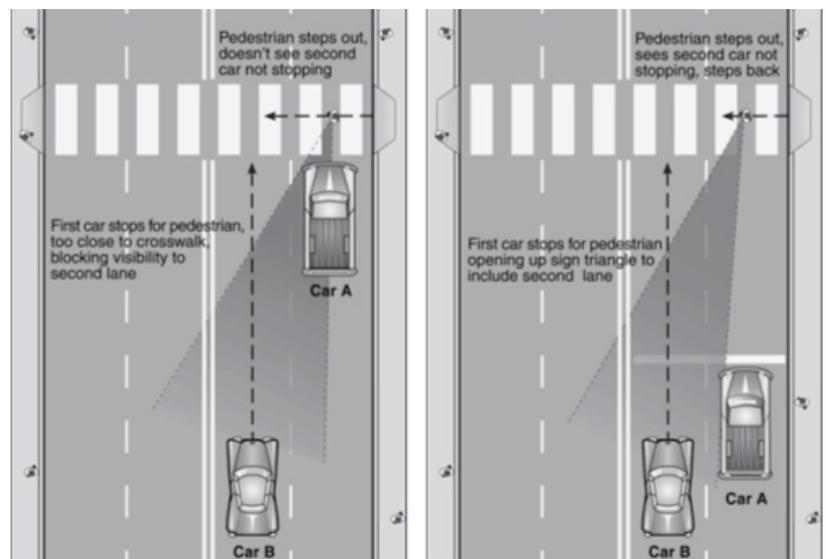
American Association of State Highway and Transportation Officials. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Metro Regional Government. (2005). Portland, Oregon: Transportation Information Center. <http://www.oregonmetro.gov>

## Advance Stop Bars

Moving the vehicle stop bar 15–30 feet back from the pedestrian crosswalk at signalized crossings and mid-block crossings increases vehicle and pedestrian visibility. Advance stop bars are 1–2 feet wide and they extend across all approach lanes at intersections. The time and distance created allows a buffer in which the pedestrian and motorist can interpret each other's intentions. Studies have shown that this distance translates directly into increased safety for both motorist and pedestrian. One study in particular claims that by simply adding a "Stop Here for Pedestrians" sign reduced pedestrian motorist conflict by 67%. When this was used in conjunction with advance stop lines, it increased to 90% (Pedestrian and Bicycle Information Center: <http://www.walkinginfo.org/engineering/crossings-enhancements.cfm>).

Below: Advance stop bars enhance visibility for pedestrians (Image from [www.walkinginfo.org](http://www.walkinginfo.org)).





International symbols used in a crosswalk to designate WALK and DON'T WALK (Image from [www.walkinginfo.org](http://www.walkinginfo.org)).

## Pedestrian Signals

There are a host of traffic signal features and enhancements that can greatly improve the safety and flow of pedestrian traffic. Some include countdown signals, the size of traffic signals, positioning of traffic signals, audible cues, and timing intervals which are discussed below (Pedestrian and Bicycle Information Center: <http://www.walkinginfo.org/engineering/crossings-signals.cfm>).

As of 2008, new federal policy requires all new pedestrian signals to be of the countdown variety. In addition, all existing signals must be updated to countdown within 10 years (updated in MUTCD). Countdown signals have proven to be an effective measure of crash reduction (25% crash reduction in 2007 FHWA study).

Countdown signals are pedestrian signals that show how many seconds the pedestrian has remaining to cross the street. The countdown can begin at the beginning of the WALK phase, perhaps flashing white or yellow, or at the beginning of the clearance, or DON'T WALK phase, flashing yellow as it counts down. Audible cues can also be used to pulse along with a countdown signal.

Signals should be of adequate size, clearly visible, and, in some circumstances, accompanied by an audible pulse or other messages to make crossing safe for all pedestrians. Considerations should be paid to the noise impact on the surrounding neighborhoods when deciding to use audible signals.

The timing of these or other pedestrian signals needs to be adapted to a given situation. In general, shorter cycle lengths and longer walk intervals provide better service to pedestrians and encourage better signal compliance. For optimal pedestrian service, fixed-time signal operation usually works best. Pedestrian pushbuttons may be installed at locations where pedestrians are expected intermittently. Quick response to the pushbutton or feedback to the pedestrian (e.g., indicator light comes on) should be programmed into the system. When used, pushbuttons should be well-signed and within reach and operable from a flat surface for pedestrians in wheelchairs and with visual disabilities. They should be conveniently placed in the area where pedestrians wait to cross. Section 4E.09 within the MUTCD provides detailed guidance for the placement of pushbuttons to ensure accessibility (Pedestrian and Bicycle Information Center: <http://www.walkinginfo.org/engineering/crossings-signals.cfm>).



Audible cues can also be used to pulse along with a countdown signal.

There are three types of signal timing generally used: concurrent, exclusive, and leading pedestrian interval (LPI). The strengths and weaknesses of each will be discussed with an emphasis on when they are best employed.

When high-volume turning situations conflict with pedestrian movements, the exclusive pedestrian interval is the preferred solution. The exclusive pedestrian intervals stop traffic in all directions. In order to keep traffic flowing regularly, there is often a greater pedestrian wait time associated with this system. Although it has been shown that pedestrian crashes have been reduced by 50% in some areas by using these intervals, the long wait times can encourage some to cross when there is a lull in traffic (Pedestrian and Bicycle Information Center: <http://www.walkinginfo.org/engineering/crossings-signals.cfm>).



An LPI gives pedestrians an advance walk signal before the motorists get a green light, giving the pedestrian several seconds to start in the crosswalk where there is a concurrent signal. This makes pedestrians more visible to motorists and motorists more likely to yield to them. This advance crossing phase approach has been used successfully in several places, such as New York City, for two decades and studies have demonstrated reduced conflicts for pedestrians. The advance pedestrian phase is particularly effective where there is a two-lane turning movement. There are some situations where an exclusive pedestrian phase may be preferable to an LPI, such as where there are high-volume turning movements that conflict with the pedestrians crossing.

The use of infrared or microwave pedestrian detectors has increased in many cities worldwide. These devices replace the traditional push-button system. They appear to be improving pedestrian signal compliance as well as reducing the number of pedestrian and vehicle conflicts. The best use of these devices is when they are employed to extend crossing time for slower moving pedestrians.

### Pedestrian Signal Guidelines:

- Pedestrian signals should be placed in locations that are clearly visible to all pedestrians.
- Larger pedestrian signals should be utilized on wider roadways, to ensure readability.
- Pedestrian signal pushbuttons should be well-signed and visible.
- Pedestrian signal pushbuttons should clearly indicate which crossing direction they control.
- Pedestrian signal pushbuttons should be reachable from a flat surface, at a maximum height of 3.5 feet and be located on a level landing to ensure ease of operation by pedestrians in wheelchairs.
- Walk intervals should be provided during every cycle, especially in high pedestrian traffic areas.

## Multi-use Trails / Greenways

### Paved Multi-use Trail: Overview

Multi-use paths are completely separated from motorized vehicular traffic and are constructed in their own corridor, often within an open-space area. Multi-use trails typically have a concrete or paved asphalt surface and are capable of being constructed within flood-prone landscapes as well as upland corridors.

- Concrete is the recommended surface treatment. Paved asphalt or permeable paving can be used as alternatives.
  1. It is recommended that concrete be used for its superior durability and lower maintenance requirements—especially in areas prone to frequent flooding, and for intensive urban applications; Consider using high albedo pavement in place of conventional concrete surfaces (it reflects sunlight, reducing radiated heat).
  2. As an alternative to concrete, paved asphalt trails offer substantial durability for the cost of installation and maintenance. As a flexible pavement, asphalt can also be considered for installing a paved trail on slopes.
  3. Consider the following for permeable paving: a) It can be twice the cost of asphalt, b) A maintenance schedule for vacuuming debris is required to retain permeability, and c) Not suitable in the floodplain, or in areas without proper drainage (sheet flow or pooling of water with sediment clogs pours).
- Proper trail foundation will increase the longevity of the trail; two inches surfacing material over four inches (min.) of base course gravel over geotextile fabric is recommended. Soil borings may need to be conducted to determine adequate material depths; it should be designed to withstand the loading requirements of occasional maintenance and emergency vehicles.
- Typically 10' wide, 2% cross slope, with two-foot wide graded shoulders; the shoulders help prevent edges from crumbling and provide an alternate walking and jogging surface.
- Centerline stripes should be considered for trails that generate substantial amounts of traffic, and are particularly useful along curving sections of trail.
- Trail landscaping and maintenance should enhance conditions for wildlife by planting only native species in the trail corridor, removing invasive species when possible, and avoiding harmful pesticides and herbicides. The overall shape of protected natural landscapes along trail corridors also influences wildlife: single, large, contiguous natural areas are more beneficial to wildlife than the same acreage split into smaller segments.



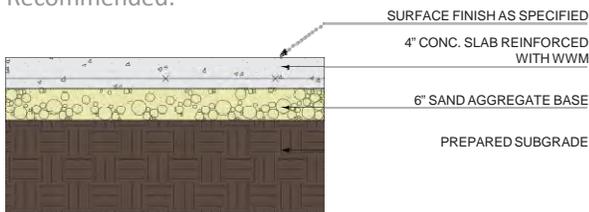
### Multi-use Trail : Floodplain Areas

'Paved Multi-use Trail' guidelines apply, with the following considerations and exceptions:

- Typically positioned outside the floodway, within the floodplain; significant vegetative buffer between the stream and trail should be left intact.
- Use existing cleared corridors for trail routing whenever possible, to avoid unnecessary vegetative clearing.
- Subject to occasional flooding, during large storm events.
- Concrete recommended, though an aggregate stone surface may be adequate in some locations.

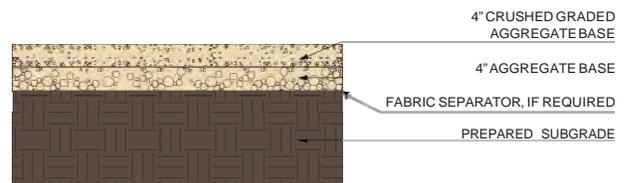


Recommended:



CONCRETE PAVING ON AGGREGATE

Alternative:



GRAVEL PAVING ON AGGREGATE

## Sidepaths

Multi-use paths located within the roadway corridor right-of-way, or adjacent to roads, are called ‘Sidepaths’. Sidepaths provides a comfortable walking space for pedestrians and enables children and recreational bicyclists to ride without the discomfort of riding in a busy street.

This configuration works best along roadways with limited driveway crossings and with services primarily located on one side of the roadway, or along a riverfront or other natural feature. Not recommended in areas with frequent driveways or cross streets.

- A minimum 10’ width is necessary on sidepaths for bicyclists to pass one another safely (12’ for areas expecting high use)
- A 6’ or greater vegetated buffer between the sidepath and the roadway should be provided where possible.
- Roadway corridors where side paths are recommended should also have adequate on-road bicycle facilities (such as shared lane markings, paved shoulders, or bicycle lanes), so that all levels of bicyclists are accommodated.
- Well-designed transitions from sidepaths to on-road facilities will direct bicyclists to the correct side of the roadway (see guidelines for Trail-Roadway Intersections)



## Natural Surface Trails

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.

- The trail can vary in width from 18-inches to 6-feet; vertical clearance should be maintained at nine-feet above grade.
- Preparation varies from machine-worked surface 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.
- At the time of this writing, a new, environmentally sound trail surface is being researched in Greenville County, SC. The organic soil stabilizer, called Roadzyme, is non-toxic, made from sugar beet extract.
- 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.
- Consider implications for accessibility when weighing options for surface treatments.
- For the purposes of this Plan, ‘Natural Surface Trails’ do not include bicycles. See following page for guidelines on mountain bike trails.



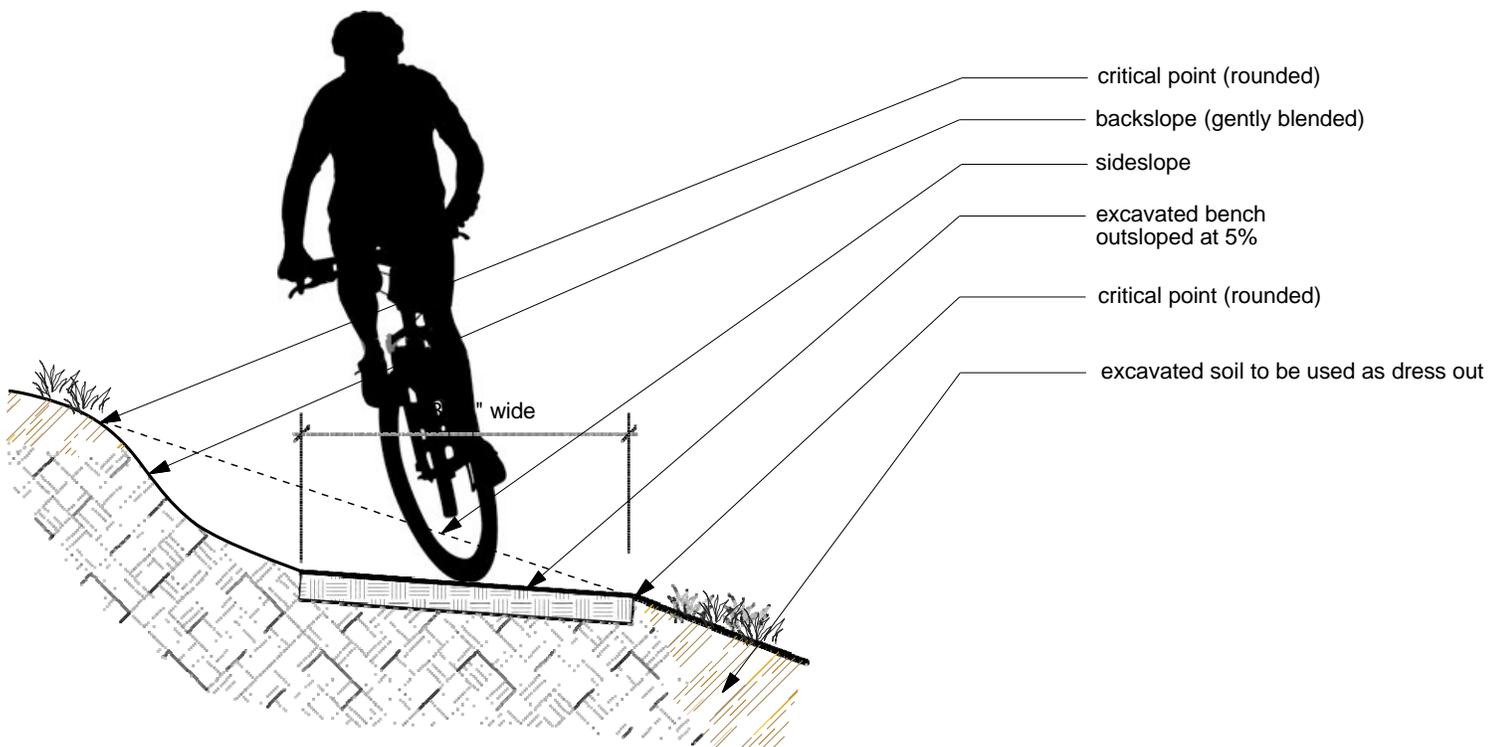
Natural surface trails provide options in areas that are environmentally sensitive.



## Single-Track Mountain Bike Trails

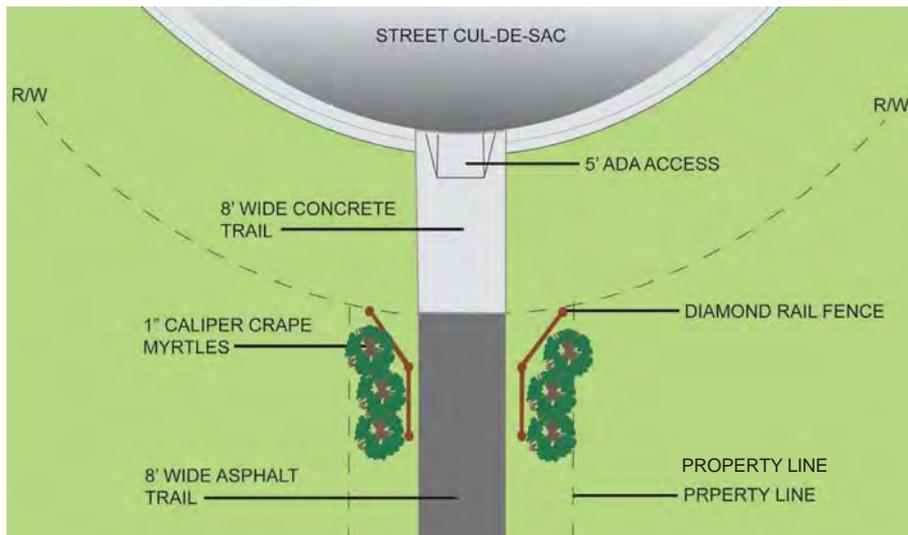
Due to their narrow width and ability to contour with the natural topography, single-track mountain bike trails (or off-road bicycling trails) require the least amount of disturbance and support features of all types of trails.

- Their minimal footprint provides opportunities for localized stormwater management solutions. Localizing the stormwater features at small scales along the network keeps the trails available for use year-round and requires very little long term maintenance.
- If trails remain unused during storm events, and are constructed correctly, they can remain virtually maintenance free.
- Mountain bike trails are typically 18-24 inches wide and have compacted bare earth or leaf litter surfacing.
- Mountain bike trails are constructed using hand tools or low impact machinery such as a mini excavator.
- Refer to the International Mountain Bicycling Association (IMBA) standards for more information.





## Neighborhood Spur Trail



Neighborhood entrance trail diagram.

Neighborhood spur trails 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, culs-de-sac, and access to nearby destinations not provided by the overall street network. Neighborhood and homeowner association groups are encouraged to identify locations where such connects would be desirable.

- Neighborhood spur trails 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 meander whenever possible.
- Landscaping shall be included at the street frontage of the access trail based upon input from the residents of the cul-de-sac or dead-end street. If the access is not in a cul-de-sac, the adjacent property owners and property owners directly across from the access trail will be invited to provide landscape design input. See following section related to landscaping.
- Two sections of diamond rail fencing should be included on each side of the trail near the street frontage. Diamond rail will not be included if the respective neighborhood deeds and covenants do not permit it.

Example of a neighborhood entrance trail, featuring landscape signage.





## Vegetation Buffer, Landscaping, and Street Trees

Vegetated buffers are used to separate trails not only for floodplain protection and noise from the road, but also, where desired, to screen trail corridors from nearby properties.

- Use native plant species and plants appropriate to the region that are already adapted to the local soil and climate, reducing overall maintenance costs and enhancing local identity. Landscape materials should be installed during the appropriate planting season for the particular species.
- Design the buffer with a combination of evergreen and deciduous plants for year-round interest.
- Plant buffers with a combination of trees and large shrubs, understory plantings, and ground cover.
- Keep the vegetation buffer maintained so that it does not impede views or interfere with trail circulation.
- Avoid vegetation “walls” that box-in trail users.
- Select and place trail vegetation to provide seasonal comfort: shade on trails in the warmer months and warming sunlight on trails in colder months.



Street trees and other plantings provide comfort, a sense of place, and a more natural and inviting setting for pedestrians.

- Street and sidewalk landscaping can be used to provide a separation buffer between pedestrians and motorists (see image at left), reduce the width of a roadway, calm traffic by creating a visual narrowing of the roadway, enhance the street environment, and help to generate a desired aesthetic.
- Growth pattern and space for maturation, particularly with larger tree plantings, are important to avoid cracking sidewalks and other pedestrian obstructions.
- Islands of vegetation can be created to collect and filter stormwater from nearby streets and buildings. These islands are referred to as constructed wetlands, rain gardens, and/or bioswales. When these devices are employed, the benefits listed above are coupled with economic and ecologic benefits of treating stormwater at its source. See Seattle’s Green Streets Program as a model.

Landscaping used on the Capital Crescent Trail, Washington DC, shows how stormwater treatment can be tied to aesthetically pleasing plantings.

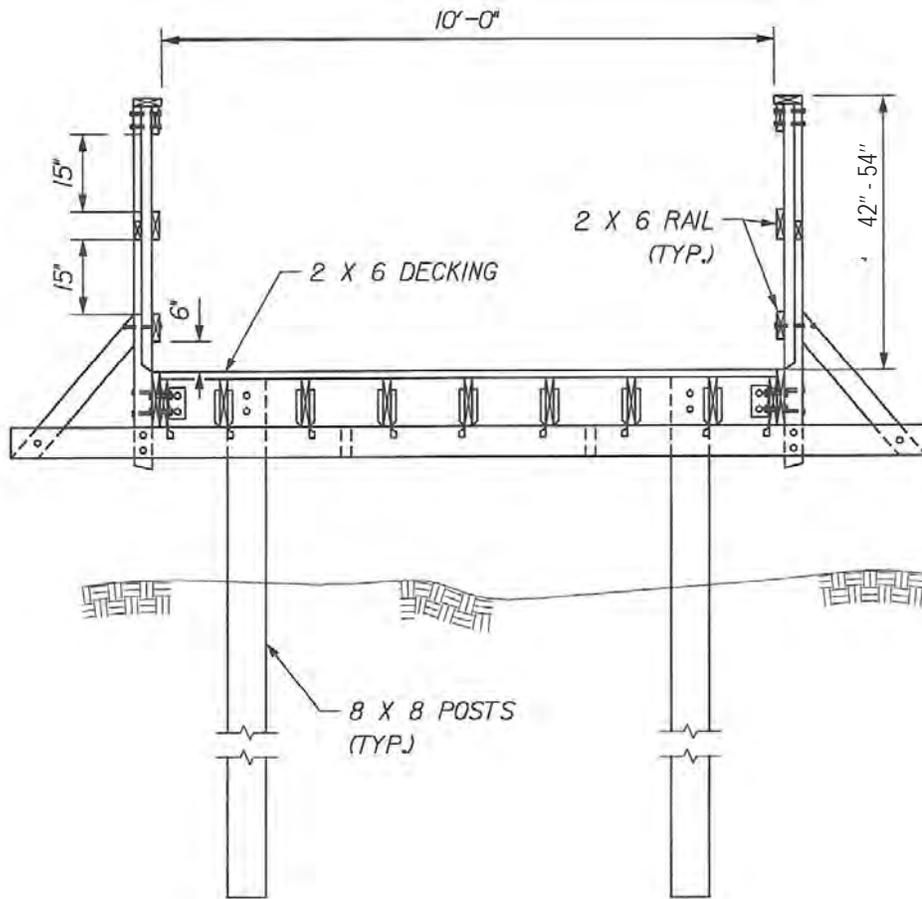
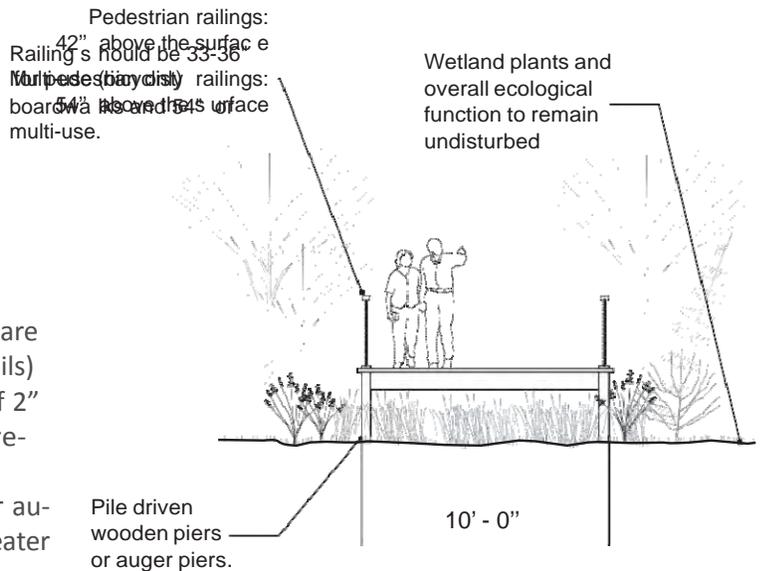




## Boardwalk

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

- When the height of a boardwalk exceeds 30", railings are required (see section on 'Railings and Fences' for details)
- The thickness of the decking should be a minimum of 2"
- Decking should be either non-toxic treated wood or recycled plastic.
- The foundation normally consists of wooden posts or auger piers (screw anchors). Screw anchors provide greater support and last much longer.
- Opportunities exist to build seating and signage into boardwalks.
- In general, building in wetlands should be avoided.
- Note: muddy bicycle tires may be slick on wood surfaces.



