2010

Bicycle Transportation Plan *for* Southern Pines

the Mid-South Resort Internationally Recognized for Excellence

Town of Southern Pines

Division of Bicycle & Pedestrian Transportation

Town of Southern Pines, North Carolina
North Carolina Department of Transportation
Division of Bicycle and Pedestrian Transportation

Officially Adopted on October 12, 2010

Acknowledgements

Citizen Involvement

A special thanks to the 350+ local residents who participated in this planning process through comment forms, public workshops, and meetings.

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Henderson Consulting

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This page: www.pedbikeimages.org / Tiffany Robinson

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Vision Statements

The Town of Southern Pines will become a bicycle-friendly community by developing a combination of infrastructure, education programs, and policies that support and encourage bicycling.

Programs will include bicycle education, encouragement for healthy and active living, and enforcement initiatives that focus on proper behavior by both bicyclists and motorists so that everyone is safe and understands the needs and desires of eachother.

The cornerstones for the future system of on-road and off-road bicycle facilities shall be safety and connectivity: Bicyclists will be able to safely ride throughout town, to parks, schools, and downtown destinations, as well as nearby communities and regional bicycling routes.

Integrate bicycling into daily life, improving health and adding to fun and fitness.

Groceries, errands, and other daily destinations will all be accessible by bicycle.

Southern Pines will serve the needs of all types of bicyclists: recreational riders, commuters, utilitarian riders, and experts.

www.pedbikeimages.org / Dan Burden

1. Project Overview & Purpose

Overview

Background

In 2009, the Town of Southern Pines 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 early 2010, Southern Pines' 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 public involvement strategies. The vision statements 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 follow:

> *"The Town of Southern Pines 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 Southern Pines 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 350 local residents.

The Planning Process and Public Involvement

Project Consultants and Steering Committee

The planning process was led by consultants Greenways Incorporated 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 Southern Pines, 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 and public input flyer.

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 (held at Southern Pines Elementary in February of 2010) and the second Steering Committee meeting.

Public Involvement

During April and May 2010 the Town of Southern Pines 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 along with the Town's water bill. Finally, this push for public involvement was also accompanied by a second public input opportunity held during Springfest in downtown Southern Pines. Altogether, more than 350 local residents have submitted comment forms, and more than 100 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. This included meeting with staff from neighboring communities and NCDOT's Division 8, to coordinate for regional connectivity and facility development on state-owned and maintained roadways in Southern Pines. The full draft plan was presented to the Steering Committee in July 2010, 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 on October 12, 2010.

Right and Below: The first public workshop for the bicycle plan (at Southern Pines Elementary in March 2010), featured public input maps, educational posters, newsletters, comment forms, and conversations among residents, students, town staff, and project consultants.

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

Above and left: The Southern Pines Bicycle Plan booth at Springfest in downtown Southern Pines, where more than 100 people stopped to learn about the plan and provide input.

Benefits of a Bicycle-Friendly Community

A bicycle-friendly Southern Pines 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.

Kid's Bike Race at Springfest in Downtown Southern Pines (photo by Larry Bateman)

"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." [1] 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 percent increase in the number of people who exercise at least three times a week.[2] 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 Sothern Pines 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." [3]

Economic Benefits

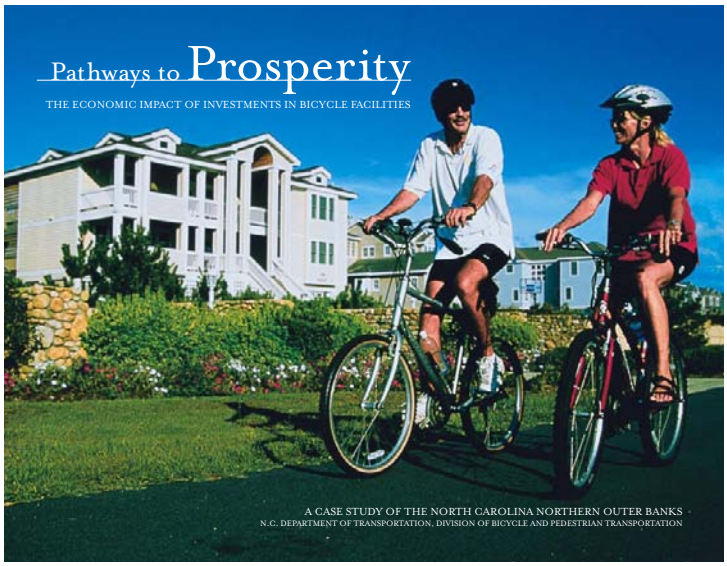
Bicycling is an affordable form of transportation. According to the Pedestrian and Bicycle Information Center (PBIC), of Chapel Hill, NC, the cost of operating a bicycle for a year is approximately $120, compared to $7,800 for operating a car over the same time period.[4] Bicycling becomes even more attractive from an economic standpoint when the unstable price of oil is factored into the equation (e.g., in summer 2008, gasoline prices topped $4 a gallon).[5] The fluctuating cost of fuel reinforces the idea that local communities should be built to accommodate people-powered transportation, such as walking and biking. Southern Pines' 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.

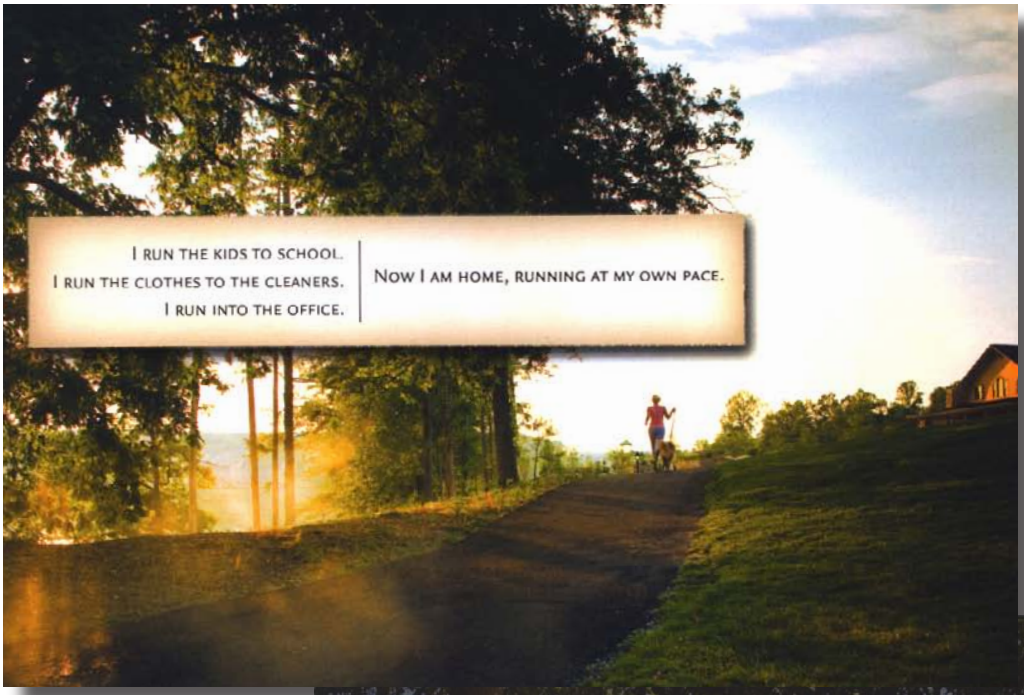
From a real estate standpoint, consider the positive impact of trails and greenways, which are essential components of a complete bicycle network. According to a 2002 survey of homebuyers by the National Association of Home Realtors and the National Association of Home Builders, trails ranked as the second most important community amenity out of a list of 18 choices.[6] 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. 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.[7] 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.[8] While these examples feature beach and mountain destinations, the Town of Southern Pines also has key advantages, such as a popular downtown, events like the Tour de Moore, and a successful tourism through the popularity of golfing in the region.

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





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.

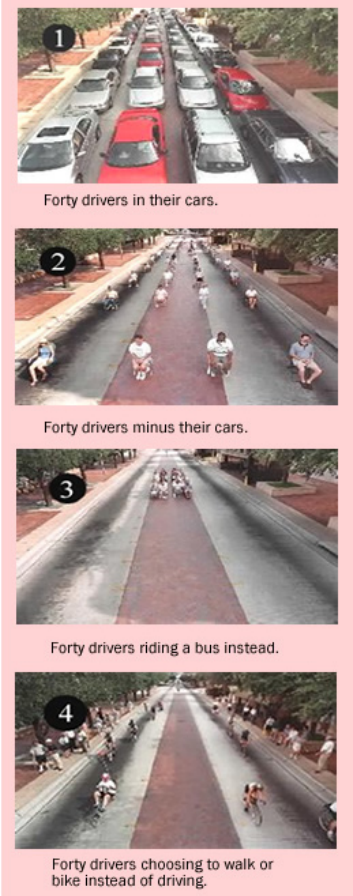
Environmental Improvements

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.[9] 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.

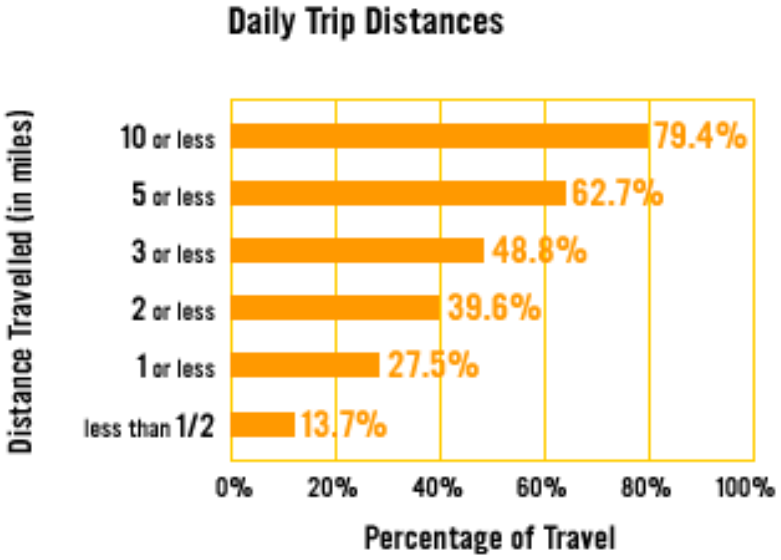
Transportation Benefits

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).



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

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.[10] An improved bicycle network provides greater and safer mobility for these residents.



Above: 'Daily Trip Distances' chart from the Bicycle and Pedestrian Information Center website, www.pedbikeinfo.org

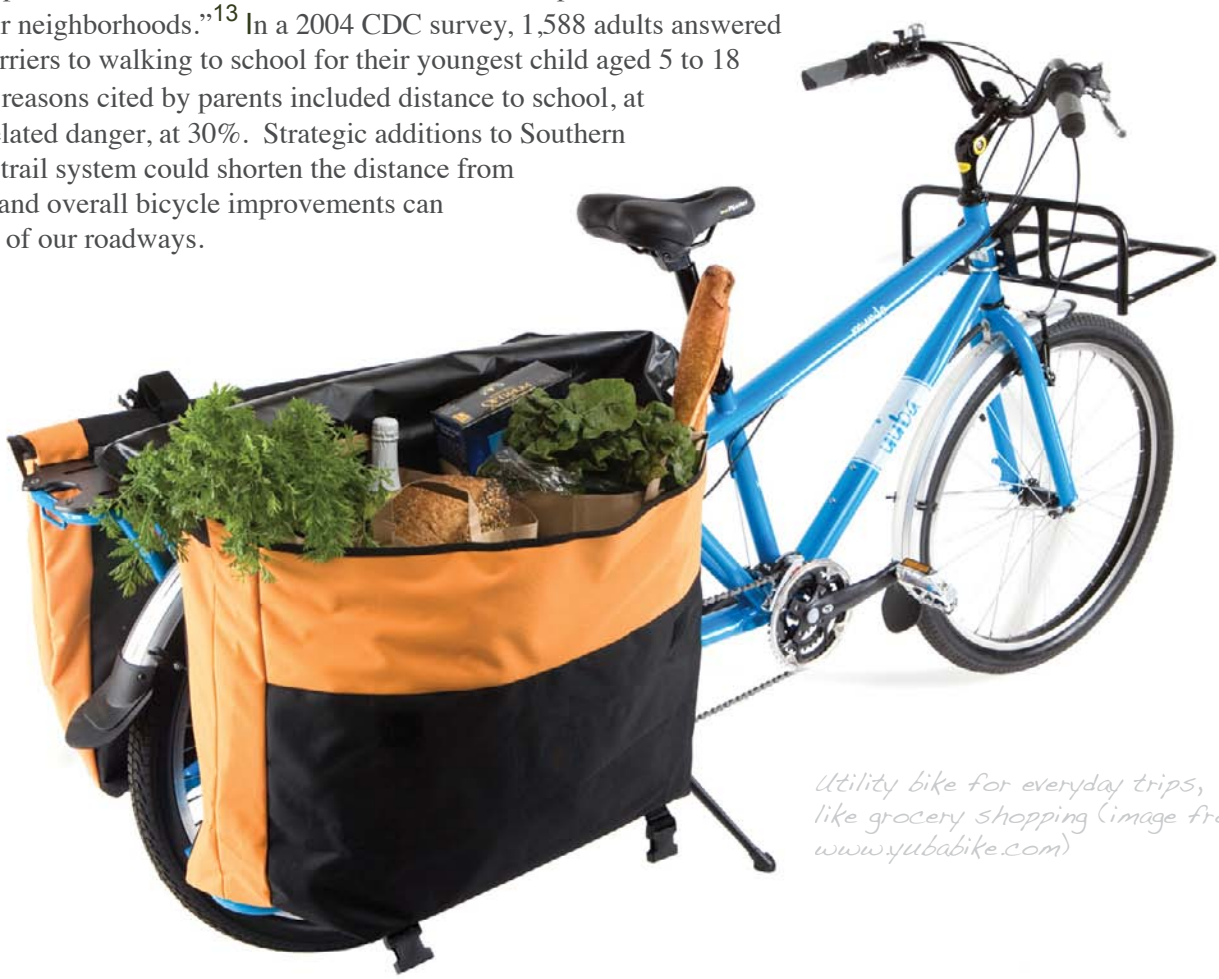
Quality of Life

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.[11] 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 bike to school than did so a generation ago. In 1969, 48 percent of students walked or biked to school, but by 2001, less than 16 percent of students between 5 and 15 walked or biked to or from school.[12]

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."[13] 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.[14] The main reasons cited by parents included distance to school, at 62%, and traffic-related danger, at 30%. Strategic additions to Southern Pines' bicycle and trail system could shorten the distance from homes to schools, and overall bicycle improvements can improve the safety of our roadways.



Utility bike for everyday trips, like grocery shopping (image from 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

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.

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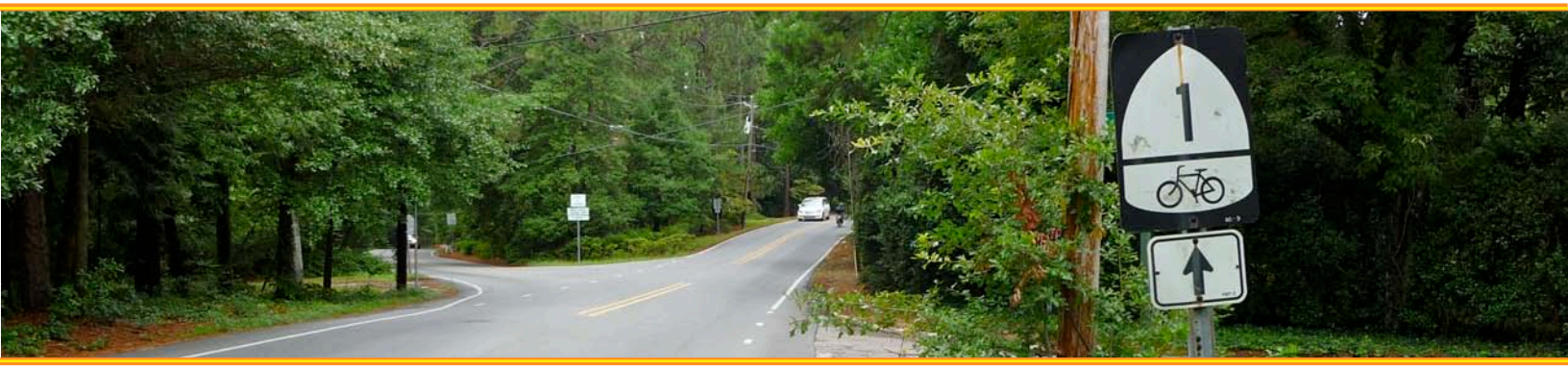


2. Current Conditions

Overview

In order to propose a comprehensive bicycle system for Southern Pines, 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*
- *Summary of Related Town Programs*

Field Inventory and Observations

The majority of Southern Pines is not bicycle-friendly with the exception of a few areas. In Downtown Southern Pines, where traffic speed is generally slower, experienced bicyclists can ride with automobile traffic (yet hazards still exist, such as cars backing out of angle parking). Even the striped shoulders along Pennsylvania Avenue can be challenging for bicyclists due to the debris and intermittent parking in the shoulder area. There are also several miles of recreational trails, in northwestern Southern Pines, but these are unpaved, and due to their occasional narrow width and obstacles, they are better suited to 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 high-speed roadways, narrow roadways with little or no shoulder space, and potentially dangerous railroad and driveway crossings. Furthermore, it was observed that few bicyclists wear helmets while riding and many ride in the wrong direction.

Shoulder on Pennsylvania Ave

Strengths of Existing Bicycle Facilities:

- Existing wide paved shoulder on several streets including Pennsylvania Avenue.
- Multi-use paths: Unpaved greenways and trails, such as the Forest Creek Greenway, Knoll Road Greenway, Reservoir Park Greenway, Tanglewood Greenway and other trails associate with parks, provide bicycling opportunities for both recreation and transportation.
- Bicycle routes: There are several state and county bicycle routes offering regional connections throughout town.

Deficiencies of Existing Bicycle Facilities:

- Lack of connectivity: As a whole, the few existing bicycle facilities are often disconnected which makes it difficult to find adequate routes to destinations.
- Design issues: Some existing bicycle facilities do not follow widely used guidelines. For example, the Knoll Road Greenway ranges from 6-8 feet with trees in the trail in many places making it difficult for passing bicycles. Additionally, all of the greenways and trails are unpaved limiting transportation options.
- Bicycle parking not widespread: Adequate and secure bike parking facilities need to be located throughout the study area through the usage of inverted U-racks.
- Bicyclist behavior: Bicyclists were observed not wearing helmets, riding in the wrong direction, riding on sidewalks, and crossing roads randomly at mid-block.

Strengths of Existing Road Network:

- Downtown grid network: Streets within the downtown area of Southern Pines are on a good grid system for all transportation modes and many have low automobile speeds.
- Roadway/lane widths: Several roadways throughout town are wide enough to offer bicycle lanes or other bicycle facilities.
- 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 because of several high speed road crossings such as Hwy 15-501 and US 1.
- High-volume, high-speed roadways: There are several high-volume commercial roadways throughout town with higher speeds and/or little shoulder where bicyclists are not safe. Some of these roads include Morganton Road, Central Drive, and Airport Road.
- Narrow roadways and lanes: There are also many roadways throughout the city 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 Midland Road).
- On street angle parking: Throughout the Downtown area of Southern Pines there are often angled parking spaces which present a safety hazard for both bicyclists and pedestrians as cars are backing out of them.
- Driveway access management: High frequency of driveways and parking lot curb-cuts on sections of some roads present hazards to cyclists as the automobile crosses the cyclists' path of travel, such as on Morganton Road between US 1 and May Street.
- 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.

Knoll Rd Greenway is better for walking than biking

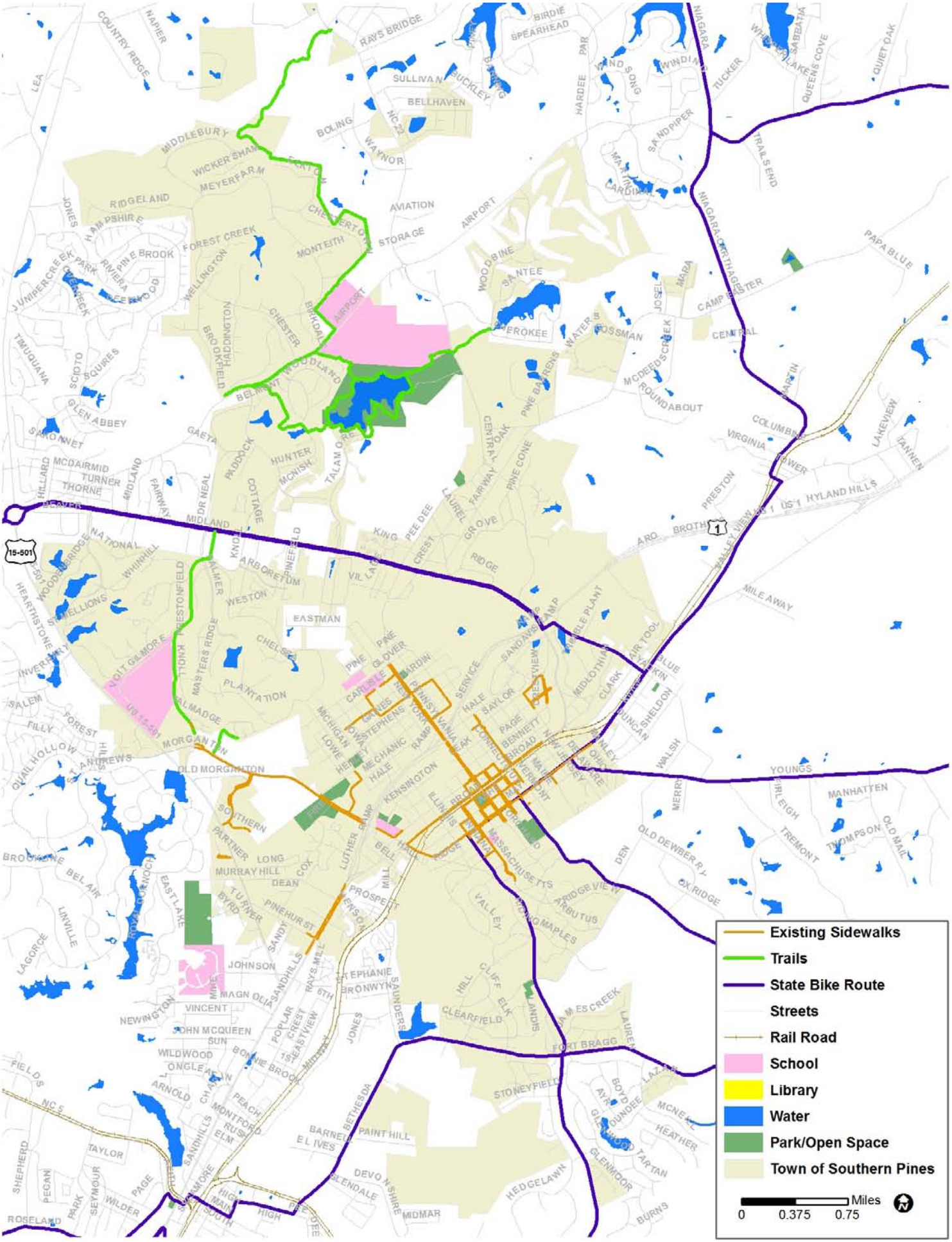
Bicyclists with no option but sidewalk on Morganton

Clear and level shoulder space to create bike lane on Pee Dee

Potential room for a sidepath on Morganton Blvd.

Potential for bike lanes on May

MAP 2.1 EXISTING CONDITIONS



MAP 2.2 NCDOT OWNED & MAINTAINED ROADWAYS IN SOUTHERN PINES

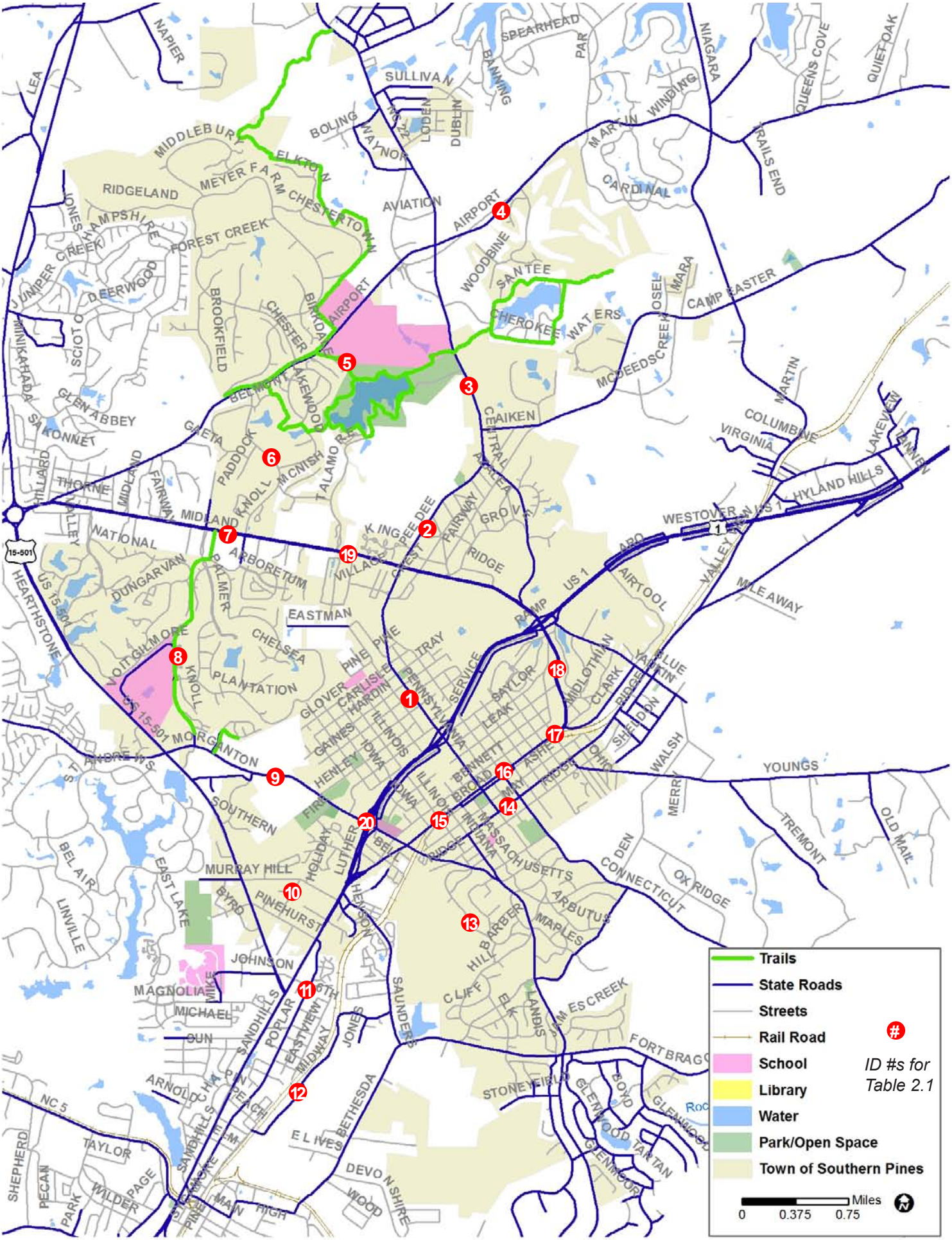


Table 2.1 Roadway Inventory by Segment

MAP 2.2 ID #	Road	From	To	Distance (Ft)	Existing Road Condition	Approx Road Width (Ft)	Notes [Average Daily Traffic (ADT) counts from NCDOT, 2007]
1	**Pennsylvania Ave**	Leak St	Pine St	4,890	2 Lane W Center Turn Lane	48	Shoulder could be converted to a bicycle lane; ADT: 7,400
2	**Pee Dee Rd**	Pine St	Central Dr	8,190	2 Lane	22	Clear & level shoulder space to add a Bike Lane; ADT: 2,800
3	**Central Dr**	Pee Dee Rd	Airport Rd	8,109	2 Lane	25	Mostly clear & level shoulder space to add a Paved Shoulder ADT: 7,600
4	**Airport Rd**	Central Dr	Cardinal Dr	7,324	2 Lane	24	Mostly clear & level shoulder space to add a Paved Shoulder; ADT: 7,000
5	**Park and School Multi Use Trails**	(multiple locations)	(multiple locations)	10,229	n/a	n/a	Short, but critical sections of existing trail could be paved for bike use
6	**Knoll Rd**	Airport Rd	Midland Rd	6,477	2 Lane W Center Turn Lane	38	Bicycle lanes could be accommodated if travel lanes were narrowed
7	**Midland Rd**	Knoll Rd	Knoll Rd Greenway	1,023	n/a	n/a	Worn foot paths are evident at this location (north side of road)
8	**Knoll Rd**	Knoll Rd Greenway	Morganton Rd	8,100	2 Lane	25	Mostly clear & level shoulder space to add a bike lane; ADT: 1,900
9	**Morganton Rd**	Knoll Rd	Henley St	5,185	2 Lanes Each Way Divided	73 (w/ median)	Sidepath could be built on north side, if ROW allows; ADT: 16,000
10	**Pinehurst/Richards/Cox/ Murry Hill/Fire**	Morganton Rd	Sandhills Blvd	6,752	2 Lane	24	Mix of facilities may be needed, esp. crossing US-1
11	**Poplar Ave**	Sandhills Blvd	Peach Ave	7,180	2 Lane	28	Mix of facilities may be needed, esp. crossing US-1
12	**Midway Rd**	Saunders Blvd	Orange St	8,072	2 Lane	22	Lower speed/volume, could be good Bike Route
13	**Saunders/Bethesda/Barber/ Country Club/Massachusetts**	Broad St	Midway Rd	15,500	2 Lane	22	Alternative route to Indiana
14	**May St**	Manley Ave	Morganton Rd	7,550	2 Lane	28	Room to stripe Bike Lanes; ADT: 5,600-7,600
15	**Broad St**	Massachusetts Ave	Wisconsin Ave	1,457	2 Lane	39	Room to stripe Bike Lanes; ADT: 7,800
16 A	**Broad St**	Vermont Ave	Massachusetts Ave	2,375	1 Lane Each Way w Parking	33	May be too tight to stripe Bike Lanes of adequate width; ADT: 6,100
16 B	**Pennsylvania Ave**	Leak St	Ridge St	3,028	2 Lane w Parking	49	May be too tight to stripe Bike Lanes of adequate width; ADT: 2,500
17	**Broad St**	Vermont Ave	Midland Rd	2,407	2 Lane	22	Mostly clear & level shoulder space to add Bike Lanes
18	**Midland Rd**	Broad St	US 1	3,865	2 Lanes Each Way Divided	60 (w/ 15' median)	Could be restriped to add a Bike Lane; ADT: 6,500 to 13,000
19	**Midland Rd**	US 1	15-501	19,700	2 Lanes Each Way Divided	60 (w/ 15' median)	Could be restriped for a Wide Outside Lane
20	**Morganton Rd**	Broad St	Henley St	3,748	1-2 Lanes Each Way + Center Turn	65 to 30	Could be restriped for a Wide Outside Lane; ADT: 8,000 to 16,000

Geographic Information Systems (GIS) Analysis

Geographic Information Systems (GIS) data was analyzed from the Town of Southern Pines, Moore County, the State of North Carolina, and the Triangle J Council of Governments (TJCOG). The analysis included information about past bicycle-related accidents, popular destinations, land use, and various demographic patterns that may be useful in assessing need for future bicycle facilities.

BICYCLE CRASHES (MAP 2.3)

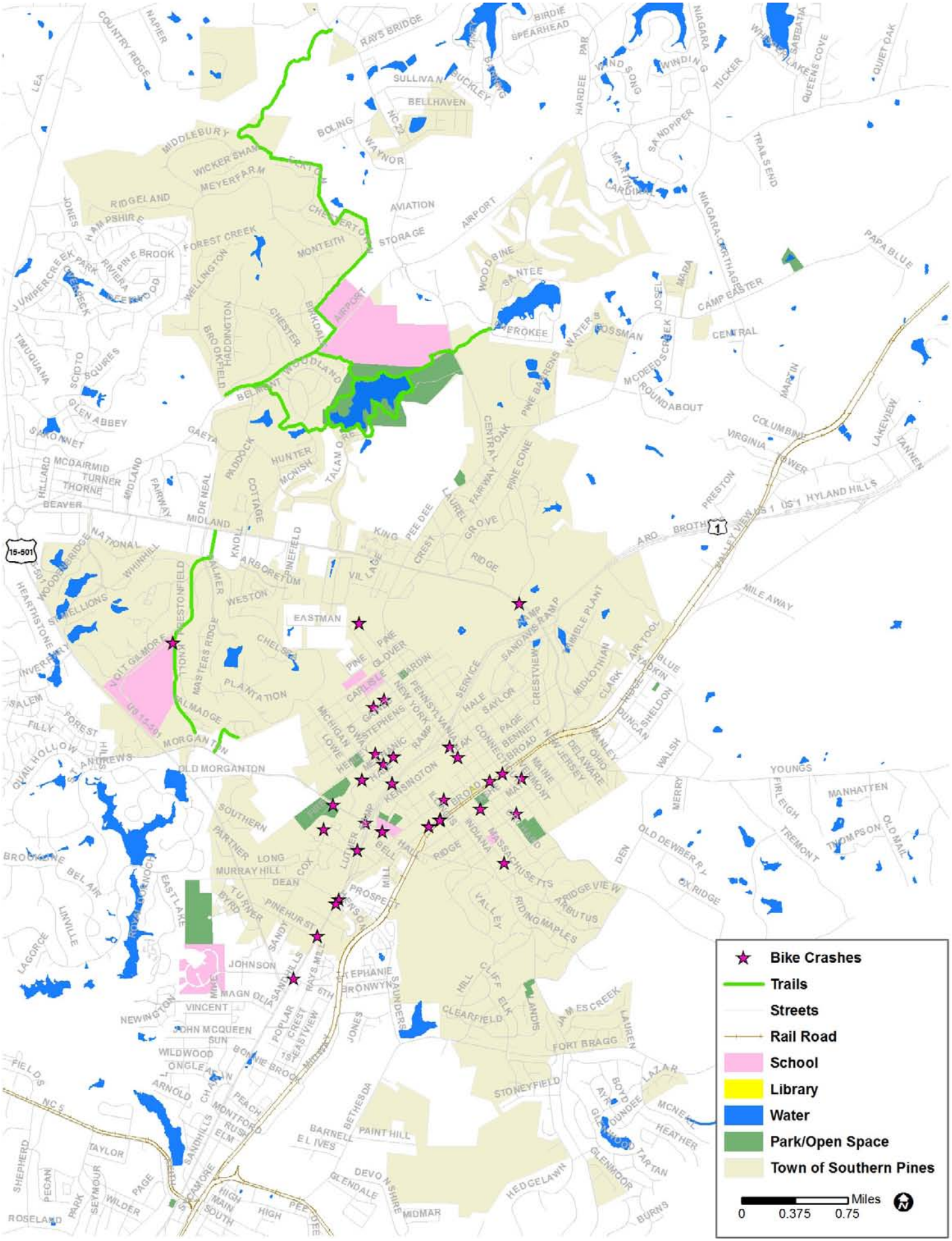
Bicycle crash data from 1990-2009 was provided by NCDOT and geocoded by Greenways Incorporated. Thirty-two accidents were mapped and can be seen in the following bicycle crash map. The majority of crashes took place in the downtown Southern Pines area with a few crashes in other locations. The highest bicycle crash density can be seen in the along Highway 1 and on Broad Street. Another dense area of incidences occurred on Morganton Blvd and Pennsylvania Avenue.

TABLE 2.1 BICYCLE CRASHES IN SOUTHERN PINES, 1990-20009 (NCDOT)

Bike Accident Location	*# of Accidents*
US 1	6
Broad St	3
Morganton Rd	3
Pennsylvania Ave	3
W Wisconsin Ave	3
Ashe St	2
Knoll Rd	1
Bennett St	1
E Illinois Ave	1
Hardin St	1
Massachusetts Ave	1
Mechanic St	1
Michigan Ave	1
Midland Rd	1
Richards St	1
Ridge St	1
S Hardin St	1
NC 2	1

According to recent data from the National Highway Traffic Safety Administration (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 ten percent 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).

MAP 2.3 BICYCLE CRASHES WITHIN SOUTHERN PINES



TRIP ATTRACTORS (MAP 2.4)

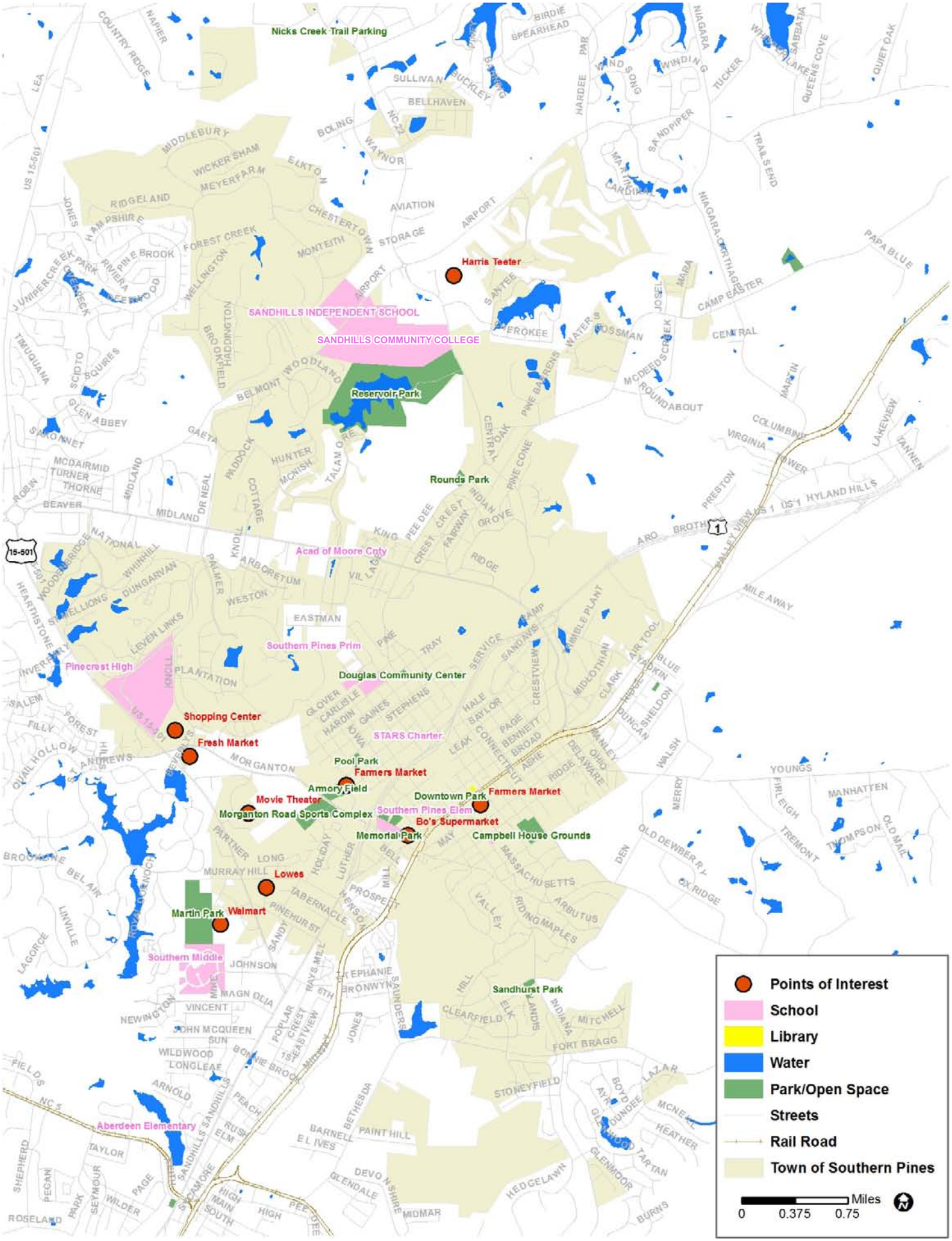
People currently drive, walk, or bike to a variety of destinations across Southern Pines for various purposes. These potential destinations and points of origin for bicyclists are referred to in this document as 'trip attractors'. Examples include:

- Downtown Southern Pines
- Parks and trails
- Farmer's market
- Sandhills Community College
- Public destinations (schools, post offices, libraries, etc.)
- Shopping locations (grocery stores, shopping centers, restaurants, drug stores, banks, etc.)
- Regional bicycling routes
- Community and recreation centers
- Historic and other points of interest
- Places of employment (office centers, 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.

Trip attractor examples: Downtown Southern Pines, schools, and Reservoir Park

MAP 2.4 TRIP ATTRACTORS



LAND USE (MAP 2.5)

The Southern Pines 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 the intersections of state highways being the main commercial areas. One challenge in the overall layout of the town is the way in which Highway 1 bisects the original grid street network, leaving many residents in close proximity to downtown, but with very few options for direct access to downtown.

DEMOGRAPHIC ANALYSIS (MAPS 2.6-2.10)

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. ***This demographic data should be reanalyzed when the 2010 Census results are available (scheduled for release in may 2011).*** The following 2000 Census maps, though outdated, still provide a framework for analysis of the 2010 data.

Map 2.6 (page 2-12) presents a geographic view of the percentage of workers that do not own a vehicle (shown at the Census block group level) and would thus be more dependent on alternative means of transportation. The darker shades of green show areas where higher percentages of the working population do not own a vehicle. The highest percentages found not owning a vehicle in Southern Pines were upwards of 14%, in the northeastern part of town.

Maps 2.7-2.8 (pages 2-13 and 2-14) present a geographic view of the percentage bicycle and pedestrian commuters by Census block group. The darker shades of green show areas in which higher numbers of people were walking or biking to work. Findings from these maps include:

- About 80% of the working population in Southern Pines drove a vehicle to work in 2000 while less than one percent of workers bicycled to work.

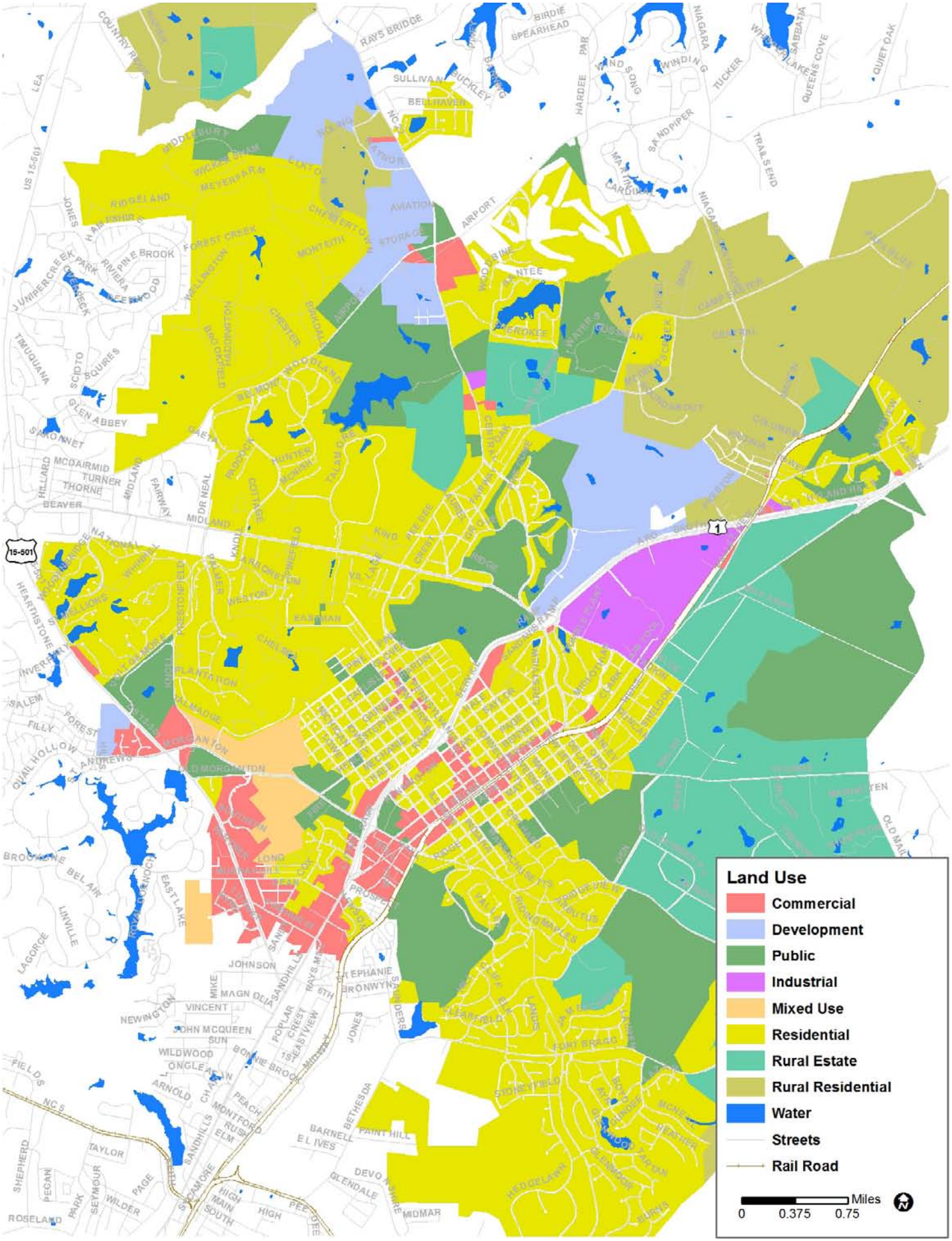
- The highest percentages of those walking to work (Map 2.7) were found in the western Downtown Southern Pines area. Nine percent of workers walked to work, especially on the east side of Hwy 15-501. Other pockets of relatively high walking commuters were found in the northeastern side of Southern Pines.

- The higher percentages of those biking to work (Map 2.8) were more geographically sporadic. The highest block group percentage is 1.9%, found in Downtown Southern Pines. The next highest percentage is 1.4%, found in the northeastern side of Southern Pines.

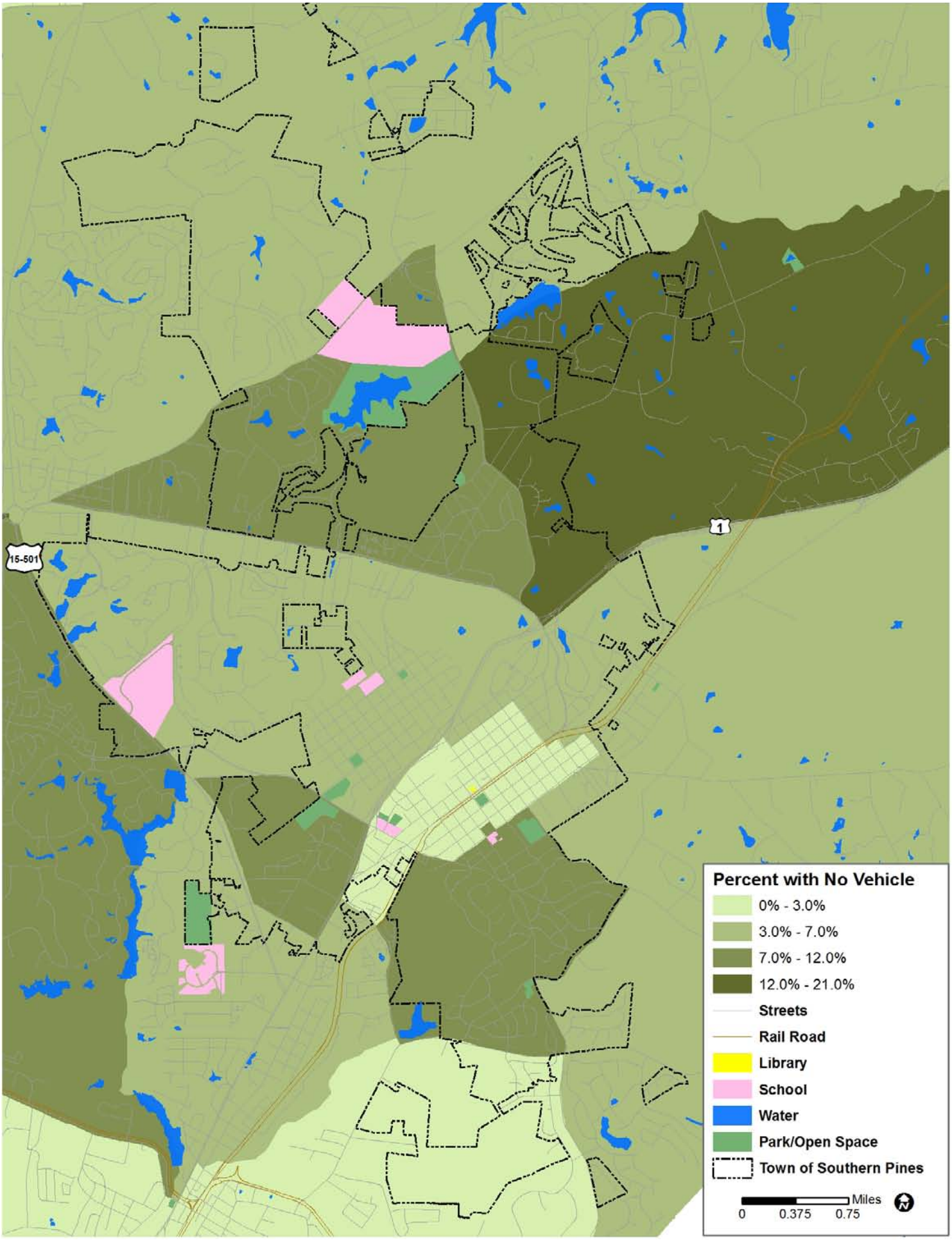
Map 2.9 (page 2-15) presents median family incomes at the Census block group level. While this is not a direct representation of bicycle and pedestrian use, it does indicate higher potential need for walkable and bikable spaces. If gas prices rise in the future or continue to be unstable, there may be increases in bicycle and pedestrian travel, especially among lower-income groups, as was evident during the escalation of gas prices in the summer of 2008. Lower-income areas (light green) were most commonly found in and around Downtown Southern Pines.

