

Section 4. Project Development

Section 4.0 describes how bicycle projects are developed, what projects are currently "in the works", and what additional projects the public and stakeholders feel are important additions to the Town. Funding categories are also described in this Section.

4.1. Introduction

This Section explains how bicycle projects are conceived, and what projects are currently in the planning and programmed stages of development. Current projects generally fall into one of two categories – public or privately funded – with the former easier to predict due to the longer planning phase involved with expending public dollars. Publicly funded projects can be financed with local, state, and/or federal monies. Privately funded projects often depend much more on the policy environment: what is the private developer of a residential or commercial subdivision expected to do for bicyclists?

Next, we discuss additional project recommendations that build upon the set of planned projects for Wake Forest (from Section 2). These additional project recommendations will supplement the proposed projects and provide more connections for the Town's bicycle system. Priorities were determined by the Stakeholder Committee and surveys from Wake Forest community members; specific project recommendations were developed using standard design criteria in conjunction with public input.

4.2. Projects

Bicycle facilities can be constructed through a number of funding avenues, thus it is important to take a comprehensive look at the planned activities of all of the parties that potentially could build bicycle facilities. In the Town of Wake Forest, bicycle facilities are generally constructed in one of two ways – using public funds or through private development actions. Since private development is market-based and frequently difficult to predict, the following paragraphs will focus more on public spending for estimating the planned locations of bicycle facilities in Wake Forest.

There are a variety of options for a project to be constructed through public funds. First, they can be constructed as part of a planned project by the Town, often either through the Public Works and Transportation Departments (frequently on-road facilities are constructed by these agencies) or through the Parks and Recreation Department (more often, greenways are constructed through this agency). Sometimes, bicycle facilities are installed in connection with the construction of other public facilities, such as schools, libraries, or health-related buildings. Often, the actual construction of a bicycle facility is affected by timeliness and coordination with other projects, sometimes leading to project improvements that are out of "priority" order. Additionally, there may be right-of-way acquisition and/or easement issues that push project construction forward or back in implementation, regardless of priority. In order to use public funds efficiently, it may be necessary for the Town to strategically

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advocate for or construct bicycle facilities outside of priority order, when other construction projects provide a venue for a contiguous bicycle improvement.

Figure 4-1 below graphically illustrates the general breakouts of public project funding.

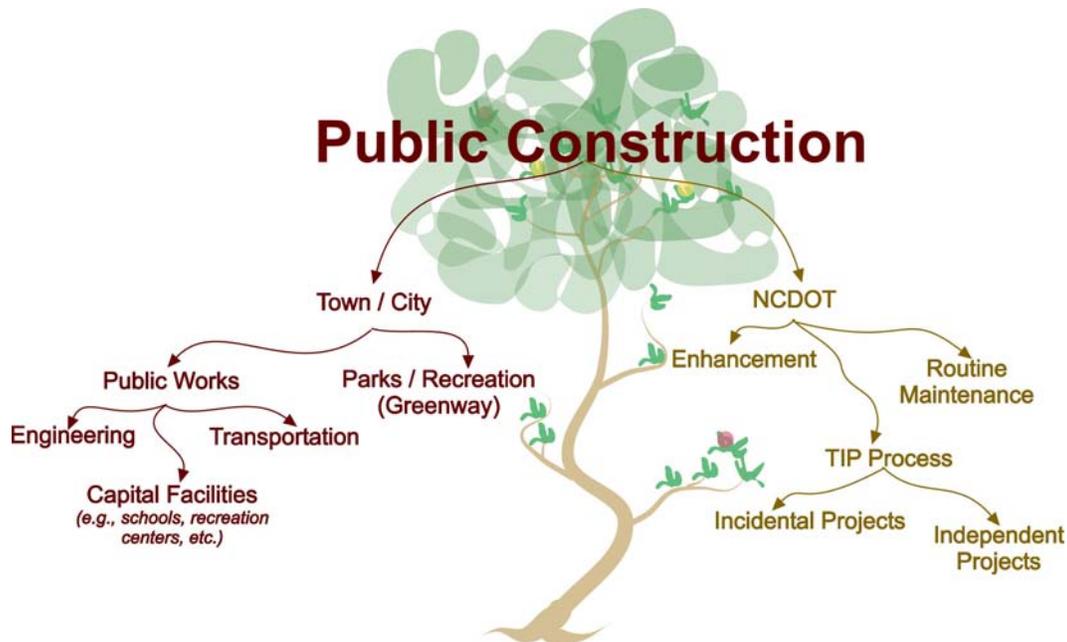


Figure 4-1. This image illustrates the various means by which bicycle facilities can be funded.

