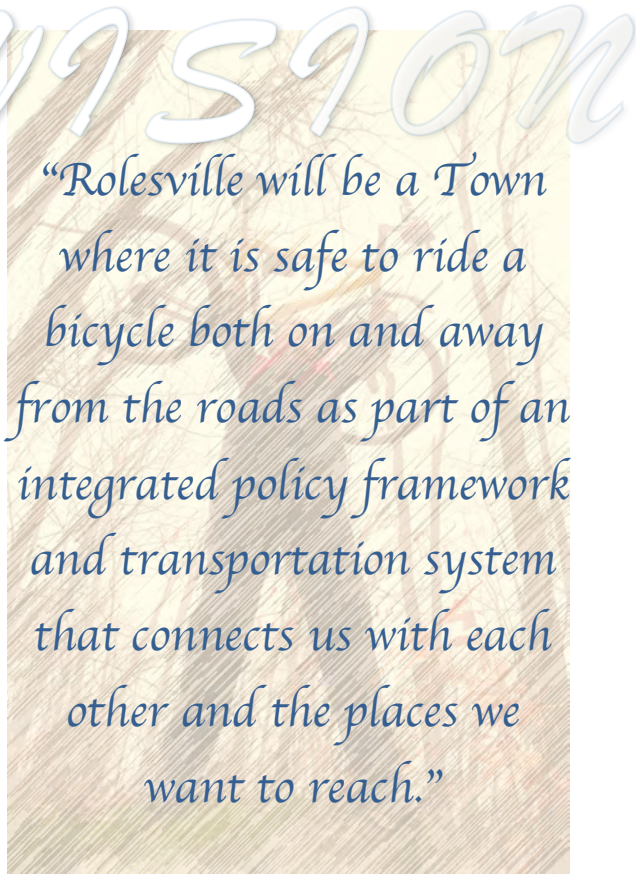
Comprehensive Bicycle Plan

for the Town of Rolesville

In 2012-2013, the Town of Rolesville undertook the development of a comprehensive plan to improve bicycling conditions. By improving bicycling, we were also improving traveling conditions for everyone; our citizen's health; our business climate; and the preservation of our natural environment as well.

Our Steering Committee, Town Staff, consultants, and the people that commented on this Plan as it was being developed are proud to present this final Plan to encourage, support and build a place for cycling.

Prepared for the Town of Rolesville by the J. S. Lane Company and NCDOT Division of Bicycle & Pedestrian Transportation



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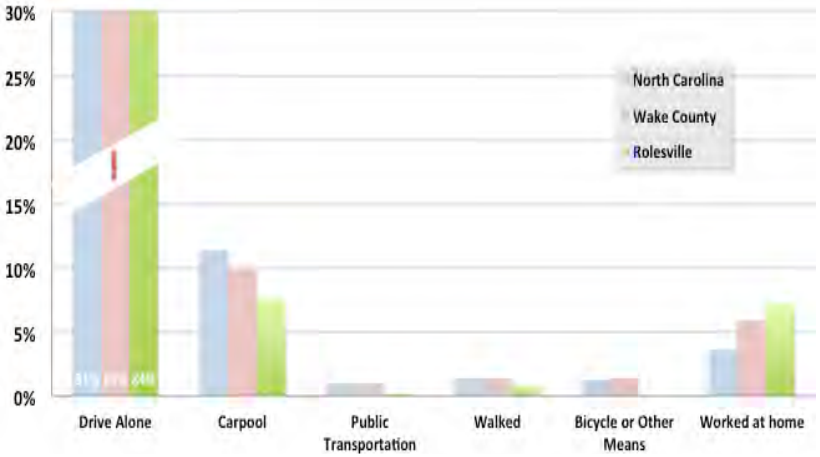
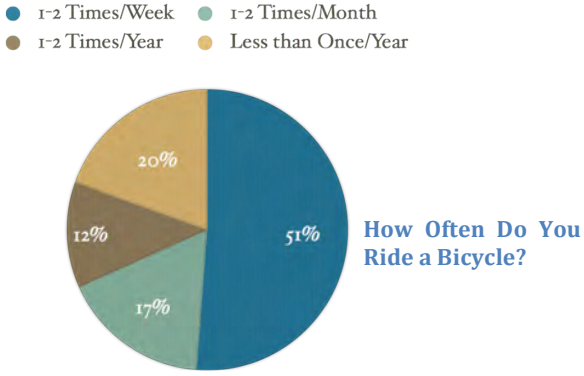


Means of Transportation to Work, 2006-2010



How Often Do You Ride a Bicycle?

Executive Summary

The Town of Rolesville undertook the development of a Comprehensive Bicycle Plan over the course of 2012. Appropriately, this was also the year of the 175th anniversary of Rolesville, and a year that would be a crossroads of sorts as the Rolesville Bypass (US 401) was starting construction. Bicycling is also located squarely at the juncture of the past and present: the first paved roadways were built to accommodate the old "boneshaker" bicycles, and the presence of cycling in America was starting to emerge again due to a renewed interest in exercise and physical fitness; a recovering economy that prompted more people to consider alternatives to owning and maintaining a car; and a general recognition that Rolesville is laid out in such a way that bicycling seems a natural way to connect a main street, businesses, schools and homes – many of which are located within two miles of each other.

Yet cycling in Rolesville has not been a popular choice: the streets are holdovers from a time when many fewer people lived or passed through them. Often narrow and carrying speed limits in excess of 35mph, these streets prove too daunting for casual cyclists, although long-distance cyclists frequently pass through town to reach the nearby, lower-volume roadways of northern Wake County. A lack of supporting signage, sidewalks, landscaping, and a steady stream of through traffic on US 401 – Rolesville's Main Street – makes cycling an unlikely activity for many people. The graph at left tells the story: no one cited cycling as a means to work during the most recent five-year Census sampling, and driving alone was a popular (literally, off-the-chart) choice. When we asked people how often they rode a bicycle, fully 68% said that they did so at least once a month, and over half said that they ride at least one or two times each week. A lack of connectivity to places that they would like to go (39%) and cars traveling too fast for them to feel secure (30%) led the reasons of why Rolesville residents don't ride even more often. Obviously, there is work that remains to be done.

The North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation, the Town of Rolesville, and the J. S. Lane Company, LLC (along with subconsultants of Kostelec Planning and Lagniappe Planning) came together in 2012 to develop a plan to change this dynamic. The Town assigned a steering committee to help guide the planning process and, with the assistance of the consulting team, engaged the public through a project website, presence at public events, and attendance at Town Council and Planning Board meetings. The public spoke clearly at these meetings: people do bicycle in Rolesville (38% at least 1-2 times a week), they feel that traffic moves too fast or dangerously for them, or that there are not easy connections to the places that they wish to go.

This *Comprehensive Bicycle Plan* hopes to support our citizens and future generations of cyclists by assigning priorities to improvements on the street; signage and pavement markings; and developing programs that can help Rolesville achieve a safer and supportive cycling environment. The Plan has some unique features worth mentioning: bicycle levels-of-service were measured for the major roadways; high-priority widening segments were identified near schools and curves; and Main Street was treated with substantial attention to detail to accommodate a future (2014) when much of the through traffic now will migrate to the new bypass to the south and east.

The following page describes the important projects, programs, and policies contained in this Plan to achieve the Town's objectives. In addition, the reader is encouraged to review Chapter Five, where a number of financing options are discussed including an option to leverage stream and wetland mitigation credits to help finance improvements or encourage private developers to participate in their construction. Short-Term (1-5 years), Mid-Term (6-10 years) and Long-Term (More than 10 years) are identified for the project recommendations.

Information by Chapter

Chapter 1: Making a Case for Cycling

- Describes the benefits of cycling
- Describes the results of the public survey
- Steering Committee composition
- Field review of current conditions of major cycling routes
- Goals and Vision Statement development

Chapter 2: Policies and Programs

- Details the relevancy of each plan and the Town's Ordinance, noting the places where they could be more supportive of cycling objectives
- Describes a number of programs in detail, including potential partnerships for implementation

Chapter 3: Project Recommendations

- Definition of Term Projects and Priorities
- Details of Project Recommendations
- Details of Main Street Improvements
- Origins and Destinations identified by the Steering Committee

Chapter 4: Design and Operations

- Describes maintenance tasks and responsibilities
- Design elements and considerations are discussed in detail

Chapter 5: Implementation and Priorities

- Pavement markings and signage recommendations
- Bicycle Program and evaluation tool is discussed
- Program financing options are described in detail, including priority options

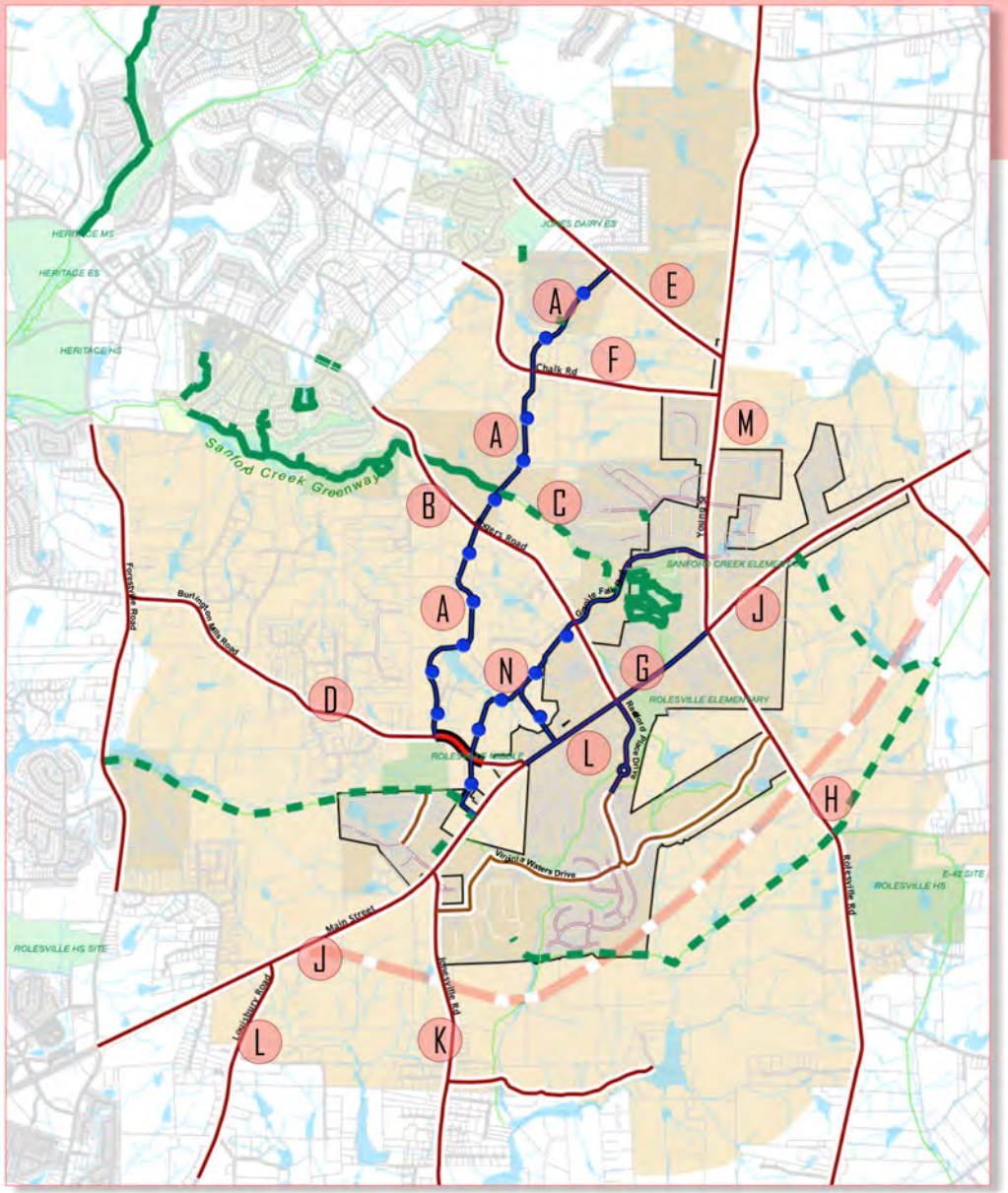
Policies *(refer to Chapter 2.1 for additional details)*

A. Reference and echo recommendations in the Bicycle Plan in various locations throughout the Town's *Community Plan*
B. The *Open Space and Greenways Plan* (2002) should be updated, including more attention to detail and road/greenway intersections
C. Strengthening the Town's position on connecting roads in various planning documents will be crucial to ensuring good access by bike
D. The *Thoroughfare Plan* (2002) needs to be updated, and really a complete re-write, to reflect ROW constraints and Complete Streets policy
E. A number of recommendations were suggested for the current development ordinance, including bicycle parking, modifying traffic impact studies to focus on bicycle (and pedestrian) impacts from development actions, and require adherence to adopted plans
F. The Town should be an active participant in the MPO's (CAMPO) planning actions, particularly the upcoming Northeast Area Study
G. The *Imagine 2040 Plan*, focusing on Main Street, needs to be refined and propose interim solutions as well as describe updates to current overlay ordinances for Main Street and the Rolesville Bypass

Programs

A. Education: Safety Video Promotion
B. Education: Expand the Bicycle Rodeo Program
C. Enforcement: Warning Tickets and Follow-Up
D. Enforcement: Traffic Calming in the Hands of the People
E. Enforcement: Helping the Police
F. Encouragement: Get On Board the Bicycle Train
G. Encouragement: Continue to Develop the St. Patrick's Day Bicycle Parade
H. Engineering: Plan Ahead to Participate in NCDOT Improvements
I. Encouragement and Education: Collaboration Opportunities with Wake Forest

Projects *(see also map on following page)*	**Term/Priority**	**Opinion of Probable Cost**
A. Connector from Jones Dairy Rd. to Burlington Mills Rd.	Long/1	Phase I: $9.9m; Phase II: $6.5m; Phase III: $4.7m
B. Rogers Rd. from Main Street to Town limits	Mid/1	$354,000
C. Greenway from New Collector street to Main St. Park	Short/2	$680,000
D. Burlington Mills Rd. Bike Lane or Sidepath	Mid/4	$367,000
E. Jones Dairy Rd. Wide Striped Shoulder	Mid/3	$196,000
F. Chalks Rd. Wide Striped Shoulder	Long/7	$237,000
G. High Visibility Crosswalk at Rolesville Elementary School	Short/1	$45,000
H. Rolesville Road Wide Striped Shoulder	Long/2	$339,000
I. Jonesville Road Wide Striped Shoulder	Long/6	$187,000
J. Main Street (North and South) Wide Striped Shoulder	Long/3	$570,000
K. Louisbury Road Wide Striped Shoulder	Long/4	$193,000
L. Main Street (Downtown) Improvements	Mid/2	Cost requires additional, detailed design study
M. Young Street Wide Striped Shoulder	Long/5	$503,000
N. Granite Boulevard Extension/Burlington Mills Realignment	Short/3	$8.7m



Project Recommendations

Increasing the Freedom and Safety of Bicycling in Our Town

A	Connector from Jones Dairy Rd. to Burlington Mills Rd.
B	Rogers Rd. from Main Street to Town limits
C	Greenway from New Collector street to Main St. Park
D	Burlington Mills Rd. Bike Lane or Sidepath
E	Jones Dairy Rd. Wide Striped Shoulder
F	Chalks Rd. Wide Striped Shoulder
G	HAWK Signal and Crosswalk at Rolesville Elementary School
H	Rolesville Road Wide Striped Shoulder
I	Jonesville Road Wide Striped Shoulder
J	Main Street (North and South) Wide Striped Shoulder
K	Louisbury Road Wide Striped Shoulder
L	Main Street (Downtown) Improvements
M	Young Street Wide Striped Shoulder
N	Granite Boulevard Extension/Burlington Mills Realignment

LEGEND

- school Schools
- Sidewalks
- Greenways Existing & Proposed
- Bicycle Lane
- Shared Lane w/Sharrow Markings
- Wide Striped Shoulder
- Adjacent Sidepath
- New Location Road

N

n.t.s.

Bike Ride (Minutes)	Distance (Miles)	Calories Burned (180-lb. person)
2	5	23
5	12	59
10	25	118

3 LANE

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Vision and Goals

Rolesville will be a Town where it is safe to ride a bicycle both on and away from the roads as part of an integrated policy framework and transportation system that connects us with each other and the places we want to reach.

1. Our Town will be **better connected** and accessible by bicycle than it is today.
2. Our Town will feature **on-road bicycle facilities that connect us** to places both within and near our borders in part to provide alternatives to making every trip with a car.
3. Our Town will **grow our greenway and trail system**, and dedicate time and resources to that end.
4. Our Town will **engage our residents proactively** to ensure that everyone – motorists and cyclists alike – will be respectful and aware of each other to ensure the safety of every cyclist.
5. Our Town will **consider bicycling and bicycle accommodations** in every new development review, policy, ordinance, and resolution adopted.

While the costs of new construction shown in the previous table may be born to a considerable extent by new development in some cases, the Town will have to work to find funding for the remaining projects in already-developed parts of Town. The final chapter describes the following preferred strategies for financing various forms of improvements:

- Municipal and County Bonds
- County Property Tax Increase
- County Sales Tax Increase
- Municipal or County Service (Business Improvement) District
- Tax Increment Financing (TIF)
- Occupancy Tax
- Spot Safety and Hazard Elimination (NCDOT)
- Powell Bill Funds
- Conservation Tax Credits
- State Transportation Improvement Program Projects (NCDOT)
- Payment-in-Lieu Fees
- Foundation Grants
- Safe Routes to Schools

How Do We Go Forward?

Through a concerted, multi-pronged effort, cycling can be an important of Rolesville's present and its future. The people we spoke with were universally enthusiastic about cycling, and recognized its value to their lives and those of their children. Now that the Plan is completed, we hope that the people, businesses, and leaders of Rolesville will continue to work together to create a place that fulfills the vision of Rolesville, and all of the people that remember what it was like to bicycle to school on a cool autumn morning.

Rolesville Bike Parade, 2012

Chapter 1 Making a Case for Cycling

Section 1.1: Benefits of Bicycling

A lot of images may come to mind when someone mentions the words "bicycle" or "bicycling"...

... the days spent during the summer riding alone or with friends when you were younger,

... maybe the spin class at the local gym that's the closest you get to cycling these days, always leaving you feeling tired but accomplished, or

... media images of cyclists wearing sleek-fitting attire on expensive road machines or bouncing across rock-strewn trails.

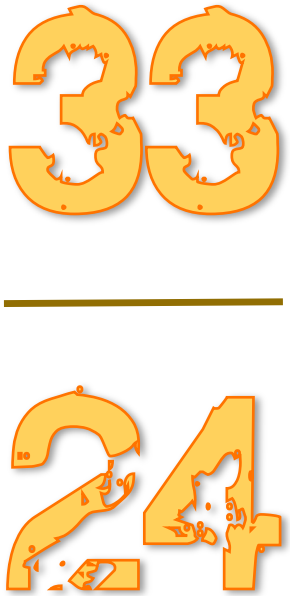
What we don't think of often enough when we hear bicycling mentioned is how this simple and (usually) leisurely activity can be a serious and important form of transportation; impart major health benefits from being part of a more active lifestyle; generate economic advantages from road and trail facilities that lure cyclists to the area; or just how much fun cycling can be for adults and children. We don't have to be Lance Armstrong or even live in a place like Portland, Oregon to realize most of these benefits – although we can learn lessons from both of them that apply to our place and our people.

HEALTH BENEFITS. Cycling more often contributes to a reduced risk of being overweight, which leads to a reduced risk of the likelihood of a myriad of ailments that are leading causes of premature death and disability. Strokes, diabetes, some types of cancer, and heart disease are all made less likely through regular exercise - and lower health care costs, a

particularly timely topic. We've listened to debates about how to manage health care in our country, but relatively little time about what we can all do to lower costs on the front end. We've also learned that you don't have to do an "insane" workout or exercise for hours on end: as little as 20-30 minutes a day is all we need to realize benefits. These benefits translate into pretty impressive outcomes: in November 2011, the National Institute of Environmental Health Sciences released a report that noted if half of all short trips of less than five miles were made by bicycle deaths would decline by 1,295 persons and $3.8 billion each year in medical costs alone would be saved in 11 upper Midwestern metropolitan areas.

IT'S THE ECONOMY. When this Plan was prepared, the major topic on a national level was creating jobs and improving economic climates, preferably without risking environmental or social values. Cycling contributes an estimated $133 billion annually to the U.S. economy, supporting 1.1 million jobs and generating nearly $18 billion in tax revenues that we would otherwise need to find elsewhere. But for our purposes, the key statistic is this: bicycling generates nearly $50 billion for non-cycling sector businesses in the form of meals, hotel lodging, clothing, and entertainment. The research on this topic in our state is spearheaded by a report released by the Institute of Transportation Research and Education (ITRE) studying the effects of cycling on the Outer Banks: cycling investments are returned nine-fold by extending tourist vacations, drawing new vacationers to the area, and encouraging them to return again and again. Cyclists tend to have higher-than-average incomes and educational levels, facts that businesses should be aware of when considering creating bike-friendly environments – and adding a $350 loop-and-post bike rack out front would be a good idea, too.

REALIZING INDEPENDENCE. In addition to bicycling making more jobs, it helps people get to them as well. Businesses that are easily accessed by bicycle are often in neighborhoods that are desirable to an increasingly large percentage of young professionals looking for places that have trails nearby and places to which they can walk or bike independent of using a car. Schools in Rolesville are also a focus of our Plan, and getting to them



Commute time, in minutes, for Rolesville (top) and North Carolina (2010)

Schools in Rolesville

Rolesville Elementary School
K-5 | Traditional | 643 | 91.7 | 38.9 | 9

Sanford Creek Elementary School
K-5 | Year-Round | 640 | 83.7 | 20.6 | 0

Rolesville Middle School
Opened in 2012

Rolesville High School
Opening in 2013

Key to statistics:
Grades | Calendar | Enrollment | Crowding % | Free+Reduced Lunch Eligible Students % | Mobile Units in Use

can and should be a family affair. Rolesville (as of 2012) has three public schools inside its borders, and another one, Jones Dairy Elementary School, close by in the adjoining Town of Wake Forest. Each of these schools should have the goal of being readily accessible by bicycle within one mile of the campus. When children get to where they are going by bicycle – even if accompanied by an adult – it is a boost to their self-confidence. One of our objectives is to promulgate ways of accessing schools that are safe and get parents as well as teachers and students involved in a healthy outing.

RELIEF FROM TRAFFIC, AND TRAFFIC RELIEF. Bicycling offers the most energy-efficient way of getting from one place to another, and combines the "reach" of a short automobile trip with the health and cost-efficiency of a long walk trip. Short trips are readily made by bicycle, and 28% of all trips in the U.S. are one mile or less in length (we would assume this number to be a little smaller for Rolesville given the longer commute times compared to North Carolina and the Nation). However, only 2.25% of these trips are made by bicycle and 60% made by driving (35% are walked). These statistics communicate clearly one reason that we have both traffic congestion and overweight and obesity issues in abundance in the U.S. In Rolesville, no one biked to work in the most recently available (2006-2010 sampling) Census survey. Not only do people in Rolesville, Wake County and North Carolina drive almost exclusively to work, they overwhelmingly choose to do so by themselves (Figure 1-1). However, work trips only account for 20% to 25% of all the trips made on a typical day for most households, and many of the destinations that aren't work-related – schools, shopping, or recreation – are located within one mile of many of Rolesville's neighborhoods, making them strong candidates for conversion to bicycle trips.

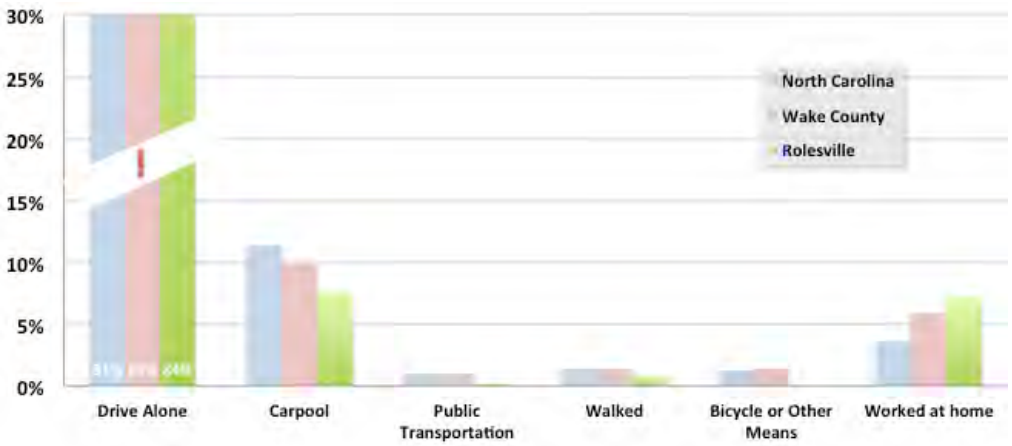


Figure 1-1. Means of Transportation to Work, 2006-2010

PURPOSE OF THIS BICYCLE PLAN. In 2012, Rolesville, in cooperation with NCDOT and J. S. Lane Company, LLC, developed a comprehensive bicycle planning document and process by studying Rolesville and its zoning jurisdiction (called an Extra-Territorial Jurisdiction, or ETJ). The purpose of the Plan was to provide recommendations on physical infrastructure, programs, policies, and implementation concepts that would help Rolesville improve its cycling environment in terms of safety and the encouragement of more cycling. This planning process was greatly facilitated by both the staff of Rolesville and a dedicated Steering Committee that aided in identifying priorities, raising awareness of the Plan, and reviewing draft reports (Table 1-1).

Table1-1. Rolesville Bicycle Plan Steering Committee

	Name	Representation	Affiliations
Town Staff	**Thomas Lloyd**	Planning Department	Town of Rolesville
	Tim Stoker	Police Department	Town of Rolesville
	Brian Hicks	Town Manager	Town of Rolesville
	J.G. Ferguson	Parks & Recreation	Town of Rolesville
Stakeholders	**Paul D. May**	Resident	Hampton Pointe Subdivision
	Patrick Delaney	Resident	Granite Falls Athletic Club
	Terry Marcellin-Little	Chairperson	Rolesville Open Space & Greenways
	Mike Honkomp	Resident	Rolesville OSAG/PARAB
	Tracy Doherty	Resident	Granite Falls Athletic Club/Rex Hospital
	Timothy Hellwig	Resident	Rolesville OSAG
	Mike Szafran	Resident	Wall Creek Neighborhood
	Alan Walker	Resident	Wall Creek Neighborhood
	Mark Powers	Vice-chairperson	Rolesville Planning Board
	Angie Coyle	Resident	BB&T Bank
	Gil Hartis	Commissioner	Rolesville Town Board of Commissioners
	Jenny Rowe	Director	Rolesville Chamber of Commerce
Consulting Staff	**Robert Mosher**	NCDOT	Division of Bicycle & Pedestrian Transp.
	J. Scott Lane	J.S. Lane Company	Owner (reporting, public engagement)
	Don Kostelec	Kostelec Planning	Owner (field review, recommendations)
	Melissa Guilbeau	Lagniappe Planning	Owner (mapping, policy review)

In the following sections, we translate these concepts about the benefits of cycling as well as what we have learned by studying Rolesville's current conditions and surveying a sample of the population into a vision statement, goals and strategies for the Rolesville Bicycle Plan. We will also discuss the main purposes of the Rolesville Bicycle Plan, as well as long- and short-range objectives.

Rolesville Bicycle Plan Steering Committee, 2012

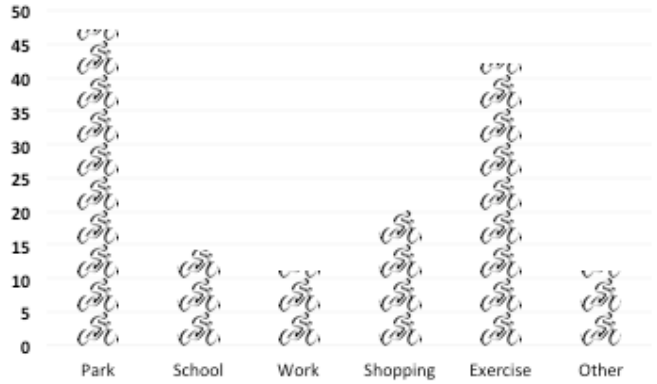


Figure 1-2. Check the places where you bike now or would like to ride a bicycle

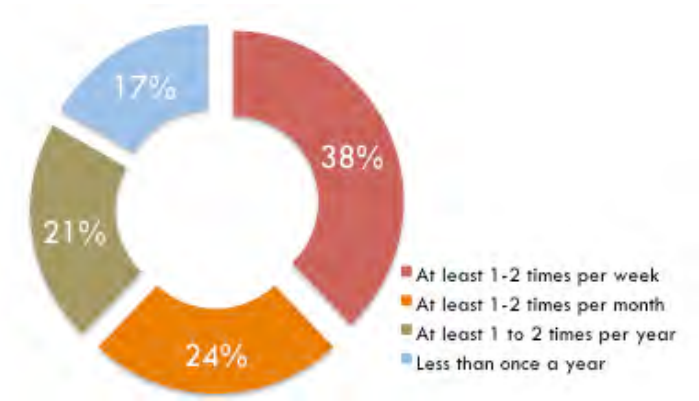


Figure 1-3. Check the one answer that best describes how often you bicycle

Section 1.2: Evaluating Current Conditions – Survey

Field observations and a public survey were conducted to provide a greater understanding of the local conditions for bicycling as well as the attitudes of Rolesville's residents towards cycling.

A total of 66 people responded to a survey that was conducted from February 2012 through May 2012. This total represents approximately 1.7% of the total population of the Town. Approximately half of the surveys were gathered at the Rolesville St. Patrick's Day Bicycle Parade on March 17th, as staff was there to promote the Plan at the parade.

The survey instrument was relatively brief, as specific destinations are limited in Rolesville currently, as is total roadway mileage. In some cases, additional cross-tabulations of results are discussed to provide a more detailed perspective of the responses.

Destinations. When asked where the respondents bike to now or would like to bike in the future, "parks" and "exercise" options were chosen 71% and 64% of the time, respectively (Figure 1-2).

Frequency. The frequency of riding by the respondents was relatively high, with 62% of the people responding saying that they ride a bike at least one or two times each month. Thirty-eight percent (38%) of respondents noted that they rode at least one-to-two times each week (Figure 1-3).

Respondents that rode bikes frequently responded only slightly differently to these two questions as compared to the rest of the respondents. For example: 15% of the respondents that cited their bicycling riding frequency as less than 1-2 times per week cited riding to work as their preferred destination, while 20% of those people that cited a frequency of 1-2 times per week cited work as a preferred destination. Frequent riders

tended to ride less often to parks, shopping and for exercise than the less-frequent riders.

Wearing a Helmet. The severity and ultimate outcome of any injury suffered during a bicycle crash is, for the rider, highly dependent on whether or not he or she was wearing a helmet. Of the 523 cyclists killed in the U.S. in 2010 where it was known if they were wearing a helmet or not, 82% of them were known to not be wearing a bike helmet at the time of the crash while only 18% were wearing a helmet.[1] In Rolesville, the survey respondents indicated that nearly two-thirds of people that rode a bike wore a bicycle helmet (Figure 1-4). Three-quarters (75%) of the people that responded "no" when asked if they wore a bicycle helmet said that they did not wear a helmet because they did not own one. The remainder cited helmets as being unnecessary or uncomfortable as the reasons that they did not wear a helmet.

