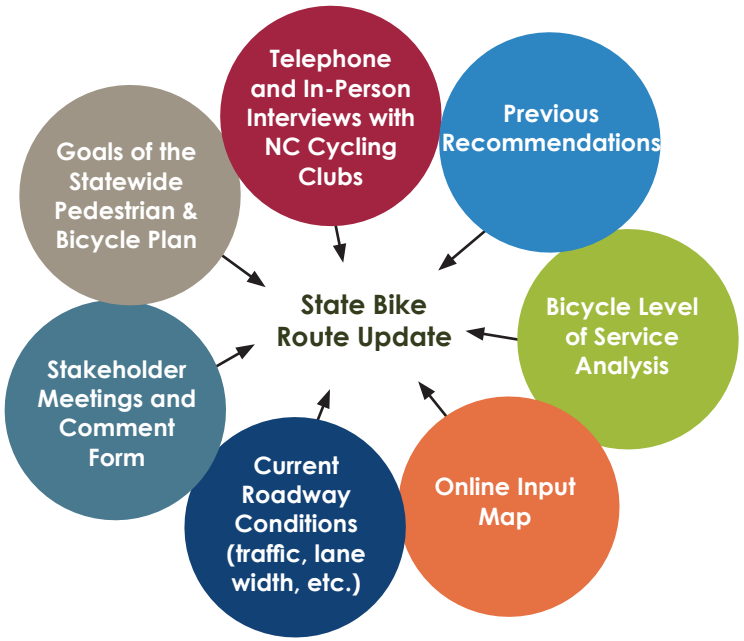
9.3 State Bike Routes

Orange County, NC

THE STATE BIKE ROUTE SYSTEM UPDATE

North Carolina's bicycle route system was developed in response to the 1974 Bicycle and Bikeway Act. The system located those roads across North Carolina that were safer for bicycling, designating a network of ''Bicycling Highways'' that provided access to small towns, state parks, historic sites, and other points of interest. The system also included the first interstate route that was approved by AASHTO in 1982, US Bike Route 1. The current network consists of nine different routes covering 2,400 miles. The 700+ mile NC 2 Mountains to Sea route is the main artery of the system, connecting east and west as well as most of the system's other routes. Bicycle tourists and adventurers use maps created for each route to navigate the state.

Given the extensive development that has occurred across North Carolina since the 1970's and associated changes to the roadway network, NCDOT recognized the need to re-evaluate and update the state bike route system as part of this 2013 plan. The following chapter summarizes the results of this evaluation, which was completed with an extensive stakeholder and public outreach process. The figure below details the many inputs used during that process. A quantitative, data-driven analysis was combined with qualitative, stakeholder-driven input to ensure a complete evaluation.



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Stakeholder input

Several themes emerged through the stakeholder and public input process, which helped to frame the goals of this plan and inform its recommendations. At the beginning of the process, over 150 key stakeholders including bike club members, bike tour operators, and cycling enthusiasts were reached through an initial comment form. Based on the results of that form, an online input map was used to gather localized feedback on existing route conditions, key destinations, and potential new routes. The map also reached 150 stakeholders and received over 130 unique comments. Beyond these strategies, additional feedback was provided through extensive emails and meetings with local planners and route experts. At least X groups and individuals were reached through this direct approach.

A selection of recurring comments and the major themes they address are summarized below:

Re-route where development has changed the character of the existing routes

"Some…pieces are now on roads that are unsafe due to development and traffic volume"

"Many were nice rural roads 20 years ago, and have become high-traffic bottleneck roads now"

"Beauty of scenery along the route is very important"

Routes should include bicycle facilities

"There is a widespread lack of shoulders on these roads"

"More riding room on the side of the road"

"Provide consistency and minimum improvements/ safety feature standards to roads marked as 'bike routes'"

"Routes…exhibit only signage, and no genuine improvements to ensure cyclist safety and consistency; ie. lack of shoulders, damaged shoulders, traffic signals inoperable by bicycles, lack of proper turning lanes"

Routes should connect major cities in North Carolina

"Link towns and cities with bike routes instead of avoiding them"

"Better routes through/around urban areas"

"More (routes) that would actually connect Point-A with Point-B with the idea that distance cycling between cities would be an actual way to travel"

Ensure routes link to necessary amenities

"Many routes are down rural roads that….have few places to stop for food/drink"

"Start routes near parking areas"

Routes should be clearly marked for both cyclists and motorists, and easy to follow

"They are sometimes not well marked…"

"Please consider using larger bike route signs in those places where very small signs (or very few) are used"

"Not well advertised"

Route information should be easy to access, up to date, and available online

"The last time I tried to look at the online routes, several years ago, those were not easy to get to or look at with accurate up to date maps"

"Offer downloadable maps, cue sheets, GPS files"

"High quality maps need to be available for these routes to be more readily used"

"A website with maps and information"

Project Goals

The goals identified for the 2013 system were built upon the input received before and during this planning process as well as the broader goals for the Statewide Plan. These goals, which supplement the system's original goals, are summarized below:

State Bike Routes Today

Route Descriptions

The nine routes of the existing statewide bicycle route system are summarized on the following pages.

1975 System Goals

- Low Traffic Volumes
- Low Speed Limits
- Good surface conditions
- Wide lanes or shoulders
- Minimal grade and curvature
- Connect to points of interest
- Connect to services

2013 System Goals

- Provide suitable roadway conditions: traffic volumes, speed limits, surface, lane width, shoulder width, grade, and curvature
- Connect to points of interest and services
- Connect major urban centers
- Link the system to state parks and other significant tourism attractions

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- Integrate the system into regional and local route networks
- Provide detailed, easy-to-access online route information
- Provide highly visible signage and wayfinding to routes and along routes
- Coordinate with other state and national bike route systems

NC 2 – MOUNTAINS TO SEA

The 700+ mile NC 2 Mountains to Sea route serves as the main artery of the North Carolina bicycle route system, bisecting the state west to east. It ties the mountains in the west with the piedmont in the center; and the piedmont with the coastal region of the east. While traversing the rugged mountains, rolling pastures of piedmont farm country, and the flats of the coastal region, it connects many of North Carolina's larger cities including Asheville, Winston-Salem, Greensboro, Durham, and Raleigh. The route begins in Murphy in the mountainous southwestern corner of the state and finishes in Manteo at the Outer Banks in the east.