The most common method for construction of bicycle facilities is through the North Carolina Department of Transportation (NCDOT). When NCDOT builds bicycle facilities, they are usually constructed as one of four different types of projects. These projects are:

1. Incidental projects. Incidental projects are those bicycle facilities, either on-road or off-road, which are constructed as part of another, larger roadway project. These projects often occur when a road is widened or a new road is constructed.
2. Independent projects. Independent projects are those bicycle facilities which are constructed independent of another roadway project. In an independent project, NCDOT may construct a greenway or multi-use trail without making any improvements on related or nearby roadways except those improvements necessary for the greenway or multi-use trail.
3. Enhancement projects. Enhancement projects are funded by the NCDOT enhancement project fund, and are often intended to make improvements to a pre-existing roadway or area to enhance its appearance or use.

4. Re-stripping and repaving maintenance. Sometimes, on-road bicycle facilities can be provided when a road is restriped and repaved in association with routine maintenance. This can only happen when and where there is adequate roadway width for the bicycle lane.

In general, both NCDOT independent and incidental projects must go through the NCDOT Transportation Improvement Program (TIP) selection process, which includes recommendations from the Capital Area Metropolitan Planning Organization (CAMPO), of which the Town of Wake Forest is a member.

Thus, in order to estimate planned bicycle facility construction in Wake Forest, it is important to look at the planned facilities of the following public agencies:

- ◆ North Carolina Department of Transportation:
 - Planned Incidental Projects
 - Independent Projects
 - Enhancement Projects
 - Maintenance Projects
- ◆ CAMPO Planned Projects
- ◆ Town of Wake Forest, including the Public Works, Transportation, and Parks and Recreation Departments

The following paragraphs provide a description of the planned projects for each of these agencies. Some projects are simply planned, while others are funded and expected for construction within the next few years.

4.3. Planned NCDOT Projects

The following projects are planned in NCDOT’s listing of TIP projects. At the time of this publication, the projects are unfunded.

Table 4-1. Planned TIP Projects (roadway and bicycle) in Wake Forest.

TIP No.		Incidental	Bicycle Related Improvements
None Assigned	E. Juniper Ave: N. White St to Town Limits		Bicycle Safety Improvements
None Assigned	N. Allen Road		Wide Paved Shoulders
None Assigned	S. Franklin St. Ext: E. Holding Ave to Forestville Rd./Rogers Rd.		Bicycle Safety Improvements
R-2809	NC 98 Bypass west of Thompson Mill Rd. to east of Jones Dairy Rd.		Pedestrian/Bike Path
R-3600	US 1A: Capital Blvd to NC 98 Bypass		Widen - Include Bike Lanes
None Assigned	Stadium Dr: US 1 to Central Business District		Bicycle Safety Improvements
E-4756*	Old Mill Stream Greenway (0.5 miles) - COMPLETE		Pedestrian/Bike Path
		Independent	Bicycle Related Improvements
E-4708	Wake Forest Bypass Greenway		scheduled for feasibility study
		Bridge Projects	Bicycle Related Improvements
NC Moving Ahead	Replace Bridge on Stadium Drive over Richland Creek		Include Bike Facilities / Design
B-3705	Replace Bridge on Burlington Mills over Smiths Creek		Include Bike Facilities / Design
B-3919	Replace Two Bridges on Jones Dairy Road over Austin Creek and Smiths Creek		Include Bike Facilities / Design



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Table 4-2. CAMPO Planned Projects in Wake Forest.