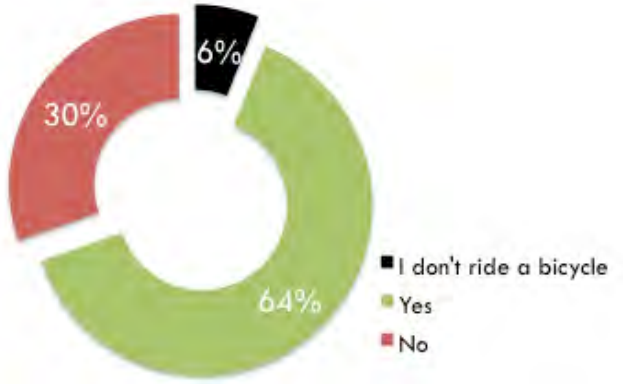


Figure 1-4 When you ride a bicycle do you wear a helmet

Barriers. When asked what prevents survey respondents from riding a bicycle more often, none of the survey respondents cited not knowing how to ride or otherwise being unable to ride as a factor. The most commonly cited factor for not riding a bike more often was the lack of "convenient connections" to places that they would like to travel (52%) followed closely by automobile traffic being too fast (41%). Notably, respondents that selected "other" cited busy schedules or a lack of time most frequently in their responses as the reason they did not ride more often (Figure 1-5).

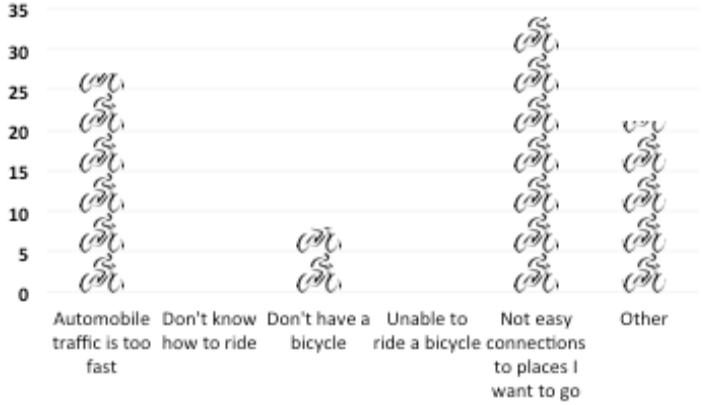


Figure1-5. What prevents you from riding a bicycle more often

Frequent bicycle riders wear helmets much more often (78%) than those respondents that ride one or two times a month or less (59%). These frequent riders also cite fast auto traffic as being less of a barrier to them riding more often (32%) compared to less-frequent riders (46.3%). A lack of convenient connections is cited more often as a barrier to frequent cyclists (56%) than to infrequent cyclists (49%).

The age of the respondent did affect helmet usage, with 64% of people aged 26 to 65 saying that they wore a helmet when they rode a bicycle.

Compared to the Rolesville population as a whole, the age of the survey respondents was skewed heavily in favor of this age bracket (26 to 65), which represented nearly 90% of all survey respondents (Figure 1-6).

The results of the survey, although obtained from a limited number of participants, indicate both a strong desire to engage in bicycling as well as the potential for creating better cycling environments through improved facilities, both on-road and off-road. These conclusions were supported by the field review discussed in the following section.

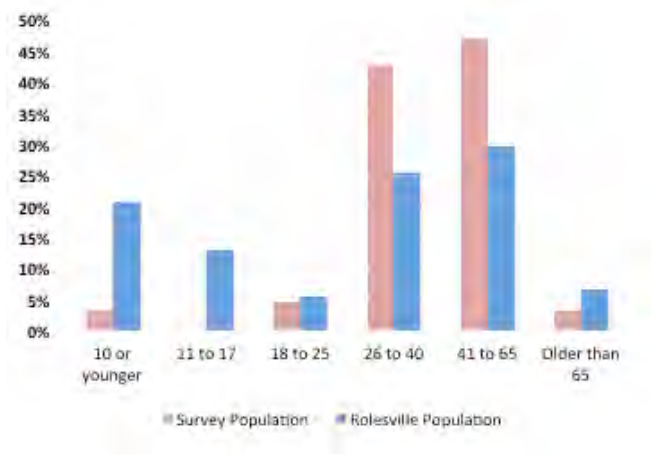


Figure 1-6. Age of Survey Respondents and Rolesville Population (2010)

Section 1.3: Evaluating Current Conditions – Field Review

A field review of every street in Rolesville was conducted by bicycle during May 2012. During this field review, notes, still pictures and video were gathered and used to help create an assessment of current conditions on the major roadway facilities as well as to ascertain the existence of off-road facilities (greenways and trails) and supporting facilities such as bicycle parking stations. For major streets in Rolesville that provide important connections for cars as well as cyclists, a bicycle level-of-service (BLOS) was calculated (*see text box on this page for an explanation of the BLOS measure*).

The following paragraphs describe the physical infrastructure of the Plan study area. On each page there are one or more pictures of the roadway, the level-of-service measure, and existing cross-section. If the roadway changes along its length, more than one cross-section may be shown.

Bicycle Level-of-Service?

How the BLOS Works

A level-of-service, or quality of cycling experience, was generated using FDOT's Quality/LOS multi-modal scoring system for the major roads in Rolesville. This system creates a score and letter "grade" (A-F) that objectively evaluates the bicycle-ability of these roadways based on traffic volumes, truck traffic, lane widths, speeds, and bicycle accommodations. Higher scores are worse; below are how the scores and letter grades relate.

- A = Less than 1.5
- B = 1.5 to 2.5
- C = 2.5 to 3.5
- D = 3.5 to 4.5
- E = 4.5 to 5.5
- F = More than 5.5

Part of our goal for the Rolesville Bicycle Plan is to change these scores for the better.

Main Street (US 401, Louisburg Road)

Bicycle LOS: E (5.2 – 5.4)
Posted Speed: 35 – 45mph
Traffic Volumes: 12k – 18k
Typical Section(s):

Main Street/Louisburg Road/US 401. Rolesville's Main Street is also the historical main connection between the Town and Raleigh, as well as Wake Technical College's east campus, I-540, and destinations to the north of Town including Louisburg and I-85 just south of the Virginia State line. This road has created the axis along which the Town has grown, as well as providing the major commercial centers for residents to shop.

Main Street makes a remarkable transition between an almost rural (but suburbanizing) area on the south and north ends of Town, to a traditional, "strip"-style of development between Burlington Mills Road and Young Street. The intersection with Young Street is the traditional downtown core for Rolesville, although the majority of government functions are now situated well to the south. This street has access to Rolesville's Main Street Park and Rolesville Elementary School as well. The combination of these destinations plus the commercial attractions and nearby residential neighborhoods makes Main Street a premier cycling route for transportation purposes. However, the current facility does not facilitate cycling well or at all, with accommodations ranging from narrow, one-foot striped shoulders to twelve-foot outside lanes sandwiching a center turn lane in the commercial sections.

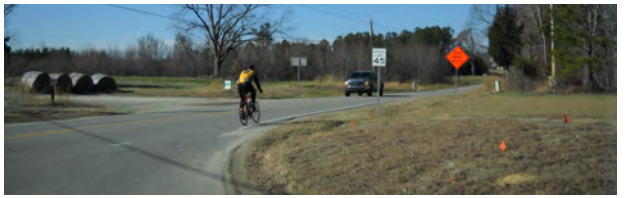
An opportunity exists now to re-think how US 401 can transition back to a true main street for the Town due to the construction of the Rolesville Bypass, which will circumvent the Town on its southeast side. Rolesville did undertake a streetscaping plan to describe how the Main Street could be transformed using roundabouts, landscaping, lighting, and decorative construction materials to create a stronger sense of place.

Regardless, the Town will need to strongly consider how to make cycling (and pedestrian) activity a more viable option on this critical street.

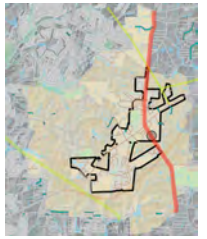
Young Street. If US 401 is Rolesville's figurative and literal main street, then Young Street provides the historical crossroad counterpart. Further to the south, Young Street changes name to Rolesville Road, connecting with other small municipalities in eastern Wake County; to the north, Wait Avenue/NC 98.

Young Street transitions from very rural settings on a cross-section using scant 10-foot lane widths with no or less than one-foot shoulders to brief stretches of three-lane sections near Sanford Creek Elementary School and at the historic crossroads with Main Street. Traffic volumes are moderate throughout its length, ranging from 4,600 at either end to a high of 6,000ADT (Average Daily Traffic) closer to the intersection with Main Street. Ditch sections (instead of curb-and-gutter) predominate Young Street, making future, typical sidewalk construction a more costly proposition.

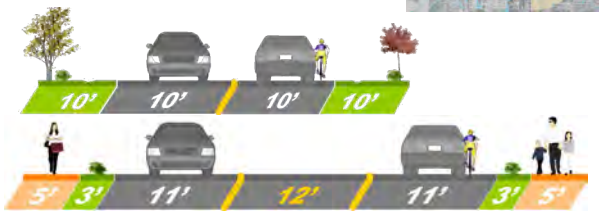
This intersection, which is surrounded by small commercial buildings, a church, and occasional government-owned properties, is worthy of a major redesign effort due to unusual geometries, large turning radii that promote higher speeds, and near-zero setbacks from existing parking areas and the street. The aforementioned Main Street streetscape plan called for this location to be converted to a roundabout (Figure 1-7). Once the volumes are reduced due to the influence of the Rolesville Bypass project, a single-lane roundabout could handle traffic here more efficiently and provide a better opportunity to establish a gateway marker into the core area of the Town.



Young Street



Bicycle LOS: E (4.7 – 4.8)
Posted Speed: 35 – 45mph
Traffic Volumes: 4k – 6k
Typical Section(s):



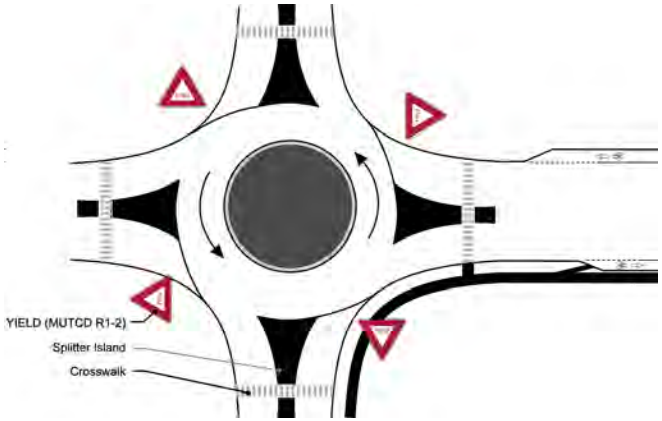
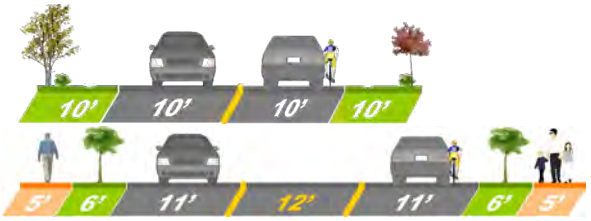


Figure 1-7. Modern Roundabout Design

Rogers Road

Bicycle LOS: E (4.5 – 4.8)
Posted Speed: 35 – 45mph
Traffic Volumes: 4k – 6k
Typical Section(s):



Rogers Road. Some residents might now consider that the new, primary crossroad to Main Street is Rogers Road, which connects the commercial centers on Main Street to Wake Forest and its (South) Main Street. Crossing to the southeast side of Main Street, Rogers Road changes name and character as Redford Place Drive, the principal street for the Villages of Rolesville subdivision. Redford Place Drive is discussed separately later in this section.

Rogers Road is a nice challenge for cyclists, too, having several small, rolling hills to navigate from Marshall Farm Road (entrance to the large Heritage subdivision) to Main Street in Wake Forest (refer to Figure 1-8).

However, much like the other roads that link Wake Forest to Rolesville, the cross-section typically has a one-foot or less paved shoulder. The downtown section has a 35 mph speed limit, sidewalks, and connects some banking and retail opportunities together. Beyond the State Credit Union, Rogers Road changes to a simple two-lane ditch section with 10-foot lanes. Although ADT counts were not available, they were estimated based on surrounding roads to be in the range of 4,000 to 6,000 vehicles per day.

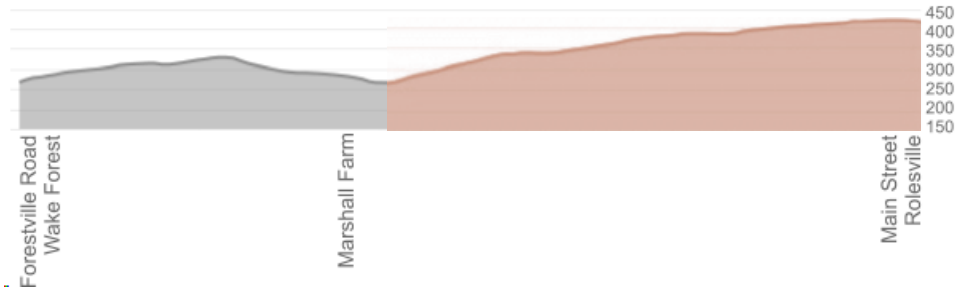
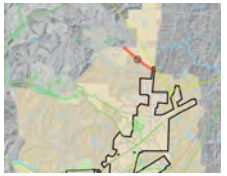


Figure 1-8. Rogers Road Elevation Change (photo credit: MapMyRide)

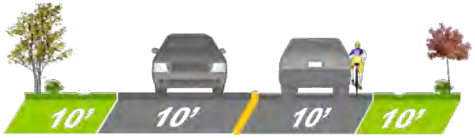
JONES DAIRY ROAD. Jones Dairy Road, while existing only for a short distance in the current Town limits, provides another important east-west connection to Wake Forest and points west of Main Street and Young Street. The Wake Forest subdivisions of Willow Deer, Northampton, Jones Dairy Farm, and Heritage are all accessed by Jones Dairy Farm Road. Just as importantly, the Jones Dairy Elementary School, while not in Rolesville's planning jurisdiction, lies just beyond and is frequented by Rolesville children on a daily basis.

However, Jones Dairy Road is hampered with respect to cycling by a 45mph speed limit and no (or negligible) paved shoulders. Even a small but consistent paved shoulder can provide an important recovery zone for cyclists. There are only very short stretches of sidewalk (near the school, for example) but otherwise the shoulder is unpaved and served by a drainage ditch with trees set well back from the roadway. Land uses are predominantly rural with scattered home sites and driveways.

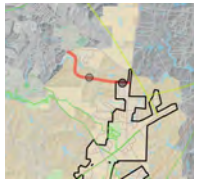
Jones Dairy Road



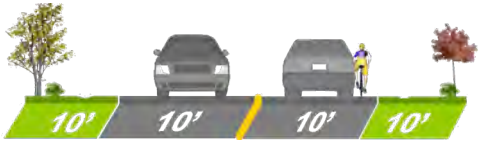
Bicycle LOS: D (4.5)
Posted Speed: 45mph
Traffic Volumes: 4k (est.)
Typical Section(s):



Chalk Road



Bicycle LOS: E (4.3 – 4.4)
Posted Speed: 35 – 45mph
Traffic Volumes: 4k (est.)
Typical Section(s):



CHALK ROAD. Chalk Road, like Jones Dairy Road, has 10-foot travel lanes and is generally unsuitable for cycling except for the most experienced road rider. Chalk Road also connects to numerous subdivisions in Wake Forest, but does not feature a premier destination like a school. Land uses are generally rural in nature, with active farming occurring along the roadside, interspersed with single-family homes and major residential subdivision entrances.

Unlike Jones Dairy, Chalk Road does change character slightly as it draws closer to Town. The speed limit drops to 35mph, and sight distances are very good all the way to the three-way intersection of Averette Road (which changes names to West Young Street closer to Main Street).

An important observation can be made that providing interconnectivity between Jones Dairy Road, Chalk Road, Rogers Road, and Burlington Mills Road (discussed next) could greatly enhance the bicycling environment in this vicinity. Large subdivisions could access various points in Rolesville while bypassing long stretches of these east-west connectors (see also the textbox on this page for more on the virtues of connecting streets).

The Importance of Connectivity

Connectivity Helps Everyone

Connecting streets together helps every traveler, whether by bike, on foot, by bus or by car. More connected street systems reduce travel times between points, reduce emergency response times that save lives, provide alternative ways of getting around construction/maintenance, and reduce traffic at congested intersections.

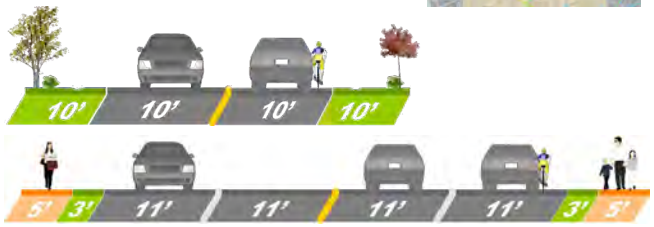
Most importantly for our purposes, improving connectivity allows for shorter bicycle trips and, if the connecting roads are designed properly, allows for a chance to create a road with bicycle lanes or other accommodations that Rolesville generally doesn't possess now.

BURLINGTON MILLS ROAD. While Burlington Mills Road is another east-west connector, its western endpoint turns sharply west to connect with Forestville Road, and then continues to the major roadways of Ligon Mill Road and US 1. The subdivisions of Tuckahoe and Laura Lakes Estates are both accessed by Burlington Mills Road, and the east end connects with Main Street, emerging near the Rolesville Town Hall and the Rolesville Commons shopping center. Importantly for this Plan, a new middle school (Rolesville Middle School) opened in 2012. One of the nice features of this school site is that a trail connection bridges the rear parking area of the school to Pristine Lane, a primary axis street of the Hampton Pointe subdivision. The frontage of this school also has sidewalks (*see photo this page*).

The characteristics of the roadway geometry are very much like the other east-west roadways discussed previously: narrow (10-foot) travel lanes, ditch drainage, and no shoulders on a 45mph speed limit. As the road enters the existing Rolesville town limits, the speed limit drops to 35mph and sidewalks appear along a brief (less than 900 feet) section of four-lane roadway. The relatively low traffic volumes (2,600 average daily traffic in 2011) create one of the better bicycle level-of-service ratings in this assessment. However, the 45mph segment of Burlington Mills Road features two sharp curves that limit the otherwise long sight distance.

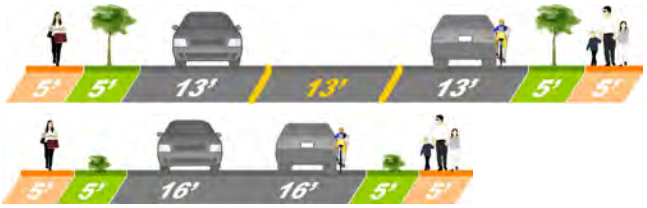
Burlington Mills Road

Bicycle LOS: C/D (2.6 – 4.0)
Posted Speed: 35 – 45mph
Traffic Volumes: 3k
Typical Section(s):



Redford Place Dr (Virginia Water Dr, Bendemeer Ln)

Bicycle LOS: A (0.5 – 1.3)
Posted Speed: 25mph
Traffic Volumes: 1k
Typical Section(s):



REDFORD PLACE DRIVE-VIRGINIA WATER DRIVE-BENDEMEER LANE. This combination of streets, which exits eastward off of Main Street at the intersection of Rogers Road, provides an important alternative to Main Street for the southeast quadrant of Rolesville. The streets through this residential subdivision, although having frequent driveway entrances, are wide (usually over 13 feet) and with very low traffic volumes. The frequency of on-street parking was low during the field observations conducted on this route. Sidewalks are typically found on both sides of the roadway, with five-foot planted buffer strips, some of which have trees. These buffers (both sidewalks and the planting strip) serve to create a visual cue to motorists of the presence of pedestrians, which in turn helps to slow traffic and raise awareness of cyclists. Two roundabouts on this route help to discourage high-speed and cut-through traffic to Jonesville Road, which is where the route exits at its western end. These features, combined with a 25mph speed limit, produce an excellent bicycle level-of-service rating.

Excellent opportunities exist in these neighborhoods to further augment the already very good conditions by using sharrow markings to reinforce the presence of bicycles in the community.

JONESVILLE ROAD. Jonesville Road lies at the extreme southern tip of Rolesville, and provides connections to the south of the Town. The road travels from the Carlton Pointe subdivision to Mitchell Mill Road before changing names to Peebles Road. On the north end, the roadway begins at Main Street / US 401 and directly across from the entrance to the Hampton Pointe residential subdivision. Note that this subdivision has direct bicycle/pedestrian access to Rolesville Middle School as well as Burlington Mills Road if one traveled through the school property (*see also the Burlington Mills Road description previously*).

Although Jonesville Road does not differ substantially from the several narrow lane/no shoulder cross-sections described earlier, the roadway's bicycle-friendliness is somewhat enhanced by the virtue of having relatively low traffic volumes presently. This low traffic volume is primarily responsible for the relatively sound "C" bicycle level-of-service rating. Speeds on Jonesville Road appeared to be higher than the 45mph speed limit would indicate during the field observation period. The Rolesville Bypass will interchange with Jonesville Road. This new access may have the effect of increasing traffic on this roadway as well as creating new development pressure adjacent to Jonesville Road.

Jonesville Road

Bicycle LOS: C (3.3)
Posted Speed: 45mph
Traffic Volumes: 1k – 2k
Typical Section(s):

Granite Falls Boulevard

Bicycle LOS: C (2.7)
Posted Speed: 35mph
Traffic Volumes: 2k – 3k (est.)
Typical Section(s):

GRANITE FALLS BOULEVARD. Granite Falls Boulevard is a relatively newer street in the Rolesville system, and its design reflects more current design principles. Sidewalks run for more than 50% of the street's length between Rogers Road and West Young Street, and on both sides of the street in the vicinity of Sanford Creek Elementary School. A continuous two-way, left-turning lane in the center separates the 12' wide outside lanes. These wider lanes translate into a 0.2 difference on the Bicycle Level-of-Service scale, and make an even more noticeable difference on this street when it is being ridden. The low (estimated) traffic volumes on this street also help to create a sense of security. This street represents an example of badly needed connections between the major secondary streets (e.g., Jones Dairy, Chalk, Young, Burlington Mills, and Rogers). Using this street also accesses a recreation center and an elementary school, and Granite Park Drive provides connections into Granite Falls and Main Street Park.

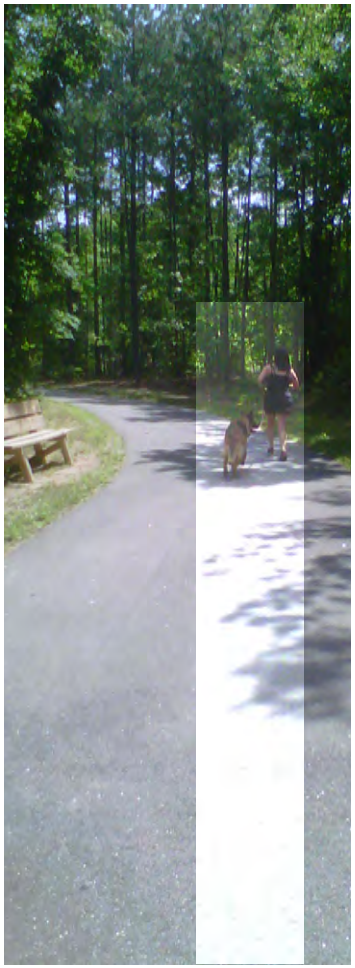
While the cycling conditions are sufficient for adult riders of moderate skills to navigate safely, a redesign of this street in the future would move the south-side sidewalk away from the edge of curb, increase the buffer (planting) strip between the north side sidewalk and back of curb, and widen the road and shrink the lane sizes to accommodate a 3' or 4' bicycle lane. Alternatively, a side path removed at least 10' from the roadway (except at intersections) would provide a better connection for younger riders as well.

GREENWAYS IN ROLESVILLE. Rolesville is just beginning to actuate its plan for creating a greenway system, but it has made some notable strides. An extension of the Sanford Creek Greenway system extending out of the Heritage South residential subdivision offers the best opportunity to create a dedicated, paved greenway between Rolesville and Wake Forest. The Sanford Creek Greenway is a 10-foot-wide asphalt greenway featuring boardwalk over the several sections that cross wetland areas along the trail. A section of this trail in Rolesville's planning jurisdiction is under construction due to a private residential development currently underway north of Rogers Road. In total, Sanford Creek Greenway will be nearly 2.5 miles in length within the planning jurisdiction of Rolesville once it is completed. The major missing section would cross Granite Falls Boulevard, and then tie this greenway into Main Street Park. This connection would also create a connection to the Granite Falls Swim & Athletic Club as well as the Sanford Creek Elementary School (Figure 1-9).

The only other existing length of greenway or trail facility in Rolesville existing now is within Main Street Park itself. The Main Street Park trail system is asphalt-surfaced, and loops within the Park for just over 1.2 miles through stands of pine. Coupled with the extension of the Sanford Creek Greenway, this park trail system provides a critical connection to Main Street. From this point, the core commercial area and two other schools are within relatively easy reach of cyclists, although on-road improvements are going to be necessary to make this riding experience tolerant of children.

The field review did indicate some "unofficial" pathways that are being used for walking and, presumably, biking for those with off-road bicycles. People will always find a way to reach the places that they want and need to go on foot or by bicycle, and will not hesitate to cut new pathways through fields, along the edges of roads, or across parking areas. These are unpaved connections between developments that indicate a "desire line" between existing facilities and destinations. One such connection is between Hampton Lake Drive and the recently constructed Bojangles restaurant to the north. This short connection

Figure 1-9. Main Street Park Entrance
(Sanford Creek Elementary School in distance on left)



Jogger and Friend on a portion of the Sanford Creek Greenway

parallels Louisburg Road / US 401. Another connection is one that links Big Willow Way with a newly constructed street in the Granite Falls subdivision. This connections provides access to Main Street Park, Sanford Creek Elementary School, and the Granite Falls Swim & Athletic Club (see image at right). Without this connection, people would have t o walk or ride an additional 400 feet on paved subdivision roads.

Unplanned Connection in Granite Falls Subdivision

Other Bicycle-Related Facilities in Rolesville. While bicycle lanes and greenways tend to get the most attention, the quality of the cycling experience in any place is partially attributable to other amenities such as bicycle parking, pedestrian (or cyclist-) activated signals, and crosswalks that might enable a less experienced rider to dismount and cross a busy street while "walking" her bicycle.

Apart from school grounds, no public bicycle parking is currently available in Rolesville, even in commercial areas. Intersections are generally oriented towards the movement of automobile traffic, although there are crosswalks noted at the following locations:

- Main Street at Young Street (high visibility, but in need of restriping)
- Main Street near Perry Street at Rolesville Elementary School (high visibility)
- Main Street at Rogers Road (pedestrian-activated signal interrupts are also present at this location)
- Granite Falls Boulevard connecting the Granite Falls Swim & Athletic facility and Sanford Creek Elementary School (high visibility).

Occasional driveway entrances are marked with crosswalks as well, but these are relatively infrequent occurrences.

Section 1.4: The Vision and Goals for Bicycling in Rolesville

Creating a vision statement – a very short description of how we envision our place to look with respect to bicycling at some point in the future – helps to not only articulate the sentiments and input from people in our community, but greatly aids in our development of goals and strategies for the Bicycle Plan.

The Bicycle Plan Steering Committee described previously provided input through a listing of key words that collectively formed the backbone of their opinions on how cycling should be in Rolesville. Combined with the previous review of survey comments as well as insights gained from the field review, the following is a description of the Vision and Goals for the Rolesville Bicycle Plan. Each member of the committee was provided with both white (favor) and red (disfavor) chips to assign to various goal statements. The following is a summary of how the Steering Committee responded collectively to the goals they stated. Note that the green numbers indicate the number of positive votes assigned to that goal, while the red numbers indicate the number of votes against that goal.

- Connect streets and other bicycle facilities together to create better connectivity with schools, parks, shopping and residences (9)
- Better off-road facilities, like greenways and soft trails (8)
- Coordinate the Bicycle Plan with other plans/policies as well as anticipated private sector developments (8)
- Better on-road facilities, such as bicycle lanes, wide outside lanes and shoulders (8)
- Increase cyclist safety (5)
- Education to teach drivers and cyclists about proper behavior and safety (4)
- Provide alternatives to single-occupant automobile travel (2)
- Invest in long-term improvements (1 / 2)
- Increase awareness of the potential for cycling for fitness (2)
- Better accommodations for long-distance riders (5)

Relating Goals to Comments from the Steering Committee

The following chart shows how we connected the Steering Committee Comments with our Plan's Goals.

Comment from Committee	Goals				
	1	2	3	4	5
Better Connections	■	■	■		
Off-Road Facilities	■		■		
Coordinate with Other Plans			■		■
On-Road Facilities			■		
Increase Cyclist Safety		■	■	■	■
Educate Drivers & Cyclists				■	■

The Steering Committee did not necessarily see the benefit to the Town of facilities to accommodate longer-distance riders, but did not feel that they entirely were outside the scope of the Town's Plan. Increasing the level of physical fitness was also not favored for emphasis in the Plan.

Areas of strong emphasis included improving connectivity, a concept that was reinforced during the field review of existing roadways and greenways. Coordination with other plans and policies was also a priority, as was the need for better off-road facilities such as greenways. Equally important was the need to improve on-road facilities. Of less importance, but still favored by the Committee, were the need to increase the safety of cyclists and improve the awareness and education levels of both motorists and cyclists in Rolesville.

Based on this input and considering the priorities identified in the public survey, the following Vision and Goals were developed for the Rolesville Bicycle Plan.

Vision Statement:

Rolesville will be a Town where it is safe to ride a bicycle both on and away from the roads as part of an integrated policy framework and transportation system that connects us with each other and the places we want to reach.

Goal Statements:

In order to achieve our Vision, we need to make sure our Bicycle Plan addresses each of the following goals, and that every recommendation contained in this Plan will further at least one of the five Plan Goals:

1. Our Town will be better connected and accessible by bicycle than it is today.
2. Our Town will feature on-road bicycle facilities that connect us to places both within and near our borders in part to provide alternatives to making every trip with a car.

3. Our Town will grow our greenway and trail system, and dedicate time and resources to that end.
4. Our Town will engage our residents proactively to ensure that everyone – motorists and cyclists alike – will be respectful and aware of each other to ensure the safety of every cyclist.
5. Our Town will consider bicycling and bicycle accommodations in every new development review, policy, ordinance, and resolution adopted.

Collectively, the Vision and Goals speak to creating a place that is much more tightly woven and less car-centric than the Rolesville of today, but also describe a place very much alive in the image of our Town that its residents and history convey.

The remainder of this Plan will focus exclusively on the recommendations for projects, programs, and policies that have to be implemented or changed to make this Vision become a reality. Our citizens, businesses, visitors, and especially our children deserve to grow and grow up in a place like this.

RESOURCES

U.S. Census Bureau, 2006-2010 American Community Survey. Commute to Work by Vehicles Available.