US 1 - CAROLINA CONNECTOR

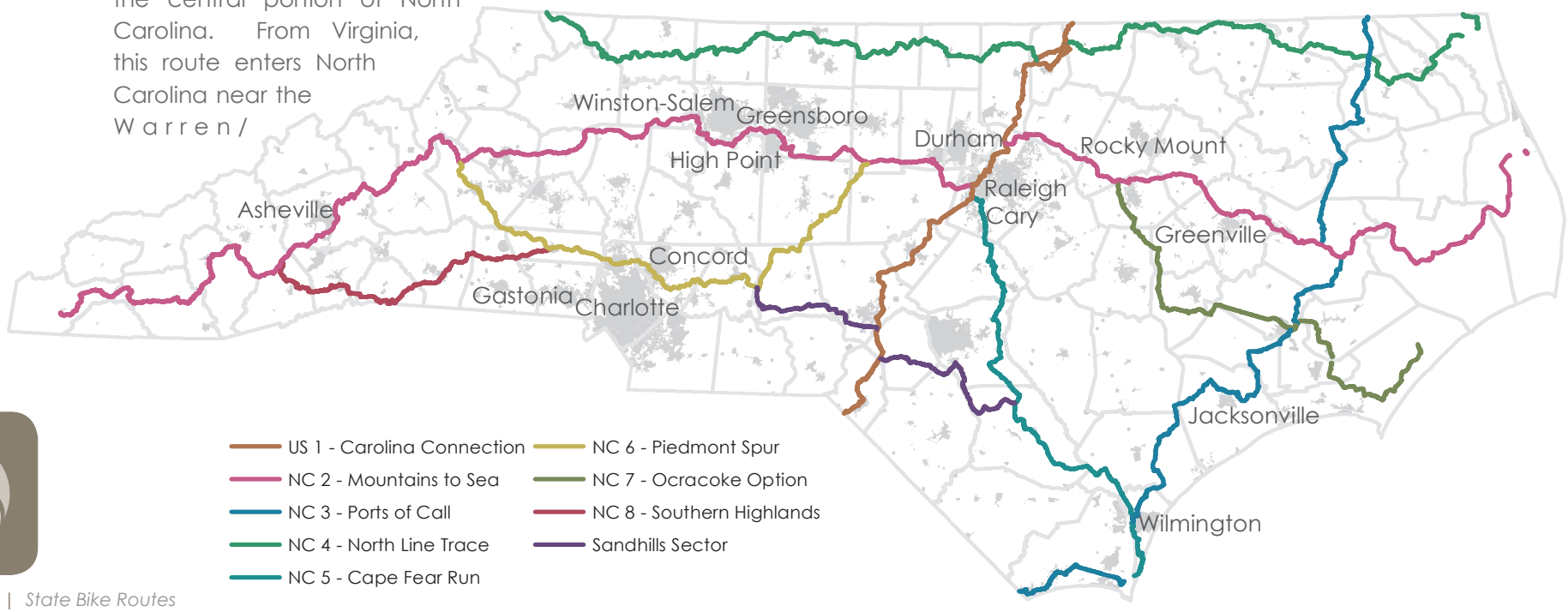
Designated as a portion of US Bike Route 1, which runs from Maine to Florida, this route covers almost 200 miles of rolling terrain. It is the main north/south connector route through the central portion of North Carolina. From Virginia, this route enters North Carolina near the Warren/Vance County border. US 1 continues south between Raleigh and Durham and eventually through Sanford, Southern Pines, and Laurinburg before advancing into South Carolina.

NC 3 - PORTS OF CALL

This route traverses North Carolina's long and varied coastline including two major sounds - the Pamlico and Albemarle Sounds. The ~300 mile route from Virginia to South Carolina passes through the major ports of the colonial era; Edenton, Bath, New Bern, Wilmington, and Southport among numerous other coastal communities.

NC 4 - NORTH LINE TRACE

Running east/west from the mountains to the coast, this ~400 mile route runs just south of and parallel to North Carolina's border with Virginia. It travels through or near numerous small towns including (from west to east) Eden, Roxboro, Henderson, Roanoke Rapids, and Elizabeth City.



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NC 5 - CAPE FEAR RUN

This 160 mile route roughly parallels the course of the Cape Fear River through the southeast coastal plain to the coast. Rolling hills give way to flat land in the swamps and Carolina bays typical of this region of the state. Just south of the Triangle, NC 5 begins at its connection with US 1 in Apex, continuing through Fuquay-Varina, passing near Fayetteville, and ending in Wilmington at its intersection with the NC 3 Ports of Call route.

NC 6 - PIEDMONT SPUR

The NC 6 Piedmont Spur is a ~200 mile route that is a southern alternate to the piedmont portion of the NC 2 Mountains to Sea route. The western endpoint of NC 6 is located in the foothills of the Blue Ridge Mountains west of Lenoir and Morganton in Burke County before making its way southeast toward Charlotte. The route stays north of Charlotte, turning northeast to its reconnection with NC 2 in central North Carolina. It passes through smaller towns such as Morganton, Lincolnton, several Charlotte suburbs, and Albemarle before eventually finishing near Snow Camp.

NC 7 - OCRACOKE OPTION

From its western terminus along the NC 2 Mountains to Sea route near Wilson, this ~170 mile route winds its way through the coastal plain to the Cedar Island Ferry over to Ocracoke. It passes through or near several smaller towns including Wilson, Goldsboro, Kinston, New Bern, and eventually Ocracoke.

NC 8 - SOUTHERN HIGHLANDS

This ~120 mile route begins northwest of Brevard with a 15-mile downhill from its connection with NC 2 Mountains to Sea on the Blue Ridge Parkwaw, passing through small mountain towns such as Brevard, Saluda, Flat Rock, and Tryon. It traverses the foothills of the Blue Ridge Mountains southeast toward the South Carolina border before turning northeast through Forest City and finishing at its intersection with the NC 6 Piedmont Spur in Lincolnton.

SANDHILLS SECTOR

The western terminus of the Sandhills Sector is its connection with the NC 6 Piedmont Spur near the Pee Dee River and the town of Albemarle. Ending near the Cape Fear River at its connection with the NC 5 Cape Fear Run, this route traverses ~125 miles of sandhills terrain characterized by rolling topography rising from 500 to 700 feet above sea level. The Sandhills Sector passes near Pinehurst/Southern Pines and meanders south of Fayetteville.

Scenic Byways

The N.C. Department of Transportation has designated 54 scenic byways from one to 173 miles long around the state. Scenic byways are typically rural roadways that give visitors and residents a chance to experience North Carolina history, geography, and culture while raising awareness for the preservation and protection of scenic landscapes. They provide an alternative to the highways and interstates filled with high-speed traffic and surrounded by commercial areas.[1]

Scenic byways currently overlap the state bicycle route system in a handful of locations. While the state bicycle route system extends continuously across North Carolina, scenic byways are generally discontinuous routes that function as destinations. Both systems highlight the dynamic geographies of North Carolina, seeking pleasant, low-traffic roads.

Where North Carolina's scenic byways and state bicycle routes overlap, opportunities exist to pool resources for roadway and bicycle facility improvements. Roadway additions like paved shoulders provide separated space for cyclists and reduce the frequency of required roadway maintenance. Where scenic byways are located away from the state bicycle route system, these roads should be incorporated into county or local bicycle route planning.

*North Carolina Department of Transportation. http://www.ncdot.gov/travel/scenic/default.html.

Route Conditions

While significant portions of the state route system remain comfortable and scenic, many of the roads have changed since their designation and are no longer ideal for bicycling. In addition, many miles of roadway around the state have been paved since the 70's and now hold potential to become part of the route system. The tables below summarize several of the key roadway characteristics of the routes in 2012. While all shown data has a degree of error, this information provides an overview of conditions today and allows for comparison between routes.

TRAFFIC VOLUMES

Traffic volumes on some segments far exceed the original goal for the system of average daily traffic (ADT) less than 1,200 and make cycling uncomfortable even where paved shoulders exist. At the same time, over half of the current system does still hold less than 3,000 ADT, a comfortable level for most cyclists, particularly when a shoulder is present.

PAVED SHOULDER

Only six percent of the current system has a paved shoulder equal to or greater than three feet. The route with the largest percentage of paved shoulder, NC-5 Cape Fear Run, still only contains a three foot paved shoulder on 18.5% of roads.

Route	< 3'	3' - 4'	> 5'	No Data
US 1 - Carolina Connection	97%	2%	0.1%	0.9%
NC 2 - Mountains to Sea	90%	7%	3%	0.4%
NC 3 - Ports of Call	94%	4%	1%	0.4%
NC 4 - North Line Trace	98%	2%	0.02%	0.0%
NC 5 - Cape Fear Run	81%	18%	0.5%	0.3%
NC 6 - Piedmont Spur	95%	4%	1%	0.2%
NC 7 - Ocracoke Option	93%	6%	0.2%	0.2%
NC 8 - Southern Highlands	99%	1%	0.1%	0.03%
Sandhills Sector	98%	2%	1%	0.01%
Grand Total	93%	5%	1%	0.3%

NC Bicycle Route Paved Shoulder Width (as a percentage of route mileage)

NC Bicycle Route Annual Average Daily Traffic (as a percentage of route mileage)

Route	<= 1,200	1,200-3,000	3,000 - 5,000	5,000 - 10,000	10,000 - 15,000	15,000 - 25,000	25,000 - 50,000	50,000 - 75,000	75,000 - 150,000	No Data
US 1 - Carolina Connection	20%	29%	12%	5%	3%	2%	1%	0%	0.002%	29%
NC 2 - Mountains to Sea	33%	33%	13%	8%	2%	3%	0.2%	0%	0%	7%
NC 3 - Ports of Call	22%	16%	12%	15%	5%	3%	0.3%	0.001%	0%	28%
NC 4 - North Line Trace	26%	29%	11%	6%	2%	0.4%	0%	0%	0%	26%
NC 5 - Cape Fear Run	34%	23%	10%	13%	6%	5%	0.01%	0%	0%	11%
NC 6 - Piedmont Spur	22%	9%	6%	16%	9%	4%	1%	0%	0%	33%
NC 7 - Ocracoke Option	19%	29%	13%	12%	3%	4%	1%	0.04%	0%	19%
NC 8 - Southern Highlands	33%	28%	11%	5%	1%	0%	0%	0%	0%	22%
Sandhills Sector	19%	32%	12%	7%	1%	2%	0%	0%	0%	27%
Grand Total	26%	26%	11%	9%	3%	3%	0.4%	0.003%	0.0002%	20%

SPEED LIMITS

A large percentage of the current bike route system is on roadways with a speed limit of 55mph. Where traffic levels are below 1,200 ADT, these roadways still meet the original criteria established when the system was developed, but where traffic has increased such speeds are problematic for cyclists.