A boardwalk allows for travel through wet areas..

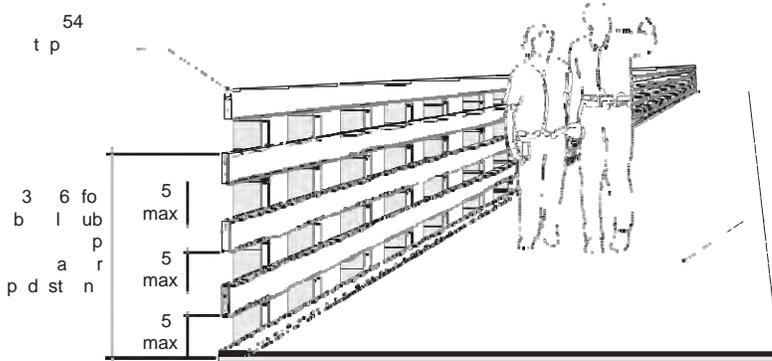
## Railings and Fences

Railing and fences are important features on bridges, some boardwalks, or in areas where there may be a hazardous drop-off or hazardous adjacent land uses (such as active rail lines).

- At a minimum, railings and fences should consist of a vertical top, bottom, and middle rail. Picket style fencing should be avoided as it presents a safety hazard for bicyclists.
- A pedestrian railing should be 42-inches above the surface.
- A bicyclist railing should be 54-inches above the surface.
- The middle railing functions as a “rub rail” for bicyclists and should be located 33-and 36-inches above the surface.
- Local, state, and/or federal regulations and building codes should be consulted to determine when it is appropriate to install railing.



Example image of fence used along a rail with trail (Grand Rounds Parkway).



Surface



## Innovative Accessways

There are also other innovative ways to provide direct access, particularly in topographically constrained areas (e.g., on steep hills, over waterways, etc.) Stairs, alleyways, bridges, and elevators can provide quick and direct connections throughout the city and can be designed so they are safe, inviting, and accessible to most trail users. For example, stairways can have wheel gutters so that bicyclists can easily roll their bicycles up and down the incline and boardwalks can provide access through sensitive wet areas and across small waterways.



Left and above: Bicycle wheel gutters on stairs.

Below: A boardwalk bridge



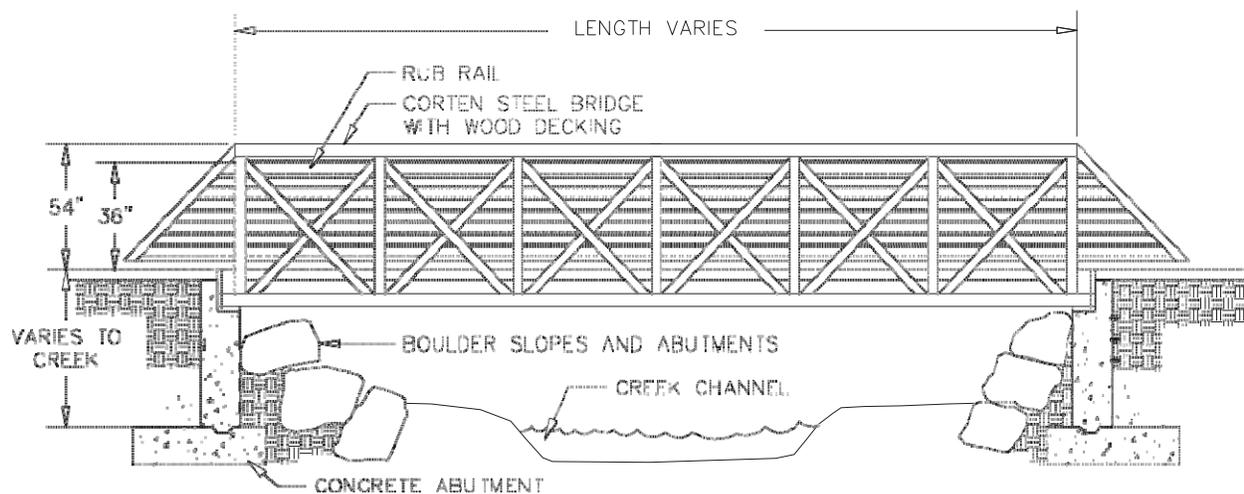


## Trail Bridges, Overpasses and Underpasses

### Trail Bridges

Multi-Use Trail bridges (also ‘bicycle/pedestrian bridges’ or ‘footbridges’) are most often used to provide trail access over natural features such as streams and rivers, where a culvert is not an option. The type and size of bridges can vary widely depending on the trail type and specific site requirements. Some bridges often used for multi-use trails include suspension bridges, prefabricated span bridges and simple log bridges. When determining a bridge design for multi-use trails, it is important to consider emergency and maintenance vehicle access.

- If a corridor already contains a bridge such as an abandoned rail bridge, an engineer should be consulted to assess the structural integrity before deciding to remove or reuse it.
- A trail bridge should support 6.25 tons; Information about the load-bearing capacity of bridges can be found in the American Association of State Highways and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges.
- There are many options in terms of high quality, prefabricated pedestrian bridges available. Prefabricated bridges are recommended because of their relative low cost, minimal disturbance to the project site, and usually, simple installation.
- All abutment design should be sealed by a qualified structural engineer and all relevant permits should be filed.





## Trail Overpass

Trail overpasses are most often used to provide trail access over large man-made features such as highways and railroads.

- Overpasses work best when existing topography allows for smooth transitions.
- Safety should be the primary consideration in bridge/overpass design.
- Specific design and construction specifications will vary for each bridge and can be determined only after all site-specific criteria are known.
- Always consult a structural engineer before completing bridge design plans, before making alterations or additions to an existing bridge, and prior to installing a new bridge.
- A 'signature' bridge should be considered in areas of high visibility, such as over major roadways. While often more expensive, a more artistic overpass will draw more attention to the trail system in general, and could serve as a regional landmark.
- For shared-use facilities, a minimum width of 14' is recommended.
- Trail overpasses are prohibitively expensive and should only be placed in areas of substantial need.



## "Vehicular" Bridges And Underpasses

All new or replacement bridges and tunnels should accommodate pedestrians and bicyclists. Even though bridge replacements do not occur regularly, it is important to consider these in longer-term pedestrian planning.

- Sidewalks should be included on roadway bridges on both sides, minimum 5' wide, with minimum handrail height of 42"
- Sufficient bridge deck width should be provided on new bridges, including approaches, to accommodate bicyclists
- In roadway underpasses, where vertical clearance allows, the pedestrian walkways should be separated from the roadway by more than a standard curb height.
- On bridges built for controlled access roadways, a separated, multi-use sidepath should be provided, minimum 12' wide, with connections made to bike/ped facilities on both sides of the bridge.

### Trail Underpass

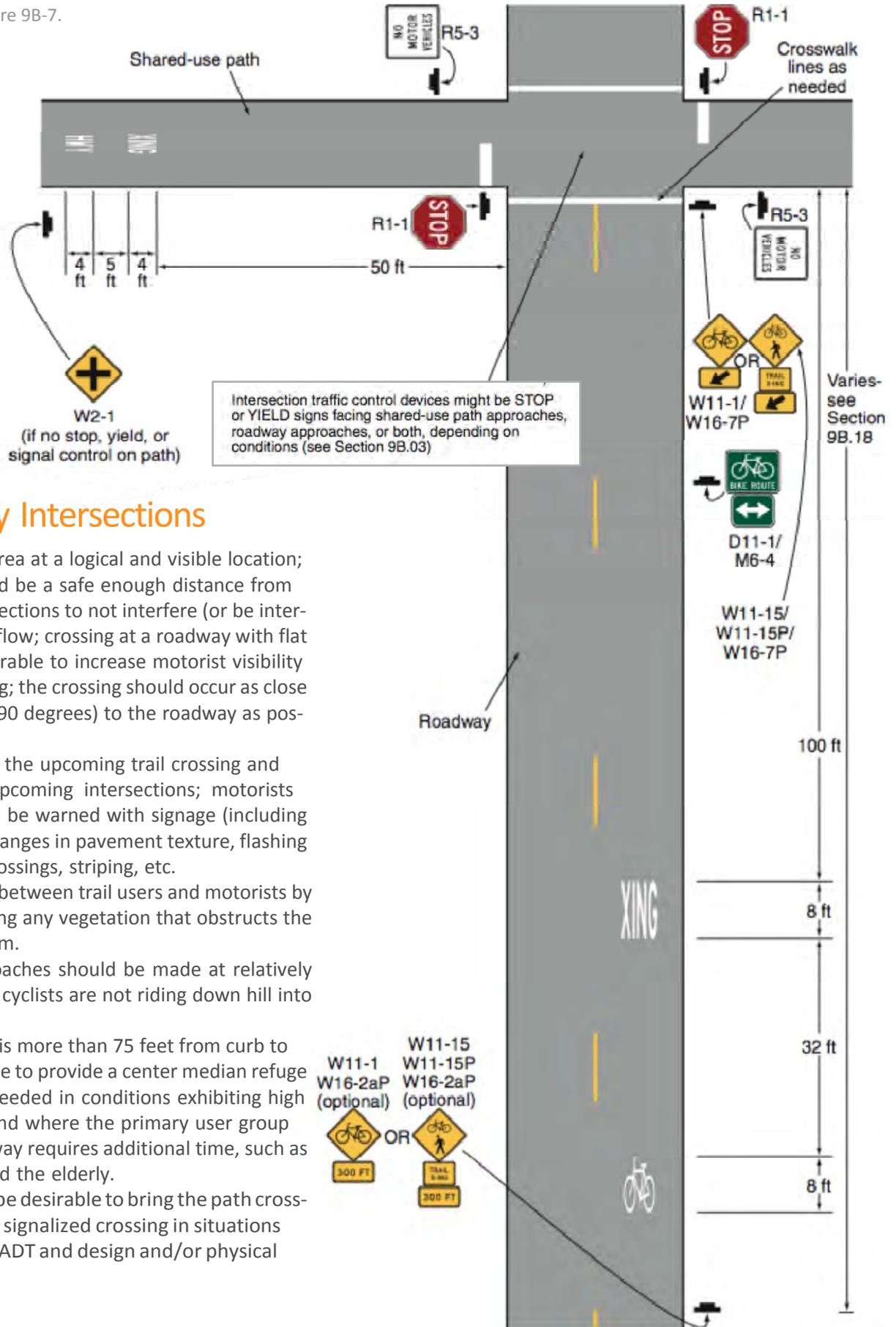
- Over and underpasses should be considered only for crossing arterials with greater than 20,000 vehicle trips per day and speeds 35 - 40 mph and over.
- Underpasses work best with favorable topography when they are open and accessible, and exhibit a sense of safety.
- Underpasses should have a daytime illuminance minimum of 10 fc achievable through artificial and/or natural light provided through an open gap to sky between the two sets of highway lanes, and a night time level of 4 foot-candle.
- Typically utilize existing overhead roadway bridges adjacent to streams or culverts under the roadway that are large enough to accommodate trail users
- Vertical clearance of the underpass is ideally at least 10'; minimum clearance is 8'.
- Width of the underpass is ideally at least 12'; minimum width is 10'.
- Proper drainage must be established to avoid pooling of stormwater, however, some underpasses can be designed to flood periodically (after significant rainfall, for instance). See image below, at top right, as an example).



Curb-cut used for drainage.



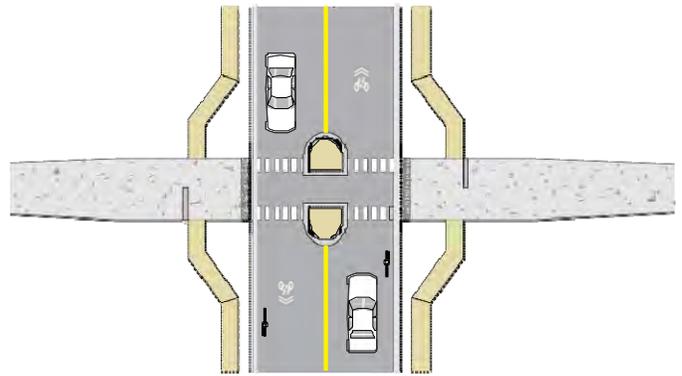
The diagram on this page is from the 2009 Manual for Urban Traffic Control Devices (MUTCD), page 803, Figure 9B-7.



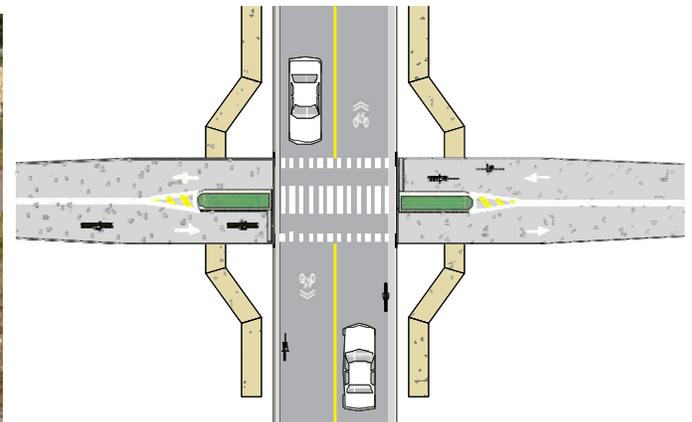
## Trail-Roadway Intersections

- Site the crossing area at a logical and visible location; the crossing should be a safe enough distance from neighboring intersections to not interfere (or be interfered) with traffic flow; crossing at a roadway with flat topography is desirable to increase motorist visibility of the path crossing; the crossing should occur as close to perpendicular (90 degrees) to the roadway as possible.
- Warn motorists of the upcoming trail crossing and trail users of the upcoming intersections; motorists and trail users can be warned with signage (including trail stop signs), changes in pavement texture, flashing beacons, raised crossings, striping, etc.
- Maintain visibility between trail users and motorists by clearing or trimming any vegetation that obstructs the view between them.
- Intersection approaches should be made at relatively flat grades so that cyclists are not riding down hill into intersections.
- If the intersection is more than 75 feet from curb to curb, it is preferable to provide a center median refuge area; a refuge is needed in conditions exhibiting high volumes/speeds and where the primary user group crossing the roadway requires additional time, such as school children and the elderly.
- If possible, it may be desirable to bring the path crossing up to a nearby signalized crossing in situations with high speeds/ADT and design and/or physical constraints.

## Trail-Roadway Intersections (Continued)



Median Refuge  
Shared Use Path with Sidewalks



Mid-block Crossing  
Shared Use Path with Sidewalks and Medians

## Trail-Roadway Intersections (Signalized)



- Signalized crossings may be necessary on trails with significant usage when intersecting with demanding roadways, but the Manual for Uniform Traffic Control Devices (MUTCD) warrants must be met for the installation of a signalized crossing. Consult the MUTCD or NCDOT for signal, sign and light placement.

- The Federal Highway Administration (FHWA) issued an interim approval for the optional use of rectangular rapid flashing beacons (RRFBs, shown at left) as warning beacons supplementing pedestrian crossing or school crossing warning signs at crossings across uncontrolled approaches. An analysis by the Center for Education and Research in Safety found them to have much higher levels of effectiveness in making drivers yield at crosswalks than the standard over-head and side-mount round flashing beacons.

## Trail Amenities

**Benches:** There are a wide variety of benches to choose from in terms of style and materials. The illustrated bench is a custom design that reflects the industrial feel of the warehouse district it is found in. Material selection should be based on the desired design theme as well as cost.

- Due to a wide range of users, all benches should have a back rest.
- A bench should normally be 16 - 20" above ground with sturdy handrails on either side.
- The seating depth should be 18-20" and the length should vary between 60 - 90".
- Provide wheelchair access alongside benches, at least a 30-by-48-inch area for adequate maneuvering. If benches are next to each other (either side by side or face to face), allow 4 feet between them.



**Other Seating:** Other more informal seating opportunities may exist along a trail or near a parking area where other furniture like a picnic table may be appropriate.

- This type of furniture can be triangulated with cooking facilities, and a trash receptacle.
- Wheelchair access spacing recommendations, as noted in the preceding section on 'benches,' also applies to other seating.



**Trash Receptacles:** Trash receptacles should be constructed of a suitable material to withstand the harsh elements of the outdoor environment. Adequate trash receptacles will combat littering and preserve the natural environment for all trail users.

- Trash receptacles should be placed along the trail and at all trailheads.
- Trash receptacles should ensure that litter is contained securely preventing contamination or spillage into the surrounding environment.





### Public Art on Trails

Explore opportunities to include public art within the overall design of the trail system. Local artists can be commissioned to provide art for the trail system, making it uniquely distinct. Many trail art installations are functional as well as aesthetic, as they may provide places to sit and play on. According to American Trails,

“Art is one of the best ways to strengthen the connection between people and trails. Across America and elsewhere, artists are employing a remarkably wide range of creative strategies to support all phases of trail activities, from design and development to stewardship and interpretation. In particular, art can be an effective tool for telling a trail’s story compellingly and memorably.”

Example art programs for trails can be found at:  
[www.americantrails.org/resources/art/ArtfulWays.html](http://www.americantrails.org/resources/art/ArtfulWays.html)



### Trail Heads

Major access points should be established near commercial developments and transportation nodes, making them highly accessible to the surrounding communities. Minor trailheads should be simple pedestrian and bicycle entrances at locally known spots, such as parks and residential developments.

A minor trailhead could include facilities such as parking, drinking fountains, benches, a bicycle rack, trash receptacles, and an information kiosk and/or signage. Major trailheads could include all of the above plus additional facilities, such as rest rooms, shelters, picnic areas, a fitness course, an emergency telephone, and a larger parking area.

Partnerships could also be sought with owners of existing parking lots near trails. Benefits are three fold: Business benefit from trail-user patronage; trail owners benefit from not having to buy more land and construct a parking facility; and the environment benefits from less development in the watershed.



A major trail head with bike racks, air compressor (for bicycle tires), water fountain, rest rooms, phone and benches.



A water fountain and pet-water fountain.



A major trail head at the Capital Crescent Trail in Maryland, featuring concessions and bicycle, canoe, and kayak rentals.



## Trail Lighting

Lighting for multi-use trails should be considered on a case-by-case basis in areas where 24-hour activity is expected (such as college campuses or downtown areas), with full consideration of the maintenance commitment lighting requires. In general, lighting is not appropriate for off-road trails where there is little to no development.

- A licensed or qualified lighting expert should be consulted before making any lighting design decisions. Doing so can reduce up-front fixed costs as well as long-term energy costs.
- Use full cut-off, energy-efficient lighting that is IDA Approved Dark Sky Friendly to avoid excess light pollution and save costs (See [www.darksky.org](http://www.darksky.org) for more info)
- If a main trail corridor is unlit and closes at dark, extended hours for commuters should be considered, particularly during winter months when trips to and from work are often made before sunrise and after dusk. See the American Tobacco Trail in Durham, NC, as an example, which is unlit and remains open to commuters until 10 PM.
- Consider lighting at the following locations:
  - Entrances and exits of bridges
  - Public gathering areas along the greenway
  - Trail access points
- Only use lighting along a trail if:
  - Night usage is desired or permitted
  - It is acceptable to residents living along or near the trail
  - The area is not a wildlife area

## Roadway Lighting

Proper lighting in terms of quality, placement, and sufficiency can greatly enhance a nighttime urban experience as well as create a safe environment for motorists and pedestrians. Two-thirds of all pedestrian fatalities occur during low-light conditions (AASHTO, 2004: Guide for the Planning, Design, and Operation of Pedestrian Facilities). Attention should be paid to crossings so that there is sufficient ambience for motorists to see pedestrians. To be most effective, lighting should be consistently and adequately spaced.

In commercial or downtown areas and other areas of high pedestrian volumes, lower level, pedestrian-scale lighting with emphasis on crossings and intersections may be employed to generate a desired ambience. Roadway street lights can range from 20-40 feet in height while pedestrian-scale lighting is typically 10-15 feet. It is important to note that every effort should be made to address and prevent light pollution. Also known as photo pollution, light pollution is 'excess or obtrusive light created by humans'.

- Ensure pedestrian walkways and crossways are sufficiently lit.
- Consider adding pedestrian-level lighting in areas of higher pedestrian volumes, downtown, and at key intersections.
- Install lighting on both sides of streets in commercial districts.
- Use uniform lighting levels
- As also noted above, use full cut-off, energy-efficient lighting that is IDA Approved Dark Sky Friendly to avoid excess light pollution and save costs (See [www.darksky.org](http://www.darksky.org) for more info)



## Crime Prevention Through Environmental Design (CPTED)

CPTED is the proper design and effective use of the built environment which may lead to a reduction in the fear and incidence of crime, and an improvement of the quality of life. CPTED is realized for trail design in many ways, some of which are described below and at right.