Insurance Institute for Highway Safety, Highway Loss Data Institute, "Fatality Facts 2010." www.iihs.org/research/fatality.aspx?topicName=Bicycles accessed July, 2012.

Bureau of Transportation Statistics, "Survey Documentation for the Bureau of Transportation Statistics Omnibus Survey Program," October 2009.

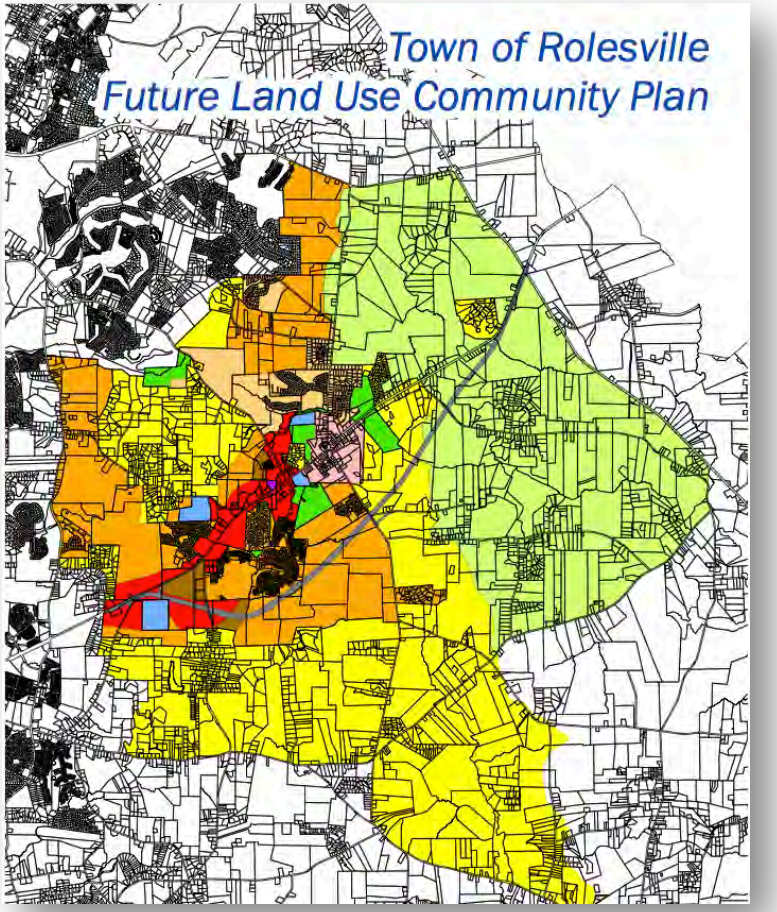
MapMyFITNESS, Inc., Map My Ride website. www.mapmyride.com/my_home.

Chapter 2 Policies and Programs

Section 2.1: Bicycling Policy Environment

Policies act like a set of instructions for how governments interact with private developers, other government agencies, and the public. Policies describe how, where, and when bicycle improvements "hit the street" and who pays for those improvements. Policies can be encoded in adopted plans; ordinances; or even in unwritten or written procedures that staff and appointed or elected officials look towards to complete their daily business. While some policies that greatly affect the cycling environment are encoded at federal or state levels and are therefore more difficult to alter (but they are not intractable), most of the policies that influence development actions and procedures happen at the local level here in Rolesville. A change in a policy should be carefully considered, and only after consulting closely with the people most likely to benefit or be harmed by a proposed change. While some people may think it's reasonable to shift the burdens of construction costs as much as possible to private sector players, for example, there are obvious impacts to how those changes would be viewed by all the people that depend directly or indirectly on private sector investments for their livelihoods. Hence, a balanced approach that looks towards prioritizing needs, taking into account the volume (or demand) of private development, and encouraging non-profit and volunteer efforts to distribute the costs and benefits across many people over time is generally viewed as the most appropriate course of action.

The following are brief descriptions of the adopted plans and existing policies that are the biggest influencers on how bicycle development occurs in Rolesville. Again, actually making these changes would be the follow-up work of Rolesville's planning staff, Planning Board, and Board of Commissioners. A Board of Adjustment also considers requests for variances to the zoning ordinance requested by developers, so that if the



Town of Rolesville Community Plan (2007) Land Use Map

specifics of a particular site or development make any requirement infeasible then the sponsors of that development action have a clear course of appeal. Adopting this Comprehensive Bicycle Plan does not translate into these changes going into effect, but they do point the way towards changes that individually or collectively improve the quality of life of Rolesville's citizens, and particularly those that would like to ride a bicycle. Ultimately, the importance of government policies is simply this: the results of policies create the legacy we leave behind, the places we want to travel, and how we interact with those places and other people in our town.

This chapter first covers the existing policies and plans already in place in Rolesville, and specific ways that they influence or could be made better to reflect a desire to improve the cycling environment.

Town of Rolesville Community Plan (March 2007)
Rolesville's Community Plan provides a vision, goals and objectives to guide future growth in the town. It specifically addresses neighborhoods, the downtown, commercial centers, community facilities, open space and recreation, and transportation.

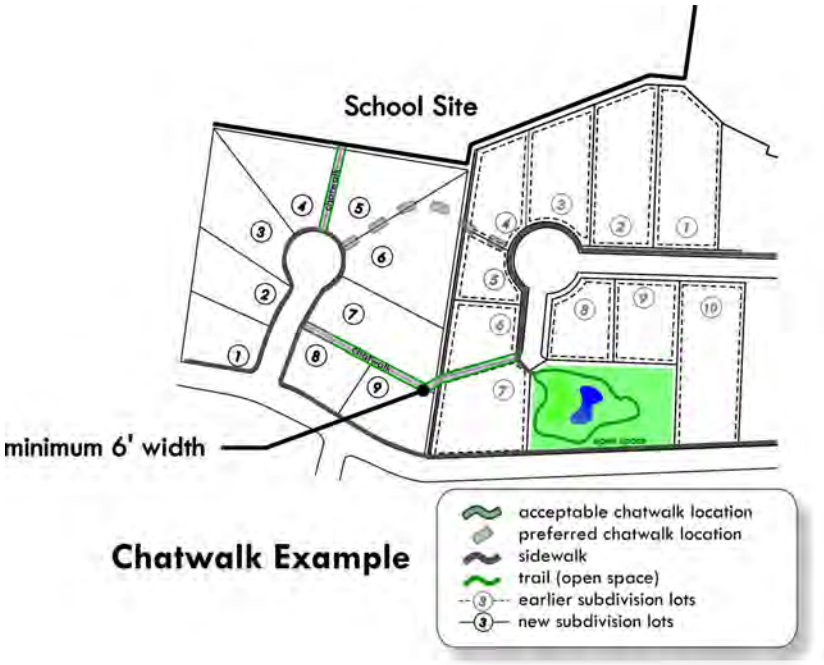
Relevancy to Rolesville Bicycle Plan

- Establishes a plan for future development in the town, including transportation, recreation and land use.
- Includes many goals, objectives and policies that specifically mention issues that are relevant to bicycling, such as establishing trails, connecting neighborhood streets, promoting bicycle travel and including a bike path along a portion of the new US 401 Bypass.

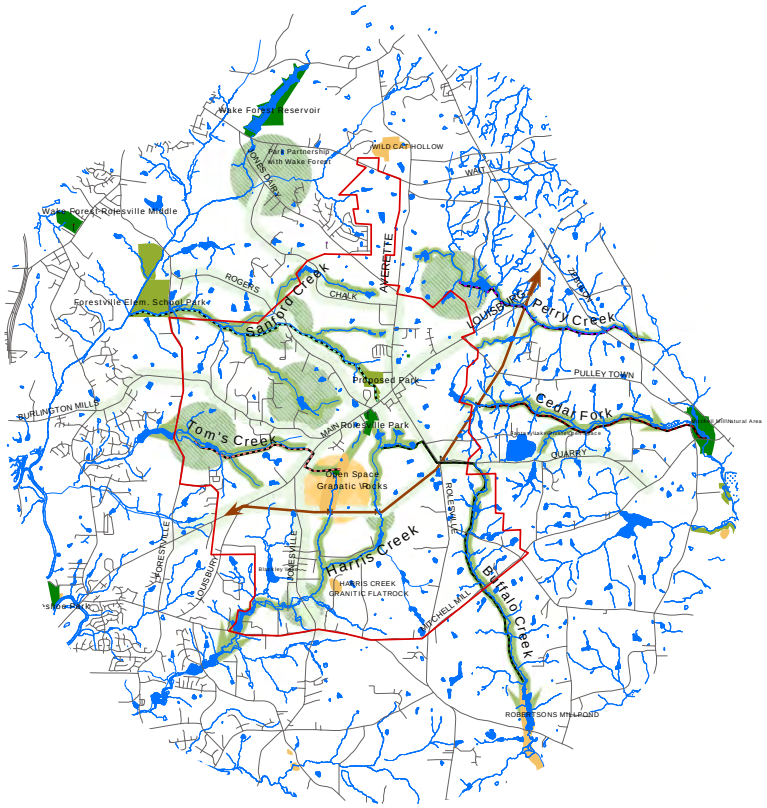
Potential Issues/Areas of Improvement for Bicycling Environment

- Neighborhoods Policy 1.2A could be reworded to call for "biking trails" or "multipurpose trails" in addition to walking trails.

- A new policy could be added to Neighborhoods Objective 1.2 similar to the following: The street network will be designed to encourage active forms of transportation, such as walking and biking.
- Amend Neighborhoods Policy 2.1D to include the Bicycle Plan, once adopted.
- Consider adding a new objective to Neighborhoods Goal 3 (or modify Objective 3.2) to ensure that neighborhoods are safe for biking, especially for inexperienced riders and children. The use of "chatwalks" and connectivity policies are examples.
- Consider adding a new policy to Downtown Objective 1.1 (or modify Policy 1.1A) to create a downtown that is bicycle friendly, including appropriate street design and bicycle parking.
- Downtown Policy 1.2A could be reworded to include "bicyclist" connectivity to adjacent districts.
- Downtown Policy 1.2C could also include consideration of bicyclist safety and bicyclist/automobile interactions.
- Consider adding a new policy to Commercial Center Objective 1.2, under Site Design, to encourage bicycle parking and describe the desired location of such parking.
- Community Facilities Policy 2.2A could be reworded to add convenient access to the bicycle network.
- Consider adding a new policy to Transportation Objective 1.1 to support NCDOT's Complete Streets policy and call for all streets in Rolesville to be constructed or rebuilt according to those guidelines.
- Consider modifying Transportation Objective 1.2 (or adding a new objective) to create a bicycle-friendly environment, including on- and off-road bicycle facilities and bicycle parking.



Pedestrian connections like "chatwalks" are easier to accomplish if planned and regulated before development begins.



Rolesville Greenways and Open Space Map

Rolesville Open Space and Greenways Plan (January 2002)

The *Open Space and Greenways Plan* was developed to protect the natural and cultural resources that community residents value most. It does this by identifying parcels and corridors in need of protection, establishing a comprehensive approach to link greenspace areas and corridors to the broader community, and defining strategies to protect these corridors while providing public access to them. The Plan was developed to be consistent with Wake County's 1999 Open Space Plan. One of the most important and lasting contributions of this Plan was to recommend underpasses of the future Rolesville Bypass project. Without these multipurpose underpasses Rolesville's citizens would have no way to get back-and-forth across this access-controlled freeway. Cycling through interchanges is one of the most intense actions that cyclists – even very experienced cyclists – find challenging, so having separated grade alternatives is critical to creating a friendly cycling environment.

Relevancy to Rolesville Bicycle Plan

- Provides a detailed plan and considerations for future greenways.

Potential Issues/Areas of Improvement for Bicycling Environment

- In the Greenway Trail Types section (pages 4-3 and 4-4), which discusses design issues, consider adding language about the importance of properly designing greenway road crossings and any transitions between greenways and on-road bicycle facilities.
- Updating this Plan or replacing it with a more modern version that incorporates other recreational opportunities as well as school-based destinations would be an important addition to the policy library of the Town.
- Strengthen the stance on connectivity, building on successes that exhibited in recent neighborhood development projects. Requiring connections between neighborhoods, extending sidewalks to nearest corner, and requiring connections to greenway facilities are commonplace examples.

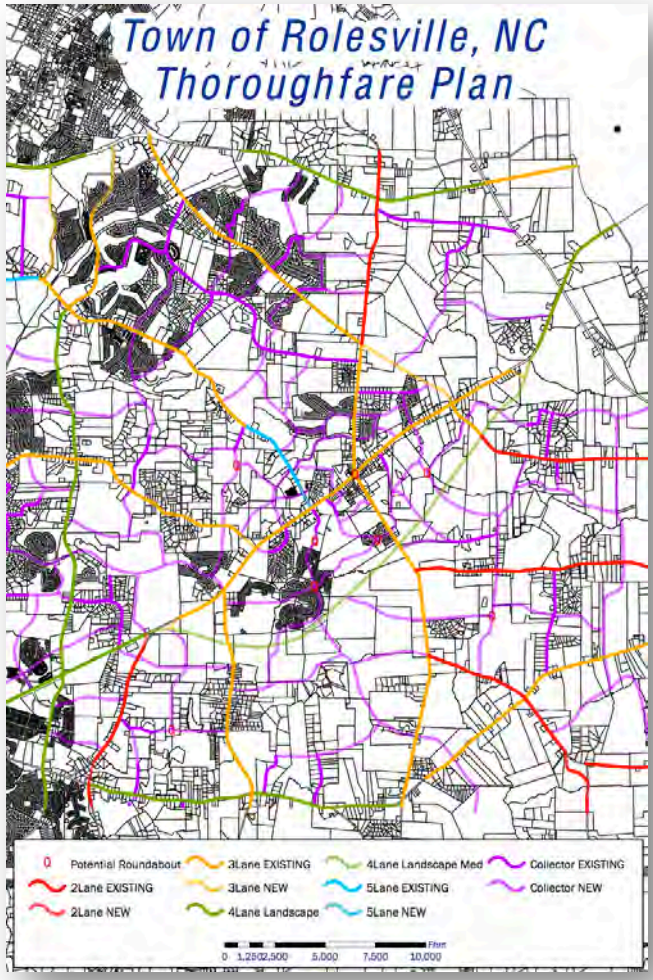
Rolesville Thoroughfare Plan (2002)
The Town's Thoroughfare Plan shows the location and desired cross-section of existing major streets as well as planned new major street corridors. It also shows the location of potential roundabouts. Thoroughfare Plans were brought into existence in North Carolina in the late 1950's, and are gradually being replaced by Comprehensive Transportation Plans (CTPs) that consider active modes of travel and public transportation more inclusively.

Relevancy to Rolesville Bicycle Plan

- Establishes a plan for future street construction and widening, which could include on-street bicycle facilities.

Potential Issues/Areas of Improvement for Bicycling Environment

- Update the corridor profiles, or cross-sections, to include bicycle lanes where called for in the Bicycle Plan.
- Ultimately, this Thoroughfare Plan will need to undergo a thorough re-write and transition to a more comprehensive planning document that links transportation, land use, environmental, and economic concerns together.
- Update the planned secondary street system to reflect realistic connections that can take advantage of new developments. These secondary streets are absolutely crucial for many reasons: emergency access, better distribution of traffic, relieving overcrowded highways, and creating lower-volume streets for cyclists and pedestrians.



The proposed "collector" streets shown in the existing Thoroughfare Plan sometimes do not have the most advantageous alignments for property owners or for the traveling public, and should be updated. The Rolesville Bicycle Plan has created new alignments for several of these streets because they are so important to providing bicycle route connectivity.

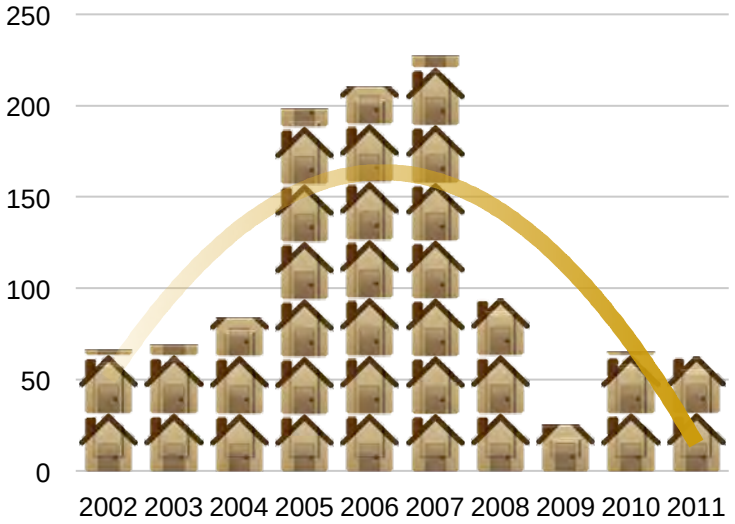


Figure 2-1. Annual Single-Family Residential Building Permits Issued in Rolesville, 2002 to 2011

Town of Rolesville Unified Development Ordinance (October 2004)

Private development, particularly residential development has driven Rolesville's growth, although the amount of growth has fluctuated greatly in the past ten years (Figure 2-1). The Town's Unified Development Ordinance (UDO) regulates development in the Town and in its extraterritorial jurisdiction in accordance with its Community Plan. In a nutshell, the UDO regulates the size and use of buildings, the density of population and the development or subdivision of land. This ordinance has important implications for how the Town will develop even in the short-term, since residential development projects already approved by the Town, if constructed, would essentially double the size of the Town's population and housing infrastructure – as well as ancillary infrastructure like greenways and sidewalks.

Relevancy to Rolesville Bicycle Plan

- Ordinances regulate the design of streets, sidewalks, greenway provisions, and bicycle parking requirements in new developments.
- Regulates all requirements for developments, such as parking and other plans a development must follow.
- Provides a fee-in-lieu for greenways.

Potential Issues/Areas of Improvement for Bicycling Environment

- Under Section 6.2, in Special Requirements, the design standards for bike paths in section (e) should be updated to reflect the most recent AASHTO standards. Additionally, a parallel bike path may not always be a good solution, and Town staff should be able to refer to the Bicycle Plan for guidance.
- Consider modifying Section 9.11 on Traffic Impact Studies to emphasize active modes more in terms of data collection, analysis and recommendations.
- Consider adding a requirement for bicycle parking to Section 10.1, perhaps as a percentage of vehicular parking spaces (1 bicycle

parking post-and-loop for every 100 auto parking spaces, with a minimum of at least one bicycle parking space. This section should also specify minimum design standards for bicycle parking.

- Consider adding language to Section 15.4.5 on Streets to address the design of on-street bicycle facilities.
- Consider adding language to Section 15.4.8 on Recreation and Open Space to make it clear that improved greenways may be used to fulfill the requirement.
- Consider adding language in the appropriate section or sections to require developments to adhere to other adopted Town plans, such as the Bicycle Plan.

CAMPO 2035 Long Range Transportation Plan (May 2009)

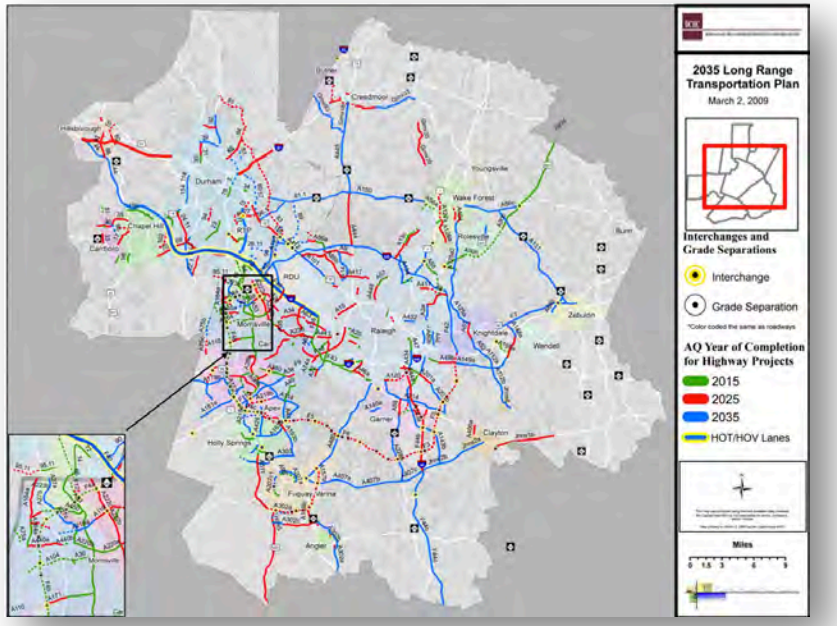
The 2035 Long Range Transportation Plan (2035 LRTP) lists future highway, bus transit, light rail, bicycle, pedestrian and other transportation projects which should be implemented by 2035 given expected revenues. The 2035 LRTP covers the Capital Area Metropolitan Planning Organization's planning area, which includes all of Wake County and portions of four surrounding counties.

Relevancy to Rolesville Bicycle Plan

- Provides a plan for future development of the transportation system in the Triangle region, including specific recommendations for bicycle transportation such as US 401 as a "corridor for bicycle accommodations."
- Also includes a recommendation on complete streets and context-sensitive solutions, which relate street design to adjacent land uses.

Potential Issues/Areas of Improvement for Bicycling Environment

- This plan is currently in the early stages of being updated, so there is an opportunity to incorporate the Rolesville Bicycle Plan into the

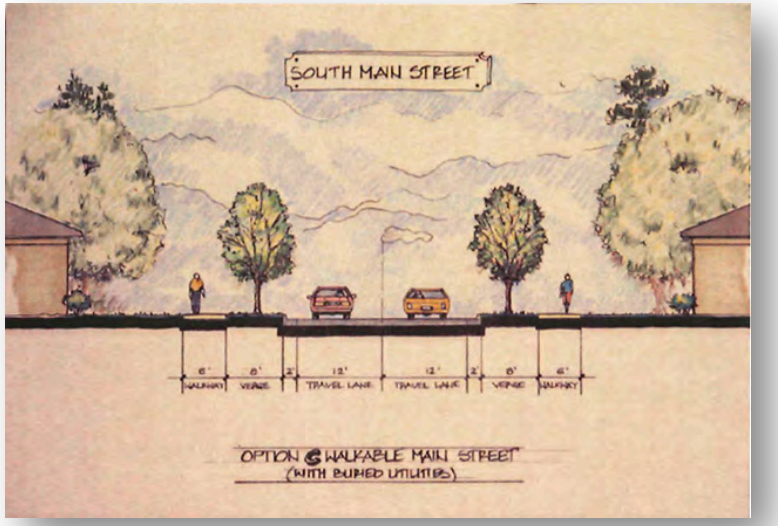


CAMPO 2035 Long-Range Transportation Plan (Highway Map).

updated LRTP. Rolesville staff needs to be an active and vocal part of the update process, which is being activated as of this writing in the Northeast Area Study (NEAS). The results of the NEAS will be incorporated into the long-range transportation plan for the Region.

Imagine Rolesville Transportation Plan (2002)

The *Imagine Rolesville Transportation Plan* was primarily focused on Main Street, although it did provide a succinct review of prior transportation plans. Key recommendations included pedestrian landscaping, lighting, and sidewalk facilities (six feet wide) to support a more appropriate main street "feel" after the completion of the Rolesville/US 401 Bypass project, now under construction.



Imagine Rolesville Plan (2002)

Relevancy to Rolesville Bicycle Plan

- While this Plan does not expressly consider bicyclists or bicycle facilities, the results of redesigning Main Street can have a major influence on how cycling is supported on the most critical commercial area of Rolesville.
- Lighting and driveway improvements translate into better visibility and safety for cyclists. A key recommendation in the Plan is the proposed roundabout at Young Street and Main Street.

Potential Issues/Areas of Improvement for Bicycling Environment

- Carefully designing this roundabout can transfer safety benefits to cyclists (as well as pedestrians and automobile travelers, where the rate of crashes typically by 50% to 60%).
- The proposed cross-section of a redesigned Main Street should include designated facilities for cyclists, including 16' outside lanes (on-street parking would translate into 11' travel lanes, bicycle lanes, and a buffer and parking area on the edge of the street). A median-separated facility, while not always desired by businesses,

would dramatically reduce the number of crashes related to left-turning vehicles. A landscaped median would also improve visual character, helping to ensure that Main Street retains character and imparts a sense of place. Those characteristics will be important to remaining competitive in an upcoming era where new interchanges on the US 401/Rolesville Bypass will likely attract chain development with a greater marketshed due to the higher level of access afforded by the high-speed roadway.

- Rolesville should undertake a detailed design study, including realistic ground-level visualizations, to determine a good design and cost for all of the elements in a major streetscape project.
- Rolesville already has three overlay districts: Neighborhood Conservation, Town Center, and Proposed US 401 Bypass (Special Highway Overlay District, or SHOD). The following changes should be made to these Overlay Districts to provide a long-term, positive influence on the cycling environment in the Town Center and US 401 Bypass (and eastern side of Town in general) areas.
    - Town Center – Extend the designation to Burlington Mills Road on both sides of Main Street
    - Town Center – Reference the recommended requirements for on-site bicycle parking noted previously
    - SHOD/US 401 Bypass - Reference the recommended requirements for on-site bicycle parking noted previously
    - SHOD/US 401 Bypass (Article I.1.) – Provide a direct connection in the form of a paved 10’ trail to the nearest point on the proposed trail system, or if not yet in existence should provide an easement for a connection measuring not less than 12’ in width to the edge of the property line from the closest parking area that connects to the front door of the establishment

Section 2.2: Bicycling Programs

There are literally hundreds of programs designed to encourage bicycling, enforce safe behavior among motorists and cyclists alike, and educate people (especially young people) about bicycling. Basic rules for creating any successful outreach program are the same for cycling as for any other topic: (1) go to where people already are, and are likely to be receptive; (2) use a combination of your own resources and other resources that are more "polished" as needed; and (3) leverage existing channels of communication and volunteer efforts to have maximum effect. The Rolesville Bicycle Plan will not attempt to create every program, but instead focus on those programs that most closely suit the resources and environment found in our Town, as well as comments received by citizenry and our Steering Committee. The following is a summary of the programs that we would like to see created or, in one instance, modified, to create more and better cyclists.

The Five E's of Bicycling. Programs, even with respect to construction or maintenance activities, typically fall into at least one of these five categories of benefit to cyclists.

EDUCATION

Education: Safety Video Promotion. Use an already-prepared safety video, such as the one prepared by the League of Illinois Bicyclists (http://www.walkinginfo.org/ videos/pubdetail.cfm?picid=42). Contact the East Wake TV station to see if they can run this video at selected times, and use it to open discussions at safety-related events as well (example: neighborhood meetings). If possible, challenge kids to create their own bicycle safety video here in Rolesville based on the Illinois example's content. Creating digital videos is very easy now, and kids can create high-quality video on their own or using school resources if conducted in concert with a willing teacher and class.

EDUCATION

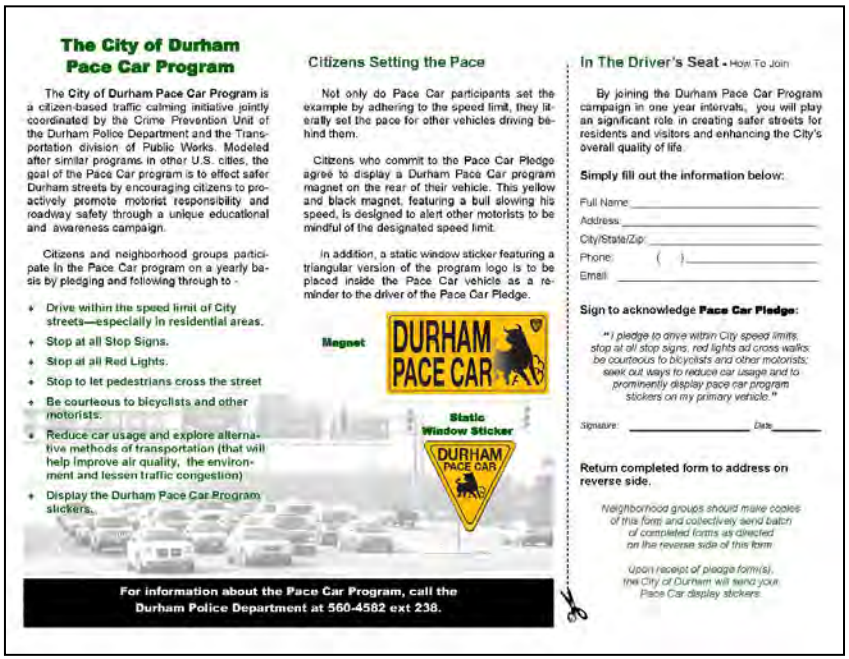
Education: Expand the Bicycle Rodeo Program. Rolesville's police department already conducts occasional bicycle rodeos, but these programs could be expanded occasionally to include a greater emphasis on street safety. The League of American Bicyclists (LAB) provides certification for instructors and master instructors (for teaching children's classes). The courses taught by these instructors include learning the rules of the road, signaling, and other behaviors that encourage safe bicycling

in addition to the balance and handling skills usually taught at bicycle rodeos. Volunteers with access to bicycles and equipment are now available in Wake County.

ENFORCEMENT Enforcement: Warning Tickets and Follow-Up. Rolesville's police force, like other police departments around the country, can provide many stories about motorists and cyclists interacting badly. Police officers may be reluctant to give a citation to motorists or bicyclists for a "near miss" or reckless behavior, but a warning ticket followed up with a printed version of a safety guide is a middle way to let people know when they have endangered themselves or others by reckless driving or riding. A great and free example of a cyclist's guide that is ready to print is from the Federal Highway Administration (http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=1227). Police officers should also know key laws, such as bicycle lighting requirements and the requirements for vehicles to pass cyclists (or other vehicles) with at least a two-foot minimum separation distance.

ENFORCEMENT Enforcement: Traffic Calming in the Hands of the People. Many traffic calming programs have been created around the country that have not been successful or are no longer in operation due to their expense (City of Wilmington, as one example). An alternative solution to costly and controversial infrastructure-based programs is the pace car program. An example is shown in Figure 2-2 of the application and explanation form for such a program developed in Durham. Drivers agree to have a magnetic (or static window sticker) decal placed on the rear of their car that alerts other drivers that this driver is going to drive the speed limit. Often, speeders aren't from out of town, but are from across the street. By creating an environment where people are controlling their own speeds and those of the cars behind them, change happens gradually without costly and unwarranted four-way stop signs and speed humps.

ENFORCEMENT Enforcement: Helping the Police. Learning from the City of Raleigh's Example. Some police departments have avoided handing out tickets for the simple reason that the officers have not been properly trained on how



The City of Durham Pace Car Program

The City of Durham Pace Car Program is a citizen-based traffic calming initiative jointly coordinated by the Crime Prevention Unit of the Durham Police Department and the Transportation division of Public Works. Modeled after similar programs in other U.S. cities, the goal of the Pace Car program is to effect safer Durham streets by encouraging citizens to proactively promote motorist responsibility and roadway safety through a unique educational and awareness campaign.

Citizens and neighborhood groups participate in the Pace Car program on a yearly basis by pledging and following through to -

- Drive within the speed limit of City streets—especially in residential areas.
- Stop at all Stop Signs.
- Stop at all Red Lights.
- Stop to let pedestrians cross the street
- Be courteous to bicyclists and other motorists.
- Reduce car usage and explore alternative methods of transportation (that will help improve air quality, the environment and lessen traffic congestion)
- Display the Durham Pace Car Program stickers.