Route	<= 25	30 - 35	40 - 45	50 - 55	60 - 70	No Data
US 1 - Carolina Connection	0.3%	12%	29%	56%	0.1%	3%
NC 2 - Mountains to Sea	1%	8%	13%	59%	0.001%	18%
NC 3 - Ports of Call	0.1%	8%	12%	79%	0.003%	1%
NC 4 - North Line Trace	3%	6%	9%	81%	0.002%	1%
NC 5 - Cape Fear Run	1%	9%	8%	78%	0.01%	4%
NC 6 - Piedmont Spur	1%	8%	19%	72%	0%	0%
NC 7 - Ocracoke Option	1%	8%	17%	75%	0%	0.004%
NC 8 - Southern Highlands	3%	14%	20%	62%	0%	1%
Sandhills Sector	1%	5%	6%	88%	0.003%	0.001%
Grand Total	1%	8%	14%	70%	0.01%	6%

▲ *NC Bicycle Route Speed Limits (as a percentage of route mileage)*

SURFACE CONDITIONS

Almost two-thirds of the current route system lie on roads with high pavement condition ratings. A small percentage, however, are on roads with a rating below 50/100. Roadways with a low-quality surface can cause discomfort or flat tires for cyclists and are less enjoyable for long rides.

Route	0 - 25	25 - 50	50 - 75	75 - 100	No Data
US 1 - Carolina Connection	0.04%	3%	21%	73%	3%
NC 2 - Mountains to Sea	2%	6%	19%	54%	19%
NC 3 - Ports of Call	6%	16%	26%	52%	1%
NC 4 - North Line Trace	1%	6%	25%	67%	1%
NC 5 - Cape Fear Run	1%	10%	24%	61%	4%
NC 6 - Piedmont Spur	1%	7%	22%	70%	0.003%
NC 7 - Ocracoke Option	3%	5%	35%	57%	0.01%
NC 8 - Southern Highlands	0%	8%	30%	62%	1%
Sandhills Sector	1%	4%	14%	81%	0.003%
Grand Total	2%	7%	23%	61%	6%

◀ *NC Bicycle Route Pavement Condition Rating (as a percentage of route mileage)*

LANE WIDTH

Almost a quarter of the current routes lie on narrow roadways with 9' wide lanes or less. These roadways can be comfortable for cycling where traffic volumes are very low, but are uncomfortable when motorists pass closely in the case where no additional shoulder exists. The majority of the routes with 10' to 11' lanes can similarly present a problem when no additional shoulder exists.

Route	<= 9'	10' - 11'	12' - 14'	15' - 17'	> 17'
US 1 - Carolina Connection	27%	53%	18%	1%	0.1%
NC 2 - Mountains to Sea	16%	43%	39%	1%	1%
NC 3 - Ports of Call	17%	51%	31%	1%	1%
NC 4 - North Line Trace	25%	51%	22%	1%	1%
NC 5 - Cape Fear Run	13%	57%	27%	1%	2%
NC 6 - Piedmont Spur	25%	52%	21%	0.5%	1%
NC 7 - Ocracoke Option	17%	36%	47%	0%	1%
NC 8 - Southern Highlands	32%	56%	10%	2%	1%
Sandhills Sector	25%	42%	30%	2%	2%
Grand Total	21%	48%	30%	1%	1%

NC Bicycle Route Lane Widths (as a percentage of route mileage)

NC Bicycle Route Level of Service (as a percentage of route mileage)

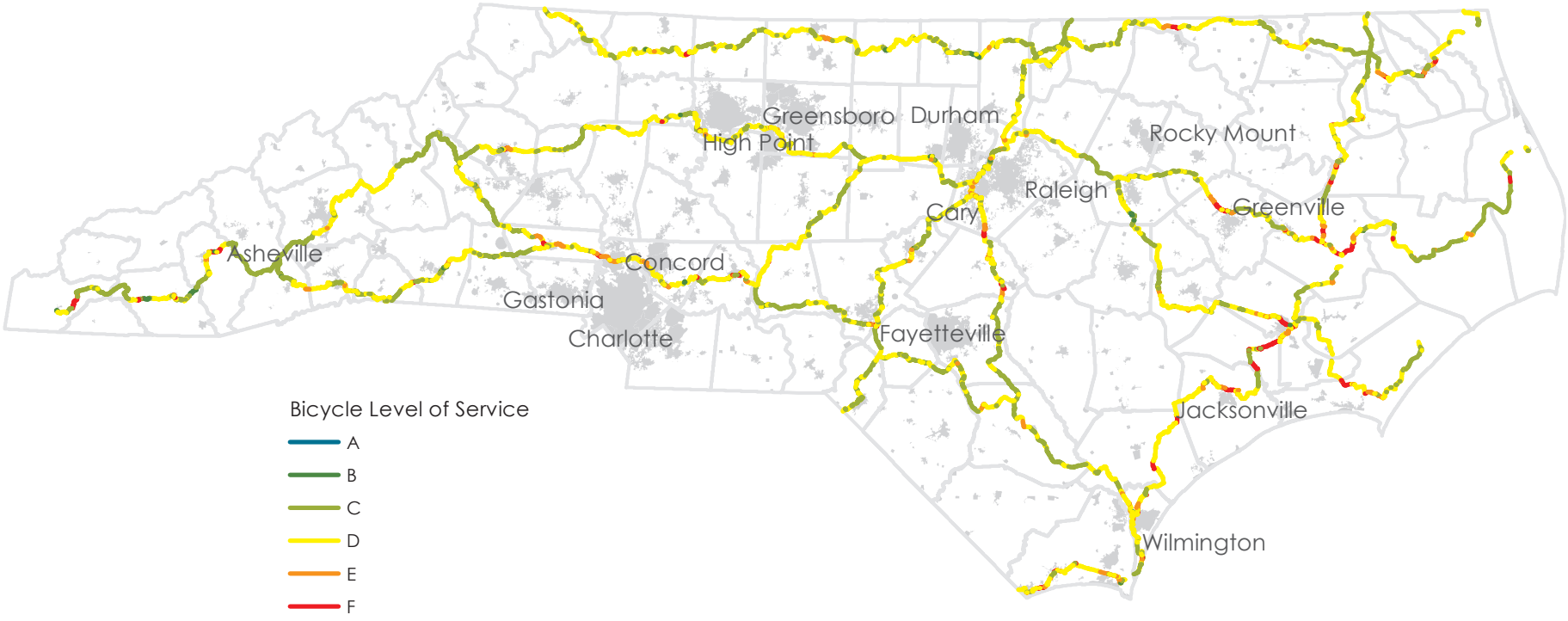
Route	B	C	D	E	F
US 1 - Carolina Connection	0.2%	41%	53%	5%	1%
NC 2 - Mountains to Sea	1%	39%	48%	6%	6%
NC 3 - Ports of Call	0.1%	21%	57%	10%	13%
NC 4 - North Line Trace	1%	31%	58%	4%	5%
NC 5 - Cape Fear Run	0%	37%	48%	10%	4%
NC 6 - Piedmont Spur	1%	19%	62%	13%	5%
NC 7 - Ocracoke Option	1%	22%	62%	8%	7%
NC 8 - Southern Highlands	1%	44%	49%	5%	2%
Sandhills Sector	0.1%	46%	46%	5%	3%
Total	1%	33%	53%	7%	6%

COMPREHENSIVE LEVEL OF SERVICE

The previous tables provide a snapshot of roadway conditions along the state routes, but do not provide a comprehensive picture of quality since the optimal level of each characteristic depends on the state of the others. The following level of service analysis provides an integrated picture of the quality of the routes. Levels of service were calculated for route segments based on a combination of each segment's roadway characteristics using available data.[1] Where data gaps existed, median values were assumed.