**Natural Surveillance:** For trails and greenways, natural surveillance occurs through increased numbers of trail users, creating an environment where behavior on the trail is monitored by trail users themselves. This type of surveillance can, of course, be supplemented with a volunteer-based trail patrol group, park service staff, or the local police (often on bicycle, horseback, and electric cart respectively).

**Emergency Call Boxes:** Callboxes can be installed at various locations on trails so that trail users can contact the police in case of an emergency. Often, these are voice call boxes using a mobile phone service, and solar-powered so no wiring need be extended to the middle of a remote location.

**Lighting in Select Areas:** Most trails operate as linear parks, officially closing at dusk. Certain high-use areas of trails are sometimes kept open after dark to serve the needs of trail commuters who use the trail after dark. For sections of the trail open after dark, lighting can serve as a tool of CPTED.

**911 Trail Address Locations:** There are several key factors involved in properly developing a 911 trail address system:

- Awareness: Ensure trail users understand 911 address marking system and how to use it
- Visibility: 911 Address Marking should be easy to see and understand but NOT interfere or overwhelm natural ambience of trail environment
- Cooperation: Critical to have cooperation among: Trail System Management, 911 Call Center, and Emergency Services
- Integration: 911 Trail Addresses MUST be properly and promptly integrated into 911 Emergency System – Addresses are useless if not incorporated into system

Model Case Study Community:

Cedar Valley Trails 911 Signs Project

Black Hawk County, Iowa

Improving Multi-Use Recreational Trail Safety

through a Coordinated 911 Sign Project

[www.americantrails.org/awards/NTS06awards/TECH06.html](http://www.americantrails.org/awards/NTS06awards/TECH06.html)



## Signage and Wayfinding

A comprehensive system of signage ensures that information is provided regarding the safe and appropriate use of all trails, both on-road and off-road. The greenway 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 is divided into several categories:

- Network signs
- Directional/wayfinding signs
- Regulatory signs and warning signs
- Educational/Interpretive signs

Trail signage should conform to the (2001) Manual on Uniform Traffic Control Devices and the American Association of State Highway Transportation Official Guide for the Development of Bicycle Facilities. Trail signage should also be coordinated with county as well as citywide networks.

### Network Signs

The Greenville County Trail Network Logo should be used to aid in reinforcing the trail's identity. Additionally, local trail logos should compliment the greenway network signage.

- Network signage should be simple, direct, and easy to identify.
- As skilled graphic designers should be consulted when generating the design for the trail logo.
- Be consistent with the logo throughout the trail network by using it as a stand alone sign, on other signage, or incorporating it into trail furnishings, such as benches or waste receptacles.

### Directional/Wayfinding Signs

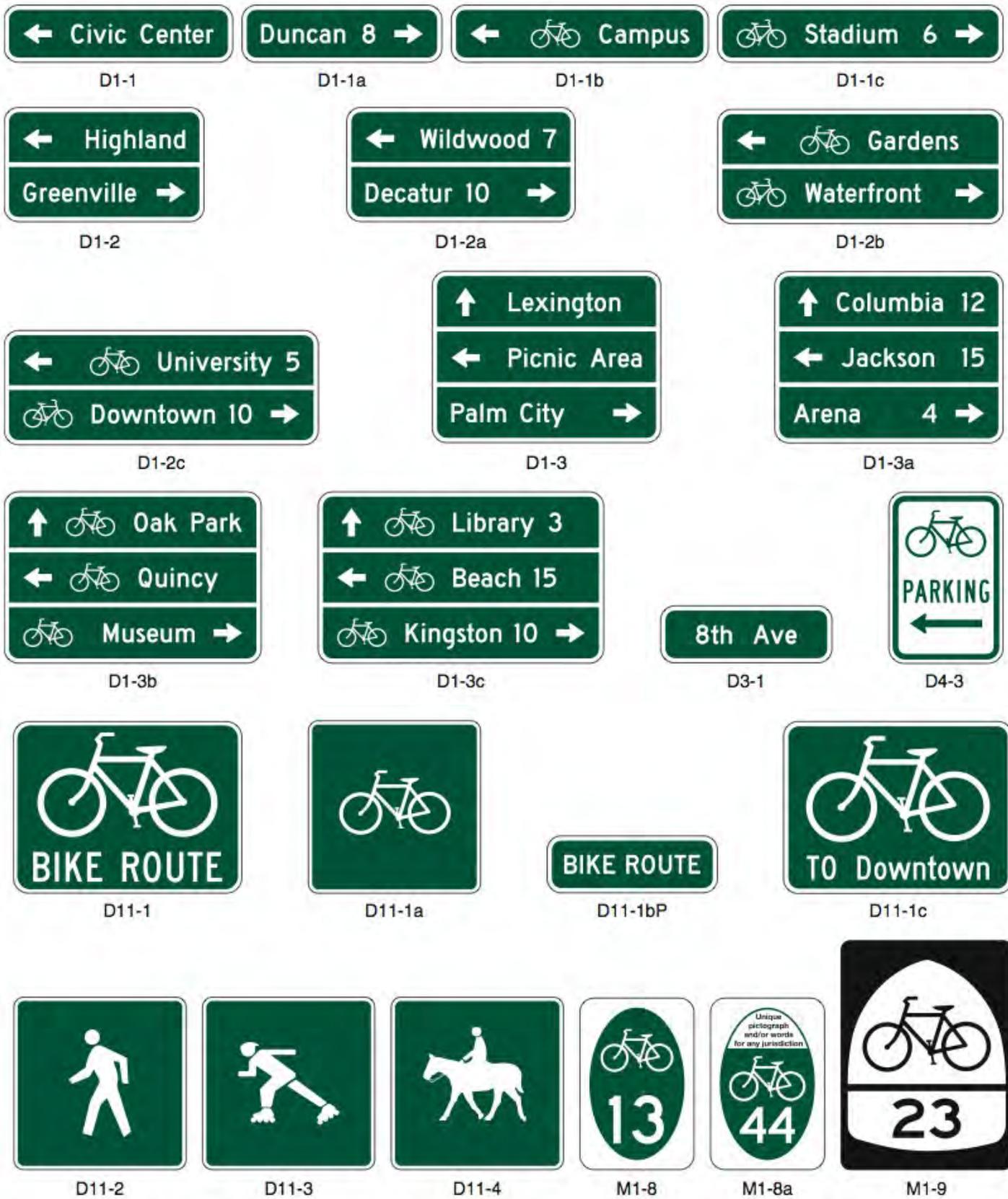
The purpose of the directional sign is to direct trail users and motorists to the location of trail heads, provide incremental distances along the trail, as well as illustrate overall maps of the trail network.

- Kiosks are a great facility for directional signage by providing a wealth of information at once, including trail opportunities, regional maps, or local/seasonal events occurring along the greenway.
- Locate informative signs and overall trail maps at trail access points to help users entering the trail determine their next destination.
- Locate directional signs at intervals along the trail to help users identify their locations or orient their position.
- Locate mile markers 3-feet from the edge of the trail and approximately one mile intervals beginning at the northern and southern ends of the trail network.



Various examples of wayfinding/directional signage for the trail include kiosks, regional maps, or bollard mile markers.

Examples of bicycle-related directional Signs (from the 2009 MUTCD)



### Regulatory/Warning Signs

Located throughout the trail system, these signs inform trail users of rules and regulations along the trail, hours of operation, upcoming street and trail crossings and other potential hazards such as trail width changes.

- Post trail rules and regulations as well as hours of operation at trail heads or in kiosks.
- Locate warning signs appropriately ahead of the specific hazards to which they refer, such as road crossings, steep terrain, trail narrowing, and stop signs.
- All signage should conform to the Manual on Uniform Traffic Control Devices (MUTCD).

### Examples of bicycle-related regulatory signs (from the 2009 MUTCD)



Examples of bicycle-related warning signs (from the 2009 MUTCD)



\* A fluorescent yellow-green background color may be used for this sign or plaque. The background color of the plaque should match the color of the warning sign that it supplements.

**Educational/Interpretive Signage**

Educational signage provides trail users with information about the greenway, native flora and fauna, history and culture, and significance of elements along the trail.

- There is a wide variety of interpretive signage styles and the amount/type of information they provide.
- Consider the character of the trail and surrounding elements when designing educational signage.
- A skilled graphic designer should be used for sign design.
- Locate interpretive signage 3-feet from the edge of the trail.



Educational signage provides opportunities for gathering and learning about local environment.



## Rectangular Rapid Flash Beacon (RRFB)

Also known as “Light Emitting Diode (LED) Rapid-Flash System”, “Stutter Flash” or “LED Beacons”, RRFBs are user-actuated amber LEDs that supplement warning signs at unsignalized intersections or mid-block crosswalks. They can be activated by pedestrians manually by a push button or passively by a pedestrian detection system. RRFBs use an irregular flash pattern that is similar to emergency flashers on police vehicles and may be installed on either two-lane or multi-lane roadways.



Activated, solar-powered, roadside RRRB at a mid-block crosswalk.

An official FHWA-sponsored experimental implementation and evaluation conducted in St. Petersburg, Florida found that RRFBs at pedestrian crosswalks are dramatically more effective at increasing driver yielding rates to pedestrians than traditional overhead beacons.

### RRFB Guidelines:

- Currently, state and federal approval is required for use.
- Flashers should only flash during the times when crossings occur). This can be done with a time clock, pedestrian push button to activate the flasher, or through automatic pedestrian detection devices.
- RRFBs can also use use automated passive (e.g., video or infrared) pedestrian detection, and should be unlit when not activated.
- RRFBs typically receive power by standalone solar panel units, but may also be wired to a traditional power source.
- Warning flashers can be mounted over the road or along the side of the road, and when used should be used in conjunction with advance warning signs

The MUTCD gave interim approval to RRFBs for optional use in limited circumstances in July 2008. The interim approval allows for usage as a warning beacon to supplement standard pedestrian crossing warning signs and markings at either a pedestrian or school crossing; where the crosswalk approach is not controlled by a yield sign, stop sign, or traffic-control signal; or at a crosswalk at a roundabout.

The MUTCD interim approval memo also contains other provisions for the implementation of the device and should be reviewed. For more details, see the see 2009 MUTCD, page 523, Section 4L.03

## High Intensity Activated Crosswalk (HAWK)

The FHWA’s Office of Safety Research recently completed a report on the High Intensity Activated Crosswalk (HAWK)— also known as the Pedestrian Hybrid Signal in the Manual on Uniform Traffic Control Devices (MUTCD). The HAWK is a pedestrian activated beacon located on the roadside and on mast arms over major approaches to an intersection. The HAWK signal head consists of two red lenses over a single yellow lens. It displays a red indication to drivers when activated, which creates a gap for pedestrians to use to cross a major roadway. The HAWK is not illuminated until it is activated by a pedestrian, triggering the warning flashing yellow lens on the major street. From the evaluation that considered data for 21 HAWK sites and 102 unsignalized intersections, the following changes in crashes were found after the HAWK was installed: a 29 percent reduction in total crashes, a 15 percent reduction in severe crashes, and a 69 percent reduction in pedestrian crashes. The HAWK is now an MUTCD approved device, so a request for experimentation is not necessary. For more details, visit this website: <http://mutcd.fhwa.dot.gov/htm/2009/part4/part4f.htm> (Source: FHWA Office of Safety, Pedestrian Forum, Fall 2010)



Above: HAWK signal.



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## B. Bicycle Program Toolbox

### *Overview*

Meeting the goals of the Town of Holly Springs Bicycle Transportation Plan will require more than construction and installation of recommended bicycle facilities. It will also require the initiation and continued support of bicycle-related programs from local officials, local residents, and community organizations. This appendix outlines a program toolbox for the Town of Holly Springs to meet the needs of bicyclists that cannot be met through facility construction alone.

### *Program Recommendations and Resources*

Bicycle-related programs fall into three main categories: education, encouragement, and enforcement. The programs listed in this appendix are provided to demonstrate the variety of opportunities available for promoting bicycling and active lifestyles in Holly Springs. The Town should work closely with local volunteers and community organizations to implement events and activities, research new program ideas, and improve upon existing programs.

### *Education*

#### **Public Education and Educational dEvicEs**

Holly Springs should build on its existing programs by continuing to develop a variety of safety materials and distribute them widely throughout the community. Educational materials focus on safe behaviors, rules, and responsibilities. Information may include important bicycle laws, bulleted keys for safe bicycle travel, helmet requirements, safe motor vehicle operation around bicycles, and general facility rules and regulations. This safety information is often available for download from national pedestrian advocacy organizations, such as the Pedestrian and Bicycle Information Center website, [www.pedbikeinfo.org](http://www.pedbikeinfo.org). The Capital Area Bicycle and Pedestrian Stakeholders Group, in cooperation with other agencies, developed a Triangle Motorist Guide to Bicycle Safety Brochure. This brochure is an excellent example of an educational brochure. Information can be distributed through brochures, newsletters, newspapers, bumper stickers, and other print media that can be inserted into routine mailings. It can also be posted on municipal websites and shown on local cable access television.

Local programs such as earn-a-bike programs, bicycle commuter mentoring, and summer camps can be organized by the Town and can be utilized to distribute information using a booth to display related print media (these programs could be modeled after existing programs, such as Holly Springs' Bicycle Rodeos). Brown-bag events and clinics are also excellent means to provide education, especially for adults. Local events, such as Springfest, should be utilized to distribute information using a booth to display related print media.



### Motorist Education

Equally important as bicyclist education is motorist education. Many motorists do not recognize the simple fact that a bicycle is a vehicle by North Carolina state law. Several examples of safety materials have already been developed. As previously mentioned, the Capital Area Bicycle and Pedestrian Stakeholders Group in cooperation with other Triangle agencies, has drafted a Triangle Motorist Guide to Bicycle Safety Brochure which is available for download on the CAMPO website: [http://www.campo-nc.us/BPSG/BPSG\\_Home.htm](http://www.campo-nc.us/BPSG/BPSG_Home.htm).

The North Carolina Driver's Handbook has an entire section devoted to bicycles, bicyclists' rights and responsibilities, and how motorists should behave. Programs to promote bicycle and pedestrian safety should be included in high school driver education classes. (Resource: [http://www.ncdot.org/transit/bicycle/safety/programs\\_initiatives/share.html](http://www.ncdot.org/transit/bicycle/safety/programs_initiatives/share.html)). The Town of Cary, NC has produced a digital bicycling video that can be used as a model. Resource <http://www.townofcary.org/depts/dsdept/P&Z/bicycleplan/bicycleplanoverview.htm>.

The StreetSmart public awareness campaign in the Washington, DC region is another example of a Public Service Agency educating residents about pedestrian and bicycle safety.

Holly Springs should also build on programs that distribute safety devices throughout the community. For example, nearby Guilford County is involved in the distribution of safety materials and devices through the Helmet Promotion Program. This program is funded by NCDOT's federal safety funds, which were used to purchase bicycle helmets for distribution at local bicycle safety events in communities across the state. (Resource: [http://www.ncdot.org/transit/bicycle/safety/programs\\_initiatives/helmets\\_promotions.html](http://www.ncdot.org/transit/bicycle/safety/programs_initiatives/helmets_promotions.html))



### Internal Training

'Internal' education refers to the training of all people who are involved in the actual implementation of the Bicycle Transportation Plan. Internal training will be essential to institutionalizing bicycle issues into the everyday operations of public works, planning, and parks and recreation departments. In addition to relevant Town staff, members of the local planning commission, NCDOT Division 5 staff, CAMPO, and Wake County staff should also be included in training sessions whenever possible. This training should cover all aspects of the transportation and development process, including planning, design, development review, construction, and maintenance. This type of 'inreach' can be in the form of brown bag lunches, professional certification programs and special sessions or conferences. Even simple meetings to go over the Bicycle Plan and communicate its strategies and objectives can prove useful for staff and newly elected officials that may not have otherwise learned about the plan. Bicycle planning and design issues are complex, and state-of-the-art research and guidelines continue to evolve. Therefore, training sessions need to be updated and repeated on a regular basis.

The NCDOT Division of Bicycle and Pedestrian Transportation hosts bicycle planning and design workshops quite often in Raleigh and Charlotte. The Town of Holly Springs should send staff including engineers, planners, and transportation professionals regularly to both bicycle workshops and also pedestrian workshops to integrate a more multi-modal and Complete Streets approach.

Local law enforcement should be trained in accurate reporting of bicycle crashes involving automobiles. In many communities, police do not always adequately understand the rights of bicyclists. Proper interpretation



of individual circumstances and events is critical for proper enforcement and respect between motorists and bicyclists. Special training sessions should be instituted and occur annually for new employees within the Police Department that focus on laws relating to bicycle travel.

### **LCI training / bike Ed**

The League of American Bicyclists (LAB) has a national bicycle education program (Bike ED) that includes training to become certified League Cycling Instructors (LCI's). LCI's are trained to teach local bicycle skills training courses. Ideally, key Town staff would take LCI courses, or even become LCI instructors themselves.



### **bicycle aMBassador PrograM**

The Bicycle Ambassadors Program would be an important bicycle outreach and education component of this plan, promoting bicycle safety and awareness. Programs around the country promote safety for all road users, bicyclists, motorists, and pedestrians. Town staff and other groups may volunteer to be ambassadors as well as recruiting community members to be ambassadors. Ambassadors host and attend programs, demonstrations, and activities at events, summer camps, and schools. One very successful model program is Mayor Daley's Bicycling Ambassadors in Chicago (<http://www.bicyclingambassadors.org/>) where the group includes adult and junior ambassadors, hosts a number of educational events, and gives presentations that promote bicycling. Local bicycle shops and groups in Holly Springs should be involved.





### **bicyclE HEIMEts PrograM**

The Town of Holly Springs and other groups should form a charity program aimed to ensure young cyclists are educated and equipped to take part in bicycling. The main objective would be to increase helmet wearing among children. Strategies should start by expanding this component of Holly Springs' existing Bicycle Rodeo Program.

### **North Carolina School Crossing Guard training PrograM**

As traffic continues to increase on North Carolina's streets and highways, concern has grown over the safety of our children as they walk and bike to and from school. At the same time, health agencies, alarmed at the increase in obesity and inactivity among children, are encouraging parents and communities to get their children walking and biking to school. In response, the Division of Bicycle and Pedestrian Transportation funded a study on pedestrian issues, including school zone safety, and decided to establish a consistent training program for law enforcement officers responsible for school crossing guards. According to the office of the North Carolina Attorney General, school crossing guards may be considered traffic control officers when proper training is provided as specified in GS 20-114.1.

Resource:[http://www.ncdot.org/transit/bicycle/safety/programs\\_initiatives/crossing.html](http://www.ncdot.org/transit/bicycle/safety/programs_initiatives/crossing.html)

### **EnvironMENTal, Cultural and Historic Education/IntErPrEtation**

Educational programs and interpretative signage could be developed along greenways. Greenways provide opportunities for learning outside the classroom. Specific programs that focus on water quality and animal habitat are popular examples. Simple educational signage would offer interactive learning opportunities for people who use the trails. Brochures can be used to supplement signage with more detailed information and a map of the interpretive system.

### **IntEractivE tours**

An educational component to Holly Springs' bicycle network could be added by developing historical, cultural, and environmental themes for the facilities, particularly on the off-road trails. This idea can be adapted to create biking tours throughout the Town, using signage, to identify the events, architecture, and habitats that make Holly Springs unique. These tours should be simple to navigate and should stand alone as an amenity. However, brochures can be used to supplement signage with more detailed information and a map of the tour. Other ideas to supplement the signage could be organized "talks" or lectures by local experts.

### **bicyclE MaP Education**

The Town of Holly Springs should develop an updated bicycle map that includes new bicycle facilities and updated bicycle routes. This map is an opportunity for the Town of Holly Springs to present education and safety materials in a foldable map.

### **EvEnts**

#### **bikE RodEos / SafEty town**

The Town of Holly Springs should continue to work with local bicycle clubs, groups, and law enforcement agencies to provide bicycle safety training to area children. Bicycling rodeos, training sessions, summer camps, and other educational activities should be continued and promoted (and in the case of bicycle rodeos, continued) so that safety skills can be taught on an ongoing basis. For more information, see: <http://www.ncdot.gov/bikeped/safetyeducation/manuals/>



### Teaching

#### Basics of Bicycling Curriculum

This elementary school-level course was developed in 1990 by the North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation and the Bicycle Federation of America (now the National Center for Bicycling and Walking). More than half of the 120 school systems across North Carolina have used the program, which currently reaches approximately 60,000 fourth and fifth graders annually. This complete curriculum package includes a clearly written and easy-to-use Instructor's Guide. A video provides an overview and tips on teaching the program as well as two instructional modules for the students. The Guide offers step-by-step instructions so that interested adults of differing cycling abilities can teach the course, using outside resources where necessary to augment their own skills. (Resource: [http://www.ncdot.org/transit/bicycle/safety/programs\\_initiatives/curriculum.html](http://www.ncdot.org/transit/bicycle/safety/programs_initiatives/curriculum.html))

#### Bike Repair Video

Having a bicycle in good repair is an important part of bike safety. Yet every year, a large percentage of bike crashes are caused by mechanical problems and poor maintenance. For this reason, the NCDOT funded the production of a bicycle repair video in collaboration with the North Carolina 4-H program. The video, which can function as a stand-alone education tool, coordinates with the 4-H Cooperative Curriculum entitled Bicycle Adventures for children aged 11 to 15. Don't Get Stuck: FIX IT! Bike Repair Video. Common problems, such as a flat tire, brakes that don't work, or a missing or broken part, make a bike unrideable and unsafe. This 38-minute video is designed to stand alone or be used by an adult to help a child learn to make 10 basic bicycle repairs. All the tools, parts, and equipment needed to make the repairs are listed in each section. Information on properly fitting a helmet and sizing a bike are also included. Most importantly, the repairs that are best left to an experienced mechanic are discussed. (Resource: [http://www.ncdot.org/transit/bicycle/safety/programs\\_initiatives/video.html](http://www.ncdot.org/transit/bicycle/safety/programs_initiatives/video.html)).