Citizens Setting the Pace

Not only do Pace Car participants set the example by adhering to the speed limit, they literally set the pace for other vehicles driving behind them.

Citizens who commit to the Pace Car Pledge agree to display a Durham Pace Car program magnet on the rear of their vehicle. This yellow and black magnet, featuring a bull slowing his speed, is designed to alert other motorists to be mindful of the designated speed limit.

In addition, a static window sticker featuring a triangular version of the program logo is to be placed inside the Pace Car vehicle as a reminder to the driver of the Pace Car Pledge.

Magnet

DURHAM PACE CAR

Static Window Sticker

DURHAM PACE CAR

In The Driver's Seat - How To Join

By joining the Durham Pace Car Program campaign in one year intervals, you will play an significant role in creating safer streets for residents and visitors and enhancing the City's overall quality of life.

Simply fill out the information below:

Full Name: _____

Address: _____

City/State/Zip: _____

Phone: ( ) _____

Email: _____

Sign to acknowledge Pace Car Pledge:

"I pledge to drive within City speed limits, stop at all stop signs, red lights ad cross walks; be courteous to bicyclists and other motorists; seek out ways to reduce car usage and to prominently display pace car program stickers on my primary vehicle."

Signature: _____ Date: _____

Return completed form to address on reverse side.

Neighborhood groups should make copies of this form and collectively send batch of completed forms as directed on the reverse side of this form

Upon receipt of pledge form(s), the City of Durham will send your Pace Car display stickers

For information about the Pace Car Program, call the Durham Police Department at 560-4582 ext 238.

Figure 2-2. Sample Pace Car Program Application (Durham)

A walking school bus is a group of children and adults that walk to school together one or more times during the month; a bicycle train is the same thing using bicycles. Both are fun, great exercise, and serve as an opportunity to get to know your neighbors better.

Before starting a walking school bus or bicycle train, there are important tips that can help make things easier and safer for everyone (see box at right).

The map on the reverse side of this page can be used to help mark off the best walking or biking routes to Wake Forest Elementary School. The initial meet-up place should be at one end of the route you choose. Mark the best route on the attached map and hand it out to the other parents and teachers that are participating. Update the map as needed to account for new construction, changing conditions, and new bike trains/walking school buses.

Contact the Wake Forest Planning Department for additional copies of the map (919.435.9510) and other information.

1. *Contact your school to see if others are interested in helping getting the program started. However, most of the successful, long-term efforts start from a group of parents that want to get in a morning walk with their children and get to know other parents.*
2. *Choose a starting place that can accommodate some parking and that works with the safest route you can determine.*
3. *Practice the route with adults only at first and make additional notes on the map, as needed.*
4. *Choose a route that is 1/4-mile to 1/2-mile in length.*
5. *It's a good idea to have about one adult per five or six kids for a walking school bus; one adult per two or three children for a bike train.*
6. *Contact the school principal and police first to get their input.*
7. *Adopt a regular schedule to conduct the walking school bus or bike train.*
8. *Have fun!*

TOWN of WAKE FOREST

Wake Forest Elementary School

Walking School Bus and Bike Train Guidance

safe routes to school north carolina

Meeting Location: _____

Meeting Time/Date: _____/_____

Leader's Name: _____

Contact the Leader: _____

J.S. LANE

5-2011

A sample description of bicycle trains and walking school buses (source: J.S. Lane Company)

a particular computer program can issue a citation to a cyclist or motorist-cyclist incident. The City of Raleigh has changed this situation and brought in assistance to help step through the citation process, and at the same time refresh the officers on key bicycle laws such as proper equipment, motorist passing requirements (true for farm equipment as well as bicycles and other vehicles), and lane sharing.

ENCOURAGEMENT

Encouragement: Get On Board the Bicycle Train. A bicycle train, like its cousin the walking school bus, gets parents, teachers and kids to collaborate on a once-per-month bike-to-school program. The graphic at right illustrates the steps involved in creating such a program at an elementary school in Wake Forest, which works well because it combines outreach to children and adults, while raising the visibility of cyclists in the community. Parents and kids get to spend time with each other walking or biking to school, get exercise outside, and interact with nature and each other. A key provision is that the parent or teacher that "sponsors" the first ride reviews the route themselves to understand the conditions and hazards that they will have to account for in the bike tour. Having experienced cyclists on-hand to help conduct the tour is important, as is having a good ratio (1:4 at worst) of adults to children. Prior to initiating the Bicycle Train, the coordinating parents and/or teachers need to make the school officials aware of what is being proposed and get their advice on how to safely guide the children to and through the school campus.

ENCOURAGEMENT

Encouragement: Continue to Develop the St. Patrick's Day Bicycle Parade. This event's first offering was a success for Rolesville. Combining this parade with promotional giveaways (e.g., helmets or bicycle), a bicycle training rodeo like the one described above, or a snail race (last one to cross the finish line wins!) can help sustain the momentum.

ENGINEERING

Engineering: Plan Ahead to Participate in NCDOT Improvements. With the advent of NCDOT's Complete Streets Policy and Guidelines, communities will have an expanded opportunity to see bicycle, pedestrian and transit facilities located in their town. However, the municipality will still be required to provide a "match" towards the costs of the enhanced facility

(probably 20% of the total cost). Rolesville should create an annual set-aside to accrue funds for this purpose so that when NCDOT embarks on a major resurfacing or improvement project to a roadway, the Town will be ready to act by providing the matching required amount. The Town may be required for example, to provide 20% of the cost for an additional two feet of pavement on outside lanes during a pavement milling and resurfacing project.

EDUCATION ENCOURAGEMENT

Encouragement and Education: Collaboration Opportunities with Wake Forest. Preliminary conversations with Wake Forest staff has indicated a willingness to work collaboratively on the annual bicycle rodeo, safety/education training, and cross-border connections. The recommendation also includes formation and participation in a combined Bicycle-Pedestrian Advisory Committee, perhaps in conjuncation with existing Open Space and Parks committees.

RESOURCES

Town of Wake Forest, Wake Forest Safe Routes to School Program. Prepared by J.S. Lane Company, LLC. 2010.

City of Durham, Pace Car Program. Website: www.ci.durham.nc.us/departments/police/forms/form_pacecar.cfm.

Transportation Research Board, National Academies. Development of a Model Drivers License Handbook (Bicycles). NCHRP 20-07/Task 212. Website: http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=1227.

Pedestrian and Bicycle Information Center, bicyclinginfor.org. Website: http://www.bicyclinginfo.org.

Bicyclist Tips

- Ride to be respected – Just as you should never operate a motor vehicle under the influence of alcohol or other drugs, never operate a bicycle under the influence.
- Be to be seen – Ride predictably and follow rules of the road. Ride in a straight path in the same direction as other traffic, and don't switch back and forth from sidewalk to street. During the day, wear bright, fluorescent colors to be seen easily by motorists. Again, at night or low light times of day, use proper front and rear lighting, reflectors and reflective clothing and gear – it's the law in N.C.
- Ride with a Helmet – Wear an approved, properly fitted safety helmet, no matter how short the trip or whether local laws or ordinances require helmet use. A majority of head injuries can be prevented by proper helmet use in the event you're involved in a bike-only crash or a crash with a motor vehicle. This includes small children riding in trailers: start them young and they'll accept wearing a helmet later.
- Ride in Repair – Use a bicycle that fits you and is in good mechanical condition. Learn to do the ABC Quick Check of tires and Air pressure, Brakes and Cables, the Crank shaft, Chain, and gears, QUICK releases, and for any loose parts before every ride.
- Ride Right – To be safe, save play or stunt-riding for off-road, designated locations such as bicycle parks. Stunt riding interferes with safe riding practices, may reduce attention for other vehicles, persons or objects, and increase risk of a collision. Do not carry extra passengers on a bicycle unless they have a proper seat.
- Ride with Youth – Young children being carried on a bike should ride in an approved child bicycle seat or trailer and wear a properly fitted safety helmet. Children too young to sit up by themselves should not be transported on a bicycle.

adapted from Sharing the Road with Bicyclists (NCHRP 20-07/Task 212)

Chapter 3. Project Recommendations

This chapter provides information on the location and basic cost estimates for recommended projects, and a prioritization scheme based on the goals of the Plan identified earlier. Prioritization is also based on factors that include safety, access, connectivity, proximity to schools and other major destinations, as well as public, staff, and stakeholder input. Using the basic cost estimates and other factors, projects are identified as short-term, mid-term, and long-term projects to help the Town determine which to address first as they begin to implement the Rolesville Comprehensive Bicycle Plan.

The project recommendations are shown on the following page (Figure 3-1). Many of these recommendations call for a standard four-foot, striped shoulder to provide ample space for cyclists on the several rural, two-lane roadways leading into the Town. A new, two-lane roadway (from the Town's Thoroughfare Plan with an updated alignment to respect existing homes) is shown that is crucial to providing a low-speed, safe alternative allowing movement between the major east-west roadways like Rogers, Burlington Mills, Chalk and Jones Dairy roads. This roadway would also interface with the extension of Sanford Creek Greenway, an important short-term project that, like the proposed collector street, would likely be constructed primarily with private development funds during the construction of new neighborhoods.

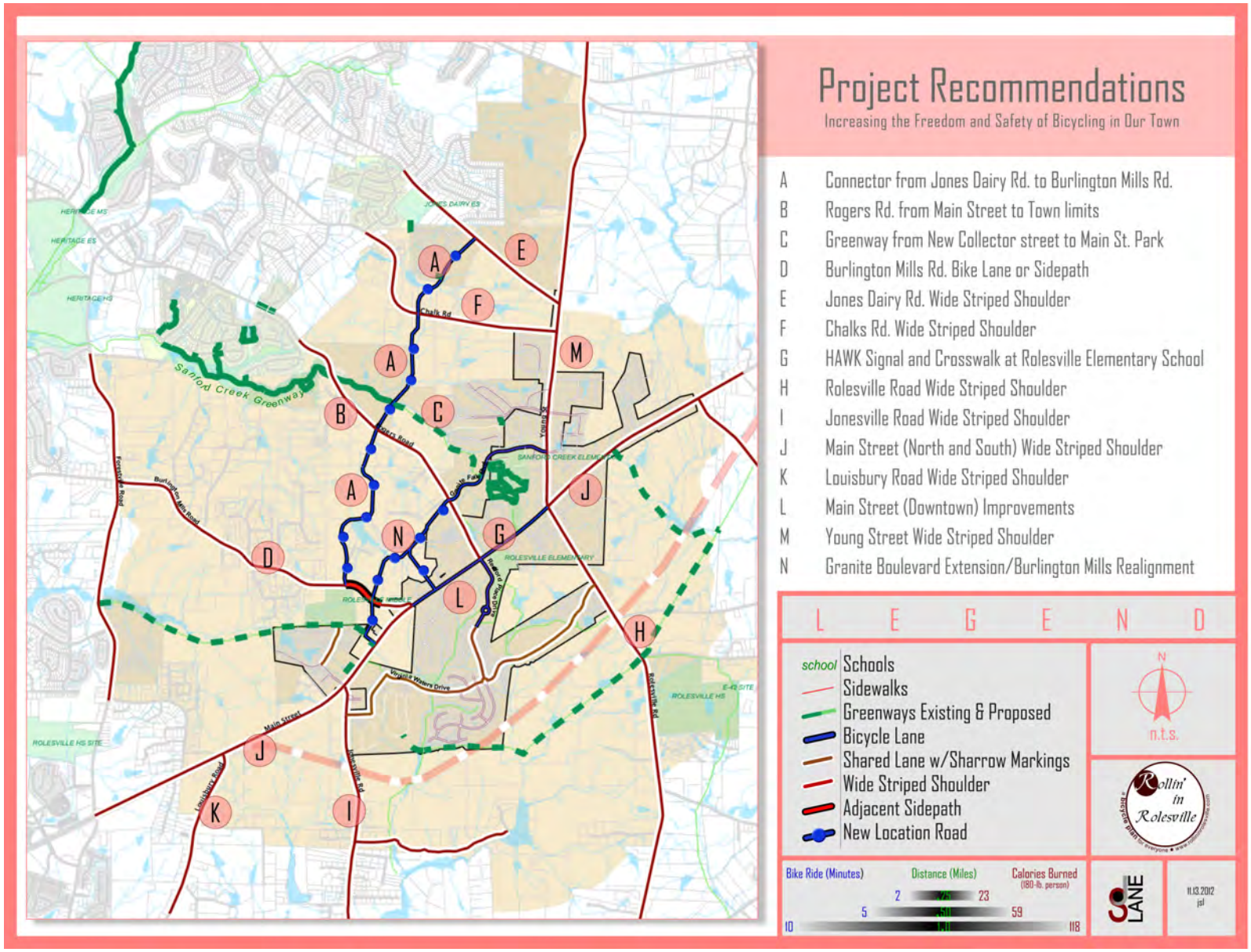


Figure 3-1. Project Recommendations

An important part of the project development process was to consider the origins and destinations of bicycle riders in the Town. The Steering Committee provided us with a number of locations, but many of them centered on Main Street.

- Post Office
- Town Hall
- Granite Crest Subdivision
- Main Street Park
- Hampton Pointe Subdivision
- Recreation Center
- Rolesville Elementary School
- Village at Rolesville
- Historic Downtown (Main and Young Streets)

Rolesville is still a very Main Street-centric community, with schools, shopping and several neighborhoods all connecting with or adjacent to Main Street. The following map (Figure 3-2) illustrates the origins (green circles) and destinations (red squares) that the Steering Committee identified during their working sessions.

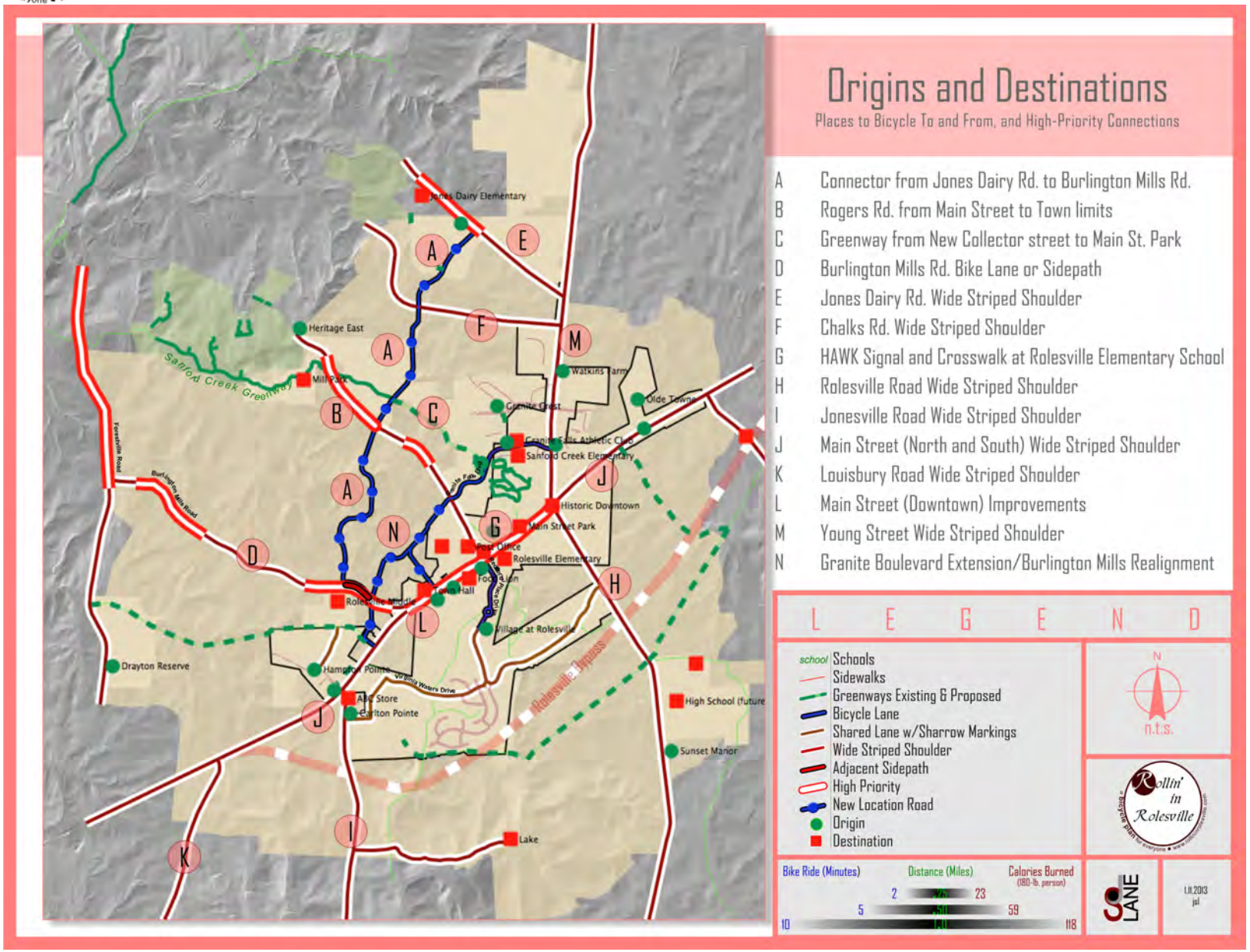


Figure 3-2. Project Recommendations

Project cost factors are variable, rarely go down, and financing is usually obtained from more than one source

Section 3.1: Project Cost Factors

The following graphic (Table 3-1) describes basic project cost estimates for each of the proposed projects in this chapter. Note that all cost estimates may increase or decrease depending on the cost of raw materials, labor, and inflation. Cost estimates do not take into account purchase of right-of-way or structure construction (i.e. bridges or tunnels) unless otherwise noted for the individual project.

Individual pricing estimates for bicycle lane projects were based on general estimates from Durham, Charlotte and Raleigh. Costs for smaller communities tend to be slightly higher since these places often have lower purchasing power. Bicycle lane projects do not include the cost of additional right-of-way purchase, additional lane width, resurfacing, or curb and gutter installation. New greenway/multi-use trail construction estimates assume a 10-foot-wide, multi-purpose trail with minor earthwork and minimal structures to cross drainage features, and do not include costs associated with the purchase of right-of-way unless otherwise noted.

Table 3-1. Basic Construction Cost Factors

Cost Item	Unit Cost*	Notes
On-Pavement Striping	$1.50/linear foot	
On-Pavement Symbols	$350 ea.	*Typical spacing at 1,300 feet on route*
Signs	$300 ea.	
10' Greenway, Paved	$800,000/mile	*Not inclusive of structures, design or ROW*
3' Soft Trail, Unpaved	$1,000/mile	*Not inclusive of structures or ROW*
Wood Boardwalk	$250/linear foot	*Not inclusive of structures or ROW*
Sidewalks	$200/linear foot	*Incls. curb-and-gutter and design ($170 w/out)*
Lighting	$1,500 ea.	
Landscaping	$50 and $500 ea.	*Shrub and Tree*
Pedestrian Signal Added to Existing Traffic Signal	$15,000 ea.	*Includes retrofit costs*
Pedestrian-Only Signal	$75,000 ea.	
Mid-Block Flashing Crosswalk	$40,000 ea.	
HAWK Flashing Signal	$45,000 ea.	
Bicycle Parking Rack (2-post)	$350	*Includes installation by Town*
Prefabricated Pedestrian Bridge	$1,200/linear foot	*Assumes 10' width*
Pedestrian Culvert	$100,000 ea.	*US 401 Bypass culverts are not shown in this Plan*

**Note: With every project, the costs associated with design, right-of-way acquisition, and structures can vary considerably. A full design will be necessary to determine costs with accuracy.*

Section 3.2: Project Prioritization

Greenway and roadway projects were prioritized based upon a number of factors including safety, access, connectivity, proximity to schools and other major destinations, as well as public, staff, and stakeholder input. The following tables divide projects into short-term, mid-term, and long-term projects. Short-term represents a project that should be addressed within the next five years dated from the Plan's adoption. Mid-term

projects should be addressed within six to ten years, and long-term projects are those that are most likely to happen beyond ten years of the Plan's adoption. Items that had the greatest priority were those that met an existing demand for facilities, or complete a necessary route to a destination. As a result, short-term projects are those that are along major, well-used thoroughfares in the center of Town. Long-term projects are those that are on less traveled roads or would connect fewer people.

Priorities in the Real World

While the prioritization of capital projects is important due to scarce resources, the real-world experience of many places suggest that projects are constructed more often based on the timing of private development actions that contribute directly to the acquisition of right-of-way or construction. Roadways that are due for a major update and reconstruction may have bicycle facilities installed at the time that project is completed, even if they are a lower priority. Finally, "short-term" projects may not be the highest priority, but are simply those that are already programmed for construction through public or private actions.

Short-Term Projects (1 – 5 years)

Many of the projects in the following table will require substantive study, design, and possibly right-of-way acquisition that may prolong their implementation; however, they are the first projects that should be addressed due to need and demand not necessarily what we would assess as being the "easiest" projects to construct.

Mid-Term Projects (6 – 10 years)

Like the short-term projects, these projects may also require additional right-of-way acquisition and substantive design; however, they received a mid-term priority because they are located on less important roads and serve fewer people as major access points into and through the town. It is important to note that, although these projects are labeled "mid-term," many of them are located on roads which will most likely undergo improvements in the future by developers, NCDOT, or through Town-planned projects. The Town should require and coordinate future private and public improvements to ensure that these bicycle facility projects are constructed in conjunction with any improvements.

Long-Term Projects (11 or more years)

Although these projects are labeled "long-term", like the "mid-term" projects many of them are located on roads that will probably undergo improvements in the future by private developers, NCDOT, or through Town-planned projects. The Town should require and coordinate future private and public improvements to ensure that these bicycle facility projects are constructed in conjunction with any improvements.

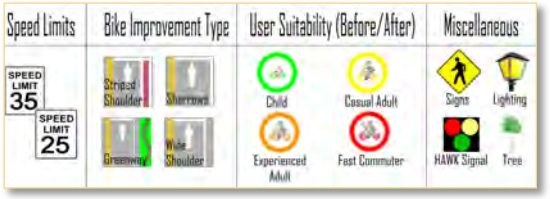
Table 3-2. Project Priorities and Basic Cost Estimates

Project ID	Location or Street Segment	Recommendations and Users (1)	Basic Cost Estimate (2)	Term/Priority
A	East-West Connector *Phase I: Rogers Rd. to Burlington Mills Rd.* *Phase II: Chalk Rd. to Rogers Rd.* *Phase III: Jones Dairy Rd. to Chalk Rd.*	*Construct new collector street with 12' lanes, sidewalks, and sharrow markings.*	*Ph. I Cost: $9.9m* *Ph. II Cost: $6.5m* *Ph. III Cost: $4.7m*	*Long-Term/1*
B	Rogers Rd. from Main Street to Town limits	*Construct wide outside lane with stripe delineation (consider bike lane near downtown)*	*Length: 1.8miles* *Cost: $354,000*	*Mid-Term/1*
C	Greenway from new collector street to Main St. Park	*Greenway completion from Main St. Park to new collector road and Heritage South subdivision*	*Length: 0.7miles* *Cost: $680,000*	*Short-Term/2*
D	Burlington Mills Rd. Adjacent Sidepath (school area) and Wide Striped Shoulder	*Construct wide outside lane with stripe delineation (consider bike lane near downtown to school)*	*Length: 2.1miles* *Cost: $367,000*	*Mid-Term/4*
E	Jones Dairy Rd. Wide Striped Shoulder	*Construct wide outside lane with stripe delineation*	*Length: 1.3miles* *Cost: $196,000*	*Mid-Term/3*
F	Chalks Rd. Wide Striped Shoulder	*Construct wide outside lane with stripe delineation*	*Length: 1.5miles* *Cost: $237,000*	*Long-Term/7*
G	HAWK Signal and Crosswalk at Rolesville Elementary School	*HAWK Signal and embedded sign at Rolesville Elementary School and Park*	*Cost: $45,500*	*Short-Term/1*

**Notes: (1) Legend for symbols included in project shown at right. (2) The opinion of probable costs of design, right-of-way acquisition, and structures vary considerably. A full design will be necessary to determine costs with accuracy. Costs shown do NOT include cost of constructing roadway on new location, but do include sidewalks, bicycle treatments, signs, and lighting/landscaping unless otherwise noted.*

(Table 3-2, Continued)

Project ID	Location or Street Segment	Recommendations and Users (1)	Basic Cost Estimate (2)	Term/Priority
H	Rolesville Road Wide Striped Shoulder	*Construct new collector street with 12' lanes, sidewalks, and sharrow markings.* 	*Length: 2.2miles* *Cost: $339,000*	*Long-Term/2*
I	Jonesville Road Wide Striped Shoulder	*Construct wide outside lane with stripe delineation (consider bike lane near downtown)* 	*Length: 1.2miles* *Cost: $187,000*	*Long-Term/6*
J	Main Street (North & South) Wide Striped Shoulders	*Greenway completion from Main St. Park to new collector road and Heritage South subdivision* 	*Length: 3.8miles* *Cost: $570,000*	*Long-Term/3*
K	Louisbury Road Wide Striped Shoulder	*Construct wide outside lane with stripe delineation (consider bike lane near downtown to school)* 	*Length: 1.3miles* *Cost: $193,000*	*Long-Term/4*
L	Main Street (Downtown) Improvements	*The Main Street Improvement Project will require additional public engagement with property owners to help define how Main Street will attract new growth, improve the beauty and character of the Heart of Rolesville, and be a premier cycling destination. See the following page for details.*		*Mid-Term/2*
M	Young Street Wide Striped Shoulder	*Construct wide outside lane with stripe delineation* 	*Length: 3.3miles* *Cost: $503,000*	*Long-Term/5*
N	Granite Boulevard Extension / Burlington Mills Realignment	*Construct new, two-lane roadway (private development) and realign intersection with Main Street and Burlington Mills Road.* 	*Length: 1.1miles* *Cost: $8.7m*	*Short-Term/3*



**Notes: (1) Legend for symbols included in project shown at right. (2) The opinion of probable costs of design, right-of-way acquisition, and structures vary considerably. A full design will be necessary to determine costs with accuracy. Costs shown do NOT include cost of constructing roadway on new location, but do include sidewalks, bicycle treatments, signs, and lighting/landscaping unless otherwise noted.*

Main Street Improvements

Main Street (US 401) between Burlington Mills Road and Young Street is the heart of Rolesville. This one-mile stretch contains an elementary school, fronts Main Street Park, businesses, and the government center. As through-traffic volumes decrease with the completion of the Rolesville Bypass to the south, our proposal is to create a new vision for Main Street that will accommodate and encourage cyclists, pedestrians, and visitors to come to this area in an environment that is much friendlier to slower forms of traffic. In order to accomplish this objective without creating undue hardship on existing businesses along Main Street, the following recommendations were developed:

- Curb Extensions, to reduce turning speeds
- Young Street Intersection Redesign, including a roundabout recommended in the Imagine Rolesville Plan (2002), to improve safety
- Driveway and Curb Resets, to reduce the number of conflict points
- Signage, including reducing the speed limit to 25mph
- Gateway Signage, to increase the recognition of this important part of Town
- Pedestrian-Scale lighting south of Rodgers Road, to improve lighting conditions and the overall appearance of the roadway
- New Sidewalk in some locations, to fill in "gaps"
- Driveway Crosswalks, to reinforce the pedestrian nature of the new Main Street
- High Visibility Crossing near Main Street Park and Rolesville Elementary School, to create a better crossing environment.

While even more improvements could be done at a future time (see graphic at right), these recommendations are an important beginning. The graphic on the next page (Figure 3-3) illustrates the extent of the recommendations.

Visualization of Main Street

The visualization at bottom goes further than the recommendations proposed herein, using center landscaping and green bike lanes to warn motorists at driveway entranceways to watch for cyclists. To continue to draw people to shops and improve the safety of the corridor, a different perspective of Main Street – as a destination, and one that is scaled towards people, not cars – will be necessary.

MAIN STREET BICYCLE IMPROVEMENTS

CREATING A BETTER ENVIRONMENT FOR CYCLISTS, BUSINESS, AND THE CORE OF THE TOWN

Figure 3-3. Main Street-Downtown Improvements *(see also enlarged version on enclosed map)*

Chapter 4 Design and Operations

Section 4.1: The importance of Maintenance and Operations

In many planning documents, even those that emphasize physical infrastructure, it is not uncommon for the engineering and physical operations and maintenance of facilities to be overlooked or, at best, underemphasized. In an era of fiscal austerity where lifecycle costs (the cost of what it takes to construct and maintain a piece of infrastructure over its full useful life) are coming under closer scrutiny, the way that a bikeway, greenway, or path is maintained and designed cannot and should not be ignored. A second issue is often that, in North Carolina at least, municipalities do not own or maintain their roads in many instances. Although the State is responsible for the maintenance and construction of major roads in the majority of cases, this fact does not preclude local governments from intervening in the design process so that their citizens and their travel needs can be met. While the recent (2012) promulgation of "complete street" design standards was an important, if overdue, step taken by NCDOT to ensure that their own streets can meet the needs of a variety of users, it is still incumbent on Rolesville to ensure that opportunities that the designs of new streets and even maintenance (e.g., repaving) of existing streets included bicycle facilities where practicable.

This chapter of the *Rolesville Bicycle Plan* provides specific design and maintenance/operations guidance for bicycle facilities. Nothing in this guidance should be construed as replacing state laws or standards; however, it is obvious that, even at the State level, our understanding of what comprises a "complete street" compatible with all kinds of travel and travelers is changing. Hence, this guide serves the purpose of describing how Rolesville should interface with the State (Department of Transportation, primarily) and other entities to create and maintain an excellent bicycling system.

Section 4.2: Maintenance and Operations of Bicycle Facilities

Understanding the likely steps Rolesville must take to properly maintain and operate bicycle facilities is key to continued promotion and use by a range of bicyclists. Not all bicycle facilities are created equal; thus they have varying needs in terms of maintenance and operations. On bike lanes, the historic role NCDOT has played in managing the primary streets within cities and towns can leave a gap in regular maintenance as sweeping of bicycle lanes is not part of their typical maintenance and operations schedules. Greenways present both opportunities and challenges for upkeep, day-to-day operations and long-term evaluation as it relates to maintaining a system in a state of good repair.

Greenways provide an opportunity for operation and maintenance through partnerships with non-governmental entities such as homeowners associations, volunteer groups, garden clubs and local businesses. Bicycle lanes may require deployment of town equipment on NCDOT-managed routes or a special contract by the Town through an area sweeping company if debris is collecting on bicycle routes, whether it is lanes or shoulders.

Even in small towns the mobilization of resources, most notably people and small equipment, can be difficult for small tasks to maintain bicycle lanes or greenways. This is especially true in remote areas such as greenways behind a major subdivision when maintenance issues need to be addressed.