The following below and table at left detail the comparative level of service results for each segment. While data limitations prevent accurate comparison of service levels shown here to those calculated elsewhere[2], the LOS findings allow intra- and inter-route comparison within the system.

NC Bicycle Route Level of Service



Route Connections

Just as many roadways across North Carolina have changed over the last several decades, towns and cities have transformed. These changes warrant the consideration of new connections and additions to the state bike route system. One of the major themes of stakeholder feedback was the need for connections into cities. In addition, the development and increasing popularity of routes in neighboring states and in larger systems like the East Coast Greenway present opportunities for interstate connections. The following list details the major additional connections recommended.

THE VIRGINIA CREEPER TRAIL

NC 4's current western terminus at the Virginia border in the northwestern part of North Carolina lies approximately 25 miles from the Virginia Creeper Trail's eastern extent. The Virginia Creeper Trail is one of the most popular rail-trails on the east coast, running 34 miles through scenic southwest Virgina. Furthermore, the Creeper Trail's midpoint in Damascus, Virginia intersects with the US 76 TransAm cross-country bike route, offering an opportunity to connect to a major coast-to-coast route system. NC 4 should be extended to link to this trail and thus US76.

TENNESSEE ROUTES

Tennessee recently updated their state bike route system. The former route system, Bike Routes Across Tennessee (BRAT) is still signed with route details listed on the Tennessee Department of Transportation's website. While neither route system includes any direct connections to North Carolina's system, there are linkage opportunities. With the potential to shift NC 2 west of the Blue Ridge Parkway and include a northern mountains extension route to Virginia, the following towns along this route near the Tennessee border could serve as gateways. These potential gateways and connectors include:

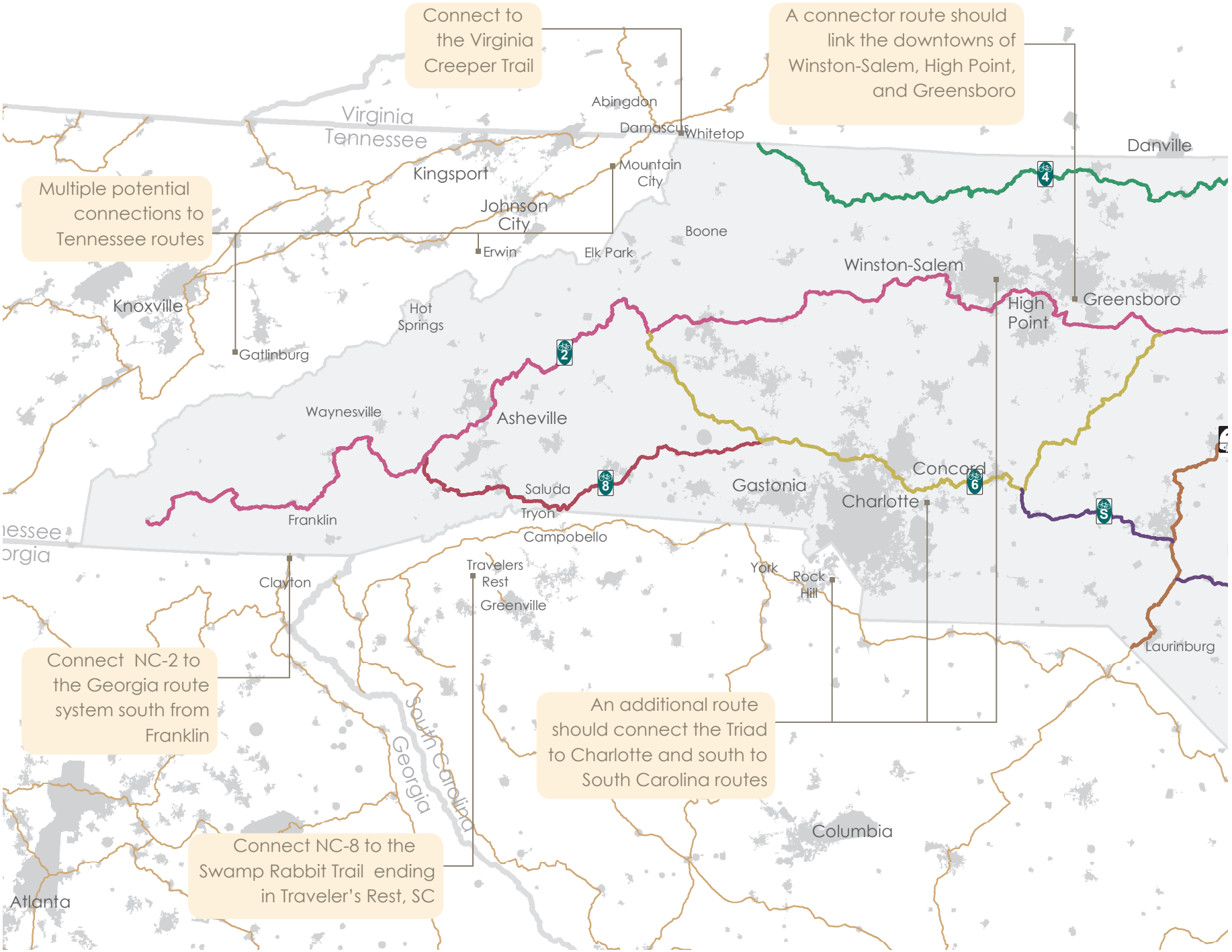
- Boone, NC - northwest of Boone, US 421 crosses into Tennessee and Mountain City. Tennessee's Chattanooga to Mountain City route passes west of Mountain City, Tn. The US 421 corridor could serve as a potential connector.
- Elk Park, NC - US 19E runs west from Elk Park and connects with the Mountains route of the BRAT system at Roan Mountain State Park in Tennessee.
- Hot Springs, NC - NC 208 heading west will connect (via Tn 70/107) to the Chattanooga to Mountain City route near Greeneville, TN less than 30 miles away
- Between Hot Springs and Burnsville, NC, NC 212 and US 19W will connect to Erwin, TN, which lies 15 miles from Tennessee's Chattanooga to Mountain City route.
- Great Smoky Mountains National Park connector - If Tennessee were to extend a bike route through Gatlinburg, TN toward Great Smoky Mountains National Park, US 441 could serve as a connector west of Sylva and Waynesville, NC.

GEORGIA

Georgia's state bike route system has one route directly connecting to North Carolina. It enters North Carolina less than 15 miles south of the town of Franklin and NC 2. US 441/US 23 could serve as a connector between Franklin, NC and the Georgia state bike route system.

THE TRIAD

NC 2 currently meanders south of Winston-Salem, avoiding the city. It similarly misses High Point and Greensboro. The network of bicycle routes identified throughout the triad provides an opportunity for routing directly through the downtowns of these cities. A connector route through the cities would yield potential savings in mileage, as well as provide an option for those interested in travelling between urban centers.