### Education Resources

This section of the Pedestrian and Bicycle Information Center website provides important messages for a range of different audiences that can be part of an educational campaign or program. It also offers links for finding more information related to bicycling education: <http://www.bicyclinginfo.org/education/>

The League of American Bicyclists has been working for better cycling in America since 1880. They do this by promoting bicycling, educating cyclists and motorists, and advocating on behalf of cyclists on Capitol Hill and with state legislators across the United States. This web page has information on some of their programs: <http://www.bikeleague.org/programs/index.php>

The mission of the National Center for Bicycling and Walking (NCBW) is to help create bicycle-friendly and walkable communities across North America by encouraging and supporting the efforts of individuals, organizations, and agencies. This section of the website provides information on the workshops they offer for the general public as well as for training professionals: <http://www.bikewalk.org/workshops.php>

NCDOT Division of Bicycle and Pedestrian Transportation provides significant information related to bicycle programming. [http://www.ncdot.org/transit/bicycle/safety/safety\\_programs.html](http://www.ncdot.org/transit/bicycle/safety/safety_programs.html) . Also, they list print material that is available for download: [http://www.ncdot.org/transit/bicycle/safety/safety\\_materials.html#posters](http://www.ncdot.org/transit/bicycle/safety/safety_materials.html#posters)

Safe Communities is a project of the National Highway Traffic Safety Administration (NHTSA). Nine agencies within the U.S. Department of Transportation are working together to promote and implement a safer national transportation system by combining the best injury prevention practices into the Safe Communities approach to serve as a model throughout the nation. <http://www.nhtsa.dot.gov/safecommunities>

Safe Kids Worldwide is a global network of organizations whose mission is to prevent accidental childhood injury, a leading killer of children 14 and under. More than 450 coalitions in 15 countries bring together health and safety experts, educators, corporations, foundations, governments and volunteers to educate and protect families. Visit their website to receive information about programs, involving media events, device distribution and hands-on educational activities for kids and their families. <http://www.usa.safekids.org/>

Rules of the Road for Grandchildren: Safety Tips is an information website for grandparenting. If you are a grandparent, you can play an important role in teaching your grandchildren the “rules of the road.” AARP. <http://www.aarp.org/contacts/grandparents/rulesroad.html>

Eat Smart, Move More is a statewide movement that promotes increased opportunities for healthy eating and physical activity wherever people live, learn, earn, play and pray. <http://www.eatsmartmovemorenc.com/>

American Trails supports local, regional, and long-distance greenways and trails, whether in backcountry, rural, or urban areas. This page of the website contains studies and reports that can be referenced in educational materials related to trails and greenways: <http://www.americantrails.org/resources/>

Worldcarfree.net is a clearinghouse of information from around the world on how to revitalize towns and cities and create a sustainable future. In addition to serving the carfree movement, Worldcarfree.net offers resources for architects, planners, teachers/professors, students, decision-makers and engaged citizens: <http://www.worldcarfree.net/>



## Encouragement

### EMPLOYER PROGRAMS

To encourage bicycling and walking to work, employers can provide programs and incentives. When bicycling is encouraged, the employer benefits from improved employee health and morale along with an enhanced community perception when protecting the environment and being active in the community. Promotions could include a Bike to Work Day or a morning Pit-Stop where employees can receive free refreshments. Employers can provide educational workshops, bicycle parking options, and employee incentives. Incentives may include prize drawings, t-shirts, free tune-ups at a local bicycle shop, and bicycle maps.

The Smart Commute Challenge is a good North Carolina example. It is actively supported and encouraged in the Triangle area by Triangle Transit and CAMPO, and is an excellent means of having residents pledge to commute to work by bicycle. Prizes are available and educational information on commuting to work are available at <http://www.smartcommutechallenge.org/>.

### SHOWERS AT WORK

Some employees will not consider biking to work without the assurance that they can shower when they arrive. Showers also allow employees to exercise at lunch. In buildings with 50-100 employees, one shower should be sufficient. In buildings with 100- 250 employees, one shower for each sex should be provided. Buildings housing over 250 employees should provide at least four showers with two of them being accessible to the disabled.

### CLOTHES LOCKERS

Ideally, there should be one lockable gym locker for every long-term bicycle parking space provided. The regular bicycle commuter can store work clothes. In addition to providing a locker to each regular bicycle commuter, other lockers should be available to encourage potential new bike commuters. These facilities will also encourage lunch-time fitness activities which benefit both the employee and the employer.

### SCHOOL PROGRAMS

Many programs exist to aid communities in developing safer pedestrian facilities around schools. Programs can be adopted by parents or the schools to provide initiatives for biking. Information is available to encourage group travel, prevent bicycle-related injuries, and sponsor commuter-related events. After-school programs, summer Bike Camps, bicycle rodeos, and Family Fun Rides can be created to provide a supportive environment for children to learn how to ride a bike comfortably and safely with friends, learn how to repair and maintain a bicycle, and tour their town and its destinations.

### SAFER ROUTES TO SCHOOL

The Town of Holly Springs should seek programming and facility funding from the Safe Routes to School program, administered by the NCDOT Bicycle and Pedestrian Transportation Division. Funding is available for school workshops and action plans. The Safe Routes to School program also provides implementation and construction funding for facilities near schools.

### AWARENESS DAYS/EVENTS

A specific day of the year can be devoted to a theme to raise awareness and celebrate issues relating to that theme. A greenway and its amenities can serve as a venue for events that will put the greenway on display for the community. Major holidays, such as July 4th, and popular local events serve as excellent opportunities to distribute bicycling information. The following are examples of other national events that the Town of Holly Springs can use to improve usage of bicycle facilities:



### bIkE-to-Work dAy (tHird Friday in MAy)

Bike-to-Work Day is an annual event held on the third Friday of May across the United States that promotes the bicycle as an option for commuting to work. Leading up to Bike-to-Work Day, national, regional, and local bicycle advocacy groups encourage people to try bicycle commuting as a healthy and safe alternative to driving by providing route information and tips for new bicycle commuters. On Bike-to-Work Day, these groups often organize bicycle-related events, and in some areas, pit stops along bicycle routes with snacks.



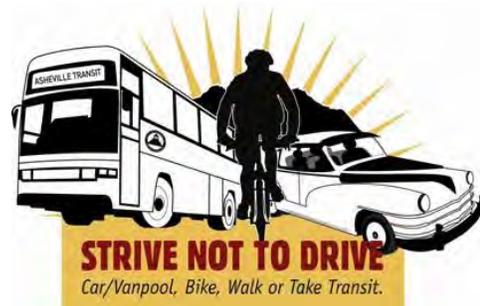
May is also National Bike Month. Events can include proclamations, marketing campaigns, commuter contests and worksite events.

### Car-frEE dAy (SEPtEMbEr 22)

Car Free Day is an international day to celebrate getting around without cars. This fall event coincides with the beginning of the school year and is the perfect way to kick-off programs that promote bicycling and raise awareness for environmental issues. Car-Free events can last for an entire week or month, featuring alternative transportation promotional activities, fitness expos, transit-use incentives, walking and jogging group activities, running and bicycling races and rides, etc.

### “StrivE Not to drivE dAy”

This event example, from the Town of Black Mountain, North Carolina, is an annual event to celebrate and promote the Town’s pedestrian achievements for the year throughout their region. Awards for pedestrian commuters, as well as booths, contests, and other events are organized through their local MPO Bicycle and Pedestrian Task Force and the Land-of-Sky Regional Council. A similar event could be held in Holly Springs to focus on bicycling issues, as the Bicycle Transportation Plan is implemented.



### nAtionAl trAils dAy

This event is held every year in June. Other events, competitions, races, and tours can be held simultaneously to promote trail use within Holly Springs. For example, in Greensboro, North Carolina, the Parks and Recreation-Trails Division sponsors events for National Trails Day, and it has become a huge event for the entire city.

### EArth dAy

Earth Day is April 22nd every year and offers an opportunity to focus on helping the environment. Efforts can be made to encourage people to help the environment by bicycling to destinations and staying out of their automobiles. This provides an excellent opportunity to educate people of all ages in Holly Springs.

### UsE fAcilitiEs to PrOMotE OtHEr CAusEs

Bicycle facilities could be used for events that promote other causes, such as health awareness. Not only does the event raise money/publicity for a specific cause, but it encourages and promotes healthy living and an active lifestyle, while raising awareness for bicycling activities. Non-profit organizations such as the American Cancer Society, American Heart Association, and the Red Cross sponsor events such as the Tour de Cure, a series of cycling events held in more than 80 cities nationwide to benefit the American Diabetes Association.

### **b**icycl**E** activiti**E**s/**P**ro**M**otion with**H**in local **O**rganizations

The Town of Holly Springs has numerous organizations that could be utilized to promote bicycling activities (e.g. the local bicycle store, Sandhills Cycling Club, local cycling groups, local schools/PTAs, neighborhood groups, homeowners associations, etc). Education, enforcement, and encouragement programs can be advertised and discussed in local organization newsletters, seminars, and meetings. Such organizations could even organize and cross-promote their own group rides, trail clean-ups, and other activities listed in this section.

### **C**ycling **C**lubs/**b**icycl**E**-**C**o**M**Muting **g**rou**P**s

Neighborhoods, local groups, or businesses could promote cycling clubs for local residents or employees to meet at a designated area and exercise on certain days before or after work (or even to work), during lunch breaks, or anytime that works for the group. This informal group could be advertised on local bulletin or information boards. These clubs could be specialized to attract different interest groups. For example, in the Durham's Research Triangle Park, several work places (Such as RTI International) have organized their own riding groups to promote cycling and active, healthy lifestyles (see example promotional poster).

### **a**rt in **t**HE **l**andscape

The inclusion of art along bikeable greenway corridors and trails would encourage use of facilities and provide a place for artwork and healthy expression to occur. Artwork could be displayed in a variety of ways and through an assortment of materials. Living artwork could be "painted" through the design and planting of various plant materials. Sculpture gardens could be arranged as an outdoor museum. Art through movement and expression could be displayed during certain hours during the day or during seasonal events. Artwork can be provided by local schools, special interest clubs and organizations, or donated in honor or memory of someone.

### **H**olly **S**prings **P**ublic **b**icycl**E** **M**ap

A bicycle map should be developed and subsequently distributed widely throughout the community, through municipal governments, schools, advocacy groups, and other organizations throughout town. Maps should be made available at parks and recreation centers, libraries, municipal buildings, the transit center, on transit buses, and at tourism information centers. The map should be updated every 3 to 5 years to reflect the bicycle and greenway improvements that will be implemented through this Plan. The map should be made available in hardcopy format and online and contain educational and safety information as well.

### **a**do**P**t-**a**-**t**rail

Local clubs and organizations provide great volunteer services for maintaining and patrolling trails. This idea could be extended to follow tour routes or specified streets/sidewalks. A sign to recognize the club or organization could be posted as an incentive to sustain high quality volunteer service. The Boy Scouts of America serve as a good model for participation in this type of program.

### **r**Ev**e**nu**E** **g**En**E**rating **P**rogra**M**s

The Town of Holly Springs should be proactive in increasing revenue from programs and events that can help fund the building, management, and maintenance of future facilities. Fees could be increased in events annually or biannually to increase revenue. Specific program and event ideas that are being used to generate revenue across the country include:

- Races/triathlons (fees and/or donations)
- Concessions
- Educational/Nature/Historic tours (fees and/or donations)
- Fund-raisers including dinners/galas
- Moonlight bike rides and walks (fees and/or donations)
- Greenway parade (fees and/or donations)
- Concerts (fees and/or donations)



- Art events along greenway (fees and/or donations)
- Events coincident with other local events such as fairs, festivals, historic/folk events, etc.
- Media events and ribbon-cuttings for new trails and bicycle facilities (donations)

#### EncouragEMent rESourceS

Safe Routes to School is a national program with \$612 million dedicated from Congress from 2005 to 2009. Local Safe Routes to School programs are sustained by parents, community leaders, and citizens to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school. Recently, the state of North Carolina has started the NC Safe Routes to School Program based off of the national program. The state has \$15 million over the next 5 years for infrastructure improvements within 2 miles of schools. This funding can also be used towards the development of school related programs to improve safety and walkability initiatives. The state requires the completion of a competitive application to apply for funding and a workshop at the school to determine what improvements are needed. <http://www.saferoutesinfo.org>



BikeIowa provides a good resource, the “Employer’s Bike to Work Guide,” providing ideas for encouraging bicycle commuting: <http://www.bikeiowa.com/asp/bike/EmployerGuide.asp>

This web page from the League of American Bicyclists has information on encouraging bicycle commuting: <http://www.bikeleague.org/resources/better/commuters.php>

The role of the Active Living Resource Center (ALRC) web site is to provide resources and tools to help make walking and bicycling part of your community’s healthy lifestyle. This page of the website has encouraging success stories from other communities: [http://www.activelivingresources.org/stories\\_directory.php](http://www.activelivingresources.org/stories_directory.php)

Bikes Belong is sponsored by the U.S. bicycle industry with the goal of putting more people on bicycles more often. From helping create safe places to ride to promoting bicycling, they carefully select projects and partnerships that have the capacity to make a difference. Their work concentrates on four main areas: federal policy and funding, national partnerships, community grants, and promoting bicycling. In addition, they operate the Bikes Belong Foundation to focus on kids and bicycle safety. <http://www.bikesbelong.org/>

## Enforcement

#### Motorist EnforcEMent

Based on crash data analysis and observed patterns of behavior, law enforcement can use targeted enforcement to focus on key issues such as motorists speeding, passing too closely to cyclists, parking in bicycle lanes, etc. These issues should be targeted and enforced consistently. The goal is for bicyclists and motorists to recognize and respect each other’s rights on the roadway.

As traffic continues to increase on North Carolina’s streets and highways, concern has grown over the safety of children as they walk or bike to and from school. At the same time, health agencies, alarmed at the increase in obesity and inactivity among children, are encouraging parents and communities to get their children walking and biking to school. In response, the Division of Bicycle and Pedestrian Transportation funded a study on school zone safety and decided to establish a consistent training program for law enforcement officers responsible for school crossing guards. According to the office of the North Carolina Attorney General, school crossing guards may be considered traffic control officers when proper training is provided as specified in GS 20-114.1.



### **bicyclist EnforcEMEnt**

Observations made by local trail and bicycle facility users can be utilized to identify any conflicts or issues that require attention (see online public comment form results). To maintain proper use of trail facilities, volunteers could be used to patrol the trails, particularly on the most popular trails and on days of heavy use. The volunteer patrol can report any suspicious or unlawful activity, as well as answer any questions a trail user may have. When users of the bicycle network witness unlawful activities, they should have a simple way of reporting the issue to police. A hot line should be created, which would compliment trail patrol programs. People could call in and talk to a live operator or to leave a voice mail message about the activity they witnessed. Accidents could also be reported to this hot line. Accident locations could then be mapped to prioritize and support necessary facility improvements.

Additionally, unsafe cycling (e.g. riding on the wrong side of the street, without lights at night, or children riding without helmets) should be addressed by local law enforcement through warnings, with an understanding that there may be a learning curve for new or inexperienced cyclists. Again, the goal is for bicyclists and motorists to recognize and respect each other's rights on the roadway.

### **PolicE on bikEs**

Having police on bikes is a significant benefit for community policing and quality of life. This idea should be coordinated with and extended to include enforcement within the college campuses. Police on bicycles should be models for other cyclists by wearing helmets and riding accordingly.





### Local Police Input

An appointed member of the Holly Springs Police Department should serve on future implementation committees if possible to understand issues in the Holly Springs area and contribute to the process. The Police Department speaks with local bicycling enthusiasts and the general public and participated in the development of this Plan.

### Enforcement Resources

The National Highway Traffic Safety Administration (NHTSA) awarded a grant to MassBike to develop a national program to educate police departments about laws relating to bicyclists. The program is intended to be taught by law enforcement officers to law enforcement officers as a stand-alone resource. The link contains downloads for presentations, videos, and other resources that are useful for police officers and everyday cyclists alike: <http://www.massbike.org/police/>

This webpage of the Pedestrian and Bicycle Information Center has a wealth of resources regarding enforcement issues, ranging from training for local law enforcement to procedures for handling violators, to enforcement example case studies: <http://www.bicyclinginfo.org/enforcement/>

### NCDOT School Crossing Guard Program

[http://www.ncdot.gov/bikeped/about/training/school\\_crossing\\_guard/](http://www.ncdot.gov/bikeped/about/training/school_crossing_guard/)

NCDOT's A Guide to North Carolina Bicycle and Pedestrian Laws. For an online resource guide on laws related to pedestrian and bicycle safety (provided by the National Highway Traffic Safety Administration), visit [www.nhtsa.dot.gov/people/injury/pedbimot/bike/resourceguide/index.html](http://www.nhtsa.dot.gov/people/injury/pedbimot/bike/resourceguide/index.html)





## Bicycle Laws of North Carolina (NCDOT, 2010)

In North Carolina, the bicycle has the legal status of a vehicle. This means that bicyclists have full rights and responsibilities on the roadway and are subject to the regulations governing the operation of a motor vehicle. North Carolina traffic laws require bicyclists to:

- Ride on the right in the same direction as other traffic
- Obey all traffic signs and signals
- Use hand signals to communicate intended movements
- Equip their bicycles with a front lamp visible from 300 feet and a rear reflector that is visible from a distance of 200 feet when riding at night.
- Wear a bicycle helmet on public roads, public paths and public rights-of-way if the bicyclist is under 16 years old
- Secure child passengers in a child seat or bicycle trailer if under 40 pounds or 40 inches

Although the law does not require adult bicyclists to wear helmets, they are strongly encouraged to do so. Some localities within the state have enacted ordinances requiring cyclists to wear helmets.

Laws pertaining to the operation of a bicycle vary from state to state. Below are three issues of bicycling that North Carolina law currently does not clarify.

- Bicycling on Interstate or fully controlled limited access highways, such as beltlines, is prohibited by policy, unless otherwise specified by action of the Board of Transportation. Currently, the only exception to the policy is the US 17 bridge over the Chowan River between Chowan and Bertie Counties.
- There is no law that requires bicyclists to ride single file, nor is there a law that gives cyclists the right to ride two or more abreast. It is important to ride responsibly and courteously, so that cars may pass safely.
- There is no law that prohibits wearing headphones when riding a bicycle; however, it is not recommended. It is important to use all your senses to ensure your safety when riding in traffic.

Retrieved on 9/17/2010, from [www.ncdot.gov/bikeped/lawspolicies/laws/](http://www.ncdot.gov/bikeped/lawspolicies/laws/)



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## C. Desk Reference for Bicycle Policies

### *Overview*

This appendix provides a reference point for local, state, and federal policies that relate to bicycle transportation. First, a draft resolution for Complete Streets is provided for consideration. Second, policy statements in the UDO were reviewed with recommended changes provided. Third, a listing of existing key state and federal policies that support bicycling and bicycle implementation is provided. For priority policy recommendations, please page 4-3.

### *Holly Springs Complete Streets Resolution*

Pages C-2 and C-3 outline a draft resolution for consideration by the Town of Holly Springs. The Town has already completed a Comprehensive Transportation Plan, Pedestrian Plan, and Bicycle Plan with a clear intention of building transportation corridors for all users. The Town may consider taking a further step by adopting a Complete Streets Resolution and may utilize the example on pages C-2 and C-3. A brief explanation of what Complete Streets are is provided in Chapter 4, and is repeated here:

“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.” By adopting a “Complete Streets” policy, the Town of Holly Springs commits to developing new roadways and reconstructing existing roadways to accommodate all users.”



## Town of Holly Springs Draft Complete Streets Resolution

RESOLUTION NO. \_\_\_\_\_

A Resolution of the Holly Springs Town Council Expressing Support for the Complete Streets Concept and Requesting that a Complete Streets Ordinance be drafted as a component of the UDO and/or Engineering Standards.

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, Holly Springs Bicycle Plan Committee members envision well-funded, functional, inter-connected community streets and walkways that support lives that are healthy, connected, and safe. Preservation of the special small-town atmosphere everyone enjoys here is important. Serving all modes of travel is important as well.

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.

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 Holly Springs Town Council that the Council requests that staff partner with community organizations and asses 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 TOWN COUNCIL ON \_\_\_\_\_, 2011.

\_\_\_\_\_  
Town Clerk

Approved as to form:

\_\_\_\_\_  
Town Attorney



## Holly Springs UDO Review

The table below and on the following pages provides the reference point, existing text related to bicycling, and recommended changes for the Holly Springs UDO.

Page	Section/Policy	Regulation/Contents	Comments & Recommendations
<b>SECTION 1: PROVISIONS OF COMMON APPLICABILITY</b>			
1.22	Sight Distance Requirements	All development shall comply with the Sight Distance Requirements at all street and driveway intersections in accordance with the regulations of the North Carolina Department of Transportation and the Sight Distance requirements of the Town of Holly Springs' Engineering Design and Construction Standards.	<i>Review the Town of Holly Springs' Engineering Design and Construction Standards: The specific sight distance requirements for bicyclists to see and be seen differ from those of motor vehicles. The height of the eye of the rider differs as well as the bike sizes. Particular concern needs to be paid to recumbent bikes due to their low profile. Refer to AASHTO Bike Guide for further details.</i>
<b>SECTION 2: GENERAL USE DISTRICT REGULATIONS – RESIDENTIAL DISTRICTS</b>			
2.08	General Regulations for Residential Districts. A. Accessory Uses, Buildings and Structures. 1. Permitted Accessory Uses, Buildings and Structures	By way of example only, some typical accessory uses, buildings and structures in Residential Districts are: garages; carports; porches; decks; awnings; canopies; mini-barns; storage sheds; patios; outdoor fireplaces; bathhouses; cabanas; children's playhouses; swings; game courts, including tennis or basketball courts; fences; parking areas; signs; swimming pools; hot tubs; radio sending and receiving antennas; satellite dish antennas; and, storage buildings	<i>Add bike parking, covered bike parking, bike lockers, and bike storage room or facility to list of accessory use examples</i>
2.08	9. Additional Regulations for Temporary Seasonal Retail Sales Uses	b. A minimum of three (3) off-street parking spaces shall be provided on-site for the temporary seasonal retail sales use, which shall not interfere with traffic movement on adjacent streets. Notwithstanding the provisions of Section 7.04 – Parking Regulations of this UDO to the contrary, such temporary off-street parking spaces shall not be required to be hardsurfaced	<i>Suggest additional wording to provide for temporary bike parking also</i>
2.09	Section 2.09 Development Options for Residential District	Intent – This Section provides developers with a variety of development options selected by the Town to design and build residential communities which encourage: ....development of pedestrian oriented communities; development of traditional style neighborhoods; development of communities that are visually and functionally connected to one another	<i>Expand wording to add encouragement of biking and bicycling connectivity to intent</i>



Page	Section/Policy	
2.09	2.09 Development Incentives for Residential Districts 2. Additional Development Requirements for Development Options in the R-30, R-20, R-15, R-10 and R-8 Districts. 2(4) Vehicular Design and Pedestrian Connectivity	The street, sidewalk, walkway and pedestrian/ bikeway systems of any overall subdivision or project shall be designed in compliance with the provisions of Section 7.09, A., 3. – Development Options, of this UDO and shall provide additional pedestrian circulation enhancements in a manner and extent appropriate to the proposed subdivision or project, including but not limited to: (a) sidewalks on both side of all local streets within the overall subdivision or project; (b) variation in street pavement texture or markings to delineate pedestrian cross-walks; (c) the provision of transit stops, bike racks, benches, shelters or other features to facilitate the convenience of pedestrian or alternative means of transportation within the overall subdivision or project; and, (d) include a sidewalk, walkway or pedestrian/bikeway system which functionally connects the various land use elements (single family, two family, multifamily, commercial or open space) of the overall subdivision or project
<b>SECTION 3: GENERAL USE DISTRICT REGULATIONS – COMMERCIAL / MIXED-USE DISTRICTS</b>		
3.02	Section 3.02 LB Local Business District	Intent – The LB Districts are established to promote a village oriented, pedestrian friendly environment for the provision of a full range of convenience goods and services, which are necessary to meet the daily needs of nearby residential neighborhoods and to promote dwelling units located in the upper stories of mixed use buildings. Permitted uses within the LB Districts are regulated in character to assure harmonious development with the nearby residential districts served and are limited in size and scale to promote pedestrian access
3.02	Section 3.02 LB Local Business District B. Development Standard	e. Walk up or Drive through with a Special Exception Use customer service windows or Automated Teller Machines (ATM's), provided that such facilities shall:.... (3) be located so as to not interfere or conflict with sidewalks, pedestrian ways, parking areas, loading areas, driveways, interior access drives, interior access driveways, perimeter landscape yards or foundation plantings
3.02	Section 3.02 LB Local Business District B. Development Standard	b. Outdoor display or sales of merchandise provided: .... (8) shall be located so as to not interfere or conflict with sidewalks, pedestrian ways by maintaining five (5) feet of sidewalk clear for pedestrian flow; and shall be located so as not interfere or conflict with any minimum required parking areas, loading areas, driveways, interior access drives, interior access driveways, perimeter landscape yards or foundation landscaping.