Map 2.10 (page 2-16) presents population density per square mile as recorded in the 2000 census. This map reveals that the more dense areas of Southern Pines were located within Downtown and areas to the west. Dense areas will be important to connect with the bicycle network, serving a greater numbers of residents.

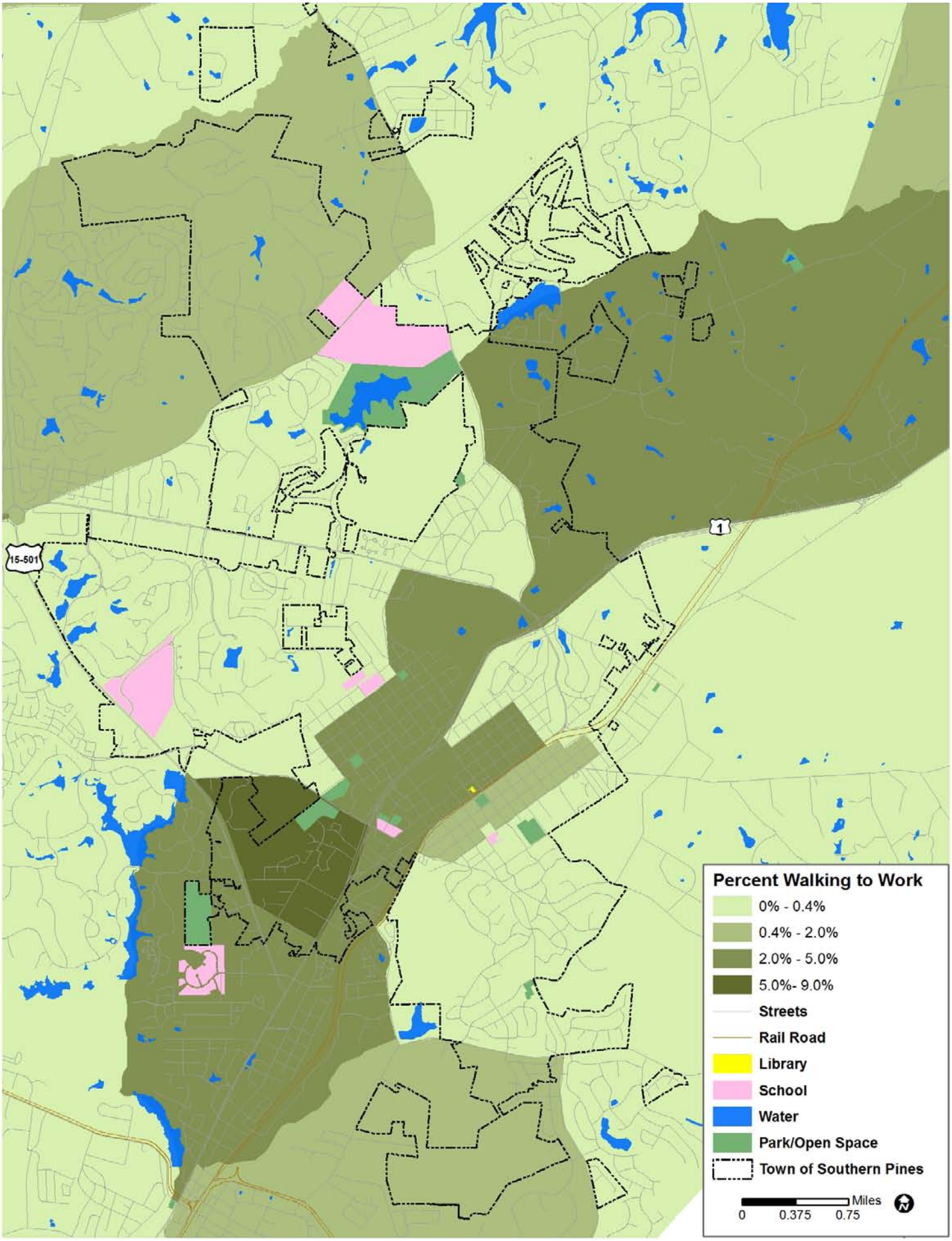
MAP 2.5 LAND USE



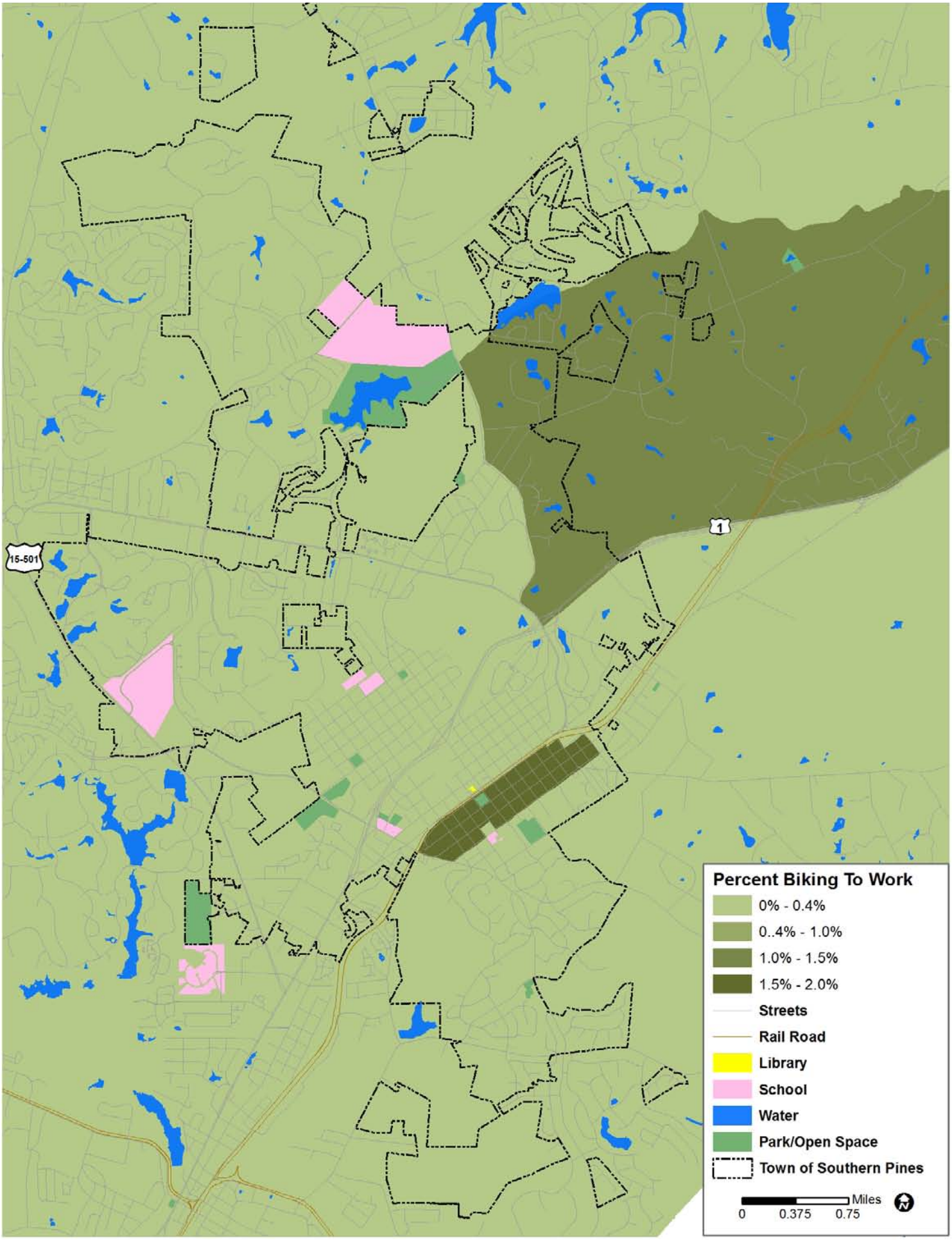
MAP 2.6 PERCENT WORKING POPULATION W/ NO CAR, 2000 (BY CENSUS BLOCK GROUP)



MAP 2.7 PERCENT WORKING POPULATION WALKING TO WORK, 2000 (BY CENSUS BLOCK GROUP)



MAP 2.8 PERCENT WORKING POPULATION BICYCLING TO WORK, 2000 (BY CENSUS BLOCK GROUP)

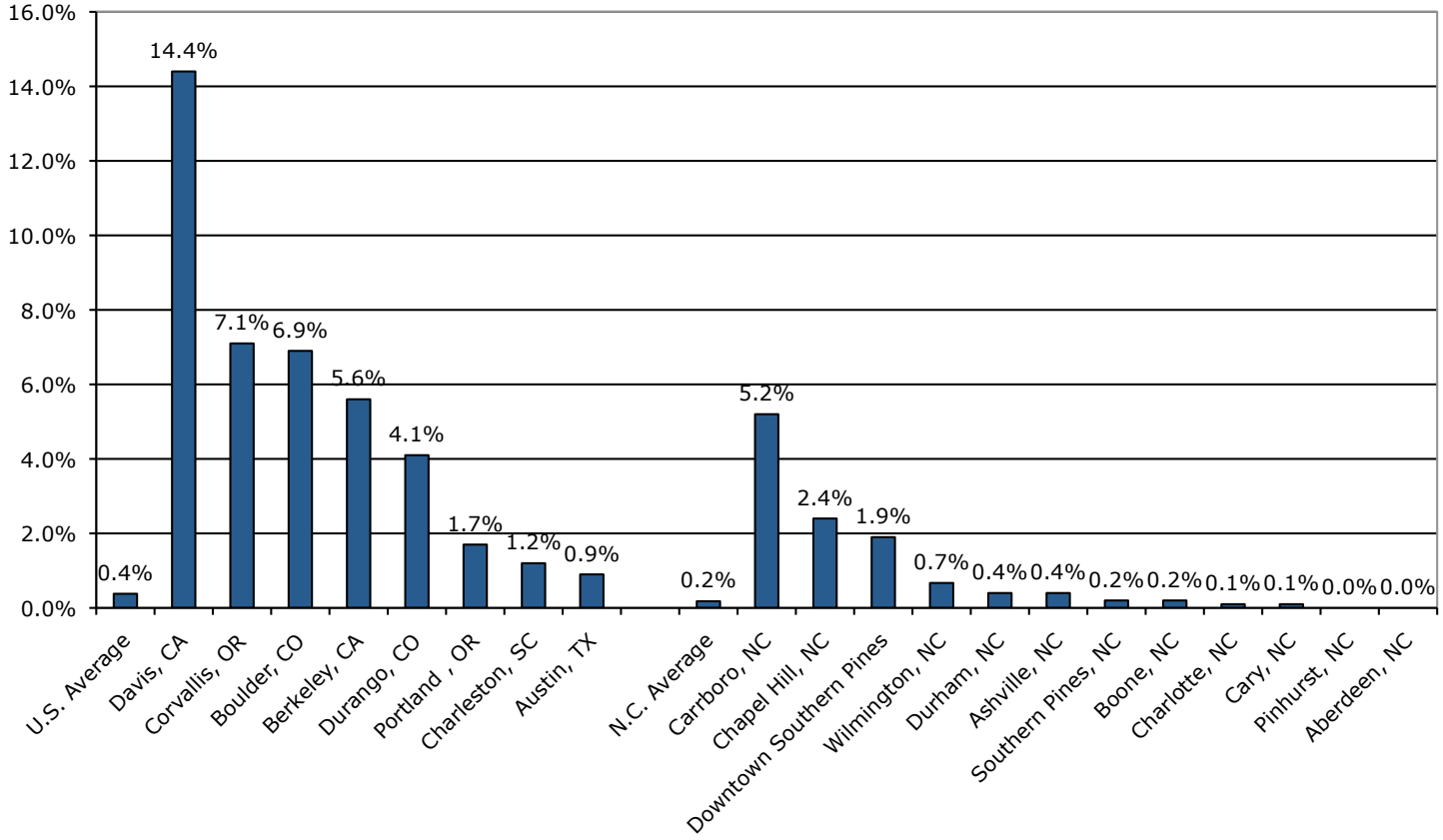


Percentages for Bicycle Commuting

The table below shows how the Town of Southern Pines (and Downtown Southern Pines) stacked up nationally, statewide, and regionally in terms of bicycle commuting in 2000. Bicycle-commuting statistics can serve as an indicator for total number of bicyclists and provide one of the most reliable benchmarks available from which to compare between communities. 1.9 and 0.2 percent seems like a small fraction of the total, but it only represents bicycle *commuting*. A 2003 national survey by the Bureau of Transportation Statistics[1] found that 95% of bicyclists primarily use their bikes for purposes other than commuting, such as exercise/health, recreation, and personal errands. Therefore the actual number of bicyclists, for all purposes, was likely much larger. Additionally, current figures may be drastically different from 2000, and should be examined once available in the 2010 Census results.

When compared to cities and towns that represent model bicycling communities, the Town of Southern Pines has room for improvement (see rates in Carrboro, NC, for example). Nevertheless, *Downtown* Southern Pines still had nearly five times the national average for bicycle commuting and nearly 10 times the North Carolina average. Southern Pines as a whole matched the state average, and was well above neighboring communities.

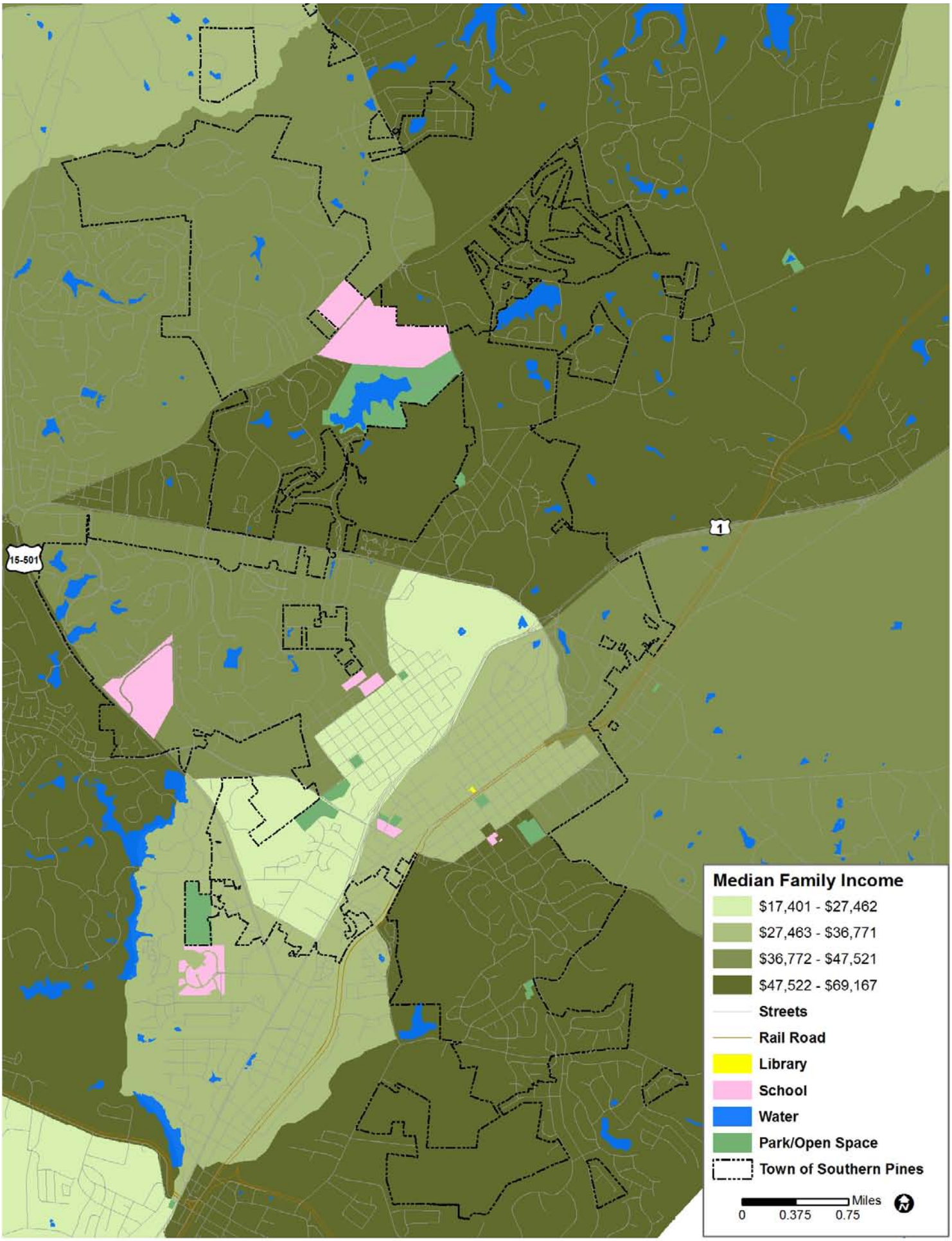
Comparison of National, Statewide, and Regional Bicycle Commute Rates[2]



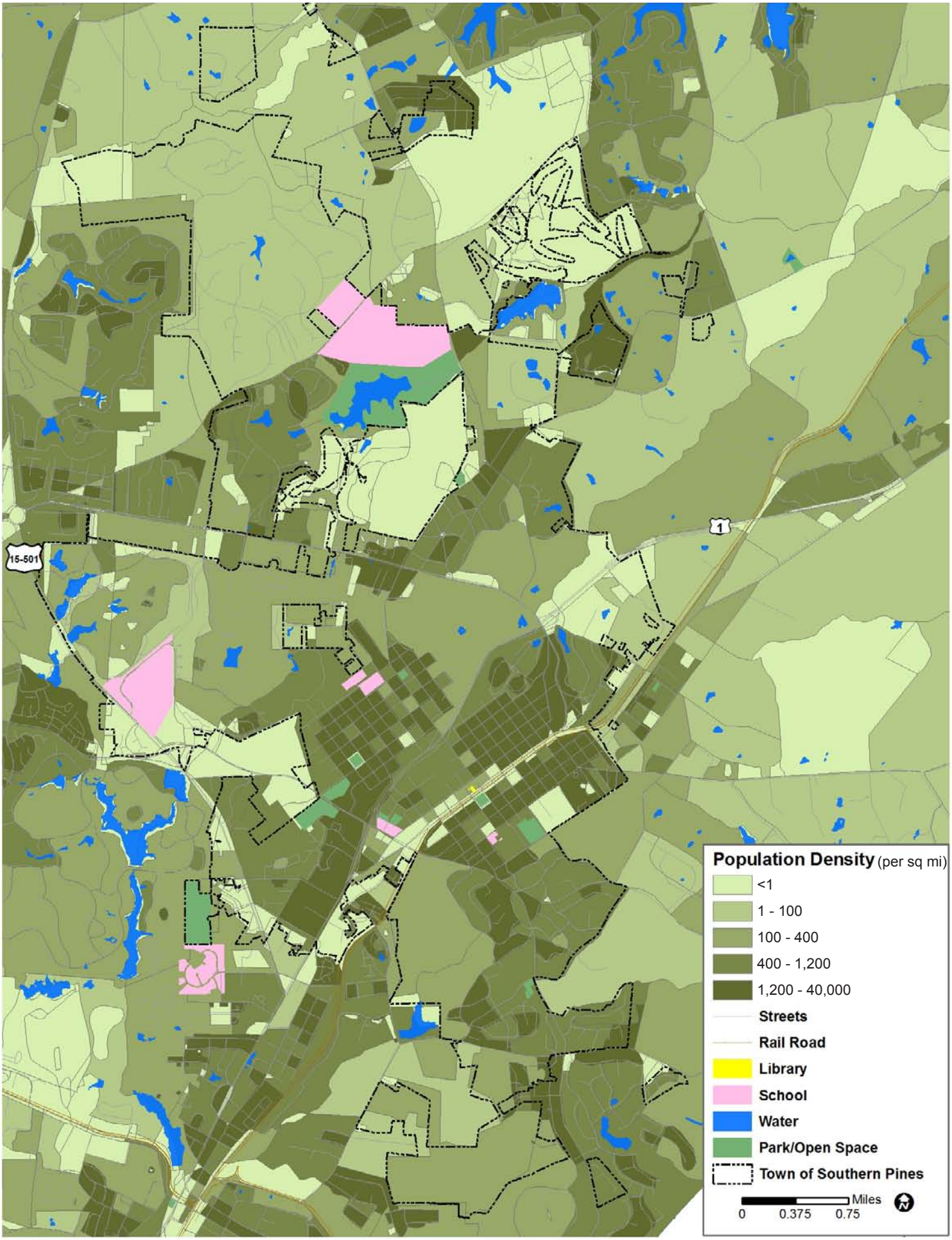
1 Bureau of Transportation Statistics Survey: www.bts.gov/programs/omnibus_surveys/household_survey/2003/february/index.html

2 Source: U.S. Census Bureau, Census 2000 Summary File 3, Table P30 Means of Transportation to Work.

MAP 2.9 MEDIAN FAMILY INCOME, 2000 (BY CENSUS BLOCK GROUP)



MAP 2.10 POPULATION DENSITY PER SQUARE MILE, 2000 (BY CENSUS BLOCK)



Public Comments Regarding Current Conditions

Below are graphs and tables that show the responses to several questions from the comment forms collected for the Southern Pines Bicycle Transportation Plan. The graphs shown below only represent input received as it relates to current conditions. Please refer to Appendix E for a full summary of public involvement.

How do you rate present bicycling conditions in Southern Pines? (select one)

	Response Percent	Response Count
Excellent	5.8%	19
Fair	**53.2%**	**174**
Poor	41.0%	134
answered question		**327**
skipped question		**25**

What bicycling destinations would you most like to get to? (choose all that apply)

	Response Percent	Response Count
Downtown	**68.9%**	**233**
Primary, Elementary, or High School	19.5%	66
Grocery stores	33.7%	114
Places of work	24.9%	84
Restaurants	28.1%	95
Public Transportation	12.4%	42
Other Shopping (retail stores)	26.3%	89
Parks (Reservoir Park, Martin Park, etc.)	63.6%	215
Entertainment	17.8%	60
Trails and greenways	67.8%	229
Farmers markets/community gardens	41.7%	141
I DON'T BICYCLE.	14.2%	48
Other specific location (please specify)	9.2%	31
answered question		**338**
skipped question		**14**

What do you think are the top three roadway intersections (in Southern Pines) most needing bicycling improvements? (Example response: Smith Street & 1st Avenue)

INTERSECTION	NUMBER OF RESPONSES
Broad & Morganton	48
15-501 & Morganton	17
May & Indiana	16
All traffic circles	13
May & Connecticut	12
Midland & Knoll	11
Fort Bragg & Indiana	10
Broad & Pennsylvania	10
Pee Dee & Midland	10
US 1 & Morganton	8
US 1 & Saunders	8
Broad & Vermont	7

What do you think are the top three roadway corridors (in Southern Pines) most needing bicycling improvements?

ROADWAY	NUMBER OF RESPONSES
Midland	84
Indiana	76
Morganton	57
May	47
Broad	32
US 1	31
Connecticut	28
Pennsylvania	28
Hwy 22	28
Youngs	18
15-501	16
Bennett	11
Fort Bragg	10
Airport	7

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	**58.4%**	**187**
Gaps in bicycle facilities	16.3%	52
Narrow lanes	58.1%	186
Poor trail conditions	19.1%	61
Other travel modes are safer or more comfortable	15.6%	50
Crossing busy roads	50.0%	160
Hills	5.9%	19
Loose gravel or potholes	23.8%	76
Yard waste in bicycle lane	8.1%	26
Drainage grates	8.8%	28
Poor lighting (along routes/trails or at roadway crossings)	17.2%	55
Personal safety (from crime)	10.0%	32
Physical ability	7.5%	24
Travel time or distance	5.9%	19
Heavy traffic	45.0%	144
High-speed traffic	48.8%	156
Inconsiderate motorists	44.1%	141
Lack of bicycle parking	25.0%	80
Lack of showers and lockers at workplace	2.2%	7
NOTHING	6.6%	21
Other (please specify)		26
answered question		**320**
skipped question		**32**

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	30.3%	94
Drive too fast	45.5%	141
Pass bicyclists too closely	**61.9%**	**192**
Tolerate bicyclists not following rules of the road	17.1%	53
Harass bicyclists	11.0%	34
Fail to yield to bicyclists crossing a street	24.2%	75
Other (please specify)	6.5%	20
	answered question	**310**
	skipped question	**42**

How do you feel bicyclists in your area typically behave? (Please check all that apply)

	Response Percent	Response Count
Courteous, obeying all traffic laws	52.5%	155
Cycle in the roadway the opposing direction as vehicles	7.1%	21
Fail to comply with traffic laws	19.0%	56
Ride too slowly	5.4%	16
Are young and/or inexperienced	4.1%	12
Multiple cyclists ride abreast in the same travel lane	**52.9%**	**156**
Behave rudely	7.1%	21
Don't signal turns or stops	20.0%	59
Ride on sidewalks	8.1%	24
Ride at night without lights	9.2%	27
	answered question	**295**
	skipped question	**57**

Summary of Related Plans

Southern Pines Comprehensive Long Range Plan (2010)

The Town of Southern Pines Comprehensive Long Range Plan provides strong support for bicycle and non-motorized transportation. This plan realizes the importance and envisions bicycling as a viable and convenient mode of transportation. Below are some relevant excerpts from this plan:

- *Transportation Vision:* Maintain existing options, build new ones residents of Southern Pines support the continued provision and maintenance of automotive rights-of-way, but envision an extensive network of foot and bike-paths, sidewalks, bicycle lanes and other infrastructure supporting non-motorized transportation. Land-use, transportation and other plan policies will be used to support development and infrastructure leading to a more walkable, inter-connected community. (2.3 page 21)

- *Bicycle and Pedestrian Systems:* Bicycle connectivity is seriously hampered by the presence of Route 1. For many of the reasons articulated under the "Streets" heading, a different design of Route 1 south of Midland Road would have great benefits to bicyclists. With or without changes to Route 1, the provision of safe, visible bike facilities throughout the town are likely to be seen not only as an alternative travel option, but a popular recreational amenity. (5.7 page 59)

- *Transportation Policies (5.8 – 5.11):*

  (P-R.02) Continue development of a greenway system, facilitating open space retention and interlinking Southern Pines' neighborhoods.

  (P-R.07) Collaborate with Moore County and others to develop non-motorized, public-access trails along roadways in Horse Country, improving community enjoyment of Horse Country.

  (P-X.01) Increase roadway interconnectivity throughout Southern Pines, creating an environment conducive to multiple transportation options and coordinating with adjacent jurisdictions as appropriate.

  (P-X.02) Make walking or bicycling a more convenient, safe and economical transportation alternative.

  (P-X.14) Design streets to accommodate autos, pedestrians and cyclists, recognizing that different street types serve different functional needs.

  (P-X.16) Facilitate the development of a non-automotive inter-regional transportation system.

  (P-S.05) Maintain, expand and improve Southern Pines' parks, greenway and open-space areas, on-pace and in concert with need and plan objectives.

Pinehurst Comprehensive Long Rage Village Plan (2003)

The Village of Pinehurst, neighboring Southern Pines to the east, views bicycling as an important mode of transportation as well. Connecting these two towns together is an important element within this plan. The Pinehurst 2003 Comprehensive Long Range Village Plan Transportation Chapter 15 states several overall goals and projects for bicycling within the Village. One of these goals is to provide underpasses under Hwy 15-501 to connect the western side with the eastern side greenways. This would also provide connections for Southern Pines into Pinehurst.

Healthy Kids, Healthy Communities Kick-Off Evaluation

Healthy Kids, Healthy Communities (HKHC) is a national program of the Robert Wood Johnson Foundation (RWJF) whose primary goal is to implement healthy eating and active living policy- and environmental-change initiatives that can support healthier communities for children and families across the United States. A recent evaluation conducted in the Southern Pines area by HKHC shows support for trails and bicycling. The evaluation had 27% of its respondents from Moore County with 10% representing Southern Pines. The remaining respondents represented areas surrounding Southern Pines. When asked, "What are the top three built environment/policy areas that you feel need to be addressed in your community?", *76% of the respondents reported that the creation of sidewalks/greenway trails was the top need that should be addressed* and, tied at second place, 43.3% responded that the creation of bike lanes and zoning changes to increase physical activity need to be addressed. Ranking 3rd, 36.7%, responded that the creation or support of a Farmers Market or Farm Cooperative was important.

Triangle Area Regional Planning Organization (TARPO)

The Triangle Area Rural Planning Organization (TARPO) is a voluntary association of local governments in Chatham, Lee, Moore, and Orange Counties of North Carolina. TARPO's main goals are:

- Developing long-range local and regional multimodal transportation plans with NCDOT
- Prioritizing suggestions for transportation projects to be included in the State Transportation Improvement Program (STIP)
- Providing transportation-related information and data to the public and private sectors
- Encouraging public participation in the transportation planning process

For more on TARPO and their ongoing work, including information about Transportation Improvement Programs (TIP), visit **www.tarpo.org**

Reconstruction of the US-1 Interchange

Reconstruction of the US-1 Interchange at Morganton Blvd is expected to begin in 2012. Preliminary design began in 2010. A letter from the Town of Southern Pines to NCDOT was submitted in fall 2010. The letter outlines a formal request for bicycle and pedestrian accommodations during reconstruction of this interchange (see Cutsheet #20 in Chapter 3 for details).

Current Bicycle Advocacy and Programs

Sandhills Cycle Club

The Sandhills Cycling Club is a premier regional club with over 75 members and has produced numerous state champions, as well as supported riders who have gone on to national success. Their mission is to encourage and support community participation in recreational and competitive cycling through events, education, and charitable activities. The club has a wide variety of member interests:

- They have club members who participate in organized bike rides, which can range from 10 to over 100 miles in length.
- They have members who just get together to ride around the neighborhood.
- Finally, they have members who race bicycles: road racers, mountain bike racers, multi-sport racers and cyclocross racers.

Their website includes information on how to join or view their calendar to find opportunities to participate in club activities. **www.sandhillscyclingclub.org**

Rainbow Cycles

Rainbow Cycles is the premier bicycle shop in the greater Sandhills area, and as such it serves as a center for bicycling and bicycle culture in the Town of Southern Pines. They have contributed merchandise to bicycle education and planning events, and their website hosts information about dozens of ride routes and local events. **www.rainbowcycles.com**

Youth Bike Race

The annual Youth Bike Races for children 10 and under takes place in Downtown Southern Pines at Springfest. The races include bikes, tricycles or big wheels.

Tour de Moore Road Race

Each year since 1976, on the last Saturday in April, the Kiwanis Club of the Pines sponsors the Tour de Moore, a 100-mile bicycle ride around the perimeter of the county (with options for 50 miles or 28 miles). This premier bicycle racing event begins in Downtown Southern Pines at the Campbell House (482 East Connecticut Avenue), with a field now limited to 600 riders.

Tour de Cure

The American Diabetes Association challenges riders to take part in the annual Tour de Cure, a national cycling event with local participation that includes the Southern Pines area. The event raises funds to cure diabetes. Cyclists from around the Sandhills and Triangle communities gather on one of six routes to participate in this event. For the Sandhills area, participants ride either 25 or 50 miles out of Southern Pines. This ride brings more than 150 room nights to Southern Pines as cyclists ride 75 and 100 miles each day during the Tour de Cure (according to a news release: *"Tour de Cure Set for June 5-6"* www.thepilot.com, 5/2/2010)

Current Conditions Conclusion

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

- Most potential on-road improvements for bicycling in Southern Pines 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 the Triangle J Council of Governments (TJCOG).

- Most bicycle accidents in Southern Pines have occurred in an approximately one mile radius of the intersection of Morganton & Broad, which also happens to be the intersection 'most in need of improvement' according the public comment form. This area also has the most trip attractors, and represents the highest concentration of commercial land uses.

- According to respondents from the public comment form, the most important destinations for bicyclists in Southern Pines include downtown, parks, and trails. These destinations could be connected by creating a safe and accessible loop of on-road and off-road bicycle facilities.

- According to respondents from the public comment form, the main factors that are preventing people from bicycling are a lack of bicycle facilities, narrow lanes, and crossing busy roads.

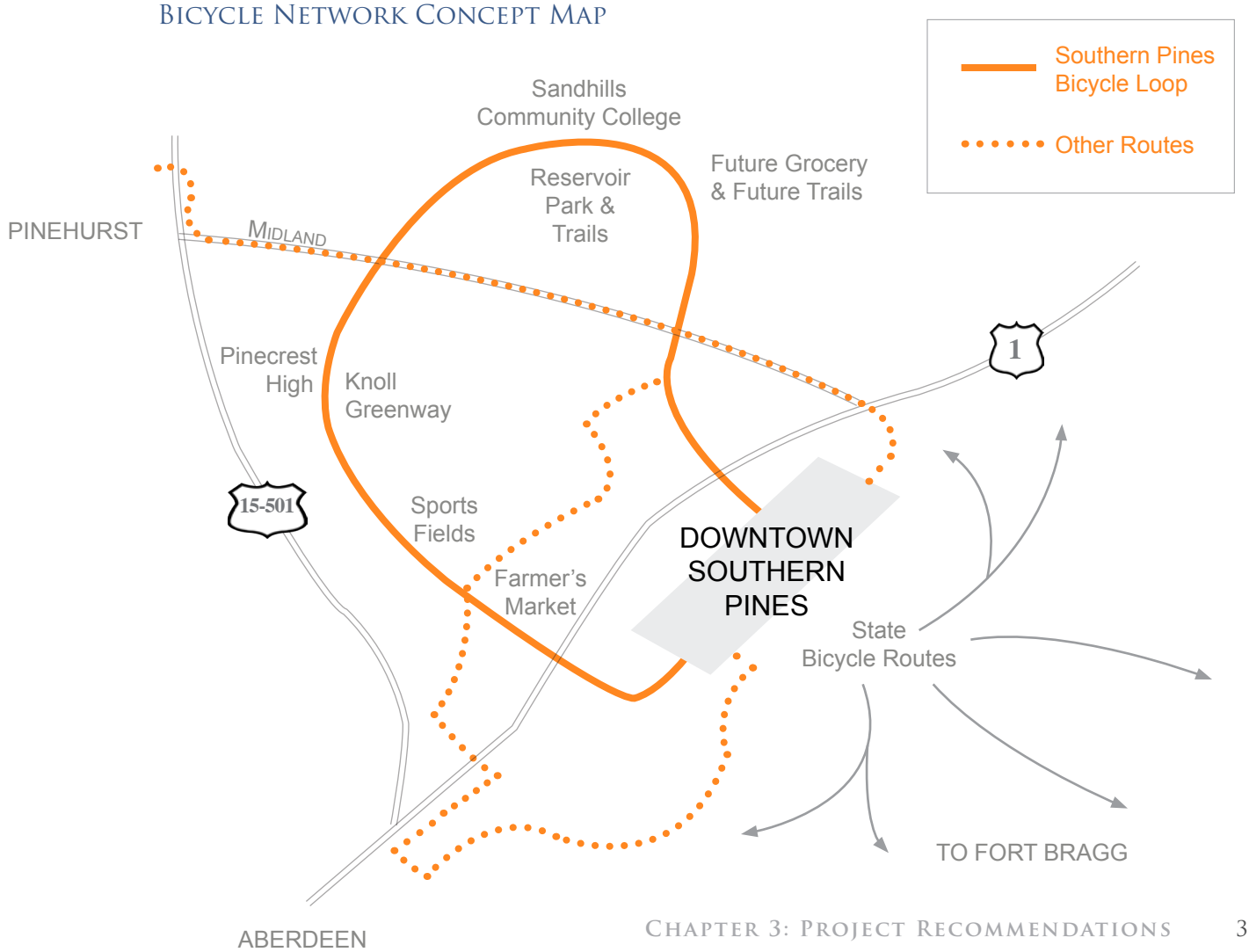
- Local resources for implementing future bicycle education and encouragement programs could draw upon existing networks of advocates, built by organizations such as the Sandhills Cycling Club and Rainbow Cycles.

3. Project Recommendations

Overview

The recommended bicycle network (page 3-3) represents a connected system that will allow transportation and recreation-based bicycle travel throughout Southern Pines. The recommended network is composed of numerous types of on-road and off-road bicycle facilities that fit each segment best. The overall framework of the network is a complete loop route with connections to and away from the loop. This chapter contains descriptions of the bicycle facility types, an overall map, and individual cutsheets that describe each segment of the overall network.

Bicycle Network Concept Map



Recommended Bicycle Facilities

Bicyclists have the same rights and responsibilities as motorists, and are allowed to ride on all roads in Southern Pines, except for limited access highways (e.g., US 1 north of Morganton). Modifications to roadways in Southern Pines will make bicycling a safer and more viable form of transportation. Below are brief descriptions of seven types of bicycle facilities recommended for roadways in Southern Pines. **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 bike 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.*

Bicycle Shared-Lane Markings *Shared lane markings 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.*

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. Southern Pines has several unpaved trails that could accommodate both walking and biking with minor improvements.*

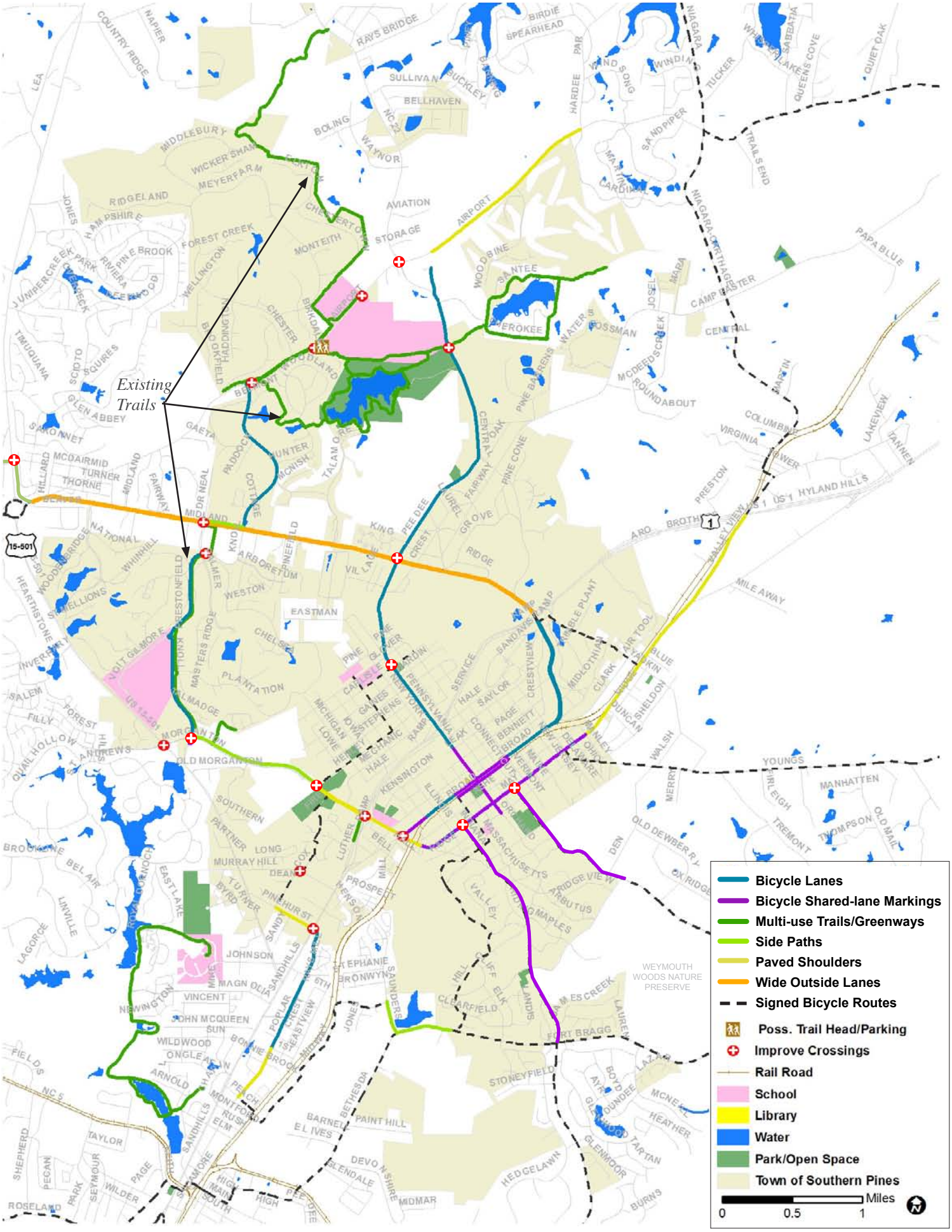
Side Paths *Multi-use trails located within the roadway corridor right-of-way, or adjacent to roads, are called 'side paths'. Side paths are most appropriate in corridors with few driveways and intersections. Bicycle routes where side paths are recommended should also have adequate on-road bicycle facilities (such as paved shoulders or bicycle lanes) wherever possible.*

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.*

Wide Outside Lanes *A wide outside is the travel lane closest to the curb and gutter of a roadway, when it is at least fourteen feet wide (14' is the standard lane width to accommodate both motorists and bicyclists). Wide outside lanes allow motorists to more safely pass slower moving bicyclists without changing lanes. Wide outside lanes are intended for bicyclists with traffic-handling skills.*

Signed Bicycle Routes *Rather than a specific a 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 more comprehensive signed bicycle route system is recommended as the bicycle facility network develops.*

MAP 3.1 RECOMMENDED BICYCLE FACILITIES



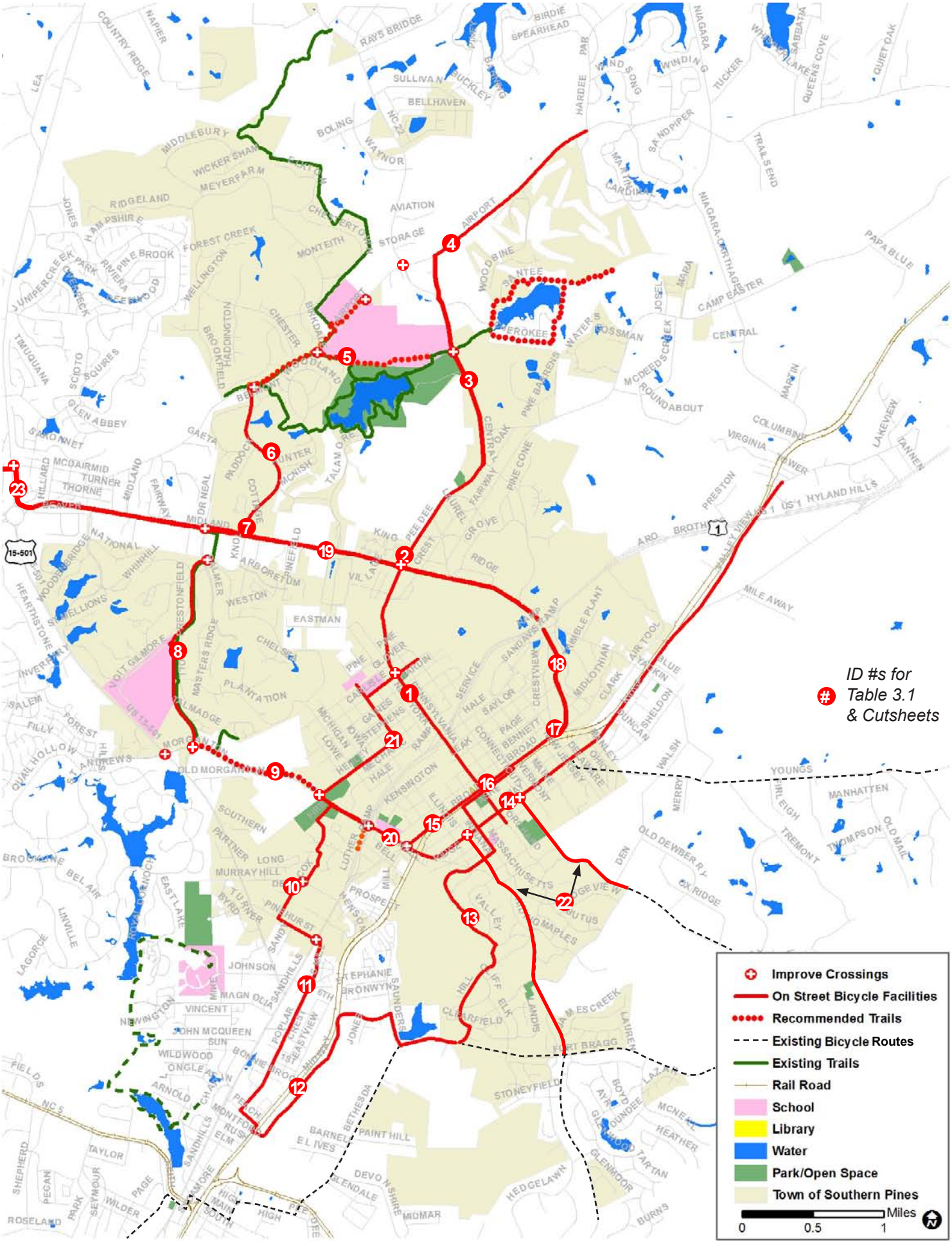
Project Cutsheets

The following pages offer detailed information on each section of road (and trail) that has bicycle facility recommendations in Southern Pines. These cutsheets provide Town staff, NCDOT staff, and related transportation agencies with a clear picture of what facility types are recommended on which roads, and provide related information for ease of use in implementation.

TABLE 3.1 PROJECT LIST

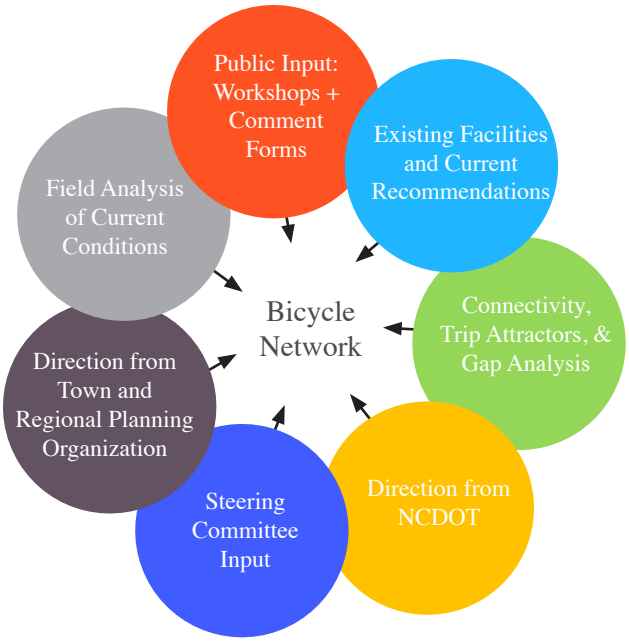
MAP 3.2 ID #	Road	From	To	Distance (Ft)	Existing Road Condition	Approx Road Width (Ft)	Bicycle Recommendation	Construction Method	Phase	Repaving Schedule (Ballpark)
1	**Pennsylvania Ave**	Leak St	Pine St	4,890	2 Lane W Center Turn Lane (curb/gutter)	48	Bike Lane	Stripe	Phase 1	(Need NCDOT input)
2	**Pee Dee Rd**	Pine St	Central Dr	8,190	2 Lane (grass shoulder)	22	Bike Lane	New Const	Phase 3 or upon resurfacing	(Need NCDOT input)
3	**Central Dr**	Pee Dee Rd	Airport Rd	8,109	2 Lane (grass shoulder)	25	Bike Lane	New Const	w/ Future Sewer Line	(Need NCDOT input)
4	**Airport Rd**	Central Dr	Cardinal Dr	7,324	2 Lane (grass shoulder)	24	Paved Shoulder	New Const	Phase 3 or upon resurfacing	(Need NCDOT input)
5	**Park and School Multi Use Trails**	(multiple locations)	(multiple locations)	10,229	n/a	n/a	Multi Use Trail	New Const	Phase 2	Not Applicable (Trail)
6	**Knoll Rd**	Airport Rd	Midland Rd	6,477	2 Lane W Center Turn (paved shoulder)	38	Bike Lane	Road Diet	Phase 3 or upon resurfacing	(Need Town input)
7	**Midland Rd**	Knoll Rd	Knoll Rd Greenway	1,900	n/a	n/a	Sidepath	New Const	Phase 2	Not Applicable (Sidepath)
8	**Knoll Rd**	Knoll Rd Greenway	Morganton Rd	8,100	2 Lane (grass houlder)	25	Bike Lane	New Const	Phase 3 or upon resurfacing	(Need Town input)
9	**Morganton Rd**	Knoll Rd	Henley St	5,185	2 Lanes Each Way Divided (curb/gutter)	73 (w/ median)	Sidepath	New Const	w/ Future Development	Not Applicable (Sidepath)
10	**Pinehurst/Richards/Cox/ Murry Hill/Fire**	Morganton Rd	Sandhills Blvd	6,752	2 Lane (grass shoulder & curb/gutter)	24	Bike Route	Signage	Phase 3	2011 (for Pinehurst Ave)
11	**Poplar Ave**	Sandhills Blvd	Peach Ave	7,180	2 Lane (grass shoulder & curb/gutter)	28	Bike Lane/Paved Shoulder	Stripe/Re Stripe	TBD	(Need NCDOT input)
12	**Midway Rd**	Saunders Blvd	Orange St	8,072	2 Lane (grass shoulder)	22	Bike Route	Signage	Phase 3 resurfacing	Not Applicable (Signage Only)
13	**Saunders/Bethesda/Barber/ Country Club/Mass.**	Broad St	Midway Rd	15,500	2 Lane (grass shoulder)	22	Bike Route/Side Path	Signage/New Const	Phase 3	Not Applicable (Signage/Sidepath)
14	**May St**	Manley Ave	Morganton Rd	6,477	2 Lane (curb/gutter)	28	Sharrows	Pavement Symbols	Phase 1	(Need NCDOT input)
15	**Broad St**	Massachusetts Ave	Morganton Rd	2,400	2 Lane (curb/gutter)	39	Bike Lane/Sharrows	Re Stripe/ Stripe	Phase 1	(Need NCDOT input)
16 A	**Broad St**	Vermont Ave	Massachusetts Ave	2,375	1 Lane Each Way w Parking (curb/gutter)	33	Sharrows	Pavement Symbols	Phase 1	(Need NCDOT input)
16 B	**Pennsylvania Ave**	Leak St	Ridge St	3,028	2 Lane w Parking (curb/gutter)	49	Sharrows	Pavement Symbols	Phase 1	(Need NCDOT input)
17	**Broad St**	Vermont Ave	Midland Rd	2,407	2 Lane (curb/gutter)	22	Bike Lane	New Const	NCDOT Project: 2011	2011 Top Seal Project
18	**Midland Rd**	Broad St	US 1	3,865	2 Lanes Each Way Divided (grass shoulder)	60 (w/ 15' median)	Bike Lane	Road Diet/ Re Stripe	NCDOT Project: 2011	2011 Top Seal Project
19	**Midland Rd**	US 1	15-501	18,700	2 Lanes Each Way Divided (grass shoulder)	60 (w/ 15' median)	Wide Outside Lane	Re Stripe + 1' New Const	Phase 2	(Need NCDOT input)
20	**Morganton Rd**	May St	Henley St	3,985	1-2 Lanes Each Way + Center Turn (curb/ gutter)	65 to 30	Paved shoulder or Wide Outside Lane w/ Sharrow	Re Stripe + New Construction	NCDOT Project: 2012	2012
21	**Carlisle/Indiana/Henley**	Connecticut	Morganton Rd	7,830	2 Lane (grass shoulder)	20 to 30	Bike Route	Signage	Phase 2	(Need Town input)
22	**Indiana & Connecticut (State & County Bike Routes)**	May St	Town Limits	9,300 + 5,500	2 Lane (grass shoulder)	20 to 22	Sharrows	Pavement Symbols & Signage	Phase 1	(Need NCDOT input)
23	**Midland Rd + 15-501**	Airport Rd	Memorial Dr	2,640	n/a	n/a	Sidepath	New Const	Phase 3	Not Applicable (Sidepath)

MAP 3.2 RECOMMENDED BICYCLE FACILITIES BY SEGMENT (PROJECT CUTSHEET KEY)



Methodology for Recommendations and Phasing

The bike facility network was designed by first assembling all existing bicycle-related recommendations and information from current plans and studies. Next, a thorough analysis with geographic information systems (GIS) and fieldwork was conducted to examine roadways for recommendations. The assembled information was then presented to the public, local government staff, the Steering Committee, and various project stakeholders. Together, the input from these groups helped to inform the overall system design; through writing and drawing on input maps, filling-out comment forms, direct dialogue, and e-mailed comments. Finally, recommendations were further refined based on full draft plan input and review from the project Steering Committee, NCDOT, and Town of Southern Pines staff. These and other key inputs are shown in the diagram at right.