Connect to the Virginia Creeper Trail
A connector route should link the downtowns of Winston-Salem, High Point, and Greensboro
Multiple potential connections to Tennessee routes
Connect NC-2 to the Georgia route system south from Franklin
An additional route should connect the Triad to Charlotte and south to South Carolina routes
Connect NC-8 to the Swamp Rabbit Trail ending in Traveler's Rest, SC
Virginia
Tennessee
Abingdon
Damascus
Whitetop
Danville
Kingsport
Mountain City
Johnson City
Erwin
Elk Park
Boone
Winston-Salem
High Point
Greensboro
Knoxville
Hot Springs
Gatlinburg
Waynesville
Asheville
Saluda
Tryon
Franklin
Gastonia
Concord
Charlotte
Campobello
Clayton
Travelers Rest
Greenville
York
Rock Hill
Laurinburg
South Carolina
Georgia
Columbia
Atlanta

NORTH-SOUTH CONNECTOR

The current system does not include a north/south connector in the western half of the state. The counties encompassing and between Charlotte and Winston-Salem - Mecklenburg, Cabarrus, Rowan, Davidson, and Forsyth - have all published bicycle route systems (Davidson's has not been finalized). These localized route systems present a potential opportunity in developing an additional segment of the statewide route system that serves as a north/south connector in the western half of North Carolina.

SOUTH CAROLINA ROUTES

North Carolina's current state bike route system connects to South Carolina's bike route system in two places. NC 3 connects to South Carolina's Coastal Route along the east coast and US 1 continues through South Carolina, entering near Laurinburg, NC.

The new North-South Connector could serve as a connection to two South Carolina routes: the Central Route finishes in the town of York, SC less than 30 miles from Charlotte and the NC border, and the Northern Crescent route runs east/west through SC, closely paralleling the NC border. Rock Hill, SC and York, SC are potential connection points to the Northern Crescent route near the the Charlotte border. NC 8 southeast of Tryon straddles the NC/SC border on Hunting CountryRd/Webster Rd. Through the town of Landrum, SC, a direct connection could be established to the Northern Crescent route in Campobello, SC, ~5 miles to the south.

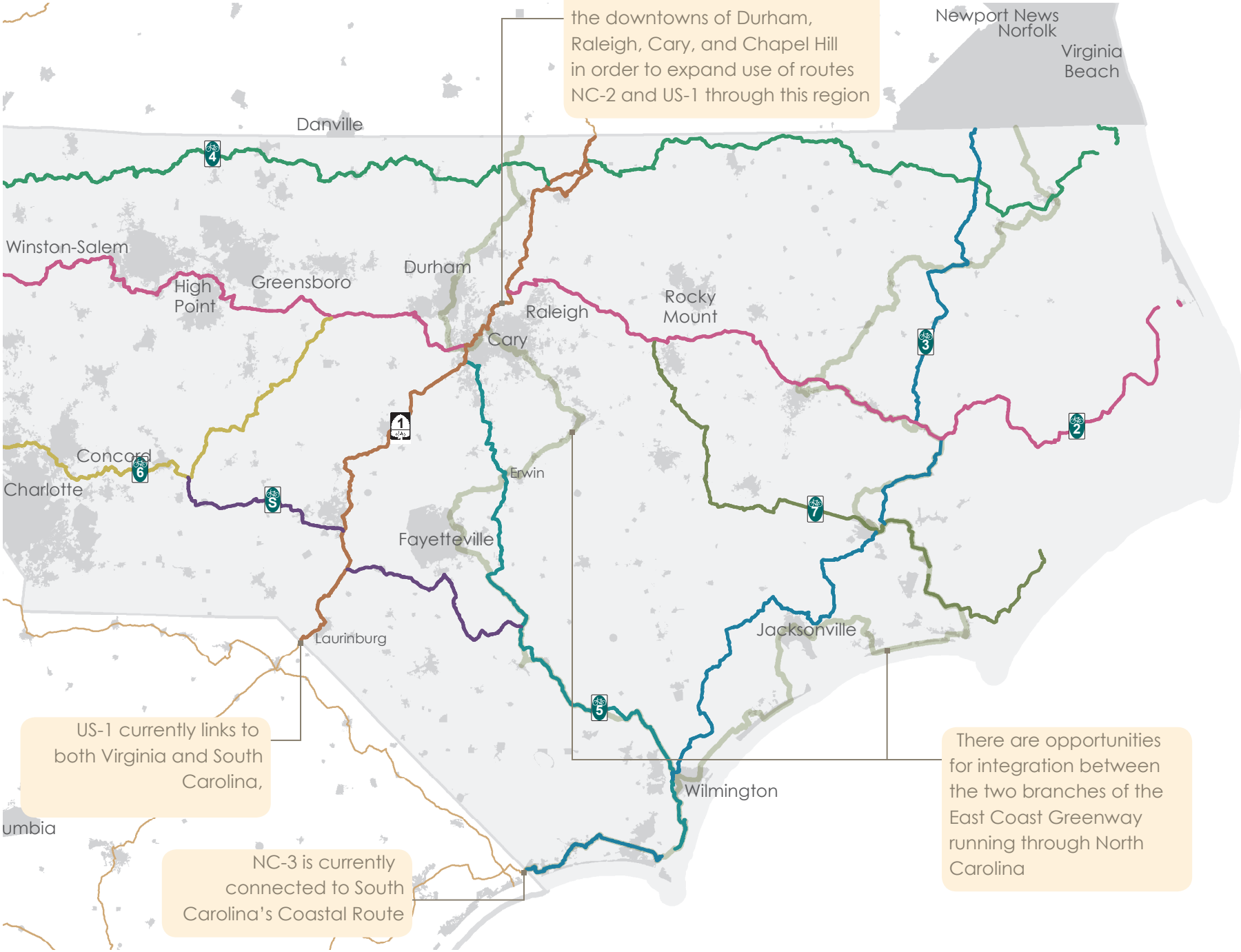
Another connection opportunity exists where the popular Swamp Rabbit Trail beginning in Greenville, SC finishes in Travelers Rest, SC - less than 30 miles from Saluda, NC and NC 8 near the NC/SC border.

THE TRIANGLE

Similar to the routing in the Triad, NC-2 and US-1 avoid the downtowns of Raleigh, Durham, Cary, and Chapel Hill. Given the amount of development in this region, this avoidance does not yield a pleasasnt rural route but is instead difficult for cyclists and identified as a problem area. A connector route or routes between these downtowns would both serve touring cyclists interested in visiting these urban centers, and provide a connection for residents of the triangle to travel between the cities by bike. Connector routes should be added through this area.

THE EAST COAST GREENWAY

The East Coast Greenway is planned to be a traffic-free long-distance urban trail project that will connect 25 major cities from Maine to Florida, incorporating waterfront esplanades, park paths, abandoned railroad corridors, canal towpaths, and other pathways designated for non-motorized use. This route system is in development, and follows roadways where trails haven't yet been developed. The main spine of the route runs through Durham utilizing the American Tobacco Trail and then southeast to Wilmington where it meets a coastal route. These two branches parallel US-1, NC-5, and NC-3 for significant sections. Routes should be coordinated with the East Coast Greenway, overlapping where appropriate and signed to emphasize the other system where the routes cross. This will allow resources invested in roadways of each to benefit the other and generate the benefit of additional travelers along shared routes, which makes routes more comfortable by increasing awareness of them and influencing motorist behavior.


Connector routes should link the downtowns of Durham, Raleigh, Cary, and Chapel Hill in order to expand use of routes NC-2 and US-1 through this region
Newport News
Norfolk
Virginia Beach
Danville
Winston-Salem
High Point
Greensboro
Durham
Raleigh
Cary
Rocky Mount
Concord
Charlotte
Erwin
Fayetteville
Laurinburg
Jacksonville
Wilmington
US-1 currently links to both Virginia and South Carolina,
NC-3 is currently connected to South Carolina's Coastal Route
There are opportunities for integration between the two branches of the East Coast Greenway running through North Carolina

Route Information

Two items stood out from the public feedback gathered on state bike routes: route information should be improved both on the ground in the form of better signage, and online for use during trip preparation.