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
3.02	Section 3.02 LB Local Business District C. Mixed Use Option	Intent – The Mixed Use Option is established, consistent with the Vision Holly Springs Comprehensive Plan, to promote and guide integrated diverse but compatible uses into a development that is defined by unique and innovative design and pedestrian friendly features. This option is intended to be an alternative to the suburban mind-set that development be unconnected and uncoordinated, increasing reliance on individual vehicles and traffic congestion.	<i>Suggest additional wording about bicycle friendly design and connectivity</i>
3.02	Section 3.02 LB Local Business District C. Mixed Use Option	b. Building Orientation (3) Where portions of a building are located away from the sidewalk (right-of-way), such areas should be treated as courtyards (developed hardscapes utilizing decorative pavement materials) as necessary to promote pedestrian activity and patron interaction.	<i>Suggest adding wording about bicycle accessibility and bike parking</i>
3.02	Section 3.02 LB Local Business District C. Mixed Use Option	f. Open Space and Public Space (1) As a whole, open space should satisfy the following criteria: (d) Be a part of the pedestrian linkage throughout the project and adjacent land uses	<i>Suggest adding additional line item: Be part of the bicycling access and connectivity throughout the project and adjacent land uses</i>
3.02	Section 3.02 LB Local Business District C. Mixed Use Option	f. Open Space and Public Space (5) Where possible, larger public spaces should be located near the main pedestrian access to the project.	<i>Suggest amending to add bicycling access also</i>
3.03	Section 3.03 TV Town Village District	Intent - The TV District is established to promote the development of the original central village core of the Town of Holly Springs....The development standards in this district are designed to: encourage a pedestrian oriented design throughout the district; and, maintain an appropriate pedestrian scale, massing and relationship between buildings and structures within the district.	<i>Suggest adding wording about encouraging bicycle friendly design, access and connectivity</i>



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
3.03	B. Development Standard 3. Use of Minimum Yards and Bufferyards	<p>c. Minimum Side and Rear Yards – may include driveways, interior access driveways, parking areas, loading areas, walkways or other pedestrian way connections to adjoining lots, provided that the remainder of said yards shall be maintained as open space free from buildings or structures;</p> <p>d. Minimum Side and Rear Bufferyards – may include walkways or other pedestrian way connections to adjoining residential areas provided that the remainder of said yards shall otherwise be maintained as open space free from buildings or structures.</p>	<p><i>c. Suggest adding bike parking</i> <i>d. Also include bikeways and connections and bike parking</i></p>
3.03	E. Waiver of Development Standard	<p>10. Access drives or driveways are or will be sufficient in size and properly located to: ensure automotive and pedestrian safety and convenience, traffic flow as set forth in Section 7.09 – Pedestrian Circulation and Vehicular Area Design; and, control and access in case of fire or other emergency.</p>	<p><i>Suggest expanding wording to include ensuring bicyclist safety and convenience</i></p>
3.04	Section 3.04 OR Office, Research & Development Park District	<p>3. Minimum Yards and Building Setback (4) no parking areas or interior access drives are located between the front lot line and front line of the primary building.</p>	<p><i>Include wording to allow for bike parking</i></p>
3.04	Section 3.04 OR Office, Research & Development Park District	<p>4. Use of Minimum Yards and Bufferyard c. Minimum Side and Rear Yards - minimum side and rear yards may include: interior access driveways; walkways; or, pedestrian ways, connecting to adjoining lots or developments provided that the remainder of said yards shall be maintained as open space free from buildings or structures</p>	<p><i>Include wording to allow for inclusion of biking access and parking</i></p>
3.04	Section 3.04 OR Office, Research & Development Park District	<p>8. Outdoor Operations b. Walk-up or drive through customer service windows or Automated Teller Machines (ATM's), provided that such facilities shall: (3) be located so as to not interfere or conflict with sidewalks, pedestrian ways, parking areas, loading areas, driveways, interior access drives, interior access driveways, perimeter landscape yards or foundation plantings.</p>	<p><i>Add note about not conflicting with bikeways or bike parking</i></p>



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
3.05	Section 3.05 CB Community Business District	Intent - CB Districts are established to provide a location for high volume and high intensity commercial uses.... Developments within the CB District shall be coordinated to facilitate vehicular and pedestrian access from nearby residential districts.	<i>Add bicycling access from nearby residential districts</i>
3.05	Section 3.05 CB Community Business District	3. Use of Minimum Yards and Bufferyard c. Minimum Side and Rear Yards - minimum side and rear yards may include: interior access driveways; walkways; or, pedestrian ways, connecting to adjoining lots or developments provided that the remainder of said yards shall be maintained as open space free from buildings or structures	<i>Include wording to allow for inclusion of biking access and parking</i>
3.05	Section 3.05 CB Community Business District	a. Outdoor seating for restaurants: (7) shall be located so as to not interfere or conflict with sidewalks, pedestrian ways, required parking areas, required loading areas, driveways, interior access drives, interior access driveways, perimeter landscape yards or foundation landscaping.	<i>Add note about not conflicting with bikeways or bike parking</i>
3.05	Section 3.05 CB Community Business District	c. Outdoor Display or Sales of Merchandise: (8) shall be located so as to not interfere or conflict with sidewalks, pedestrian ways by maintaining five (5) feet of sidewalk clear for pedestrian flow; shall be located so as not interfere or conflict with any minimum required main parking areas, loading areas, driveways, interior access drives, interior access driveways, perimeter landscape yards or foundation landscaping.	<i>Add note about not conflicting with bikeways or bike parking</i>
3.05	Section 3.05 CB Community Business District	7. Outdoor Operations f. Walk-up or drive through customer service windows or Automated Teller Machines (ATM's), provided that such facilities shall be located so as to not interfere or conflict with sidewalks, pedestrian ways, parking areas, loading areas, driveways, interior access drives, interior access driveways, perimeter landscape yards or foundation plantings	<i>Add note about not conflicting with bikeways or bike parking</i>



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
3.05	Section 3.05 CB Community Business District	3. Development Standards (3) Where portions of a building are located away from the sidewalk (right-of-way), such areas should be treated as courtyards (developed hardscapes utilizing decorative pavement materials) as necessary to promote pedestrian activity and patron interaction.	<i>Suggest adding wording about bicycle accessibility and bike parking</i>
3.05	Section 3.05 CB Community Business District	c. Building Setbacks and Separation (c) There shall be no interior setbacks and separation requirements. All internal non-residential buildings are encouraged to be located within ten (10) feet of street rights-of-way to enhance the walkability of the development. Buildings located large distances from roads and pedestrian trails are strongly discouraged.	<i>Suggest adding wording about bikability</i>
3.05	Section 3.05 CB Community Business District	f. Open Space and Public Space (1) As a whole, open space should satisfy the following criteria d) Be a part of the pedestrian linkage throughout the project and adjacent land uses	<i>Suggest expanding wording to include bikability and bike access and connections</i>
3.05	Section 3.05 CB Community Business District	f. Open Space and Public Space (4) Encouraged to be located adjacent to the retail component of the project that can be converted for joint use with outdoor dining and pedestrian access. However, when used in conjunction with an outdoor dining area, the area shall be designed in such a manner that pedestrian access is not being impeded or hindered. The minimum dimension for clear pedestrian access should be at least six (6) feet	<i>Suggest including bicycling access in the description. Note that where bikes and pedestrians share two-way facilities, generally the recommended minimum width is 10 feet (per AASHTO)</i>
3.06	Section 3.06 GB General Business District	Intent – GB Districts are established to provide a location for those retail sales and service functions whose operations are typically characterized by: outdoor display or sales of merchandise; major repair of motor vehicles; commercial amusement and recreational activities; or, activities or operations conducted in structures which are not completely enclosed. ...	<i>Suggest adding wording about bicycling access</i>
3.06	Section 3.06 GB General Business District 2. Minimum Yards and Building Setback	(4) no parking areas or interior access drives are located between the front lot line and front line of the primary building	<i>Suggest adding exception for bicycle parking</i>



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
3.06	Section 3.06 GB General Business District B. Development Standards d. Minimum Yards for Out Lots	(2) documentary assurances are provided on the final plat or by other legally binding instrument which binds the adjoining lots to be developed in compliance with the special provisions of this subSection allowing such minimum yards to be used for parking areas, loading areas, interior drives or interior access drives subject to the provision of such additional foundation landscaping area or additional interior parking area landscaping	<i>Suggest adding specific wording about bicycle parking</i>
3.06	Section 3.06 GB General Business District B. Development Standard 3. Use of Minimum Yards and Bufferyards	c. Minimum Side and Rear Yards - minimum side and rear yards may include: interior access driveways; walkways; or, pedestrian ways, connecting to adjoining lots or developments provided that the remainder of said yards shall be maintained as open space free from buildings or structures;	<i>Include wording to allow for inclusion of biking access and parking</i>
3.06	Section 3.06 GB General Business District B. Development Standard b. Outdoor Display or Sales of Merchandise	(3) shall be designed and located so as to provide for the safe and efficient maneuvering of motor vehicles and pedestrians and shall maintain five (5) feet of sidewalk clear for pedestrian flow on or around sidewalks, pedestrian ways; required parking areas, loading areas, driveways, interior access drives, interior access driveways;	<i>Include bikeways in the description. Note that where bikes and pedestrians share two-way facilities, generally the recommended minimum width is 10 feet (per AASHTO)</i>
3.06	Section 3.06 GB General Business District B. Development Standard 7. Outdoor Operations – shall be permitted subject to the following regulation	e. Walk-up or drive through customer service windows or Automated Teller Machines (ATM's), provided that such facilities shall be located so as to not interfere or conflict with sidewalks, pedestrian ways, parking areas, loading areas, driveways, interior access drives, interior access driveways, perimeter landscape yards or foundation plantings	<i>Add note about not conflicting with bikeways or bike parking</i>
3.07	3.07 General Regulations for Commercial / Mixed Use District 3. Additional Development Standards for Accessory Uses, Buildings or Structures in any Commercial / Mixed Use District	g. Drive through facilities - shall be so designed that: (1) drive through lanes do not conflict with the safe and efficient flow of traffic into and out of required parking spaces or loading spaces;	<i>Add note about not conflicting with bikeways or bike parking</i>



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
3.07	3.07 General Regulations for Commercial / Mixed Use District  6. Additional Regulations for Temporary Seasonal Retail Sales Uses and Temporary Retail Sales Uses	Any temporary seasonal retail sales use, structure or building shall also comply with the following regulations c. The location of the temporary seasonal retail sales use and its required amount of parking spaces shall not interfere with any required parking spaces or safe and efficient flow of vehicular and pedestrian traffic around the parking area for the permanent primary use of the site;	<i>Add note about not conflicting with bikeways or bike parking</i>
3.07	3.07 General Regulations for Commercial / Mixed Use District  E. Zoning Violations in Commercial / Mixed Use District	2. Failure to comply with district development standards, including but not limited to landscaping, paving of parking areas, minimum parking space requirements, trash dumpster enclosure, fencing or screening requirements	<i>Suggest adding specific wording about bicycle parking</i>
3.08	Section 3.08 Architectural and Site Design Requirements A. General Architectural and Site Design Requirement	7. Open Space. In order to encourage pedestrian friendly shopping facilities and human scale office, retail and other business establishments, regardless of the size of the project, all projects located in the LB, CB or GB districts shall include open space site design features such as plazas, courtyards, or other public gathering spaces, in an amount not less than the greater of two-hundred (200) square feet or one-half (0.5) percent of the project area	<i>Suggest adding wording about bicycle friendly design</i>
<b>SECTION 4: GENERAL USE DISTRICT REGULATIONS – INDUSTRIAL DISTRICTS</b>			
4.04	Section 4.04 General Regulations for Industrial District  3. Additional Development Standards for Accessory Uses, Buildings or Structures in any Industrial District.	f. Drive through facilities - shall be so designed that: (1) drive through lanes do not conflict with the safe and efficient flow of traffic into and out of required parking spaces or loading spaces;	<i>Add note about not conflicting with the safe and efficient use of biking parking also</i>
4.05	Section 4.05 Architectural and Site Design Requirements. B. Gateway Corridor Architectural and Site Design Requirements	9. Open Space. In order to encourage pedestrian friendly and human scale office, retail and other business establishments, regardless of the size of the project, all projects shall include open space site design features such as plazas, courtyards, walking trails, or other gathering spaces, in an amount not less than the greater of two-hundred (200) square feet or one-half (0.5) percent of the project area.	<i>Note also the need to encourage bicycling-friendly retail and other business establishments. Include bike parking and bikeways and connections.</i>



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
<b>SECTION 5: PLANNED UNIT DEVELOPMENT (PUD) DISTRICT</b>			
5.01	Section 5 Planned Unit Development District 5.01 Purpose and Intent	The Planned Unit Development (PUD) District is designed to: encourage the master planning of development for larger tracts of land and to coordinate such development so as to manage the impacts of the development on the provision of Town services and infrastructure;.....	<i>Suggesting adding wording about encouraging efficient routes, short cuts and connectivity for bicycle users</i>
5-4	C. Review Procedures and Recommendation by the Planning Board	In its determination of the appropriateness of the proposed PUD and whether to recommend approval or disapproval of the PUD District zoning map change and PUD Master Plan to the Board of Commissioners, the Planning Board shall be guided by the extent to which the proposal:  (3) Development of common open space and recreational areas (passive or active) accessible to the residents or users of the PUD by way of sidewalks, footpaths, walkways or bikeways;	<i>Suggest adding sidepaths, and shared use paths</i>
<b>SECTION 7: SPECIAL REGULATIONS</b>			
7.01	Section 7.01 Landscaping Regulations E. Foundation Landscaping in Multifamily Districts, Commercial/ Mixed Use Districts and Industrial Districts	2. Foundation landscaping areas as described above shall be subject to the following requirements: a. Location – Foundation landscaping areas shall be located along or adjacent to each applicable front, side or rear of a building, provided, however, where a portion of the front, side or rear of a building is devoted to pedestrian ingress/egress, vehicular ingress/ egress, loading or drop-off zones,.....	<i>Add bike parking to the list of uses that may be found to the front/side/rear of building</i>
7.01-9	Section 7.01 Landscaping Regulations F. Interior Parking Area Landscaping in Multifamily Districts, Commercial/ Mixed Use Districts and Industrial District	d. when landscape strips extend for more than ten (10) parking spaces, such landscape strips shall be provided with a crosswise walkway to facilitate pedestrian and shopping cart movement	<i>Expand list to include provision for bike movement through landscape strips also</i>
7.01-17	7.1 Landscape Regulations I. Fence, Wall or Berm	A fence, wall or berm shall be designed to not interfere with any walkway or pedestrian/bikeway system serving the site.	<i>Note also that fence should not interfere with sight distance (for both drivers and bicyclists ability to see and be seen)</i>



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
7.02	Section 7.02 Lighting Standard	Intent: t – The Lighting Standards contained in this Section are intended to provide for the erection, design, or placement of outdoor light fixtures which: provide for illumination levels on individual lots which are adequate for the safe and efficient movement of individuals or vehicles to and from a lot and within a lot (i.e., areas that are dangerous if unlit, such as stairs, intersections or changes in grade)	<i>Add lighting provisions for bicyclists on bikeways as well as for bike parking areas</i>
7.02-2	Section 7.02 Lighting Standard A. General Requirements Table 7.02 – A: Lighting Standards	(2) Non-cutoff outdoor light fixtures shall be limited to walkways, outdoor seating areas or other areas approved for such fixtures as part of an Architectural and Site Design Review approval	<i>Add non-cutoff lighting provisions for bikeways and bike parking areas</i>
7.02-5	Section 7.02 Lighting Standard A. General Requirements	15. Lighting Plans – The following information, at a minimum, shall be provided for all lighting plans: a. A site plan which includes the outline of buildings, structures and other improvements (e.g., parking areas, loading areas, interior access drives, etc.) on the lot	<i>Suggest showing an outline of the bike parking area on the site plan also</i>
7.02-7	Section 7.02 Lighting Standard C. Exempt Lights	2. Public Lighting – All outdoor light fixtures originating from public areas and ways, including but not limited to parks, rights-of-way, public art or other public facilities, that are installed for the benefit of the public health, safety and welfare	<i>Include also bikeways, connections, and bike parking</i>
7.03	7.03 Sign Regulations	Intent: These Sign Regulations are intended to .....eliminate potential hazards to motorists and pedestrians resulting from signs;	<i>Add bicyclists to the list also</i>
7.03	7.03 Sign Regulations B. Sign Zones	2. Incidental Sign Zone An incidental sign zone shall be the area...located at each critical turning point along an interior access drive when required to safely direct vehicular traffic (e.g., to direct vehicular traffic to a: drive through facility; a customer or employee parking area; or, a delivery or loading area)	<i>Suggest adding another example also: to direct bicyclists to bike parking areas</i>



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
7.03	7.03 Sign Regulations F. Signs in the LB District When Along a Residential Gateway and the TV District	(3) Minimum Height Above Grade for a Projecting Sign. The bottom edge of a projecting sign shall not be less than eight (8) feet above grade over a walkway or sidewalk, or fifteen (15) feet above grade over a driveway or public right-of-way.	<i>Bicyclists standing on pedals when riding need 100 inches of vertical clear distance (per AASHTO Bike Guide). Recommend revising projecting sign height to not less than 8.5 feet above grade over a walkway/sidewalk.</i>
7.07-8	7.07 Street Design and Right-of-Way Reservation C. Sidewalks	2. Walkway or Pedestrian / Bike Path Alternative. Under appropriate circumstances or when approved for use as part of a development plan approval, an alternative walkway or pedestrian / bike path may be proposed in addition to sidewalks. Walkways or pedestrian / bike paths shall be a minimum of eight (8) feet in width to a maximum of eighteen (18) feet in width and may be located in easements reserved for such use outside of the street right-of-way.  3. Walkways or other pedestrian / bike paths may be constructed of concrete, asphalt or other approved material. The proposed materials and standards for construction to be used shall be included as part of the request for such walkways or other pedestrian / bike paths. The walkways or other pedestrian / bike paths shall be installed in compliance with the approved materials and standards.	<i>Suggest using terms sidepath and shared use paths to describe bikeways also (per AASHTO). Shared use paths are recommended to be a minimum of 10 feet in width (per AASHTO) and should only be reduced to 8 feet in unusual circumstances.</i>  <i>Bike surfaces: It is unclear what additional surface materials are approved but generally soft surfaces such as woodchips and gravel are considered unsuitable/not-desirable for bicycling while they may be suitable for pedestrian use.</i>
7.09-1	7.09 Pedestrian Circulation and Vehicular Area Design	The development of private walkways or pedestrian/bikeway systems is required for all new developments and additions to existing developments.	<i>Suggest additional wording about seeking and adding connections to adjacent properties and close-by bikeways also.</i>
7.09-1	A. Single Family Residential Districts	Subdivisions shall be design to: 3. include a sidewalk, walkway or pedestrian/bikeway system which functionally connects the various required open space elements of the subdivision with residential areas in the subdivision;  Development Incentives: Any single family subdivision, two family subdivision, multifamily project or commercial use developed pursuant to development incentives provisions of Section 2.09 – Development Incentives for Residential Districts, shall include a walkway or pedestrian/bikeway system	<i>Wording could be expanded to about adding connections to adjacent properties and close-by bikeways also.</i>



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
7.09-2	B. Multifamily Districts, Commercial / Mixed Use Districts and Industrial Districts	<p>1. Walkways or Pedestrian/Bikeway System Design. Any multifamily project, integrated center, business park, industrial park or single use site shall include a walkway or pedestrian/bikeway system complying with the following requirements as part of the site design:</p> <p>b. a private walkway or pedestrian/ bikeway system shall provide a direct linkage to any planned or existing town greenway which abuts or is adjacent to the multifamily project, integrated center, business park, industrial park or single use site.</p> <p>2. Vehicular Area Design. The site design for each multifamily project, integrated center, business park, industrial park or single use site shall, to the maximum extent practical, include an off-street parking area design which:</p> <p>f. includes a sidewalk, walkway or pedestrian/ bikeway system which functionally connects the various required open space elements of the project with residential areas within, abutting or adjacent to the project;</p> <p>j. provides a widened area as a visitor drop-off zone near the building entrance or a walkway or pedestrian/ bikeway which provides a direct connection to the building entrances; and,</p>	<p><i>Suggest expanding wording about linkage to include shortages and establishing connectivity that facilitate bike routes (connections need not necessarily be to other greenway to prove useful to bicyclists).</i></p> <p><i>Suggest expanding the Vehicular Area Design to include easy access to bike parking area.</i></p>



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
7.10-4 – 7.10-5	7.9 Open Space Regulations  A. Types of Open Space	Open space is encouraged to provided recreational opportunities ranging from tot lots to large community parks  7. b Greenbelt – All greenbelts may, in areas within a greenbelt which are located more than twenty (20) feet from a perimeter of the project, include a sidewalk, footpath, walkway or combined pedestrian / bikeway system;  8. Greenways, walkways or pedestrian / bike path alternatives may be credited against the requirements of this UDO, provided that such greenways, walkways or pedestrian / bike path alternatives are: a. a part of the Town's greenway plan; b. dedicated to public use; and, c. located in an easement measuring at least twenty (20) feet in width.	<i>Consider not having a requirement for a 20 foot easement.</i>
	B. Access to Open Space	Any open space regulated by this Section and required to be provided by other applicable regulations of this UDO...shall be designed and located so as to be accessible to all residents, owners and users within the project, and their guests, by way of sidewalk, footpath, walkway or combined pedestrian / bikeway.  Any access to and use of a greenbelt which is in excess of twenty (20) feet in width, including but not limited to a sidewalk, footpath, walkway or combined pedestrian / bikeway, shall be subject to the specific approval in connection with the approval of a project, provided that the first twenty (20) feet of any greenbelt abutting the perimeter of a project shall be maintained as a vegetative landscape buffer.	<i>Same comment as above.</i>
<b>SECTION 9: ADMINISTRATION AND DECISION MAKING BODIES</b>			
9.10	Section 9.10 Special Exception Use A. Uses Permitted by Special Exception Use Approval 2. Findings of Fact for a Special Exception Use	e. Access drives or driveways are or will be sufficient in size and properly located to: ensure automotive and pedestrian safety and convenience, traffic flow as set forth in Section 7.09 – Pedestrian Circulation and Vehicular Area Design; and, control and access in case of fire or other emergency	<i>Suggest adding bicyclists</i>



Page	Section/Policy	Regulation/Contents	Comments & Recommendations
9.10	Section 9.10 Special Exception Use A. Uses Permitted by Special Exception Use Approval 2. Findings of Fact for a Special Exception Use	f. Off-street parking areas, off-street loading areas, trash enclosures, trash pick-up and removal, and other service areas are located so as to be safe, convenient, allow for access in case of emergency, and to minimize economic, glare, odor, and other impacts on adjoining properties and properties in the general neighborhood	<i>Suggest to specifically list bike parking also</i>
11	Section 11 Definitions. 11.01 Interpretation of Terms or Words	11.02 Definitions	<i>Add definitions for bicycle, bicyclist, bikeway, bike parking, bike storage, greenway, side path and shared-use path. Bikeway definition should include the full range of bicycling facilities including sidepaths and shared use paths. Include the range of types of bicycles (tandems, tricycles, recumbent, tagalongs, etc.) Suggest adding definition for electric bicycles also as they are expected to be an increasing part of the bicycling mix in the future.</i>

### Holly Springs Engineering Department Standard Specifications

The table below and on the following pages provides the reference point, existing text related to bicycling, and recommended changes for the engineering department standards.