Objectives of Maintenance & Operations Programs

Themes contained throughout the Rolesville Bicycle Plan promote safety, ensure access for persons of all abilities, and help connect destinations throughout the community. Keeping the bicycle system in a state of good repair is critical to ensuring these goals are met years after construction of the facilities. With that being said, the primary objectives of maintaining and operating a bicycle and greenway system should be to:

- Preserve Existing Investment: Greenways are one of many visible public investments that are assets to the Town in the same manner as the Town Hall, a major park, or a school. A well-maintained asset is fundamental to fiscal stewardship and ensuring usability of that asset over a long period of time. The outlay of resources for the initial construction of trails, pathways, amenities, access points, parking lots, signage and lighting requires consideration of how these investments will be preserved. Bicycle lanes are similar in that they link greenways and treasured destinations. Bike lanes clear of foliage that grows over the shoulder preserves pavement condition, ensures water does not pond long after a storm, and prevents grass from growing through the pavement. A clear bicycle lane also allows debris to wash away instead of settling in the lane.
- Protect Habitat & Environment: Greenways by their nature are desired in areas that promote or enhance natural environments, even in their most urban settings. A greenway in a state of good repair positively impacts the quality of the surrounding habitat and environment that it was meant to protect. Neglected routes can negatively impact public opinion on the benefits of greenways and can make future investments harder to sell.
- Safeguard the Public: Maintenance involves both the greenway or bike lane infrastructure and the environment around it, both of which can greatly impact the safety and the perception of safety for users. The humid climate in Rolesville lead to fast rates of growth for foliage, which can overtake greenways and bike lanes, block safety-related signage, and create an "enclosed" feeling where users may not feel safe. The environment also impacts the greenway surface as root heaves create tripping hazards for users while encroachment of trailside grasses and shrubs degrade the edge of pavement or shorten the effective width of the greenway and create user conflicts. Stormwater runoff can compromise the integrity of the greenway or bike lane base and natural surface trails can be washed away during major storms, both creating unexpected conditions for users.

Closing a bicycle lane involves plenty of advance notice so that cyclists can merge into the main roadway.

Considering Context

Maintenance on a new bicycle facility begins soon after it is built and is directly tied to operations. Some of these maintenance needs can be anticipated while others require methods of reporting maintenance needs, response policies, and clearly defined roles for maintenance participants.

Proactively incorporating maintenance activities for bicycle routes preserves the community's investment. Without it, a cycle of degradation can quickly result in the need to completely repave or rebuild a trail. Trimming foliage on and around greenways and bike lanes, sweeping sediment from routes, and fixing cracks before they become safety hazards are the equivalent of applying lube to a bicycle chain, putting air in the tires, and adjusting brake cables.

Making the case to funding partners and elected officials on the importance of preventive maintenance is very important. Fixing cracks may not warrant a ribbon cutting. Sweeping a trail once a month probably won't win any awards. And some volunteers have to be convinced that sweeping a trail or trimming shrubs is a great way to spend a weekend morning.

Importance of Design. Even when economic conditions are very strong, the financial needs of public agencies were not always being met by existing resources. This situation inevitably led to investment decisions in many communities that looked at the cost of the project while making tradeoffs in design to reflect revenues. This is a part of doing business and building a bicycle route system—whether on- or off-street; however, the design and construction of bikeways is a critical facet of protecting the asset well into the future.

The pavement base of a greenway or bike lanes is fundamental to maintaining its long-term viability, as it was with railroads and as it is with other road building techniques. Asphalt is a material that performs best when its pliability is maximized. Asphalt can withstand freeze and thaw

cycles better than concrete. It is also cheaper to build than concrete and easier to replace or repair. The pliability of asphalt is best preserved through weight transfer, which roadways gets from heavy traffic volumes and large vehicles—neither of which are functions that greenways or bike lanes serve or promote.

The design features related to base and materials, as well as some type of shoulder treatment are intended to bolster the strength of the asphalt and offset the negative effects that come with a lack of weight loads on the pavement. Over the life of a bikeway this reduces maintenance costs and lessens the need to completely repave or overlay the trail as frequently.

Different Settings. There was usually strong support among citizens for greenways and trails in natural settings to be built with natural surfaces (e.g. soft trails), such as crushed gravel (gravel fines), mulch, or dirt. Joggers prefer them. Bicyclists not using skinny road tires can navigate them with some ease if it is a gravel fines surface. There are several maintenance advantages that come with soft trails, most notably replacement costs and less influence of tree roots on the trail surface. There are also several challenges, such as erosion, encroachment of trailside vegetation, muddy or poorly draining sites and concerns over user conflicts and accessibility in high use areas.

Communities that want to protect or enhance a natural feel through soft trails should be aware of the potential challenges that come with being able to maintain those trails, particularly in remote settings. This does not and should not mean that a default position should be to pave the trail. Rather, a different set of expectations should be established for how the Town and other partners can address maintenance needs if a soft trail is desired.

In some settings, stream and river buffer requirements may require a soft trail. More reliance may need to be placed on volunteers to inspect the trails, report major problems and conduct maintenance activities than with trails in more urban or transitional settings.

The Triangle's long growing season can introduce a variety of hazards.

Access & Detours. It can be frustrating for greenway or bicycle route users to come upon maintenance activities that restrict their use of the bikeway. New development in a growing community oftentimes causes the need to temporarily close a nearby greenway, road or sidewalk. Suitable alternative routes should be identified as part of the construction plans for such projects. The Manual on Uniform Traffic Controls Devices has clear standards for Temporary Traffic Controls (TTCs) for sidewalks. These standards should be followed for greenways and it is advisable to consider signing a detour route for bikes if an on-street bike route is being impacted or repaved. Identifying and assigning detour routes are difficult with greenway trails, particularly in rural areas where on-street bike routes or sidewalk alternatives do not exist.

Luckily, most pedestrians can walk around a maintenance impediment and bicyclists may be able to walk their bike around a temporary obstacle. Individuals with mobility impairments are not as fortunate and attempts should be made to erect advance warnings for all users so they can choose whether or not to use that route during the time of maintenance activities. Users can also be alerted via text messages, social media, and web site announcements.

Materials, Supplies & Equipment. Relying upon a diverse set of partners and agencies to properly maintain greenways requires consideration of access to materials and supplies needed for maintenance, as well as reliability of equipment. Labor may be easy to come by but continued support from volunteers and partners is best sustained by consistent access to the supplies needed to perform various maintenance duties. A Town staff person or a contracted service is also needed to coordinate and manage volunteer efforts. With its proximity to Wake Forest, perhaps Rolesville can work with Wake Forest or Wake County to partner on such endeavors.

For many regular maintenance activities, Rolesville may be able to keep enough inventory on-hand to address most needs. Equipment such as

small earthmovers, mowers and large trimming equipment may be used sporadically and may already be owned by other town departments, nearby towns, or Wake County. Finding a way to achieve economies of scale in the purchase and maintenance of such equipment will help maximize efficiency and allow resources to be focused on greenway system expansion, encouragement programs or other maintenance activities.

Planning for Maintenance. Maintenance must be standard business practice for a town. This is difficult when historical roles for street maintenance have been heavily managed by NCDOT. It can take time to build capacity, both personnel and budget, within a municipality to undertake wholesale management of a bike route system. As the greenway system grows it will become increasingly important to define maintenance roles for the many entities involved. This could mean setting aside specific funding amounts in the Town's annual budget, examining maintenance and life-cycle costs in the specific design of trail segments, understanding maintenance expectations when new developments construct a public use greenway, and incorporating a maintenance element into future corridor planning in coordination with NCDOT.

Using Technology. Communication between bicyclists and greenway users and those in charge of maintenance is greatly enhanced by the use of established and emerging technologies. Social media outlets will allow Rolesville and its partners to report maintenance activities that can disrupt travel or recreational plans for greenway users. Interpretive GIS software can also be used. Cities and counties are developing mobile phone applications that allow citizens to report maintenance problems such as potholes, street light outages, and clogged storm drains. A similar effort could be incorporated into bicycle route maintenance issues if the Town pursues such technology in the future.

Maintenance & Operations Participants

Maintenance of Rolesville's greenways and bicycle route system could (and should) have many partners playing a role to help maximize limited

resources. Some maintenance can be conducted by volunteer organizations, some by the town, and some may require contract with local companies. Table 4-1 on the following page characterizes various maintenance activities by typology and the most likely responsible party for conducting the activity. The typologies identified are:

- Spot or Incident Maintenance activities are un-planned and occur in response to a particular reported problem, event or incident. In most greenway or bike lane settings these will be the resulting impacts or damage from storms, floods or nearby construction activities.
- Regular Maintenance consists of programmed or continuous activities that occur at logical intervals based on the characteristics of the greenway or bike lane. Trail inspection, trimming, sweeping, and clean-up activities are examples of regular maintenance activities.
- Long-Term Maintenance requires major planning and budgeting for what are oftentimes very specific projects such as major pavement repair, re-building, erecting new signage or replacing major structures such as bridges or culverts.

Types of Maintenance & Operations Activities	Parks & Recreation, Contractors	Volunteers, Other Contract Organizations	Facilities Maintenance, Municipal Public Works, Transportation Departments, Contractors
Spot / Incident: Occurs as necessary or warranted.	• Citizen Response • Low Water Crossing / Warning Signs • Major Debris Removal • Securing Temporary Signage • Identify Detours • Information Dissemination • Special Events Policies & Permitting • Lighting Replacement	• Citizen Response • Spot Improvement & Incident Reporting • Water New Vegetation • Minor Debris Removal • Placing Temporary Signage • Information Dissemination • Special Event Monitoring / Support	• Asphalt Spot Patches • Major Debris Removal • Graffiti Control • Parking Lot Repair • Major Debris Removal
Regular: Programmed or continuous at logical intervals based on features and their needs.	• Scheduling Major Maintenance Tasks • Trail Edge / Path Weed Treatment • Major Mowing & Trimming • Trash Disposal • Plant & Trim Trees • Stock, Clean Amenities • Rotary/Machine Sweeping • Bollards / Bollard Locks • Sign Replacement • Mapping • Volunteer Training • Accident & Incident Tracking • Pest Management	• Trail Inspection & Condition Surveys • Scheduling Minor Maintenance Tasks • Minor Mowing & Trimming • Removing noxious weeds • Trail Shoulder / Borrow Ditch Clean-up • Trash Collection • Planting Shrubs, Grasses & Flowers; Mulch Planting Beds • Locking / Securing Trailheads & Access Points • Hand Tool Sweeping • Volunteer Training Support • Accident & Incident Monitoring	• Asphalt Crack Sealing / Seal & Cover • Shoulder Protection & Maintenance • Large Scale Vegetation Removal • Dust Management • On-Street Sidewalk & Connecting Route Maintenance
Long-Term: Requires major planning, budgeting and coordination for anticipated investments or major initiatives.	• Fence & Structure Paint / Maintenance • Trail Location Signage / Wayfinding • Major Amenities Procurement & Replacement • Habitat / Environmental Maintenance & Control • Secure Funding	• Benches & Table Paint / Maintenance • Support / Pursue Funding	• Asphalt Seal & Cover / Overlay • Centerline Striping / Crosswalk Markings • Street Location Signage & Lighting • Bridge inspections & Maintenance • Fencing & Railing • Drainage / Borrow Ditches, Culverts

Table 4-1. Types of Maintenance Actions and Implementing Agents

Table 4-2 illustrates a sample maintenance schedule that considers these typologies and the type of maintenance activities to help Rolesville plan for maintenance of the greenways and multi-use paths.

Tasks	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Basic Maintenance												
Inspection & conditions survey				✓						✓		
Graffiti removal	As needed throughout the year											
Hand tool sweeping		✓		✓	✓	✓	✓	✓	✓	✓		✓
Major mowing & trimming					✓	✓	✓	✓	✓			
Machine Sweeping	✓			✓			✓			✓		
Planting shrubs, grasses & flowers				✓	✓					✓		
Plant, trim trees				✓	✓					✓		
Shoulder / borrow ditch clean-up	As needed or annually											
Trail edge, shoulder, gravel path weed control			✓			✓			✓			
Trash collection & disposal	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water new vegetation				✓	✓	✓				✓		
Weed control & pest management				✓		✓		✓		✓		
Substantial Maintenance												
Asphalt patching	As needed, fall and spring											
Asphalt crack sealing				✓								
Painting	As needed year around; Every 10 years for major structures & amenities											
Overlay	Once every 20 years											
Shoulder / borrow ditch protection & maintenance					✓							

Table 4-2. Sample Maintenance Schedule for Greenways & Multi-Use Paths

Facility Inventory

A critical component of any maintenance plan is to know the condition and location of various items such as signs, benches, and markers. The trail condition record of activity is also helpful in planning future maintenance and monitoring schedule requirements. It is recommended that Rolesville incorporate the growth of its bicycle facilities into other inventory duties of the Town.

A database can be updated as maintenance tasks are complete, used to project budgetary needs, and inform volunteers of what types of activities are short-term needs. The database can also be used to assess performance of the greenway system and provide feedback for planning, design and construction of new trails. Emerging smartphone, GPS and GIS technologies offer an efficient means toward developing such an inventory and volunteers can be used to conduct certain functions of the inventory.

This facilities inventory should include:

- Design characteristics, such as length, width, pavement type, and year constructed;
- Surface condition, including pavement condition, date of last inspection and photo at last inspection;
- Usage by mode and characteristics, such as pedestrians, bicyclists, joggers, etc.;
- Sign inventory, including type of sign, location, and date installed;
- Amenities and their location, such as benches, bicycle racks, and trail markers; and
- Bridge and culvert database, including location, date of last inspection and condition.

Complete Streets

"…A complete streets philosophy means that NDDOT and its partners will provide a network of streets that safely and comfortably accommodate all users, including bicycles, pedestrians, and transit users. Typical elements that make up a complete street include sidewalks, bicycle lanes, appropriate street widths and speeds…."

NCDOT Draft Complete Streets Planning and Design Guidelines

4.3 Design and the Design User

How we design greenways and trails impacts the experience and, ultimately, the safety of the diverse set of users that take to greenways and trails for a variety of recreational, utilitarian, health and transportation purposes. This chapter illustrates aspects of facility design to help guide future actions by Wake County and its partners in planning for, designing, constructing and maintaining greenways that connects to a variety of destinations, promotes a diverse user experience, and is built to a maintainable scale.

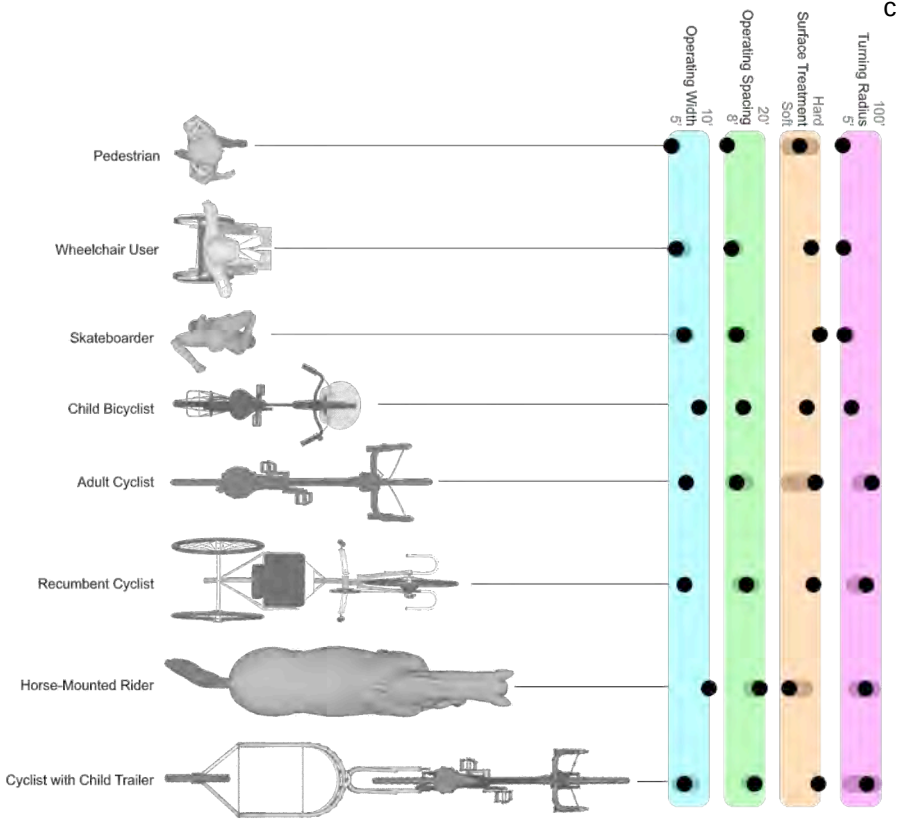


Figure 4-1. Active Modes and Design Parameters

The Design User

A discussion on the design of bicycle facilities should not begin with the dimensional aspects of the trail; rather it begins with understanding the different user types, how their needs are unique, and how those differences are accommodated into trail design and construction.

A well-connected bicycle system is often conflated with the idea of a well-connected greenway system, which is one the most diverse facets of our built environment in terms of how people interact. When compared to traditional walking trails or paved walkways within parks, their function transcends a recreational or experiential purpose to include a transportation element. When compared to other transportation facilities, greenways have a much more diverse set of user capabilities, "vehicles," and speeds occupying and traveling through the same space.

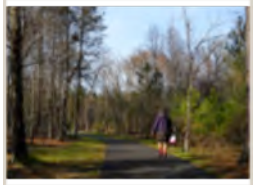
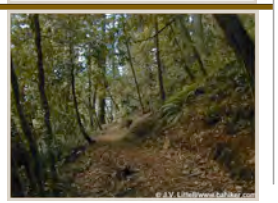
A family walking the dog along a trail has different needs than the bicyclist using the greenway as a link between two roadways. The needs of a person in a wheelchair vary greatly from members of a running club, the romantic couple walking arm-in-arm or a child learning to ride a bike. How we accommodate a multitude of functions depends on understanding the context of the greenway and what user types are most likely to interact. Figure 4-1 illustrates the various functional widths required for the largest share of greenway users. Each type of user has a unique requirement in terms of operating width and clear space

required for comfort and safety. These characteristics ultimately drive our design standards, design exceptions and location-based design decisions.

As we establish design standards and practices, it is important that they not conform to a "one-size-fits-all" approach. Such an approach detracts from aesthetics of the overall bicycle transportation system, thus negating the potential positive aspects of the experience. It can have negative safety impacts if applied universally without consideration of user characteristics.

A greenway near an elementary school is likely to have students using the trail during the school day as an outdoor classroom. Children in groups tend to spread across the length of the trail, which creates conflicts with faster walkers, joggers, and bicyclists. Places where terrain and resulting grades lead to faster speeds for bicyclists creates conflicts with pedestrians due to a greater speed differential as well as uphill bicyclists who need more space to climb. Downhill road cycling implies that sight distance from the rear of the cyclist is less than optimal and that a wider shoulder to provide refuge to the cyclist is desirable to avoid conflicts from motorists broaching a hill behind them.

Facility Types for Various Design Users
Figure 4-2 on the following page illustrates the range of facilities and their characteristics.

Bike Lane	
Bicycle Boulevard	
Shared Curb Lane (with sharrow markings shown)	
Wide Curb Lane Paved Shoulders/Wide Striped Shoulders	
Shared Use/Multi-Purpose Path / Multi-Use Trail	
Single Track Trail	

Facility Type	Category	Width	Surface	Treatment	Function
Bike Lane	On-Street	4'-6'	Asphalt (same as street surface)	On-street lane striped and signed to NCDOT standards; design should ensure a limited number of commercial driveways and turning movements	For bicyclists on roadways
Signed Shared Roadways	On-Street	varies	Asphalt	May either be a low-volume roadway with traffic calming and signage to create a safe shared use environment, OR a higher volume roadway with wide (14' – 16') outside lanes	Used for designated bicycle routes; can include signage and pavement markings, including "sharrows"
Bicycle Boulevard	On-Street	varies	Asphalt	Multiple traffic calming treatments combined with bike lanes and or signed shared roadways to create priority streets for bicyclists	Provides a continuous facility on streets with varying widths, volumes and speeds
Shared Curb Lane	On-Street	9'-12'	Asphalt	Common facility type in low-speed and low-volume street types; can include signage and treatment markings, including sharrows	Utilitarian cycling on streets which are not otherwise designated as elements of the bicycle network
Wide Curb Lane	On-Street	12'-14'	Asphalt	Smooth pavement, bicycle compatible storm grates; can include signage and treatment markings, including sharrows	For skilled bicyclists who are capable of sharing the road with motor vehicles
Paved Shoulders/Wide Striped Shoulders	On-Street	varies (min. 2')	Asphalt	The outside lane (in each direction of travel) is widened behind the white edge delineator stripe	For utilitarian bicyclists depending on condition, width, speed of adjacent traffic, and frequency of driveways
Shared Use/Multi-Purpose Path / Multi-Use Trail	Off-Street	10'-14'	Asphalt, concrete or other smooth firm surface	Designed to NCDOT standards. Separated from roadway by planting strip or vertical curbing	Typical application for regional trail and some community pathways and bikeways. Accommodates bicycles, pedestrians, and wheelchairs. Minimizes potential trail crossing conflicts with autos
Single Track Trail	Off-Street	3'-8'	Natural Surface	Designed to meet International Mountain Biking Association (IMBA) guidelines	Designed for mountain bicyclists; can include a variety of off-road bicycling trail types

Figure 4-2. Types of Bicycling Facilities

All of these bicycle facilities are commonly grouped into three categories: 1) Off-Street Facilities that include Shared Use Paths, Greenways and Trails, 2) On-Street Bikeways, and 3) Bicycle Parking and Support facilities. The following sections are based on definitions established by AASHTO (Association of American State Highway and Transportation Officials), NCDOT, the MUTCD (*Manual on Uniform Traffic Control Devices*) and innovative design concepts from other communities in the U.S. Due to the

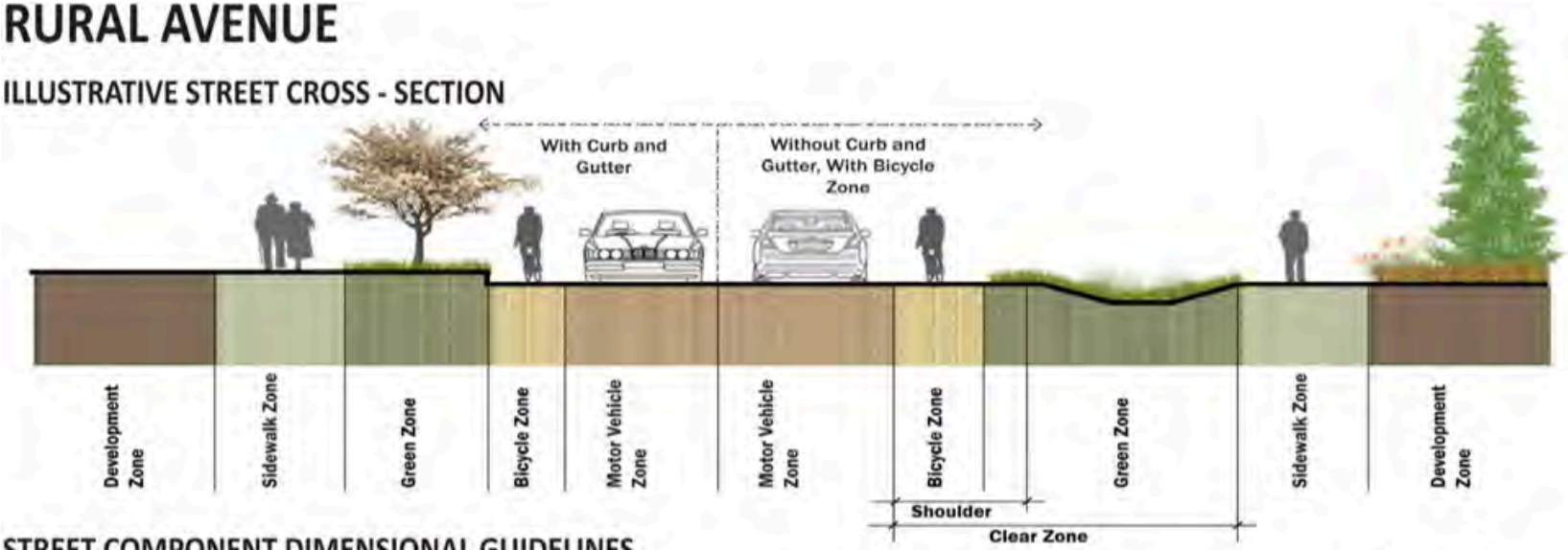
inter-related town boundaries between Wake Forest and Rolesville, the former's Comprehensive Bicycle Plan was also used to coordinate recommendations. Similarly, the draft *Final Complete Streets Planning and Design Guidelines* was also reviewed to take advantage of the flexibility that this guidance offers designers. To facilitate easier reading, the design components are broken out into three main sub-sections: on-road, intersection treatments, and off-road recommendations.

Preferred Design for Rural Avenues

The Town of Rolesville is confronted with a number of streets that are currently or are "evolving" out of what the NCDOT Complete Streets Guidance suggests is a "Rural Avenue." Rural Avenues are typically narrow streets that once served remote, sparsely populated regions of our State and that are now being placed under stress due to abundant growth, particularly from residential development. As traffic volumes on these streets increase, the maintenance, available capacity for all kinds of traffic, and propensity for accidents are likely to change negatively. The NCDOT Complete Streets guide for these types of streets is shown on the following page (Figure 4-3). A footnote in this guidance suggests that outside lanes should accommodate cyclists with a 5' bicycle lane. Bicycle lanes are typically located in areas where there are few driveways or street intersections, since these locations tend to introduce more conflicts from turning vehicles that may or may not see a cyclist traveling alone. In the case of Rolesville, this Plan proposes that a wide outside lane with a preferred width of 16' be used instead to promote (a) safe passing accommodations for motorists overtaking cyclists; (b) better "sweeping" of the streets by passing cars to provide a better riding surface; and (c) safer conditions for motorists that have to use the shoulder in the event of a vehicular breakdown or other emergency. Note that that a 16'-wide lane would require the same amount of pavement (and therefore less costly to maintain and with a smaller environmental footprint) than an 11' travel lane coupled with a 5' bicycle lane, and actually reduce costs associated with striping and maintaining bicycle symbol pavement markings.

RURAL AVENUE

ILLUSTRATIVE STREET CROSS - SECTION



STREET COMPONENT DIMENSIONAL GUIDELINES

	Sidewalk Zone *(feet)*	Green Zone *(feet)*	Shoulder Zone *(feet)*	Bicycle Zone *(feet)*	Motor Vehicle Zone *(lane width-feet)*
Rural Village	6' - 8'	4'- 12' (see notes 2 and 3)	8' - 10'	4'-6' bicycle lanes (see notes 6 and 7)	10' - 12' lanes
Rural Developed	5' - 8'	4'- 12' (see notes 2 and 3)	8' - 10'	4'-6' bicycle lanes (see notes 6 and 7)	10' - 12' lanes

1. Sidewalk zone should typically be a minimum unobstructed width of 6'. In areas that are currently or are planned to be pedestrian-oriented or mixed-use development, 8' wide unobstructed sidewalks can be provided.
2. Green zone may include landscaping, street trees, lighting, street furniture, hardscaping in some circumstances and related pedestrian/bike/transit amenities. 8' minimum green zone is preferred, to allow for separation between pedestrians and vehicles, and space for street trees.
3. For areas outside of towns and communities, wider green zones of 10' to 12' are preferred where street trees are provided.
4. Parking is an option on avenues. Parking zone dimensions vary depending upon the type of parking provided. Angle parking will require a wider dimension than shown.
5. Bicycle lanes are the preferred treatment. If bicycle lanes are not possible, shared lanes may be allowed. For a shared lane, the outside lane should be a minimum of 14' wide. Sharrows can be used on streets < 35mph, with either shared lane or standard lane dimensions.
6. In the shared vehicle zone and the bicycle zone, the gutter pan is not considered part of the lane width or the bicycle lane width.
7. Bicycle lanes located next to on-street parking should be a minimum of 5' wide (generally, the combined dimension for parking and a bicycle lane should be at least 13' from the face of the curb).
8. Avenues may or may not include a center turn lane with intermittent landscaped islands. Avenues typically do not include a continuous median, but it may be allowed in some circumstances.
9. Pedestrian lighting should be considered adjacent to development.

Figure 4-3. NCDOT Complete Streets Guidance for Rural Avenues

An important advantage of shared car-bicycle facilities is the treatment of cyclists at intersections: there is no "merging over" maneuver required of bicyclists at any intersection, which also means that transitions between sections of roadway would be easier to accommodate as discontinuous lengths of street are widened due to development actions or reconstruction/repaving.

Preferred Design for Collector and Low-Volume Residential Streets

Collector Streets fall between local residential streets and major arterials in the street hierarchy, with this hierarchy reflecting the balance between mobility and accessibility. Local streets service driveways that lead to homes or low-intensity commercial development (rare). The goal for the designer of these streets should be to reduce traffic speeds while still supporting a variety of users. This goal turns the paradigm of calling for wider facilities to accommodate bicycles completely around: cyclists are safer sharing spaces with slow-moving traffic, especially under conditions where there are many driveways and curb cuts.

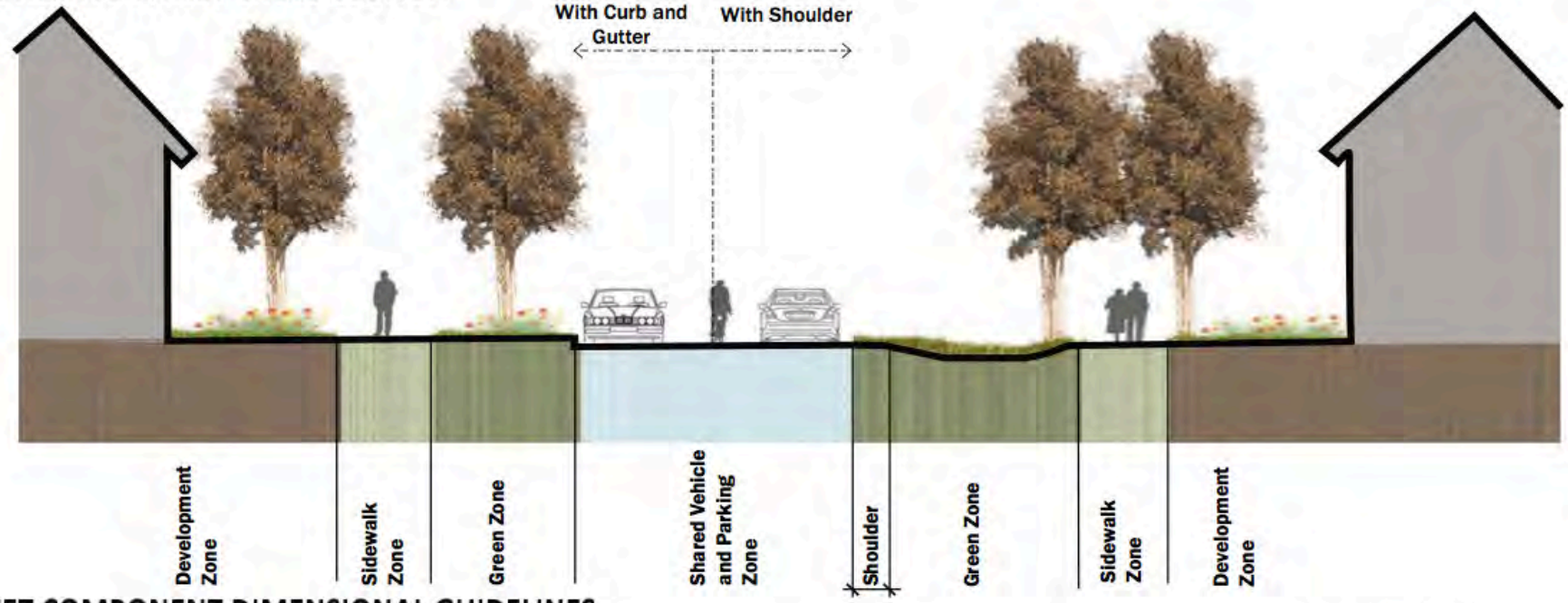
Collector streets may have a center turn lane or have speed limits up to 35mph, but 25mph or less is preferred. Note that IF the lane widths are minimized in accordance with this guidance (Figure 4-4), then shared spaces for cyclists are appropriate. Once lane widths become larger, the costs to the developer and the traffic speeds go up – as do complaints about speeding traffic from concerned parents. Additionally, many neighborhood traffic calming countermeasures such as speed humps are not conducive to bicycle travel unless they are carefully designed and sparingly used. As these neighborhood traffic complaints are usually associated with too-wide residential streets, keeping the street widths down fosters a more relaxed residential "feel" that translates to lower vehicular speeds and a safer environment for everyone. In situations where the street has higher traffic volumes (e.g., at least 2,000 vehicles per day) and on-street parking is used often, the use of sharrows markings would provide an additional warning and guidance to cyclists and motorists alike.