Recommendations for Intersections and Crossing Improvements

Some intersections and roadway crossings are identified on maps 3.1 and 3.2 for improvements. This *Bicycle* Plan recommends several *pedestrian* improvements due to the fact that less experienced bicyclists often prefer to cross intersections as pedestrians. These improvements are noted in the following table as well as in their corresponding project cutsheets. Page numbers listed refer to further guidance on each treatment type in Appendix A.

Intersection or Crossing	High-visibility, ladder-style crosswalks (page A-25)	Pedestrian Activated Countdown Signal (page A-29)	Median Refuge Island (page A-44)	Bicycle Activated Loop Detector (page A-14)	Trail Crossing Signage (page A-43)
Pennsylvania & Carlisle	✔				
Central @ Reservoir Park Trail	✔				✔
Airport & Central	✔				
Airport @ Sandhills CC			✔		✔
Airport @ Reservoir Park Trail	✔		✔		✔
Midland @ Knoll Greenway	✔		✔		✔
Knoll @ Knoll Greenway	✔				✔
Knoll & Morganton	✔	✔			✔
15-501 & Morganton	✔	✔	✔		
US 1 & Morganton	*See cutsheet 20 for details on this intersection*				
Morganton & Henley	✔		✔		✔
Broad & Morganton	✔	✔		✔	
Murry Hill & Richards/Cox	*See cutsheet 10 for details on this intersection*				
US 1 & Pinehurst	✔	✔		✔	
Pee Dee & Midland				✔	
May & Connecticut	✔	✔		✔	
May & Indiana	✔	✔		✔	
15-501 & Memorial	✔	✔	✔		✔

Cost Estimate Totals & Assumptions

Total for Phase 1 (Cutsheets 1, 14, 15 and 16)	**$59,285.26**

*Cost reduced if done during scheduled resurfacing

Grand Total Estimate for All Projects	**$8,481,954.20**

*Cost reduced if done during scheduled resurfacing

Cost Estimate Assumptions	
4'' stripe removal: $/foot	*$0.40*
4'' stripe placement: $/foot	*$0.60*
New paved shoulder or bicycle lanes: $/mile (both sides)	*$440,000.00*
Sharrow or bicycle lane markings: $/marking	*$250.00*
Signage: $/sign installed	*$250.00*
10' Wide Multi-Use Trail or Sidepath: $/foot	*$133.00*

Sources include NCDOT, past projects, and current projects in other locations. ROW costs not included. Tables should be updated with local costs as projects are completed.

Project Cutsheet 1:

Pennsylvania Ave

To/From: Leak/Pine

Distance (feet): 4,890

Facility Type: Bicycle Lane

Construction Method:
The existing striped shoulder can be used as bicycle facility in the short-term. Regular street sweeping to the curb face is recommended. Converting the shoulders to bicycle lanes would require relocation of a few parking space along the corridor and painting the bicycle lane symbol and arrow.

Trip Generators: Downtown Southern Pines, Douglas Community Center, and residential areas

Development/Funding Mechanism:
Encroachment Agreement from Local NCDOT. Local CIP funding for bicycle lane markings, signage, and relocation of parking

Road/Land Ownership:
NCDOT

Existing Lane Configuration:
2 Lane w/ Center Turn
and occasional parking (48'):
7 | 11.5 | 11 | 11.5 | 7

Proposed Lane Configuration:
2 Lane w/ Center Turn
and Bicycle Lanes (48'):
7 | 11.5 | 11 | 11.5 | 7

Constraints: May need to study existing parking situation to determine if side streets have capacity to relocate parking. Town of Southern Pines would need to extend street sweeping to include this corridor. No known ROW constraints for what is recommended.

Notes/Comments: This is a low cost opportunity to create the first major segment of the proposed bicycle loop for Southern Pines.

Below: Existing Conditions

Project Cutsheet 1

Project Segment Road	Pennsylvania Ave
From	Leak
To	Pine
Facility Type	Bicycle Lane
Method	Stripe
Miles	0.93
Feet	4,890
Number of Lanes	2

# of bike lane symbol markings (start/stop & at intersections)	24
$/marking	$250
Subtotal	*$6,000.00*

# of signs (start/stop & at major intersections)	8
$/sign	$250
Subtotal	*$2,000.00*

Total Estimate	**$8,000.00**
Contingency	0.15
Grand Total	**$9,200.00**

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 2:

Pee Dee Road

To/From: Pine St/Central Dr
Distance (feet): 8,190

Facility Type: Bike Lane

Construction Method:
New Construction: Add 5' pavement width to each side; existing shoulder space is already mostly cleared and level; some signs would need to be relocated.

Trip Generators:
Sandhills Community College & Reservoir Park to the north and Downtown Southern Pines to the south.

Development/Funding Mechanism:
Town to obtain encroachment agreement from NCDOT. Funding source has not been identified.

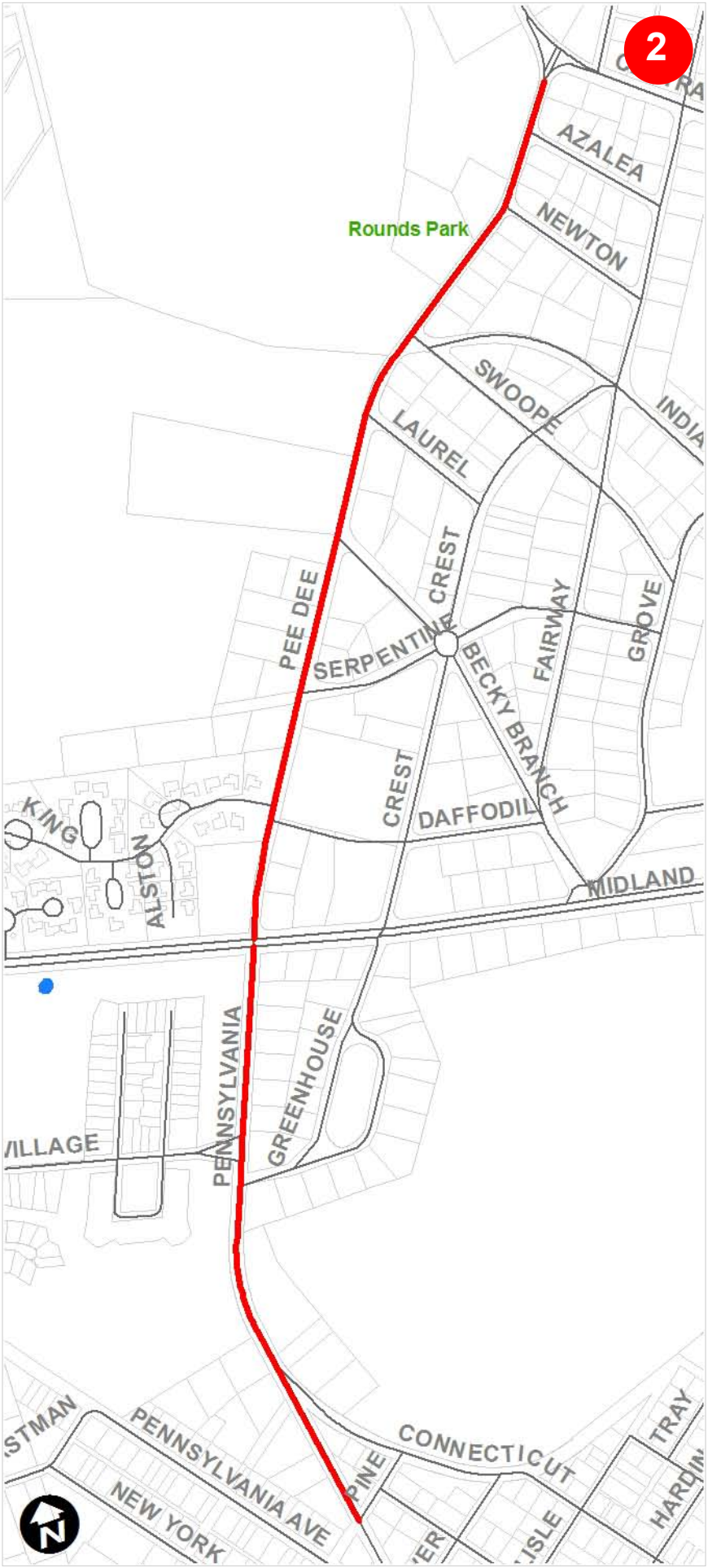
Road/Land Ownership:
NCDOT

Existing Lane Configuration:
2 Lane (22'):
11 | 11

Proposed Lane Configuration:
2 Lane with Bicycle Lanes (32'):
5 | 11 | 11 | 5

Constraints: Funding.
ROW needs to be researched.

Notes/Comments: The Southern Pines Sidewalk Master Plan calls for a sidewalk on the east side of Pee Dee Road, identified for construction in 2011. The sidewalk should be set back far enough from the roadway to allow a minimum 2-3 foot buffer between the planned pavement width for the bicycle lane and the sidewalk.



Below: Existing Conditions

Below: Rendering with bike lanes

Project Cutsheet 2

Project Segment Road	Pee Dee
From	Pine St
To	Central Dr
Facility Type	Bicycle Lane
Method	New Construction
Miles	1.55
Feet	8,190
Number of Lanes	2

Miles of new pavement for bike lanes or shoulders	1.55
$/mile*	*$440,000.00*
Subtotal	*$682,500.00*

# of bike lane symbol markings (start/stop & at intersections)	24
$/marking	250
Subtotal	*$6,000.00*

# of signs (after major intersections)	4
$/sign	$250
Subtotal	*$1,000.00*

Total Estimate	**$689,500.00**
Contingency	0.15
Grand Total	**$792,925.00**

*Project cost reduced if done during scheduled resurfacing

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 3:

Central Drive

To/From: Pee Dee Rd/Airport Rd
Distance (feet): 8,109

Facility Type: Bicycle lanes

Construction Method:
New Construction: Add 5' pavement width, total, and restripe; existing shoulder space is already mostly cleared and level; limited regrading of drainage ditches may be required.

Trip Generators:
Sandhills Community College & Reservoir Park to the north and Downtown Southern Pines to the south.

Development/Funding Mechanism:
Town to obtain encroachment agreement from NCDOT. Funding source has not been identified (see note below)

Road/Land Ownership:
NCDOT

Existing Lane Configuration:
2 Lane with Paved Shoulders (25'):
1-2 | 11 | 11 | 1-2

Proposed Lane Configuration:
Same, but with bicycle lanes (30'):
4 | 11 | 11 | 4

Constraints: Close coordination with future grocery/shopping center development required. No known ROW constraints for what is recommended.

Notes/Comments:
New water line being put in along Central may be an opportunity to add pavement width for wider shoulders.

Current ADT is about 7,600

Below: Existing Conditions

Project Cutsheet 3

Project Segment Road	Central Dr
From	Pee Dee Rd
To	Airport Rd
Facility Type	Paved Shoulder
Method	New Construction
Miles	1.54
Feet	8,109
Number of Lanes	2

# of 4 inch stripes to remove	4
$/foot*	0.4
Subtotal	*$12,974.40*

Miles of new pavement for bike lanes or shoulders	1.54
$/mile*	*$440,000.00*
Subtotal	*$675,750.00*

# of 4 inch stripes to stripe	4
$/foot*	0.6
Subtotal	*$19,461.60*

Total Estimate	**$708,186.00**
Contingency	0.15
Grand Total	**$814,413.90**

*Project cost reduced if done during scheduled resurfacing

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 4:

Airport Road

To/From: Central Dr/Cardinal Dr

Distance (feet): 7,324

Facility Type: Paved Shoulder

Construction Method:
New Construction: Add 6' pavement width, total, and restripe; existing shoulder space is already mostly cleared and level.

Trip Generators:
Sandhills Community College, Reservoir Park, future grocery and future trails to south; residential areas and regional connections to the north.

Development/Funding Mechanism:
Town to obtain encroachment agreement from NCDOT. Funding source has not been identified.

Road/Land Ownership:
NCDOT

Existing Lane Configuration:
2 Lane (24'):
12 | 12

Proposed Lane Configuration:
2 Lane w/ Paved Shoulders (30):
4 | 11 | 11 | 4

Constraints: Lane widths narrow dramatically heading into the roundabout (especially from the south). A bicyclists would have to take the lane or cross through as a pedestrian. However, sidewalks and crosswalks are needed in order to cross more safely as a pedestrian (curb cuts and refuge islands are already in place). No known ROW constraints for what is recommended.

Notes/Comments: The most up-to-date GIS data available was used to create the map at right, yet some parcel lines may be outdated.

Current ADT is about 7,000

Below: Existing Conditions

Project Cutsheet 4

Project Segment Road	Airport Rd
From	Central Dr
To	Cardinal Dr
Facility Type	Paved Shoulder
Method	New Construction
Miles	1.39
Feet	7,324
Number of Lanes	2

# of 4 inch stripes to remove	4
$/foot*	0.4
Subtotal	*$11,718.40*

Miles of new paved shoulder	1.39
$/mile*	*$440,000.00*
Subtotal	*$610,333.33*

# of 4 inch stripes to stripe	4
$/foot*	0.6
Subtotal	*$17,577.60*

Total Estimate	**$639,629.33**
Contingency	0.15
Grand Total	**$735,573.73**

*Project cost reduced if done during scheduled resurfacing

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 5:

Park & School Multi-Use Trails

To/From: Reservoir Park/Airport Rd

Distance (feet): 10,229

Facility Type: Multi-Use Trail

Construction Method:
New Construction and Trail Retrofit:

Trip Generators:
Sandhills Community College, Reservoir Park, future grocery, future trails, and residential areas.

Development/Funding Mechanism:
Obtain easements from all impacted property owners. Consult with local NCDOT regarding midblock crossings on Airport Rd. Existing crosswalks enter an island of yellow stripping; median refuge islands should be considered.

Road/Land Ownership:
Sandhills Community College,
Sandhills Independent School,
NCDOT, and the Town of Southern Pines.

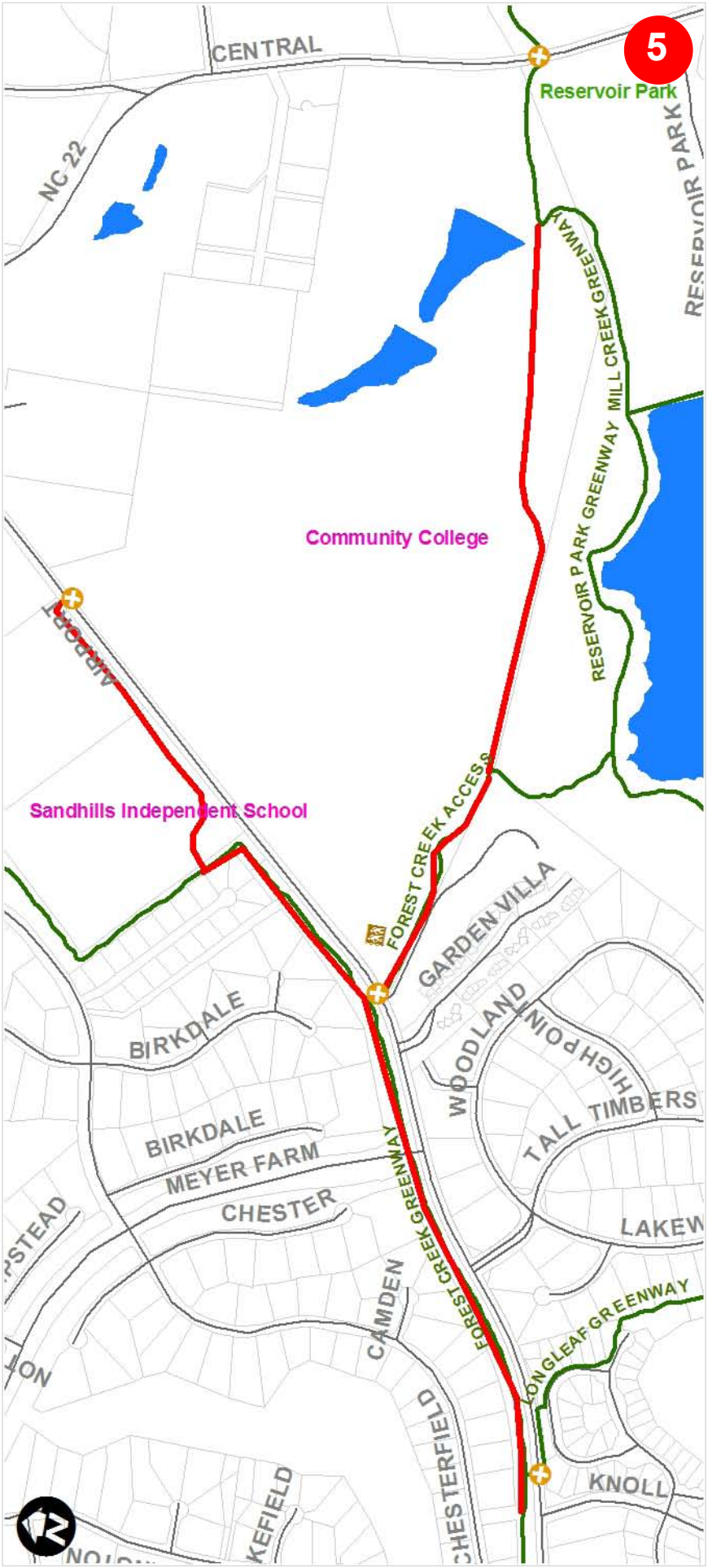
Existing Lane Configuration:
N/A

Proposed Lane Configuration:
N/A

Constraints:
Easements and environmental permitting required. ROW needs to be secured with Sandhills Community College & Sandhills Independent School

Notes/Comments: First step is to meet with the appropriate staff from each of the schools where proposed trails are located.

Proposed trail that overlaps with existing trail indicates a proposed trail retrofit, from unpaved/variable width trail, to a 10' wide paved multi-use trail. Having paved trail for these sections will provide an opportunity for bicyclists to use these portions for both recreation *and transportation*.



Below: Existing Conditions

Project Cutsheet 5

Project Segment Road	Park and Schools Multi-Use Trail
From	Reservoir Park
To	Airport Rd
Facility Type	Multi Use Trail
Method	New Construction
Miles	1.94
Feet	10,229

10' Wide Multi-Use Trail Distance (mile)	1.94
$/foot*	133
Subtotal	*$1,360,457.00*

Total Estimate	**$1,360,457.00**
Contingency	0.15
Grand Total	**$1,564,525.55**

*Project cost of $133/LF is on the high end of state-wide averages

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Below: Rendering with multi-use trail

Project Cutsheet 6:

Knoll Road

To/From: Airport Rd/Midland Rd

Distance (feet): 6,477

Facility Type: Bike Lane

Construction Method:
Road Diet: Remove center turn lane and restripe w/ bicycle lanes

Trip Generators: Reservoir Park, existing and proposed trails, and Sandhills Community College to the north, Knoll Greenway and Pincrest High School to the south.

Development/Funding Mechanism:
Undetermined

Road/Land Ownership:
Town of Southern Pines

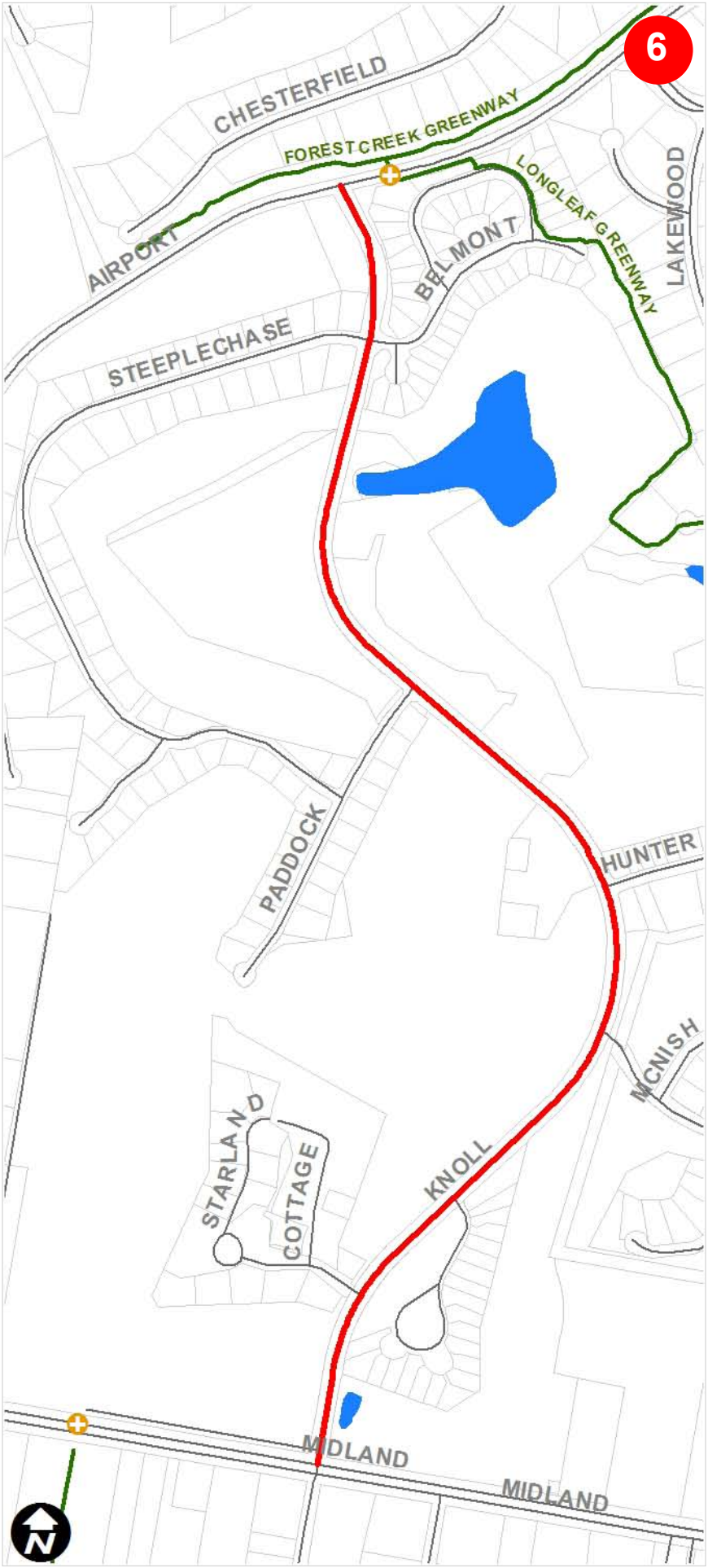
Existing Lane Configuration:
2 Lane w/ Center Turn Lane and small shoulders (38'):
1 | 11 | 14 | 11 | 1

Proposed Lane Configuration (A):
2 Lane w/ Center Turn Lane and Bicycle Lanes (38'):
4 | 10 | 10 | 10 | 4

Proposed Lane Configuration (B):
2 Lane w/ Shared Bicycle & Golf Cart Lanes (No Center Turn Lane) (38'):
7 | 12 | 12 | 7

Constraints: For proposed Lane Configuration B , the removal of the Center Turn Lane may require further study, particularly at Hunter, where sight lines for turning vehicles are limited due to the curve in the road. No known ROW constraints for what is recommended.

Notes/Comments: Currently 40 MPH: Consider dropping to 35 MPH.



Below: Existing Conditions

Project Cutsheet 6

Project Segment Road	Knoll Rd
From	Airport Rd
To	Midland Rd
Facility Type	Bicycle Lane
Method	Road Diet/Restripe
Miles	1.23
Feet	6,477
Number of Lanes	2

# of 4 inch stripes to remove	4
$/foot*	0.4
Subtotal	*$10,363.20*

# of 4 inch stripes to stripe	4
$/foot*	0.6
Subtotal	*$15,544.80*

# of bike lane symbol markings (start/stop & at intersections)	14
$/marking	$250
Subtotal	*$3,500.00*

# of signs (after major intersections)	4
$/sign	$250
Subtotal	*$1,000.00*

Total Estimate	**$30,408.00**
Contingency	0.15
Grand Total	**$34,969.20**

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

*Project cost eliminated if done during scheduled resurfacing

Project Cutsheet 7:

Midland Road

To/From: Knoll Rd Greenway/ Knoll Road

Distance (feet): 1,900

Facility Type: Sidepaths

Construction Method: New Construction:
1) Extend the 10' greenway trail through the pines to join the southeast corner of the intersection of Midland/Dr. Neal Rd.

2) Stripe a high-visibility crosswalk on the east side of Dr. Neal Rd at Midland, crossing Midland Rd.

3) The nose of the landscaped (but not raised) median does not go far enough west to meet the location of where the crosswalk will be striped so part of this recommendation is to extend the median so that vehicles turning left will not interfere with ped safety in the crosswalk.

4) Install advance warning signs (pedestrian crossing ahead) in both directions for motorists on Midland Rd.

5) Install warning sign for northbound motorists on Dr. Neal Rd. (exiting the Mid Pines South neighborhood) "Right Turns Yield to Pedestrians"

6). Build 10' sidepath along the north side of Midland Rd.

Trip Generators: Knoll Rd Greenway and Pincrest High School to the south, park and schools to the north.

Development/Funding Mechanism: Secure an easement from the Mid Pines South homeowners association/developer and an encroachment agreement from NCDOT. Construction funding unidentified.

Road/Land Ownership:
NCDOT/3 private parcels.

Existing Lane Configuration:
2 Lanes Each Way, Divided (60' w/ 15' Median):
11 | 11 | 15 M | 11 | 11

Proposed Lane Configuration: Same

Constraints: ROW needs to be researched; easements from nearby properties may be necessary. Mid-block crossing warrants are also needed.

Notes/Comments: People are already crossing at this location; in fact, there is a worn asphalt slab in the median, where the greenway currently meets Midland.

Below: Existing Conditions

Below: Rendering with new trail crossing and sidepaths (looking west on Midland with Dr. Neal Drive at right)

Project Cutsheet 7

Project Segment Road	Midland Rd
From	Knoll Rd Greenway
To	Knoll Rd Greenway
Facility Type	Side Path/Multi Use Trail
Method	New Construction
Miles	0.36
Feet	1,900

10' Wide Multi-Use Trail Distance (mile)	0.36
$/foot*	133
Subtotal	*$252,700.00*

# of High Visibility Cross Walks (at Midland/Dr. Neal)	*1*
$/each	*$1,500.00*
Subtotal	*$1,500.00*

# of Curb Ramps with Truncated Domes	*2*
$/each	*$800.00*
Subtotal	*$1,600.00*

Total Estimate	**$255,800.00**
Contingency	0.15
Grand Total	**$294,170.00**

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

*Project cost of $133/LF is on the high end of state-wide averages

Project Cutsheet 8:

Knoll Road

To/From: Knoll Road Greenway/ Morganton Road

Distance (feet): 8,100

Facility Type: Bike Lanes

Construction Method:
New Construction: Add 7' pavement width, total, and restripe; existing shoulder space is already mostly cleared and level; limited regrading of drainage ditches may be required.

Consider paving a small portion of the Knoll Road Greenway, between Midland and Knoll, to better accommodate road cyclists connecting through.

Trip Generators: Knoll Road Greenway, Pincrest High School, commercial areas near Morganton/15-501

Development/Funding Mechanism:
Undetermined

Road/Land Ownership:
Town of Southern Pines

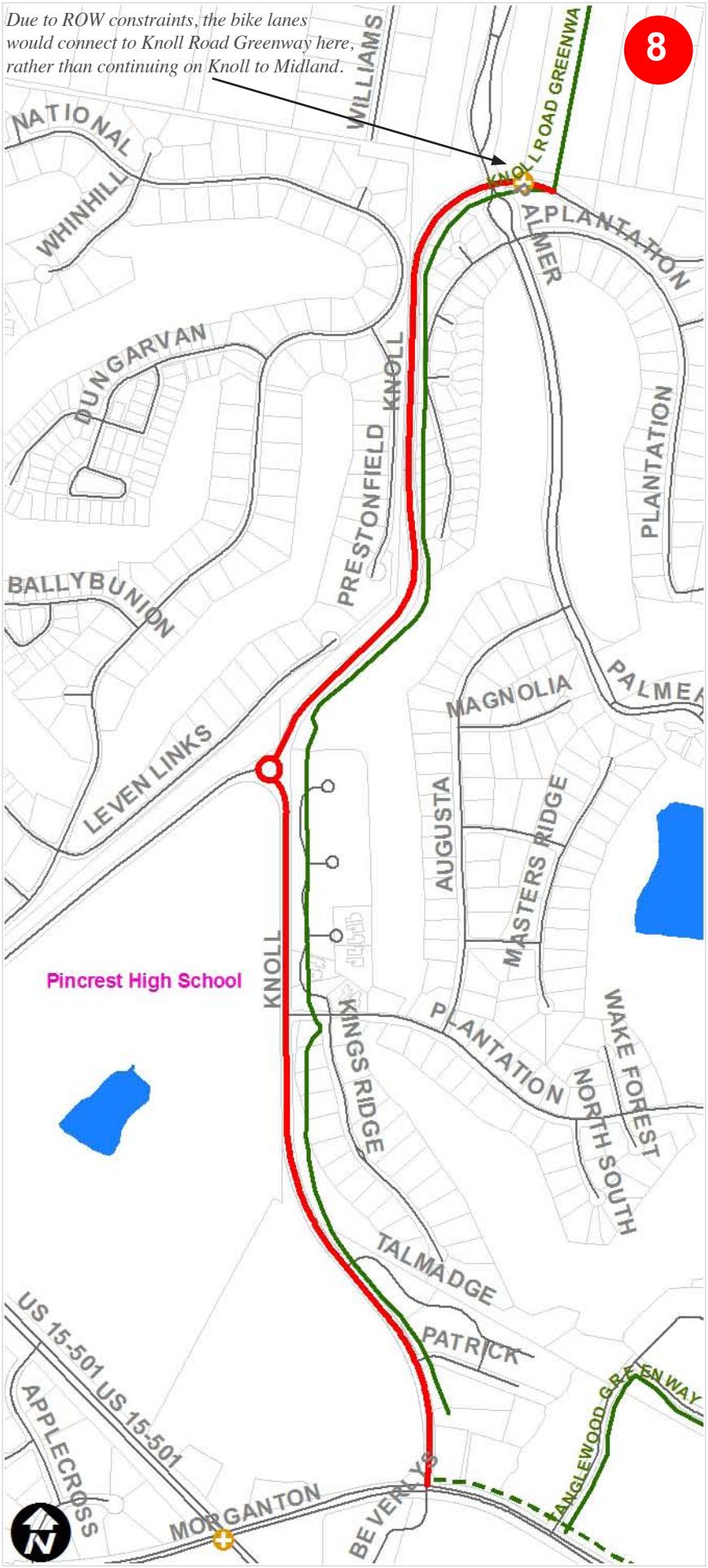
Existing Lane Configuration:
2 Lane (25'):
12.5 | 12.5

Proposed Lane Configuration:
2 Lane (32'):
5 | 11 | 11 | 5

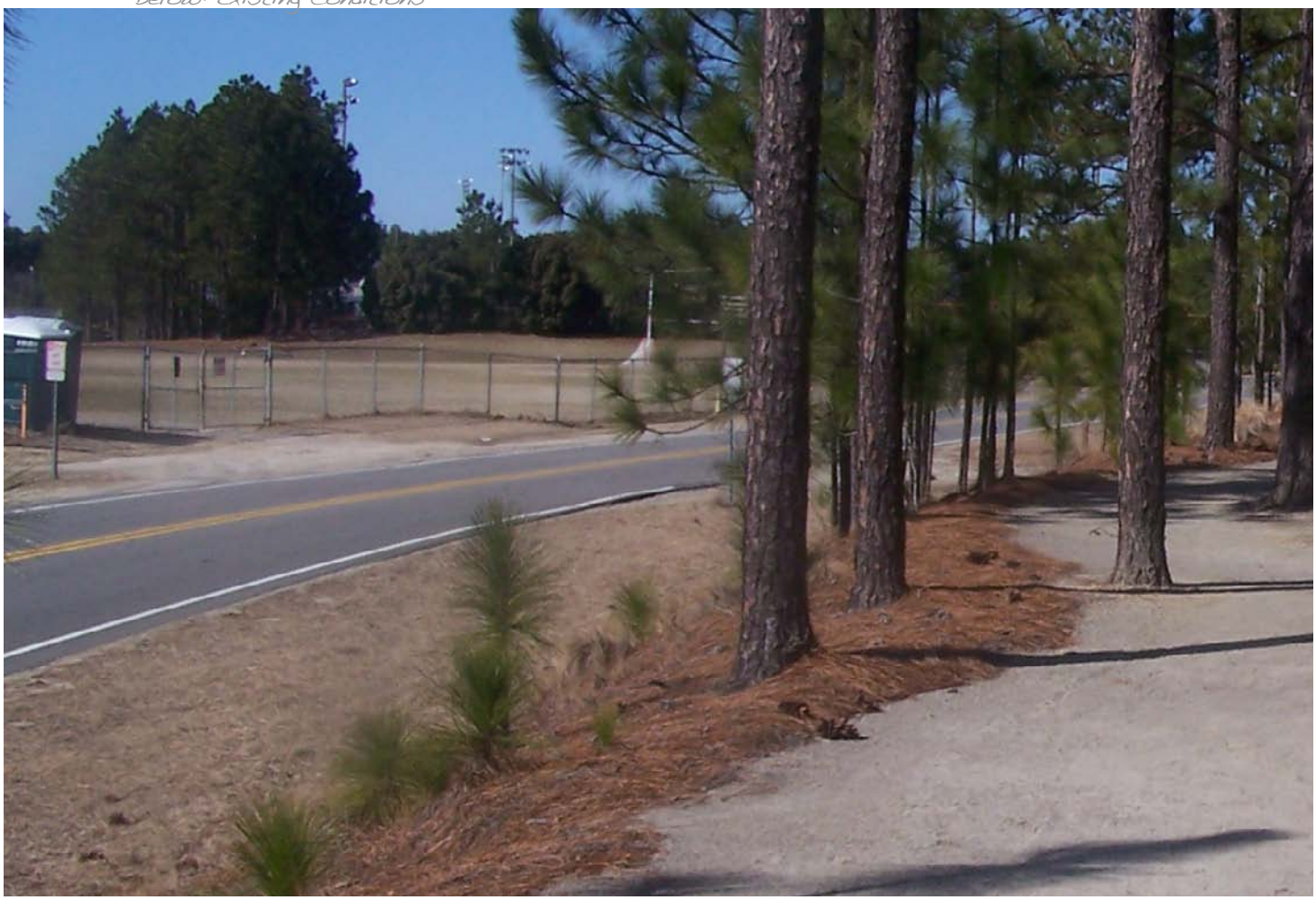
Constraints: Special attention will be needed for upgrading the existing roundabout and the Morganton/Knoll intersection. Bicyclists should have the option to pass through with traffic as a vehicle, or to dismount and cross as a pedestrian.

Due to ROW constraints (such as multiple driveways, sloped shoulders, and tress), the bike lanes would connect north to Knoll Road Greenway near Palmer, rather than continuing on Knoll to Midland.

Notes/Comments: Illegal parking near the high school stadium on Knoll Road way be reduced by the addition and clear delineation of bicycle lanes.



Below: Existing Conditions



Project Cutsheet 8

Project Segment Road	Knoll Road
From	Knoll Road Greenway
To	Morganton Road
Facility Type	Bicycle Lane
Method	New Construction
Miles	1.53
Feet	8,100
Number of Lanes	2

Miles of new pavement for bike lanes or shoulders	1.53
$/mile*	*$440,000.00*
Subtotal	*$675,000.00*

# of bike lane symbol markings (start/stop & at intersections)	12
$/marking	$250
Subtotal	*$3,000.00*

# of signs (start/stop & at major intersections)	6
$/sign	$250
Subtotal	*$1,500.00*

Total Estimate	**$679,500.00**
Contingency	0.15
Grand Total	**$781,425.00**

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

*Project cost reduced if done during scheduled resurfacing

Project Cutsheet 9:

Morganton Rd

To/From: Knoll Rd/Henley St

Distance (feet): 5,185

Facility Type: Sidepath; Also, see notes in map about crossing improvements.

Construction Method:
New construction

Trip Generators: Knoll Road Greenway, Pincrest High School, commercial areas near Morganton/15-501, Armory Field, Morganton Road Sports Complex, future development.

Development/Funding Mechanism:
Secure easements from adjacent land owners/developers, and an encroachment agreement from NCDOT (there is roughly 15' of ROW on the north side). Build in conjunction with future development of adjacent parcels.

Road/Land Ownership:
NCDOT/Multiple private parcels

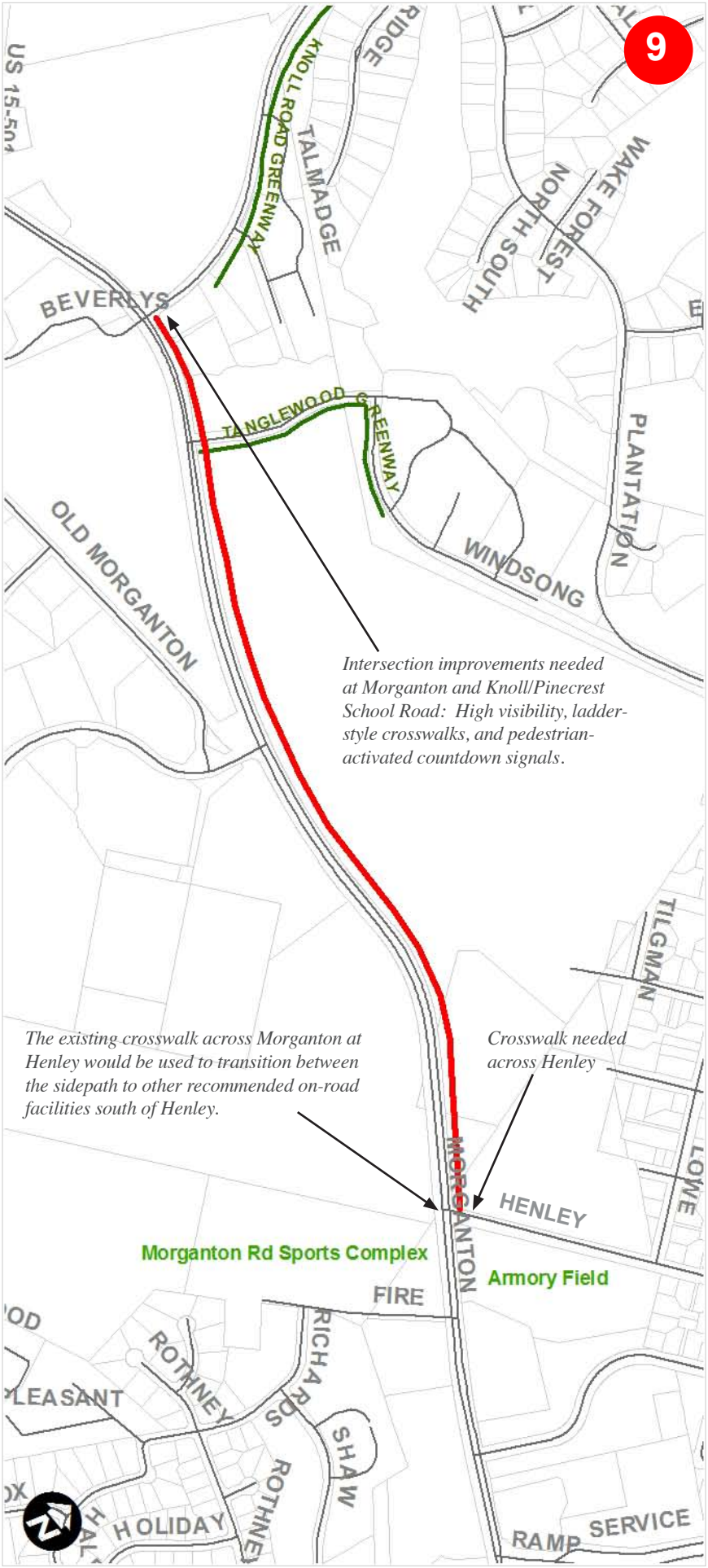
Existing Lane Configuration:
2 Lanes Each Way, Divided
(70 inc. median):
13 | 13 | 18 M | 13 | 13

Proposed Lane Configuration:
Same

Constraints: In addition to the NCDOT encroachment agreement, additional corridor ROW will be required to create a quality bike/ped environment along Morganton Rd. Dedicated easements from future development may be necessary.

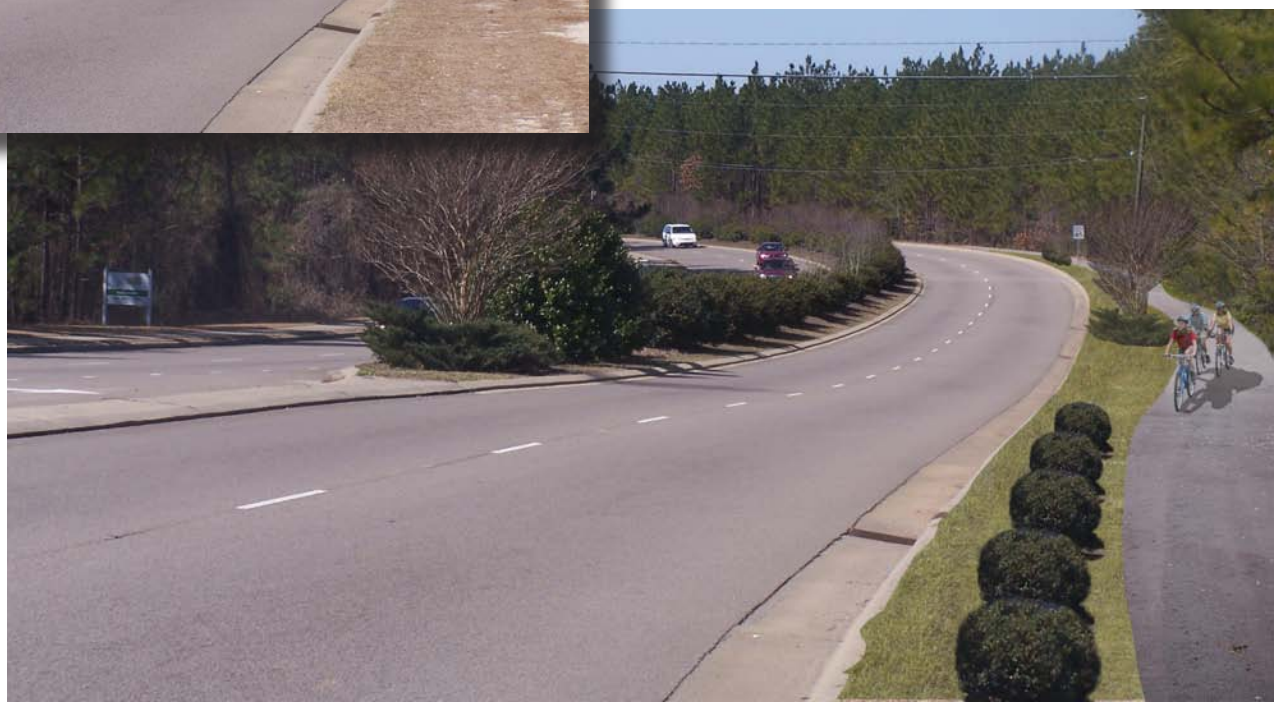
Notes/Comments: Close coordination with the future development of the adjacent parcels will be necessary to successfully developing this sidepath.

Future development along Morganton should be designed with a limited number of driveways, if any, to minimize conflict points with the sidepath.



Below: Existing Conditions

Below: Rendering with sidepath on the north side of Morganton Road.



Project Cutsheet 9

Project Segment Road	Morganton Rd
From	Knoll Rd
To	Henley St
Facility Type	Side Path/Multi Use Trail
Method	New Construction
Miles	0.98
Feet	5,185

10' Wide Multi-Use Trail Distance (mile)	0.98
$/foot*	133
98145.452	*$689,605.00*

# of High Visibility Cross Walks (at Tanglewood & at Henley)	*2*
$/each	*$1,500.00*
Subtotal	*$3,000.00*

# of Curb Ramps with Truncated Domes	*4*
$/each	*$800.00*
Subtotal	*$3,200.00*

Total Estimate	**$695,805.00**
Contingency	0.15
Grand Total	**$800,175.75**

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

*Project cost of $133/LF is on the high end of state-wide averages

Project Cutsheet 10:

Pinehurst/Richards/Murry Hill/Cox/Fire

To/From: Morganton Rd to Sanhills Blvd

Distance (feet): 6,752

Facility Type: Signed bicycle route with paved shoulders on portions of Pinehurst and Murray Hill

Construction Method: Install directional signage. New construction required for paved shoulder sections: Add 4' pavement width to each side, and stripe shoulders; existing shoulder space is already mostly cleared and level; limited regrading of drainage ditches may be required.

Trip Generators: Commercial areas on Sandhills Blvd, residential areas, Morganton Rd Sports Complex, Armory Field, future Morganton Road sidepath, and future on-road bicycle facilities towards the Town of Aberdeen.

Development/Funding Mechanism: Undetermined

Road/Land Ownership: Town of Southern Pines

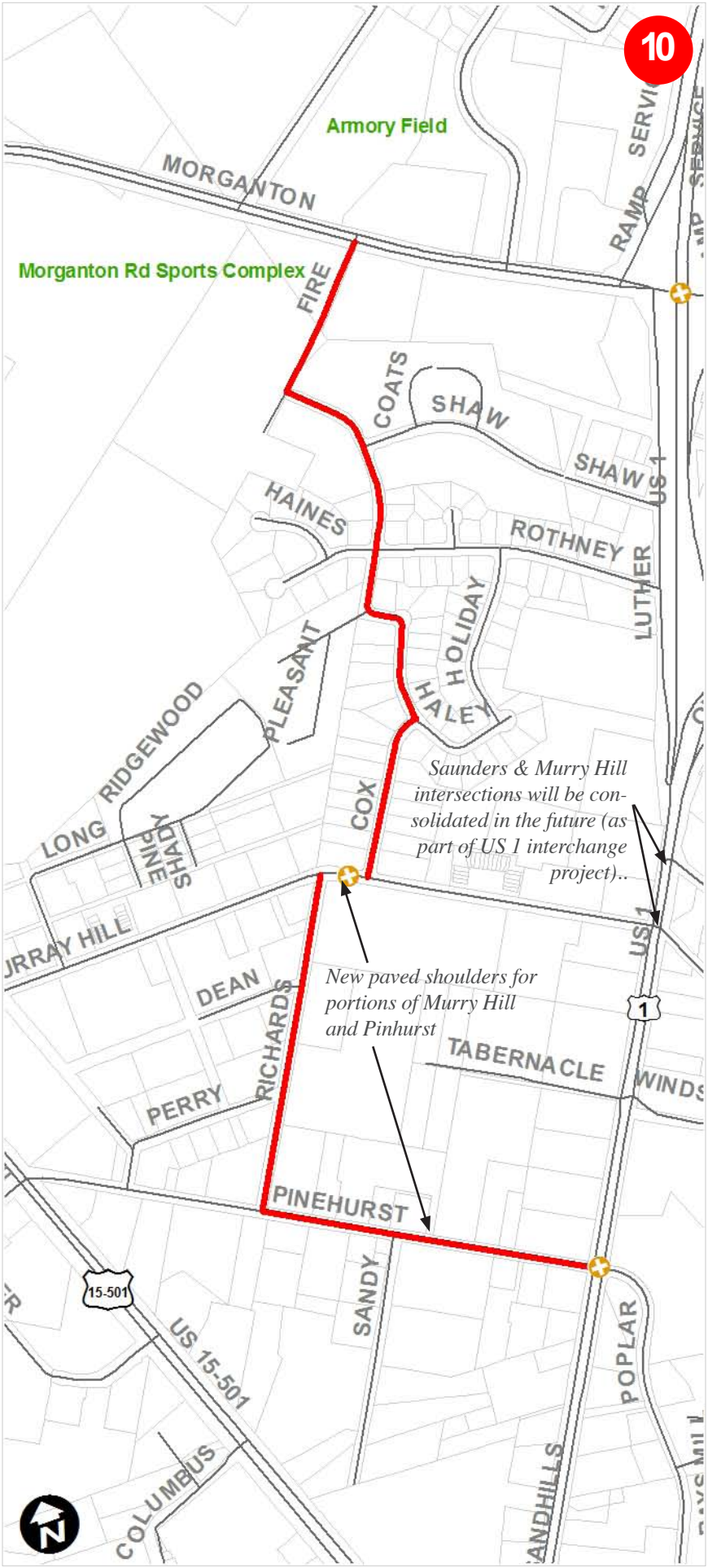
Existing Lane Configuration:
2 Lane (about 24', varies)
12 | 12

Proposed Lane Configuration:
Same, except for portions on Murry Hill and Pinhurst, which would be 2 Lane with Paved Shoulders (32'):
4 | 12 | 12 | 4

Constraints: Sight distances for crossing Murry Hill may require trimming nearby vegetation and continuing the paved shoulder section west, past the curve. No known ROW constraints for most streets on this route; ROW needs to be researched on Murry Hill and Pinhurst only.