SIGNAGE

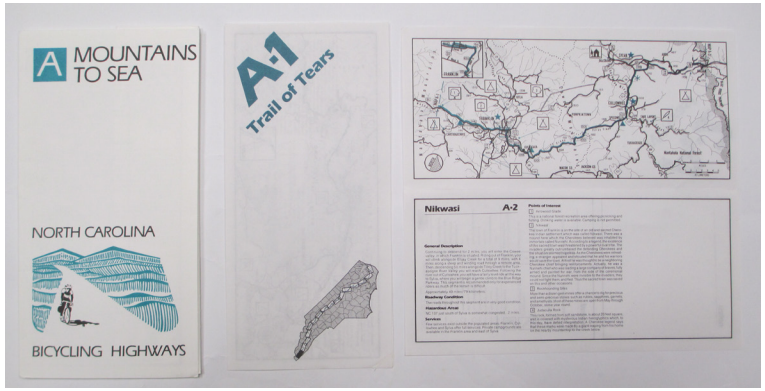
Originally, routes were signed at each turn with the green bike route sign, shown below. While these wayfinding signs are useful for those following a route exactly, they do not provide additional information such as distance to the next town, or information about connections to local and regional routes where these touch or come close to the state bike routes. Further, as development has occurred along the routes, many signs have been removed, making it difficult to follow the routes with signs alone.

Current signage for NC-2 in Carrboro

GUIDES

Paper maps are currently available to order through the NCDOT Bicycle and Pedestrian Division's website. The maps come with a guide full of useful information including bicycle laws and safety tips, detailed route descriptions, and the location of hazardous segments, camping areas, bicycle shops, services, and other points of interest.

While these guides provide much of the information cyclists are looking for, they sometimes take several weeks to arrive upon order and are out of date in some areas. This makes them inconvenient for use by cyclists who plan trips on short notice or visitors interested in comparing different route options. Cyclists around the state have requested that the information contained in these guides be made available on the web. Even further, cyclists are interested in using interactive maps that can be viewed on smart phones or imported into other trip planning tools.



The current Bike Route Guide for NC-2

9.3

Recommendations for the System

Route Changes

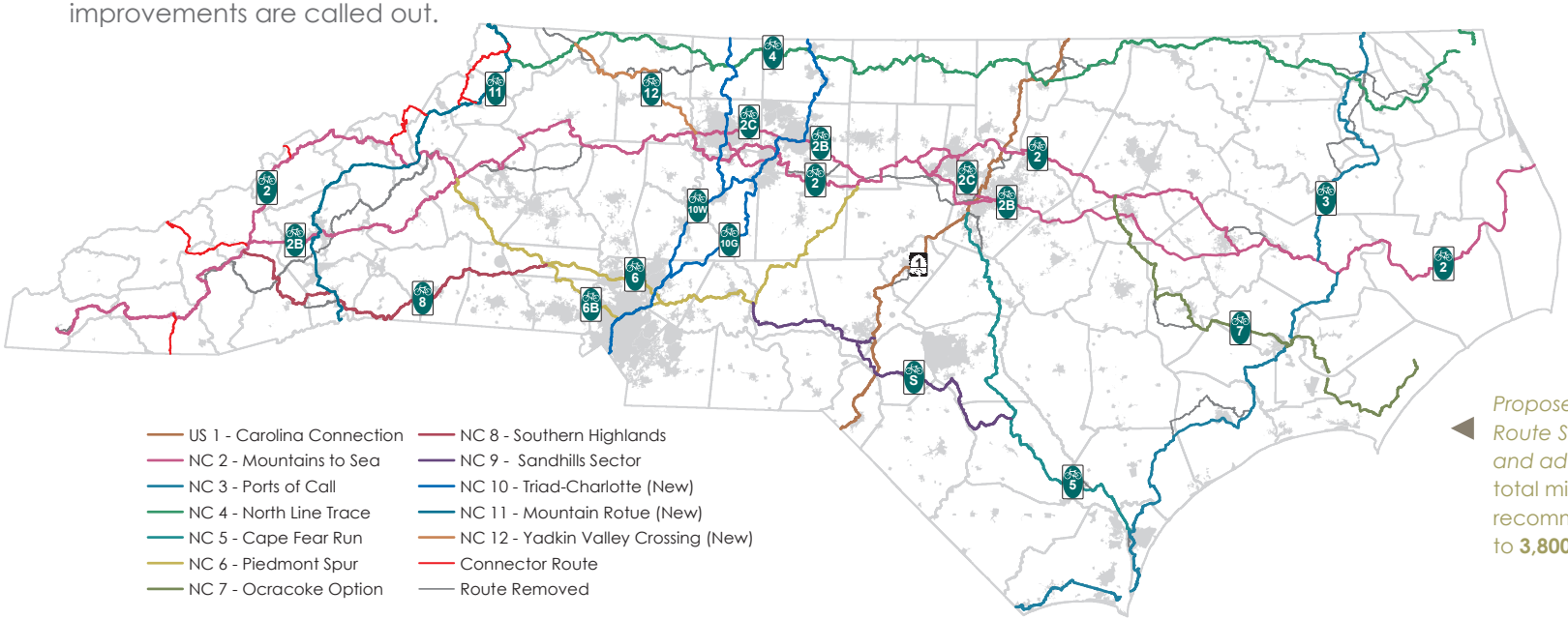
Using a combination of the following inputs, detailed re-routing recommendations for each state bike route are provided on the following pages. **A total of 805 miles of re-routes are recommended.**

- Bicycle Level of Service along the current routes
- Local and regional route locations
- Neighboring state route locations
- Online map input
- Local cyclist input

While in some cases re-routing can address segments that have become unsuitable for cycling, in many cases no suitable alternatives exist through developed or environmentally sensitive areas. In these cases, improvements are recommended. For each segment of the system, priority areas requiring short-term improvements are called out.

Additional Routes and Connections

Many additional route connections are recommended to make the system comprehensive, efficient, and useful to a broader range of cyclists. This includes three new routes as well as other connectors that tie into neighboring state systems, link to key destinations, and fill current gaps in the system. **A total of 1,167 additional miles are recommended** and detailed on the following pages. One key additional route type is the 'business route'. Business routes complement the existing system where it avoids cities, providing connections directly through downtown areas. While current rural routes bypassing cities are useful for cyclists interested solely in scenic, undeveloped landscapes, many cyclists have expressed an interest in routes connecting directly to urban areas. Business routes provide this option for routes travelling near the major urban centers of the state. Beyond their use for touring cyclists interested in seeing cities, business routes will also be useful to local cyclists interested in travelling around their own urban areas. Improvements on these routes will therefore benefit many different groups.



Proposed State Bike Route System: Re-routes and additions bring the total mileage of the recommended system to **3,800 miles.**

US 1 - CAROLINA CONNECTOR

Re-route near Middleburg to avoid possible roadway flooding

Evaluate and incorporate re-routing recommendations proposed by local cyclist Larry Sams

Re-route through the Triangle in coordination with re-routes of NC 2 and other planning efforts, such as the Triangle Commuter Bike Initiative

Re-route southwest from Sanford using Carbonton Rd, Franklin Dr, Henley Rd, Center Church Rd, and Plank Rd

No changes further south of Sanford

US 1 - Proposed Route
US 1 - Alternative Considered
Proposed Route System
Current Route System
East Coast Greenway
State Park
Federal Land