CAMPO 2030 Incidental Bike Project List
Thompson Mill Road: NC 98 to Granville Co.
Averette Road: US 401 (North) to NC 98
Forestville Road: US 1A to Smithfield Road

4.4. Planned Town Projects

In addition to funded roadway improvements, the Town also has several plans for future projects which relate to bicycle facilities. The Town has funded some bicycle projects locally (Table 4-3), and the Town's *Transportation Plan* (2003) contains a section on bicycle facilities (Table 4-3).

Table 4-3. Planned bicycle facilities in the 2003 *Wake Forest Transportation Plan*. (from Section 2, Table 2-2)

Corridor	End Points	
Durham Road (NC 98)	Hampton Way Drive	US 1
Durham Road (NC 98)	US 1	Tyler Run Drive
Franklin Street	Wait Avenue	Holding Avenue
Franklin Street Extension	Holding Avenue	Rogers Road
Harris Road (& ext.)/North Loop	Capital Boulevard (US 1)	East Wait Avenue (NC 98)
Heritage Lake Road (& ext.)/Forestville Road	East Wait Avenue (NC 98)	Louisburg Road (US 401)
Jenkins Road	Horse Creek Greenway	Capital Boulevard (US 1)
Jones Dairy Road	NC 98 Bypass	Averette Road
Juniper Avenue	North White Street	Planned Smith Creek Greenway
Ligon Mill Road	South Main Street	Burlington Mills Road
Ligon Mill Road	Burlington Mills Road	Louisburg Road (US 401)
Ligon Mill Road Extension	Durham Road (NC 98)	South Main Street
North Main Street	Harris Road	North Avenue
North White Street	Wake/Franklin County Line	Spring Street
Purnell Road	Horse Creek Greenway	Capital Boulevard
Rogers Road	South Main Street	Forestville Road
Rogers Road	Forestville Road	Louisburg Route (US 401)
Seminary Loop		
South Main Street	South Avenue	Holding Avenue
South Main Street	Holding Avenue	Planned NC 98 Bypass
South Main Street	Planned NC 98 Bypass	Capital Boulevard
Stadium Drive	Capital Boulevard (US 1)	Wingate Street
Wait Avenue/Roosevelt Avenue	White Street	Planned North Loop
Wait Avenue	Planned North Loop	Zebulon Road (NC 96)

Some of the other projects that are in construction through private development or the Town include widening S. Main Street to have wide outside lanes and adding bike lanes on Franklin Street.

The Town also recently completed its *Pedestrian Plan* (2006), which contains a listing of corridors that should be considered for pedestrian improvement (Table 4-5). The Town should consider making bicycle facility improvements in conjunction with these pedestrian improvements, when the time comes for them to be constructed.

Table 4-4. Priority pedestrian corridors as listed in the Town of Wake Forest Pedestrian Plan, January 2007.

Corridor		End Points
North Main Street	North Avenue	Harris Road
Durham Road	Capital Blvd (US 1)	North Wingate Street
North White Street	Roosevelt Road	Flaherty Park
North Avenue	Start	End
Roosevelt Road	Front Street	Wait Avenue
Rogers Road	Forestville Road	South Main Street
South Main Street	South Avenue	Holding Avenue
E. Cedar Avenue	North Main Street	Railroad Tracks
North Franklin Street	NC 98 Bypass	Wait Avenue
Front Street	Start	End
Heritage Lake Road	Rogers Road	Heritage Heights
South Avenue	Start	End
South Wingate Street	Holding Avenue	Stadium Drive
Spring Street	North White Street	Taylor Street
Wait Avenue	Allen Road	Roosevelt Avenue
Rogers Road	Wake Forest ETJ	Forestville Road
Stadium Drive	North Wingate Street	Capital Blvd.
North Wingate Street	Stadium Drive	Chestnut Street
Rock Spring Road	Stadium Drive	Juniper Avenue
South Main Street	Holding Avenue	Rogers Road

4.5. Greenway Priorities

The Town’s Greenways Advisory Board maintains a listing of priority greenway segments. While the Town’s greenway system is minimal at this time, these priority greenway segments are critical to making connections in the future with Raleigh’s greenway system and providing links between the Town’s various major park facilities. Table 4-5 is a listing of the priority greenway locations as identified by the Town’s Greenways Advisory Board as of March 12, 2007.