Notes/Comments: Intersection improvements will be required at Sandhills Blvd and Morganton Rd.

As noted by the NCDOT Transportation Planning Branch, traversing US 1 at the location shown may require a grade separation in the future, according to potential future upgrades along US 1.



Below: Existing Conditions

Project Cutsheet 10

Project Segment Road	Pinehurst/Richards/Murray Hill/Cox/Fire
From	Morganton Rd
To	Sandhills Blvd
Facility Type	Signed Bicycle Route
Method	Signage/New Const
Miles	1.28
Feet	6,752
Number of Lanes	2

Miles of new pavement for shoulders (on portions of Pinehurst & Murry Hill only)	0.50
$/mile*	*$440,000.00*
Subtotal	*$220,000.00*

# of signs (for wayfinding after intersections)	16
$/sign	$250
Subtotal	*$4,000.00*

# of High Visibility Cross Walks (at Morganton & at Sandhills)	*2*
$/each	*$1,500.00*
Subtotal	*$3,000.00*

Total Estimate	**$227,000.00**
Contingency	0.15
Grand Total	**$261,050.00**

*Project cost reduced if done during scheduled resurfacing

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 11:

Poplar Ave

Note: Regional Connection/ Outside Study Area

To/From: Sandhills Blvd/Peach Ave

Distance (feet): 7,180

Facility Type: Bike Lanes

Construction Method:

1. From Peach to 1st: Add paved shoulders.
2. From 1st to Providence: Stripe bicycle lanes
3. From Providence to Pinehurst: Stripe shoulder (curb space will only allow 2-3 feet)

Trip Generators: Commercial areas on Sandhills Blvd, residential areas, and future on-road bicycle facilities towards the Town of Aberdeen and Downtown Southern Pines.

Development/ Funding Mechanism:
Aberdeen or County would need an encroachment agreement from local NCDOT. Funding undetermined.

Road/Land Ownership:
NCDOT

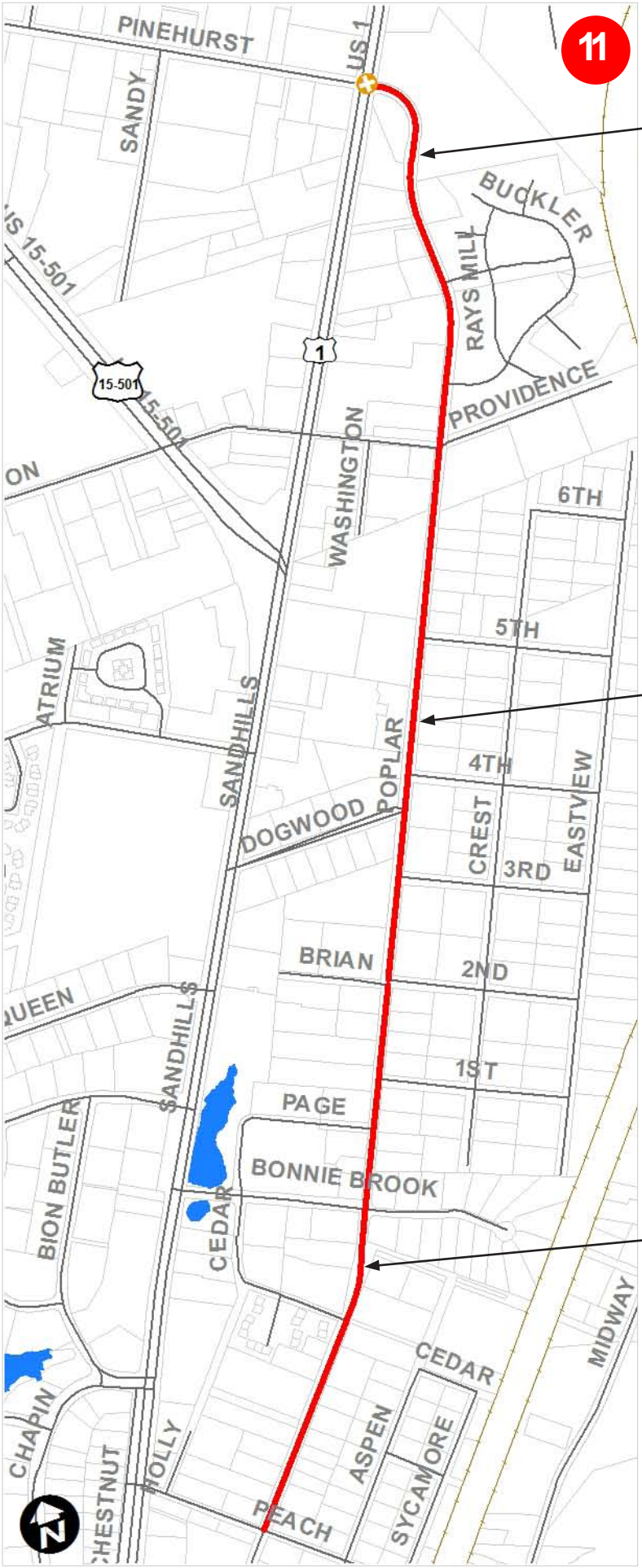
Existing Lane Configuration:
2 Lane (about 28', varies):
14 | 14

Proposed Lane Configuration:
2 Lane with Paved Shoulders/
Bicycle Lanes (about 28', varies):
4 | 10 | 10 | 4

Constraints: Intersection improvements will be required at Sandhills Blvd. ROW needs to be researched from Peach to 1st only.

Notes/Comments: Aberdeen & County to work closely with local NCDOT

As noted by the NCDOT Transportation Planning Branch, traversing US 1 at the location shown may require a grade separation in the future, according to potential future upgrades along US 1.



Below: Existing Conditions

Project Cutsheet 11

Project Segment Road	Poplar Ave
From	Sandhills Blvd
To	Peach Ave
Facility Type	Bike Lanes
Method	New Construction/Stripe
Miles	1.36
Feet	7,180
Number of Lanes	2

Miles of new paved shoulder (from Peach to 1st)	0.43
$/mile*	*$440,000.00*
Subtotal	*$188,250.00*

# of 4 inch stripes to stripe (1st to Johnson/ Providence)	2
$/foot*	0.6
Subtotal	*$8,616.00*

# of bike lane symbol markings (start/stop & at intersections)	16
$/marking	$250
Subtotal	*$4,000.00*

# of signs (start/stop & after major intersections)	8
$/sign	250
Subtotal	*$2,000.00*

Total Estimate	**$202,866.00**
Contingency	0.15
Grand Total	**$233,295.90**

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

*Project cost reduced if done during scheduled resurfacing

Project Cutsheet 12:

Midway Road

Note: Regional Connection/ Outside Study Area

To/From: Saunders Blvd/Orange St

Distance (feet): 8,072

Facility Type: Signed Bicycle Route

Construction Method:
Install directional signage (both ways) at the four intersections/turns along the route.

Trip Generators: Commercial areas on Sandhills Blvd, residential areas, and future on-road bicycle facilities towards the Town of Aberdeen and Downtown Southern Pines.

Development/Funding Mechanism:
Aberdeen or County would need an encroachment agreement from local NCDOT. Funding undetermined.

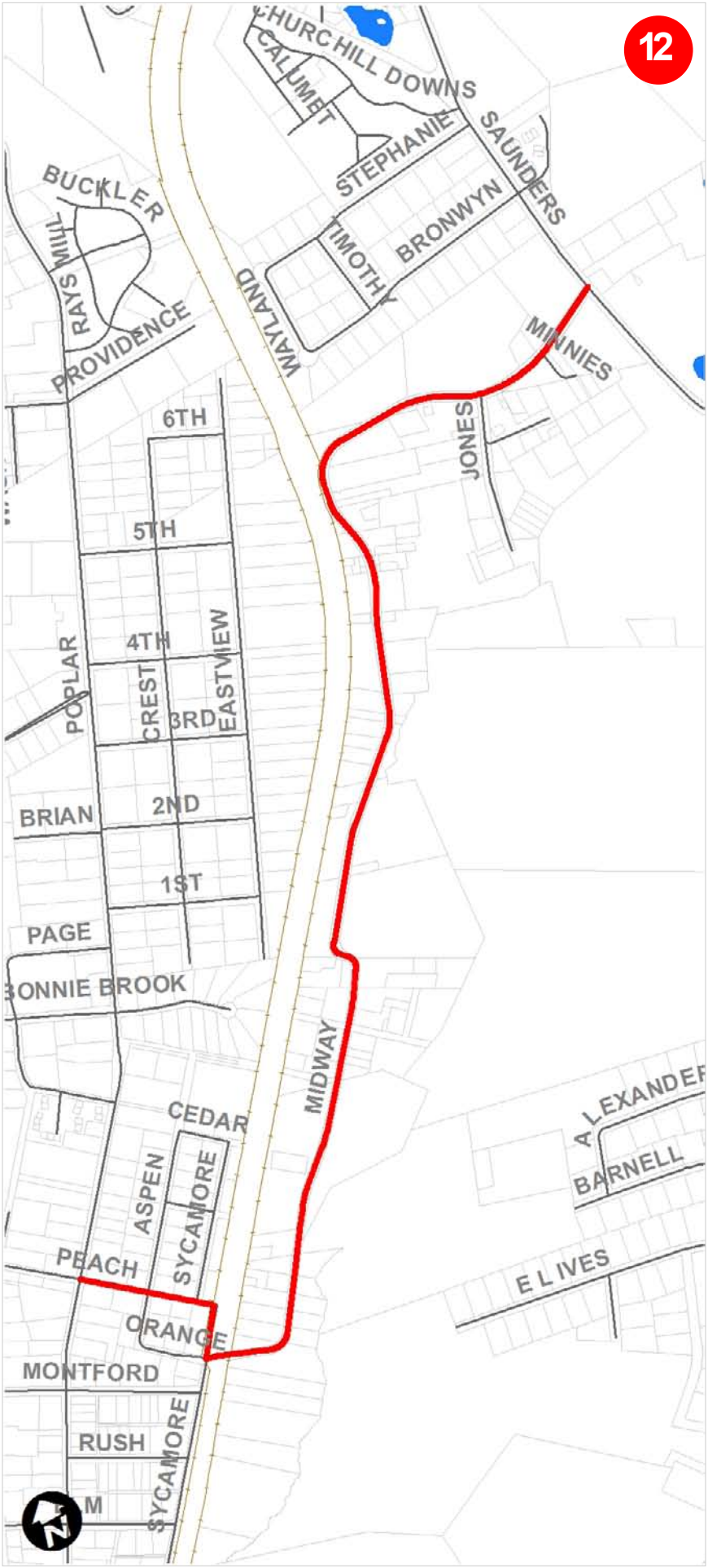
Road/Land Ownership:
NCDOT, except for portions on Sycamore and Peach, which are in Aberdeen or Moore County

Existing Lane Configuration:
2 Lane (22'):
11 | 11

Proposed Lane Configuration: Same

Constraints: Crossing improvements will be necessary at Midway & Sauders to connect with the proposed sidepath on the east side of Sauders. No known ROW constraints for what is recommended.

Notes/Comments: Provide proper signage where the route crosses the RR tracks. See the 2009 MUTCD, page 797, for warning signs, or page A-52 of this plan.



Below: Existing Conditions

Project Cutsheet 12

Project Segment Road	Midway Rd
From	Saunders Blvd
To	Orange St
Facility Type	Signed Bicycle Route
Method	Signage
Miles	1.53
Feet	8,072
Number of Lanes	2

# of signs (for wayfinding after intersections)	8
$/sign	$250
Subtotal	*$2,000.00*

Total Estimate	**$2,000.00**
Contingency	0.15
Grand Total	**$2,300.00**

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 13:

Saunders/Bethesda/ Barber/Country Club /Massachusetts

To/From: Midway Rd to Broad St

Distance (feet): 15,500

Facility Type: Signed bicycle route and sidepath or trail

Construction Method:
1. Install directional signage (both ways) at the nine intersections/turns along the route.
2. If easement and space allows, construct a sidepath along Saunders and Fort Bragg Rd, near Ray's Mill Pond; if feasible, route part of the trail along the pond.

Trip Generators: Downtown Southern Pines, commercial areas on Sandhills Blvd, residential areas, and future on-road bicycle routes towards the Town of Aberdeen; also serves as an alternate route out of downtown (instead of Indiana).

Development/Funding Mechanism:
Town needs an encroachment agreement from local NCDOT. Funding undetermined.

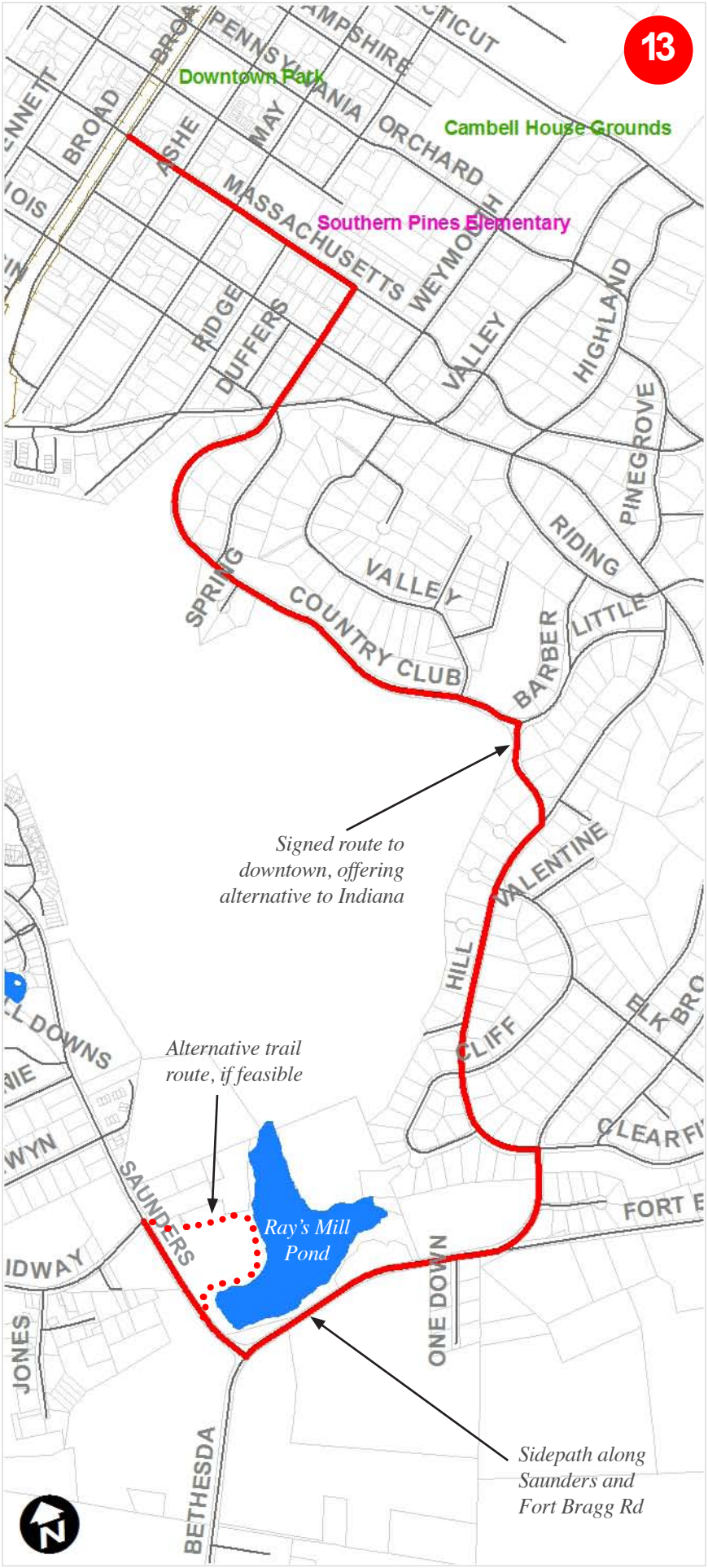
Road/Land Ownership:
NCDOT, the Town of Southern Pines, and private land owners

Existing Lane Configuration:
2 Lane (about 22', varies)
11 | 11

Proposed Lane Configuration:
Same, but with a sidepath along portions of Saunders and Fort Bragg Rd.

Constraints: Crossing improvements will be necessary at Indiana & Country Club, and at Midway & Saunders. ROW needs to be researched for sidepath/trail near Ray's Mill Pond.

Notes/Comments: Further study is needed to determine the ROW potential for the proposed sidepath along Powells Pond, at the corner of Saunders and Fort Bragg Rd.



Below: Existing Conditions

Project Cutsheet 13

Project Segment Road	Saunders/Bethesda/Barber/ Country Club/Massachusetts
From	Midway Rd
To	Broad St
Facility Type	Signed Bicycle Route
Method	Signage/New Const
Miles	2.94
Feet	15,500
Number of Lanes	2

10' Wide Multi-Use Trail Distance (mile)(near Powells Pond)	0.65
$/foot*	133
Subtotal	*$456,456.00*

# of signs (for wayfinding after intersections)	20
$/sign	$250
Subtotal	*$5,000.00*

# of High Visibility Cross Walks (at Midway & Saunders)	*2*
$/each	*$1,500.00*
Subtotal	*$3,000.00*

Total Estimate	**$464,456.00**
Contingency	0.15
Grand Total	**$534,124.40**

*Project cost of $133/LF is on the high end of state-wide averages

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 14:

May Street

To/From: Manely Ave/Morganton Rd

Distance (feet): 6,477

Facility Type: Bicycle Shared-Lane Markings (a.k.a. sharrows) and intersection improvements at May & Indiana.

Construction Method: Place bicycle shared-lane markings on May Street with and signage. Add high visibility, ladder-style crosswalks and pedestrian-activated countdown signals to intersection of May and Indiana. Consider adding the MUTCD-approved sign, "[Bicyclist] May Use Full Lane" next to the overhead signals (see 2009 MUTCD, page 793, or page A-51 of this plan).

Trip Generators: Downtown Southern Pines, State Bicycle Routes, parks, and schools.

Development/Funding Mechanism: Sharrows could be placed ahead of next scheduled roadway resurfacing. Funding undetermined.

Road/Land Ownership:
NCDOT

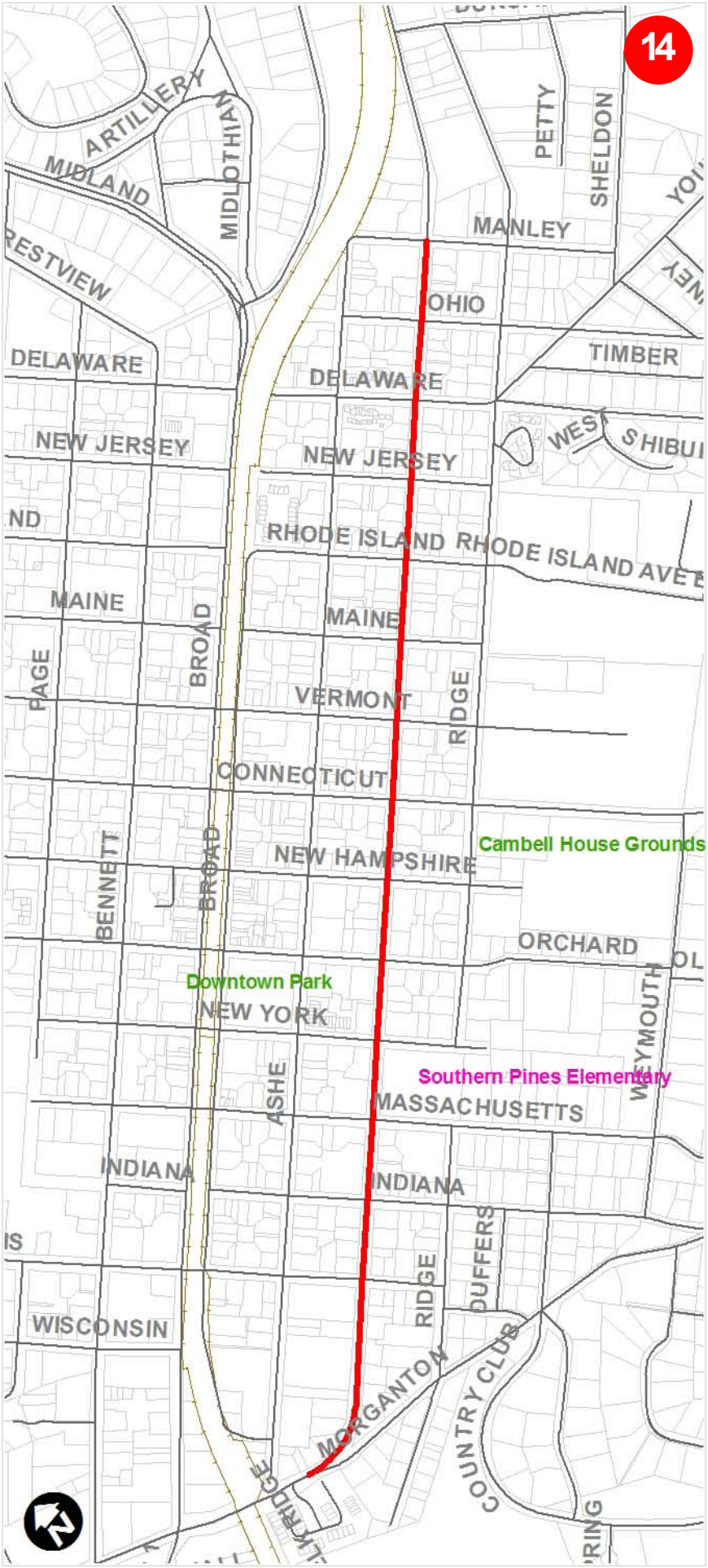
Existing Lane Configuration:
2 Lane (28')
14 | 14

Proposed Lane Configuration:
Same as above.

Constraints: Even though speed limit is posted at 35 MPH it needs to be enforced for the safety of bicyclists. No other known ROW constraints for what is recommended.

Notes/Comments: May is preferred over Ashe as a cross town route, due to the frequent stops on Ashe's cross streets. Less skilled bicyclists, however, may still prefer to ride on Ashe, though no changes are recommended there.

The intersection of May & Indiana was the 3rd most identified intersection as "in need of improvement" in this plan's public comment form.



Below: Existing Conditions

Project Cutsheet 14

Project Segment Road	May St
From	Manley Ave
To	Morganton Rd
Facility Type	Bicycle Lane
Method	Stripe
Miles	1.23
Feet	6,477
Number of Lanes	2

# of sharrow markings (every 250 ft & after intersections)	52
$/marking	$250
Subtotal	*$13,000.00*

# of signs (start/stop & after major intersections)	8
$/sign	$250
Subtotal	*$2,000.00*

Total Estimate	**$15,000.00**
Contingency	0.15
Grand Total	**$15,2250.00**

*Project cost reduced if done during scheduled resurfacing

Intersection improvements for this cutsheet (new crosswalks, countdown pedestrian signals, and signage not included).

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 15:

Broad Street

To/From: Massachusetts Ave/Morganton Rd

Distance (feet): 2,400

Facility Type: Bike lanes (Massachusetts Ave to Wisconsin Ave) and Shared-Lane Markings (Wisconsin Ave to Morganton Rd)

Construction Method:
Restripe with pavement markings and signage

Trip Generators: Downtown Southern Pines, State Bicycle Routes, Memorial Park, commercial areas on Morganton Road, and schools.

Development/Funding Mechanism:
Restripe Broad Street upon next scheduled roadway resurfacing. Funding undetermined, but cost is minimal if done in conjunction with roadway resurfacing.

Road/Land Ownership:
NCDOT

Existing Lane Configuration
(Massachusetts Ave to Wisconsin Ave):
2 Lane with Center Turn Lane (39'):
13 | 13 | 13

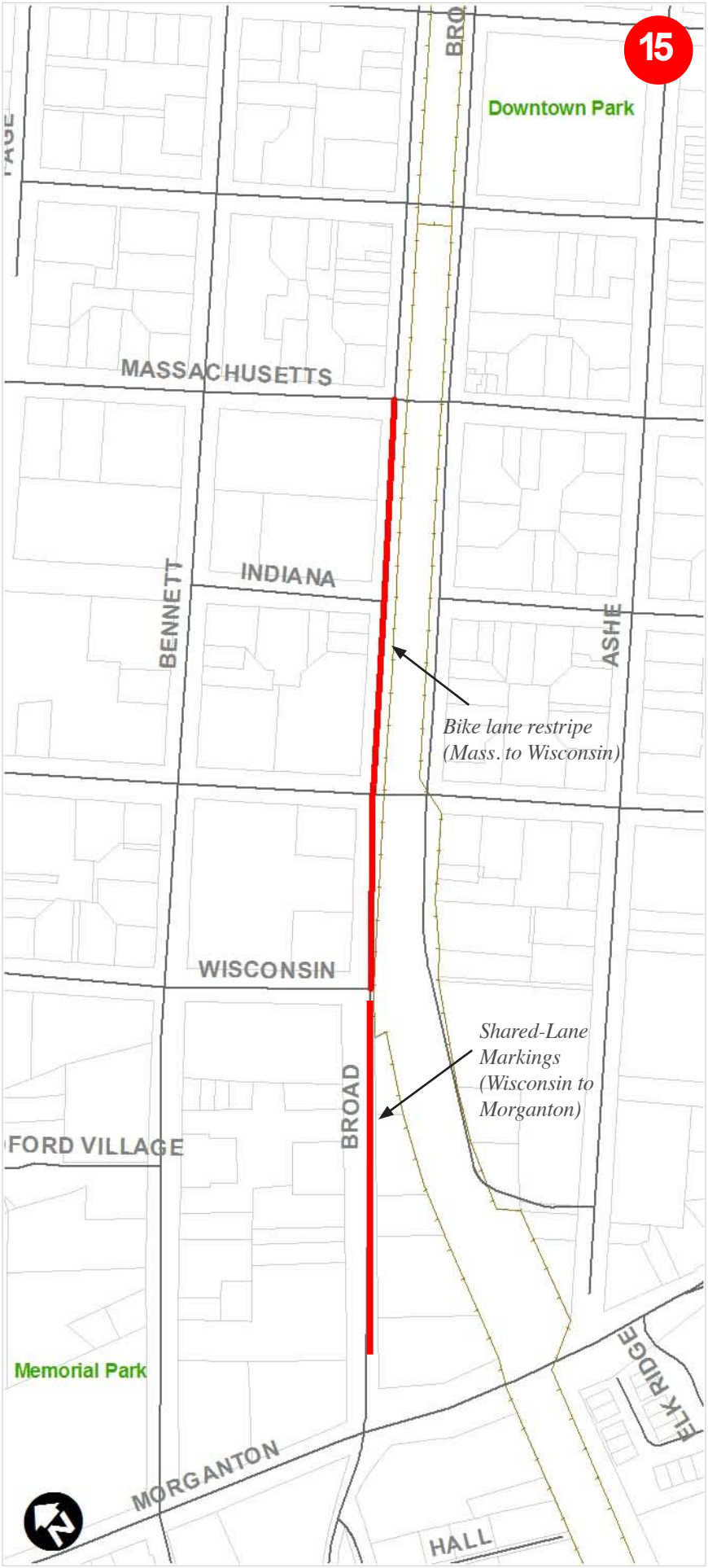
Proposed Lane Configuration
(Massachusetts Ave to Wisconsin Ave):
2 Lane with Center Turn Lane and Bicycle Lanes (39'):
4.5 | 10 | 10 | 10 | 4.5

Existing Lane Configuration
(Wisconsin Ave to Morganton Rd):
2 Lane with Parallel Parking, both sides (39'):
8.5 | 11 | 11 | 8.5

Proposed Lane Configuration
(Wisconsin Ave to Morganton Rd):
Same, but with Bicycle Shared-Lane Markings

Constraints: 10' travel lanes may be too narrow (see discussion in Chapter 4). No other known ROW constraints for what is recommended.

Notes/Comments: The northeast bound bicycle lane will need to drop after Indiana to allow bicyclists to merge with traffic turning left or right at Massachusetts.



Below: Existing Conditions

Project Cutsheet 15

Project Segment Road	Broad St
From	Massachusetts Ave
To	Morganton Rd
Facility Type	Bicycle Lane/Shared-Lane
Method	Restripe/Stripe
Miles	0.45
Feet	2,400
Number of Lanes	2

# of 4 inch stripes to remove (from Mass. to Wisconsin)	4
$/foot*	0.4
Subtotal	*$2,240.00*

# of 4 inch stripes to stripe (from Mass. to Wisconsin)	6
$/foot**	0.6
Subtotal	*$5,040.00*

# of bike lane symbol markings (start/stop & at intersections, from Mass. to Wisconsin)	6
$/marking	$250
Subtotal	*$1,500.00*

# of sharrow markings (every 250 ft & after intersections, from Wisconsin to Morganton)	8
$/marking	$250
Subtotal	*$2,000.00*

# of signs (start/stop & after major intersections)	10
$/sign	$250
Subtotal	*$2,500.00*

Total Estimate	**$13,280.00**
Contingency	0.15
Grand Total	**$15,272.00**

*Project cost eliminated if done during scheduled resurfacing

**Project cost reduced if done during scheduled resurfacing

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 16:

Downtown Sharrows (Broad & Pennsylvania)

To/From:
Vermont Ave/Massachusetts Ave & Leak St/ Ridge St

Distance (feet): 2,375 & 3,028

Facility Type: Bicycle Shared-Lane Markings (a.k.a. sharrows) with back-in angle parking

Construction Method:
1. Short-term: identify a side street in the business district where a demonstration of back-in parking can be conducted. It should get enough turnover to truly test public opinion and adaptability, but not so busy that back-ups cause a furor.
2. Short-term: resurface/repave the street to change the angled parking from head-in type to back-in parking (see Appendix A for guidelines)
3. Mid-term: place shared-lane markings along the parallel on-street parking spaces (as opposed to along angle parking), spaced as per MUTCD standards (See Appendix A). Share the road signs should also be installed.

Trip Generators: Downtown Southern Pines, parks, schools, and State Bicycle Routes

Development/Funding Mechanism: See above. Funding undetermined, but cost is minimal if done in conjunction with roadway resurfacing.

Road/Land Ownership: NCDOT

Broad Lane Configuration:
1 Lane Each Way w/ parking (33')

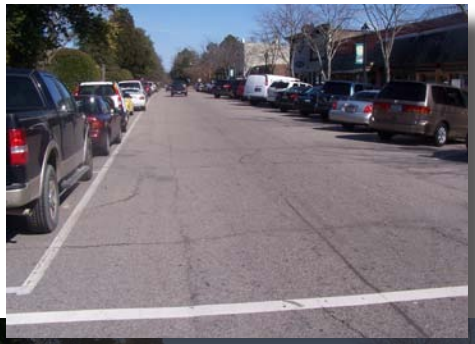
Pennsylvania Lane Configuration:
1-2 Lane Each Way w/ parking (49')

Proposed Lane Configuration:
Same, but with sharrows and back-in angle parking

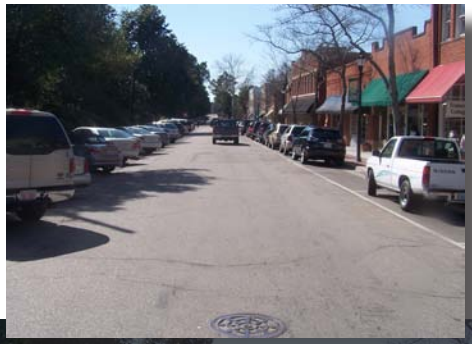
Constraints: No known ROW constraints for what is recommended.

Notes/Comments: No change to existing intersection traffic control is recommended.

Sharrows are not recommended without back-in angle parking. See page A-5 of this plan for more on back-in angle parking.



Left & right: Existing Conditions downtown on Broad



Above: Renderings of bicycle shared-lane markings and back-in angle parking on Broad, looking northeast (left) and southwest (right).

Project Cutsheet 16

Project Segment Road	Downtown Sharrows (Broad and Pennsylvania)
From	Vermont Ave/Leak St
To	Massachusetts Ave/Ridge St
Facility Type	Shared-Lane Markings
Method	Stripe
Miles	1.02
Feet	5,403
Number of Lanes	2

# of sharrow markings (every 250 ft & after intersections)	44
$/marking	$250
Subtotal	*$11,000.00*

# of signs (start/stop & after major intersections)	8
$/sign	$250
Subtotal	*$2,000.00*

Total Estimate	**$13,000.00**
Contingency	0.15
Grand Total	**$14,950.00**

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 17

Project Cutsheet 17:

Broad Street

To/From: Vermont Ave/Midland Ave

Distance (feet): 2,407

Facility Type: Bike lanes

Construction Method:
New construction: Add 8' pavement width, total, and restripe; existing shoulder space has trees either in or near the ROW; limited regrading of drainage ditches may be required.

Trip Generators: Downtown Southern Pines, parks, schools, and State Bicycle Routes

Development/Funding Mechanism:
Town needs an encroachment agreement from local NCDOT. Funding undetermined.

Road/Land Ownership:
NCDOT

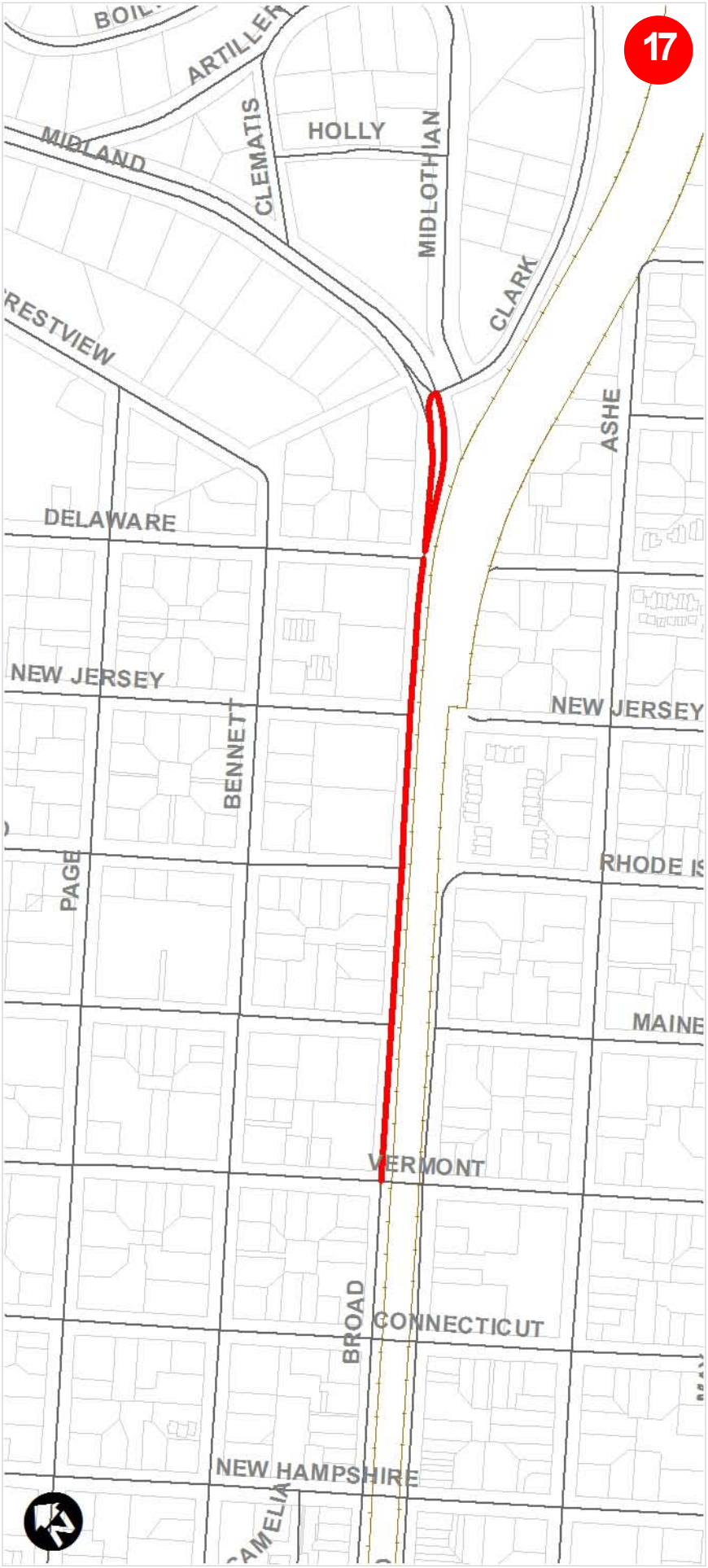
Existing Lane Configuration:
2 Lane (22'):
11 | 11

Proposed Lane Configuration:
2 Lane with Bicycle Lanes (30'):
5 | 10 | 10 | 5

Constraints: May not be feasible in the short term if not done in conjunction with upcoming top-seal project.

10 feet may be too narrow for travel lanes (see discussion in Chapter 4), in which case additional new pavement width would be necessary.

Notes/Comments: Further ROW research is needed.



Below: Existing Conditions

Project Segment Road	Broad St
From	Vermont Ave
To	Midland Rd
Facility Type	Bicycle Lane
Method	New Construction
Miles	0.46
Feet	2,407
Number of Lanes	2

Miles of new pavement for bike lanes or shoulders	0.46
$/mile*	*$440,000.00*
Subtotal	*$200,583.33*

# of bike lane symbol markings (start/stop & at intersections)	10
$/marking	$250
Subtotal	*$2,500.00*

# of signs (start/stop & after major intersections)	2
$/sign	$250
Subtotal	*$500.00*

Total Estimate	**$203,583.33**
Contingency	0.15
Grand Total	**$234,120.83**

*Project cost reduced if done during scheduled resurfacing

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 18:

Midland Road

To/From: Broad St/ US 1

Distance (feet): 3,865

Facility Type: Bike Lanes

Construction Method: Road Diet/Restripe: Upon resurfacing (or top-seal project), restripe to one travel lane each way with bicycle lanes.

Trip Generators: Downtown Southern Pines & State Bicycle Route

Development/Funding Mechanism: See above. Funding undetermined, but cost is minimal if done in conjunction with roadway resurfacing.

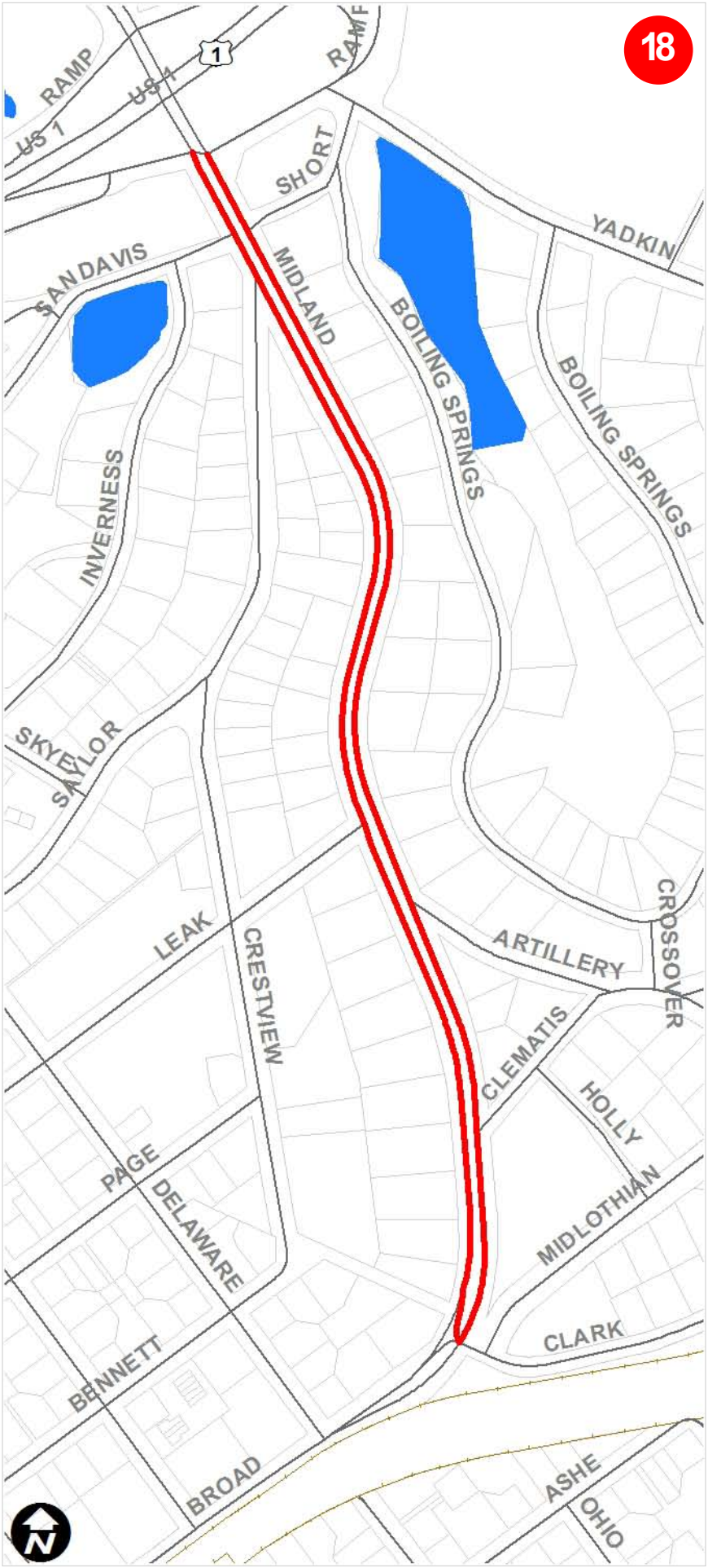
Road/Land Ownership: NCDOT

Existing Lane Configuration:
2 Lane Each Way, Divided (60', inc. 15' median):
11 | 11 | 15 M | 11 | 11

Proposed Lane Configuration:
1 Lane Each Way, Divided, with Bicycle Lanes and median shoulders (60', inc. 15' median):
6 | 14 | 2 | 15 M | 2 | 14 | 6

Constraints: May not be feasible in the short term if not done in conjunction with upcoming top-seal project.

Notes/Comments:
Consult with local NCDOT to determine latest resurfacing schedule and ROW issues.



Below: Existing Conditions

Project Cutsheet 18

Project Segment Road	Midland Rd
From	Broad St
To	US 1
Facility Type	Bicycle Lane
Method	Road Diet/Restripe
Miles	0.73
Feet	3,865
Number of Lanes	4

# of 4 inch stripes to remove	4
$/foot*	0.4
Subtotal	*$6,184.00*

# of 4 inch stripes to stripe	6
$/foot*	0.6
Subtotal	*$13,914.00*

# of bike lane symbol markings (start/stop & at intersections)	8
$/marking	$250
Subtotal	*$2,000.00*

# of signs (start/stop & after major intersections)	4
$/sign	$250
Subtotal	*$1,000.00*

Total Estimate	**$23,098.00**
Contingency	0.15
Grand Total	**$26,562.70**

*Project cost reduced if done during scheduled resurfacing

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 19:

Midland Road

To/From: US-1 to 5-501

Distance (feet): 18,700
(about 3.5 miles)

Facility Type: Wide outside lanes, with bicycle shared-lane markings.

Construction Method:
1'-2' additional pavement width needed in each direction, plus restripe existing lanes. Could be done relatively easily upon next resurfacing project. Reduce speed to 35 MPH to allow bicycle shared-lane markings (see page 4-15 for how to request speed reductions). Also add 'Share the Road ' signage.

Trip Generators: Regional connection for the Town of Southern Pines and The Town of Pinehurst; State Bicycle Route

Cost: $1,822,985

Development/ Funding Mechanism:
Add slight width and restripe upon next scheduled roadway resurfacing. Funding undetermined, but cost is minimal if done in conjunction with roadway resurfacing.

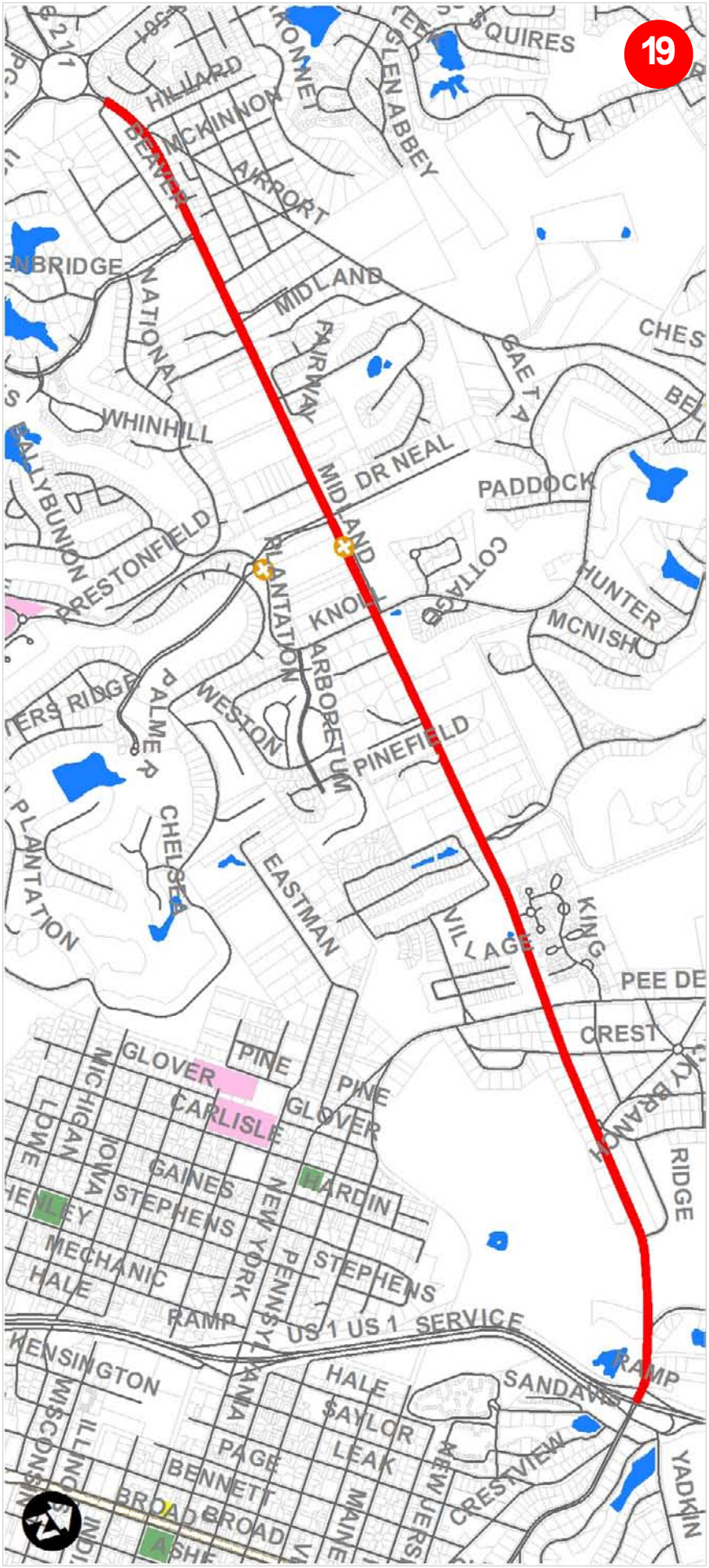
Road/Land Ownership:
NCDOT

Existing Lane Configuration:
2 Lane Each Way, Divided (60', inc. 15' median):
11 | 11 | 15 M | 11 | 11

Proposed Lane Configuration:
Same, but with a wide outside lane, and bicycle shared-lane markings:
13 | 10 | 15 M | 10 | 13

Constraints: Midland Road has great significance to residents for local identity. Even a slight change may be challenging. The primary ROW constraints are the existing trees at the current edge of pavement. Avoid impacting trees to the greatest extent possible, with the goal of removing zero trees in the process.

Notes/Comments: Midland Road was identified as the #1 roadway "most in need of improvement for bicycylists" in this plan's public comment form. The recommendation above makes minimal changes to the road (1' additional pavement plus painted symbols) and would greatly improve conditions for bicyclists.



Below: Existing Conditions

Project Segment Road	Midland Rd
From	US 1
To	15-501
Facility Type	Wide Outside Lane
Method	New Construction/Restripe
Miles	3.54
Feet	18,700
Number of Lanes	4

# of 4 inch stripes to remove	4
$/foot*	0.4
Subtotal	*$29,920.00*

Miles of new paved shoulder (only 1'-2' on each side)	3.54
$/mile** (per mile cost estimated at 1/2 of full shoulders)	*$220,000.00*
Subtotal	*$389,583.33*

# of 4 inch stripes to stripe	4
$/foot**	0.6
Subtotal	*$44,880.00*

# of sharrow markings (every 250 ft & after intersections)	150
$/marking	$250
Subtotal	*$37,500.00*

# of signs (start/stop & after major intersections)	16
$/sign	$250
Subtotal	*$4,000.00*

Total Estimate	**$505,883.33**
Contingency	0.15
Grand Total	**$581,765.83**

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

*Project cost eliminated if done during scheduled resurfacing

**Project cost reduced if done during scheduled resurfacing

Project Cutsheet 20: Option 1

Project Cutsheet 20:

Morganton Road

To/From: May St/Henley St
Distance (feet): 3,985 (minus interchange area)
Facility Type: Paved (Striped) shoulders or Wide outside lanes

Construction Method: Preliminary design is underway by NCDOT for an interchange modification at US 1 and Morganton Road in Southern Pines. The Town of Southern Pines is developing recommendations be incorporated into the design (also, see notes on p. 3-45 for Luther Way recommendations). Options being considered:

Option 1: Striped shoulders
A. Stripe all six travel lanes on the future Morganton Road bridge over US 1 as 11' instead of the planned 12' lanes; add a white edgeline stripe on both sides, leaving 3' striped shoulders
B. Add "Share the Road" signs on both approaches to the Morganton Road bridge
C. Restripe travel lanes on Morganton Road west of US 1 to 11 feet, providing striped shoulders with remaining road width.
D. Add pavement width on each side of Morganton Road east of US 1, providing striped shoulders on both sides.
E. Bicycle shared-lane markings from Broad to May.