Redford Place Drive is at the upper limit of a typical low-volume collector or residential street. The particular design and infrequent curb cuts of this road might suggest dedicated bicycle lanes; such a prescription would probably preclude a center turn lane due to the costs of relocating utilities, curbing and landscaping that would be necessary were the center turn lane retained. Sharrows markings would be a good intermediate step.

Sharrow Dimensions:
A=Distance from Driver Side Door to Face of Curb
B=Door Swing Distance
C=Distance from Open Door To Centerline of Sharrow Pavement Marking
D=Distance from Face of Curb to Centerline of Sharrow Pavement Marking

LOCAL / SUBDIVISION STREET: RESIDENTIAL

ILLUSTRATIVE STREET CROSS-SECTION



STREET COMPONENT DIMENSIONAL GUIDELINES

	Minimum Travelway F.O.C. to F.O.C. *(feet)*	Sidewalk Zone *(feet)*	Green Zone *(feet)*	Parking Zone *(feet)*	Lane Width (includes bikes) *(feet)*	Number of Vehicles Provided For (parking and moving) *(lanes)*	Shoulder *(feet)*
Local / Subdivision (Traditional Neighborhood Guidelines - Lane)	18'	5' - 6'	4' - 8'	very low demand	9' with no parking	2	4' - 6'
Local / Subdivision (Low Parking Demand)	24'	5' - 6'	4' - 8'	low demand	10' with low demand parking	2	4' - 6'
Local / Subdivision (Parking On 1 Side)	26'	5' - 6'	4' - 8'	7' on one side unmarked	9' with parking/ 13' with no parking	up to 3	4' - 6'
Local / Subdivision (Parking On 2 Sides)	34'	5' - 8'	4' - 8'	7' on both sides unmarked	10' with one parked vehicle / 9' with two parked vehicles	4	4' - 6'

Figure 4-4. NCDOT Complete Street Guidance for Local Streets

Signs and Pavement Markings

Signs and pavement markings provide information, warnings of potentially hazardous conditions, and regulatory messages to drivers of cars and bicycles alike. Signage includes post- or pole-mounted signs and pavement striping. Signage and pavement markings should conform to the *Manual on Uniform Traffic Control Devices* (especially Chapter 9) and the American Association of State Highway Transportation Official's *Guide for the Development of Bicycle Facilities,* as well as NCDOT's own *Roadway Design Manual*. The following categories of signage and markings are described in general terms; specific signage recommendations are contained in this Plan, notably Share the Road signs at several locations.

Warning Signs

The purpose of warning signs is to provide the driver with information about upcoming conditions that may be hazardous under certain conditions or if certain actions are not taken. Roadway warning signs are often diamond-shaped with black lettering on a yellow background.

Regulatory Signs

Regulatory signs are classified into six basic groupings: the right-of-way series, the speed series, the movement series, the parking series, the pedestrian series, and the miscellaneous series. Regulatory signs are generally rectangular with white and black coloring; an example of a bicycle-specific regulatory sign is a Bike Lane sign.

Informational Signs

There are a variety of signs that provide supplemental information to cyclists, motorists, and other travelers. The following is not a comprehensive listing, and new designs can be utilized on an experimental basis with the prior written approval of NCDOT.

- Temporary Conditions, usually related to construction activities. These signs are important to cyclists, since they may indicate a roadway condition that, while not threatening to an automobile, may create a roadway surface conditions that is extremely

Commonplace Bicycle Regulatory Signs (*MUTCD*, 2009, Figure 9B-2)

hazardous to cyclists. Temporary signage is frequently black on an orange background.

- Wayfinding, either standard or special case. Wayfinding (sometimes called directional signing) signs help designate bicycle routes, for example, or provide information on destinations (usually, name, direction of travel and distance). Wayfinding signs are frequently white on a green background, although some communities have developed their own color scheme and logos to promote certain destinations or serve as "branding" to market their community to visitors. Since cyclists are especially interested in understanding how much physical effort is going to be required to reach their destination, wayfinding signs are particularly important.
- Test Case, as allowed by state (and sometimes federal) transportation agencies. In some cases, signs are not addressed in the MUTCD or local guidance, but may be permitted on a trial basis. A current example is the HAWK signal, which may be used on a trial condition if allowed by NCDOT to warn motorists of high-volume pedestrian crossings. When these trials are allowed, careful observation of their performance should be undertaken so that later editions of the MUTCD can be modified to allow their widespread use or eliminated from consideration. Other, recent examples of trial bicycle-related signage include the allowance of green paint to designate a bicycle lane, alternative U.S. bicycle route signs, and shared lane ("sharrow") markings.

A few considerations should be kept in mind when locating signs and developing an overall signage strategy.

- First, signs and pavement markings can be overused, or used in places where they are not warranted. When either of these conditions occur, motorists, cyclists, and other travelers have a tendency to pay less attention to regulatory and warning signs, thus defeating an important part of their purpose. An excessive use of four-way STOP-controls on low-volume, residential streets has been practiced in some areas, for example, to reduce vehicular speeds – not the purpose of a STOP sign. In fact, STOP

signs and other regulatory signs should not even share a pole with (most) other signs that might dilute the level of their interaction with drivers.

- Second, signs are now required to have a retroreflective coating to increase their visibility, especially at night or in other poor lighting conditions. Improving visibility of warning and regulatory signs at night is important since the rate of crashes nationwide is about three times greater in the evening hours than during the daytime. This benefit is weighed against the fact that the retroreflective material degrades over time, indicating that signs have to be replaced by the agency responsible for their installation.
- Pavement markings improve the awareness level of motorists and cyclists alike, and they serve to reinforce vertical signage, such as a stop "bar" showing where a vehicle should stop before encroaching into a pedestrian crosswalk area. However, like signs, pavement markings can be overused or used in an inappropriate circumstance. A special concern with the overuse of pavement markings is that many of them are created with thermoplastic, which becomes slippery and hazardous to cyclists when the markings get wet.

Intersection Treatments

Many guides on riding bicycles safely stress the importance of lane positioning: maneuvering to the correct place in the travel lane to go straight, right, or left. While the designer's job is made somewhat easier at intersections when sharrow treatments or joint-use lanes are in place, bicycle lanes have to make a transition, which is further complicated in the presence of right-turn lanes, lanes being dropped, or on-street parking. Figure 4-5 shows common ways of signing and marking travel lanes to accommodate these conditions.

Handling Intersections

The presence of turning lanes and on-street parking can create special design needs at intersections.

❶ *Right-Turn Only Lane.* Use mini-skips to denote the "weave" movement between bicycles going straight and cars crossing into a right-turn-only lane.

❷ *On-Street Parking.* Again, the use of mini-skips helps mark the bike lane for drivers wishing to turn right.

❸ *Through-Right with Right-Turn Only Lane.* Here, the bicycle lane disappears as the cyclist must negotiate a route to the right-center position of the through-right lane.

Source: AASHTO Guide for the Development of Bicycle Facilities (1999)

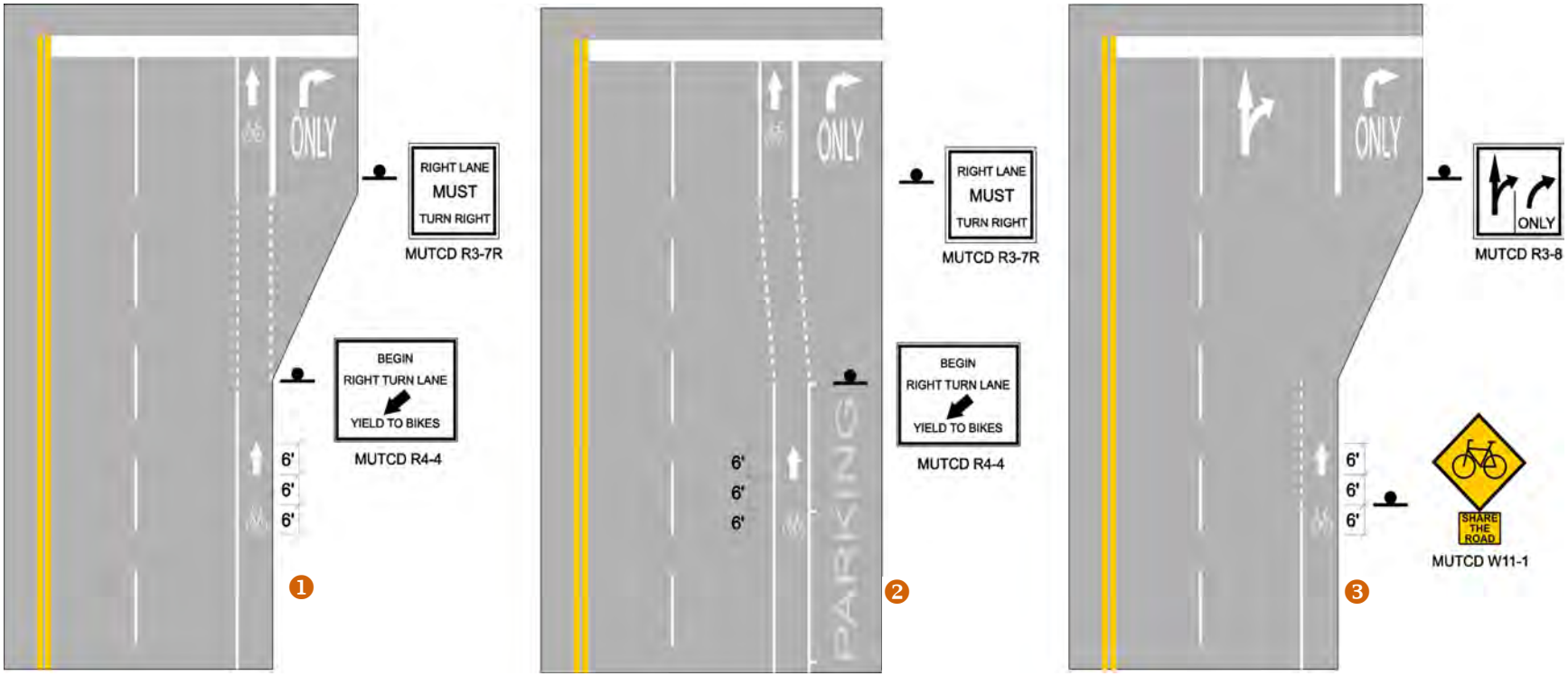


Figure 4-5. Intersection Treatments for Bicycle Lanes

A stencil is often helpful to indicate where cyclists are supposed to position their bicycles for maximum potential to activate a traffic signal or be most visible to upcoming automobile drivers. Figure 4-6 illustrates the design as well as the placement of a bicycle stencil and accompanying signage.

Additional intersection treatments such as specialized warning or advisory signs may also be warranted, such as the *Push Button for Green Light* sign recognized in the MUTCD (see image on this page).

Note that the use of special guidance or crossing mechanisms outlined in this chapter does NOT indicate that traffic signal detectors shouldn't be set to a level of sensitivity that can "pick up" the ferrous metal content of even modern road bicycles. The delay from occasional false detections is inconsequential to the delays and potential for encouraging "dart out" maneuvers from young or inexperienced cyclists.

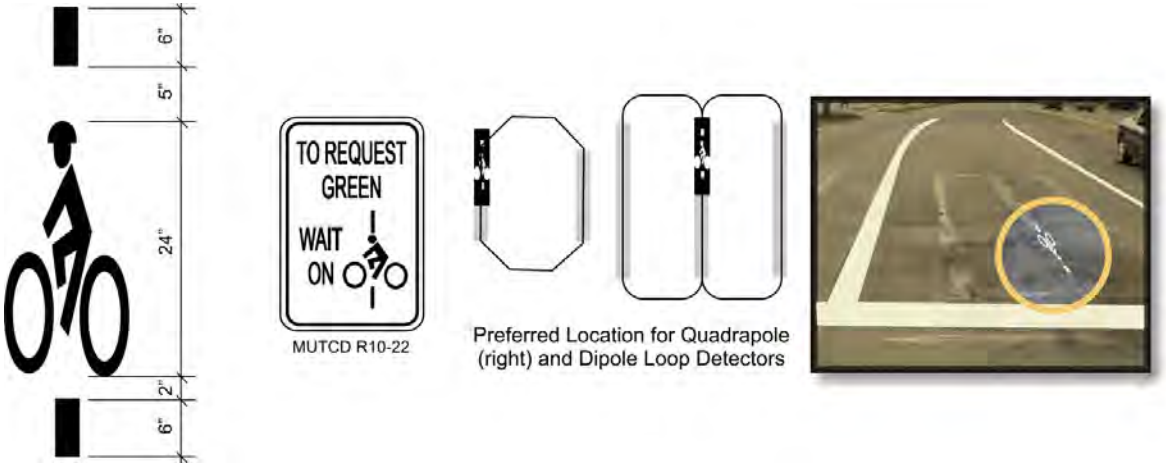


Figure 4-6. Bicycle Position Stencil for Signal Loop Detector

Bicycle Parking and Ancillary Facilities

Bicycle parking is not widespread in Rolesville, but new commercial developments and multi-family residential developments should provide minimum parking for cyclists.

Bicycle parking at parks and schools should be covered and near the entrances to shelters or buildings; this location is preferred even for commercial properties but if that is not possible then the parking should at least be clearly visible from the street and the front entrance (i.e., not in the rear of the building). Figure 4-7 illustrates the minimum space requirements for bicycle parking.

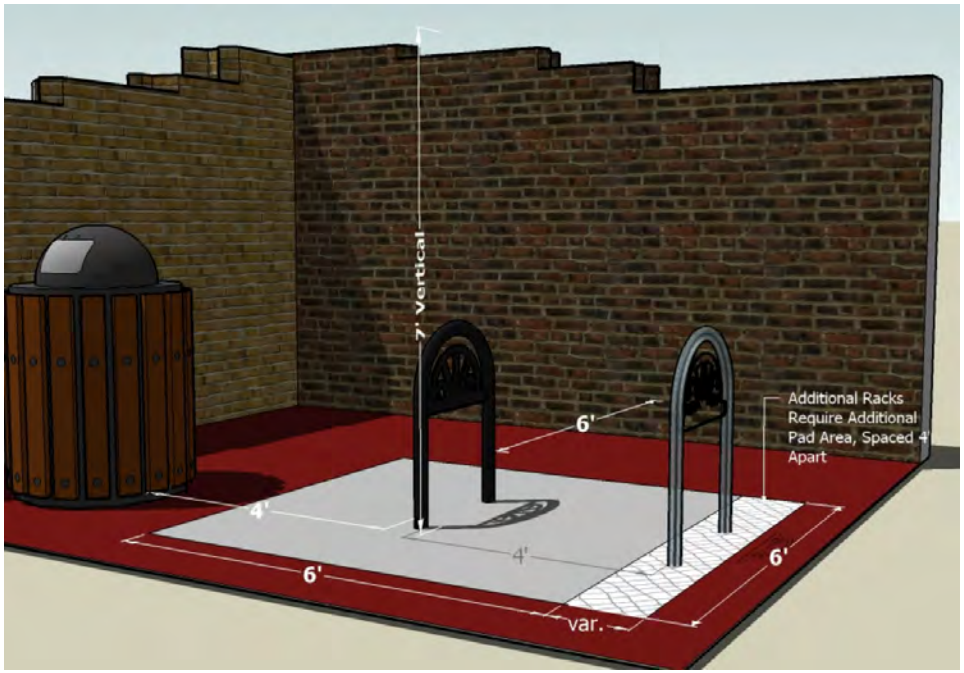


Figure 4-7. Bicycle Parking Space Needs

Greenways and Paths

A greenway is defined as a paved or unpaved strip of land that connects people to the places they want to be. Greenways are often thought of as a minimum 10'-wide (the preferred minimum is 12') asphalt-surfaced pathway with a variety of amenities like benches, trashcans, trash bags (for pet waste) and information kiosks, trail markers/signage, and edging. While all of this can be used successfully for higher-use trails and attract a broader range of users, "soft" trails can also be constructed through volunteer labor that are no more than about three feet in width and have a natural dirt surface.

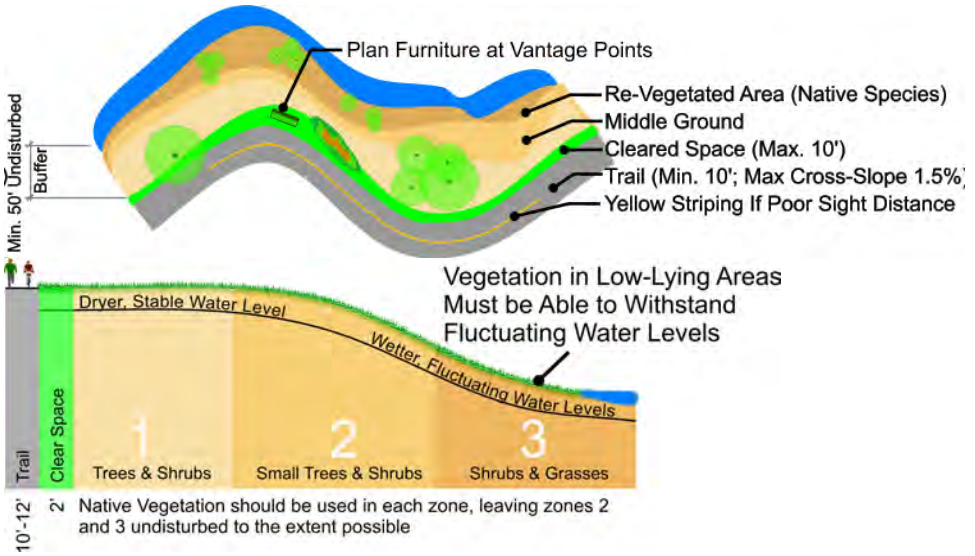


Figure 4-8. Greenway Plan View (top) and Cross-Section (bottom)

The following paragraphs describe the major design features of greenways as well as some of the more important amenities that Rolesville's citizens may expect to see on their own greenways. The purpose is not to create a comprehensive greenway construction guide that is beyond the scope or interest of our Plan, but instead to highlight best practices where we can do so.

Greenway Cross-Sections. Greenways are typically at least 10' in width to accommodate the variety of design users, with (posted) speed limits of 10mph and typical widths of 12' or more to allow safer two-way passage of pedestrians, skateboarders, cyclists, and dog-walkers (this last is a notorious user of greenway width).

The use of natural vegetation close to the trail, which is bordered by a two-foot-wide open swath on each side of the greenway to allow errant vehicles room to safely maneuver back onto the trail surface, is important in terms of reducing maintenance as well as keeping a small environmental footprint on the landscape. Most important, if the greenway or even simple footpath borders a stream, a minimum 50' undisturbed zone is important to keeping stream sedimentation levels and bank erosion to a minimum.

Nothing fancy, but this soft trail at Heritage High School was constructed with volunteer labor and works fine for cross-country runners from the school as well as for off-road cyclists.

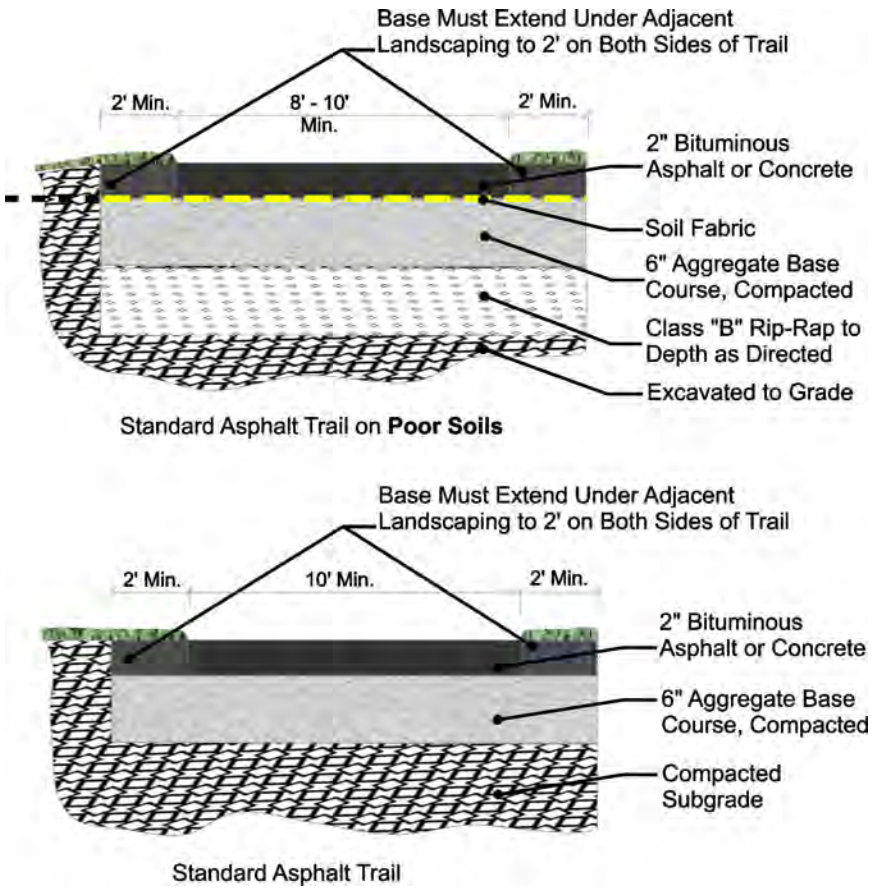


Figure 4-9. Greenway Construction Diagram

Constructing on Poor Soils. Greenways are often constructed on soft or poor soils since development typically avoids these same areas – and for the same reasons: it's harder to construct a permanent structure on poor soils whether it be a house or a greenway. While the typical greenway construction may be two inches of asphalt or concrete on top of a 6" base, another 6" or more of compacted rip-rap stone may be required to stabilize the greenway on poor soils. The results of improper grading, excavation and base development are the premier causes of greenways becoming unstable, cracked, and eventually unusable. While the additional materials and excavation increase costs during construction, the long-term maintenance benefits will more than compensate for the initial outlay.

Tunnels and Bridges. It is often necessary and/or aesthetically desirable to carry people from one side of a roadway or waterway to the other. Pedestrian bridges can come in pre-fabricated varieties, but for "soft" trails, these have been constructed in high school carpentry classes (after having a design cleared by a qualified engineer). Keep in mind that crossing roadways at grade (the subject of the next section) must be carefully designed, the expense of constructing a tunnel or pedestrian bridge over a road only rarely justifies the amount of use it is likely to received: the shortest and most-used path across a roadway is straight across, not up-and-over or down-and-under. Consider the two tunnel visualizations at one of our favorite schools on the following page (Figure 4-10); under some conditions even the most well-lit tunnel or bridge can appear unsafe.

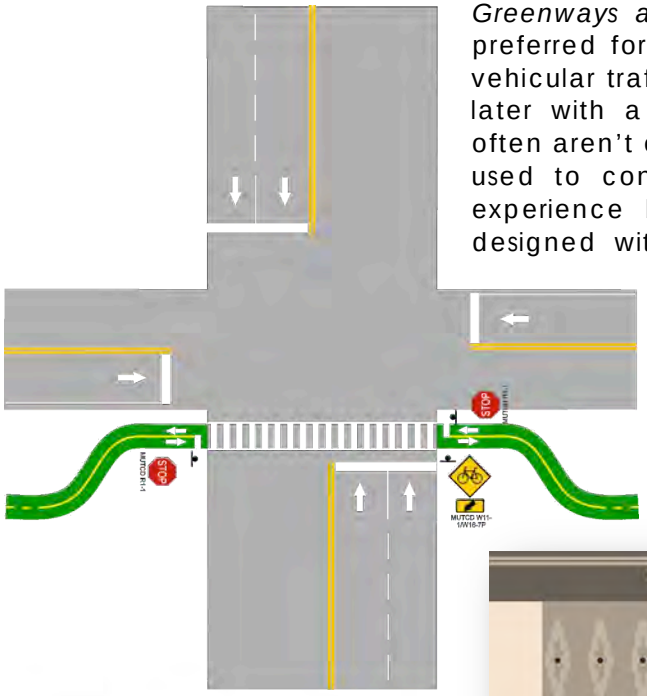
Figure 4-10. Visualization of Tunnel at Night (left) and Inside
Photo credit: Stantec Consulting Services Inc.

Greenway-Street Intersections

(a) Crossings are typically handled with a standard or "zebra" crosswalk or enhanced with in-pavement lighting activated by pedestrians crossing the street,

(b) but in cases where greenways do not meet cleanly at street intersections special measures may have to be taken (b) to ensure that users are aware of the upcoming crossing.

(c) The HAWK signal treatment is a relatively new device that gets driver's attention through a combination of high-visibility crosswalks and flashing, cyclist-activated lighting.



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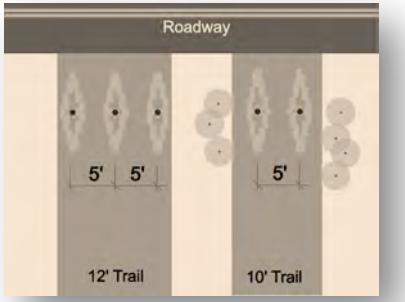
Greenways and Street Intersections. While greenways are preferred for many people precisely because they avoid vehicular traffic, most greenways must interface sooner or later with a roadway. Conflicts between motorists that often aren't expecting cyclists (who, in turn, have become used to controlling the right-of-way on their greenway experience before reaching a road crossing) must be designed with the safety of the pedestrian or cyclist in mind. These graphics illustrate how to make crossings safer.



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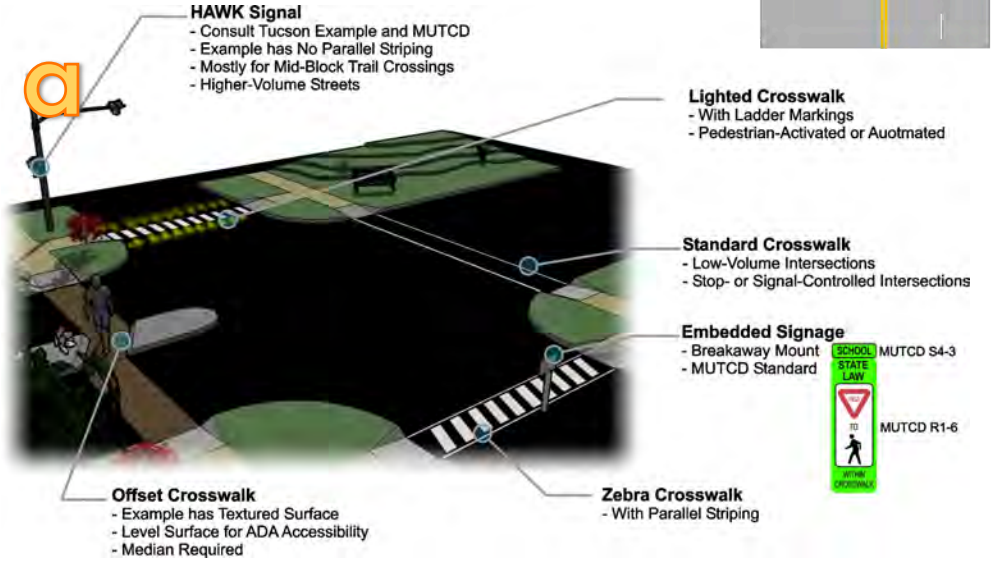

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Other Amenities and Provisions. The following illustrates additional amenities that enhance the trail user's experience in Rolesville.

a. Park-n-Pedal Lots. Underused or dedicated parking areas where trail users can drive in with their bicycles then leave them to finish their journey by bicycle are becoming increasingly popular.
b. Bag Depositories. These dispense (and often collect) bags for disposing of pet waste, an essential item for a well-maintained trail.
c. Bicycle Parking. Bike parking racks are very important at trail heads and destinations, allowing the paths to reach their full multi-modal potential.
d. Benches, Water Fountains and Trash Receptacles. For higher-use trails, benches can provide a quiet resting place for seniors or families with small children. Trashcans are a necessity, as is daily emptying.
e. Decorative Walls and Retaining Walls. Decorative stone walls and fencing can greatly enhance the beauty of a greenway while separating other, adjacent land uses or keeping backfill away from the trail surface.
f. Kiosks and Signing. Directional signing at trail turning points and street intersections are helpful for out-of-town or infrequent users, as are trail distance markers that tell the user how far she has come since a trail head. Information kiosks can create an outdoor educational opportunity for school children and attract a different type of user.
g. Raingardens. Raingardens can be constructed through volunteer efforts and help manage stormwater runoff without expensive construction or maintenance.
h. Bicycle FixIt Stations. Bicycle "fixit" stations offer a range of tools and a stable platform to create a place for cyclists to repair their bicycles safely. One vendor even sells a vending machine with high-energy snacks as well as a variety of tubes and other parts.

Resources

Guide for the Development of Bicycle Facilities, 1999.
American Association of State Highway and Transportation Officials, Washington, DC.

Policy on Geometric Design of Streets and Highways, 2011. American Association of State Highway and Transportation Officials, Washington, DC.

The North Carolina Bicycle Facilities Planning and Design Guidelines, 1994
NCDOT Division of Bicycle and Pedestrian Transportation.

Manual on Uniform Traffic Control Devices, 2009.

Bicycle Facility Selection: A Comparison of Approaches.
Michael King, for the Pedestrian and Bicycle Information Center Highway Safety Research Center, University of North Carolina – Chapel Hill, August 2002.

North Carolina Department of Transportation
Complete Streets Guidelines, July 2012. (www.completestreetsnc.org/resources/)

Chapter 5 Implementation & Priorities

In order for Rolesville to move forward with the next steps in becoming a more bicycle-friendly Town, it must have the priorities and the funding available to proceed with implementation. This section addresses potential funding sources that the Town could consider for some of the proposed projects. An implementation plan is also provided which identifies potential partners for the recommendations, and a phased implementation schedule that considers priority and cost.

5.1 Implementation

The implementation of the recommendations contained in earlier sections of the Bicycle Plan will require a coordinated effort amongst Town officials, leaders, and citizen volunteers. The following tables summarize specific project, policy, and program recommendations that have been made in order of short-term, mid-term, and long-term time frames. The table should be used by the Town as a flexible framework for implementing the recommendations in the Plan – recognizing that it is important to capitalize on unexpected opportunities while also pursuing long-term goals. In general, the Town should consider working with a wide range of partners, such as those listed below, to implement various elements of the Plan and conduct periodic evaluations of projects, policies and programs after implementation.