In addition to these local trails prioritized by the Town, several Wake County municipalities have begun planning for a 28-mile paved regional “Neuse River Trail” from the Falls Lake Dam to the Wake & Johnston County lines. The City of Raleigh has committed \$13 million or nearly half of the funds needed to complete the trail. The first eight miles of the trail will extend from Falls of Neuse Road to the CASL Soccer Complex, with construction slated to begin by late summer/early fall 2009. The final section will extend to the Johnston County line four years later in 2013. The available funding and regional support for this trail creates a unique opportunity for Wake Forest to connect to a regionally significant trail and provide access to many miles of walking, biking, hiking trail for citizens to enjoy. The Neuse River Trail is illustrated as part of the Smith Creek Greenway corridor in Figure 2-3 (see *Section 2: Evaluating Current Conditions*), as well as Figure 4-2. The two segments of the trail in Wake Forest are the:

- 1) Smith Creek to Neuse Trail - includes bridge and paved trail to connect to the current end of trail (1,600 linear feet, or approximately 1/3 mile). Costs are estimated to include Design: \$133,466; Construct: \$1,462,854, Total: \$1,596,319.

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- 2) US-1 to Smith Creek - includes a trail head, parking and greenway trails leading to the Smith Creek Greenway (5,900 linear feet, or over 1 mile). Costs are estimated to include Design: \$131,829; Construct: \$1,230,262; Total: \$1,362,090.

Table 4-5. Priority greenway projects as established by the Wake Forest Greenways Advisory Board (2007)

Section	Segment Location
Smith Creek	East side of reservoir, from 98 Bypass tunnel to the north end of the reservoir
	West side of reservoir, from dam/east side connection (bridge over spillway), north along the west side, to the north end
	North end of golf course, north to 98 bypass to pedestrian tunnel
	Soccer center bridge, up the creek/east side of golf course, to sidewalk
	Rogers Rd south to park/school complex
	Heritage HS Park/school south to the opposite lot
	Opposite lot
	North end of the existing greenway at Burlington Mill Rd north to the opposition lot
Richland Creek North	South end of existing Burlington Mills greenway to waste treatment plant and new tract recently purchased, meeting Neuse River trail
	from Durham Rd north to Joyner Park
	Joyner Park north to existing Mill Stream southern end Mill stream northern end to Franklin County line
Richland Creek South	From Durham Rd south to 98 Bypass
	From 98 Bypass south to Wakefield trail connection
	From Wakefield trail south to Neuse River trail
Dunn Creek	Soccer center to just north of 98 Bypass
	Just north of 98 Bypass north just past Wait Ave
	North within "Reservoir Tract"
Downtown	From Dunn Creek connection (via sidewalks, to Kiwanis Trail and downtown)
	From Downtown west to Richland Creek greenway (along Stadium Dr)
Austin Creek	From Smith Creek north of golf course to Bowling Green
	Within Bowling Green to Austin Creek trail
	Austin Creek subdivision
Sanford Creek	From Smith Creek connection (Heritage HS) east to Heritage South western end
	Heritage South/Wildflower
	Sanford east from Wildflower part way to Rolesville line Sanford east the rest of the way to Rolesville line
Bishops Reservoir	From east side of reservoir through Bishop's Grant
	In Bishop's Landing and The Reserve
	East of Bishop's Landing part way to Averette Rest of the way to Averette and beyond
Holding Farm	Network within new village and connections to adjacent trails
98 Bypass	Along Bypass from reservoir west to S. Main St.
	From S. Main St. west to Capital Blvd/Richland trail connection
	From Capital Blvd. West to NC 98
	From NC 98 north to Horse Creek connection?
Neuse River	North side, west side of Capital, east to Waste Treatment Plant
	North side, from Waste Treatment Plant east to US 401
Horse Creek	From Franklin Co. line to Falls Lake
Northwest Area	From Horse Creek northwest via unnamed Creek, to Franklin/Granville County line

4.6. New Proposed Projects

Based on the responses from the Wake Forest Bicycle Plan survey conducted in the earlier part of this project, as well as input from the Stakeholder Committee and Town Staff, a listing of proposed on-road project locations were generated and are presented in Figure 4- on page 4-9 and in Appendix 3. Over 45 miles of on-road improvements were identified, covering nearly every major road in Wake Forest, and 15.3 miles of greenways on new location.