Option 2: Wide outside lanes with bicycle shared-lane markings
A. Stripe four inside travel lanes on the future Morganton Road bridge over US 1 as 11' instead of the planned 12' lanes; stripe the two outermost lanes as 14' and add bicycle shared-lane markings.
B. Add "Share the Road" signs on both approaches to the Morganton Road bridge
C. Restripe travel lanes on Morganton Road west of US 1 to create wide outside lanes, and add bicycle shared-lane markings.
D. Add pavement width on each side of Morganton Road east of US 1, providing wide outside lanes, and add bicycle shared-lane markings.
E. Bicycle shared-lane markings from Broad to May.

Trip Generators: Morganton Rd Sports Complex, Armory Field, Farmer's Market, commercial areas on Morganton Road.

Cost: Parts A & B of each option above would be included in the interchange modification. See page 3-45 for remaining costs of options 1 & 2.

Development/Funding Mechanism: See above.

Road/Land Ownership: NCDOT

Existing Lane Configuration:
Varies, and is in transition: 1-2 Lanes Each Way w/ Center Turn

Proposed Lane Configuration: See above.

Constraints: If a gutter pan is included (rather than paving to the curb face), then ensure that the seam between the asphalt and gutter pan is smooth, otherwise a foot of travel width for the cyclist is essentially lost. The lack of driveway access management is a major constraint b/w US 1 and Broad.

Notes/Comments: Bridge project contact: Mr. James S. Goodnight, P.E. Roadway Design Unit, NCDOT. Project scheduled for let in 2012.

Below: Existing Conditions

Additional Recommendations (for Luther Way Reconstruction):

The Town recommends that NCDOT prepare the roadway pavement plans for Luther Way (as part of the interchange modification) with the following accommodations:

a. Change the pavement demolition plans so that a 12-foot wide asphalt strip is retained on Luther Way, connecting sidewalk on the south side of Morganton Road with existing sidewalk on the east side of US 1 at Saunders Boulevard.

b. Change right-of-way plans to reflect public right-of-way along Luther Way between Morganton Road and US 1 for the purpose of a multi-use path.

c. Add detail to include bollards or other suitable safety devices at the intersections of Luther Way with the Morganton Road sidewalk and also at Luther Way at US 1 so that pedestrians and bicyclists are aware of where safe crossings are provided.

Project Cutsheet 20: Option 2

Project Segment Road	Morganton Rd
From	Henley St
To	May St
Facility Type	Paved (Striped) Shoulders
Method	Restripe/New Construction
Miles (minus interchange area)	0.75
Feet (minus interchange area)	3,985
Number of Lanes	Varies, 3 to 6

# of 4 inch stripes to remove (Henley to US 1: 1,815')	6
$/foot*	0.4
Subtotal	*$4,356.00*

# of 4 inch stripes to stripe (Henley to US 1: 1,815')	8
$/foot**	0.6
Subtotal	*$8,712.00*

Miles of new paved shoulder (US 1 to Broad: 1,300')	0.25
$/mile**	*$440,000.00*
Subtotal	*$110,000.00*

# of 4 inch stripes to stripe (US 1 to Broad: 1,300')	2
$/foot**	0.6
Subtotal	*$1,560.00*

# of sharrow markings (every 250 ft & after intersections; Broad to May: 870')	8
$/marking	$250
Subtotal	*$2,000.00*

Total Estimate	**$126,628.00**
Contingency	0.15
Grand Total	**$145,622.20**

*Project cost eliminated if done during scheduled resurfacing

**Project cost reduced if done during scheduled resurfacing

Project Segment Road	Morganton Rd
From	Henley St
To	May St
Facility Type	Wide Outside Lanes & Sharrows
Method	Restripe/New Construction
Miles (minus interchange area)	0.75
Feet (minus interchange area)	3,985
Number of Lanes	Varies, 3 to 6

# of 4 inch stripes to remove (Henley to US 1: 1,815')	6
$/foot*	0.4
Subtotal	*$4,356.00*

# of 4 inch stripes to stripe (Henley to US 1: 1,815')	6
$/foot**	0.6
Subtotal	*$6,534.00*

Miles of new paved shoulder (US 1 to Broad: 1,300')	0.25
$/mile**	*$440,000.00*
Subtotal	*$110,000.00*

# of sharrow markings (every 250 ft & after intersections; 3,985' total)	32
$/marking	$250
Subtotal	*$8,000.00*

Total Estimate	**$128,890.00**
Contingency	0.15
Grand Total	**$148,223.50**

*Project cost eliminated if done during scheduled resurfacing

**Project cost reduced if done during scheduled resurfacing

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

Project Cutsheet 21:

Carlisle/Indiana/Henley

To/From: Connecticut (Douglass Community Center) to Morganton Rd (Morganton Sports Complex)

Distance (feet): 7,830

Facility Type: Signed Bicycle Route, with crossing improvements at Pennsylvania.

Construction Method:
Install directional signage (see example on page A-50).

Trip Generators: Residential areas, the Douglas Community Center, schools Pool Park, Morganton Rd Sports Complex, Armory Field, future Morganton Road sidepath, and the Farmers' Market.

Development/Funding Mechanism:
Undetermined

Road/Land Ownership:
Town of Southern Pines (except for the Pennsylvania crossing, which requires coordination with NCDOT)

Existing Lane Configuration:
2 Lanes, Undivided (20' to 30'):
12.5 | 12.5

Proposed Lane Configuration:
Same, but with signage.

Constraints: Crossing improvements and Pennsylvania will need to be approved by NCDOT.

Notes/Comments: No known ROW constraints for streets on this route.

Below: Existing Conditions (Pennsylvania at Carlisle)

Below: Existing Conditions (Henley)

Project Cutsheet 21

Project Segment Road	Carlisle/Indiana/Henley
From	Connecticut
To	Morganton Rd
Facility Type	Signed Bicycle Route
Method	Signage/New Const
Miles	1.48
Feet	7,830
Number of Lanes	2

# of signs (for wayfinding after intersections)	10
$/sign	$250
Subtotal	*$2,500.00*

# of High Visibility Cross Walks (at Pennsylvania)	*1*
$/each	*$1,500.00*
Subtotal	*$1,500.00*

Total Estimate	**$4,000.00**
Contingency	0.15
Grand Total	**$4,600.00**

Project Cutsheet 22:

Indiana & Connecticut

Note: Regional Connection/ State & County Bicycle Routes

To/From: May Street to Town Limits

Distance (feet):
Indiana: 9,300
Connecticut: 5,500

Facility Type: Signed Bicycle Route with bicycle shared-lane markings. Upon roadway resurfacing, extend roadway width to the greatest extent feasible (see constraints below).

Construction Method:
Place bicycle shared-lane markings immediately after major intersections, and every 250 feet thereafter. Install "Share the Road" signage every half mile, at blind curves, or according to engineering judgement.

Trip Generators: Regional connection for Moore County and the State of North Carolina

Development/Funding Mechanism:
Town needs an encroachment agreement from local NCDOT. Explore funding partnership opportunities with the Moore County and NCDOT.

Road/Land Ownership:
NCDOT

Existing Lane Configuration:
2 Lanes, Undivided (20' to 22'):
10.5 | 10.5

Proposed Lane Configuration:
Same, but with bicycle shared-lane markings:
10.5 | 10.5

Constraints: The primary constraint for both of these corridors is the narrow roadway width, coupled by ROW issues with private property and large trees along each corridor. Hence, the recommendations above incorporate lower cost, near-term solutions that do not require roadway widening.

Notes/Comments: A bicyclist was struck on Connecticut in August 2010, generating further discussion on the need for improvements on these routes. Addressing issues with these roads was also identified by Bicycle Plan Steering Committee members as critical to improving safety for bicyclists in Southern Pines.

Below: Existing Conditions (Indiana)

Below: Existing Conditions (Connecticut)

Project Cutsheet 22

Project Segment Road	Indiana and Connecticut (State & County Bicycle Routes)
From	May St
To	Town Limits
Facility Type	Shared-Lane Markings
Method	Pavement Symbols & Signage
Miles	2.80
Feet	14,800
Number of Lanes	2

# of sharrow markings (every 250 ft & after intersections)	65
$/marking	$250
Subtotal	*$16,250.00*

# of signs (start/stop & after major intersections)	14
$/sign	$250
Subtotal	*$3,500.00*

Total Estimate	**$19,750.00**
Contingency	0.15
Grand Total	**$22,712.50**

Project Cutsheet 23:

Midland Road & 15-501

Note: Regional Connection - Southern Pines to Pinehurst

To/From: Airport Road to Memorial Drive (in Pinehurst)

Distance (feet): 2,640

Facility Type: Sidepath; Also, see notes in map about crossing improvements.

Construction Method:
New construction

Trip Generators: First Health of Carolinas Moore County Regional Hospital, regional connection between Pinhurst and Southern Pines.

Development/Funding Mechanism:
Secure easements from adjacent land owners, and an encroachment agreement from NCDOT (exact ROW needs to be researched). Explore funding partnership opportunities with the hospital, Pinhurst, Moore County, and NCDOT.

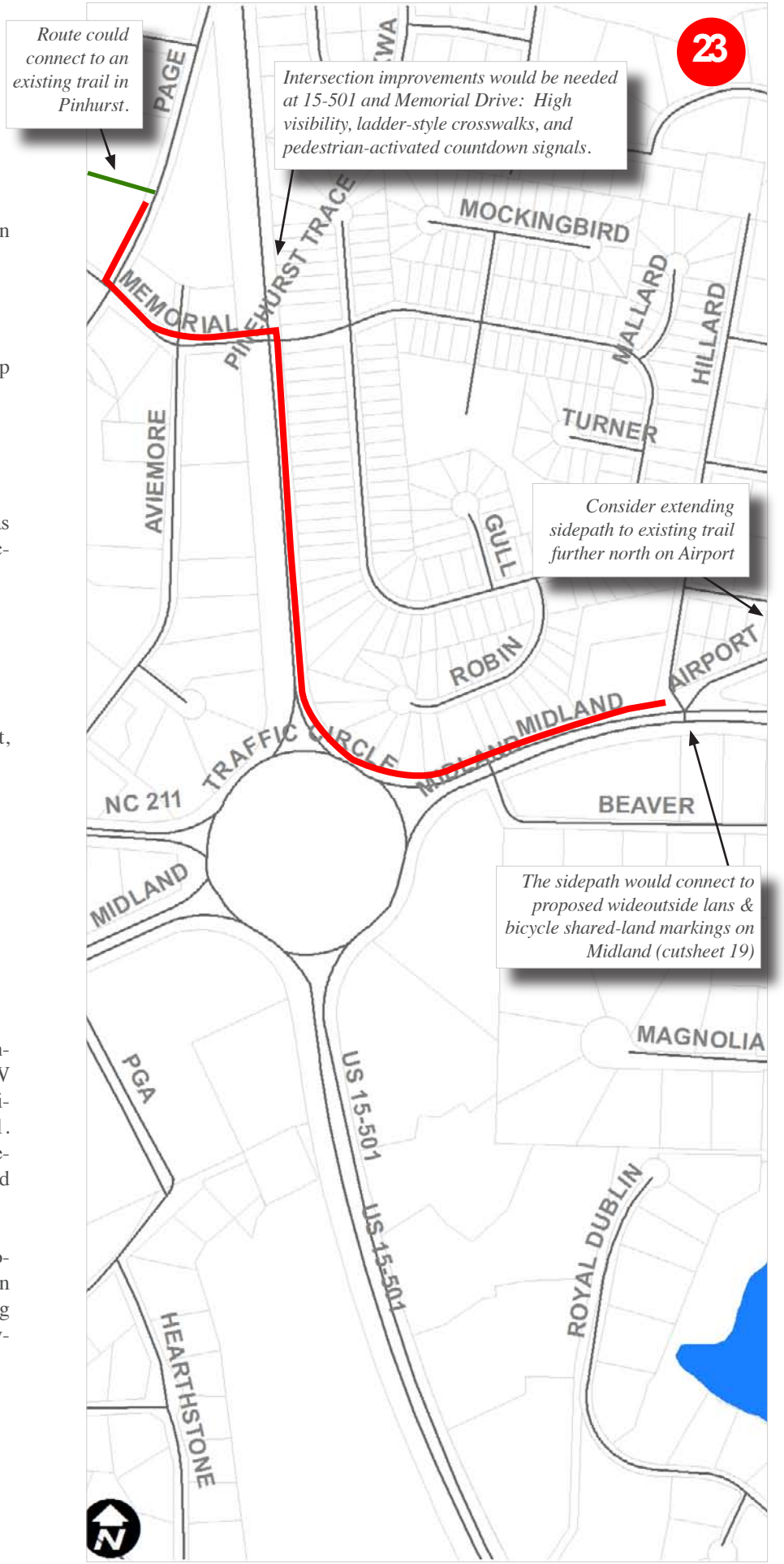
Road/Land Ownership:
NCDOT/Multiple private parcels

Existing Lane Configuration:
Varies - high volume/high speed.

Proposed Lane Configuration: Same, but with accommodations to cross 15-501 safely at Memorial Drive

Constraints: In addition to the NCDOT encroachment agreement, additional corridor ROW may be required to create a quality bike/ped environment along these portions of Midland & 15-501. Removal of vegetation and select trees would be required in some areas, particularly north of Midland Road for the section shown at right.

Notes/Comments: Developing a safe, non-motorized connection between Pinhurst and Southern Pines was identified by the Bicycle Plan Steering Committee as a critical link for regional connectivity.



Below: Existing Conditions (looking west on Midland, into the roundabout)

Below: Existing Conditions (looking south on 15-501, into the roundabout)

Project Cutsheet 23

Project Segment Road	Midland Rd and 15-501
From	Airport Rd
To	Memorial Dr
Facility Type	Side Path/Multi Use Trail
Method	New Construction
Miles	0.50
Feet	2,640

10' Wide Multi-Use Trail Distance (mile)	0.50
$/foot*	133
Subtotal	*$351,120.00*

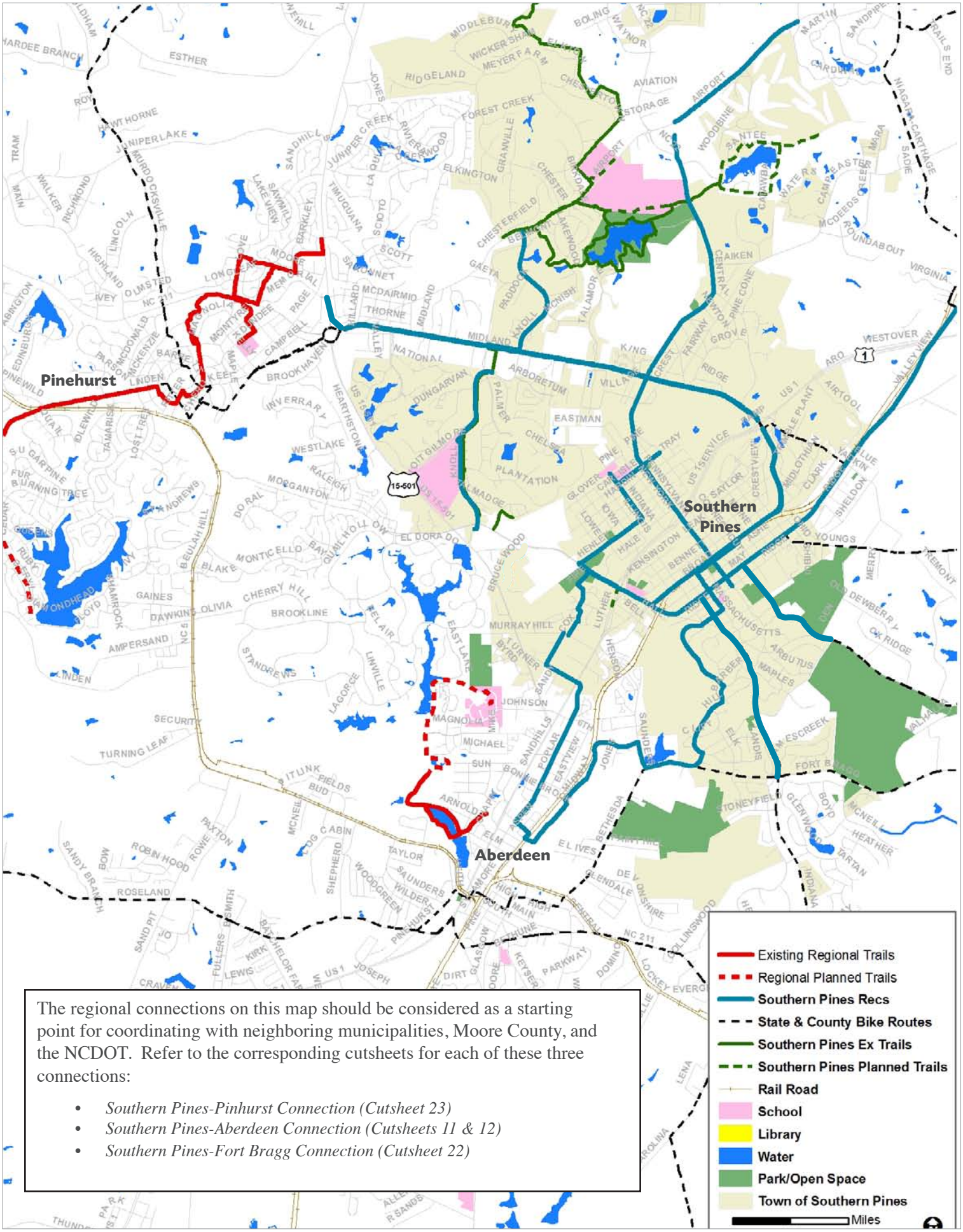
# of High Visibility Cross Walks	*2*
$/each	*$1,500.00*
Subtotal	*$3,000.00*

# of signs (start/stop & after major intersections)	10
$/sign	$250
Subtotal	*$2,500.00*

Total Estimate	**$356,620.00**
Contingency	0.15
Grand Total	**$410,113.00**

*Project cost of $133/LF is on the high end of statewide averages

MAP 3.3 REGIONAL CONNECTIONS



The regional connections on this map should be considered as a starting point for coordinating with neighboring municipalities, Moore County, and the NCDOT. Refer to the corresponding cutsheets for each of these three connections:

- *Southern Pines-Pinhurst Connection (Cutsheet 23)*
- *Southern Pines-Aberdeen Connection (Cutsheets 11 & 12)*
- *Southern Pines-Fort Bragg Connection (Cutsheet 22)*

www.pedbikeimages.org / Austin Brown

4. IMPLEMENTATION

Overview

The three main ways to improve bicycling conditions in Southern Pines are through facility construction, program implementation and policy enforcement. This chapter outlines the implementation priorities, key partners in implementation, facility development methods, and over 30 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, the this plan's appendices provide a variety of in-depth resources for assisting in carrying out these tasks.

1. Adopt this Plan

Before any other action takes place, the Town of Southern Pines should adopt this plan. This should be considered the first step in implementation. Through adoption of this plan and its accompanying maps as the Town's official bicycle transportation plan, Southern Pines will be better able to shape transportation and development decisions so that they fit with the goals of this plan. Most importantly, having an adopted plan is extremely helpful in securing funding from state, federal, and private agencies. Adopting this plan does not commit the 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.

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 Streets Division staff, Public Works Engineering staff, Planning staff, and Recreation and Parks 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 Southern Pines, it makes more sense to fold these responsibilities into current staff responsibilities.

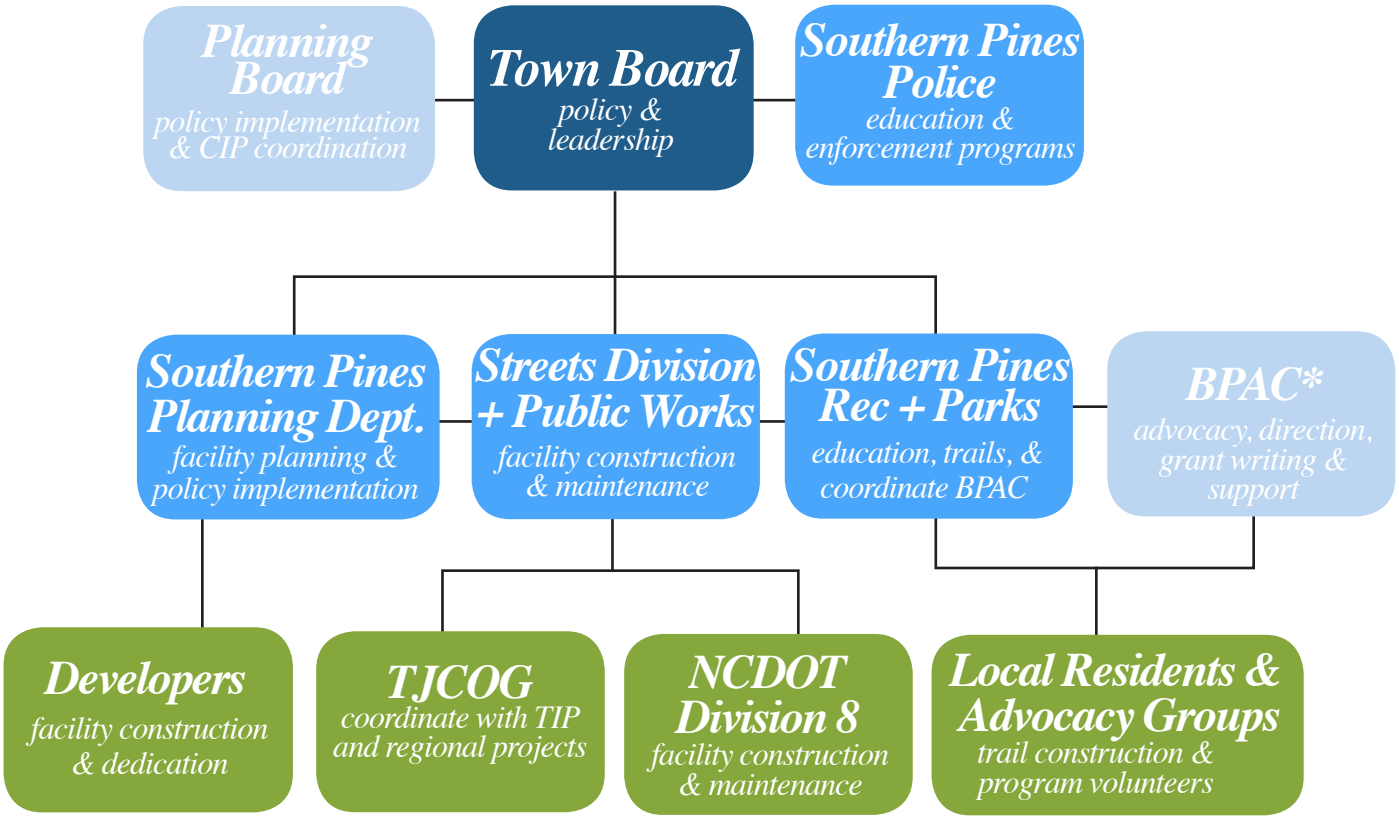
3. Establish a Bicycle and Pedestrian Advisory Commission (BPAC)

The Town of Southern Pines should establish a Bicycle and Pedestrian Advisory Commission (BPAC) to assist in the implementation of this Plan. The BPAC would be comprised of both commuting and recreational cyclists, and should champion the recommendations of this 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.

The BPAC could be represented by individuals from the Steering Committee (above) and individuals from local organizations such as the Sandhills Cycling Club, health and wellness organizations, TJCOG, and others.

Models for BPAC exist throughout North Carolina. Durham, NC, has had in place their own BPAC (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. Southern Pines 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, 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 F: 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 Southern Pines Comprehensive Long Range Plan and Code of Ordinances 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 in 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 Southern Pines 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

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 Southern Pines, the BPAC, and groups such as the Sandhills Cycling Club, 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. 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 kids bicycle classes, to be provided in partnership between a locally certified League of American Bicyclists (LAB) instructor, BPAC, and Southern Pines 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.
- Training for Southern Pines' 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).
- Recreation and Parks 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 Southern Pines Police Department has been an active participant 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 Southern Pines' 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). 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 Southern Pines 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, Davidson, and Charlotte. Southern Pines 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.

Key Partners in Implementation

Role of Southern Pines Town Council

The Town Council will be responsible for adopting this plan. 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 Board 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 8.

Adoption of this Plan is in line with public support. The Southern Pines' online comment form (which yielded over 350 responses) showed strong support for improving bicycling conditions. The comment form asked, "How important to you is improving bicycling conditions in Southern Pines?" Sixty-eight (68) percent responded "Very important", while only seven (7) percent responded "Not important". See Appendix E: Public Involvement for more information.

Role of the Town of Southern Pines Planning Board

The Town of Southern Pines Planning Board serves as an advisory board to the Council on all 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 Southern Pines Public Works/Streets Division

The Public Works Department and Streets Division will take primary responsibility for the construction and 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.
- Design, construct and maintain 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 Southern Pines Recreation and Parks Director on priority projects for town-maintained roadways and trail corridors/easements.
- Communicate and coordinate with Moore County, TJCOG, 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 Southern Pines, as they relate to the recommendations in this Plan.

• Communicate and coordinate with NCDOT Division 8 on this Plan's recommendations for NCDOT-owned and maintained roadways. Provide comment and reminders about this Plan's recommendations no later than the design phase.

• Work with Division 8 to ensure that when NCDOT-owned and maintained roadways in Southern Pines are resurfaced or reconstructed, that this Plan's adopted recommendations for bicycle facilities are included on those streets. If a compromise to the original recommendation is needed, then contact NCDOT Division of Bicycle and Pedestrian Transportation for guidance on appropriate alternatives.

Role of the Town of Southern Pines Recreation & Parks Department

The Town of Southern Pines Recreation and Parks Department operates the recreation, athletic, and special event programs for the citizens of Southern Pines. They also 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 (based on communication with Public Works) 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 Southern Pines Public Works, Moore County, and neighboring municipalities on regional trails and bicycle facilities; partner for joint-funding opportunities.

• Work with BPAC to present bicycle-related policy and policy revisions to the Town Council for their approval. Encourage the Council to approve funding for plan implementation, even if only for small amounts (to be matched with outside sources).

Role of the Town of Southern Pines Planning Department

The Planning Department will take primary responsibility for the contact with new development to implement the plan (with support from the Public Works Department). 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.

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 Recreation and Parks 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 8

Division 8 of the NCDOT is responsible for the construction and maintenance of bicycle facilities on NCDOT-owned and maintained roadways in the Town of Southern Pines, OR is expected to allow for the Town to do so with encroachment agreements. Division 8 should be prepared to:

- Recognize this Plan as not only as an adopted plan of the Town of Southern Pines, but also as an approved plan of the NCDOT.

- 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 Southern Pines Public Works Department of all upcoming roadway reconstruction or resurfacing/restriping projects in Southern Pines, 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 Southern Pines Police Department

The Town of Southern Pines Police Department is responsible for making Southern Pines 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/)

- 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.

- 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 Public Works Department as projects are implemented.

Role of Developers

Developers in Southern Pines 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 Ordinance revisions related to bicycle facilities.

Role of Local Residents, Clubs and Advocacy Groups

Local residents, clubs and advocacy groups (e.g., the Sandhills Cycling Club, Rainbow Cycles, Tour de Moore volunteers, health organizations, etc.) play a critical role in the success of this plan. They should be prepared to:

- Continue offering input regarding bicycling issues in Southern Pines.
- 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 Board 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. 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.

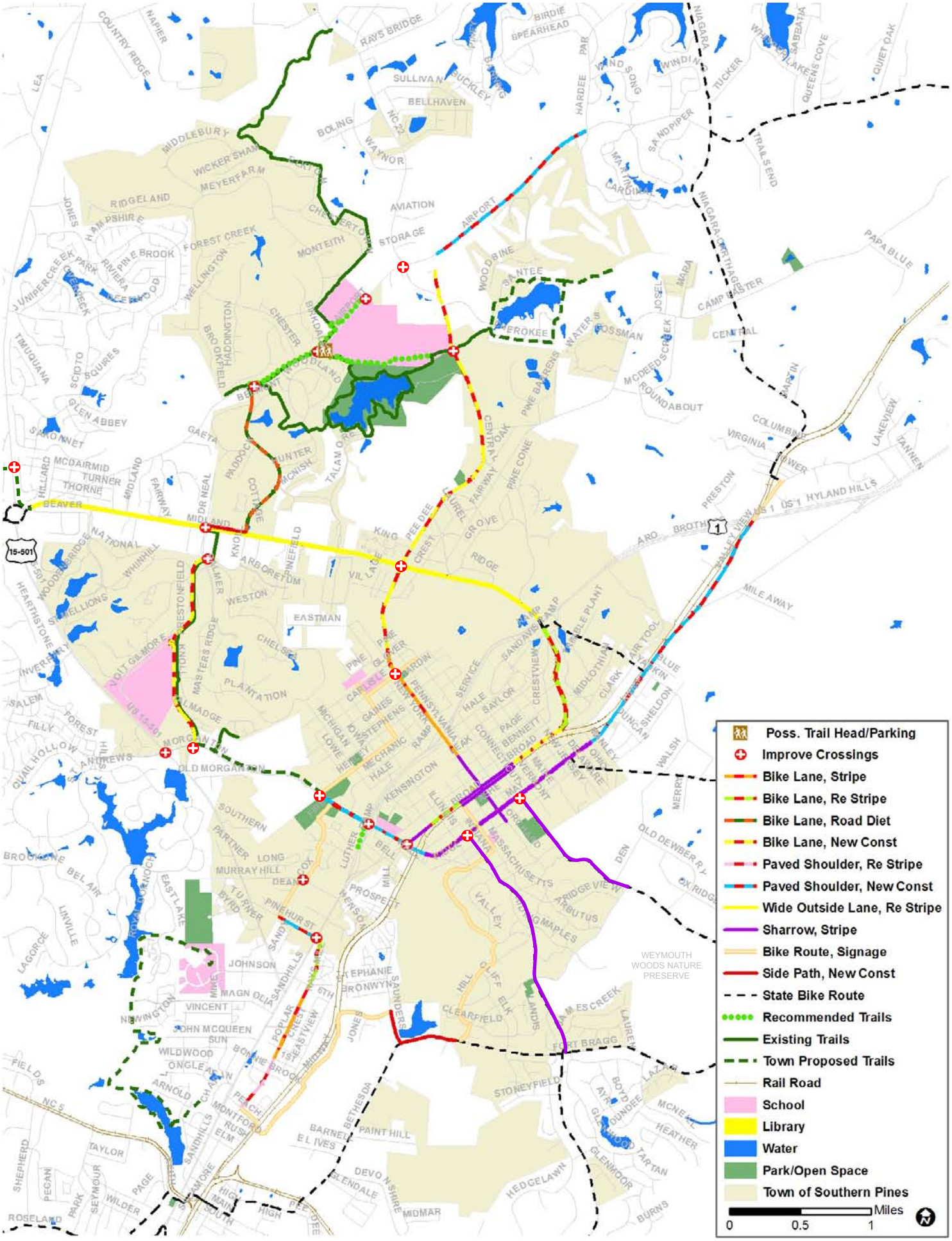
These types of projects are explained more below:

- 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. (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 - *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.

MAP 4.1 RECOMMENDED BICYCLE FACILITIES BY CONSTRUCTION METHOD



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 Southern Pines, guided by the priority projects within this plan, should present pedestrian projects along State roads to the Triangle Area Rural Planning Organization (TARPO) and State. Local requests for small bike/pedestrian projects, such as crosswalks, signage, and shared-lane markings, can be directed to the TARPO or the local NCDOT Division 8 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 Southern Pines 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. 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 collections 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 4.1 Policy, Program, and Administrative Action Steps Table

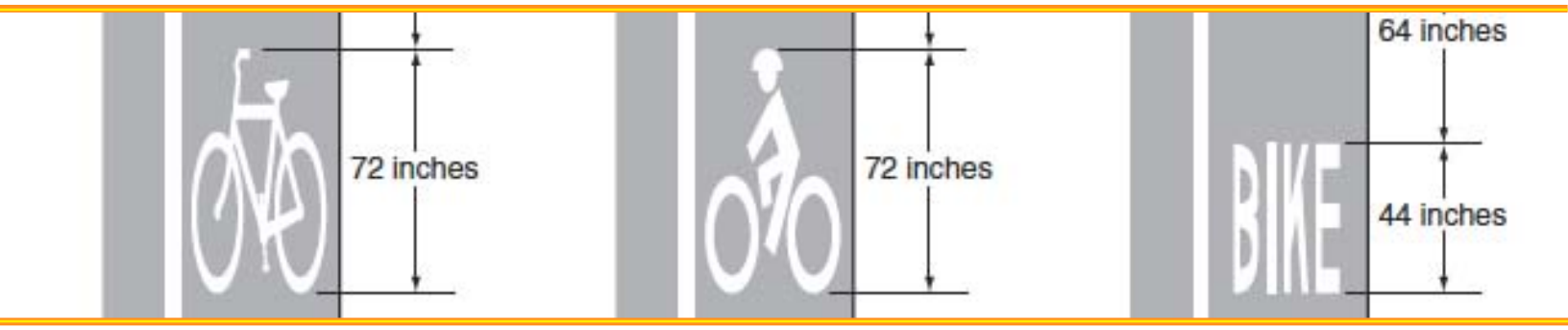
Task	Lead Agency	Support	Details	Phase	Page Reference
Present Plan to Town Council	Southern Pines Recreation and Parks & Planning	Project Consultants	Presentation to Town Board in September 2010	Fall 2010	n/a
Approve this Plan	NCDOT Bike/Ped Division	Project Consultant	Official letter of approval expected by October 2010	Fall 2010	n/a
Adopt this plan	Southern Pines Town Council	Southern Pines Planning Department & Recreation and Parks Department	Through adoption, the Plan becomes an offical planning document of the Town. Adoption shows that the Town of Southern Pines has undergone a successful, supported planning process.	Fall 2010	n/a
Designate Staff	Southern Pines Town Council	Southern Pines 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 Public Works Staff (Engineering/Streets Superintendent), Planning staff and Recreation and Parks staff oversees the day-to-day implementation of this plan.	Fall 2010	4-1
Establish a Bicycle and Pedestrian Advisory Commission (BPAC)	Southern Pines Town Council	Bicycle Plan Steering Committee	The Town of Southern Pines 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	Southern Pines Recreation and Parks 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	Southern Pines Planning Department	Town Manager, other Town departments, BPAC	Chapter 3 contains project cost estimates and Appendix F contains potential funding opportunities.	Short Term (2011)	Appendix F
Improve Bicycle Policies	Southern Pines Town Council	Southern Pines Recreation and Parks Department, BPAC	Suggested policy revisions to the Town of Southern Pines 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 (2011)	Appendix C
Develop Bicycle Facility Striping Plans and Trail Construction Documents	Southern Pines Public Works	NCDOT Division 8, NCDOT Bike/Ped Division, Town of Southern Pines Recreation and Parks	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 (2011)	Chapter 3 Cutsheets and Appendix A
Launch Programs as New Projects are Built	Southern Pines Recreation and Parks Department	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 Southern Pines 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 (2011) /Ongoing	Appendix B

Task	Lead Agency	Support	Details	Phase	Page Reference
Offer Training for Enforcement	Southern Pines Police Department	National Highway Traffic Safety Administration (NHTSA) or League of American Bicyclists	Training for Southern Pines' 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 (2011)	4-4
Complete top priority, phase 1 projects	Southern Pines Public Works + NCDOT Division 8	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 Southern Pines. Aim to complete this plan's Phase 1 bicycle projects by the end of 2011 (including Downtown's bicycle shared-lane markings and Pennsylvania Ave bicycle lanes)	Short Term (2011)	Chapter 3; Table 3.1 on page 3-4
Present this Plan to other local and regional bodies and agencies.	Southern Pines Recreation and Parks Department	BPAC	This Plan should be presented to other local and regional bodies and agencies. Possible groups to receive a presentation might include: the Triangle Area Regional Planning Organization, local bike store owners, regional transportation planners, Moore County park planners, health clubs and fitness facilities, schools and youth organizations, riding clubs, major employers, and large neighborhood groups.	Short Term (2011)	Primarily Chapter 3
Develop a long term funding strategy	Southern Pines Public Works, Planning and Recreation and Parks departments	Southern Pines 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 (2011)	Appendix F
Maintain bicycle facilities	Southern Pines Public Works + Southern Pines Recreation and Parks Department + NCDOT Division 8	BPAC + General Public (for reporting maintenance needs)	Pay special attention to sweeping to the face of the curb on Pennsylvania Ave, where bike lanes are proposed; Town should plan to take over sweeping of bicycle lanes on NCDOT-owned roadways. The Town of Southern Pines 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-2011.	Southern Pines Public Works	Southern Pines Recreation and Parks and BPAC	Provide bicycle racks in Downtown Southern Pines at key locations (such as at Broad & Pennsylvania). Work with BPAC and Downtown business organizations to determine specific locations.	Short Term (2011)	A-20 and A-21
Communicate and coordinate with NCDOT Division 8 on priority projects for NCDOT-maintained roadways.	Southern Pines Public Works + Planning departments	NCDOT Division 8, NCDOT Bike/Ped Division	Ensure that when NCDOT-maintained roadways in Southern Pines are resurfaced or reconstructed, that this Plan's adopted recommendations for bicycle facilities are included on those streets.	Continuous/ Ongoing	4-10
Notify the Town of Southern Pines Public Works Department of all upcoming roadway reconstruction or resurfacing/restriping projects, no later than the design phase.	Public Works Director, and NCDOT Division 8	Southern Pines 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
Explore possibility of a regional bike/ped coordinator	Southern Pines Recreation and Parks Department	TARPO, Moore County, neighboring municipalities	Explore the possibility of partnering with neighboring municipalities in hiring a regional Alternate Modes/ Active Modes Transportation Coordinator	Short Term (2011)	-

Task	Lead Agency	Support	Details	Phase	Page Reference
Ensure planning efforts are integrated regionally	Southern Pines Planning Department	TARPO, Moore County, neighboring municipalities	Combining resources and efforts with surrounding municipalities, regional entities, and stakeholders is mutually beneficial. Communicate and coordinate with TARPO, Moore 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	Southern Pines Recreation and Parks Department	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.	Continuous/ Ongoing	Appendix B
Coordinate Family Rides	Southern Pines Recreation and Parks Department	BPAC	Recreation and Parks 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	Southern Pines Parks and Recreation Department	Southern Pines Planning Department, BPAC	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	Southern Pines Parks and Recreation Department	Local Arts Organizations	See examples in Appendix A.	Continuous/ Ongoing	A-46
Strengthen overall maintenance program	Southern Pines Public Works + Southern Pines Recreation and Parks Department	BPAC + General Public (for reporting maintenance needs)	A Southern Pines 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	Southern Pines Town Council, Planning Board, Planning Staff, Public Works Director, Streets Division and NCDOT Division 8	NCDOT Bike/Ped Division	Become familiar with State and Federal bicycle policy, as outlined in Appendix C.	Short Term (2011)	Appendix C
Design Orientation	Town Planning Board, Public Works Director, and NCDOT Division 8	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 (2011)	Appendix A
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 8	Southern Pines Public Works, 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 (2011)	Chapter 3
Initiate a local bicycle safety and courtesy educational campaign by 2012	Southern Pines Recreation and Parks 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

Task	Lead Agency	Support	Details	Phase	Page Reference
Launch three new programs in three years that aim to increase bicycling among a) children, b) commuter/ utilitarian cyclists, and c) recreational/fitness cyclists.	Southern Pines Recreation and Parks 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 (2011-2014)	Appendix B
If the Town determines that there are streets where speeds need to be lowered for safety purposes, contact NCDOT to lower them.	Southern Pines Public Works	NCDOT Division 8, 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 (2011-2014)	-
Produce and distribute a user-friendly bicycle map	Southern Pines G.I.S. Department/Recreation and Parks Department	NCDOT Bike/Ped Division	Once more facilities are in place, produce and distribute a user-friendly bicycle map of Southern Pines, 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.	Mid-Term (2012-2014)	-
Provide police officers with educational material to hand out with warnings	Southern Pines 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
Work together to create a multi-use trail from Central Ave to Airport Road.	Southern Pines Recreation and Parks Department	Sandhills Community College	After agreeing upon an alignment, securing an easement, and securing funding, generate construction documents to build the trail. See Cutsheet 5 for more information.	Long Term (2014)	3-14
Become Designated as a Bicycle Friendly Community	Southern Pines Planning Department	BPAC	Southern Pines 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	Southern Pines Public Works	NCDOT Division 8, 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)	-

Task	Lead Agency	Support	Details	Phase	Page Reference
Attend a bicycle planning and design training session	Southern Pines Public Works Department, Recreation and Parks Dept., and Planning Dept.	NCDOT Bike/Ped Division	Sponsor at least one planner, one engineer, and one parks staff from the Town of Southern Pines 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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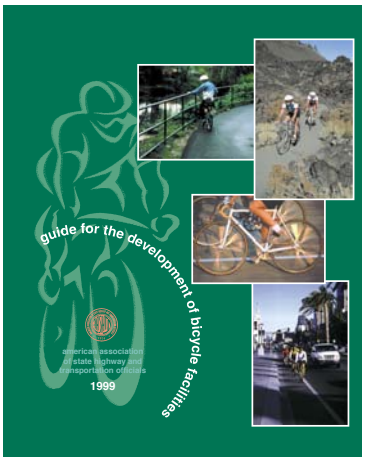
Overview

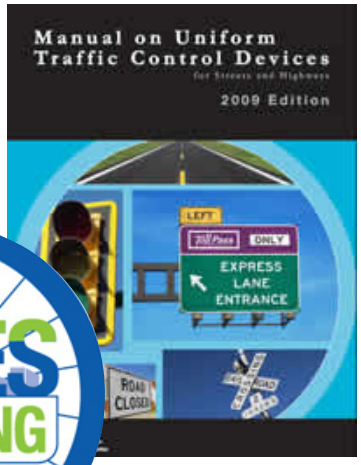
This appendix provides design guidelines for bicycle, pedestrian and trail-related facilities that are used in various locations across the United States. These guidelines can be used to determine a comprehensive bike-ped network throughout Southern Pines, while still providing for flexibility on a project 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.

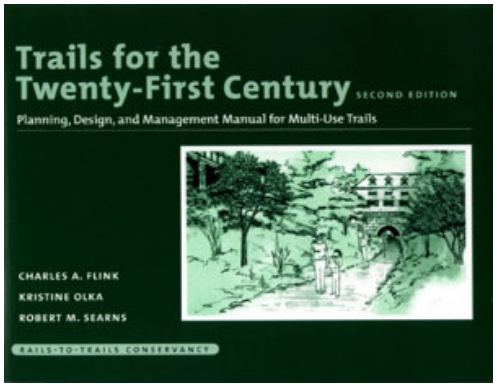
The guidelines should be used with the understanding that design adjustments will be necessary in certain situations in order to achieve the best results. Facility installation and improvements should be evaluated on a case-by-case basis, in consultation with local or state bicycle coordinators, and/or 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.

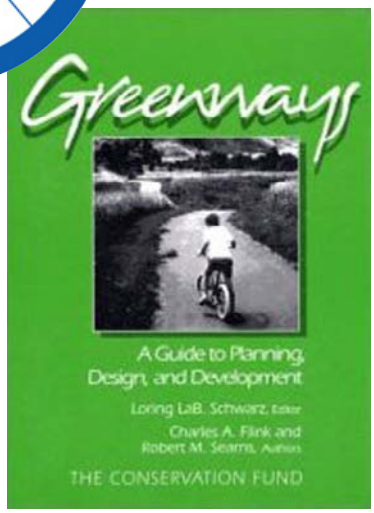
On facilities maintained by NCDOT, the State's design guidelines will apply. The Town of Southern Pines has the potential to exceed minimum guidelines where conditions warrant (within their jurisdiction).

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









bicyclinginfo.org
Pedestrian and Bicycle Information Center

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/

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

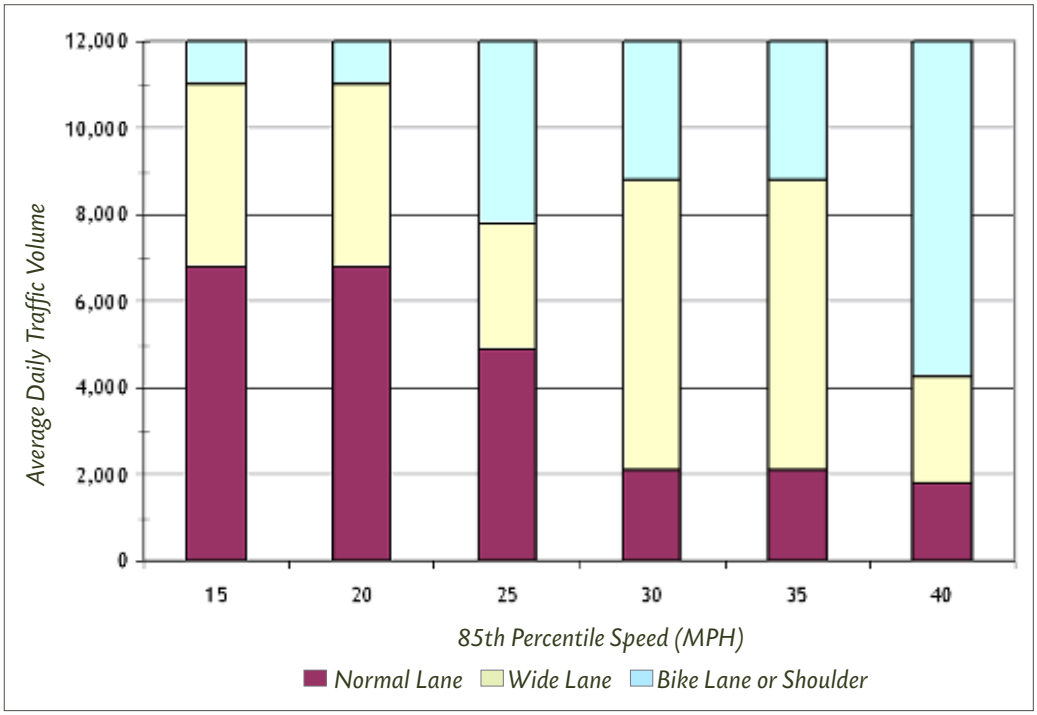
Cities for Cycling Urban Bikeway Design Guide. National Association of City Transportation Officials.
www.nacto.org/citiesforcycling.html

**Once available, Southern Pines should use the updated AASHTO Bicycling Guide scheduled for release in 2010.*

Bicycle Facilities and Related Streetscape Improvements

A wide variety of on-road bicycle facilities are recommended to meet different transportations 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).

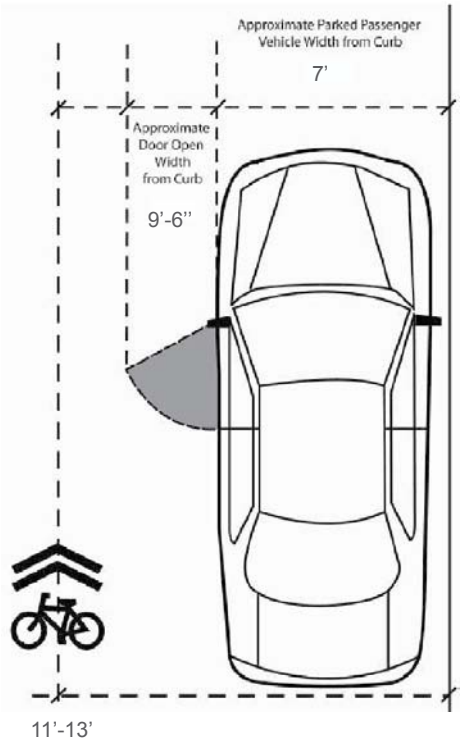
Left: Neighborhood street examples.