0 10 20 Miles

9.3

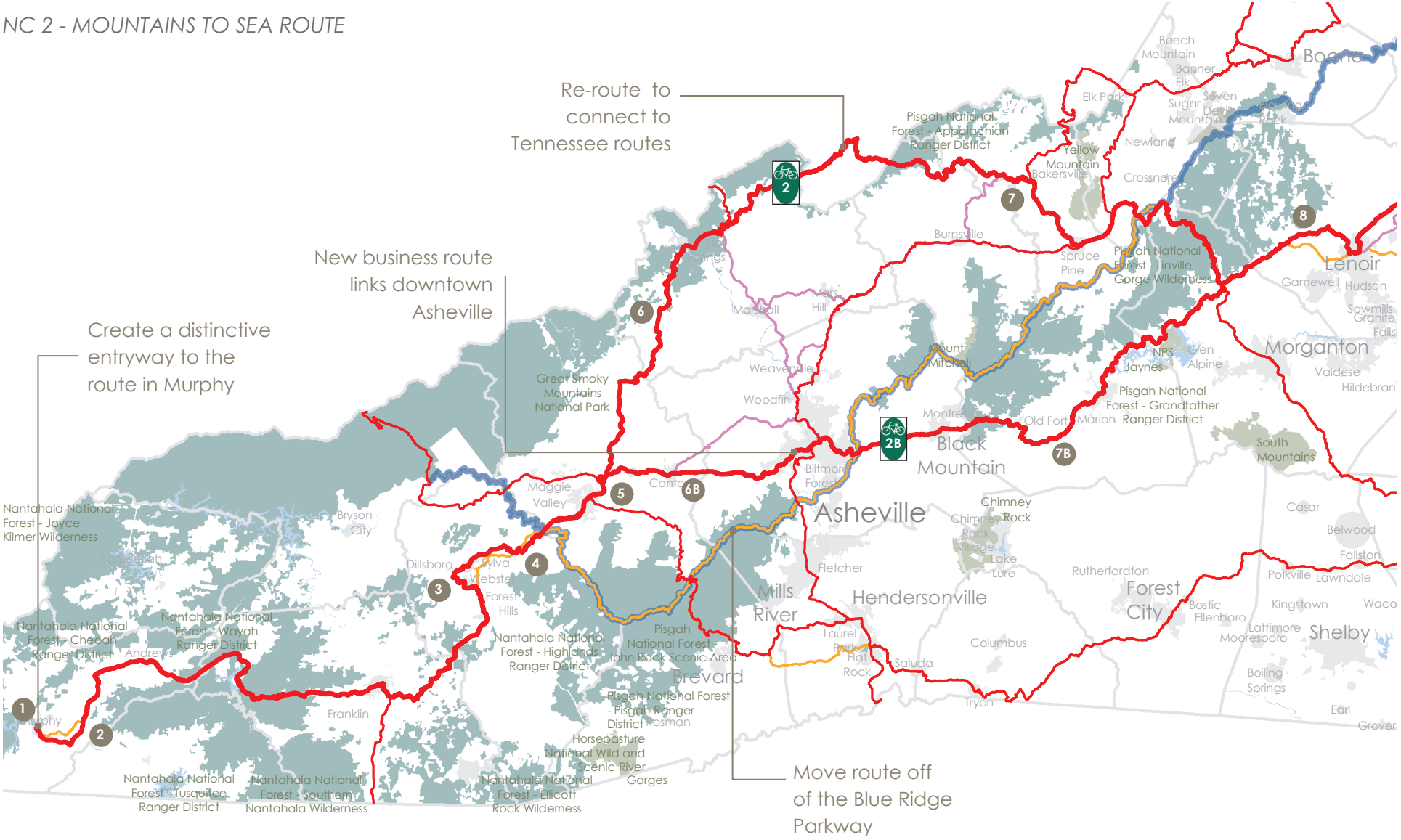
ID	Segment	Current Condition	Recommendation	Improvement Sections	Input Source(s)
1	Virginia border to the Triangle region north of Falls Lake	Generally pleasant riding conditions, rural	Eliminate the section of US 1 Carolina Connector going over Kerr Lake between Hicksboro Rd and Jacksontown Rd. Eliminate section from Middleburg to intersection of Jacksontown Rd and Manson-Drewery Rd via Manson; utilize Jacksontown Rd/N Lee Ave to connect Middleburg to Jacksontown Rd and Manson-Drewery Rd.	NC 39 heading west into Henderson; US 158 heading north from Henderson	Tony Goodnight; Mike Dayton; Dave Connellly
2	Triangle Region	This section has been affected by development from the growing triangle region.	Cyclist Larry Sams studied this section and proposed re-routing recommendations for US 1 through the triangle. Re-route Six Forks Rd/Norwood Rd section to Durham Rd and Carpenter Pond Rd in order to connect New Light Rd and Norwood Rd. Also, align with East Coast Greenway utilizing Cary greenways from Umstead Park to Davis Dr.	Due to high traffic volumes on roads through this area, a large majority will need bicycle facility upgrades. *Prioritize Carpenter Pond Rd and Davis Dr	Larry Sams; input map comments; Cary bike map; Triangle Bike Commuter Initiative; Donna Kidder (Team CBC)
3	South of the Triangle region to the South Carolina border	Generally pleasant riding conditions, rural; Heavier traffic closer to Apex	Besides one change southwest of Sanford (see 4), no changes; some sections through towns should be prioritized for upgrades	*Prioritize Charlotte Ave and Carthage St through Sanford; Old Hwy 1 and Salem St entering Apex	Rainbow Cycles bike shop in Southern Pines; Tony Goodnight; Bob Oderkirk (Team CBC); input map comments; field review
4	Sanford area	Higher amounts of traffic on current route between Sanford and S Plank Rd	Re-route from Sanford heading southwest utilizing Carbonton Rd, Franklin Dr, Henley Rd, Center Church Rd, and Plank Rd		John Mueller - Rainbow Cycles bike shop in Southern Pines; Bob Oderkirk (Team CBC)

US Bike Routes

US Bike Route 1 Carolina Connector, adopted as part of the North Carolina State Bike Route system, is part of a developing network of long-distance bicycle routes across the United States. It is a collaborative effort spearheaded by a task force under the auspices of the American Association of State Highway and Transportation Officials (AASHTO). Members of the task force include officials and staff from state DOTs, the Federal Highway Administration, and non-profits, including Adventure Cycling Association, the East Coast Greenway Alliance, and Mississippi River Trail, Inc. North Carolina designated US 1 as part of the State Bike Route system in 1982. Changes to US 1 will need final approval from AASHTO.

Source: Adventure Cycling Association. http://www.adventurecycling.org/routes-and-maps/us-bicycle-route-system/usbrs-101/

NC 2 - MOUNTAINS TO SEA ROUTE



NC 2 - Proposed Route
NC 2 - Alternative Considered
Proposed Route System
Current Route System
Blue Ridge Parkway
State Park
Federal Land

9.3

ID	Segment	Current Condition	Recommendation	Improvement Sections	Input Source(s)
	General	The Mountains to Sea Route bike route is often confused with the cross-state Mountains-to-Sea Trail , an off-road hiking trail.	Rename NC 2 to avoid this confusion.		
1	Terminus of NC 2 in Murphy	The current "end" sign is placed at the intersection of US 64 with US 19/74/129 in Murphy. This is a barren, high traffic intersection with little to highlight Murphy.	Extend route into downtown Murphy continuing straight across the intersection to SR 1326, Hiwassee Street, which should be followed to US 19 Business. This is the "square" in Murphy and is much more interesting and unique than the current "end" intersection.		Reuben Moore
2	Murphy to Cullowhee	Quality route from Murphy past Cullowhee to the intersection of 107 and River Rd. While a back route alternative exists going through Cullowhee, which the higher-traffic current route on 107 skips, 107 has bike lanes until River Rd.	Re-route small section east of Murphy, utilizing new US 64 rather than Old US 64 - use NC 141 to reconnect with current NC 2. Show links to Cullowhee.	Paved shoulder generally	Smoky Mountain Bicycle bike shop in Franklin; Cherokee County CTP Committee
3	107 & River Rd to north of Sylva	Current NC 2 on 107 north of River Rd is a high traffic section with little to no space for cyclists.	Eliminate this current section. Re-route via River Rd to the west. Although this alternative adds distance, it is more scenic and connects through downtown Sylva.	Paved shoulder generally	Reuben Moore
4	North of Sylva to Balsam Gap and the intersection of US 23/74 and the Blue Ridge Parkway	US 23/74 Expressway is carries high volume and high speed traffic	Re-route using parallel county roads that are now paved and offer an alternative to the current route on the US 23/74 Expressway toward Balsam Gap.	Paved shoulder generally	Kent Cranford