Page	Specifications/ Recommendations	Contents	Comments
SECTION 3.02: STREETS DESIGN			
3-15	I. Sidewalks	Where sidewalks and/or greenways intersect any section of curb and gutter, a wheelchair ramp shall be installed.	<i>Suggest referencing ADA. Ease of use by bicyclists should be considered in the selection of the location</i>
3-16	K. Pavement Marking and Signage	All roadways shall be marked and signed in accordance with the latest revisions of the MUTCD unless otherwise approved by the Director of Engineering.  The pavement markings along thoroughfares or boulevards shall be installed such that the outside lanes are 13 feet in width to accommodate bicycle traffic unless otherwise approved by the Director of Engineering.	<i>AASHTO Bike Guide recommends 14 foot wide outside lane where bikes and motor vehicles are to share the same travel lane</i>
SECTION 3.08: TRAFFIC CALMING DEVICES			
3-27	Rumble Strip	A rumble strip may not vary more than 1 inch in height from the pavement elevation of the adjacent travelway. All rumble strips must be located outside any public right of way, unless otherwise approved by the Director of Engineering and the Public Safety Director.	<i>Note that the use of rumble strips is considered undesirable by many bicyclists. When used, suggest providing gaps to allow crossing by bicyclists: recommended gaps 12 feet min. length at 40-60 feet intervals Rumble strips: recommended clear distance from edge of paved shoulder: 4 feet</i>



3-27	Raised Pavement Markers	<p>Raised pavement markers may be used to create an irregular surface to draw the attention of motorists and to alert them of potential hazards or conflicts.</p> <p>The markers must be made of a flexible and durable solid material designed to support vehicular traffic. The placement of markers may be staggered in a manner as approved by the Engineering Department.</p> <p>All raised pavement markers shall have a maximum height of 1 inch above the pavement surface. The minimum size of the marker shall be 4" x 4". The markers must be located outside any public right of way. All raised pavement markers shall have cube-corner microprism reflectors visible from either direction of travel.</p>	<i>See rumble strip comments</i>
<b>SECTION 3.12: GREENWAY SPECIFICATIONS</b>			
3-29	Greenway locations and alignments shall be as directed and approved by the Director of Parks and Recreation.	<p>Greenway trails are required the following guidelines shall be followed:</p> <ul style="list-style-type: none"> <li>• Maximum cross slope grade shall be 2 %.</li> <li>• Maximum grade shall be 8%, unless approved by the Director of Parks and Recreation.</li> <li>• Positive drainage shall be established.</li> <li>• At all drainage crossings a Professional Engineer shall provide properly sized drainage pipe with supporting calculations.</li> <li>• Bridge crossings may be required in some locations.</li> <li>• When the greenway intersects with a roadway, a 10' wide, 6" thick concrete pad will be required extending from the back of curb to the right of way line, or 18', whichever is less. There shall be a handicap curb...</li> <li>• Where the greenway trail intersects roadway in which sidewalk is on opposite side of road a handicap ramp will be required on sidewalk side of street to allow travel onto sidewalk from greenway.</li> <li>• Greenways shall be located and constructed so as to prevent damage from Floodwaters</li> <li>• The minimum material must be 2" of approved asphalt base material and 1" I-2.</li> <li>• Documentation of required permits, approvals, etc. shall be provided for greenways prior to construction drawing approval of the project on which the greenway is required.</li> <li>• Greenways shall be subject to the same construction inspections, performance, and warranty requirements as roadway infrastructures.</li> </ul>	<i>The minimum material must be 2" of approved asphalt base material and 1" I-2: additional pavement depth may be needed if maintenance vehicles are allowed to travel on trails</i>



## *United States Department of Transportation Bicycle and Pedestrian Policy*

A United States Department of Transportation (US DOT) policy statement regarding the integration of bicycling and walking into transportation infrastructure recommends that, “bicycling and walking facilities will be incorporated into all transportation projects” unless exceptional circumstances exist. The Policy Statement was drafted by the U.S. Department of Transportation in response to Section 1202 (b) of the Transportation Equity Act for the 21st Century (TEA-21) with the input and assistance of public agencies, professional associations and advocacy groups. USDOT hopes that public agencies, professional associations, advocacy groups, and others adopt this approach as a way of committing themselves to integrating bicycling and walking into the transportation mainstream. The full statement reads as follows, with some minor adjustments for applicability in Butner:

1. Bicycle and pedestrian ways shall be established in new construction and reconstruction projects in all urbanized areas unless one or more of three conditions are met:

- Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the right of way or within the same transportation corridor.
- The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Excessively disproportionate is defined as exceeding twenty percent of the cost of the larger transportation project.
- Where sparsity of population or other factors indicate an absence of need. For example, on low volume, low speed residential streets, or streets with severe topographic or natural resource constraints.

2. In rural areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day. Paved shoulders have safety and operational advantages for all road users in addition to providing a place for bicyclists and pedestrians to operate. Rumble strips are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of four feet in which a bicycle may safely operate.

3. Sidewalks, shared use paths, street crossings (including over- and undercrossings), pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated and maintained so that all pedestrians, including people with disabilities, can travel safely and independently.

4. The design and development of the transportation infrastructure shall improve conditions for bicycling and walking through the following additional steps:

- Planning projects for the long-term. Transportation facilities are long-term investments that remain in place for many years. The design and construction of new facilities that meet the criteria in item 1) above should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements. For example, a bridge that is likely to remain in place for 50 years, might be built with sufficient width for safe bicycle and pedestrian use in anticipation that facilities will be available at either end of the bridge even if that is not currently the case.
- Addressing the need for bicyclists and pedestrians to cross corridors as well as travel along them. Even where bicyclists and pedestrians may not commonly use a particular travel corridor that is being improved or constructed, they will likely need to be able to cross that corridor safely and conveniently. Therefore, the design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is safe, accessible and convenient.
- Getting exceptions approved at a senior level. Exceptions for the non-inclusion of bikeways



and walkways shall be approved by a senior manager and be documented with supporting data that indicates the basis for the decision.

- Designing facilities to the best currently available standards and guidelines. The design of facilities for bicyclists and pedestrians should follow design guidelines and standards that are commonly used, such as the AASHTO Guide for the Development of Bicycle Facilities, AASHTO's A Policy on Geometric Design of Highways and Streets, and the ITE Recommended Practice "Design and Safety of Pedestrian Facilities. (Many of these guidelines are summarized in Chapter 4: Bicycle Facility Standards)

(Retrieved from <http://www.fhwa.dot.gov/environment/bikeped/design.htm> on 5/6/2008)

## *United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations (March 2010)*

### **Purpose**

The United States Department of Transportation (DOT) is providing this Policy Statement to reflect the Department's support for the development of fully integrated active transportation networks. The establishment of well-connected walking and bicycling networks is an important component for livable communities, and their design should be a part of Federal-aid project developments. Walking and bicycling foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use. Legislation and regulations exist that require inclusion of bicycle and pedestrian policies and projects into transportation plans and project development. Accordingly, transportation agencies should plan, fund, and implement improvements to their walking and bicycling networks, including linkages to transit. In addition, DOT encourages transportation agencies to go beyond the minimum requirements, and proactively provide convenient, safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities, and utilize universal design characteristics when appropriate. Transportation programs and facilities should accommodate people of all ages and abilities, including people too young to drive, people who cannot drive, and people who choose not to drive.

### **Policy Statement**

The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide — including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.

### **Authority**

This policy is based on various sections in the United States Code (U.S.C.) and the Code of Federal Regulations (CFR) in Title 23—Highways, Title 49—Transportation, and Title 42—The Public Health and Welfare. These sections, provided in the Appendix, describe how bicyclists and pedestrians of all abilities should be involved throughout the planning process, should not be adversely affected by other transportation projects, and should be able to track annual obligations and expenditures on nonmotorized transportation facilities.



## Recommended Actions

The DOT encourages States, local governments, professional associations, community organizations, public transportation agencies, and other government agencies, to adopt similar policy statements on bicycle and pedestrian accommodation as an indication of their commitment to accommodating bicyclists and pedestrians as an integral element of the transportation system. In support of this commitment, transportation agencies and local communities should go beyond minimum design standards and requirements to create safe, attractive, sustainable, accessible, and convenient bicycling and walking networks. Such actions should include:

- **Considering walking and bicycling as equals with other transportation modes:** The primary goal of a transportation system is to safely and efficiently move people and goods. Walking and bicycling are efficient transportation modes for most short trips and, where convenient intermodal systems exist, these nonmotorized trips can easily be linked with transit to significantly increase trip distance. Because of the benefits they provide, transportation agencies should give the same priority to walking and bicycling as is given to other transportation modes. Walking and bicycling should not be an afterthought in roadway design.
  - **Ensuring that there are transportation choices for people of all ages and abilities, especially children:** Pedestrian and bicycle facilities should meet accessibility requirements and provide safe, convenient, and interconnected transportation networks. For example, children should have safe and convenient options for walking or bicycling to school and parks. People who cannot or prefer not to drive should have safe and efficient transportation choices.
  - **Going beyond minimum design standards:** Transportation agencies are encouraged, when possible, to avoid designing walking and bicycling facilities to the minimum standards. For example, shared-use paths that have been designed to minimum width requirements will need retrofits as more people use them. It is more effective to plan for increased usage than to retrofit an older facility. Planning projects for the long-term should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements.
  - **Integrating bicycle and pedestrian accommodation on new, rehabilitated, and limited-access bridges:** DOT encourages bicycle and pedestrian accommodation on bridge projects including facilities on limited-access bridges with connections to streets or paths.
  - **Collecting data on walking and biking trips:** The best way to improve transportation networks for any mode is to collect and analyze trip data to optimize investments. Walking and bicycling trip data for many communities are lacking. This data gap can be overcome by establishing routine collection of nonmotorized trip information. Communities that routinely collect walking and bicycling data are able to track trends and prioritize investments to ensure the success of new facilities. These data are also valuable in linking walking and bicycling with transit.
  - **Setting mode share targets for walking and bicycling and tracking them over time:** A byproduct of improved data collection is that communities can establish targets for increasing the percentage of trips made by walking and bicycling.
- Removing snow from sidewalks and shared-use paths:** Current maintenance provisions require pedestrian facilities built with Federal funds to be maintained in the same manner as other roadway assets. State Agencies have generally established levels of service on various routes especially as related to snow and ice events.

**Improving nonmotorized facilities during maintenance projects:** Many transportation agencies spend most of their transportation funding on maintenance rather than on constructing new facilities. Transportation



agencies should find ways to make facility improvements for pedestrians and bicyclists during resurfacing and other maintenance projects.

### Conclusion

Increased commitment to and investment in bicycle facilities and walking networks can help meet goals for cleaner, healthier air; less congested roadways; and more livable, safe, cost-efficient communities. Walking and bicycling provide low-cost mobility options that place fewer demands on local roads and highways. DOT recognizes that safe and convenient walking and bicycling facilities may look different depending on the context — appropriate facilities in a rural community may be different from a dense, urban area. However, regardless of regional, climate, and population density differences, it is important that pedestrian and bicycle facilities be integrated into transportation systems. While DOT leads the effort to provide safe and convenient accommodations for pedestrians and bicyclists, success will ultimately depend on transportation agencies across the country embracing and implementing this policy.

Ray LaHood, United States Secretary of Transportation

## *North Carolina Department of Transportation Complete Streets Policy*

In 2009, NCDOT unveiled its efforts to routinely provide for all users of the roads - pedestrians, bicyclists, public transportation users, and motorists of all ages and abilities. The new document:

- Explains the scope and applicability of the policy (“all transportation facilities within a growth area of a town or city funded by or through NCDOT, and planned, designed, or constructed on state maintained facilities, must adhere to this policy”);
- Asserts the Department’s role as a partner to local communities in transportation projects;
- Addresses the need for context-sensitivity;
- Sets exceptions (where specific travelers are prohibited and where there is a lack of current or future need) and a clear process for granting them (approval by the Chief Deputy Secretary); and
- Establishes a stakeholders group, including transportation professionals and interest groups, tasked to create comprehensive planning and design guidelines in support of the policy.

Visit [www.ncdot.gov](http://www.ncdot.gov) for the full document.

## *FHWA Memorandum On Mainstreaming Bicycle and Pedestrian Projects*

(See pages C-23 through C-25)

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Environment

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**U.S. Department of  
Transportation  
Federal Highway Administration**

# Memorandum

**Subject:** ACTION: Transmittal of Guidance on Bicycle and Pedestrian Provisions of the Federal-aid Program

**Date:** February  
24, 1999

**From:** Kenneth R. Wykle  
Federal Highway Administrator

**In reply, HEPH-30  
refer to:**

**To:**  
Division Administrators  
Federal Lands Highway Division Engineers

This memorandum transmits the Federal Highway Administration's (FHWA) Guidance on the Bicycle and Pedestrian Provisions of the Federal-aid Program and reaffirms our strong commitment to improving conditions for bicycling and walking. The nonmotorized modes are an integral part of the mission of FHWA and a critical element of the local, regional, and national transportation system. Bicycle and pedestrian projects and programs are eligible for but not guaranteed funding from almost all of the major Federal-aid funding programs. We expect every transportation agency to make accommodation for bicycling and walking a routine part of their planning, design, construction, operations and maintenance activities.

The Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21) continues the call for the mainstreaming of bicycle and pedestrian projects into the planning, design, and operation of our Nation's transportation system. Under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), Federal spending on bicycle and pedestrian improvements increased from \$4 million annually to an average of \$160 million annually. Nevertheless, the level of commitment to addressing the needs of bicyclists and pedestrians varies greatly from State to State.

The attached guidance explains how bicycle and pedestrian improvements can be routinely included in federally funded transportation projects and programs. I would ask each division office to pass along this guidance to the State DOT and to meet with them to discuss ways of expediting the implementation of bicycle and pedestrian projects. With the guidance as a basis for action, States can then decide the most appropriate ways of mainstreaming the inclusion of bicycle and pedestrian projects and programs.

Bicycling and walking contribute to many of the goals for our transportation system we have at FHWA and at the State and local levels. Increasing bicycling and walking offers the potential for cleaner air, healthier people, reduced congestion, more liveable communities, and more efficient use of precious road space and resources. That is why funds in programs such as Congestion Mitigation and Air Quality Improvement, Transportation Enhancements, and the National Highway System, are eligible to be used for bicycling and



walking improvements that will encourage use of the two modes.

We also have a responsibility to improve the safety of bicycling and walking as the two modes represent more than 14 percent of the 41,000 traffic fatalities the nation endures each year. Pedestrian and bicycle safety is one of FHWA's top priorities and this is reflected in our 1999 Safety Action Plan. As the attached guidance details, TEA-21 has opened up the Hazard Elimination Program to a broader array of bicycle, pedestrian, and traffic calming projects that will improve dangerous locations. The legislation also continues funding for critical safety education and enforcement activities under the leadership of the National Highway Traffic Safety Administration. If we are successful in improving the real and perceived safety of bicyclists and pedestrians, we will also increase use.

You will see from the attached guidance that the Federal-aid Program, as amended by TEA-21, offers an extraordinary range of opportunities to improve conditions for bicycling and walking. Initiatives such as the Transportation and Community and System Preservation Pilot Program and the Access to Jobs program offer exciting new avenues to explore.

Bicycling and walking ought to be accommodated, as an element of good planning, design, and operation, in all new transportation projects unless there are substantial safety or cost reasons for not doing so. Later this year (1999), FHWA will issue design guidance language on approaches to accommodating bicycling and pedestrian travel that will, with the cooperation of AASHTO, ITE, and other interested parties, spell out ways to build bicycle and pedestrian facilities into the fabric of our transportation infrastructure from the outset. We can no longer afford to treat the two modes as an afterthought or luxury.

The TEA-21 makes a great deal possible. However, in the area of bicycling and walking in particular, we must work hard to ensure good intentions and fine policies translate quickly and directly into better conditions for bicycling and walking. While FHWA has limited ability to mandate specific outcomes, I am committed to ensuring that we provide national leadership in three critical areas.

- The FHWA will encourage the development and implementation of bicycle and pedestrian plans as part of the overall transportation planning process. Every statewide and metropolitan transportation plan should address bicycling and walking as an integral part of the overall system, either through the development of a separate bicycle and pedestrian element or by incorporating bicycling and walking provisions throughout the plan. Further, I am instructing each FHWA division office to closely monitor the progress of projects from the long-range transportation plans to the STIPs and TIPs. In the coming months, FHWA will disseminate exemplary projects, programs, and plans, and we will conduct evaluations in selected States and MPOs to determine the effectiveness of the planning process.
- The FHWA will promote the availability and use of the full range of streamlining mechanisms to increase project delivery. The tools are in place for States and local government agencies to speed up the delivery of bicycle and pedestrian projects - it makes no sense to treat installation of a bicycle rack or curb cut the same way we treat a new Interstate highway project - and our division offices must take a lead in promoting and administering these procedures.
- The FHWA will help coordinate the efforts of Federal, State, metropolitan, and other relevant agencies to improve conditions for bicycling and walking. Once again, our division offices must ensure that those involved in implementing bicycle and pedestrian projects at the State and local level are given maximum opportunity to get their job done, unimpeded by regulations and red tape from the Federal level. I am asking each of our division offices to facilitate a dialogue among each State's bicycle and pedestrian coordinator, Transportation Enhancements program manager, Recreational Trails Program administrator, and their local and FHWA counterparts to identify and remove obstacles to the implementation of bicycle and pedestrian projects and programs.



In less than a decade, bicycling and walking have gone from being described by my predecessor Tom Larson as "the forgotten modes" to becoming a serious part of our national transportation system. The growing acceptance of bicycling and walking as modes to be included as part of the transportation mainstream started with passage of ISTEA in 1991 and was given a considerable boost by the Congressionally-mandated National Bicycling and Walking Study. That study, released in 1994, challenges the U.S. Department of Transportation to double the percentage of trips made by foot and bicycle while simultaneously reducing fatalities and injuries suffered by these modes by 10 percent - and we remain committed to achieving these goals.

The impetus of ISTEA and the National Bicycling and Walking Study is clearly reinforced by the bicycle and pedestrian provisions of the TEA-21. The legislation confirms the vital role bicycling and walking must play in creating a balanced, accessible, and safe transportation system for all Americans.

### **[FHWA Guidance \(1999\)](#) - Bicycle and Pedestrian Provisions of Federal Transportation Legislation**

To provide Feedback, Suggestions, or Comments for this page contact Gabe Rousseau at [gabe.rousseau@dot.gov](mailto:gabe.rousseau@dot.gov).

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United States Department of Transportation - **Federal Highway Administration**



## *NCDOT Board of Transportation Resolution: Bicycling and Walking in North Carolina: A Critical Part of the Transportation System*

(ADOPTED BY THE BOARD OF TRANSPORTATION ON SEPTEMBER 8, 2000)

The North Carolina Board of Transportation strongly reaffirms its commitment to improving conditions for bicycling and walking, and recognizes nonmotorized modes of transportation as critical elements of the local, regional, and national transportation system.