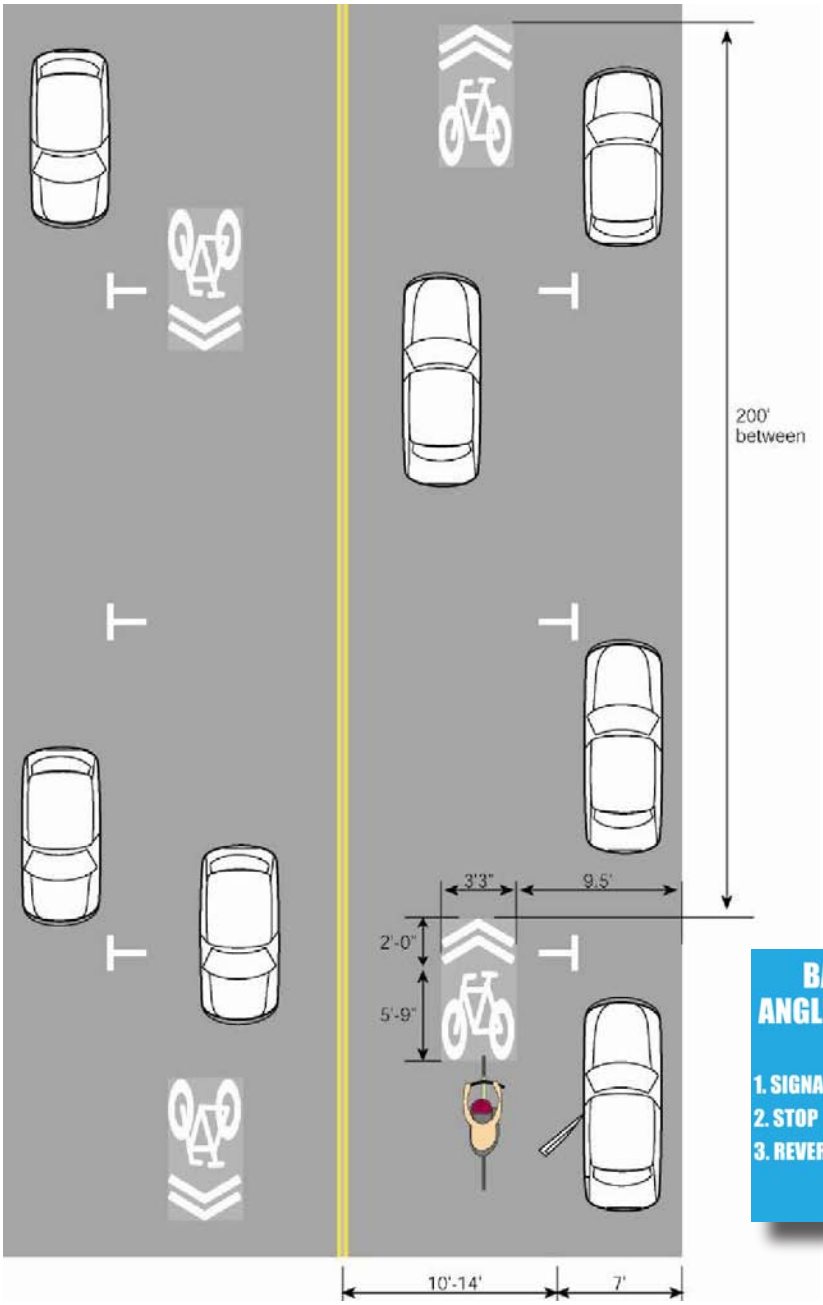
Shared Lane Marking

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

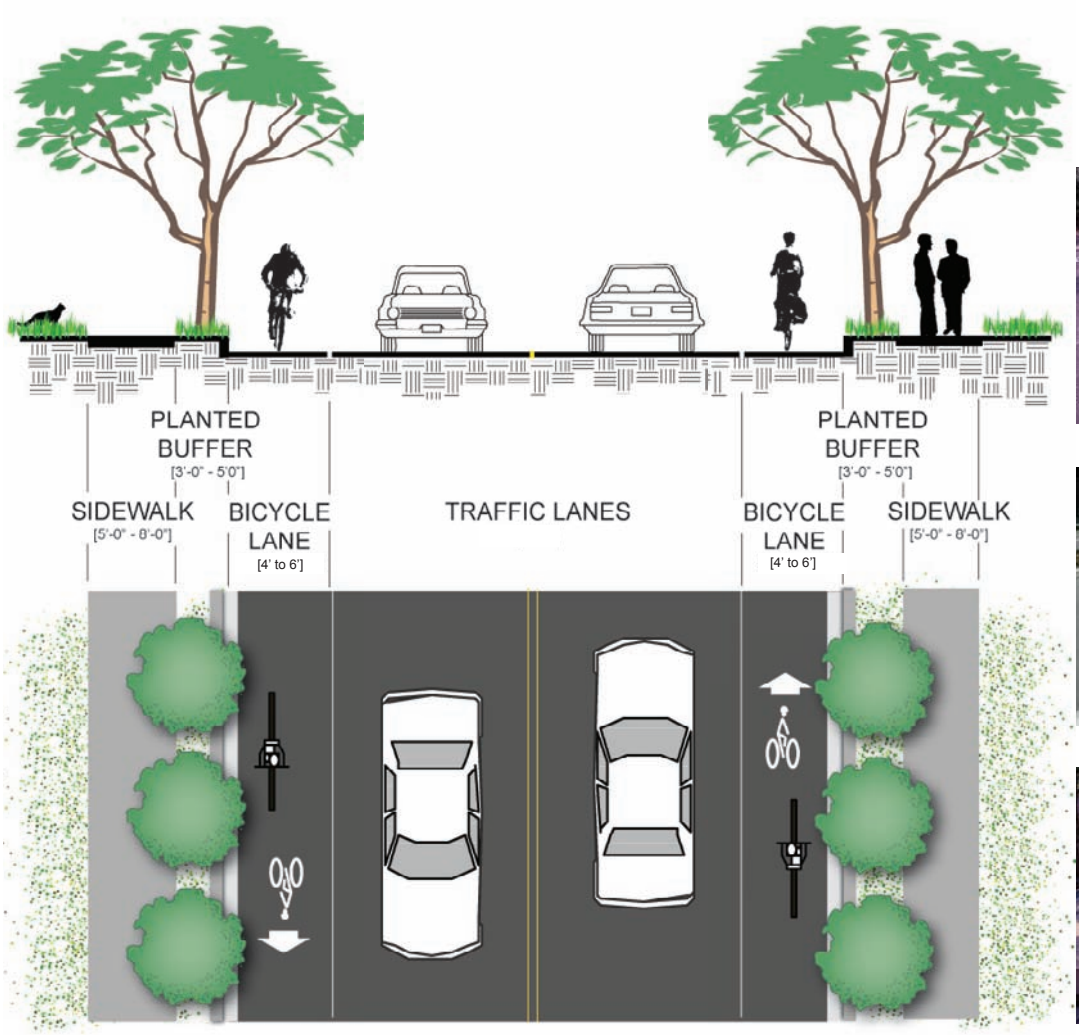
Back-in/head-out diagonal parking and conventional head-in/back-out diagonal parking have common dimensions, but the back-in/headout is superior for safety reasons due to better visibility when leaving. This is particularly important on busy streets or where drivers find their views blocked by large 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

Bicycle Lanes

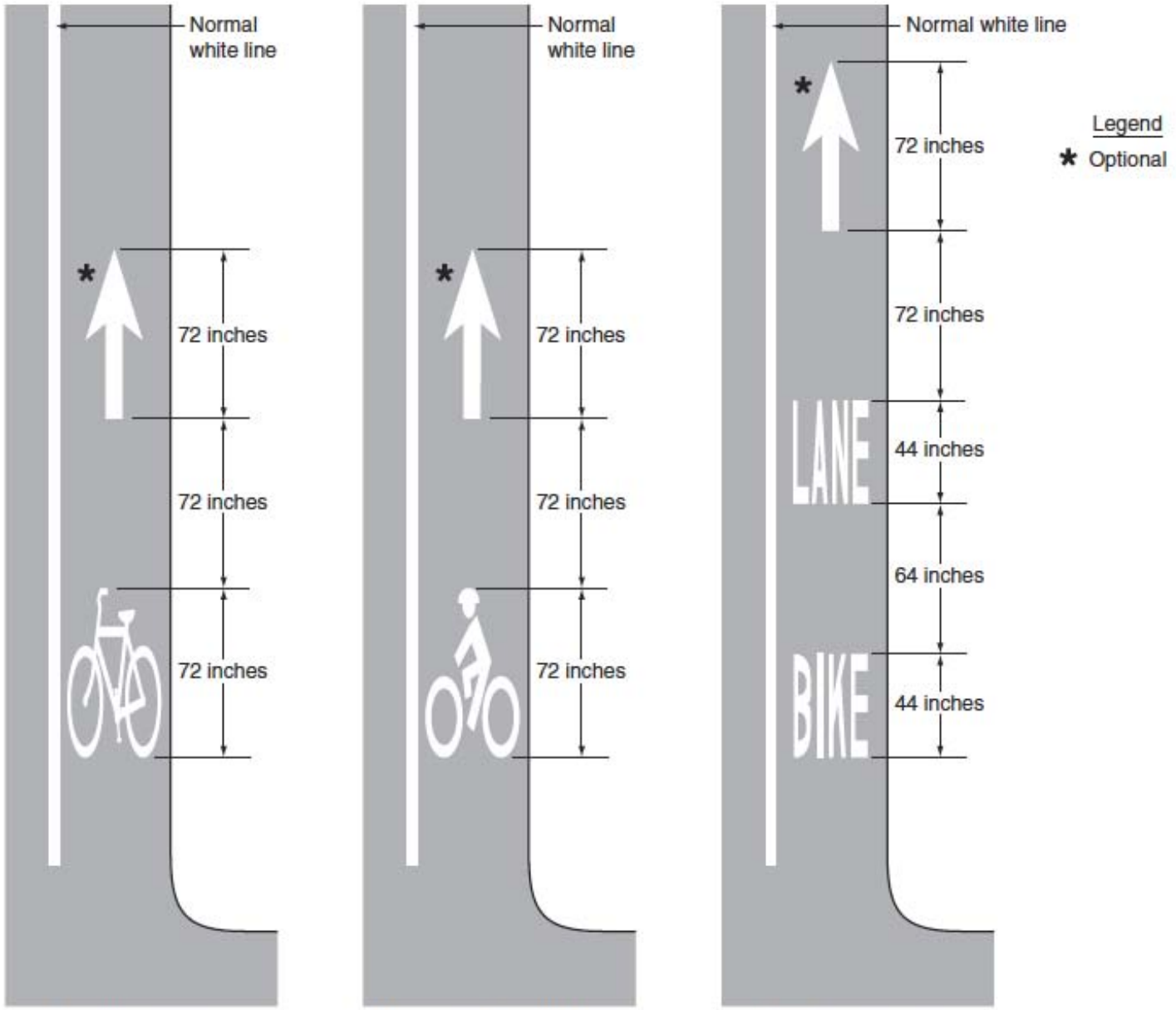
A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicyclists. Bicycle lanes are located on both sides of the road, except one way streets, and carry bicyclists in the same direction as adjacent motor 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.



A - Bike Symbol

B - Helmeted Bicyclist Symbol

C - Word Legends

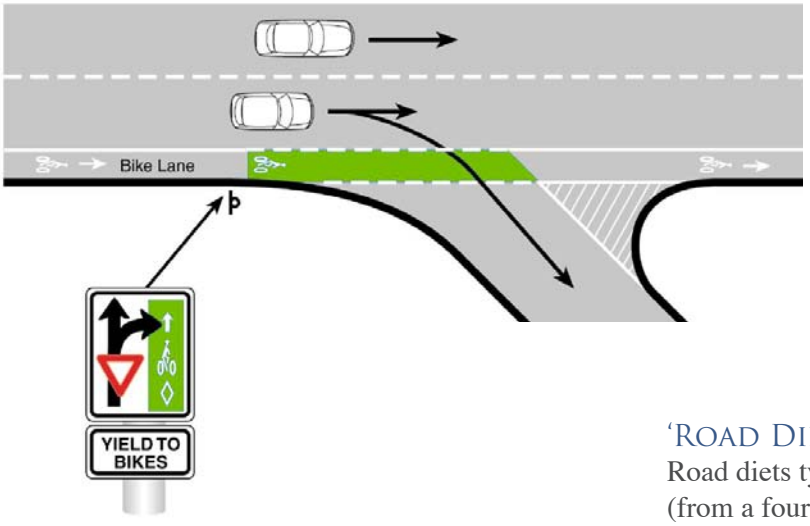
Colorized Bike Lanes

In addition to markings presented in the MUTCD, the following experimental pavement markings may be considered. 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.

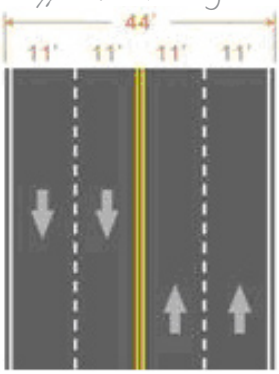


Left: colorized bicycle lane application at a potential conflict area.

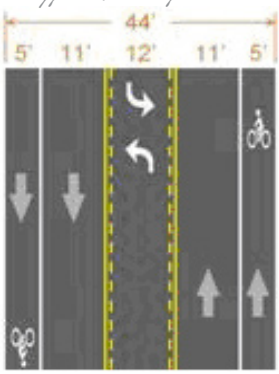
'Road Diets' for Bicycle Lanes

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 diets to ensure that capacity and level-of-service needs are balanced against bicycle level of service needs.

Typical Existing



Typical Proposed



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).

Striped/Paved Shoulder

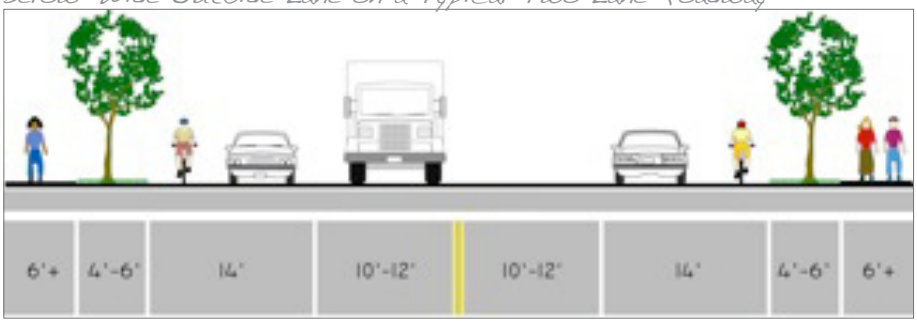
Paved shoulders are the part of a roadway which is contiguous and on the same level as the regularly traveled portion of the roadway. There is no minimum width for paved shoulders, however a width of at least four feet is preferred. Ideally, paved shoulders should be include in the construction of new 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

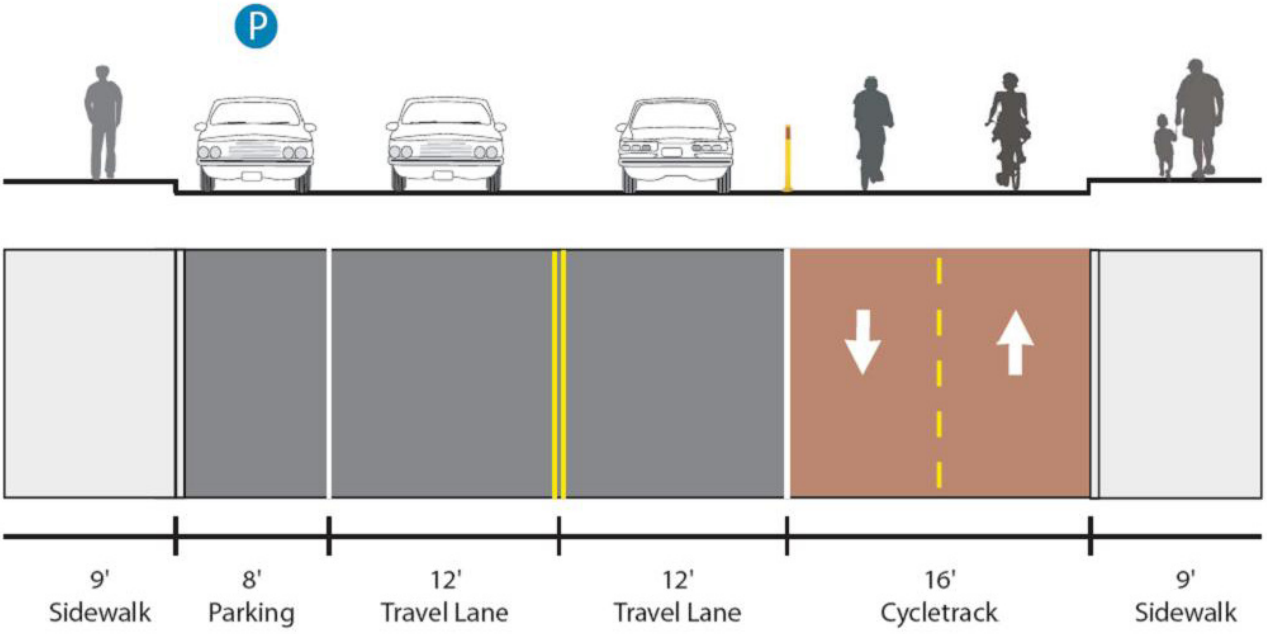


Cycle Tracks

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.

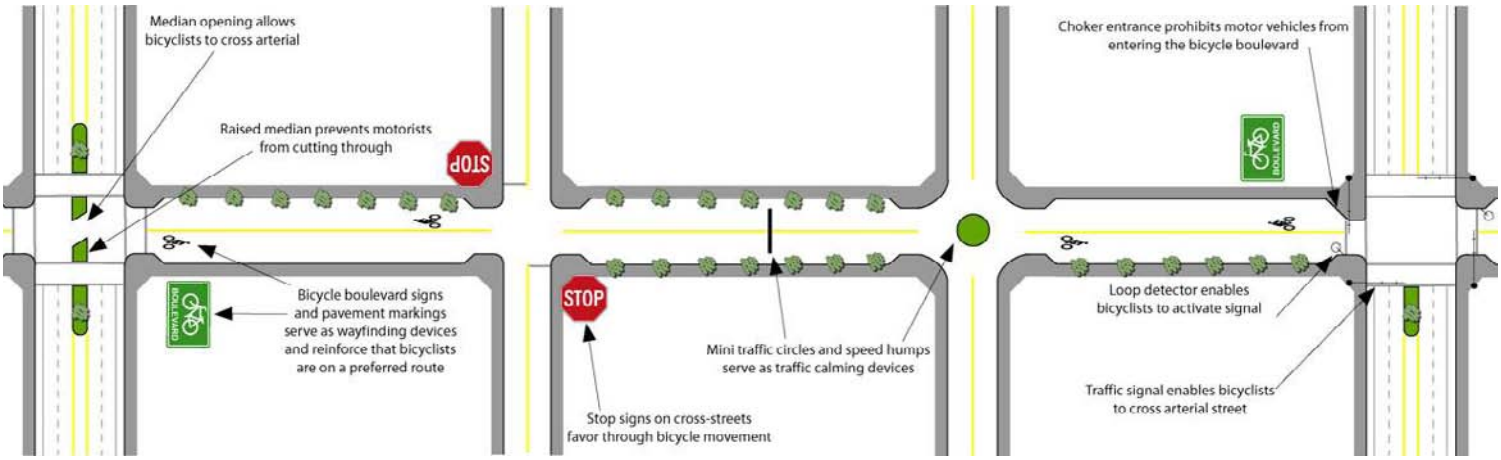
Bicycle Boulevards

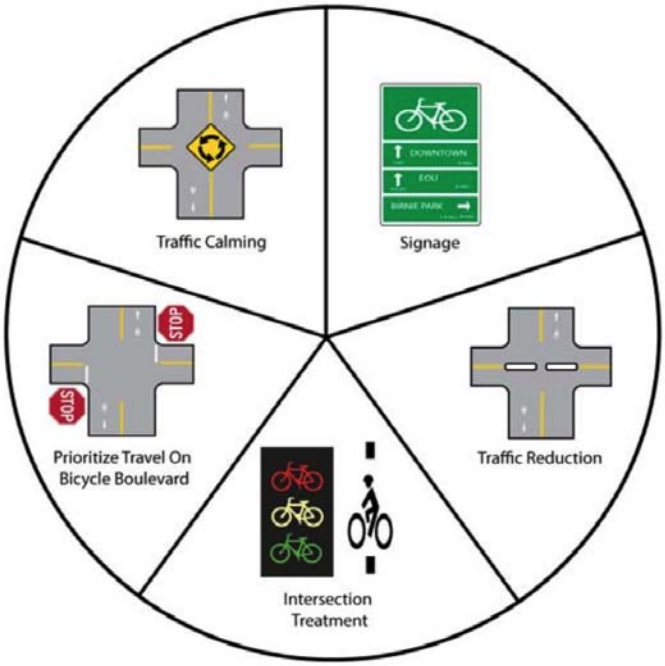
To further identify preferred routes for bicyclists, the operation of lower volume roadways may be modified to function as a through street for bicycles while maintaining local access for automobiles. Traffic calming devices reduce traffic speeds and through trips while limiting conflicts between motorists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

For a complete overview, see www.ibpi.usp.pdx.edu/guidebook.php

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

Bicycle Facilities at Intersections

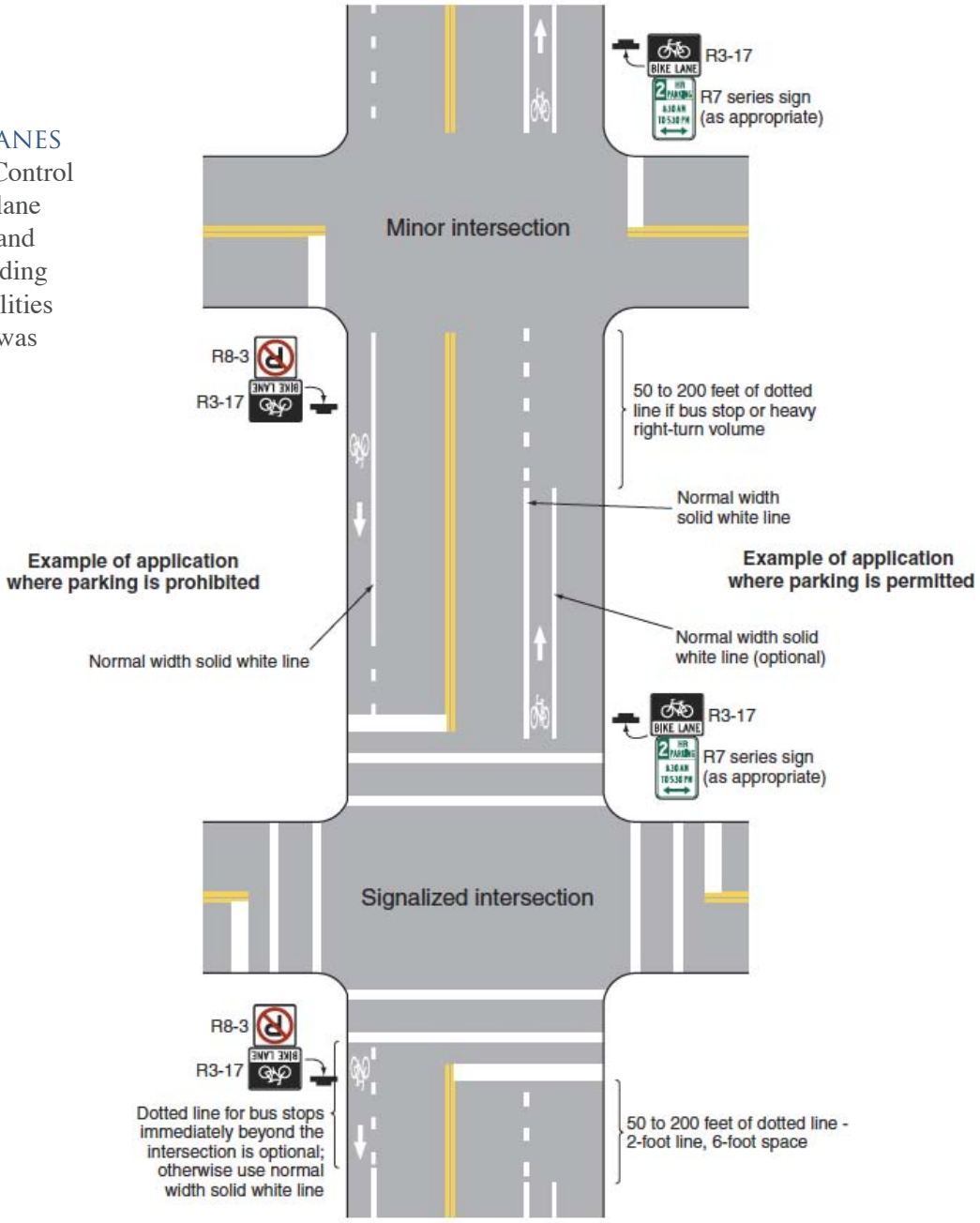
Intersections represent one of the primary collision points for bicyclists, with many factors involved:

- 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.

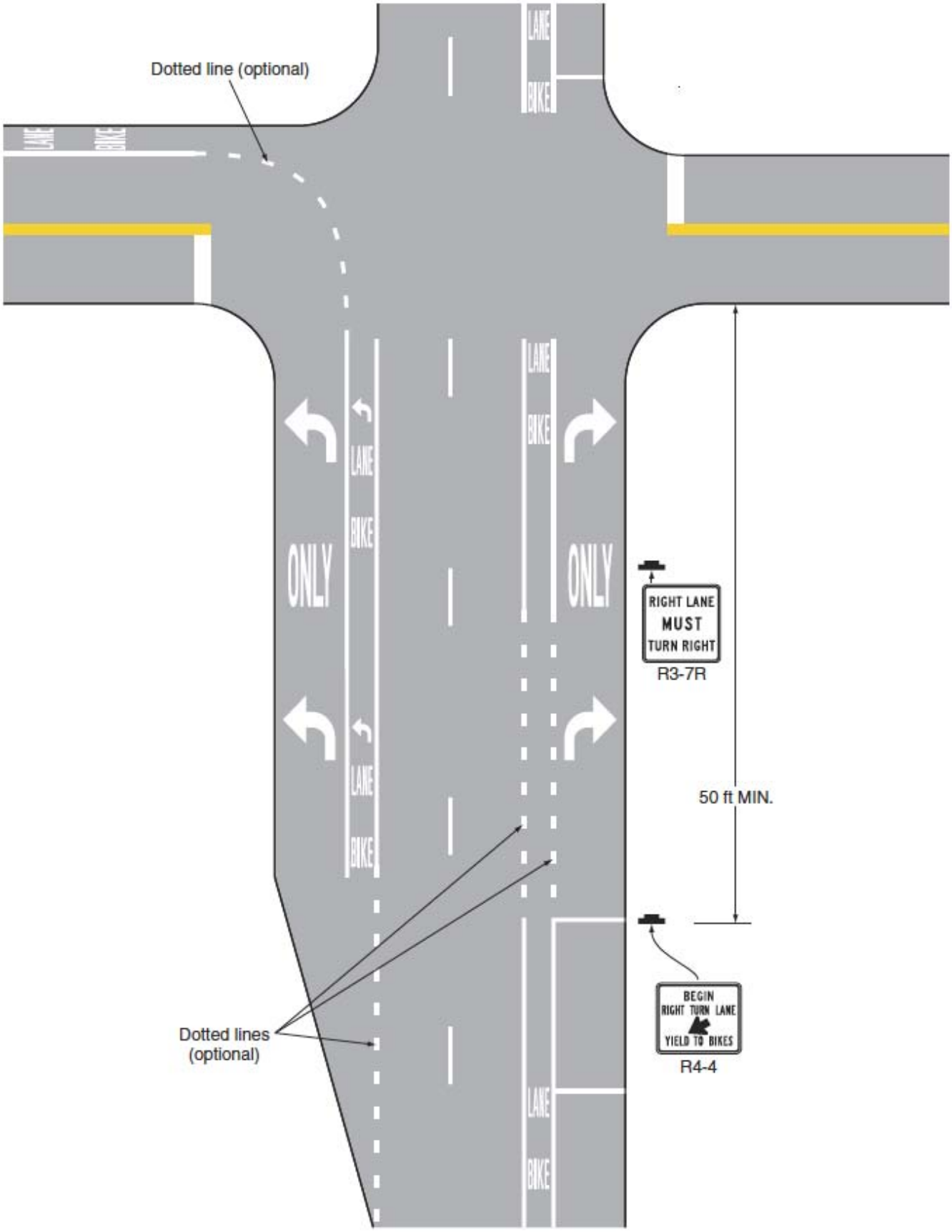
Typical Intersection Configuration for Bike Lanes

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

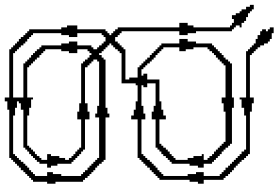
(Image below from the 2009 MUTCD, Figure 9C-1).



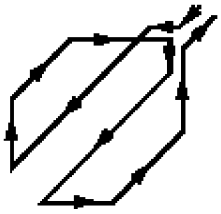
Bicycle-Activated Detector Loop

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:

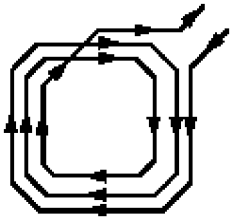
Use pavement marking to aid bicyclists in locating loop detectors at intersections.



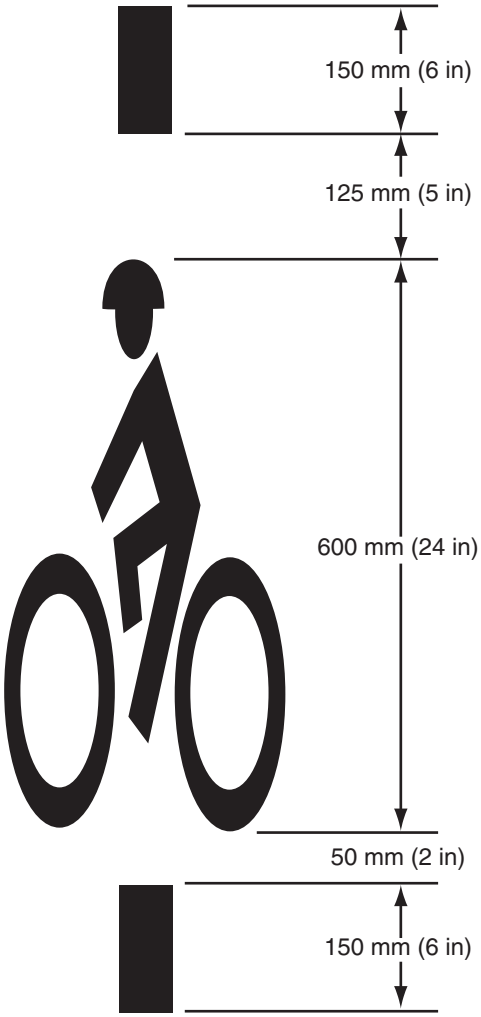
Quadruple Loop
(Recommended for bike lanes)
- Detects most strongly in center
- Sharp cut-off sensitivity



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:

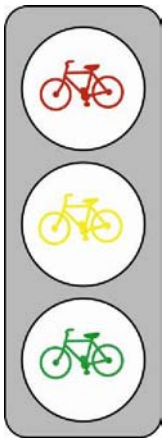
1. Volume. When W = B x V and W > 50,000 and B >50.

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.

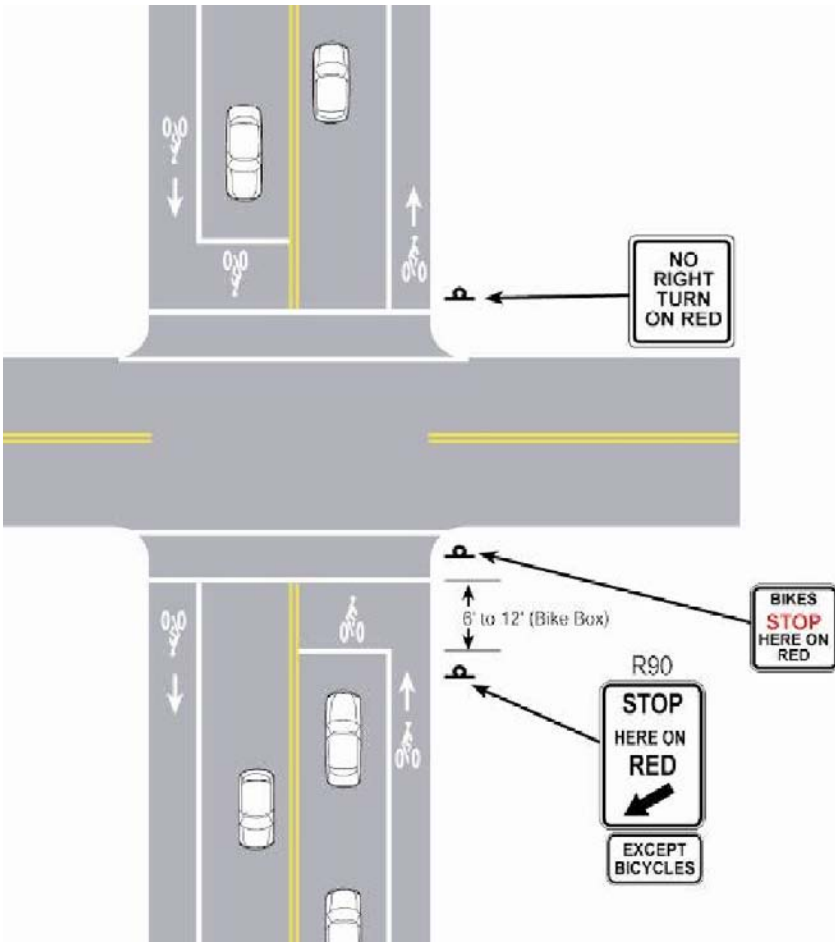
See: MUTCD 2003 and MUTCD 2003 California Supplement (May 20, 2004), Sections 4C.103 and 4D.104 - www/dot.ca.gov/hq/traffopps/signtech/mutcdsupp/



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

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.



Plan view of a bike box.

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)

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.

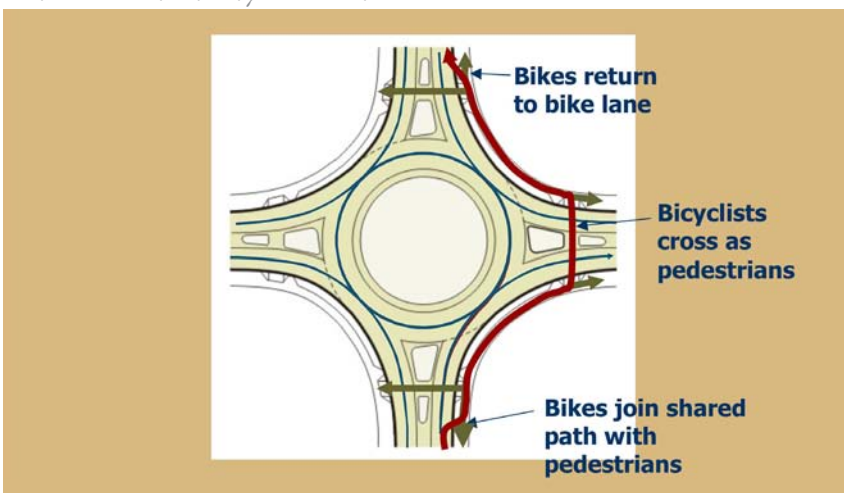
Roundabouts/Traffic Circles

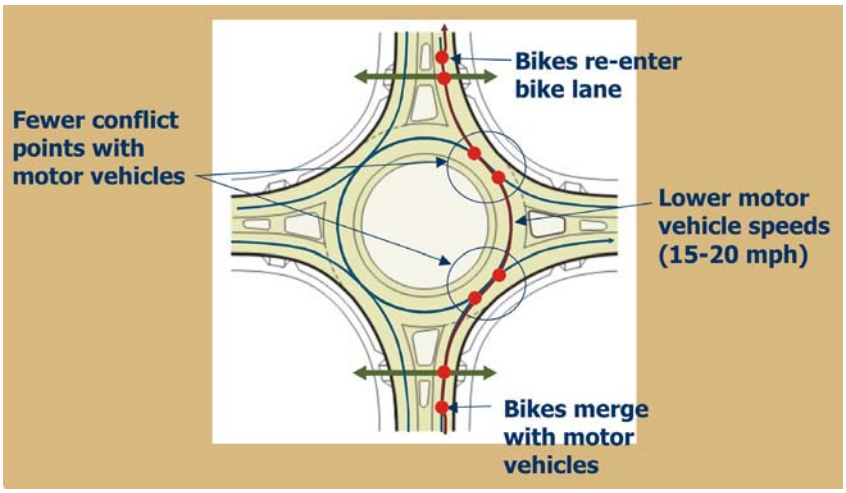
Roundabouts are one-way circular intersections in which traffic flows around a center island without stop signs or signals. Because roundabout traffic enters and exits through right turns only and speeds are reduced, the occurrence of severe crashes is substantially less than in many traditional four-way 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.





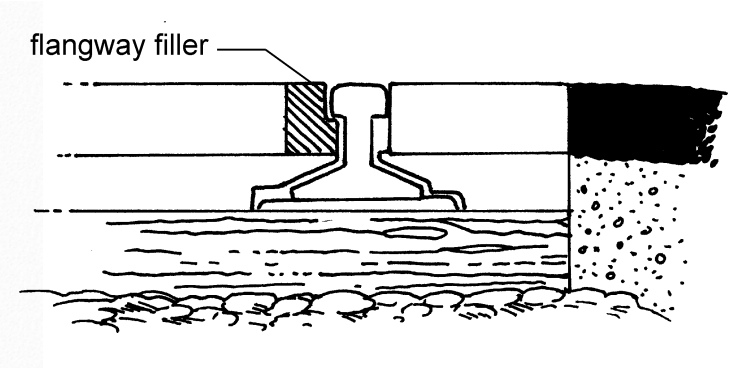
Above: Circulating as a Vehicle: Bike lanes are not recommended within a roundabout. Instead, cyclists merge with traffic before entering the roundabout, circulate with traffic, and then re-enter the bike lane after existing.

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.

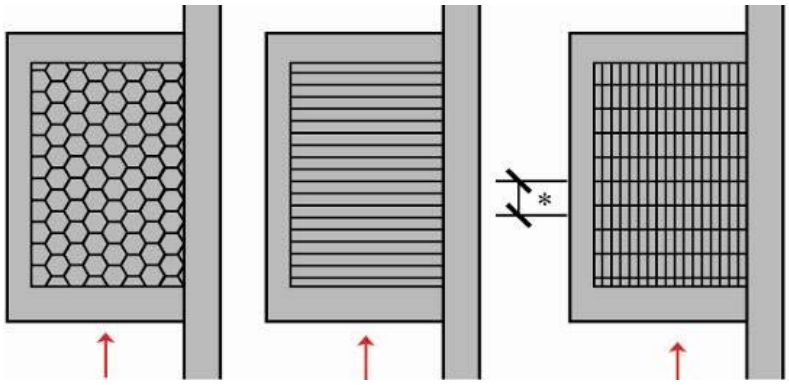


The "flangeway filler" eliminates the gap in the path of travel for pedestrians crossing railroad tracks. The filler, consisting of a rubber insert, will deflect downward with the weight of a train and does not affect railway function.

Bicycle Friendly Drainage Grates

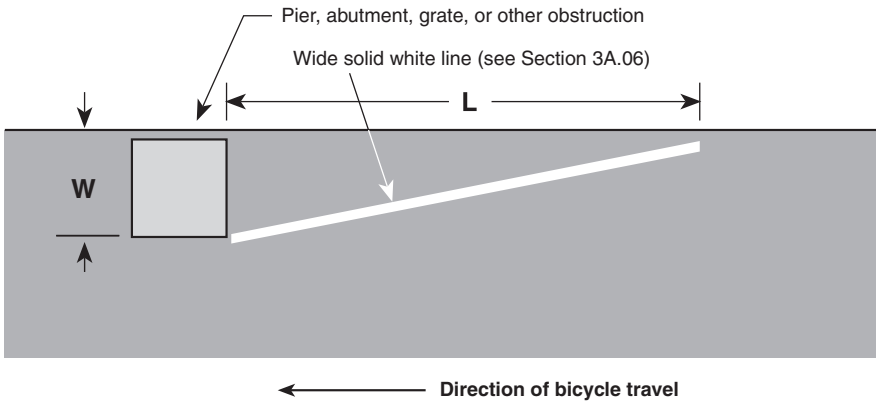
Drainage grates usually occupy portions of roadways, such as bicycle lanes, where bicycles frequently travel. Often drainage grates are poorly maintained or are of a design that can damage a bicycle wheel or in severe circumstances, cause a bicyclist to crash. Improper drainage grates create an unfriendly 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: Bicycle Friendly Drainage Grate Designs



*max 150 mm (6") spacing

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.

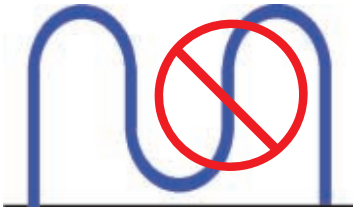
INVERTED "U"
One rack element supports two bikes.

"A"
One rack element supports two bikes.

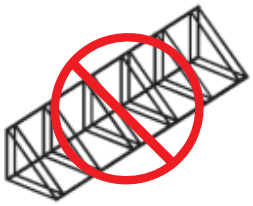
POST AND LOOP
One rack element supports two bikes.

COMB
One rack element is a vertical segment of the rack.

Not recommended

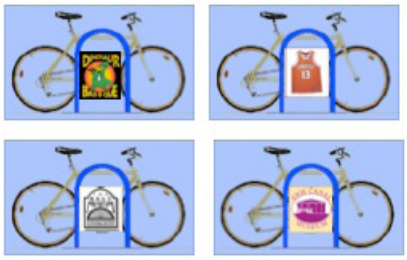


WAVE
One rack element is a vertical segment of the rack.
(see additional discussion on page 3)



TOAST
One rack element holds one wheel of a bike.

Recommended guidelines for bicycle parking from the Association of Pedestrian and Bicycle Professionals, 2002, www.apbp.org.

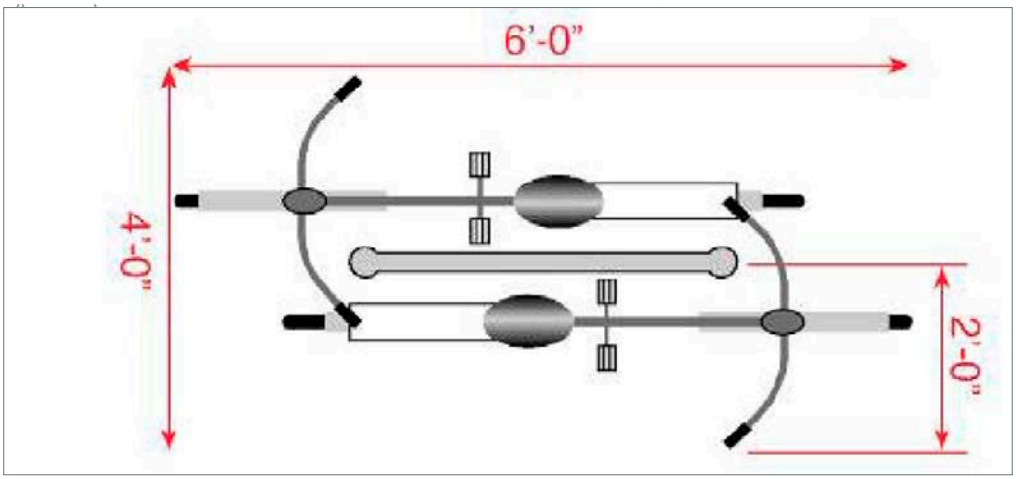


Bicycle racks that incorporate advertising can be sponsored by local merchants.

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 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).

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).

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.

Lousiville'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.

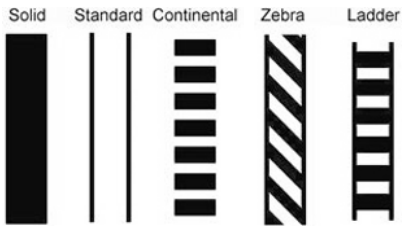
Bicycle Stations and Repair Stands

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.



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

Marked Crosswalks

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 handcarts, 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). 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 (visable 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 for the Access board's right-of-way report.

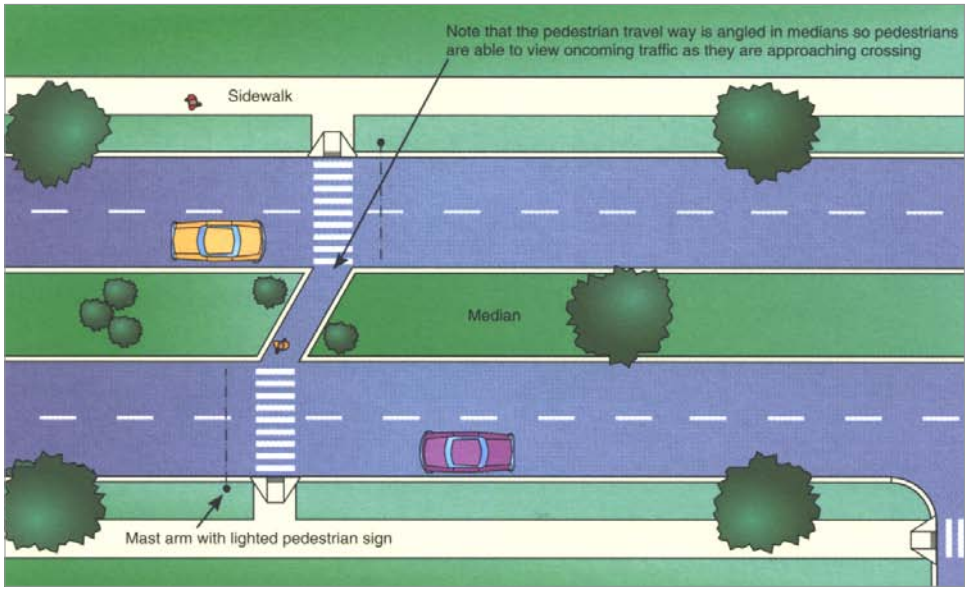
Raised or Lowered Medians

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.

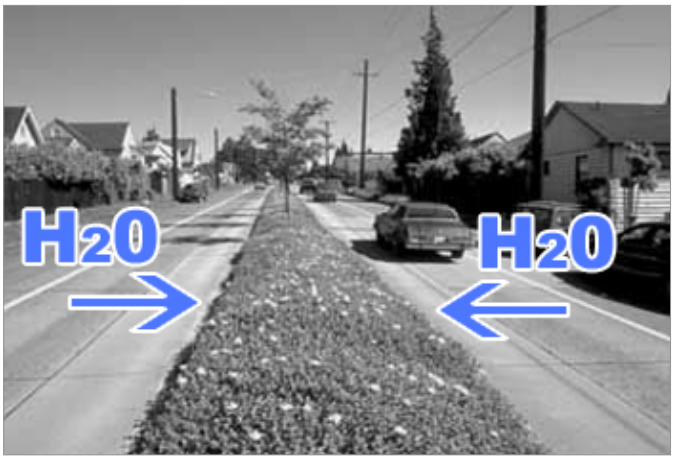
A continuous median can present several problems when used inappropriately. If all left-turn opportunities are removed, there runs a possibility for increased traffic speeds and unsafe U-turns at intersections. Additionally, the space occupied may be taking up room that could be used for bike lanes or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

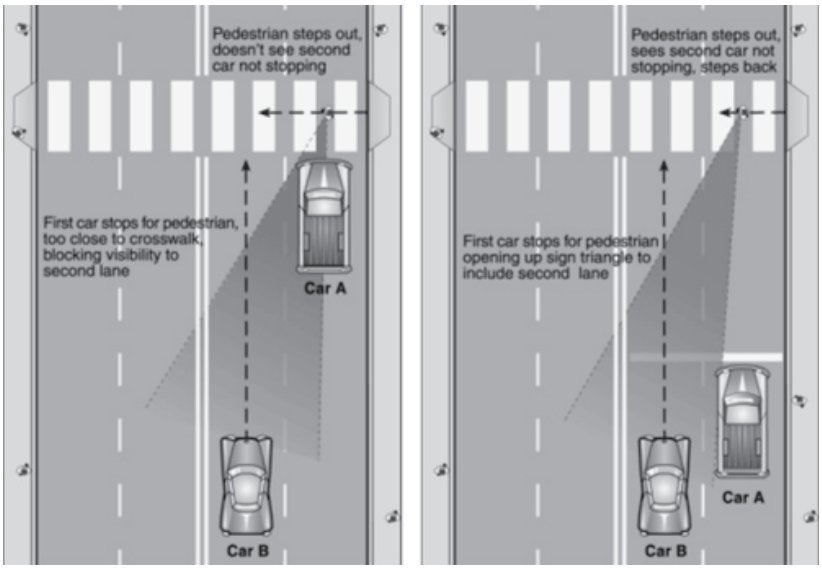
American Association of State Highway and Transportation Officials. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

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).



International symbols used in a crosswalk to designate WALK and DON'T WALK (Image from 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.

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. Consideration 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).

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. Theses 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:

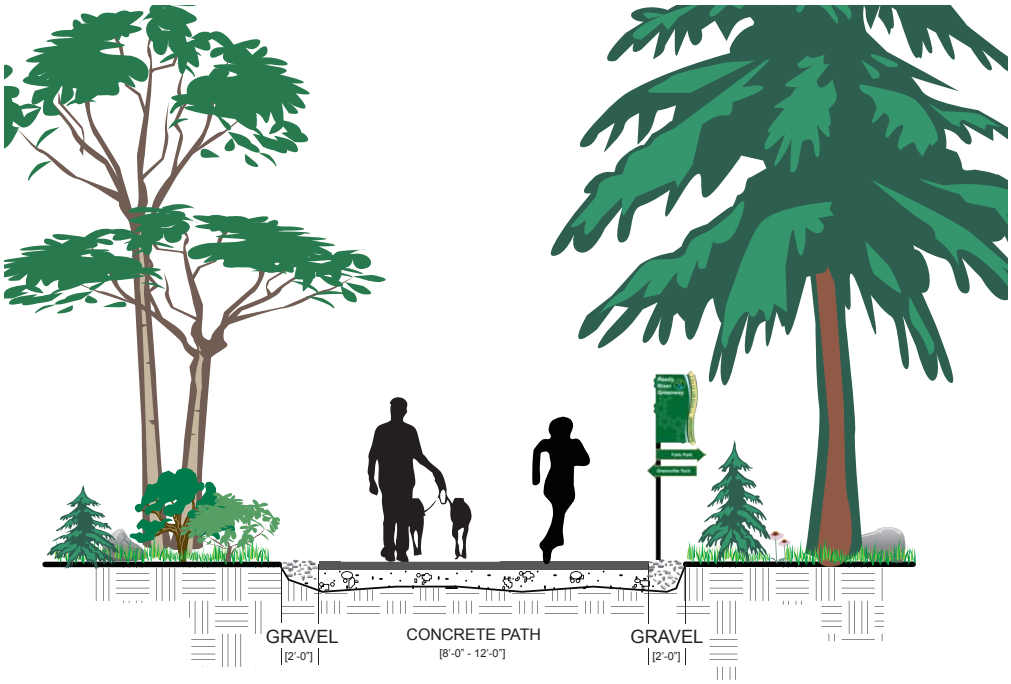
- Pedestrian signals should be placed in locations that are clearly visible to all pedestrians.
- Larger pedestrian signals should be utilized on wider roadways, to ensure readability.
- Pedestrian signal pushbuttons should be well-signed and visible.
- Pedestrian signal pushbuttons should clearly indicate 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.

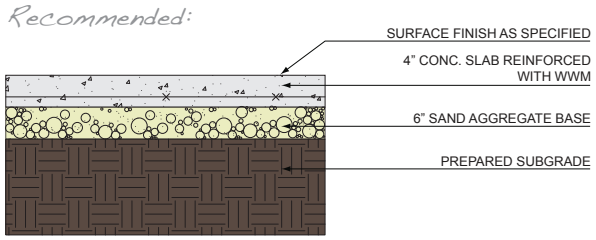
- Concrete is the recommended surface treatment. Paved asphalt or permeable paving can be used as alternatives.
  1. It is recommended that concrete be used for its superior durability and lower maintenance requirements—especially in areas prone to frequent flooding, and for intensive urban applications; 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.