Many of the education, encouragement and enforcement programs will be carried out by partnerships between Town departments, local non-profit and civic organizations, business owners, private developers and others. Creating strong partnerships in the Town-wide effort to improve bicycling safety and increase the "bikeability" of the community will help spread the word and awareness, as well as lead to programs that can withstand the test of time. Potential partners for implementation of the *Rolesville Bicycle Plan* include:

Volunteer efforts like this one to construct a rain garden require both government coordination and citizen involvement.

The Best is the Enemy of the Good.

Voltaire

- Rolesville and Wake County Chambers of Commerce
- Wake County Health Department
- Advocates for Health in Action (WakeMed)
- Town of Rolesville Open Space and Greenways Committee
- Local Neighborhood Associations
- Wake County School System and Parent Teacher Associations (PTAs)
- Town of Rolesville Police Department
- Wake County Sherif's Department
- Local Kiwanis, Lions and Roary Clubs
- Granite Falls Swim and Athletic Club

It is important to recognize that not every project has equal importance, and that many improvements in the realm of cycling can be done relatively inexpensively. The figure (Figure 5-1) on the following page illustrates signage, bicycle rack installations, and pavement markings that could be implemented at a fraction of the cost of the total bicycle improvement program outlined herein. Collectively, these improvements would make a noticeable difference in the overall perception of bicycle safety – and commitment to safety – in Rolesville. In short, a shortage of money to complete an important project shouldn't be viewed as a failure – don't let the best be the enemy of the good.

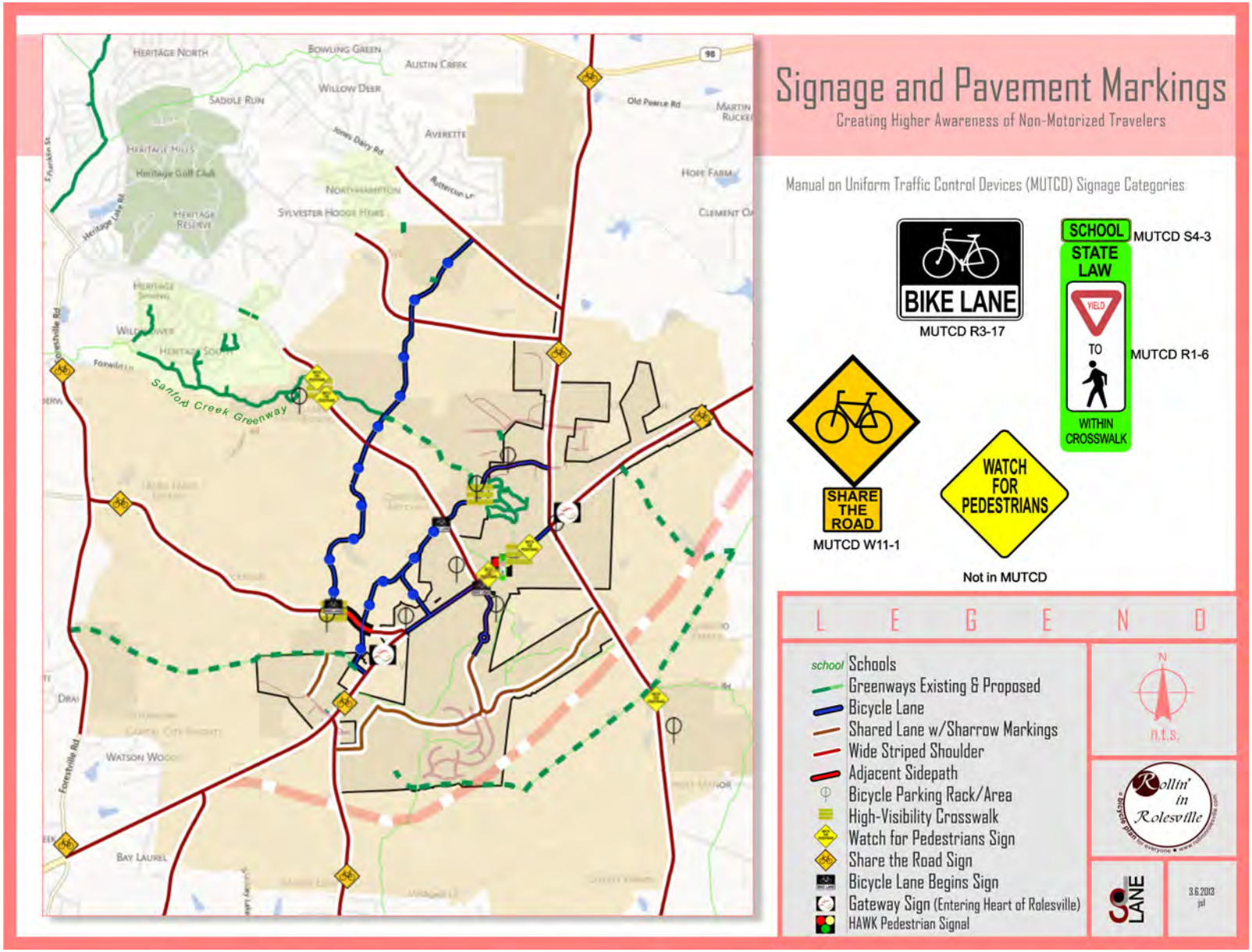


Figure 5-1. Signage and Pavement Marking Recommendations

5.2 Program Evaluation and Phased Schedule

Evaluation is a useful tool for measuring local progress after the adoption of a Plan. Following up on program activities to verify successes and make changes as needed, and tracking key indicators such as crash statistics, can help provide a focus for future implementation and re-evaluate new needs. It is recommended that the Town of Rolesville consider working with the existing Open Space and Greenways Committee and, ultimately, a combined Bicycle/Pedestrian Advisory Committee in collaboration with the Town of Wake Forest, to help implement this Plan, track successes, re-evaluate needs, and help conduct future, joint Plan updates. Key indicators that Town staff, citizens and committee members might track include:

- Number of students walking or biking to school
- Records of pedestrian and bicycle crashes in Rolesville
- Accomplishments in terms of construction and program actions

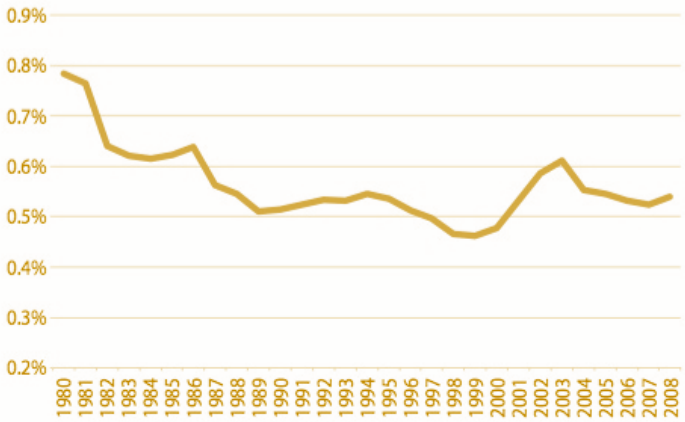
The figure on the next page (Figure 5-2) shows a report card to help track Rolesville's progress in meeting its goals (*notes: 2013 is a sample evaluation; this image is captured from MS-Excel™ spreadsheet tool provided to the Town*).

Evaluator (Staff) Year of Evaluation	Description	(sample) 2013	2014	2015	2016	2017	2018	2019	2020
Projects	*Projects initiated OR completed (from Plan)*								
A	Connector from Jones Dairy Rd. to Burlington Mills Rd.								
B	Rogers Rd. from Main Street to Town limits								
C	Greenway from new collector street to Main St. Park	Yes							
D	Burlington Mills Rd. Bike Lane or Wide Striped Shoulder								
E	Jones Dairy Rd. Wide Striped Shoulder	Yes							
F	Chalks Rd. Wide Striped Shoulder								
G	High Visibility Crosswalk at Rolesville Elementary School								
H	Rolesville Road Wide Striped Shoulder								
I	Jonesville Road Wide Striped Shoulder								
J	Main Street (North & South) Wide Striped Shoulders								
K	Louisbury Road Wide Striped Shoulder								
L	Main Street (Downtown) Improvements (short-term)								
M	Young Street Wide Striped Shoulder								
N	Granite Boulevard Extension / Burlington Mills Realignment								
Programs	*Programs conducted (from Plan)*								
Education: Safety Video Promotion									
Education: Expand the Bicycle Rodeo Program									
Enforcement: Warning Tickets and Follow-Up									
Enforcement: Traffic Calming in the Hands of the People									
Enforcement: Helping the Police		Yes							
Encouragement: Get On Board the Bicycle Train		Yes							
Encouragement: Continue to Develop the St. Patrick's Day Bicycle Parade									
Engineering: Plan Ahead to Participate in NCDOT Improvements									
Encouragement and Education: Collaboration Opportunities with Wake Forest		Yes							
Additional Elements									
Signage	*Other elements by number completed*	0							
Pavement Markings	*Other elements by number completed*	0							
Bicycle-Related Crashes	*Number of crashes in most recent year*	0							
Letter Grade	*A through F with a "+" or "-" based on markings/signage completion*	D-							
Raw Score	*[illegible]*	2.17							

Figure 5-2. Bicycle Plan Reporting (2013 as sample only)

5.3 Program Financing

Greenway and trail facilities are constructed – and therefore funded – through a number of avenues. Funding can be divided into four categories: local, state, federal, and private funding. Rolesville should tap into all of these sources in order to take maximum advantage of the funds that are available. The following are general descriptions of three categories of financing available for greenway and trail construction.



Federal Funding for transportation projects as a share of compared to Gross Domestic Product (GDP) has been generally decreasing since 1980.
(source: Schmitt, Angie, "American's Waning Commitment to Transportation Funding." Streetsblog Network. May 26, 2011)

Local Funding Options. Rolesville does not have a dedicated budget line item for greenway and trail construction that is available each and every year ta known (minimum) amount. Programming projects in an uncertain financial environment makes prioritization of projects more challenging. More importantly, the budget item should be available to quickly match grant or other sources of funds that require a cash match, which frequently amounts to between 20% and 50% of the external funding source. Other locally-driven sources include benefit assessment districts, various bonding instruments, or work with private developers to either require or cost-share in various improvements including right-of-way dedication and construction costs. Greenway "trust funds" administered through local advocacy groups are another option that can help leverage multiple sources of funds to match locally-generated revenues. Purchase of development right programs have become somewhat common, and even transfer of development rights programs are getting a second look in some communities.

State and Federal Funding Options. The amount of state and federal funds available to local governments for all kinds of transportation improvements has generally shrunk in real dollar terms, as fuel taxes that are normally indexed have been frozen at the state level in recent years, with another attempt passing in the N.C. House of Representatives but failing to get through the Senate. Without indexing to inflation, the real value of fuel taxes will continue to drop. However, hazard elimination, Powell Bill, enhancements, and general fund revenues for both

independent (just the greenway or trail project) and incidental (the greenway, trail, sidewalk, or bicycle improvement is "incidental" to the main roadway project) are still available and an important source for many rural communities, in particular.

Grants and Non-Profit Sources. While grants have certainly taken similar hits generally as other revenue sources, most of the ones that were important five or ten years ago are still around. Many of these are used to protect property or stream buffers for environmental preservation purposes, but greenway and trail facilities are often still viable components of grant-related projects. Coordinating volunteer and non-profit groups, perhaps to help maintain and even construct "soft" trails, should not be overlooked as an increasingly important role for advocacy organizations. Cheyenne, Wyoming has created a volunteer manual for would-be greenway volunteers with release forms, guidelines for working in 100-year floodplains, and other actions including their "Adopt-a-Spot" program where volunteers not only pick up trash but can install landscaping, do pruning, and even install amenities. The City of Raleigh's Greenway Volunteer Program is another close-at-hand example. Volunteers must be at least 18 years old and possess a basic knowledge of the greenway system. Being imaginative and catering to the existing groups and their interests, as well as making sure that there is a stable, long-term presence in government that supports volunteer work, is crucial to successfully coordinating and maximizing volunteer efforts.

The following pages describe in more detail the specific financing sources that are the most likely to yield positive results for the Town (and Wake County, an important financing partner as well), although it is not all-inclusive and the "important" sources are coming, going, or changing on a near-constant basis. A list of additional funding sources and discussion is also provided after the main funding sources.

Source	Eligibility	Description	Project Type	More information
Municipal and County Bonds	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	*Revenue, general obligation, special assessment and GARVEE bonds are used by various government entities – after a public referendum approving the bond proposal – to construct a variety of transportation improvements.*	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity Other	NC G.S. 159-43 through 159-79 (GO Bonds)
County Property Tax Increase	■ County Cities / Towns Non-Profits Transit Operators School Districts Other:	*Although any tax increase would be publicly and politically challenging, Wake's relatively low property tax rate of .534/$100 valuation (2012) might make this a more viable option. A number of the greenways in the Rolesville Bicycle Plan are county routes.*	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity Other	NC G.S. 150 § 161.7
County Sales Tax Increase	■ County Cities / Towns Non-Profits ■ Transit Operators School Districts Other:	*Any sales tax increase would require a popular referendum vote by the population of the County. Most counties (76) have the same 2% sales tax rate as Wake in 2012.*	Greenway Bicycle Pedestrian Amenities ■ Connectivity Other	NC Department of Revenue
Municipal or County Service (Business Improvement) District	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	*Cities can form special tax improvement districts for downtowns; counties may apply them anywhere. In both cases, infrastructure is the intended use, which may include transportation projects including sidewalks.*	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity Other	NC G.S. 160A-535 § 153A-300
Tax Increment Financing (TIF)	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	*Generally encouraging redevelopment, TIFs (and synthetic TIFs) use marginal property value increases to pay off debt from private infrastructure investment. Rolesville's downtown streetscape project might be a strong candidate for this source.*	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity Other	NC G.S. 159C-103

Source	Eligibility	Description	Project Type	More info
Occupancy Tax	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	*Wake has a relatively high hotel occupancy tax rate of 6%, in a range of 3% to 6% in almost every county. Uses are very broad as long as they are not applied to the construction of another hotel. In recent years, the hotel occupancy tax revenues are up.*	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities Connectivity Other	NC G.S. 153A-155 § 160A-215
Spot Safety and Hazard Elimination (NCDOT)	■ County ■ Cities / Towns Non-Profits Transit Operators ■ School Districts Other:	*The NCDOT sponsors these three programs through the NC Highway Safety Improvement Program. The Spot Safety program focuses on smaller ($250,000 or less) projects and mentions pedestrian facilities by name. Small urban funds are a similar source, but not often used for trails projects.*	■ Greenway ■ Bicycle ■ Pedestrian Amenities ■ Connectivity ■ Other: Intersections	NCDOT Highway Safety Improvement Program
Powell Bill Funds	County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	*This program is paid to municipalities for the purposes of maintaining or constructing local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways and sidewalks.*	Greenway ■ Bicycle ■ Pedestrian Amenities ■ Connectivity Other: Grade Crossing Closures	NCDOT Powell Bill Program
Conservation Tax Credits	■ County ■ Cities / Towns ■ Non-Profits Transit Operators School Districts ■ Other: State	*Persons donating their land through conservation easements for public trails (among other uses) can receive up to $250,000 or 25% of the fair market value of the land conserved. Credits are not transferable to new property owners.*	■ Greenway Bicycle Pedestrian Amenities Connectivity Other:	One North Carolina Naturally Conservation Tax Credit; NC G.S. 113A-231

Source	Eligibility	Description	Project Type	More info
Land and Water Conservation Fund	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts ■ Other: Tribal	*The LWCF program is managed by NCDENR for acquiring land at a single site with grants up to $250,000 for permanent outdoor recreation uses.*	■ Greenway Bicycle Pedestrian Amenities Connectivity ■ Other: Land	LWCF Overview by NC Division of Parks and Recreation
North Carolina Recreational Trails Program Grant	■ County ■ Cities / Towns ■ Non-Profits Transit Operators School Districts Other:	*NCDENR manages a trails grant program with amounts up to $75,000 with a 25% match requirement. All grants are matched 1:1 with cash, donated property value, or in-kind services.*	■ Greenway Bicycle Pedestrian Amenities Connectivity ■ Other: Land	North Carolina Recreational Trails Program Grant General Information
Clean Water Management Trust Fund	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	*The CWMTF can be used to plan and design greenways or acquire land (fee simple or conservation easement) for them in riparian areas ONLY. Construction costs are not eligible, but utilities are allowed in the corridor.*	■ Greenway Bicycle Pedestrian Amenities Connectivity ■ Other: Land	Clean Water Management Trust Fund
Community Development Block Grant Program	■ County ■ Cities / Towns ■ Non-Profits Transit Operators School Districts Other:	*CDBG funds have been used to construct trail projects, such as the Boulding Branch Greenway in High Point, NC. Amounts are typically between $50,000 and $200,000. Projects should benefit low- and moderate-income persons.*	■ Greenway Bicycle Pedestrian Amenities Connectivity Other:	CDBG Information Website
Parks and Recreation Trust Fund	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other: Public Authority	*NCDENR also matches the venerable PARTF grants, but these go to trail projects only infrequently (the focus being on parks). The matching requirement is 50/50 in cash (no in-kind services) but land value can be used in lieu of cash.*	■ Greenway Bicycle Pedestrian Amenities Connectivity ■ Other: Land	NC Parks and Recreation Trust Fund Website

Source	Eligibility	Description	Project Type	More info
State Transportation Improvement Program Projects (NCDOT)	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other: Tribal	*NCDOT funds projects both incidental to highway construction / widening and independent bicycle/pedestrian projects based on established project selection criteria. Approval of metropolitan or rural planning organizations is required.*	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity ■ Other: Land	NCDOT Bicycle and Pedestrian Transportation Funding Information
Payment-in-Lieu Fees	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	*Communities may choose to allow developers to pay a fee for future improvements required by the government that the development is located within instead of constructing the improvement themselves. Note that private developers can often construct more for less money than their public sector counterparts.*	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity ■ Other: Land	
Foundation Grants	■ County ■ Cities / Towns ■ Non-Profits Transit Operators School Districts Other: Non-Profit Organizations	*Like other grants, foundations issue funds for projects that meet specific requirements – and they are highly competitive. Deadlines, submission requirements, degree of interagency collaboration desired, and match characteristics vary greatly.*	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities Connectivity ■ Other: Education	Bikes Belong International Mountain Biking Association Rails-to-Trails
Safe Routes to Schools	■ County ■ Cities / Towns Non-Profits Transit Operators ■ School Districts Other:	*SRTS funding is distributed by NCDOT for the purpose of funding education programs, school-based audits that lead to infrastructure improvements within two miles of an elementary or middle school. However, recent federal transportation legislation has cast doubt about the security of federal funds for this popular program.*	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities ■ Connectivity ■ Other: Education	SRTS National Center and FHWA Program Guidance Safe Routes To School (SRTS)

Source	Eligibility	Description	Project Type	More info
Federal Recreational Trails Program (FHWA)	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other: Tribal	*NCDENR administers these funds for North Carolina, which received $796,000 in 2012. Funding typically falls into the $10,000 to $30,000 range, and has most often used for trail construction or supporting uses (e.g., parking, restrooms) in our State. See also NC Recreational Trails Program.*	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities Connectivity ■ Other:	NC Recreational Trails Program (NC State Parks) FHWA Recreational Trails Program
Capital Area Metropolitan Planning Organization	■ County ■ Cities / Towns Non-Profits Transit Operators School Districts Other:	*CAMPO administers the LAP Program (LAPP) that can be used to finance 80% of bicycle projects. Scoring criteria include: connectivity, overcome obstacle to cyclists, and address safety concerns and existing demands. Not eligible for improving an existing facility.*	■ Greenway ■ Bicycle ■ Pedestrian ■ Amenities Connectivity ■ Other:	Locally Administered Projects Program

More Funding Sources

While perhaps less suitable than those listed previously, the following sources may also be of interest to the Town.

Local Funding. Currently, Rolesville does not have an annual budget line item specifically for pedestrian improvements. In the future, Rolesville should consider creating a specific annual budget item to set aside funds for improving pedestrian facilities, especially in cooperation with road repaving and improvement projects conducted by NCDOT A specific budget item is the most direct way to ensure that funding for cycling facilities is available, but sometimes a Town's budget may be too limited to finance this work. Pedestrian facilities can also be built through "incidental" projects, by ensuring that such features are constructed with any new projects or improvements, such as parks and recreation facilities,

libraries, schools, and new roads. In addition, future private development should be reviewed for adequate pedestrian access and connections.

Municipalities also often plan for the funding of pedestrian facilities or improvements through development of Capital Improvement Programs (CIP). Typical capital funding mechanisms include the following: capital reserve fund, capital protection ordinances, municipal service district, tax increment financing, taxes, fees, and bonds.

Fees. Three fee options that have been used by local governments to assist in funding pedestrian and bicycle facilities are listed here:

- *Stormwater Utility Fees.* Greenway sections may be purchased with stormwater fees, if the property in question is used to mitigate floodwater or filter pollutants. Stormwater charges are typically based on an estimate of the amount of impervious surface on a user's property. Impervious surfaces (such as rooftops and paved areas) increase both the amount and rate of stormwater runoff compared to natural conditions. Such surfaces cause runoff that directly or indirectly discharges into public storm drainage facilities and creates a need for stormwater management services. Thus, users with more impervious surface are charged more for stormwater service than users with less impervious surface. The rates, fees, and charges collected for stormwater management services may not exceed the costs incurred to provide these services. The costs that may be recovered through the stormwater rates, fees, and charges includes any costs necessary to assure that all aspects of stormwater quality and quantity are managed in accordance with federal and state laws, regulations, and rules.
- *Streetscape Utility Fees.* Streetscape Utility Fees could help support streetscape maintenance of the area between the curb and the property line through a flat monthly fee per residential dwelling unit. Discounts would be available for senior and disabled citizens. Non-residential customers would be charged a per foot fee based on the length of frontage on streetscape improvements. This amount could

be capped for non-residential customers with extremely large amounts of street frontage. The revenues raised from Streetscape Utility fees would be limited by ordinance to maintenance (or construction and maintenance) activities in support of the streetscape.

Exactions. Exactions are similar to impact fees in that they both provide facilities to growing communities. The difference is that through exactions it can be established that it is the responsibility of the developer to build the greenway or pedestrian facility that crosses through the property, or adjacent to the property being developed.

Facility Maintenance Districts. Facility Maintenance Districts (FMDs) can be created to pay for the costs of on-going maintenance of public facilities and landscaping within the areas of the Town where improvements have been concentrated and where their benefits most directly benefit business and institutional property owners. An FMD is needed in order to assure a sustainable maintenance program. Fees may be based upon the length of lot frontage along streets where improvements have been installed, or upon other factors such as the size of the parcel. The program supported by the FMD should include regular maintenance of streetscape of off road trail improvements. The municipality can initiate public outreach efforts to merchants, the Chamber of Commerce, and property owners. In these meetings, Town staff will discuss the proposed apportionment and allocation methodology and will explore implementation strategies. The municipality can manage maintenance responsibilities either through its own staff or through private contractors.

State Transportation Improvement Program (STIP). This program is the overall funding source for study, design, and construction of major transportation projects, including pedestrian facilities, in the state. Frequently, projects funded by the STIP are also partly funded by other sources, including matching funds from local municipalities. Pedestrian facilities are eligible for funding from this program as independent projects separate from a roadway construction, widening, or some other sort of

roadway work, but one of the most cost-effective and efficient ways to gain funding for pedestrian facility construction is to incorporate them as incidental to a larger project. Overall, most pedestrian accommodations within the state are made as incidental improvements.

In North Carolina, the Department of Transportation, Division of Bicycle and Pedestrian Transportation (DBPT, or "Division") manages the Transportation Improvement Program (TIP) selection process for independent bicycle and pedestrian projects. Projects programmed into the TIP as "independent projects" are those that are not related to a scheduled highway project. "Incidental projects" – those related to a scheduled highway project – are bicycle and pedestrian accommodations, such as wide shoulders, included as incidental features of highway projects. In addition, pedestrian-safe railings are becoming a more standard feature of all highway construction – but should be expected only on designated routes. Most bicycle and pedestrian safety accommodations built by NCDOT are included as part of scheduled highway improvement projects funded with a combination of National Highway System funds and State Highway Trust Funds.

The DBPT has an annual budget of about $6 million. Eighty percent of these funds are from STP-Enhancement funds, while the State Highway Trust Fund provides the remaining 20 percent of the funding. Each year, the DBPT regularly sets aside a total of $200,000 of TIP funding for NCDOT to fund projects such as training workshops, pedestrian safety and research projects, and other pedestrian needs statewide. Those interested in learning about training workshops, research and other opportunities should contact the DBPT directly for information.

Below are other relevant state-guided programs and grants.

- Governor's Highway Safety Program (GHSP) – The mission of the GHSP is to promote highway safety awareness and reduce the number of traffic crashes in the state of North Carolina through the planning and execution of safety programs. GHSP funding is provided through an

annual program, upon approval of specific project requests. Amounts of GHSP funds vary from year to year, according to the specific amounts requested. Communities may apply for a GHSP grant to be used as seed money to start a program to enhance highway safety. Once a grant is awarded, funding is provided on a reimbursement basis. Evidence of reductions in crashes, injuries, and fatalities is required. For information on applying for GHSP funding, visit: www.ncdot.org/programs/ghsp/.

- Community Development Block Grants (CDBG) – CDBG funding is intended to help communities provide housing, create suitable living environments, and expand economic opportunities primarily in low- and medium-income areas. Rolesville could use these grant funds for recreation facilities and planning. It should be noted that CDBG Funds are highly competitive and the requirements are extensive. For more information, please see: www.hud.gov/offices/cpd/communitydevelopment/programs.
- NC Adopt-A-Trail Grant Program. This program, operated by the Trails Section of the NC Division of State Parks, offers annual grants to local governments to build, renovate, maintain, sign and map and create brochures for pedestrian trails. Grants are generally capped at about $5,000 per project and do not require a match. A total of $108,000 in Adopt-A-Trail money is awarded annually to government agencies. Applications are due during the month of February. For more information, visit: http://ils.unc.edu/parkproject/trails/grant.html.
- Natural Heritage Trust Fund. This trust fund, managed by the NC Natural Heritage Program, has contributed millions of dollars to support the conservation of North Carolina's most significant natural areas and cultural heritage sites. The NHTF is used to acquire and protect land that has significant habitat value. Some large wetland areas may also qualify, depending on their biological integrity and characteristics. Only certain state agencies are eligible to apply for this fund, including the Department of Environment and Natural Resources, the Wildlife Resources Commission, the Department of Cultural Resources and the Department of Agriculture and Consumer Services. As such, municipalities must work with State level partners to access this fund.

Additional information is available from the NC Natural Heritage Program. For more information and grant application information, visit www.ncnhtf.org/.

- Ecosystem Enhancement Program. Developed in 2003 as a new mechanism to facilitate improved mitigation projects for NC highways, this program offers funding for restoration projects and for protection projects that serve to enhance water quality and wildlife habitat in NC. Information on the program is available by contacting the Natural Heritage Program in the NC Department of Environment and Natural Resources (NCDENR). For more information, visit www.nceep.net/pages/partners.html or call 919-715-0476.
- Conservation Reserve Enhancement Program (CREP). This program is a joint effort of the North Carolina Division of Soil and Water Conservation, the NC Clean Water Management Trust Fund, the Ecosystem Enhancement Program (EEP), and the Farm Service Agency - United States Department of Agriculture (USDA) to address water quality problems of the Neuse, Tar-Pamlico and Chowan river basins as well as the Jordan Lake watershed area. CREP is a voluntary program that seeks to protect land along watercourses that is currently in agricultural production. The objectives of the program include: installing 100,000 acres of forested riparian buffers, grassed filter strips and wetlands; reducing the impacts of sediment and nutrients within the targeted area; and providing substantial ecological benefits for many wildlife species that are declining in part as a result of habitat loss. Program funding will combine the Federal Conservation Reserve Program (CRP) funding with State funding from the Clean Water Management Trust Fund, Agriculture Cost Share Program, and North Carolina Wetlands Restoration Program. The program is managed by the NC Division of Soil and Water Conservation. For more information, visit www.enr.state.nc.us/dswc/pages/crep.html.
- Agriculture Cost Share Program. Established in 1984, this program assists farmers with the cost of installing best management practices (BMPs) that benefit water quality. The program covers as much as 75 percent of the costs to implement BMPs. The NC Division of Soil and

Water Conservation within the NC Department of Environment and Natural Resources administers this program through local Soil and Water Conservation Districts (SWCD). For more information, visit www.enr.state.nc.us/DSWC/pages/agcostshareprogram.html or call 919-733-2302.

- North Carolina Health and Wellness Trust Fund. The NC Health and Wellness Trust Fund was created by the General Assembly as one of 3 entities to invest North Carolina's portion of the Tobacco Master Settlement Agreement. HWTF receives one-fourth of the state's tobacco settlement funds, which are paid in annual installments over a 25-year period. Fit Together, a partnership of the NC Health and Wellness Trust Fund (HWTF) and Blue Cross and Blue Shield of North Carolina (BCBSNC) established the Fit Community designation and grant program to recognize and rewards North Carolina communities' efforts to support physical activity and healthy eating initiatives, as well as tobacco-free school environments. Fit Community is one component of the jointly sponsored Fit Together initiative, a statewide prevention campaign designed to raise awareness about obesity and to equip individuals, families and communities with the tools they need to address this important issue. All North Carolina municipalities and counties are eligible to apply for a Fit Community designation, which will be awarded to those that have excelled in supporting physical activity, healthy eating and tobacco use prevention in communities, schools, and workplaces.

  Designations are valid for two years, and designated communities may have the opportunity to reapply for subsequent two-year extensions. The benefits of being a Fit Community include heightened statewide attention that can help bolster local community development and/or economic investment initiatives (highway signage and a plaque for the Mayor's or County Commission Chair's office will be provided), as well as the use of the Fit Community designation logo for promotional and communication purposes.

The application for Fit Community designation is available on the Fit Together Web site: http://www.fittogethernc.org/home.aspx. Fit Community grants are designed to support innovative strategies that help a community meet its goal to becoming a Fit Community. Eight to nine, two-year grants of up to $30,000 annually will be awarded to applicants that have a demonstrated need, proven capacity, and opportunity for positive change in addressing physical activity and/or healthy eating.

Private Funding and Partnerships. Another method of funding pedestrian systems and greenway trails is to partner with public agencies, private companies and/or not-for-profit organizations. Contrary to NCDOT and federal funding, most private funding sources offer limited grants. In addition, public-private partnerships engender a spirit of cooperation, civic pride and community participation. The key to the involvement of private partners is to make a compelling argument for their participation. Major employers and developers should be identified and provided with a "Benefits of Walking" handout for themselves and their employees. Very specific routes that make critical connections to place of business would be targeted for private partners' monetary support following a successful master planning effort. Potential partners include major employers that are located along or accessible to pedestrian facilities such as multi-use paths or greenways. Name recognition for corporate partnerships could be accomplished through trailhead signage or interpretive signage along greenway systems. Utilities often make good partners and many trails now share corridors with them. Money raised from providing an easement to utilities can help defray the costs of maintenance. It is important to have a lawyer review the legal agreement and verify ownership of the subsurface, surface or air rights in order to enter into an agreement. The following paragraph provides a description of some private funding sources that Rolesville might consider.