WHEREAS, increasing bicycling and walking offers the potential for cleaner air, healthier people, reduced congestion, more liveable communities, and more efficient use of road space and resources; and

WHEREAS, crashes involving bicyclists and pedestrians represent more than 14 percent of the nation's traffic fatalities; and

WHEREAS, the Federal Highway Administration (FHWA) in its policy statement "Guidance on the Bicycle and Pedestrian Provisions of the Federal-Aid Program" urges states to include bicycle and pedestrian accommodations in its programmed highway projects; and

WHEREAS, bicycle and pedestrian projects and programs are eligible for funding from almost all of the major Federal-aid funding programs; and

WHEREAS, the Transportation Equity Act for the 21st Century (TEA-21) calls for the mainstreaming of bicycle and pedestrian projects into the planning, design and operation of our Nation's transportation system;

NOW, THEREFORE, BE IT RESOLVED, the North Carolina Board of Transportation concurs that bicycling and walking accommodations shall be a routine part of the North Carolina Department of Transportation's planning, design, construction, and operations activities and supports the Department's study and consideration of methods of improving the inclusion of these modes into the everyday operations of North Carolina's transportation system; and

BE IT FURTHER RESOLVED, North Carolina cities and towns are encouraged to make bicycling and pedestrian improvements an integral part of their transportation planning and programming.

## *NCDOT Policy on Street and Driveway Access to NC Highways*

Refer to the NCDOT policy on 'Street and Driveway Access to North Carolina Highways' for examples on how to reduce conflict points between motor vehicles and pedestrians and bicyclists. Consider access management for both future development and retrofits to existing development:

[www.ncdot.org/doh/preconstruct/altern/value/manuals/pos.pdf](http://www.ncdot.org/doh/preconstruct/altern/value/manuals/pos.pdf)



## *NCDOT Administrative Action to Include Local Adopted Greenways Plans in the NCDOT Highway Planning Process*

(ADOPTED JANUARY 1994)

In 1994 the NCDOT adopted administrative guidelines to consider greenways and greenway crossings during the highway planning process. This policy was incorporated so that critical corridors which have been adopted by localities for future greenways will not be severed by highway construction. Following are the text for the Greenway Policy and Guidelines for implementing it.

In concurrence with the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and the Board of Transportation's Bicycle Policy of 1978 (updated in 1991) and Pedestrian Policy of 1993, the North Carolina Department of Transportation recognizes the importance of incorporating local greenways plans into its planning process for the development and improvement of highways throughout North Carolina.

**NCDOT Responsibilities:** The Department will incorporate locally adopted plans for greenways into the ongoing planning processes within the Statewide Planning (thoroughfare plans) and the Planning and Environmental (project plans) Branches of the Division of Highways. This incorporation of greenway plans will be consistent throughout the department. Consideration will be given to including the greenway access as a part of the highway improvement.

Where possible, within the policies of the Department, within the guidelines set forth in provisions for greenway crossings, or other greenway elements, will be made as a part of the highway project or undertaken as an allowable local expenditure.

**Local Responsibilities:** Localities must show the same commitment to building their adopted greenway plans as they are requesting when they ask the state to commit to providing for a certain segment of that plan. It is the responsibility of each locality to notify the Department of greenway planning activity and adopted greenway plans and to update the Department with all adopted additions and changes in existing plans.

It is also the responsibility of each locality to consider the adopted transportation plan in their greenways planning and include its adopted greenways planning activities within their local transportation planning process. Localities should place in priority their greenways construction activities and justify the transportation nature of each greenway segment. When there are several planned greenway crossings of a proposed highway improvement, the locality must provide justification of each and place the list of crossings in priority order. Where crossings are planned, transportation rights of way should be designated or acquired separately to avoid jeopardizing the future transportation improvements.

## *NCDOT's Traditional Neighborhood Development Street Design Guidelines*

These guidelines are available for proposed TND developments and permits localities and developers to design certain roadways according to TND guidelines rather than the conventional subdivision street standards. The guidelines recognize that in TND developments, mixed uses are encouraged and pedestrians and bicyclists are accommodated on multi-mode/shared streets.

<http://www.ncdot.org/doh/preconstruct/altern/value/manuals/tnd.pdf>



## *Guidelines for NCDOT to Comply With Administrative Decision to Incorporate Local Greenways Into Highway Planning Process*

- Thoroughfare plans will address the existence of greenways planning activity, which has been submitted by local areas. Documentation of mutually agreed upon interface points between the thoroughfare plan and a greenway plan will be kept, and this information will become a part of project files.
- Project Planning Reports will address the existence of locally adopted greenways segment plans, which may affect the corridor being planned for a highway improvement. It is, however, the responsibility of the locality to notify the Department of the adopted greenways plans (or changes to its previous plans) through its current local transportation plan, as well as its implementation programs.
- Where local greenways plans have not been formally adopted or certain portions of the greenways plans have not been adopted, the Department may note this greenway planning activity but is not required to incorporate this information into its planning reports.
- Where the locality has included adopted greenways plans as a part of its local transportation plan and a segment (or segments) of these greenways fall within the corridor of new highway construction or a highway improvement project, the feasibility study and/or project planning report for this highway improvement will consider the effects of the proposed highway improvement upon the greenway in the same manner as it considers other planning characteristics of the project corridor, such as archeological features or land use.
- Where the locality has justified the transportation versus the leisure use importance of a greenway segment and there is no greenway alternative of equal importance nearby, the project planning report will suggest inclusion of the greenway crossing, or appropriate greenway element, as an incidental part of the highway expenditure.
- Where the locality has not justified the transportation importance of a greenway segment, the greenway crossing, or appropriate greenway element, may be included as a part of the highway improvement plan if the local government covers the cost.
- A locality may add any appropriate/acceptable greenway crossing or greenway element at their own expense to any highway improvement project as long as it meets the design standards of the NCDOT.
- The NCDOT will consider funding for greenway crossings, and other appropriate greenway elements only if the localities guarantee the construction of and/or connection with other greenway segments. This guarantee should be in the form of inclusion in the local capital improvements program or NCDOT/municipal agreement.
- If the state pays for the construction of a greenway incidental to a highway improvement and the locality either removes the connecting greenway segments from its adopted greenways plans or decides not to construct its agreed upon greenway segment, the locality will reimburse the state for the cost of the greenway incidental feature. These details will be handled through a municipal agreement.
- Locality must accept maintenance responsibilities for state-built greenways, or portions thereof. Details will be handled through a municipal agreement.



## *NCDOT Bicycle Policy*

### General

Pursuant to the Bicycle and Bikeways Act of 1974, the Board of Transportation finds that bicycling is a bonafide highway purpose subject to the same rights and responsibilities and eligible for the same considerations as other highway purposes, as elaborated below.

1. The Board of Transportation endorses the concept that bicycle transportation is an integral part of the comprehensive transportation system in North Carolina.
2. The Board of Transportation endorses the concept of providing bicycle transportation facilities within the rights-of-way of highways deemed appropriated by the Board.
3. The Board of Transportation will adopt Design Guidelines for Bicycle Facilities. These guidelines will include criteria for selecting cost-effective and safety-effective bicycle facility types and a procedure for prioritizing bicycle facility improvements.
4. Bicycle compatibility shall be a goal for state highways, except on fully controlled access highways where bicycles are prohibited, in order to provide reasonably safe bicycle use.
5. All bicycle transportation facilities approved by the Board of Transportation shall conform with the adopted “Design Guidelines for Bicycle Facilities” on state-funded projects, and also with guidelines published by the American Association of State Highway and Transportation Officials (AASHTO) on federal aid projects.

### Planning and Design

It is the policy of the Board of Transportation that bicycle facility planning be included in the state thoroughfare and project planning process.

1. The intent to include planning for bicycle facilities within new highway construction and improvement projects is to be noted in the Transportation Improvement Program.
2. During the thoroughfare planning process, bicycle usage shall be presumed to exist along certain corridors (e.g., between residential developments, schools, businesses and recreational areas). Within the project planning process, each project shall have a documented finding with regard to existing or future bicycling needs. In order to use available funds efficiently, each finding shall include measures of cost-effectiveness and safety-effectiveness of any proposed bicycle facility.
3. If bicycle usage is shown likely to be significant, and it is not prohibited, and there are positive cost-effective and safety-effective findings; then, plans for and designs of highway construction projects along new corridors, and for improvement projects along existing highways, shall include provisions for bicycle facilities (e.g., bike routes, bike lanes, bike paths, paved shoulders, wide outside lanes, bike trails) and secondary bicycle facilities (traffic control, parking, information devices, etc.).
4. Federally funded new bridges, grade separated interchanges, tunnels, and viaducts, and their improvements, shall be designed to provide safe access to bicycles, pursuant to the policies of the Federal Highway Administration.



5. Barriers to existing bicycling shall be avoided in the planning and design of highway projects.
6. Although separate bicycle facilities (e.g., bike paths, bike trails) are useful under some conditions and can have great value for exclusively recreational purposes, incorporation of on road bicycle facilities (e.g., bicycle lanes, paved shoulders) in highway projects are preferred for safety reasons over separate bicycle facilities parallel to major roadways. Secondary complementary bicycle facilities (e.g., traffic control, parking, information devices, etc.) should be designed to be within highway rights-of-way.
7. Technical assistance shall be provided in the planning and design of alternative transportation uses, including bicycling, for abandoned railroad rights-of way. This assistance would be pursuant to the National Trails act Amendment of 1983, and the resultant national Rails to Trails program, as will the Railway Revitalization Act of 1975.
8. Wherever appropriate, bicycle facilities shall be integrated into the study, planning, design, and implementation of state funded transportation projects involving air, rail, and marine transportation, and public parking facilities.
9. The development of new and improved bicycle control and information signs is encouraged for the increased safety of all highway users.
10. The development of bicycle demonstration projects which foster innovations in planning, design, construction, and maintenance is encouraged.
11. Paved shoulders shall be encouraged as appropriate along highways for the safety of all highway users, and should be designed to accommodate bicycle traffic.
12. Environmental Documents/Planning Studies for transportation projects shall evaluate the potential use of the facility by bicyclists and determine whether special bicycle facility design is appropriate.
13. Local input and advice shall be sought, to the degree practicable, during the planning stage and in advance of the final design of roadway improvements to ensure appropriate consideration of bicycling needs, if significant.
14. On highways where bicycle facilities exist, (bike paths, bike lanes, bike routes, paved shoulders, wide curb lanes, etc.), new highway improvements shall be planned and implemented to maintain the level of existing safety for bicyclists.
15. Any new or improved highway project designed and constructed within a public-use transportation corridor with private funding shall include the same bicycle facility considerations as if the project had been funded with public funds. In private transportation projects (including parking facilities), where state funding or Department approval is not involved, the same guidelines and standards for providing bicycle facilities should be encouraged.



## Construction

It is the policy of the Board of Transportation that all state and federally funded highway projects incorporating bicycle facility improvements shall be constructed in accordance with approved state and federal guidelines and standards.

1. Bicycle facilities shall be constructed, and bicycle compatibility shall be provided for, in accordance with adopted Design Guidelines for Bicycle Facilities and with guidelines of the American Association of State Highway and Transportation Officials.
2. Rumble strips (raised traffic bars), asphalt concrete dikes, reflectors, and other such surface alterations, where installed, shall be placed in a manner as not to present hazards to bicyclists where bicycle use exists or is likely to exist. Rumble strips shall not be extended across shoulder or other areas intended for bicycle travel.
3. During restriping operations, motor vehicle traffic lanes may be narrowed to allow for wider curb lanes.

## Maintenance

It is the policy of the Board of Transportation that the state highway system, including state-funded bicycle facilities, shall be maintained in a manner conducive to bicycle safety.

1. State and federally funded and built bicycle facilities within the state right-of-way are to be maintained to the same degree as the state highway system.
2. In the maintenance, repair, and resurfacing of highways, bridges, and other transportation facilities, and in the installation of utilities or other structures, nothing shall be done to diminish existing bicycle compatibility.
3. Rough road surfaces which are acceptable to motor vehicle traffic may be unsuitable for bicycle traffic, and special consideration may be necessary for highways with significant bicycle usage.
4. For any state-funded bicycle project not constructed on state right-of-way, a maintenance agreement stating that maintenance shall be the total responsibility of the local government sponsor shall be negotiated between the Department and the local government sponsor.
5. Pot-holes, edge erosion, debris, etc., are special problems for bicyclists, and their elimination should be a part of each Division's maintenance program. On identified bicycle facilities, the bike lanes and paths should be routinely swept and cleared of grass intrusion, undertaken within the discretion and capabilities of Division forces.

## Operations

It is the policy of the Board of Transportation that operations and activities on the state highway system and bicycle facilities shall be conducted in a manner conducive to bicycle safety.

1. A bicyclist has the right to travel at a speed less than that of the normal motor vehicle traffic. In exercising this right, the bicyclist shall also be responsible to drive his/her vehicle safely, with due consideration to the rights of the other motor vehicle operators and bicyclists and in compliance with the motor vehicle laws of North Carolina.
2. On a case by case basis, the paved shoulders of those portions of the state's fully controlled access highways may be studied and considered as an exception for usage by bicyclists where adjacent highways do not exist or are more dangerous for bicycling. Pursuant to federal highway policy, usage by bicyclists must receive prior approval by the Board of Transportation for each specific segment for which such usage is deemed



appropriate, and those segments shall be appropriately signed for that usage.

3. State, county, and local law enforcement agencies are encouraged to provide specific training for law enforcement personnel with regard to bicycling.

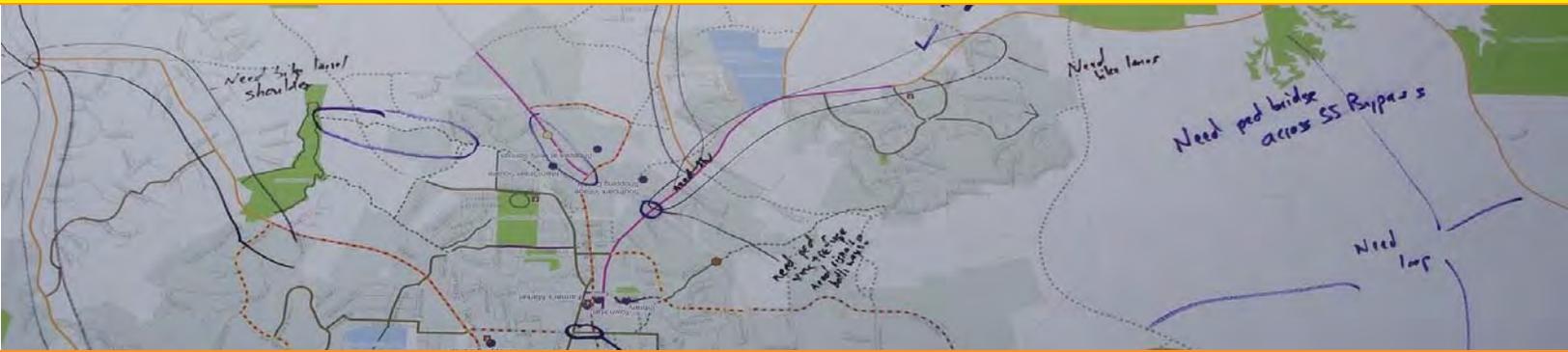
4. The use of approved safety helmets by all bicyclists is encouraged.

## Education

It is the policy of the Board of Transportation that education of both motorists and bicyclists, regarding the rights and responsibilities of bicycle riders, shall be an integral part of the Department's Bicycle Program. School systems are encouraged to conduct bicycle safety education programs as a part of and in addition to the driver's education program, to the maximum extent practicable, and in conjunction with safety efforts through the Governor's Highway Safety Program. The Division of Motor Vehicles is also urged to include bicycle safety and user information in its motor vehicle safety publications.

## Parking

It is the policy of the Board of Transportation that secure and adequate bicycle parking facilities shall be provided wherever practicable and warranted in the design and construction of all state-funded buildings, parks, and recreational facilities.



## D. Public Involvement

### *Overview*

In order to gain local knowledge and input, a public outreach component was included as an integral part of planning efforts for the Holly Springs Bicycle Transportation Plan. Public input was gathered through several different means including the following: Steering Committee meetings, a table at the Holly Springs bicycle rodeo, a booth at the Turtlefest at Bass Lake Park, and public comment forms. This offered the representatives and citizens of Holly Springs opportunity to contribute to the Plan's development.

Steering Committee meetings were held throughout the planning process with representatives from Holly Springs, NCDOT, and the community. These took place to establish visions and goals for this effort. Committee members also identified key opportunities and strategies for the bicycle system.

### *Citizen and Staff-based Steering Committee*

This committee, composed of citizens, Town staff, NCDOT staff, CAMPO staff, and other agencies met four times during the planning process. The group established visions and goals for the Plan, identified areas of need in the Holly Springs area, and reviewed the Plan. Members of the Committee marked up maps and identified bicycle problem areas and possible solutions. The goals are listed in Chapter 1 and input from the Committee is reflected throughout the recommendations of this planning document.

The Steering Committee also provided comment on the Draft Plan. These comments led to revisions made by the Consultant in the development of the Final Plan.

### *Public Workshops*

Two public input workshops were conducted during the planning process. Tremendous interest and input was received during both events. The first opportunity was during a bicycle rodeo held by Town Hall by the Police Department. Information and educational boards and maps were presented for review and comment. This initial public input session sought to gather preliminary input from citizens to assist in the development of draft recommendations for the plan. The second public workshop presented draft recommendations and solicited public comment during the Turtlefest event at Bass Lake Park. Preliminary recommendations were presented in map form at this meeting. Citizens responded to these draft recommendations by providing feedback and discussion of proposed bicycle facilities.

At both workshop sessions, public input was taken in the form of map markups, written comments, ques-



Left: two project newsletters (front of newsletter #1 and back of newsletter #2)

tion and answer sessions, and through discussions between citizens, consultant staff from Alta/Greenways and Town staff. In addition, a hardcopy public comment form was developed and distributed for hand written responses during each meeting.

### Comment Form

A comment form was developed for Holly Springs during this process and made available in both hard-copy and online form. The comment form was available online for four months. It was also distributed through local agencies and listserves. To maximize the responses to the online form, the web address was distributed at the public meeting, to local interest groups, in newsletters, and on flyers throughout the Town. Approximately 234 persons completed the comment form.

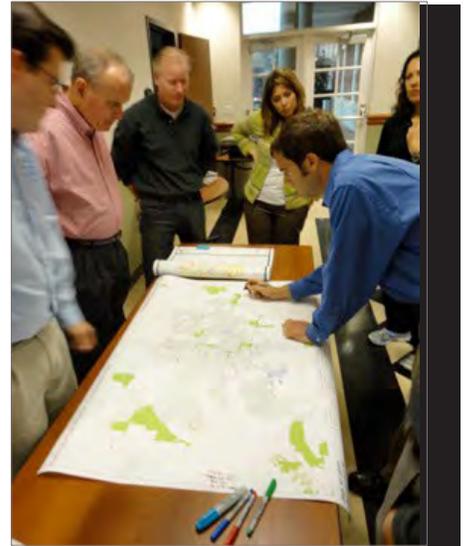
The comment form results shown on the following pages have been tabulated by Alta/Greenways to provide insight into local residents' opinions and values.



*Right and Below: The first public workshop for the bicycle plan (at Town Hall bicycle rodeo), featured public input maps, educational posters, newsletters, comment forms, and conversations among residents, town staff, and project consultants.*



*Right: The Bicycle Plan Steering Committee identifies major opportunities and constraints at the second meeting.*



*Above and right: The booth at the second workshop (Turtlefest) at Bass Lake Park, where nearly 100 people stopped to learn about the plan and provide input.*





**1. Which statement best describes your comfort level on a bicycle.**

		Response Percent	Response Count
I am comfortable bicycling on the road with automobiles in all situations, including heavy traffic.		11.2%	25
<b>I am most comfortable on off-road paths or in a clearly designated bicycle lane.</b>		<b>53.4%</b>	<b>119</b>
I don't feel comfortable sharing any roadway with cars and prefer off-road paths or very low-traffic residential roads.		35.4%	79
	Other (please specify)		10

<b>answered question</b>	<b>223</b>
<b>skipped question</b>	<b>11</b>

**2. How long have you been bicycle riding? (select one)**

		Response Percent	Response Count
Do not bicycle		12.4%	29
1-2 years		7.3%	17
2-5 years		10.3%	24
5-10 years		10.3%	24
10-20 years		12.9%	30
<b>20+ years</b>		<b>46.8%</b>	<b>109</b>
	<b>answered question</b>		<b>233</b>
	<b>skipped question</b>		<b>1</b>

**3. How frequently do you bicycle? (select one)**

		Response Percent	Response Count
never		15.0%	35
<b>few times per month</b>		<b>53.0%</b>	<b>124</b>
few times per week		29.1%	68
5+ times per week		3.0%	7
	<b>answered question</b>		<b>234</b>
	<b>skipped question</b>		<b>0</b>



**4. Do you feel, in general, bicycling for daily needs (commuting to work, errands, etc.) in Holly Springs is:**

		Response Percent	Response Count
Very Safe		1.3%	3
Somewhat Safe		15.7%	36
Neutral		14.0%	32
<b>Somewhat Dangerous</b>		<b>42.4%</b>	<b>97</b>
Very Dangerous		26.6%	61
<b>answered question</b>			<b>229</b>
<b>skipped question</b>			<b>5</b>

**5. Do you feel, in general, bicycling for recreation in Holly Springs is:**

		Response Percent	Response Count
Very Safe		3.9%	9
Somewhat Safe		22.3%	51
Neutral		21.8%	50
<b>Somewhat Dangerous</b>		<b>41.0%</b>	<b>94</b>
Very Dangerous		10.9%	25
<b>answered question</b>			<b>229</b>
<b>skipped question</b>			<b>5</b>

**6. How important to you is improving bicycling conditions in Holly Springs? (select one)**

		Response Percent	Response Count
Very important		63.1%	142
Somewhat important		29.3%	66
Not important		7.6%	17
<b>answered question</b>			<b>225</b>
<b>skipped question</b>			<b>9</b>



**7. Would you bicycle more if safety issues in Holly Springs were addressed:**

		Response Percent	Response Count
Strongly Agree		60.1%	137
Agree		22.8%	52
Neutral		11.4%	26
Disagree		3.1%	7
Strongly Disagree		2.6%	6
<b>answered question</b>			<b>228</b>
<b>skipped question</b>			<b>6</b>

**8. What bicycling destinations would you most like to get to? (choose all that apply)**

		Response Percent	Response Count
Neighbor's house		43.2%	98
Downtown		48.9%	111
Schools		34.4%	78
Grocery stores		43.2%	98
Places of work		18.9%	43
Restaurants		38.8%	88
Public Transportation		6.6%	15
Other Shopping (retail stores)		24.7%	56
Parks		79.7%	181
Entertainment		27.3%	62
<b>Trails and greenways</b>		<b>81.1%</b>	<b>184</b>
Farmers markets/community gardens		45.4%	103
I DON'T BICYCLE.		7.0%	16
Other specific location (please specify)		7.0%	16
<b>answered question</b>			<b>227</b>
<b>skipped question</b>			<b>7</b>