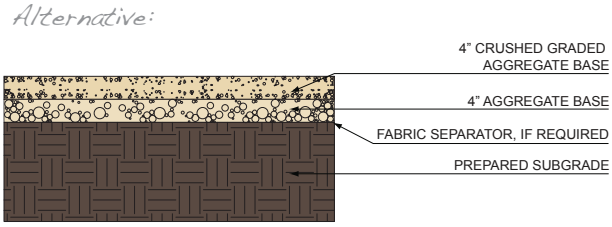
Multi-use Trail : Floodplain Areas

'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.



CONCRETE PAVING ON AGGREGATE



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.

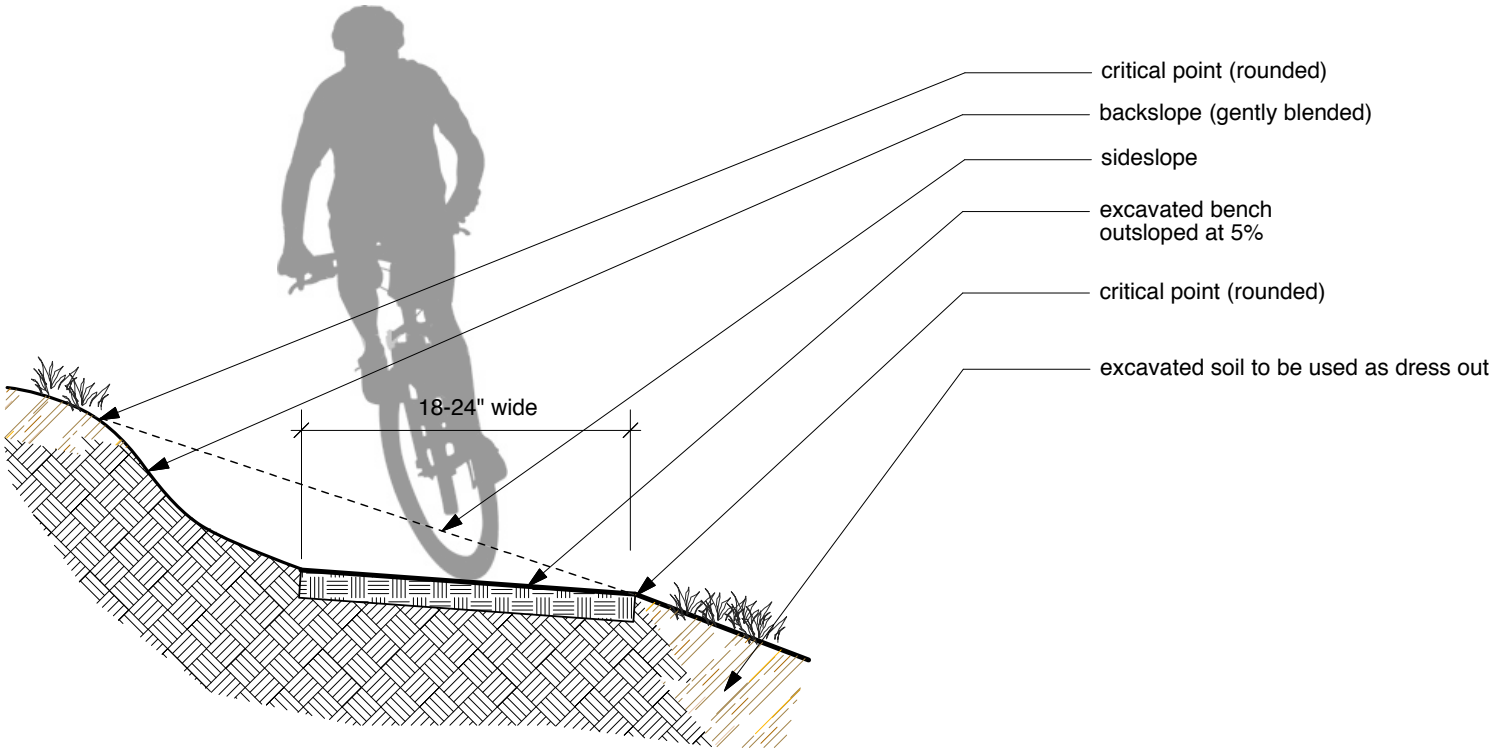
- The trail can vary in width from 18-inches to 6-feet; vertical clearance should be maintained at nine-feet above grade.
- Preparation varies from machine-worked surfaces to those worn only by usage.
- Trail surface can be made of dirt, rock, soil, forest litter, or other native materials. Some trails use crushed stone (a.k.a. "crush and run") that contains about 4% fines by weight, and compacts with use.
- 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.

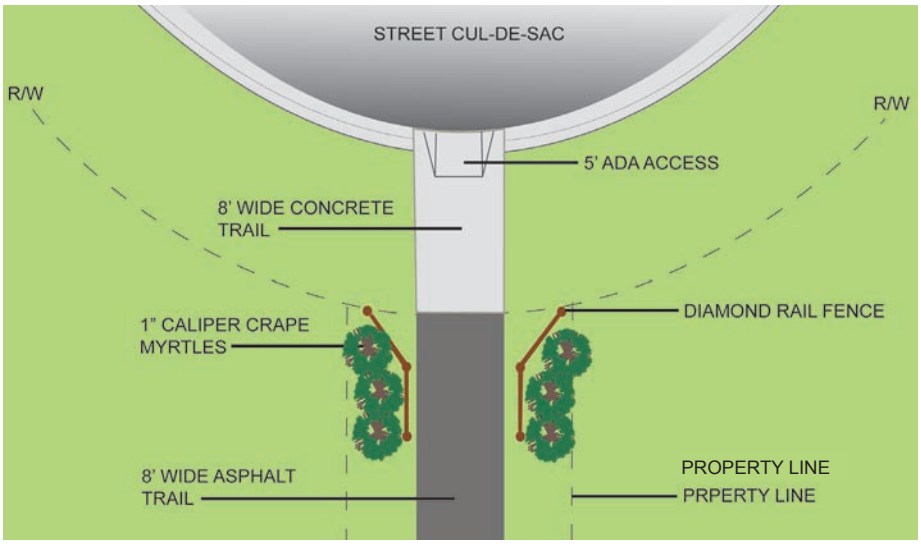
Single-Track Mountain Bike Trails

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.

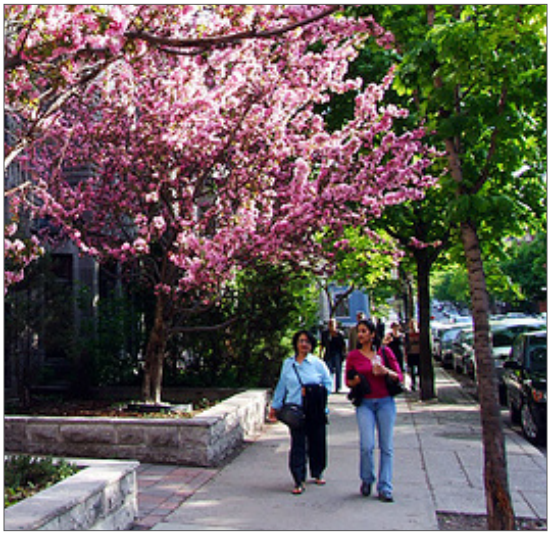
- Neighborhood spur trails should remain open to the public.
- Trail pavement shall be at least 8' wide to accommodate emergency and maintenance vehicles, meet ADA requirements and be considered suitable for multi-use.
- Trail widths should be designed to be less than 8' wide only when necessary to protect 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 interefere 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.



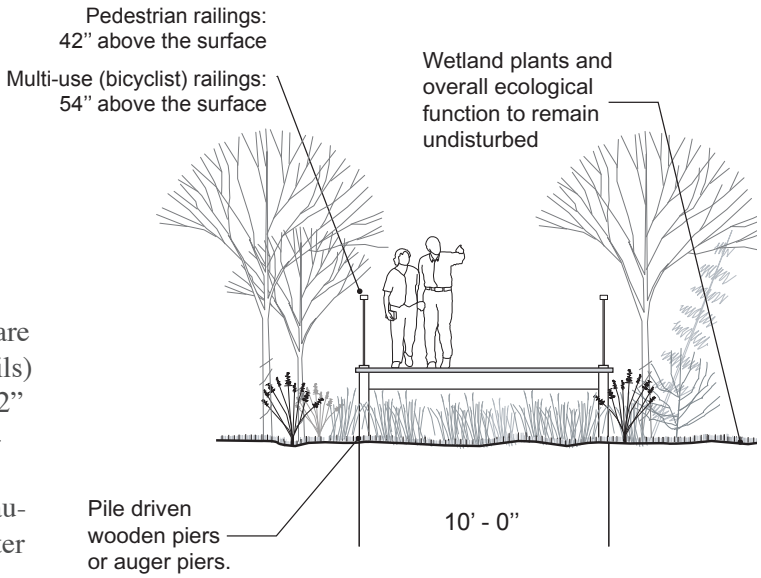
Street trees and other plantings provide comfort, a sense of place, and a more natural and inviting setting for pedestrians.

- 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.

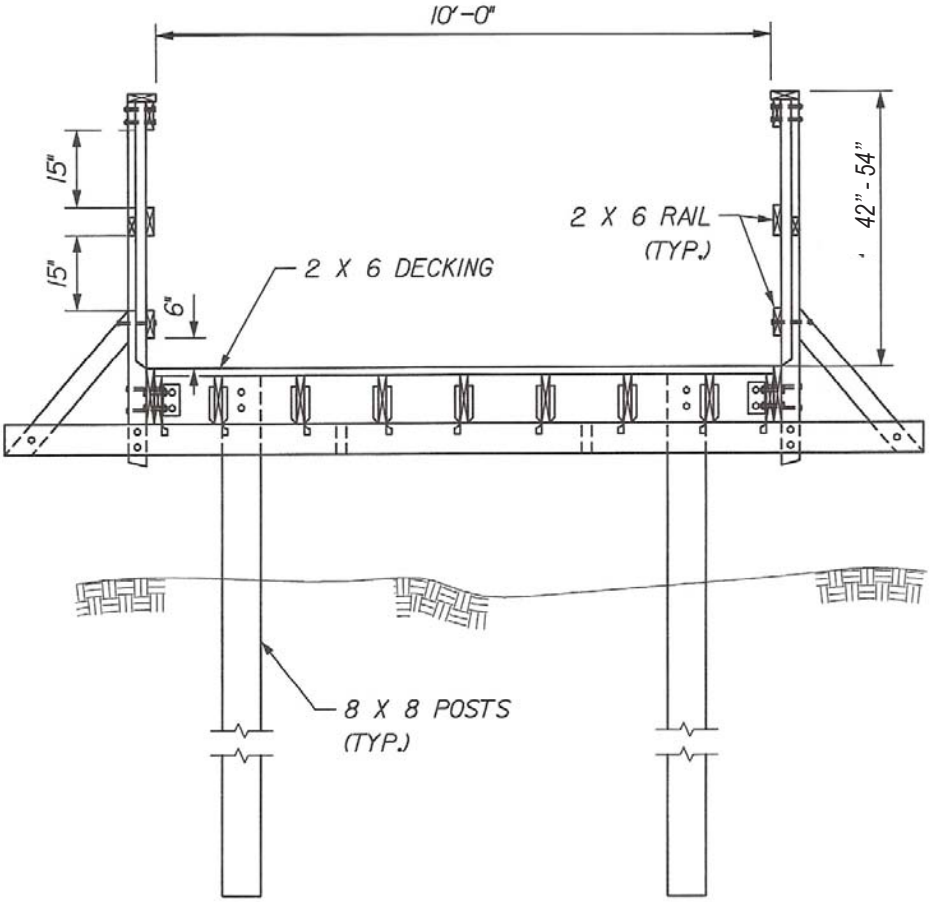
Landscaping used on the Capital Crescent Trail, Washington DC, shows how stormwater treatment can be tied to aesthetically pleasing plantings.

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 low-impact 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.



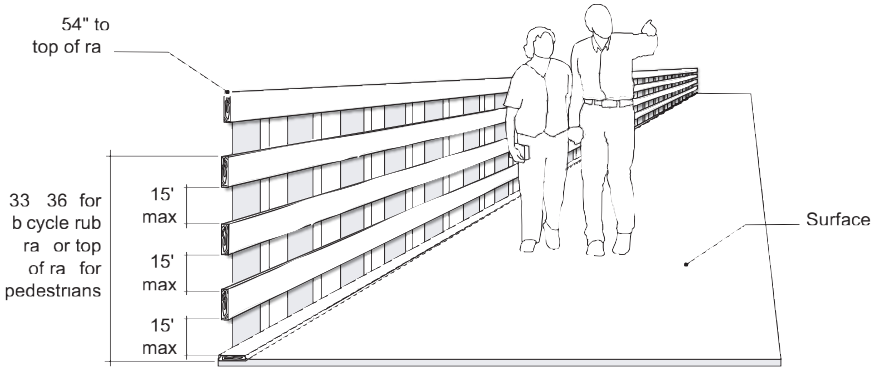
A boardwalk allows for travel through wet areas..

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 a railing.

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



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.

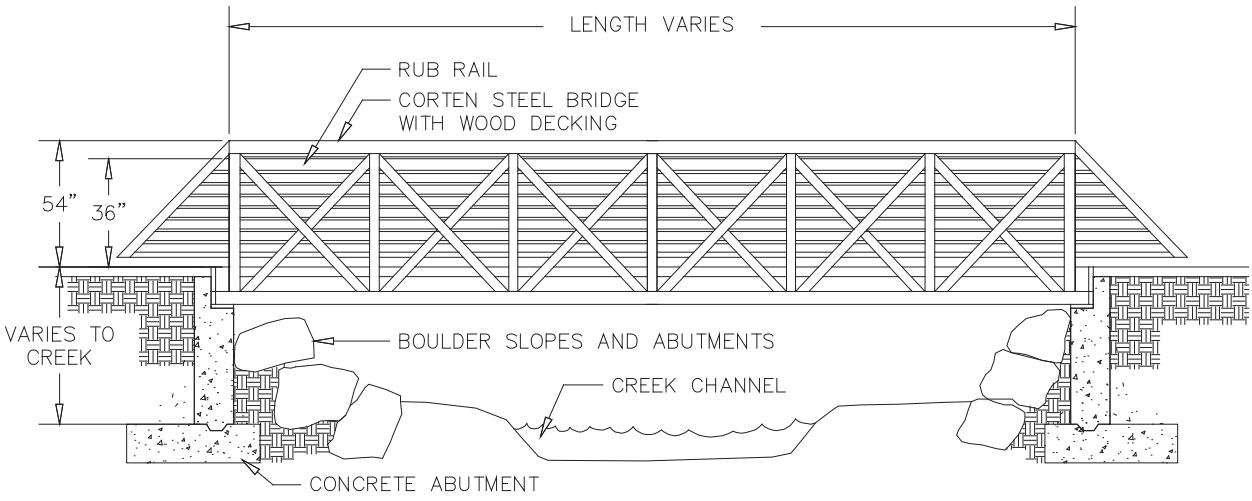
Below: A boardwalk bridge

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.

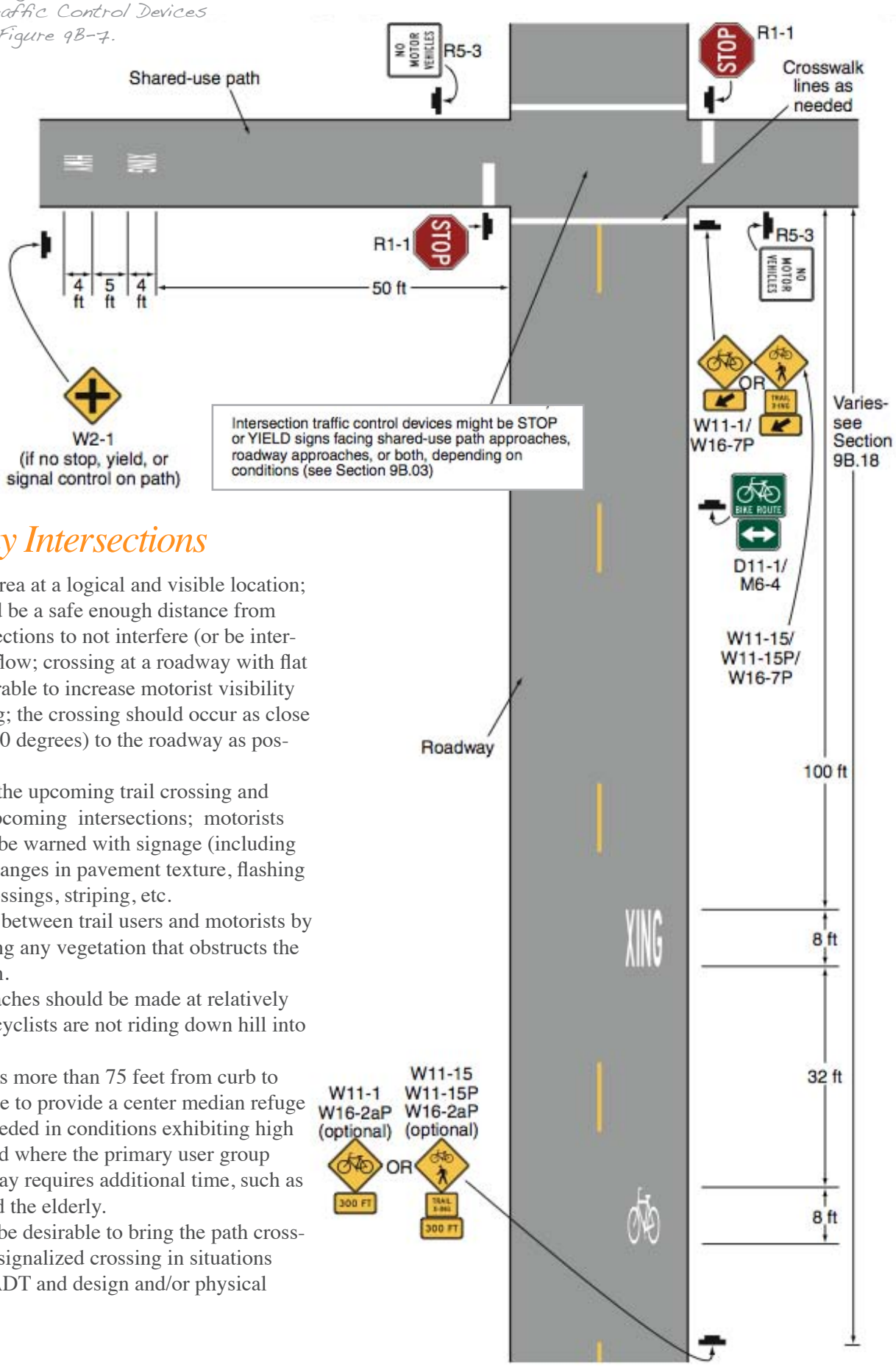
- Sidewalks should be included on roadway bridges on both sides, minimum 5' wide, with minimum handrail height of 42"
- Sufficient bridge deck width should be provided on new bridges, including approaches, to accommodate bicyclists
- In roadway underpasses, where vertical clearance allows, the pedestrian walkway should be separated from the roadway by more than a standard curb height.
- On bridges built for controlled access roadways, a separated, mult-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 steams 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 undepasses 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.

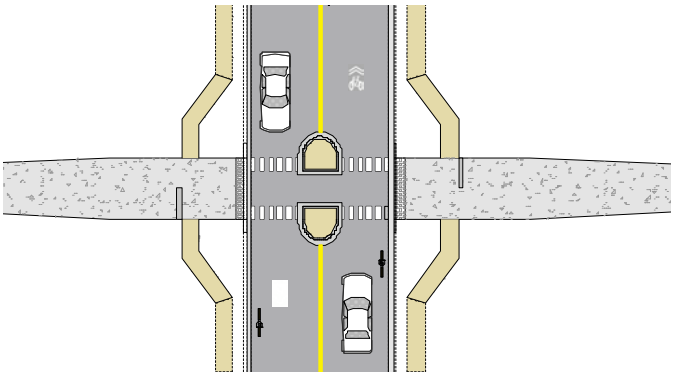
The diagram on this page is from the 2009 Manual for Urban Traffic Control Devices (MUTCD), page 803, Figure 9B-7.



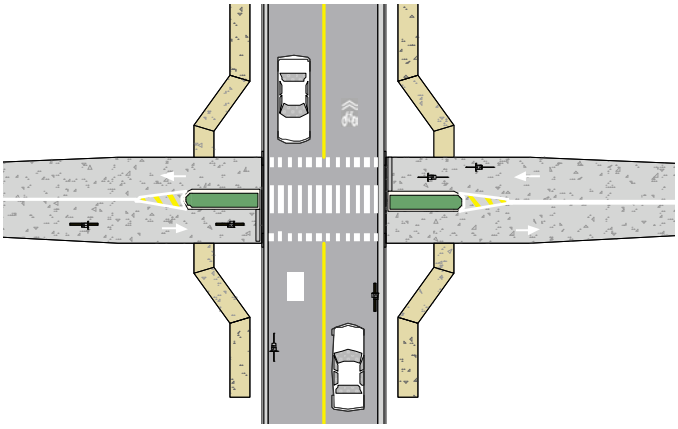
Trail-Roadway Intersections

- 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

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

A water fountain and pet-water fountain.

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 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 ambiance. Roadway streetlights 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 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

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.
- A skilled graphic designer 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.

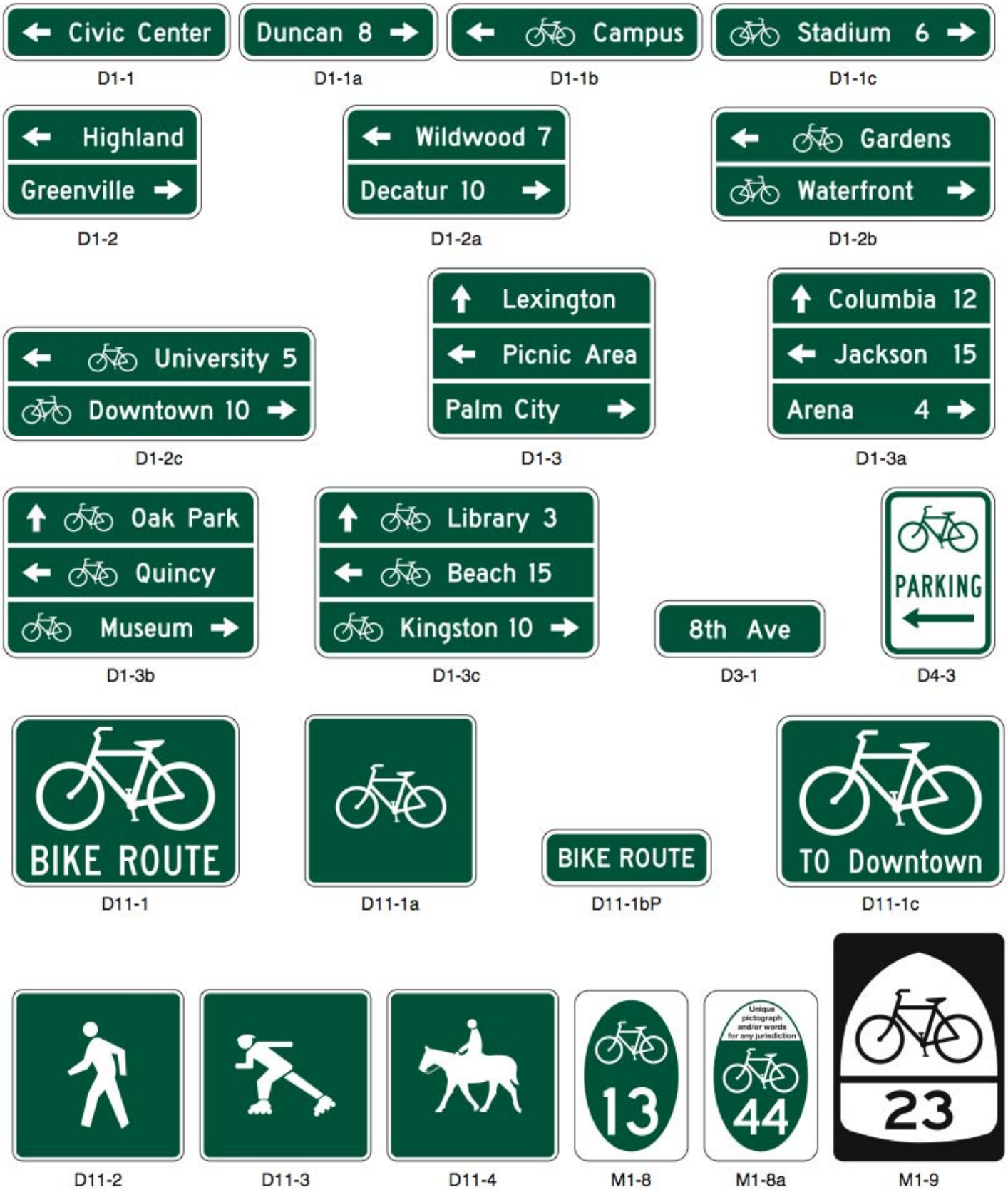
Directional/Wayfinding Signs

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 occuring 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)

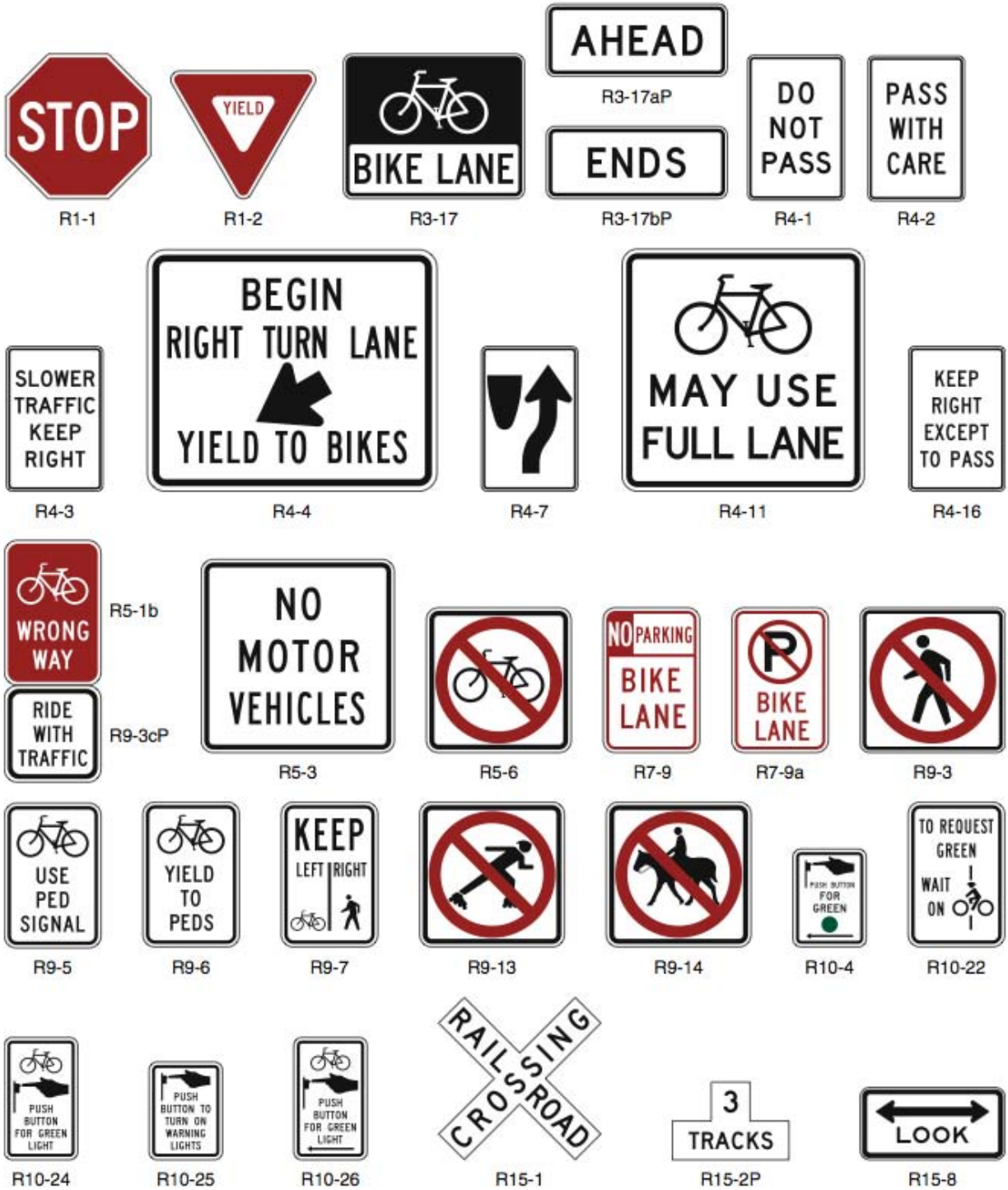


Regulatory/Warning Signs

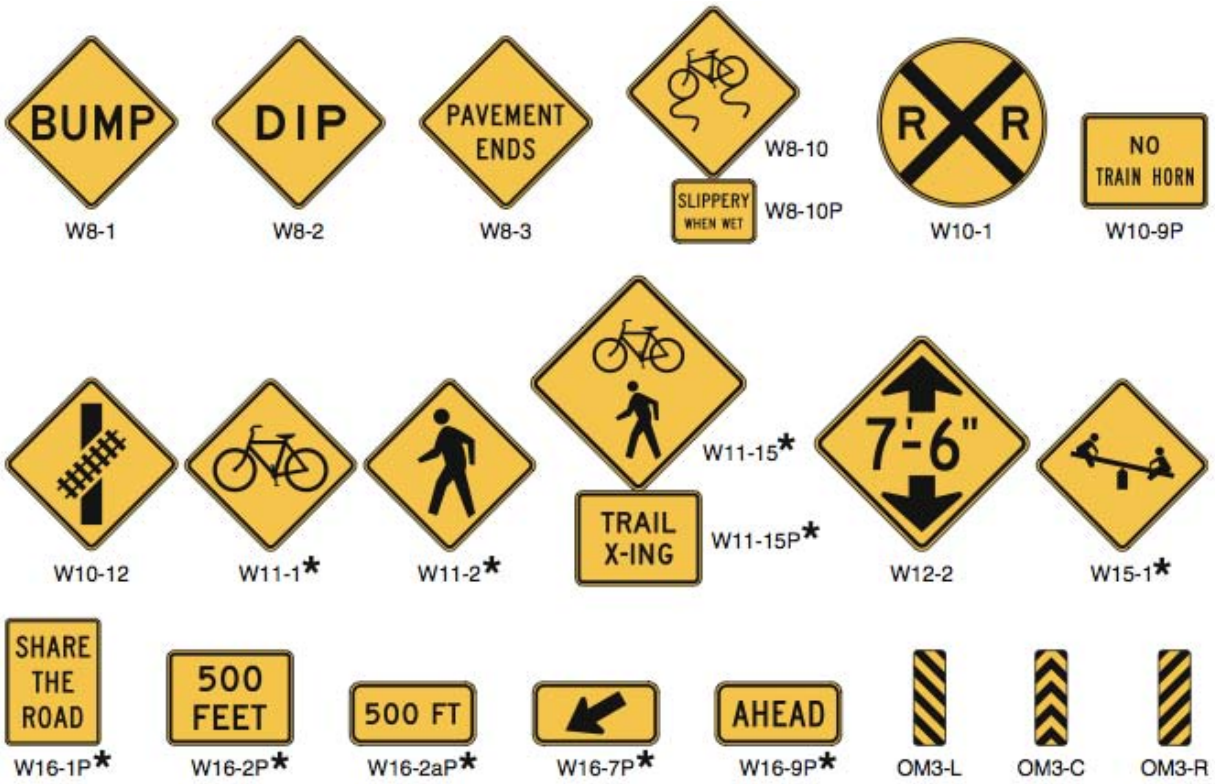
Located throughout the trail system, these signs inform trail users of rules and regulations along the trail, hours of trail operation, upcoming street and trail crossings and other potential hazards such as trail width changes.

- 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.

B. Bicycle Program Toolbox

Overview

Meeting the goals of the Town of Southern Pines 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 Southern Pines 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 Southern Pines. 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

Southern Pines 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. 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 Southern Pines' 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.

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). 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.

Southern Pines 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 devises 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)

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 8 staff, and Moore 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 Southern Pines 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 Southern Pines should be involved.

Bicycle Helmets Program

The Town of Southern Pines 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 Southern Pines' 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

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

Events

Bike Rodeos / Safety Town

The Town of Southern Pines 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)

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).

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 . Also, they list print material that is available for download: 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/confacts/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.

Safe Routes to School

The Town of Southern Pines 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 theTown of Southern Pines 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.

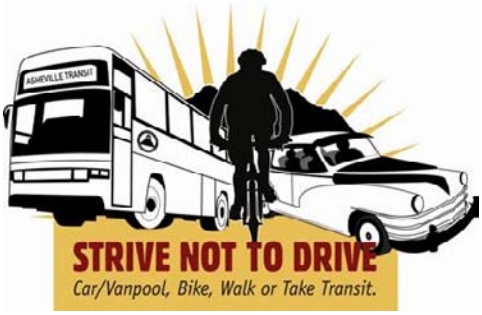
May is also National Bike Month. Events can include proclamations, marketing campaigns, commuter contests and worksite events.

Car-Free Day (September 22)

Car Free Day is an international day to celebrate getting around without cars. This fall event coincides with the begining 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 Southern Pines 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 Southern Pines. 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 Southern Pines.

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.

Bicycle Activities/Promotion within Local Organizations

The Town of Southern Pines 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.

Cycling Clubs/Bicycle-Commuting Groups

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).

Art in the Landscape

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.

Southern Pines Public Bicycle Map

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.

Adopt-A-Trail

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.

Revenue Generating Programs

The Town of Southern Pines 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

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 Southern Pines Police Department should serve on future implementation committees if possible to understand issues in the Southern Pines 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/

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

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 bicyclists 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/

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 Code of Ordinances 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.

Southern Pines Complete Streets Resolution

Pages C-2 and C-3 outline a draft resolution for consideration by the Town of Southern Pines. The text for this draft was developed out of a Complete Streets Workshop that was held as part of the Bicycle Plan planning process, in conjunction with project Steering Committee meeting. An 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 Southern Pines commits to developing new roadways and reconstructing existing roadways to accommodate all users."*

Town of Southern Pines Draft Complete Streets Resolution

RESOLUTION NO. _____

A Resolution of the Southern Pines Town Council Expressing Support for the Complete Streets Concept and Requesting that a Complete Streets Ordinance be drafted as a component of the Code of City Ordinances Title IX, Section 100.01(E).

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, Southern Pines 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. In 2007, two bicyclists were injured in reported crashes with motor vehicles in Southern Pines.

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 Southern Pines 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 _____, 2010.

_____
Town Clerk

Approved as to form:

_____
Town Attorney

Southern Pines Code of Ordinances Review

The table below and on the following pages provides the reference point, existing text related to bicycling, and recommended changes for the Southern Pines Code of Ordinances.

Source Document	Reference	Existing Text	Recommended Change	Notes
Code of Ordinances			[Add]: Consider adding a new section to the Code of Ordinances for a separate Bicycle Ordinance that is comprised of these policy recommendations listed below.	
Code of Ordinances	Title VII: Traffic Code Chapter 70:General Provisions		[Add New Definition]: Bicycle: Bicycle means every device propelled solely by human power upon which a person or persons may ride, having two tandem wheels either of which is sixteen or more inches in diameter, or three wheels, any one of which is more than twenty inches in diameter.	
Code of Ordinances	Title VII: Traffic Code Chapter 70:General Provisions	STREET. A HIGHWAY, as defined above. The terms HIGHWAY and STREET and their cognates are synonymous.	[Add to Definition]: Regardless of classification, the design and construction of streets and intersections in the Town of Southern Pines should aim to serve all types of users, including pedestrians, bicyclists, and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young.	
Code of Ordinances	Title VII: Traffic Code Chapter 70:General Provisions	TRAFFIC. Pedestrians, ridden or herded animals, vehicles, and other conveyances, either singly or together, while using any street for purposes of travel.	[Add New Definition] Traffic: Pedestrians and vehicles including bicycles, automobiles and other conveyances either singly or together while using streets for the purposes of travel.	
Code of Ordinances	Title VII: Traffic Code Chapter 70:General Provisions		[Add New Definition]: Multi Use Easements: In such cases and at such locations as the Planning Board deems advisable, easements alongside or near lot lines not exceeding twenty (20) feet in width may be required for pedestrian or bicycle traffic to and from schools, neighborhood parks, and other places that may attract or generate such traffic.	
Code of Ordinances	Title VII: Traffic Code Chapter 70:General Provisions	VEHICLE. Every device in, upon, or by which any person or property is or may be transported or drawn upon a highway, excepting devices moved by human power or used exclusively upon fixed rails or tracks; provided, that for the purposes of this title, a bicycle or a ridden animal shall be deemed vehicles and every rider of a bicycle upon a highway shall be subject to the provisions of this title applicable to the driver of a vehicle except those which by his or her nature can have no application. This term shall not include a device which is designed for and intended to be used as a means of transportation for a person with a mobility impairment, or who uses the device for mobility enhancement, is suitable for use both inside and outside a building, including on sidewalks, and is limited by design to 15 mph when the device is being operated by a person with a mobility impairment, or who uses the device for mobility enhancement. This term shall not include an electric personal assistive mobility device as defined in G.S. § 20-4.01(7a).		
Code of Ordinances	Title VII: Traffic Code Chapter 70:General Provisions 70.05	No person riding on any bicycle, motorcycle, coaster, sled, roller skates, or toy vehicle shall attach it or himself or herself to any moving vehicle on any roadway.		
Code of Ordinances	Title VII: Traffic Code Chapter 70:General Provisions 70.06	No person shall ride a bicycle or motorcycle on any street without having his or her hands on the handlebars.		
Code of Ordinances	Title VII: Traffic Code Chapter 70:General Provisions 70.08 Riding Bicycle on Sidewalk or Walkway Restricted	Persons of the age of 10 or less when under the immediate supervision of an accompanying adult on foot.		
Code of Ordinances	Title VII: Traffic Code Chapter 70:General Provisions 70.08		[Add]: Every bicycle when in use during the hours of darkness as defined by the Town of Southern Pines shall be equipped with a lamp on the front which shall emit a white light visible from a distance of at least five hundred feet to the front and with a red reflector on the rear of a type approved by the state patrol which shall be visible from all distances from one hundred feet to six hundred feet to the rear when directly in front of lawful lower beams of head lamps on a motor vehicle. A lamp emitting a red light visible from a distance of five hundred feet to the rear may be used in addition to the red reflector. (2) Every bicycle shall be equipped with a brake which will enable the operator to make the braked wheels skid on dry, level, clean pavement.	

Source Document	Reference	Existing Text	Recommended Change	Notes
Code of Ordinances	Title VII: Traffic Code Chapter 70:General Provisions 70.09		[Add]: Persons of the age of 16 or less shall wear bicycle helmets at all times when operating a bicycle within the city limits of Southern Pines. This is a State Law Currently.	Ninety-one percent of bicyclists killed in 2008 reportedly weren't wearing helmets. Source: the U.S. Department of Transportation's Fatality Analysis Reporting System (FARS)
Code of Ordinances	Title VII: Traffic Code Chapter 71: Traffic Rules, Operation of Vehicles 71.030	Upon all streets of sufficient width, except on one-way streets, the driver of a vehicle shall drive on the right half of the street. Slow-moving vehicles shall be driven as closely as possible to the right-hand edge or curb of the street, unless it is impracticable to travel on that side of the street and except when overtaking and passing another vehicle subject to the limitations applicable in overtaking and passing.	[Revise/Add]: When overtaking and passing a bicycle proceeding in the same direction, a person driving a motor vehicle shall exercise due care by leaving a safe distance between the motor vehicle and the bicycle of not less than three feet until the motor vehicle is safely past the overtaken bicycle. Exception: The statute exempts drivers from the three feet passing law if the bicyclist is in a vehicular lane and a bicycle lane or path exists.	
Code of Ordinances	Title VII: Traffic Code Chapter 71: Traffic Rules, Operation of Vehicles 71.030		[Add]: Whenever a bicycle lane has been established on a roadway, any person operating a bicycle upon the roadway at a speed less than the normal speed of traffic moving in the same direction shall ride within the bicycle lane, except that such person may move out of the lane under any of the following situations: (1) Whenever overtaking or passing another bicycle, vehicle or pedestrian within the lane or about to enter the lane if such overtaking and passing cannot be done safely within the lane. (2) When preparing for a turn at an intersection or into a private road or drivway. (3) When reasonably necessary to leave the bicycle lane to avoid debris or other hazardous conditions.	
Code of Ordinances	Title IX: General Regulations Chapter 100: Streets and Sidewalks 100.1		[Add]: It shall be the policy of the Town to follow the recommendations set forth in the Town of Southern Pines Comprehensive Bicycle Master Plan on all streets which are maintained by the Town that have adequate right-of-way available.	
Code of Ordinances	Title XV: Land Usage, Appendix A: Unified Development Ordinance, Article II Basic Definitions		[Add New Definition]: Bicycle: Bicycle means every device propelled solely by human power upon which a person or persons may ride, having two tandem wheels either of which is sixteen or more inches in diameter, or three wheels, any one of which is more than twenty inches in diameter.	
Code of Ordinances	Title XV: Land Usage, Appendix A: Unified Development Ordinance, Article II Basic Definitions	Street: A right-of-way for vehicular traffic that is open as a matter of right to the public or to a class of persons, including the owners or occupants of lots into which a tract of land has been divided, to which the right-of-way has been dedicated.	[Add]: Regardless of classification, the design and construction of streets and intersections in the Town of Southern Pines should aim to serve all types of users, including pedestrians, bicyclists, and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young.	
Code of Ordinances	Title XV: Land Usage, Appendix A: Unified Development Ordinance, Article II Basic Definitions		[Add New Definition] Traffic: Pedestrians and vehicles including bicycles, automobiles and other conveyances either singly or together while using streets for the purposes of travel.	
Code of Ordinances	Title XV: Land Usage, Appendix A: Unified Development Ordinance, Article II Basic Definitions		[Add New Definition]: Multi Use Easements: In such cases and at such locations as the Planning Board deems advisable, easements alongside or near lot lines not exceeding twenty (20) feet in width may be required for pedestrian or bicycle traffic to and from schools, neighborhood parks, and other places that may attract or generate such traffic.	
Code of Ordinances	Title XV: Land Usage, Appendix A: Unified Development Ordinance, Article IX Zoning Districts		[Add Language Throughout Article]: Regardless of district classification, the design and construction of streets and intersections in the Town of Southern Pines should aim to serve all types of users, including pedestrians, bicyclists, and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young.	

Source Document	Reference	Existing Text	Recommended Change	Notes
Code of Ordinances	Title XV: Land Usage, Article XII: Recreational Facilities, Section 205 Usable Open Space	Is left in its natural or undisturbed state (as of the date development began), if wooded, except for the cutting of trails for walking or jogging or if not wooded at the time of development is landscaped for ball fields, picnic areas or similar facilities or is properly vegetated and landscaped with the objective of creating a wooded area or other area that is consistent with the objective set forth in Sub-division (4);	[Revise]: Consider adding langauge about greenways and multi-use trails being an acceptable use for unusable open space and shall be designed in accordance with the Town of Southern Pines Comprehensive Bicycle Master Plan.	
Code of Ordinances	Title XV: Land Usage, Article XIV Streets and Sidewalks, Section 210 Street Classification		[Add]: Regardless of classification, the design and construction of streets and intersections in the Town of Southern Pines should aim to serve all types of users, including pedestrians, bicyclists, and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young.	
Code of Ordinances	Title XV: Land Usage, Article XIV Streets and Sidewalks, Section 216 Street Width, Sidewalk, and Drainage Requirements in Subdivisions		[Add]: Regardless of classification, the design and construction of streets and intersections in the Town of Southern Pines should aim to serve all types of users, including pedestrians, bicyclists, and motorists, and should be inclusive of all levels of ability, such as those in wheelchairs, the elderly and the young. Also add in each Street Classification, i.e. Collector Streets, that requires bike lanes that they should be designed in accordance with the guidelines set forth in the Town of Southern Pines Comprehensive Bicycle Master Plan.	
Code of Ordinances	Title XV: Land Usage, Article XIII: Parking, Section 290 Definitions		[Add New Definition]: Bicycle Parking: The Town of Southern Pines requires bicycle parking in all new multi-family residential, commercial, institutional, and public use developments. Parking consists of either standard U Racks or covered bicycle storage facilities as set forth in the Town of Southern Pines Comprehensive Bicycle Master Plan.	
Code of Ordinances	Title XV: Land Usage, Article XIII: Parking, Section 291 Parking Requirements		Add bicycle parking requirements for all uses except residential uses smaller than 4 units/building and designed in accordance with the Town of Southern Pines Comprehensive Bicycle Master Plan.	

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 for the full document.

FHWA Memorandum On Mainstreaming Bicycle and Pedestrian Projects

(See pages C-11 through C-12)

U.S. Department of Transportation
Federal Highway Administration

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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, refer to: HEPH-30

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 21st 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.

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FHWA

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

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. Trail Development Resources

Overview

There are many different ways to secure trail right-of-way for greenway systems. It will be necessary to work with some landowners to secure trail right-of-way when it does not exist. The following text provides a list of options that should be considered. Funding sources for acquiring right-of-way and trail development are described and provided in Appendix F.

The following sections detail a list of specific strategies including the formation of partnerships and a toolbox of acquisition options.

Partnerships

The Town of Southern Pines should pursue partnerships with land trusts and land managers to make more effective use of their land acquisition funds and strategies. The following offers recommendations on how these partnerships could be strengthened

Land Trusts

Land trust organizations are valuable partners when it comes to acquiring land and rights-of-way for greenways. These groups can work directly with landowners and conduct their business in private so that sensitive land transactions are handled in an appropriate manner. Once the transaction has occurred, the land trust will usually convey the acquired land or easement to a public agency, such as a town or county for permanent stewardship and ownership.

Private Land managers

Another possible partnership that could be strengthened would be with the utility companies that manage land throughout the region. Trails and greenways can be built on rights-of-ways that are either owned or leased by electric and natural gas companies. Electric utility companies have long recognized the value of partnering with local communities, non-profit trail organizations, and private land owners to permit their rights-of-ways to be used for trail development. This has occurred all over the United States and throughout North Carolina.

The Town of Southern Pines should actively update and maintain relationships with private utility and land managers to ensure that community wide bicycle, pedestrian and greenway system can be accommodated within these rights-of-way. The respective municipalities will need to demonstrate to these companies that maintenance will be addressed, liability will be reduced and minimized and access to utility needs will be provided.

Greenway Acquisition Tools

The following menu of tools describe various methods of acquisition that can be used by landowners, land conservation organizations, the Town of Southern Pines, Moore County, and other surrounding municipalities to acquire greenway lands.

Government Regulation

Regulation is defined as the government's ability to control the use and development of land through legislative powers. Regulatory methods help shape the use of land without transferring or selling the land. The following types of development ordinances are regulatory tools that can meet the challenges of projected suburban growth and development as well as conserve and protect greenway resources.

Growth Management Measures (Concurrency): Concurrency-based development approaches to growth management simply limit development to areas with adequate public infrastructure. This helps regulate urban sprawl, provides for quality of life in new development, and can help protect open space. In the famous case with the Town of Ramapo (1972), the Town initiated a zoning ordinance making the issue of a development permit contingent on the presence of public facilities such as utilities and parks. This was upheld in Court and initiated a wave of slow-growth management programs nationwide. This type of growth management can take the form of an adequate public facilities ordinance.

Performance Zoning: Performance zoning is zoning based on standards that establish minimum requirements or maximum limits on the effects or characteristics of a use. This is often used for the mixing of different uses to minimize incompatibility and improve the quality of development. For example, how a commercial use is designed and functions determines whether it could be allowed next to a residential area or connected to a greenway.

Incentive Zoning (Dedication/Density Transfers): Also known as incentive zoning, this mechanism allows greenways to be dedicated for density transfers on development of a property. The potential for improving or subdividing part or all of a parcel can be expressed in dwelling unit equivalents or other measures of development density or intensity. Known as density transfers, these dwelling unit equivalents may be relocated to other portions of the same parcel or to contiguous land that is part of a common development plan. Dedicated density transfers can also be conveyed to subsequent holders if properly noted as transfer deeds.

Conservation Zoning: This mechanism recognizes the problem of reconciling different, potentially incompatible land uses by preserving natural areas, open spaces, waterways, and/or greenways that function as buffers or transition zones. It can also be called buffer or transition zoning. This type of zoning, for example, can protect waterways by creating buffer zones where no development can take place. Care must be taken to ensure that the use of this mechanism is reasonable and will not destroy the value of a property.

Overlay Zoning: An overlay zone and its regulations are established in addition to the zoning classification and regulations already in place. These are commonly used to protect natural or cultural features such as historic areas, unique terrain features, scenic vistas, agricultural areas, wetlands, stream corridors, and wildlife areas.

Negotiated Dedications: This type of mechanism allows municipalities to negotiate with landowners for certain parcels of land that are deemed beneficial to the protection and preservation of specific stream corridors. This type of mechanism can also be exercised through dedication of greenway lands when a parcel is subdivided. Such dedications would be proportionate to the relationship between the impact of the subdivision on community services and the percentage of land required for dedication-as defined by the US Supreme Court in Dolan v Tigard.

Reservation of Land: This type of mechanism does not involve any transfer of property rights but simply constitutes an obligation to keep property free from development for a stated period of time. Reservations are normally subject to a specified period of time, such as 6 or 12 months. At the end of this period, if an agreement has not already been reached to transfer certain property rights, the reservation expires.

Planned Unit Development: A planned unit development allows a mixture of uses. It also allows for flexibility in density and dimensional requirements, making clustered housing and common open space along with addressing environmental conditions a possibility. It emphasizes more planning and can allow for open space and greenway development and connectivity.