- 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 work days. Volunteers can also be used for fund-raising, maintenance, and programming needs.
- Private Foundations and Organizations. Many communities have solicited greenway funding assistance from private foundations and other conservation-minded benefactors. Below are a few examples of private funding opportunities available in North Carolina.
  - *Z. Smith Reynolds Foundation.* This Winston-Salem based Foundation has been assisting the environmental projects of local governments and non-profits in North Carolina for many years. The foundation has two grant cycles per year and generally does not fund land acquisition. However, the foundation may be able to support municipalities in other areas of greenways development. More information is available at www.zsr.org.
  - *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. In addition, the foundation manages various scholarship programs statewide. Web site: http://nccommunityfoundation.org.

- *National Trails Fund.* In 1998, the American Hiking Society created the National Trails Fund, the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting and maintaining foot trails in America. Each year, 73 million people enjoy foot trails, yet many of our favorite trails need major repairs due to a $200 million in badly needed maintenance. National Trails Fund grants give local organizations the resources they need to secure access, volunteers, tools and materials to protect America's cherished public trails. For 2005, American Hiking distributed over $40,000 in grants thanks to the generous support of Cascade Designs and L.L. Bean, the program's Charter Sponsors. 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. The American Hiking Society will consider project types such as acquisition of trails and trail corridors, building and maintaining and constituency building around specific trail projects including volunteer recruitment and support. For more information on the National Trails fund, consult: www.americanhiking.org/alliance/fund.html.

5.4 Conclusion

Using this Bicycle Plan as a guide, the Town of Rolesville should be able to create a better, safer network of sidewalks, greenway trails, paths, and crossings for pedestrians. The Town's next steps should begin to immediately address the short-term priority program, policy, and project recommendations. At the same time, the Town should also start to lay the groundwork for the longer-term recommendations by developing relationships with potential partners such as the Rolesville Chamber of Commerce, the Wake County Health Department, and by starting to budget for future projects. Most importantly, the Town should continue its efforts to raise awareness about the importance of making a community more "bikable" in order to continue to cultivate support for more pedestrian improvements and programs. Residents, visitors, and local

leaders should be familiar with the economic, health, and environmental benefits of a community in which there is less dependence on automobiles and more reliance on foot travel as not only a form of recreation, but also as a form of transportation.

As a small Town realizing significant growth and development, Rolesville is at a critical crossroads that has to be negotiated in order to develop a better, safer, and more encouraging bicycle community. The Town should capitalize on its location to reinforce its existing pedestrian infrastructure with new projects and improvements. With careful planning, deliberate steps and persistence, Rolesville can become a more bike-friendly community.

Appendix Engaging Rolesville

The scale of bicycling is personal – usually, we have one person per bicycle independently controlling his or her own destiny. Speeds are slower than in an automobile, and the "feel" of the riding surface; the details of what we notice visually; and the sounds of approaching cars or the more pleasant sounds of a lawn mower, children laughing, or church bell make the experience of riding a bicycle special. In order to grasp these details, the experiences of other individuals that work, live, and play in a study area must be consulted. The public engagement plan for the Rolesville Comprehensive Bicycle Plan was designed to gather that detailed information, and emphasized five public involvement "projects:"

- Creation of a Steering Committee dedicated to seeing the Plan through to completion and offering their insights in a very detailed fashion;
- Development of a project website (www.rollininrolesville.com) that helped communicate events as well as preliminary information to the public and Steering Committee;
- Conducting two public events that would allow the general populace direct contact with the consultant and provide a venue for collecting information from the public;
- Creating surveys (2) that could be used in conjunction with the other methods to enhance consistent feedback from participants; and
- Presenting the Plan at local Planning Board and Town Council meetings during the review and adoption process to allow final comment by citizens as well as commentary from elected and appointed officials to incorporate into the final Plan document.

In addition, the draft Plan was submitted to the NCDOT Division of Bicycle and Pedestrian Transportation (DBPT) (and one drive-around review of the streets was conducted with Division Staff as well), Wake County, and the City of Raleigh and Town of Wake Forest, both of which share political boundaries with Rolesville. The following sections summarize the methods and results from each of these outreach methods and how the Plan responded to each of them.

A.1 Steering Committee

The Steering Committee met a total of three times over the course of the Project. Each meeting was advertised in advance with a published agenda emailed to each member and placed on the project website (refer to Section A.2, below). Meetings normally lasted two hours, and included a presentation by the Consultant followed by at least one

"hands-on" exercise conducted with the Steering Committee. The impact of the Steering Committee was considerable: this group identified origins/destinations, vision/goals, and review project, program and policy recommendations at the same level of detail as the Town staff.

The following are the meeting summaries from each of the three meetings.

Summary – Steering Committee Meeting No. 1

April 30, 2012 | 6:30pm | Rolesville Community Center | 514 Southtown Circle | Rolesville | NC

Attendees (Affiliation)
Angie Coyle, Citizen (BB&T)
Patrick Delaney (Granite Falls Athletic Club)
J.G. Ferguson, Town of Rolesville (Parks & Recreation)
Gil Hartis – Town Board of Commissioners
Timothy Hellwig, Citizen (Open Space & Greenways Committee)
Mike Honkomp, Citizen (Parks & Recreation Advisory Board)
Thomas Lloyd, Town of Rolesville (Planning)
Scott Lane, Consultant (J. S. Lane Company, LLC)
Paul May, Citizen
Bob Mosher, NCDOT (Bicycle and Pedestrian)
Mark Powers, Town of Rolesville (Planning Board)
Tim Stoker, Town of Rolesville (Police Department)
Mike Szafran, Citizen (Wall Creek Neighborhood)
Alan Walker, Citizen (Wall Creek Neighborhood)

1. Introductions
Discussion: Please tell us about yourself, why you wanted to be a part of this Committee, and one hopeful outcome or goal of this project.

Mr. Lane and Mr. Lloyd welcomed the participants to the first Steering Committee meeting, and Mr. Lloyd noted that the project is funded in part by NCDOT through a grant. The participants went around the room and talked about early or current cycling experiences as well as what they would like to see developed as part of the planning process, which are bulleted below.

- Connect streets and other bicycle facilities together to create better connectivity with schools, parks, shopping and residences (+9)
- Better off-road facilities, like greenways and soft trails (+8)
- Coordinate the Bicycle Plan with other plans/policies as well as anticipated private sector developments (+8)
- Better on-road facilities, such as bicycle lanes, wide outside lanes and shoulders (+8)
- Increase cyclist safety(+5)
- Education to teach drivers and cyclists about proper behavior and safety (+4)
- Provide alternatives to single-occupant automobile travel (+2)
- Invest in long-term improvements (+1, -2)
- Increase awareness of the potential for cycling for fitness (-2)
- Better accommodations for long-distance riders (-5)

The participants were also asked later to rate their favorite objectives with white chips (one white chip = one point shown in parentheses) and their least favorite objectives (red chip = one negative point shown in parentheses above).

Mr. Mosher discussed the history of NCDOT's sponsorship of the bicycle and pedestrian grants, noting that over 100 bicycle or pedestrian plans had been created. The importance of the plan is to make sure that the community thinks about its cycling priorities, as well as to communicate those priorities accurately back to NCDOT.

2. Project Scope of Work

Discussion: The Consultant will walk us through the adopted scope of work, including the role of the Steering Committee and your responsibilities during the course of the project.

Mr. Lane reviewed the project scope of work for the project, and discussed projects, policies and programs, as well as how all three were needed. The current meeting would focus on the goals that the group would identify; future meetings would lay out suggested projects and review draft documents.

He continued by outlining the responsibilities of the Steering Committee, which would require approximately five meetings (one of which might be combined with a public workshop). The Committee's input would be required on goals, projects, programs, and policies, as well as prioritizing the many recommendations that would come from the Plan since there isn't enough money to address every need.

3. Prioritizing Our Goals

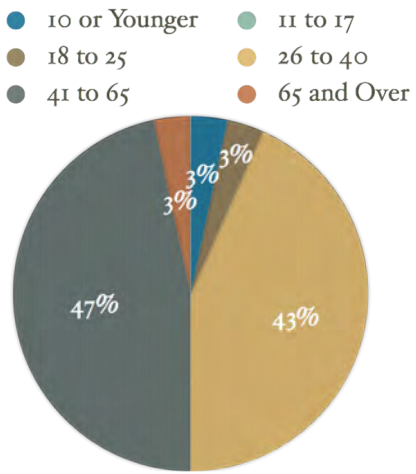
Discussion: We'll stretch our legs and prioritize our goals using a high-tech approach.

Mr. Lane reviewed various types of bicycle (e.g., road, mountain, hybrid, etc.) and types of cyclist (beginner, medium, and advanced) and how various types of facilities (bicycle lane, wide roadway shoulders, sharrow markings, etc.) as well as ancillary facilities (e.g., bicycle parking) accommodate these cyclists.

Mr. Lane asked each person to show how they would prioritize the objectives identified when they introduced themselves. (The results are shown in item one of this agenda.) Mr. Lane noted that in the next meeting they would review the results, as well as goals and a vision statement that would be created from these prioritized objectives as well as what we've learned from the preliminary survey.

4. Preliminary Results from the Public

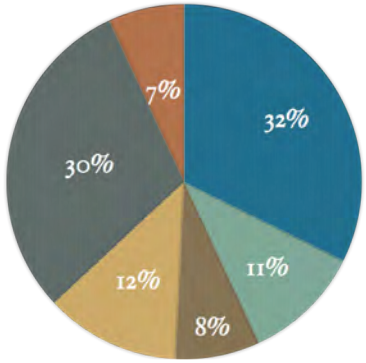
Discussion: We've already been working at gathering input from the public through a survey distributed at the St. Patrick's Day (Bicycle) Parade, and its on-line counterpart (www.rollinginrolesville.com).

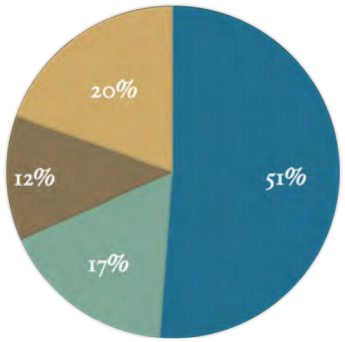


Mr. Lane reviewed the results from the survey, noting that additional surveys would potentially change the results.

←Of the 60 surveys received, none were from teenagers (11 to 17 years old); 90% were from people aged 26 to 65.

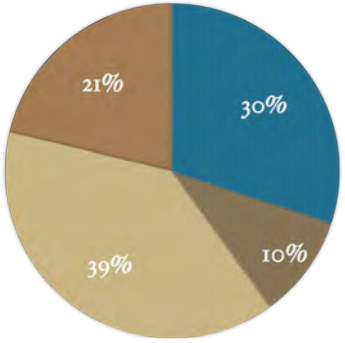
Most of the participants cited either (or both) accessing parks (30%) or cycling for exercise as their main reasons for riding a bicycle. Some people noted that reaching shopping (12%) or school (11%).➔





➔When asked how frequently they ride, respondents mostly (51%) cited that they ride 1-2 times per week. However, one-fifth of the respondents cited that they rode less than once each year.

Respondents stated that the main reason that they don't ride more is because of a lack of connectivity (39%) to places that they want to go, and that cars travel too fast (30%). Other responses included not having a bicycle (10%) and miscellaneous responses (21%) that included aggressive dogs and a lack of time (three respondents). ➔



The final questions dealt with helmet use – 62% of people asked said they wore a bicycle helmet. Of the 38% that don't wear a helmet, the main reason (79%) said that they

don't own a helmet.
Some respondents also wrote in additional comments, which are listed below in no particular order.

- I would ride more should we have safer, better ways to ride distances and especially safe areas.
- Speeding is a huge problem in neighborhoods and on 401. I'm thinking that accidents will go up without a real crack down on speeders.
- Ecstatic about this news! This would be wonderful attraction for our "little" town.
- Would love to see Rolesville more bicycle friendly.
- I love riding my bike for exercise and definitely ride out on the back roads, my only concern is the traffic and that cars are not always "nice" to bike riders.
- This is a great idea for Rolesville. When the Bypass is finished, biking in Rolesville should be much easier, let's plan for that now, so things will be in place when the Bypass is completed. Also, connecting neighborhoods and parks with Greenway trails is a great amenity for any community.
- Would be great if you can ride and/or walk safely through all of Rolesville. Connect all the neighborhoods with Schools and Parks.

5. Future Workflow and Upcoming Tasks

Discussion: We'll talk about the best meeting days and times for you, and what we would like to do at our next meeting.

Mr. Lane emphasized the following items as upcoming work:

Complete the survey if you have not already done so.
Hand out blank surveys to at least five people you know.
Set date for second meeting 4-6 weeks from now.
The Consultant will collect data and prepare base mapping, as well as collect photographs and videos in anticipation of starting to identify facilities.

Other members of the group noted that two underpasses (culverts) had been designed into the Rolesville (401) Bypass to accommodate pedestrian and cyclist crossings.

Mr. Lane invited members to go on a small, casual group ride if they were interested, and suggested that they consider involving a school in some way, such as conducting a bicycle safety clinic. The law enforcement representative said that the Town hosts bicycle rodeos, but that attendance varies greatly.

Summary – Steering Committee Meeting No. 2

July 30, 2012 | 6:30pm | Rolesville Town Hall | 514 Southtown Circle | Rolesville | NC

Attendees (Affiliation)
Patrick Delaney (Granite Falls Athletic Club)
J.G. Ferguson, Town of Rolesville (Parks & Recreation)
Melissa Guilbeau, Consultant (Lagniappe Planning)
Gil Hartis – Town Board of Commissioners
Timothy Hellwig, Citizen (Open Space & Greenways Committee)
Thomas Lloyd, Town of Rolesville (Planning)
Scott Lane, Consultant (J. S. Lane Company, LLC)
Paul D. May, Resident, Hampton Pointe Neighborhood
Mark Powers, Town of Rolesville (Planning Board)
Tim Stoker, Town of Rolesville (Police Department)
Mike Szafran, Citizen (Wall Creek Neighborhood)

1. Recap

Discussion: We'll talk about what we did at the first meeting and our current status in the project, and anything that you would like to see addressed in the Plan. This will become a standing item at our meetings.

Mr. Lane reviewed the work completed at the last Steering Committee meeting (April 30) and discussed the work that the Consultant Team had been doing in the interim (field surveys, drafting of existing conditions, base mapping).

Mr. Lane also asked the group what they considered as "must haves" in the Rolesville Bicycle Plan to make it a comprehensive success:

- Recreational riding facilities (e.g., greenways)
- Implementation and financing resources identified

- Discuss bicycle lanes for running errands
- User-friendly bicycle systems and facilties
- Safety action plan
- Physical space to ride in (with cars)
- Explore grant monies for financing construction
- Create a modern, complete plan for the Town
- Create projects that are competitive for financing in the eyes of NCDOT
- Safe facilities for the "not-so-hardcore" riders
- Create programs to encourage safe bicycle riding for both motorists and pedestrians

2. Review of the First Plan Sections

Discussion: We'll distribute and discuss the Plan sections, which include an overview, existing conditions and (draft) visions/goals for the Plan.

Mr. Lane reviewed the draft sections of the Plan presented in the Committee's binder: reasons for cycling, public opinion, existing conditions on major facilities, and the vision/goals for the Plan. He further explained that his overview was simply to provide them with an introduction to the content this evening, not to replicate the full contents of the draft report.

The group discussed the important of having roadways wide enough to accommodate parents with kids in trailers; double-file riding groups; and how wide outside lanes may stay cleaner due to the passing of cars (as compared to bicycle lanes). Mr. Lane noted that some neighborhoods did not use on-street parking while others used it extensively; the group noted that some neighborhood associations may prohibit on-street parking. The only known bicycle parking apart from schools was located at Main Street Park.

Mr. Lane discussed how the Vision and Goals were produced, noting that the keywords developed by the Steering Committee at their first meeting were instrumental in generating both the goals and the vision statement for the Plan. The goals of the Rolesville Bicycle Plan are:

- Our Town will be better connected and accessible by bicycle than it is today.
- Our Town will feature on-road bicycle facilities that connect us to places both within and near our borders in part to provide alternatives to making every trip with a car.
- Our Town will grow our greenway and trail system, and dedicate time and resources to that end.

- Our Town will engage our residents proactively to ensure that everyone – motorists and cyclists alike – will be respectful and aware of each other to ensure the safety of every cyclist.
- Our Town will consider bicycling and bicycle accommodations in every new development review, policy, ordinance, and resolution adopted.

The Vision Statement is:

Rolesville will be a Town where it is safe to ride a bicycle both on and away from the roads as part of an integrated policy framework and transportation system that connects us with each other and the places we want to reach.

3. Developing Projects

Discussion: The committee will break into 2-3 "teams" to identify origins and destinations on maps

(This item was combined with agenda item number four.) Mr. Lane reviewed some of the information from the previous meeting concerning the purpose of different bicycle facility types, noting that the group would be suggesting on- and off-road solutions to connecting origins and destinations this evening. Mr. Lane also led a discussion with the group concerning the death of Steve Jordan, a cyclist struck and killed on US 401 south of Rolesville on July 4th. The group noted that no treatment could make US 401 very safe, although wider outside lanes, adjacent sidepaths (although with concerns about driveway conflicts), and a separate path were addressed as alternatives. Mr. Lane also led the group in a safety discussion with four true/false questions concerning the most recent facts on cycling fatalities and accident statistics.

The group prepared a map showing origins (green dots), destinations (red dots) and on-road (red lines) and off-road (green lines) connections. Figure 1 on the following page illustrates the outcome of these initial recommendations. Many of the destinations were along Main Street. One group focused more on destinations outside of Rolesville and reaching them via the major arterials, while the other group focused more on the core of Rolesville and building both on- and off-road facilities to reach them.

4. More About Facility Types

Discussion: Mr. Lane will discuss the different kinds of bicycle facilities, as well as ways of improving safety.

(This item was combined with agenda item number three.)

5. Future Workflow and Upcoming Tasks

Discussion: We'll discuss the upcoming policy and program elements of the draft Plan.

Mr. Lane briefly discussed the upcoming work of the Committee, noting that preliminary project recommendations, policy and program discussions would be the focus of the third Steering Committee Meeting. He also asked the group to consider public venues to present the draft Plan when it became ready.

The meeting adjourned at 8:20pm.

Summary – Steering Committee Meeting No. 3

September 10, 2012 | 6:30pm | Rolesville Board Chambers| 502 Southtown Circle | Rolesville | NC

1. Recap

Discussion: We'll discuss what we accomplished at the second meeting, and move into the recommendations that we considered for facilities at this meeting.

No one presented any major new issues from the prior meeting or notes.

2. Review of the Physical (Project) Recommendations

Discussion: We'll discuss the project recommendations and make any additional adjustments.

Most comments created by the Committee related to the proposed improved routes. The Committee did have a couple of additional locations for bicycle racks that are in place. Mr. Mosher noted the west side of town and lack of north-south connectivity for a bicycle route considering the east-west routes is 45 mph speed limits and there is a draw with the school complex. The group discussed the issue and noted that the development characteristics in the middle of that area stem from an old 1970s county subdivision where the parcels are not likely to redevelop in a coordinated manner.

The group discussed the utility corridor on the south side of town and potential to become either a greenway or location for some mountain bike trails. One member of the group mentioned that the utility company has caught people walking on it and that they are not happy when that happens.

Main Street: The Committee expressed a desire to develop two tiers of recommendations - 1) Short-term improvements for re-striping, signage, etc.; 2) Long-term more substantial improvements as noted in the design plan in the document. Seek a pre- / post study on the route prior to the bypass opening to gauge volumes, turning movements, speeds, other characteristics, perhaps via CAMPO and/or NE Area Study that is happening shortly.

Mr. Lloyd noted that all of the Town's development policies hinge on the impacts of the bypass, saying it feels like the Town is in limbo until that opens.

3. Developing Programs and Policies

Discussion: The committee will review suggested programs and policies developed and presented by the consultants.

The Committee liked the idea of recommending that the Town organize an annual bicycle event, noting the criterium in Wake Forest or similar community rides (10 mi., 30 mi., 60 mi. distances to accommodate different skill sets of riders).

The Committee also mentioned the idea of having a walk/bike/run event on the US 401 Bypass before it

officially opens; perhaps a Ciclovia-type event on Main Street annually when Bypass opens.
Mr. Kostelec noted that there is a missing link in education for greenway use; we have bicycle rodeos for kids and TS 101 for adults focused on road-riding. The greenway system needs to have a comparable educational component.

Also noted was the fact that Asheville has a program where they purchased bicycle lights for police officers to give to people who are riding at night without lights. The Committee also favored this idea.

Mr. Lloyd noted that the Town does have an Overlay District in place similar to what is recommended.

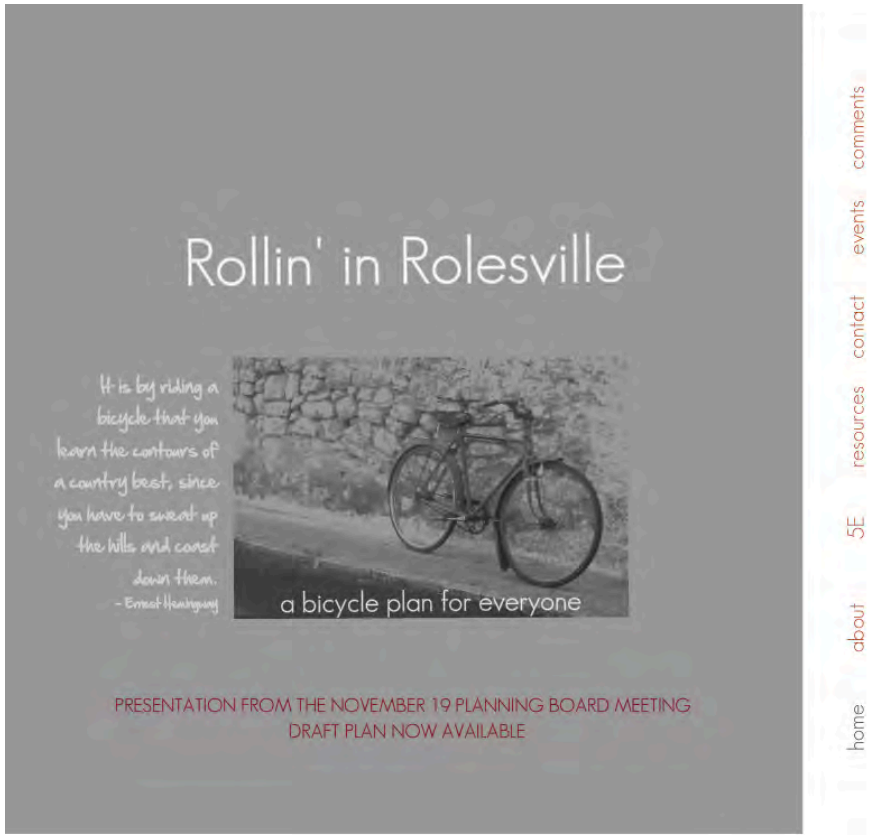
4. Future Workflow and Upcoming Tasks

Discussion: We'll discuss how to advertise the plan and its remaining pieces.

When asked about the potential for an upcoming festival or other event to introduce the draft Plan for comments, the Committee made several suggestions. The Committee noted the Fall Festival and the Chamber's 5k/10k event as potential events for outreach. They also suggested tying into the HOAs, which have meetings and newsletters that cover a large number of the residents. There is a Saturday morning bike ride out of Heritage and a Triathlon group that meets by Granite Falls. Either of these groups could be instrumental in advertising the Plan.

A.2 Project Website

The project website (www.RollinInRolesville.com) was constructed in the first month of the Project and maintained throughout the planning process. It was active for approximately one year: January 2012 through January 2013. The activities included posting a video/simulation; meeting agendas and summaries; project resources and objectives; contact information; and preliminary draft plan components. A blog page was also included but not heavily utilized, although the Consultant did note major occurrences in this location. The utility of the project website was mainly to communicate information to the Steering Committee and serve as a document repository.



A.3 Public Events

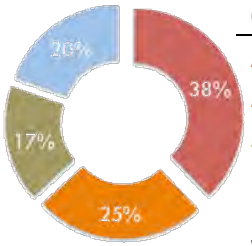
Apart from the actual Plan adoption process by the Town of Rolesville (see Item A.5, below), two public events were attended in an attempt to gather direct information from the public. These two venues were chosen instead of a dedicated public meeting because (a) the events have had good historical participation; and (b) surveys and other information could be created that fit into the overall event framework. These events shaped the Plan directly by influencing projects such as the crossing treatment on Main Street near the Elementary School and Park, and indirectly by generating survey data that was used to inform the Steering Committee and influence project priorities.

The St. Patrick's Day Bicycle Parade held on July 12, 2012 was especially relevant since children and adults were invited to bring their bicycles to the event. This event is popular in Rolesville, and is actually mentioned in the program section of the Plan in terms of ways of enhancing the benefits and goals of the Bicycle Plan. A member of the consulting team was present to distribute postcard-style surveys to people attending the event, and over 60 surveys were collected this way. People that completed and returned a survey were eligible to win a $50 gift certificate at a local restaurant as well.

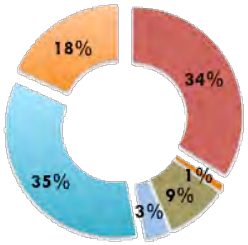
The Fall FunFest event was held on November 5, 2012. Since the atmosphere at this event was more oriented towards a crafts fair, a booth was set up by the Town and Consultant to engage people in learning more about the Plan and to provide a venue to offer their comments. A digital survey kiosk, looping summary video, five copies of the draft Plan, and draft Recommendations poster were on display. Staff also conducted demonstrations of a bicycle blender, and offered free smoothies to anyone that completed a survey. Approximately 20 surveys were completed at this event.

A.4 Survey Results

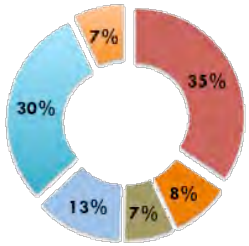
Since two versions of the survey were distributed at two different times but contained several questions that were the same or similar, the results of the surveys are presented as one. The maximum number of respondents was 87 for any question.



Check the one answer that best describes how often you bicycle.		
At least 1-2 times per week	33	38%
At least 1-2 times per month	22	25%
At least 1 to 2 times per year	15	17%
Less than once a year	17	20%

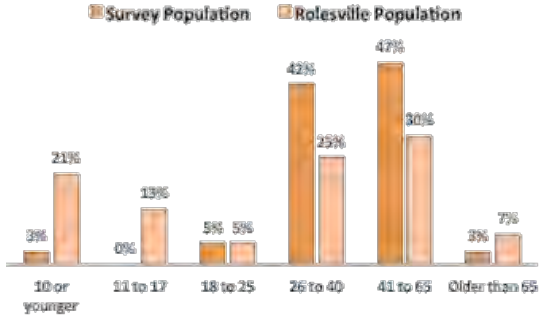


What prevents you from riding a bicycle more often?		
Automobile traffic is too fast	39	34%
Don't know how to ride	1	1%
Don't have a bicycle	10	9%
Unable to ride a bicycle	4	3%
Not easy connections to places I want to go	40	35%
Other	21	18%



Check the places where you bike now or would like to ride a bicycle.		
Park	57	35%
School	14	8%
Work	12	7%
Shopping	21	13%
Exercise	49	30%
Other	12	7%

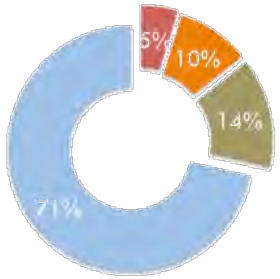
Please tell us your approximate age.	Survey Population	Rolesville Population*
10 or younger	3%	21%
11 to 17	0%	13%
18 to 25	5%	5%
26 to 40	42%	25%
41 to 65	47%	30%
Older than 65	3%	7%



Presented for comparative purposes; source: 2010 U.S. Census

Do You Think that If the Plan Were Implemented, It Would Make Bicycling Better/Easier/Safer than It is Right Now? (n=21*)

No! This Plan Won't Help at All	1	5%
Not Sure...	2	10%
Yes, This Plan Will Make Biking Somewhat Better	3	14%
Yes! This Plan Will Make Biking a Lot Better	15	71%



Note: This question was only asked of the 21 people who took the survey at the Fall FunFest after the Draft Plan had been completed.

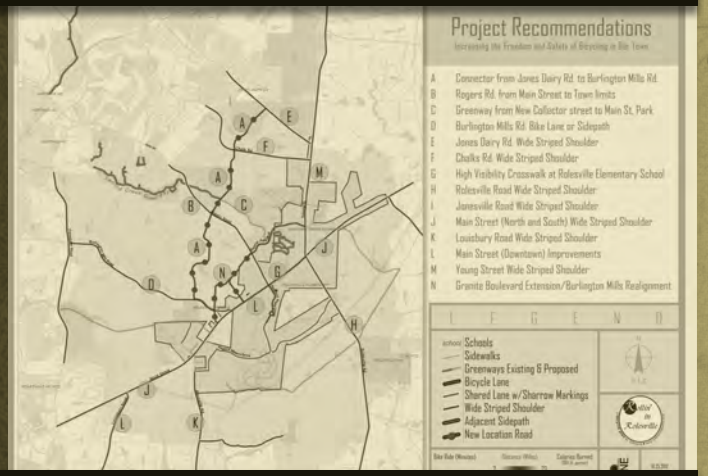
A.5 Plan Review and Adoption

The Rolesville Comprehensive Bicycle Plan was reviewed by the Planning & Zoning Board on November 19, by the Town Commissioners on February 4, 2013; and again for a public hearing on February 19th. At the November 19th meeting, Thomas Lloyd, Planning Director, presented the Plan to the Planning & Zoning Board, noting that the Plan contained recommendations for physical improvements as well as program and policy changes. Mr. Westbrook, Member of the Board, asked about bicycle lanes and paths, and asked who has the final authority on the Plan. Mr. Lloyd responded that additional changes could be made even after the Town adopts the Plan by a vote of Town Commissioners.

The Town Commissioners heard a presentation by Scott Lane, Project Manager of the consulting team for the Plan, which outlined the public engagement process, purposes, and recommendations of the planning process. Mr. Lane acknowledged the work of the Town staff as well as the Steering Committee that reviewed and provided recommendations for the Plan. Mr. Lane responded to inquiries concerning the use of a HAWK signal treatment at the site of the Main Street Park and elementary school, citing that this novel treatment (Mr. Hicks showed an image of such a signal to help illustrate the description) was warranted due to the proximity of these two primary locations along the main street of Rolesville. Several commissioners indicated that they would like to bicycle more themselves or have their children/grandchildren do so, but are prevented by concerns about the speed and volume of traffic. Commissioner Whitley motioned to schedule a public hearing on Tuesday, February 19; Commissioner Hartis seconded the motion, which passed unanimously.

Comprehensive Bicycle Plan

for the Town of Rolesville



Prepared for the Town of Rolesville by the J. S. Lane Company and NCDOT Division of Bicycle & Pedestrian Transportation