Appendix 3 presents information on the project locations, proposed treatments and level of service. In general, the appropriate bicycle facility for a particular roadway is identified by a variety of “level of service” factors that influence the relative comfort of the bicycle facility for the rider, including vehicle volumes, lane widths and the speed of the roadway. For this Bicycle Plan, treatments were identified similarly, and the basic characteristics of each roadway segment (number of lanes, right-of-way, speed) are identified in Appendix 3. Many of the projects in Appendix 3 are located on roads which have been identified for future motor vehicle improvements in the Town’s *Transportation Plan* (2003). To assist the Town in determining the appropriate action necessary for each project, the table also identifies any changes to the existing 2003 Transportation Plan recommendations. It is recommended that the Town’s Planning Department periodically monitor non-prioritized projects in Appendix 3 to ensure that “non-priority” projects are implemented as unforeseen opportunities arise, and also to consider these projects for re-evaluation as the built environment changes.

Treatment recommendations were based on an analysis of the existing conditions on the roadways and guided by national and state guidelines for bicycle facilities. Table 4-9 shows a reproduction of the matrix in the *Bicycle Facility Selection Guide* for bicycle facility treatment guidelines used by the Federal Highway Administration. This is generally representative of the national approach to bicycle facility treatments.

Table 4-6. United States (FHWA) Matrix for Bicycle Facility Treatments.

Facility/Treatment	Posted Speed					
	15 mph	20 mph	25 mph	30 mph	35 mph	40 mph
Narrow Lane	--	--	--	--	--	--
Wide Lane	< 10,000 ADT	< 10,000 ADT	--	--	--	--
Bike Lane or Shoulder	> 10,000 ADT	> 10,000 ADT	All ADT	All ADT	All ADT	All ADT
Separated Lane or Path	--	--	--	--	--	--

Source for both tables: King, Michael. “Bicycle Facility Selection: A Comparison of Approaches.” Pedestrian and Bicycle Information Center, Highway Safety Research Center, University of North Carolina at Chapel Hill. August 2002.

From this table, the proposed treatments in Wake Forest were:



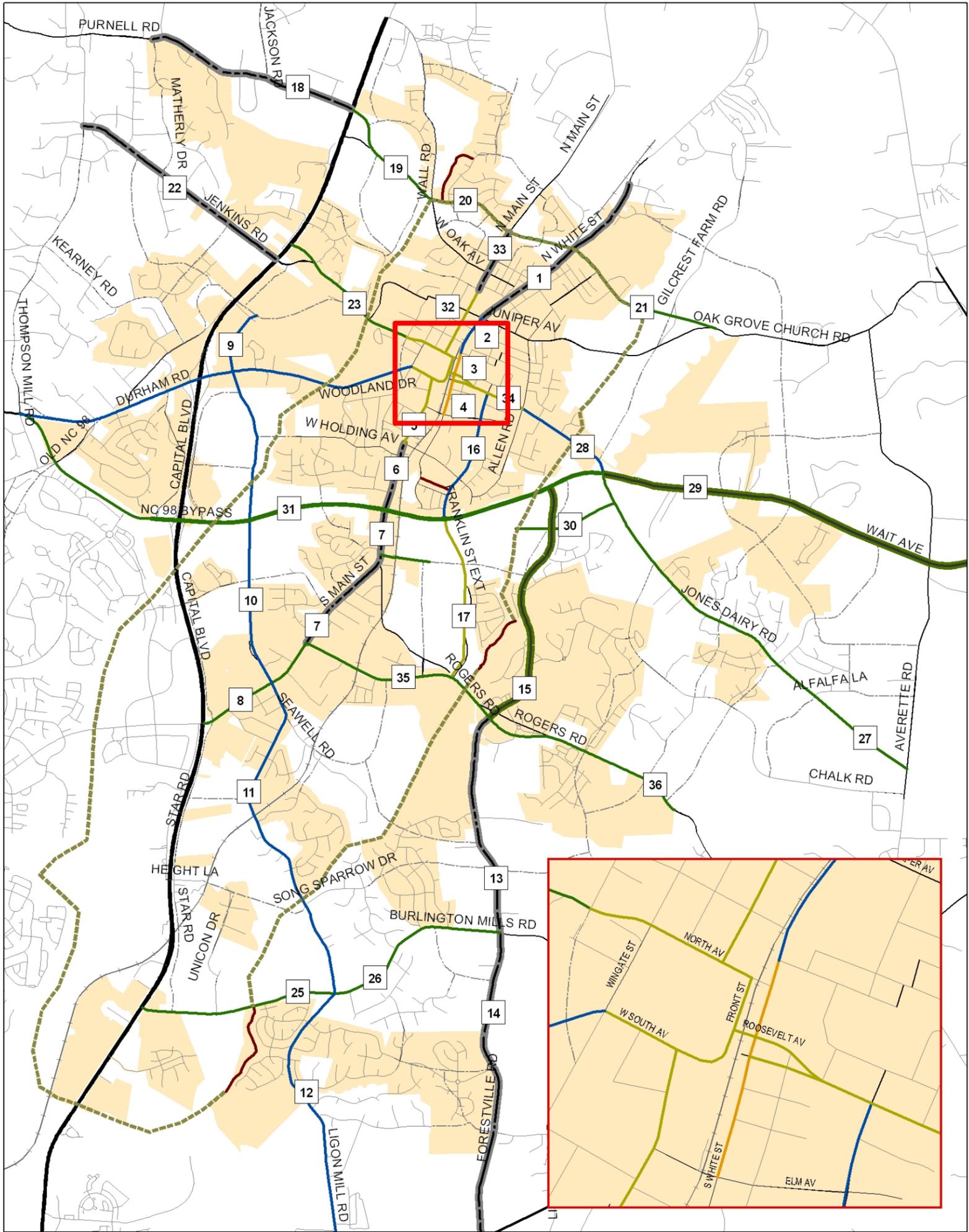
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- ◆ Bike Lanes
- ◆ Wide Striped Shoulder
- ◆ Sharrows
- ◆ Shared Lanes
- ◆ Multi-Purpose Path
- ◆ Multi-Purpose Path and a Wide Striped Shoulder
- ◆ Greenway on new location

Descriptions of these treatments are provided in Section 7: Design Guidelines, Table 7-1. The final design of bicycle accommodations on state-maintained roads will require further coordination and evaluation by the Town of Wake Forest and NCDOT Highway Division 5.

Following an extended discussion with stakeholders, it was determined that when possible the preferred treatment for bicycle facilities in Wake Forest should be to install multi-use paths. However, roadways, especially those that already exist, frequently have inadequate right-of-way available to construct multi-use paths without incurring great expense and disruption to existing homes and businesses at the edge of the roadway. In addition, multi-use paths adjacent to roadways can create hazardous situations for cyclists and motorists on certain types of roadways, especially those with many driveways and intersections. For this reason, multi-use paths are not always recommended by national and state standards. For roads in which multi-use paths are inappropriate (due to constructability or design limitations), the Town should use bicycle lanes or other alternatives.



Legend

Ultimate Treatment

- Bike Lanes
- Wide Striped Shoulder
- Sharrows
- Shared Lanes
- Multi-Purpose Path
- Multi-Purpose Path, Wide Striped Shoulder
- Greenway (new location)

- Existing Greenway
- Future Road on New Location
- Town Limits

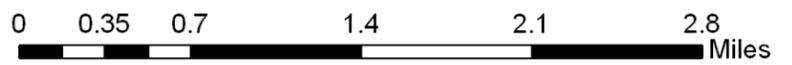


Figure 4-2. Map of proposed projects in the Bicycle Plan.

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