Cluster Development: Cluster development refers to a type of development with generally smaller lots and homes close to one another. Clustering can allow for more units on smaller acreages of land, allowing for larger percentages of the property to be used for open space and greenways.

Land Management

Management is a method of conserving the resources of a specific greenway parcel by an established set of policies called management plans for publicly owned greenway land or through easements with private property owners. Property owners who grant easements retain all rights to the property except those which have been described in the terms of the easement. The property owner is responsible for all taxes associated with the property, less the value of the easement granted. Easements are generally restricted to certain portions of the property, although in certain cases an easement can be applied to an entire parcel of land. Easements are transferable through title transactions, thus the easement remains in effect perpetually.

Management Plans: The purpose of a management plan is to establish legally binding contracts which define the specific use, treatment, and protection for publicly owned greenway lands. Management plans should identify valuable resources; determine compatible uses for the parcel; determine administrative needs of the parcel, such as maintenance, security, and funding requirements; and recommend short-term and long-term action plans for the treatment and protection of greenway lands.

Conservation Easement: This type of easement generally establishes permanent limits on the use and development of land to protect the natural resources of that land. When public access to the easement is desired, a clause defining the conditions of public access can be added to the terms of the easement. Dedicated conservation easements can qualify for both federal income tax deductions and state tax credits. Tax deductions are allowed by the Federal government for donations of certain conservation easements. The donation may reduce the donor's taxable income.

Preservation Easement: This type of easement is intended to protect the historical integrity of a structure or important elements in the landscape by sound management practices. When public access to the easement is desired, a clause defining the conditions of public access can be added to the terms of the easement. Preservation easements may qualify for the same federal income tax deductions and state tax credits as conservation easements.

Public Access Easements: This type of easement grants public access to a specific parcel of property when a conservation or preservation easement is not necessary. The conditions of use are defined in the terms of the public access easement.

Acquisition

Acquisition requires land to be donated or purchased by a government body, public agency, greenway manager, or qualified conservation organization.

Donation or Tax Incentives: In this type of acquisition, a government body, public agency, or qualified conservation organization agrees to receive the full title or a conservation easement to a parcel of land at no cost or at a "bargain sale" rate. The donor is then eligible to receive a federal tax deduction of up to 30 to 50 percent of their adjusted gross income. Additionally, North Carolina offers a tax credit of up to 25 percent of the property's fair market value (up to $5000). Any portion of the fair market value not used for tax credits may be deducted as a charitable contribution. Also, property owners may be able to avoid any inheritance taxes, capital gains taxes, and recurring property taxes.

Fee Simple Purchase: This is a common method of acquisition where a local government agency or private greenway manager purchases property outright. Fee simple ownership conveys full title to the land and the entire "bundle" of property rights including the right to possess land, to exclude others, to use land, and to alienate or sell land.

Easement Purchase: This type of acquisition is the fee simple purchase of an easement. Full title to the land is not purchased, only those rights granted in the easement agreement. Therefore the easement purchase price is less that the full title value.

Purchase / Lease Back: A local government agency or private greenway organization can purchase a piece of land and then lease it back to the seller for a specified period of time. This lease may contain restrictions regarding the development and use of the property.

Bargain Sale: A property owner can sell property at a price less than the appraised fair market value of the land. Sometimes the seller can derive the same benefits as if the property were donated. Bargain Sale is attractive to sellers when the seller wants cash for the property, the seller paid a low cash price and thus is not liable for high capital gains tax, and/or the seller has a fairly high current income and could benefit from the donation of the property as an income tax deduction.

Installment Sale: An installment sale is a sale of property at a gain where at least one payment is to be received after the tax year in which the sale occurs. These are valuable tools to help sellers defer capital gains tax. This provides a potentially attractive option when purchasing land for open space from a possible seller.

Option / First Right of Refusal: A local government agency or private organization establishes an agreement with a public agency or private property owner to provide the right of first refusal on a parcel of land that is scheduled to be sold. This form of agreement can be used in conjunction with other techniques, such as an easement to protect the land in the short-term. An option would provide the agency with sufficient time to obtain capital to purchase the property or successfully negotiate some other means of conserving the greenway resource.

Purchase of Development Rights: A voluntary purchase of development rights involves purchasing the development rights from a private property owner at a fair market value. The landowner retains all ownership rights under current use, but exchanges the rights to develop the property for cash payment.

Land Banking: Land banking involves land acquisition in advance of expanding urbanization. The price of an open space parcel prior to development pressures is more affordable to a jurisdiction seeking to preserve open space. A municipality or county might use this technique to develop a greenbelt or preserve key open space or agricultural tracts. The jurisdiction should have a definite public purpose for a land banking project.

Condemnation: The practice of condemning private land for use as a greenway is viewed as a last resort policy. Using condemnation to acquire property or property rights can be avoided if private and public support for the greenway program is present. Condemnation is seldom used for the purpose of dealing with an unwilling property owner. In most cases, condemnation has been exercised when there has been an absentee property ownership, when the title of the property is not clear, or when it becomes apparent that obtaining the consent for purchase would be difficult because there are numerous heirs located in other parts of the United States or different countries.

Eminent Domain: The right of exercising eminent domain should be done so with caution by the community and only if the following conditions exist: 1) the property is valued by the community as an environmentally sensitive parcel of land, significant natural resource, or critical parcel of land, and as such has been defined by the community as irreplaceable property; 2) written scientific justification for the community's claim about the property's value has been prepared and offered to the property owner; 3) all efforts to negotiate with the property owner for the management, regulation, and acquisition of the property have been exhausted and that the property owner has been given reasonable and fair offers of compensation and has rejected all offers; and 4) due to the ownership of the property, the timeframe for negotiating the acquisition of the property will be unreasonable, and in the interest of pursuing a cost effective method for acquiring the property, the community has deemed it necessary to exercise eminent domain.

Example Sewer/Greenway Easement

Instrument Prepared By: City Attorney's Office
Brief Description for Index: Sewer/Greenway Easement
Parcel Identifier: _____
Mail After Recording To: City Clerk's Office
P. O. Box 590
Raleigh, N.C. 27602

STATE OF NORTH CAROLINA

COUNTY OF WAKE

GENERAL WARRANTY DEED
EASEMENT FOR SANITARY SEWER AND GREENWAY PURPOSES

THIS DEED OF EASEMENT, made and executed this _____ day of _____, 19_____, by _____, hereinafter referred to as the "Grantors", to the City of Raleigh, a municipal corporation of the State of North Carolina, hereinafter referred to as the "City";

W I T N E S S E T H:

WHEREAS, the Grantors are the Owners of the land hereinafter described and have agreed to convey to the City, according to the terms set forth below, the easement hereinafter described;

The designation "Grantors" as used herein shall include the singular and plural, as required, and the masculine, feminine and neuter gender as appropriate.

NOW, THEREFORE, in consideration of Ten Dollars ($10.00) and other valuable consideration paid to the Grantors, receipt of which is hereby acknowledged, the Grantors, do hereby grant unto the City, its successors and assigns, the right, privilege and easement in perpetuity to: establish upon and maintain the land, hereinafter described, specifically as a greenway with facilities or improvements which may include trails, litter receptacles, boat launches, gates, trail markers, trail bridges, shelters, and other facilities necessary or convenient thereto and including the right of ingress and egress to the City and members of the general public for greenway maintenance and use; to construct, install, improve, remove, replace, inspect, repair, maintain, and use a system of pipelines or mains for sanitary sewer purposes, together with all the appurtenant facilities and equipment necessary or convenient thereto; subject to the laws and ordinances of the city, in, upon, and across the property of the Grantors described in a deed recorded in Deed Book _____, Page _____, Wake County Registry, which said easement is more particularly described in Exhibit A attached hereto and incorporated herein.

Example Sewer/Greenway Easement (Continued)

TO HAVE AND TO HOLD the aforesaid easement interest and all privileges and rights thereunto belonging to the City of Raleigh, its successors and assigns forever.

THE FURTHER TERMS AND CONDITIONS of the easement interest herein conveyed are as follows:

1. The City is authorized hereunder to remove and keep removed from the easement all trees, shrubs, underbrush, and part thereof, or other obstructions as necessary to maintain, repair or protect said greenway and sanitary sewer lines and appurtenances or as necessary for the prevention or treatment of disease and for other good husbandry practices. Except as hereinabove allowed there shall be no other removal, destruction or cutting of trees, shrubs or other vegetation from the easement interest herein described and conveyed by any person or entity.

2. Nothing herein shall be construed to grant to the City of Raleigh or the general public any right of access through or over any property of the Grantors except that lying within the easement interest herein described and conveyed.

3. Following the installation of a sanitary sewer main and appurtenant facilities within the permanent easement hereinabove referenced and described, any and all temporary construction easement interest conveyed herein to the City shall terminate; and further, the City shall regrade, mulch, and reseed all damaged lands lying with the permanent and temporary easements, to the end that the same shall be restored to a condition as good as or better than that before construction.

4. Except as herein authorized, no building, fence, sign, or other structure nor any vehicular surface area shall be erected within the easement interest herein described and conveyed.

5. There shall be no dumping of ashes, garbage, waste, or other unsightly or offensive material on the easement interest herein described and conveyed.

6. There shall be no excavation, dredging, removal of loam, rock, sand, gravel or other material, nor any building of roads or other change in the natural topography of the easement interest herein described and conveyed, excepting for the construction and maintenance of the greenway and the sanitary sewer system undertaken by the City of Raleigh or its agents.

7. The City of Raleigh shall have the right and duty to maintain this Greenway Easement in a clean, natural, and undisturbed state, consistent with the City's master Greenway Plan.

Example Sewer/Greenway Easement (Continued)

8. The City agrees to hold Grantors harmless from liability for personal injury or property damage arising out of the use of the easement for greenway purposes; provided Grantors shall not be held harmless from liability caused by the active conduct or instrumentalities of the Grantors, their agents, invitees, or contractors; or by acts of Grantors, their agents, invitees or contractors which violate the terms and conditions of this Deed of Easement.

The City does not waive or forfeit the right to take action to insure compliance with the terms, conditions and purposes of this easement by a prior failure to act.

The City reserves the right to enter the subject property at reasonable times in order to monitor compliance with the terms, conditions, restrictions, and purposes of this easement.

The Grantors expressly reserve the right to continue the use of the property for all purposes not inconsistent with this easement.

The Grantors agree that the terms, conditions and restrictions of this easement will be inserted by them in any subsequent deed or other legal instrument by which they divest themselves of either the fee simple title to, or of their possessory interest in, the subject property.

TO HAVE AND TO HOLD the said right, privilege and easement herein granted to the City of Raleigh, its successors and assigns forever. The covenants agreed to and the terms, conditions and restrictions imposed herein shall be binding upon the said Grantors and their agents, personal representatives, heirs and assigns, and all other successors to them in interest and shall continue as a servitude running in perpetuity with the above described land.

AND the said Grantors covenant that they are vested of the premises in fee and have the right to convey the same in fee simple; that the same are free from encumbrances except as hereinafter stated; and that they will warrant and defend title to the same against the claims of all persons whomsoever, subject only to the following exceptions:

IN WITNESS WHEREOF, the said Grantors have hereunto set their hand and seals the day and year first above written.

WITNESS:

_____ _____ (SEAL)

_____ (SEAL)

Approved as to Form: _____ (SEAL)

_____

(Deputy) City Attorney _____ (SEAL)

Example Sewer/Greenway Easement (Continued)

STATE OF NORTH CAROLINA INDIVIDUAL

COUNTY OF _____

I, _____, a Notary Public do hereby certify that _____, personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

This the _____day of _____, 19_____.

(SEAL) _____
Notary Public

My Commission Expires:

STATE OF NORTH CAROLINA PARTNERSHIP (INDIVIDUAL)

COUNTY OF _____

I, _____, a Notary Public do hereby certify that _____, general partner of_____, personally appeared before me this day and acknowledged the execution, with proper authorization, of the foregoing instrument, all in accordance with partnership instruments recorded in Book _____ Page _____ in the _____ County Registry and that the instrument is the act and deed of the partnership.

This the _____day of _____19____.

(SEAL) _____
Notary Public

My Commission Expires:

NORTH CAROLINA CORPORATE

COUNTY OF _____

This is to certify that on the _____day of _____, 19_____, before me personally came _____, with whom I am personally acquainted, who, being by me duly sworn, says that (s)he is the (assistant) secretary, and _____ is the (vice) president of _____, the corporation described in and which executed the foregoing instrument; that (s)he knows the common seal of said corporation; that the seal affixed to the foregoing instrument is said common seal, and the name of the corporation was subscribed thereto by the said (assistant) secretary, and that the said (assistant) secretary and (vice) president subscribed their names thereto, and said common seal was affixed, all by order of the Board of Directors of said corporation, and that the said instrument is the act and deed of said corporation.

WITNESS my hand and official seal this the _____day of _____19_____.

(SEAL) _____
Notary Public

My Commission Expires:

D. Trail Development Resources

Overview

There are many different ways to secure trail right-of-way for greenway systems. It will be necessary to work with some landowners to secure trail right-of-way when it does not exist. The following text provides a list of options that should be considered. Funding sources for acquiring right-of-way and trail development are described and provided in Appendix F.

The following sections detail a list of specific strategies including the formation of partnerships and a toolbox of acquisition options.

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Greenway Acquisition Tools

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Regulation is defined as the government's ability to control the use and development of land through legislative powers. Regulatory methods help shape the use of land without transferring or selling the land. The following types of development ordinances are regulatory tools that can meet the challenges of projected suburban growth and development as well as conserve and protect greenway resources.

Growth Management Measures (Concurrency): Concurrency-based development approaches to growth management simply limit development to areas with adequate public infrastructure. This helps regulate urban sprawl, provides for quality of life in new development, and can help protect open space. In the famous case with the Town of Ramapo (1972), the Town initiated a zoning ordinance making the issue of a development permit contingent on the presence of public facilities such as utilities and parks. This was upheld in Court and initiated a wave of slow-growth management programs nationwide. This type of growth management can take the form of an adequate public facilities ordinance.

Performance Zoning: Performance zoning is zoning based on standards that establish minimum requirements or maximum limits on the effects or characteristics of a use. This is often used for the mixing of different uses to minimize incompatibility and improve the quality of development. For example, how a commercial use is designed and functions determines whether it could be allowed next to a residential area or connected to a greenway.

Incentive Zoning (Dedication/Density Transfers): Also known as incentive zoning, this mechanism allows greenways to be dedicated for density transfers on development of a property. The potential for improving or subdividing part or all of a parcel can be expressed in dwelling unit equivalents or other measures of development density or intensity. Known as density transfers, these dwelling unit equivalents may be relocated to other portions of the same parcel or to contiguous land that is part of a common development plan. Dedicated density transfers can also be conveyed to subsequent holders if properly noted as transfer deeds.

Conservation Zoning: This mechanism recognizes the problem of reconciling different, potentially incompatible land uses by preserving natural areas, open spaces, waterways, and/or greenways that function as buffers or transition zones. It can also be called buffer or transition zoning. This type of zoning, for example, can protect waterways by creating buffer zones where no development can take place. Care must be taken to ensure that the use of this mechanism is reasonable and will not destroy the value of a property.

Overlay Zoning: An overlay zone and its regulations are established in addition to the zoning classification and regulations already in place. These are commonly used to protect natural or cultural features such as historic areas, unique terrain features, scenic vistas, agricultural areas, wetlands, stream corridors, and wildlife areas.

Negotiated Dedications: This type of mechanism allows municipalities to negotiate with landowners for certain parcels of land that are deemed beneficial to the protection and preservation of specific stream corridors. This type of mechanism can also be exercised through dedication of greenway lands when a parcel is subdivided. Such dedications would be proportionate to the relationship between the impact of the subdivision on community services and the percentage of land required for dedication-as defined by the US Supreme Court in Dolan v Tigard.

Reservation of Land: This type of mechanism does not involve any transfer of property rights but simply constitutes an obligation to keep property free from development for a stated period of time. Reservations are normally subject to a specified period of time, such as 6 or 12 months. At the end of this period, if an agreement has not already been reached to transfer certain property rights, the reservation expires.

Planned Unit Development: A planned unit development allows a mixture of uses. It also allows for flexibility in density and dimensional requirements, making clustered housing and common open space along with addressing environmental conditions a possibility. It emphasizes more planning and can allow for open space and greenway development and connectivity.

Cluster Development: Cluster development refers to a type of development with generally smaller lots and homes close to one another. Clustering can allow for more units on smaller acreages of land, allowing for larger percentages of the property to be used for open space and greenways.

Land Management

Management is a method of conserving the resources of a specific greenway parcel by an established set of policies called management plans for publicly owned greenway land or through easements with private property owners. Property owners who grant easements retain all rights to the property except those which have been described in the terms of the easement. The property owner is responsible for all taxes associated with the property, less the value of the easement granted. Easements are generally restricted to certain portions of the property, although in certain cases an easement can be applied to an entire parcel of land. Easements are transferable through title transactions, thus the easement remains in effect perpetually.

Management Plans: The purpose of a management plan is to establish legally binding contracts which define the specific use, treatment, and protection for publicly owned greenway lands. Management plans should identify valuable resources; determine compatible uses for the parcel; determine administrative needs of the parcel, such as maintenance, security, and funding requirements; and recommend short-term and long-term action plans for the treatment and protection of greenway lands.

Conservation Easement: This type of easement generally establishes permanent limits on the use and development of land to protect the natural resources of that land. When public access to the easement is desired, a clause defining the conditions of public access can be added to the terms of the easement. Dedicated conservation easements can qualify for both federal income tax deductions and state tax credits. Tax deductions are allowed by the Federal government for donations of certain conservation easements. The donation may reduce the donor's taxable income.

Preservation Easement: This type of easement is intended to protect the historical integrity of a structure or important elements in the landscape by sound management practices. When public access to the easement is desired, a clause defining the conditions of public access can be added to the terms of the easement. Preservation easements may qualify for the same federal income tax deductions and state tax credits as conservation easements.

Public Access Easements: This type of easement grants public access to a specific parcel of property when a conservation or preservation easement is not necessary. The conditions of use are defined in the terms of the public access easement.

Acquisition

Acquisition requires land to be donated or purchased by a government body, public agency, greenway manager, or qualified conservation organization.

Donation or Tax Incentives: In this type of acquisition, a government body, public agency, or qualified conservation organization agrees to receive the full title or a conservation easement to a parcel of land at no cost or at a "bargain sale" rate. The donor is then eligible to receive a federal tax deduction of up to 30 to 50 percent of their adjusted gross income. Additionally, North Carolina offers a tax credit of up to 25 percent of the property's fair market value (up to $5000). Any portion of the fair market value not used for tax credits may be deducted as a charitable contribution. Also, property owners may be able to avoid any inheritance taxes, capital gains taxes, and recurring property taxes.

Fee Simple Purchase: This is a common method of acquisition where a local government agency or private greenway manager purchases property outright. Fee simple ownership conveys full title to the land and the entire "bundle" of property rights including the right to possess land, to exclude others, to use land, and to alienate or sell land.

Easement Purchase: This type of acquisition is the fee simple purchase of an easement. Full title to the land is not purchased, only those rights granted in the easement agreement. Therefore the easement purchase price is less that the full title value.

Purchase / Lease Back: A local government agency or private greenway organization can purchase a piece of land and then lease it back to the seller for a specified period of time. This lease may contain restrictions regarding the development and use of the property.

Bargain Sale: A property owner can sell property at a price less than the appraised fair market value of the land. Sometimes the seller can derive the same benefits as if the property were donated. Bargain Sale is attractive to sellers when the seller wants cash for the property, the seller paid a low cash price and thus is not liable for high capital gains tax, and/or the seller has a fairly high current income and could benefit from the donation of the property as an income tax deduction.

Installment Sale: An installment sale is a sale of property at a gain where at least one payment is to be received after the tax year in which the sale occurs. These are valuable tools to help sellers defer capital gains tax. This provides a potentially attractive option when purchasing land for open space from a possible seller.

Option / First Right of Refusal: A local government agency or private organization establishes an agreement with a public agency or private property owner to provide the right of first refusal on a parcel of land that is scheduled to be sold. This form of agreement can be used in conjunction with other techniques, such as an easement to protect the land in the short-term. An option would provide the agency with sufficient time to obtain capital to purchase the property or successfully negotiate some other means of conserving the greenway resource.

Purchase of Development Rights: A voluntary purchase of development rights involves purchasing the development rights from a private property owner at a fair market value. The landowner retains all ownership rights under current use, but exchanges the rights to develop the property for cash payment.

Land Banking: Land banking involves land acquisition in advance of expanding urbanization. The price of an open space parcel prior to development pressures is more affordable to a jurisdiction seeking to preserve open space. A municipality or county might use this technique to develop a greenbelt or preserve key open space or agricultural tracts. The jurisdiction should have a definite public purpose for a land banking project.

Condemnation: The practice of condemning private land for use as a greenway is viewed as a last resort policy. Using condemnation to acquire property or property rights can be avoided if private and public support for the greenway program is present. Condemnation is seldom used for the purpose of dealing with an unwilling property owner. In most cases, condemnation has been exercised when there has been an absentee property ownership, when the title of the property is not clear, or when it becomes apparent that obtaining the consent for purchase would be difficult because there are numerous heirs located in other parts of the United States or different countries.

Eminent Domain: The right of exercising eminent domain should be done so with caution by the community and only if the following conditions exist: 1) the property is valued by the community as an environmentally sensitive parcel of land, significant natural resource, or critical parcel of land, and as such has been defined by the community as irreplaceable property; 2) written scientific justification for the community's claim about the property's value has been prepared and offered to the property owner; 3) all efforts to negotiate with the property owner for the management, regulation, and acquisition of the property have been exhausted and that the property owner has been given reasonable and fair offers of compensation and has rejected all offers; and 4) due to the ownership of the property, the timeframe for negotiating the acquisition of the property will be unreasonable, and in the interest of pursuing a cost effective method for acquiring the property, the community has deemed it necessary to exercise eminent domain.

Example Sewer/Greenway Easement

Instrument Prepared By: City Attorney's Office
Brief Description for Index: Sewer/Greenway Easement
Parcel Identifier: _____
Mail After Recording To: City Clerk's Office
P. O. Box 590
Raleigh, N.C. 27602

STATE OF NORTH CAROLINA

COUNTY OF WAKE

GENERAL WARRANTY DEED
EASEMENT FOR SANITARY SEWER AND GREENWAY PURPOSES

THIS DEED OF EASEMENT, made and executed this _____ day of _____, 19_____, by _____, hereinafter referred to as the "Grantors", to the City of Raleigh, a municipal corporation of the State of North Carolina, hereinafter referred to as the "City";

W I T N E S S E T H:

WHEREAS, the Grantors are the Owners of the land hereinafter described and have agreed to convey to the City, according to the terms set forth below, the easement hereinafter described;

The designation "Grantors" as used herein shall include the singular and plural, as required, and the masculine, feminine and neuter gender as appropriate.

NOW, THEREFORE, in consideration of Ten Dollars ($10.00) and other valuable consideration paid to the Grantors, receipt of which is hereby acknowledged, the Grantors, do hereby grant unto the City, its successors and assigns, the right, privilege and easement in perpetuity to: establish upon and maintain the land, hereinafter described, specifically as a greenway with facilities or improvements which may include trails, litter receptacles, boat launches, gates, trail markers, trail bridges, shelters, and other facilities necessary or convenient thereto and including the right of ingress and egress to the City and members of the general public for greenway maintenance and use; to construct, install, improve, remove, replace, inspect, repair, maintain, and use a system of pipelines or mains for sanitary sewer purposes, together with all the appurtenant facilities and equipment necessary or convenient thereto; subject to the laws and ordinances of the city, in, upon, and across the property of the Grantors described in a deed recorded in Deed Book _____, Page _____, Wake County Registry, which said easement is more particularly described in Exhibit A attached hereto and incorporated herein.

Example Sewer/Greenway Easement (Continued)

TO HAVE AND TO HOLD the aforesaid easement interest and all privileges and rights thereunto belonging to the City of Raleigh, its successors and assigns forever.

THE FURTHER TERMS AND CONDITIONS of the easement interest herein conveyed are as follows:

1. The City is authorized hereunder to remove and keep removed from the easement all trees, shrubs, underbrush, and part thereof, or other obstructions as necessary to maintain, repair or protect said greenway and sanitary sewer lines and appurtenances or as necessary for the prevention or treatment of disease and for other good husbandry practices. Except as hereinabove allowed there shall be no other removal, destruction or cutting of trees, shrubs or other vegetation from the easement interest herein described and conveyed by any person or entity.

2. Nothing herein shall be construed to grant to the City of Raleigh or the general public any right of access through or over any property of the Grantors except that lying within the easement interest herein described and conveyed.

3. Following the installation of a sanitary sewer main and appurtenant facilities within the permanent easement hereinabove referenced and described, any and all temporary construction easement interest conveyed herein to the City shall terminate; and further, the City shall regrade, mulch, and reseed all damaged lands lying with the permanent and temporary easements, to the end that the same shall be restored to a condition as good as or better than that before construction.

4. Except as herein authorized, no building, fence, sign, or other structure nor any vehicular surface area shall be erected within the easement interest herein described and conveyed.

5. There shall be no dumping of ashes, garbage, waste, or other unsightly or offensive material on the easement interest herein described and conveyed.

6. There shall be no excavation, dredging, removal of loam, rock, sand, gravel or other material, nor any building of roads or other change in the natural topography of the easement interest herein described and conveyed, excepting for the construction and maintenance of the greenway and the sanitary sewer system undertaken by the City of Raleigh or its agents.

7. The City of Raleigh shall have the right and duty to maintain this Greenway Easement in a clean, natural, and undisturbed state, consistent with the City's master Greenway Plan.

Example Sewer/Greenway Easement (Continued)

8. The City agrees to hold Grantors harmless from liability for personal injury or property damage arising out of the use of the easement for greenway purposes; provided Grantors shall not be held harmless from liability caused by the active conduct or instrumentalities of the Grantors, their agents, invitees, or contractors; or by acts of Grantors, their agents, invitees or contractors which violate the terms and conditions of this Deed of Easement.

The City does not waive or forfeit the right to take action to insure compliance with the terms, conditions and purposes of this easement by a prior failure to act.

The City reserves the right to enter the subject property at reasonable times in order to monitor compliance with the terms, conditions, restrictions, and purposes of this easement.

The Grantors expressly reserve the right to continue the use of the property for all purposes not inconsistent with this easement.

The Grantors agree that the terms, conditions and restrictions of this easement will be inserted by them in any subsequent deed or other legal instrument by which they divest themselves of either the fee simple title to, or of their possessory interest in, the subject property.

TO HAVE AND TO HOLD the said right, privilege and easement herein granted to the City of Raleigh, its successors and assigns forever. The covenants agreed to and the terms, conditions and restrictions imposed herein shall be binding upon the said Grantors and their agents, personal representatives, heirs and assigns, and all other successors to them in interest and shall continue as a servitude running in perpetuity with the above described land.

AND the said Grantors covenant that they are vested of the premises in fee and have the right to convey the same in fee simple; that the same are free from encumbrances except as hereinafter stated; and that they will warrant and defend title to the same against the claims of all persons whomsoever, subject only to the following exceptions:

IN WITNESS WHEREOF, the said Grantors have hereunto set their hand and seals the day and year first above written.

WITNESS:

_____ _____ (SEAL)

_____ (SEAL)

Approved as to Form: _____ (SEAL)

_____

(Deputy) City Attorney _____ (SEAL)

Example Sewer/Greenway Easement (Continued)

STATE OF NORTH CAROLINA INDIVIDUAL

COUNTY OF _____

I, _____, a Notary Public do hereby certify that _____, personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

This the _____day of _____, 19_____.

(SEAL) _____
Notary Public

My Commission Expires:

STATE OF NORTH CAROLINA PARTNERSHIP (INDIVIDUAL)

COUNTY OF _____

I, _____, a Notary Public do hereby certify that _____, general partner of_____, personally appeared before me this day and acknowledged the execution, with proper authorization, of the foregoing instrument, all in accordance with partnership instruments recorded in Book _____ Page _____ in the _____ County Registry and that the instrument is the act and deed of the partnership.

This the _____day of _____19____.

(SEAL) _____
Notary Public

My Commission Expires:

NORTH CAROLINA CORPORATE

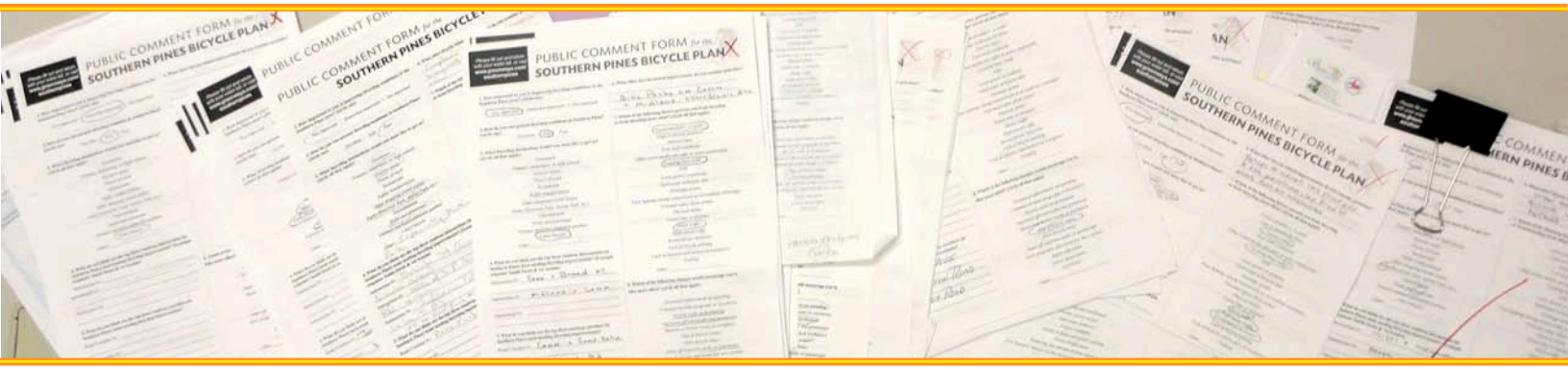
COUNTY OF _____

This is to certify that on the _____day of _____, 19_____, before me personally came _____, with whom I am personally acquainted, who, being by me duly sworn, says that (s)he is the (assistant) secretary, and _____ is the (vice) president of _____, the corporation described in and which executed the foregoing instrument; that (s)he knows the common seal of said corporation; that the seal affixed to the foregoing instrument is said common seal, and the name of the corporation was subscribed thereto by the said (assistant) secretary, and that the said (assistant) secretary and (vice) president subscribed their names thereto, and said common seal was affixed, all by order of the Board of Directors of said corporation, and that the said instrument is the act and deed of said corporation.

WITNESS my hand and official seal this the _____day of _____19_____.

(SEAL) _____
Notary Public

My Commission Expires:



E. 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 Southern Pines Bicycle Transportation Plan. Public input was gathered through several different means including the following: Steering Committee meetings, a table at a Southern Pines Elementary School event, a booth at the Tour de Moore Classic, and public comment forms. This offered the representatives and citizens of Southern Pines opportunity to contribute to the Plan's development.

Steering Committee meetings were held throughout the planning process with representatives from Southern Pines, 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, 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 Southern Pines 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. The first opportunity was during an evening event at Southern Pines Elementary School. 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 Tour de Moore Classic in the Downtown area. 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, question and answer sessions, and through discussions between citizens, consultant staff from Greenways In-

Left: example project newsletter and public input flyer.

corporated and Town staff. In addition, a hardcopy public comment form was developed and distributed for hand written responses during each meeting.

General goals and ideas that were voiced most consistently were:

- Create a stronger culture for every-day bicycling in Southern Pines.
- Connect disjointed areas of town safely such as communities living north of US 1 into the Downtown region.
- Provide separated spaces for bicycling throughout the town such as bicycle lanes and greenways.
- Provide signage and bicycle racks
- Connect neighborhoods to schools and local businesses such as grocery stores, farmers market, and Downtown.
- Slow traffic - speeding is an issue.
- Address safety concerns for bicyclist-motorist interactions.

Comment Form

A comment form was developed for Southern Pines 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 in the local water bill. 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 352 persons completed the comment form.

The comment form results shown on the following pages have been tabulated by Greenways Incorporated to provide insight into local residents' opinions and values.

Right and Below: The first public workshop for the bicycle plan (at Southern Pines Elementary in March 2010), featured public input maps, educational posters, newsletters, comment forms, and conversations among residents, students, town staff, and project consultants.

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

Above and left: The Southern Pines Bicycle Plan booth at Springfest in downtown Southern Pines, where more than 100 people stopped to learn about the plan and provide input.

1. How important to you is improving bicycling conditions in the Southern Pines area? (select one)

	Response Percent	Response Count
Very important	**68.1%**	**235**
Somewhat important	24.3%	84
Not important	7.5%	26
	answered question	**345**
	skipped question	**7**

2. How do you rate present bicycling conditions in Southern Pines? (select one)

	Response Percent	Response Count
Excellent	5.8%	19
Fair	**53.2%**	**174**
Poor	41.0%	134
	answered question	**327**
	skipped question	**25**

3. What bicycling destinations would you most like to get to? (choose all that apply)

	Response Percent	Response Count
Downtown	**68.9%**	**233**
Primary, Elementary, or High School	19.5%	66
Grocery stores	33.7%	114
Places of work	24.9%	84
Restaurants	28.1%	95
Public Transportation	12.4%	42
Other Shopping (retail stores)	26.3%	89
Parks (Reservoir Park, Martin Park, etc.)	63.6%	215
Entertainment	17.8%	60
Trails and greenways	67.8%	229
Farmers markets/community gardens	41.7%	141
I DON'T BICYCLE.	14.2%	48
Other specific location (please specify)	9.2%	31
	answered question	**338**
	skipped question	**14**

4. What do you think are the top three roadway intersections (in Southern Pines) most needing bicycling improvements? (Example response: Smith Street & 1st Avenue)

INTERSECTION	NUMBER OF RESPONSES
Broad & Morganton	48
15-501 & Morganton	17
May & Indiana	16
All traffic circles	13
May & Connecticut	12
Midland & Knoll	11
Fort Bragg & Indiana	10
Broad & Pennsylvania	10
Pee Dee & Midland	10
US 1 & Morganton	8
US 1 & Saunders	8
Broad & Vermont	7

5. What do you think are the top three roadway corridors (in Southern Pines) most needing bicycling improvements?

ROADWAY	NUMBER OF RESPONSES
Midland	84
Indiana	76
Morganton	57
May	47
Broad	32
US 1	31
Connecticut	28
Pennsylvania	28
Hwy 22	28
Youngs	18
15-501	16
Bennett	11
Fort Bragg	10
Airport	7

6. What other bicycle related improvements do you consider priorities?

See end of appendix for responses

7. 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	**58.4%**	**187**
Gaps in bicycle facilities	16.3%	52
Narrow lanes	58.1%	186
Poor trail conditions	19.1%	61
Other travel modes are safer or more comfortable	15.6%	50
Crossing busy roads	50.0%	160
Hills	5.9%	19
Loose gravel or potholes	23.8%	76
Yard waste in bicycle lane	8.1%	26
Drainage grates	8.8%	28
Poor lighting (along routes/trails or at roadway crossings)	17.2%	55
Personal safety (from crime)	10.0%	32
Physical ability	7.5%	24
Travel time or distance	5.9%	19
Heavy traffic	45.0%	144
High-speed traffic	48.8%	156
Inconsiderate motorists	44.1%	141
Lack of bicycle parking	25.0%	80
Lack of showers and lockers at workplace	2.2%	7
NOTHING	6.6%	21
Other (please specify)		26
answered question		**320**
skipped question		**32**

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

	Response Percent	Response Count
Increased enforcement on speeding	23.1%	74
Commute-by-bike programs or incentives	22.4%	72
Bicycle racks at destination	46.1%	148
Improved off-road paths and greenways	58.3%	187
Showers or locker rooms at workplace	4.4%	14
Map of bicycle routes	41.1%	132
More bicycle lanes	**79.1%**	**254**
More off road bike paths or greenways	51.1%	164
More programs and events for new cyclists	20.6%	66
Safety education	13.1%	42
Lower speed limits	12.8%	41
NOTHING	9.3%	30
	Other (please specify)	25
	answered question	**321**
	skipped question	**31**

9. How long have you been bicycle riding? (select one)

	Response Percent	Response Count
Do not bicycle	18.3%	59
1-2 years	6.5%	21
2-5 years	8.7%	28
5-10 years	9.6%	31
10-20 years	11.8%	38
20+ years	**45.0%**	**145**
	answered question	**322**
	skipped question	**30**

10. How frequently do you bicycle? (select one)

	Response Percent	Response Count
never	22.0%	70
few times per month	**40.3%**	**128**
few times per week	29.6%	94
5+ times per week	8.2%	26
	answered question	**318**
	skipped question	**34**

11. 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.	25.0%	74
I am most comfortable on off-road paths or in a clearly designated bicycle lane.	**48.0%**	**142**
I don't feel comfortable sharing any roadway with cars and prefer off-road paths or very low-traffic residential roads.	27.0%	80
	answered question	**296**
	skipped question	**56**

12. Should public funds be used to improve bicycle transportation options? (yes/no)

	Response Percent	Response Count
Yes	**91.2%**	**291**
No	8.8%	28
	answered question	**319**
	skipped question	**33**

13. Which types of funds should be used to improve bicycle transportation options? (please check all that apply)

	Response Percent	Response Count
Existing local taxes	58.1%	173
New local taxes	14.8%	44
State and federal grants	**71.8%**	**214**
NCDOT maintenance funds	66.1%	197
Other (please specify)	10.7%	32
	answered question	**298**
	skipped question	**54**

14. Which aspect of biking is most appealing to you? (choose all that apply)

	Response Percent	Response Count
Increased health and fitness	**86.6%**	**285**
Money saved on fuel	35.6%	117
More time outdoors	67.2%	221
Faster commute	5.2%	17
Easier to find convenient parking	8.8%	29
Fewer traffic jams	10.6%	35
Reducing the amount of time spent in a car	27.7%	91
Less negative impact on the environment/preserving the environment	52.6%	173
I DO NOT BICYCLE.	14.9%	49
Other (please specify)	4.3%	14
	answered question	**329**
	skipped question	**23**

15. 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	30.3%	94
Drive too fast	45.5%	141
Pass bicyclists too closely	**61.9%**	**192**
Tolerate bicyclists not following rules of the road	17.1%	53
Harass bicyclists	11.0%	34
Fail to yield to bicyclists crossing a street	24.2%	75
Other (please specify)	6.5%	20
	answered question	**310**
	skipped question	**42**

16. How do you feel bicyclists in your area typically behave? (Please check all that apply)

	Response Percent	Response Count
Courteous, obeying all traffic laws	52.5%	155
Cycle in the roadway the opposing direction as vehicles	7.1%	21
Fail to comply with traffic laws	19.0%	56
Ride too slowly	5.4%	16
Are young and/or inexperienced	4.1%	12
Multiple cyclists ride abreast in the same travel lane	**52.9%**	**156**
Behave rudely	7.1%	21
Don't signal turns or stops	20.0%	59
Ride on sidewalks	8.1%	24
Ride at night without lights	9.2%	27
	answered question	**295**
	skipped question	**57**

18. Where do you live?

	Response Percent	Response Count
Southern Pines	**83.3%**	**279**
Aberdeen	4.5%	15
Pinebluff	0.0%	0
Pinehurst	5.1%	17
Whispering Pines	3.6%	12
Carthage	1.5%	5
Vass	0.6%	2
Fort Bragg	0.0%	0
Other	1.5%	5
	answered question	**335**
	skipped question	**17**

19. What is your gender?

	Response Percent	Response Count
Male	46.5%	151
Female	**53.5%**	**174**
	answered question	**325**
	skipped question	**27**

20. What is your age?

	Response Percent	Response Count
0-9	0.0%	0
10-19	1.2%	4
20-29	5.4%	18
30-39	17.3%	58
40-49	22.6%	76
50-59	21.4%	72
60 and older	**32.1%**	**108**
	answered question	**336**
	skipped question	**16**

6. What other bicycle related improvements do you consider priorities?

Bicycle lanes
Public awareness of bicycle etiquette for cyclists and drivers of motor vehicles.
Bike lanes or sidewalks. We'd love to go biking with our kids or let them go on their own but it's not safe. People drive by and honk or throw things at you and they often don't move over and pass as closely as possible.
We need more bicycle racks at destinations, and more signs alerting drivers to cyclists.
"1) No bicycle route currently exists along Knoll Rd and Airport Road in order to bicycle to schools along Airport Rd. 2) No safe bicycle route exists to go to First Health Hospital or to navigate the traffic circle where Midland/15-501/211 merge. 3) The Greenway Trail evaporates at Knoll Rd near Midland and Palmer drive--a connector should be built 4) No bicycle route exists in order to bike to the Southern Pines train station along Midland Road or Morganton Road. 5) The Greenway Trail is a disorganized tangle of trails without good signage. It often ends without notice onto a major road without bicycle lanes."
"More signs indicating ""Share the Road""
Wider shoulders"
Smooth Road surfaces, eliminate potholes
Bicycle lanes or larger shoulders. I avoid what I consider difficult intersections... anything on Sandhills Blvd, 15-501
Bike Lockers and Racks
TRAILS (see NC S1383)
connecting Reservior Park to downtown SP, connecting Resv to Pinehurst, connecting Resv to Carthage
While I am very excited about seeing bicycle improvements, I would really like to see at least a little paved off road area for children or beginners to bike and for other wheeled sports such as in line skating. If that could be made part of a plan, it would be wonderful!! Good luck.
BICYCLING LANES ARE NEEDED ON ALL ROADWAYS
"Adding bike lane to more roads
creating more mtn bike trails"; wider spaces for bikes, bike lanes.
Why is Pinecrest High School not connected to the Southern Pines Greenway? Why are there no bike racks in the town?
Heading out to reserveration
BIcycle awareness signs. Create bicycling awareness in the community so that bicycling is integrated into the culture for exercise and for transportation, so that drivers will be alerted and the roads are safer.
Signage to "Share the Road"
More options for mountain biking, perhaps a downhill course for future competitions and sponsorships? This would lead to more revenue and tourism; mountain biking is very big around here; however, we must travel away from the local area to injoy it:(
There should be a dashed white line on all roads at least three feet, preferably four feet, inside the solid white line on all roads. This would be the "bicycle" lane. Cars would have the entire lane out to the solid white line when there is no bicycle traffic. When there is bicycle traffic, cars would yield to bicycles in the lane until it is safe to pass. A bicycle lane outside the solid white line would be littered with glass and other debris since there would be no automobile traffic there to keep it cleared away. This debris laden lane would be too detrimental to having flats on a bicycle and potentially more hazardous since blow-outs can cause a cyclist to potentially swerve and crash into a automobile traffic lane.

Roadway markings, signs to yield to bikes
NC 1383 Bikes allowed on state owned trails
Lanes, signs, police enforcement, racks
Safe paths for children
Places to park bicycles.
Very important to have trail go out toward aberdeen toward Forest Hills development. There is currently no sidewalk or trail for all (mostly elderly) to walk or bike into downtown SP without crossing 4 lanes of traffic. Recently an elderly man was killed trying to cross the road. Please consider making it out this way. I have 2 young children and cannot find any good pathes to be able to take them strolling or biking. Thank you.
more opportunity for mountain biking
Making marked sides of rd's that hove small areas to ride
"Teach cyclists that Stop signs are not optional.
Keep cyclists off roads with no paved shoulders where they cannot maintain the speed limit.
Inform cyclists that riding three or four abreast with traffic stacked up behind them on a two lane road does not win them any supporters."
Connect Greenways
General awareness of bicycle presence and rules of etiquette
I didn't notice any bicycle related improvement
"Bennett Street needs bike lanes.
Morganton Road needs bike lanes"
would be nice to have a bike path all around southern pines like in hilton head sc
The 10 blocks surrounding downtown should be more amenable to both pedestrians and cyclists.
Bike lanes for all roadways
Clearly mark the bike lanes
I would love to have more bike trails that connect to the parks, downtown and other shops around HWY 1 and Midland Road
The 10 blocks any direction from Penn. Ave and the RR tracks should be more amenable to both pedestrians and cylists.
None
"Road Quality
Bike Racks"
Crosswalk and bike lanes
"1. more places downtown to safely park bikes 2. encouragement and accessibility for children to ride their bikes to local schools"
Mostly increased shoulder space on roads, or a bike lane. Not enough room for bikes and traffic. Puts both bikes and drivers in danger.
Wide shoulders along the road
Bike racks, better connections between greenways, maybe a designated lane? You guys are the experts-I trust you.
Improved signage to share the road
Shoulders added to major roads
Improved signage for motorists to use caution
Maintain roads with smooth surface whenever possible instead of oil & rock slurry (too rough)

connecting downtown to the greenways. this will encourage families to bike to town for lunch, events, and shopping.
No riding bicycles on sidewalks
Bicycle and walking paths along roadways
Need bicycle lanes
something adjacent to tour De moore route along Ridge road
should wear bright clothes and flashing lights
bike lanes on streets with no shoulders
bicycle lanes
Indiana Ave should not be bike route without lanes
bike racks downtown
creating bike lanes
Pave paths on either side of main arteries in town. It will pay for its self in tourism
Bicycle parking at shopping areas
There should be a bike lane from Pinehurst to SP business area
teach basic highway courtesy to bikers
All major thoroughfares should have a dedicated lane/sidewalk for bicyclists and walkers
none
being able to push a button to cause a longer green light
Bike lanes on Saunders/Indiana/Broad/Midland/Connecticut
Bike lanes
More share the road signs
ride in single columns, not 2 or 3
separate trails from sidewalks
Bike racks around town and more bike lanes
Need bike lanes, Need speed enforcement on Conn Rd badly
Connecticutt
bike lanes or safe routes for biking
wide bike paths
All intersections
All roads need bicycle shoulders or bicycle lanes.
Dedicated bicycle lanes on major thoroughfares
bike lanes
Keeps bikes off US1 between S Pines and Aberdeen. Keep off all busy roadways.
There should be a separate bike path that connects all major sections/areas of town.
bike parking
Safe, wide areas for families and young bikers
Bicycle parking downtown and at parks is needed.
Widen roads for bicycle lane
“bike lanes
bike racks”
Bicycle trail along 22 and Camp Easter Rd.
Enough of a bicycle path on sides of road

Places to lock bikes/park them
Identifiable bike lanes
Bike lanes put on all highways and/or country roads throughout the State
a place for kids to ride their bikes to school park or into downtown, or a planned 5-10 mile loop they can do
bike racks on Broad St
bike paths on Conn and Midland and other scenic routes
Reservoir Park. Empasis on drivers recognizing bicyclists and their rights on the road
bike lanes on busier roads like May and Midland
Widen all roads to include bicycle lanes when being repaired.
Paved shoulders or paths
Paths, sidewalk, bike trails; clean up bushes around intersections downtown
Use the Netherlands as a model
We need a separate path in most cases. I know cars and bikes are supposed to share but in most cases, this does not work.
Greenways/more slow down/watch your speed areas/especially near homes and schools
“dog walking
shopping”
lanes designated for bikes DT, linking across SP and adjoining towns/trails
Need to interconnect the various trails in the local communities and add new trails so we can stay off of roads
Bicycle racks on Broad St.
awareness
wider shoulders on backroads
driver (cars) education
Bike path around Reservoir Park
More Share the Road signs
designated bike lanes
educate the public drivers
more greenways
pathways
make routes to practical places
let the bicycles do what they know best
off road trails with parking
bike lanes
bike lanes!!
signs, newspaper education
more places to park
signage
mountain bike facility/open state park trails in Sandhurst for Mountain bike connect reservoir park with downtown by greenway
signage warning car drivers

Bicyclists should ALWAYS day and night, wear uniforms or clothing, hats, and shoes that glow in the dark, fluorescent fabric or reflectors
more access to greenway, less soft sand on greenway
greenways throughout downtown
1. off road trails - greenways; 2. sidewalks! need more sidewalks!
more bike racks donwntown
none
all; the safety value now is obsolete
Bicycle lane on road
bicyclers getting ticketed/reported
make towns more rideable for kids and families
street improvements
Broad St.
Bike racks, covered bike racks
I don't like that certain roads are considered bike routes yet there is barely even a shoulder much less a bike lane.
adding greenways around town
Electric intown vehicles are 5 years away - many elderly people will use these in town - make these alternatives fir your bicycle solutions too (i.e., "their" lanes wide enough)
bicycle lanes
signage to indicate cars should yield to bikes, pedestrians, esp. Broad ST. where are intersections
more bike racks at destination points
sidewalks
sidewalks, bike lanes, making riding safer for children!!
bike paths on 2-lane roads (Indiana/Morganton/May St.)
paved bike paths
a safe park for seniors to cycle, plus young people
bicycle lanes would make it possible for my children to ride with me.
bike lanes for bikes not sidewalks
safer areas than city streets add busy roadways
bicycle sharing
make it easier to get to Pinehurst (around the traffic circle). increase greenway paths for off-roaders
bike paths along all roads in Southern Pines
Safety! Safety!! Safety!! Cyclists spill over into auto lanes. No adequate bicycle lanes

Word Cloud for Question #6 (What other bicycle related improvements do you consider priorities?) The image below was created using a tool at www.wordle.net which gives greater prominence to words that appear more frequently in the source text. The source text in this case was all the public responses listed on the previous five pages, allowing for a quick snapshot of the responses submitted.

F. Funding

Overview

When considering possible funding sources for the Town of Southern Pine's 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. 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. These projects do not qualify for the recently passed federal stimulus funding (2009 American Recovery and Reinvestment Act) since they are not "shovel ready." Also, 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 Triangle Area Rural Planning Organization (TARPO) 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 Southern Pines 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

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/ 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 Rural Planning Organization

The Triangle Area Rural Planning Organization (TARPO) manages the transportation planning process required by Federal law. The RPO plans for the area's surface transportation needs, including highways, transit, bicycle, and pedestrian facilities. There are two subcommittees of the RPO: 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 Southern Pines' transportation infrastructure.

It is suggested that the Town work closely with the RPO 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 Southern Pines Capital Improvement programming and Reserve Funds

The Town of Southern Pines 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/.

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.

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.

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.

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.

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.
E-mail: 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/.

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 form church groups, civic groups, scout troops and environmental groups to work on greenway development on special community workdays. Volunteers can also be used for fund-raising, maintenance, and programming needs.