9. Which of the following changes would encourage you to bike more often? (choose all that apply)			
		Response Percent	Response Count
Increased enforcement on speeding		15.5%	35
Commuter-by-bike programs or incentives		11.9%	27
Bicycle racks at destination		44.2%	100
<b>Improved off-road paths and greenways</b>		<b>80.5%</b>	<b>182</b>
Showers or locker rooms at workplace		8.4%	19
Map of bicycle routes		48.7%	110
More bicycle lanes		66.8%	151
More off road bike paths or greenways		76.5%	173
More programs and events for new cyclists		16.4%	37
Safety education		11.1%	25
Lower speed limits		6.2%	14
NOTHING		5.8%	13
	Other (please specify)		6
<b>answered question</b>			<b>226</b>
<b>skipped question</b>			<b>8</b>



**10. Which of the following factors prevent you from bicycling or from bicycling more often?  
(choose all that apply)**

		Response Percent	Response Count
Lack of bicycle lanes, paved shoulders, or paths		79.5%	178
Gaps in bicycle facilities		15.6%	35
Narrow lanes		56.7%	127
Poor trail conditions		25.0%	56
Other travel modes are safer or more comfortable		22.3%	50
Crossing busy roads		51.8%	116
Hills		9.8%	22
Loose gravel or potholes		26.8%	60
Drainage grates		7.6%	17
Poor lighting (along routes/trails or at roadway crossings)		18.8%	42
Personal safety (from crime)		8.0%	18
Physical ability		5.8%	13
Travel time or distance		12.1%	27
Heavy traffic		36.6%	82
High-speed traffic		32.6%	73
Inconsiderate motorists		38.4%	86
Lack of bicycle parking		20.5%	46
Lack of showers and lockers at workplace		5.8%	13
NOTHING		4.0%	9

Other (please specify) 9



11. What do you think are the top three roadway corridors (in holly springs) most needing bicycling improvements?

INTERSECTION	NUMBER OF RESPONSES
Holly Springs	97
Avent Ferry	68
Main	63
Bass Lake	35
Sunset Lake	27
55 Bypass	19
Optimist Farm	16
Pierce-Olive	6
Downtown	6
New Hill - New Hill-Holleman	5

12. What do you think are the top three roadway intersections (in Holly Springs) most needing bicycling improvements?

ROADWAY	NUMBER OF RESPONSES
Avent Ferry & NC 55 Bypass	44
Holly Springs & Main	42
Holly Springs & Sunset Lake	27
Main & NC 55 Bypass	19
Holly Springs & Bass Lake	10
Holly Springs & Linksland	8
Sunset Lake & Optimist Farm	5
Avent Ferry & Cass Holt	4

13. What other bicycle related improvements do you consider priorities?

See end of appendix for responses



14. Should public funds be used to improve bicycle transportation options? (yes/no)			
		Response Percent	Response Count
Yes		84.5%	180
No		15.5%	33
answered question			213
skipped question			21

15. Which types of funds should be used to improve bicycle transportation options? (please check all that apply)			
		Response Percent	Response Count
Existing local taxes		70.2%	139
New local taxes		16.2%	32
State and federal grants		72.2%	143
NCDOT maintenance funds		58.1%	115
Other (please specify)		7.6%	15
answered question			198
skipped question			36

16. If you had \$100 to spend on bicycle facility improvements, how would you spend it? You can spend it on one thing or spread it around. (Be sure your total equals \$100 and do not include the "\$" sign.)

FACILITY	AVERAGE \$ AMOUNT
Greenways	\$48.67
Sidepaths	\$25.75
Bike Lanes	\$25.04



17. Which aspect of biking is most appealing to you? (choose all that apply)			
		Response Percent	Response Count
Increased health and fitness		90.8%	197
Money saved on fuel		42.9%	93
More time outdoors		82.0%	178
Faster commute		4.6%	10
Easier to find convenient parking		9.2%	20
Fewer traffic jams		10.1%	22
Reducing the amount of time spent in a car		26.3%	57
Less negative impact on the environment/preserving the environment		45.6%	99
I DO NOT BICYCLE.		5.5%	12
Other (please specify)		4.1%	9
<b>answered question</b>			<b>217</b>
<b>skipped question</b>			<b>17</b>

18. How do you feel drivers in your area typically behave around bicyclists? (Please check all that apply)			
		Response Percent	Response Count
Courteous, yield, and give bicyclists space		29.4%	62
Drive too fast		45.0%	95
Pass bicyclists too closely		59.2%	125
Tolerate bicyclists not following rules of the road		19.4%	41
Harass bicyclists		10.0%	21
Fail to yield to bicyclists crossing a street		24.2%	51
Other (please specify)		7.6%	16
<b>answered question</b>			<b>211</b>
<b>skipped question</b>			<b>23</b>



**19. How do you feel bicyclists in your area typically behave? (Please check all that apply)**

		Response Percent	Response Count
Courteous, obeying all traffic laws		55.7%	112
Cycle in the roadway the opposing direction as vehicles		12.4%	25
Fail to comply with traffic laws		27.4%	55
Ride too slowly		12.4%	25
Are young and/or inexperienced		10.4%	21
Multiple cyclists ride abreast in the same travel lane		43.8%	88
Behave rudely		7.5%	15
Don't signal turns or stops		25.9%	52
Ride on sidewalks		14.9%	30
Ride at night without lights		14.9%	30
	Other (please specify)		19
		<b>answered question</b>	<b>201</b>
		<b>skipped question</b>	<b>33</b>

**20. Where do you live?**

		Response Percent	Response Count
Holly Springs		84.6%	176
Apex		2.9%	6
Cary		1.4%	3
Fuquay-Varina		5.3%	11
Wake County		5.8%	12
	Other (please specify)		7
		<b>answered question</b>	<b>208</b>
		<b>skipped question</b>	<b>26</b>



21. What is your gender?			
		Response Percent	Response Count
Male		51.6%	111
Female		48.4%	104
answered question			215
skipped question			19

22. What is your age?			
		Response Percent	Response Count
0-9		0.0%	0
10-19		2.8%	6
20-29		6.0%	13
30-39		36.7%	79
40-49		35.8%	77
50-59		10.2%	22
60 and older		8.4%	18
answered question			215
skipped question			19



### 13. What other bicycle related improvements do you consider priorities?

Bass lake road is a fourth road corridor
driver education
shoulders
Room to bike
Just need some room to stay out of motorists way
Share the Road signs
paths
Greenways
bike lanes!!!!
Bike racks, maps of trails, greenways, and trails, bike lanes and sidepaths
providing a bicycle lane or a much wider burm. The county rds outside of Holly Springs are already popular for bicycling. If the town itself had bicycle lanes the town could become a more desirable destination/ home for young educated professionals throughout the region.
Just need bike lanes or sidewalks!!!
none
Connections with other community bicycle facilities
Bicycle and running-walking path on Avent Ferry. I would love to ride my bike with my sin to get ice cream at Harris Teeter but there is no way kids can rude on that road. Plus, I see high school students walking right next to cars every day. Let's make Holly Springs a bike friendly town!
pedestrian bridge over the Bypass
More bicycle themed events. like races, family rides and charity/fund raising rides.
bike lanes are horrible for commuters, slows traffic, narrows lanes...but more greenways for recreation use is great. Bike nuts should buy a motorcycle and drive to work, not inconvenience the rest of the commuting public...biking to RTP isn't going to happen! Get real.
Better education to drivers to look out for bicyclists will improve safety.
Just moved here so not to sure of road names yet, but would like bike lane on hwy 55 where food lion is, coming into downtown and up into walmart shopping center. Also, sunset lake rd
sidewalks/paths for kids to ride to school. very few options connect to allow kids a safe way to travel.
Parks and Greenways
Bike lanes, Bike lanes, Bike lanes. We have plenty of room to create real bike lanes and the ability to make us an inviting community for biking. Our main issue is connectivity.
While driving a car motorists illegally pass me on a double line on Piney Grove Road all the time. I enjoy biking in my subdivision but nothing would make me feel safe with the way people drive today on a public road. Driving a car is dangerous these days. I love to get the exercise but if the patrolman cannot enforce basic motorists rules how can they make biking safer??
Paths that are family friendly for biking and walking
For our children to be able to ride to schools.
none
I do not want to waste the city tax dollars on something that we already have laws for - bikers go with traffic and should obey traffic laws - this is needless and a waste of public money.
OFF ROAD PATHS, scenic, are what people want and what we need for adequate quality of life in Holly Springs. Who wants to take their 3 year old child on a busy road bike lane? I sure don't and won't.
Warning Signs



A lot more bike paths, the shoulder of the roads are very dangerous and the traffic is too busy to ride on the side of the road.
Bicycle Lanes and/or sidewalks on these roads
Wider lanes or decent sized, rideable shoulders.
Definitely a bike lane on specific roads would be excellent! I think sidewalks would be a benefit on these roads also for runners & walkers too!
wider roads, roads w/ shoulders
Shoulders on Roads and/or designated bike paths.
none
I wouldn't bicycle on main highways. I prefer trails, and would love if the sewer access trail between Holly Thorn Trace and Avent Ferry was cycle-able
With all the roads accessible for the kids to get to Womble Park
Water fountains at parks- could bike somewhere and be thirsty. Free air pumps at town facilities (in case you get tire flats).
Off Road Bike Trails would not only provide entertainment for the residents, but would bring in visitors and revenue to business owners.
off road
Wider Roads
Development of off road trails to connect parks and neighborhoods
crossing times at large intersections like above that would accommodate bicycles safely and easily
To increase cycling to local businesses it is essential to have bike racks.
Protective gear - cars with their lights on at night, reflective light bands on bikers or bikes at night
Long distance routes; education/awareness programs
Bike lanes for safety
Maintaining trails
Better maintenance of all greenways in Holly Springs, and regular street sweeping to remove debris and stones from the shoulder of the roadways, including subdivisions
Most people bike ride for recreation, not to go to a destination other than a park or similar. More greenway and off road paths would lead to a tremendous increase in bicycle use and enjoyment. Attempting to make roadways safe for cyclists will have only a small impact in getting children out cycling.
55 Bypass needs at least one pedestrian/bicycle bridge, Avent Ferry being likely best location
It seems that there is so many people in sunset oaks development and westcott... there should be a way to bike to Sunset Commons shopping area.
Bicycle Racks made available at major destinations
bicycle parking racks in parks, in town and at retail establishments
place to secure your bicycle when shopping etc...
connect all the sidewalks and add sidewalks and/or bike lanes and bike paths
specially designed bikeways thru greenways
need a bike lane along avent ferry from braxton village until it reaches downtown and then continue downtown and onto holly springs road.
Safety Lane on Avent Ferry west of Hwy 55 bypass
Repair the dangerous shoulder on Bass Lake Road. We need cycling AND walking paths all the way from Holly Springs Road to Nature's Reach subdivision.
Visibility by obstructions at corners. Enforcement of ordinances or creation to remove landscaping and other obstacles at intersections for better visibility.



Having connecting trails so you can ride from downtown to Harris Lake.
BIKE LANES!!!! With sidewalks, please!
I want to be able to ride my bike, but narrow roads won't allow for it. There's no place to go but into the ditch
More designated trails that route around Holly Springs
Education to drivers allowing safe passage of bikes
trails and designated areas through the woods ect.
greenway connecting different areas.
I have lived in other states and they have beautiful paved bike paths that we spent many family hours on however we dont do it here because they arent many and not safe. Pathways needed,paved is best and wide enough for more than one bike and lighted
there needs to be more room so the cyclists can get out of the way of cars. There are no shoulders for the cyclists or the cars and the cyclists make no attempt to make room for the cars to get by. There need to be bike lanes for them to stay in or off road paths for them to be on.
bike lanes like the only one I've seen in this area in apex on very show Apex Peakway
Pathways through woods.
some greenways without cars.
To add signage to encourage motorists to share the road
Changing sewer easement behind Braxton Village and Holly Glen into bicycle-rideable trail to downtown.
bike racks at retail/grocery stores
Education and Communication
Build safe and connected greenways Get schools to put in bike racks and promote biking to school
Need striped continuous bike facilities. Holly Springs has a very diverse population that would use bike facilities.
Shoulder widenings everywhere





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## E. Funding

### *Overview*

When considering possible funding sources for the Town of Holly Springs' bicycle projects, it is important to remember that not all construction activities will be accomplished with a single funding source. It will be necessary to consider several sources of funding, that when combined, would support full project construction. Also, as described in Chapter 4, it is likely that many bicycle facilities will be built as part of future roadway restriping, widening, and reconstruction projects in which the direct funding necessary may be minimized. This appendix outlines the most likely sources of funding for the projects at the federal, state, local government level and from the private sector.

### *State and Federal*

Federal funding is typically directed through State agencies to local governments either in the form of grants or direct appropriations. State budget shortfalls may make it extremely difficult to accurately forecast available funding for future project development. The following is a list of possible Federal and State funding sources that could be used to support construction of the many bicycle projects. Federal funding requires a 20% local match, however the recent stimulus money does not require a match. Since these funding categories are difficult to forecast, it is recommended that the Town continue to work with the Capital Area Metropolitan Planning Organization (CAMPO) on getting bicycle projects listed in the TIP (Transportation Improvement Program), as discussed below.

#### Department of Energy (DOE)

The Department of Energy's Energy Efficiency and Conservation Block Grants (EECBG) grants may be used to reduce energy use 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, this grant period has passed, more opportunities may arise. More information can be found at <http://www.eecbg.energy.gov/>

#### NC Department of Transportation and SAFETEA-LU

The most likely source of funding for the bicycle projects would come from the North Carolina Department of Transportation and the federal funding program SAFETEA-LU. Some of the sub-programs within SAFETEA-LU and within NCDOT are listed below:

- State Transportation Improvement Program (STIP): The STIP contains funding for various transportation divisions of NCDOT including: highways, aviation, enhancements, public transportation, rail, bicycle and pedestrians, and the Governor's Highway Safety Program. STIP is the largest single source of funding within SAFETEA-LU and NCDOT.



- **NCDOT Discretionary Funds:** The Statewide Discretionary Fund consists of \$10 million and is administered by the Secretary of the Department of Transportation. This fund can be used on any project at any location within the State. Primary, urban, secondary, industrial access, and spot safety projects are eligible for this funding. The Town would have to make a direct appeal to the Secretary of NCDOT to access these funds.
- **NCDOT Contingency Fund:** The Statewide Contingency Fund is a \$10 million fund administered by the Secretary of Transportation. Again, the Town would have to appeal directly to the Secretary.
- **NCDOT Enhancement Funding:** Federal Transportation Enhancement funding is administered by NCDOT and serves to strengthen the cultural, aesthetic, and environmental aspects of the State's intermodal transportation system. Transportation Enhancement (TE) funding is awarded through NCDOT. The State typically will make a Call for Projects, and each project must benefit the traveling public and help communities increase transportation choices and access, enhance the built or natural environment and create a sense of place.
- **NCDOT Bicycle and Pedestrian Project:** Funds for bicycle and pedestrian projects come from several different sources. Allocation of funds depends on the type of project/program and other criteria. Projects can include independent and incidental projects.

### **NC Department of Environment – 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.

### **Powell Bill Funds**

Annually, State street-aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. Powell Bill funds shall be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways.

### **Community Development Block Grant Funds**

Community Development Block Grant (CDBG) funds are available to local municipal or county governments for projects that 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 the Town of Holly Springs Bicycle Projects: infrastructure and community revitalization.

### **Land and Water Conservation Trust Fund**

The Land and Water Conservation Fund (LWCF) has historically been a primary funding source of the US Department of the Interior for outdoor recreation development and land acquisition by local governments



and state agencies. In North Carolina, the program is administered by the Department of Environment and Natural Resources.

### **N.C. 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% of the total cost of the project, and may contribute more than 50%. 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. [http://www.ncparks.gov/About/grants/partf\\_main.php](http://www.ncparks.gov/About/grants/partf_main.php)

### **Safe Routes to School Program (managed by NCDOT, DBPT)**

The NCDOT Safe Routes to School Program is a federally funded program that was initiated by the passing of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005, which establishes a national SRTS program to distribute funding and institutional support to implement SRTS programs in states and communities across the country. SRTS programs facilitate 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 Division of Bicycle and Pedestrian Transportation at NCDOT is charged with disseminating SRTS funding.

The state of North Carolina was allocated \$15 million in Safe Routes to School funding for fiscal years 2005 through 2009 for infrastructure or non-infrastructure projects. In 2009, more than \$3.6 million went to 22 municipalities and local agencies for infrastructure and non-infrastructure projects. All proposed projects must relate to increasing walking or biking to and from an elementary or middle school. An example of a non-infrastructure project is an education or encouragement program to improve rates of walking and biking to school. An example of an infrastructure project is construction of sidewalks around a school. Infrastructure improvements under this program must be made within 2 miles of an elementary or middle school. The state requires the completion of a competitive application to apply for funding. For more information, visit [www.ncdot.org/programs/safeRoutes/](http://www.ncdot.org/programs/safeRoutes/) or contact DBPT/NCDOT, (919) 807-0774.

## ***Local Government***

Local funding sources that would support bike facility project construction will most likely be limited but should be explored.

### **Local Area Metropolitan Planning Organization**

The Capital Area Metropolitan Planning Organization (CAMPO) manages the transportation planning process required by Federal law. The RMPO plans for the area's surface transportation needs, including highways, transit, bicycle, and pedestrian facilities. There are two subcommittees of the MPO: the Technical Advisory Committee and the Technical Coordinating Committee. An important part of the transportation planning process is to identify transportation needs and to explore feasible alternatives to meet those needs. Plans and programs are often conducted in partnership with the NC Department of Transportation to identify needs and projects to enhance Holly Springs' transportation infrastructure.

It is suggested that the Town work closely with the MPO on getting these projects listed on the TIP since this may be the primary source of funding for the project. Typically, projects on this list require a 20% local match.



## Town of Holly Springs Capital Improvement programming and Reserve Funds

The Town of Holly Springs may have funding available to support some elements of construction or repair. It will be important to meet with Town Council representatives and the Town Manager to judge the availability of this funding.

### Other local funding options

- Bonds/Loans
- Taxes
- Impact fees
- Exactions
- Tax increment financing
- Partnerships

## *Private Sector*

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 is asking the North Carolina General Assembly to support issuance of a bond for \$200 million a year for five years to preserve and protect its special land and water resources. Land for Tomorrow will 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; historic downtowns and neighborhoods; and more, will be there to enhance the quality of life for generations to come. Website: <http://www.landfortomorrow.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 assure 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/](http://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 nonprofit organizations and institutions throughout the state. Based in Raleigh, North Carolina, 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. Web site: <http://nccommunityfoundation.org/>

### **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. More information is available at [www.zsr.org](http://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. Visit the web site for more information: [www.bankofamerica.com/foundation](http://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. Web site: <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 visit The Conservation Fund’s website at: [www.conservationfund.org](http://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.

Web site: [www.americanhiking.org/alliance/fund.html](http://www.americanhiking.org/alliance/fund.html).

### 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. One hundred percent of its member companies' dues go directly to diverse, local community groups across the nation - groups like Southern Utah Wilderness Alliance, Alliance for the Wild Rockies, The Greater Yellowstone Coalition, the South Yuba River Citizens' League, RESTORE: The North Woods and the Sinkyone Wilderness Council (a Native American-owned/operated wilderness park). For these groups, who seek to protect the last great wild lands and waterways from resource extraction and commercial development, the Alliance's grants are substantial in size (about \$35,000 each), and have often made the difference between success and defeat. Since its inception in 1989, The Conservation Alliance has contributed \$4,775,059 to grassroots environmental groups across the nation, and its member companies are proud of the results: To date the groups funded have saved over 34 million acres of wild lands and 14 dams have been either prevented or removed-all through grassroots community efforts.

The Conservation Alliance is a unique funding source for grassroots environmental groups. It is the only environmental grant maker whose funds come from a potent yet largely untapped constituency for protection of ecosystems - the non-motorized outdoor recreation industry and its customers. This industry has great incentive to protect the places in which people use the clothing, hiking boots, tents and backpacks it sells. The industry is also uniquely positioned to educate outdoor enthusiasts about threats to wild places, and engage them to take action. Finally, when it comes to decision-makers - especially those in the Forest Service, National Park Service, and Bureau of Land Management, this industry has clout - an important tool that small advocacy groups can wield.

The Conservation Alliance Funding Criteria: The Project should be focused primarily on direct citizen action to protect and enhance our natural resources for recreation. We're not looking 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.

Web site: [www.conservationalliance.com/index.m](http://www.conservationalliance.com/index.m).

E-mail: [john@conservationalliance.com](mailto:john@conservationalliance.com).

### National Fish and Wildlife Foundation (NFWF)

The National Fish and Wildlife Foundation (NFWF) is a private, nonprofit, 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. Website: <http://www.nfwf.org/AM/Template.cfm?Section=Grants> where additional grant programs are described.

### **The Trust for Public Land**

Land conservation is central to the mission of the Trust for Public Land (TPL). Founded in 1972, the Trust for Public Land is the only national nonprofit 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. TPL's legal and real estate specialists work with landowners, government agencies, and community groups to:

- Create urban parks, gardens, greenways, and riverways
- Build livable communities by setting aside open space in the path of growth
- Conserve land for watershed protection, scenic beauty, and close-to home recreation safeguard the character of communities by preserving historic landmarks and landscapes.

The following are TPL's Conservation Services:

- Conservation Vision: TPL helps agencies and communities define conservation priorities, identify lands to be protected, and plan networks of conserved land that meet public need.
- Conservation Finance: TPL helps agencies and communities identify and raise funds for conservation from federal, state, local, and philanthropic sources.
- Conservation Transactions: TPL helps structure, negotiate, and complete land transactions that create parks, playgrounds, and protected natural areas.
- Research and Education: TPL acquires and shares knowledge of conservation issues and techniques to improve the practice of conservation and promote its public benefits.

Since 1972, TPL has worked with willing landowners, community groups, and national, state, and local agencies to complete more than 3,000 land conservation projects in 46 states, protecting more than 2 million acres. Since 1994, TPL has helped states and communities craft and pass over 330 ballot measures, generating almost \$25 billion in new conservation-related funding. For more information, visit [www.tpl.org/](http://www.tpl.org/).

### **BlueCross BlueShield 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 nonprofit, provide an audit.



BlueCross BlueShield of NC Foundation  
P.O Box 2291  
Durham, NC 27702  
919-765-7347  
<http://www.bcbsncfoundation.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.

### Volunteer Work

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