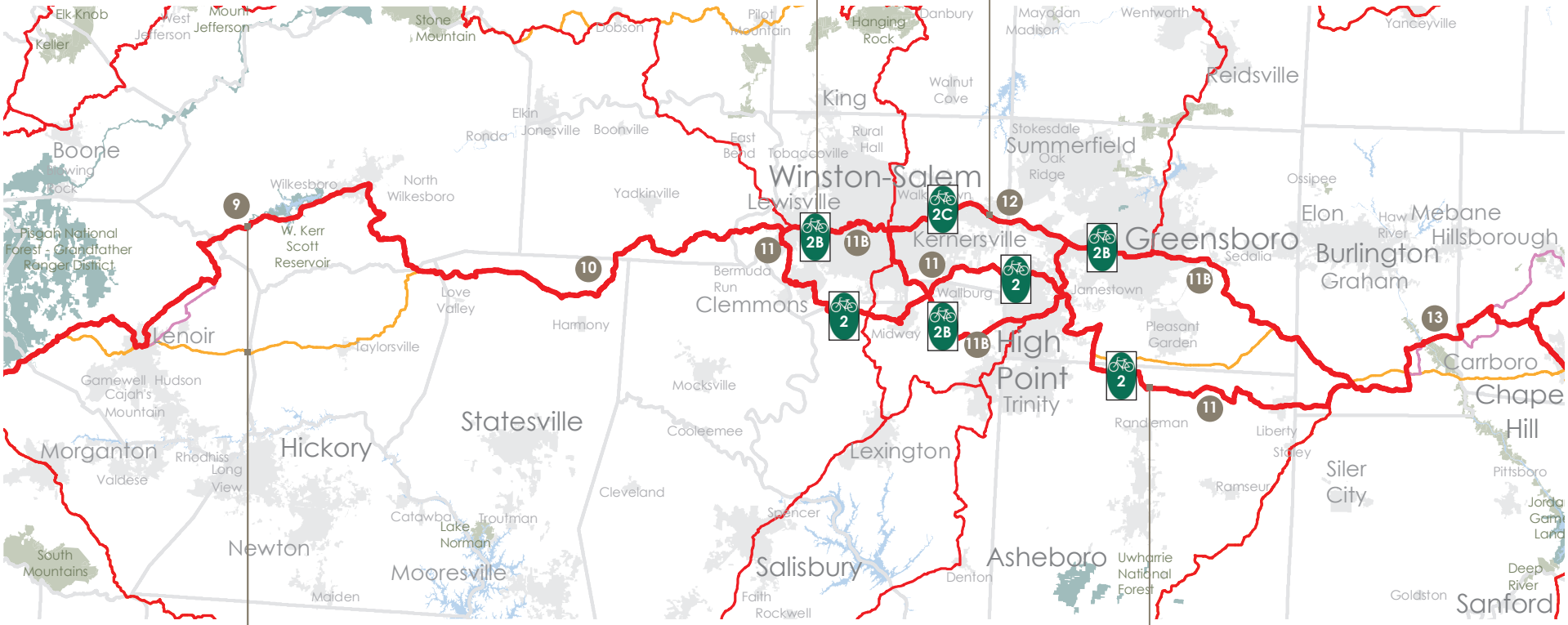
ID	Segment	Current Condition	Recommendation	Improvement Sections	Input Source(s)
5	Balsam Gap heading northeast from the intersection of US 23/74 and the Blue Ridge Parkway to Lake Junaluska	Existing route runs along the Blue Ridge Parkway. A lack of shoulders, pavement deterioration, and significant touring traffic make this road difficult for cyclists. In addition, the Blue Ridge Parkway is a well-known signed route, so those cyclists interested in riding it can easily access information about the route whether or not it is a designated state bike route.	Re-route NC 2 off of the Blue Ridge Parkway. Route through Waynesville, Lake Junaluska, Clyde, and Canton. From west to east, take Old Balsam Rd from near Balsam Gap toward Waynesville. From east to west, must take US 23/74. If bicycle facility improvements are implemented along the N Main St corridor in the future, consider utilizing the N Main St corridor through Waynesville rather than the greenway.	East to west section of US 23/74 - high speed, high traffic climb to Balsam Gap	Cecil Yount
6	Lake Junaluska to Spruce Pine via Tennessee	Tennessee is currently updating their state bike route system and interested in establishing connections to North Carolina's updated statewide bike route sytem. This would provide a link in addition to linking scenic, rural, and rugged mountainous terrain in western NC.	Route on NC 209 north from Lake Junaluska to Hot Springs. Significant climbing but spectacular route. From Hot Springs, head north through very scenic but challenging route to Spruce Pine via Tennessee connection and Bakersville, NC. This skips Asheville, Weaverville, and Burnsville but serves as a regional connector to eastern Tennessee and rural western NC. Aligns with segment 7 of the (Draft) High Country Regional Bike Plan route from Bakersville to Spruce Pine	Paved shoulder generally	Cecil Yount; John Mudge - RollsRite bike shop in Waynesville; Sam White - Liberty Bicycles in Asheville; Phil Trew; Asheville/ Buncombe area bike map; Jessica Wilson of Tennessee DOT
7	Spruce Pine to the Blue Ridge Parkway and current NC 2	Three-Mile Hwy and US 221 currently provide a low level of service for bicyclists	Follow 19E east/north of Spruce Pine eventually connecting to Three Mile Hwy and eventually the Blue Ridge Parkway. Aligns with segment 9 (partially) and 9A of the High Country Regional Bike Plan (Draft)	Three-Mile Hwy and US 221 connecting to NC 183	Randy Raskin

ID	Segment	Current Condition	Recommendation	Improvement Sections	Input Source(s)
6B	Business Route: Lake Junaluska to downtown Asheville	Pavilion in Clyde has water, bathrooms, and parking available - gathering spot for bicyclists.	Highlight pavilion in Clyde. Heading east of Canton, use a combination of US 19/23, Old 19/23 through Candler and Sand Hill Rd to connect to downtown Asheville. Running parallel to Sand Hill Rd, highlight Sulphur Springs Rd on which lies a school, city pool, and heavily used park.	US 19/23 Asheville Hwy east of Canton; *Prioritize Haywood Street into Asheville	Cecil Yount; input map comments
7B	Business Route: downtown Asheville to current NC 2 (intersection of Brown Mountain Beach Rd and NC Rt 181 north of Morganton)	There is a lack of bike route options heading east out of downtown Asheville. Low bicycle level of service between downtown Asheville and Black Mountain	Add this route to the NC 2 Business Route. This section will need improvements, but would make a much needed connection east from downtown Asheville toward Black Mountain, Old Fort, Marion, and the Morganton area.	*Prioritize Tunnel Rd/US 70, and Swannanoa River Rd	Julie White; Lyuba Zuyeva
8	Blue Ridge Parkway to Lenoir	Abington Rd currently provides a low level of service for bicycling; better alternative exists on NC 90.	Re-route section on Abington Rd into Lenoir with NC 90.	Paved shoulder on NC 181 from Blue Ridge Parkway toward Lenoir.	Bob Giduz; Shawn Moore and Jeff Welch of Luna Cycles bike shop in Lenoir
9	Lenoir to the intersection of Brushy Mountain Rd and Sulphur Springs Rd/Linneys Mill Rd.	Wide road with varying shoulder (1-2 feet); heavy traffic including trucks (for motor vehicles, this road is used as a more direct route to the mountains as I-40 turns southwest toward Asheville)	Re-route this section. Route north along 268 (Happy Valley) toward Wilkesboro; reconnect to current NC 2 east of Taylorsville. Route is beautiful and scenic but adds significant distance. New route highlights greenways in Lenoir and links Wilkesboro.	Paved shoulder generally	Bob Giduz; Shawn Moore; Jeff Welch; input map comments
10	Love Valley to Lewisville (western edge of Winston-Salem)	Rural, lower traffic, currently a good route	No change	Paved shoulder generally	Tony Goodnight

NC 2 - MOUNTAINS TO SEA ROUTE

Add a business route through Winston-Salem, High Point, and Greensboro to complement the existing rural route through this region

As part of the new business route system, the Triad Connector will link downtown Winston-Salem to downtown Greensboro



268 provides a scenic alternative to the heavily trafficked 64/90 between Lenoir and Taylorsville

Groomstown Rd is the preferred option from High Point to Snow Camp and connects through the Town of Liberty

NC 2 - Proposed Route
NC 2 -Alternative Considered
Proposed Route System
Current Route System
State Park
Federal Land
Miles 0 10 20

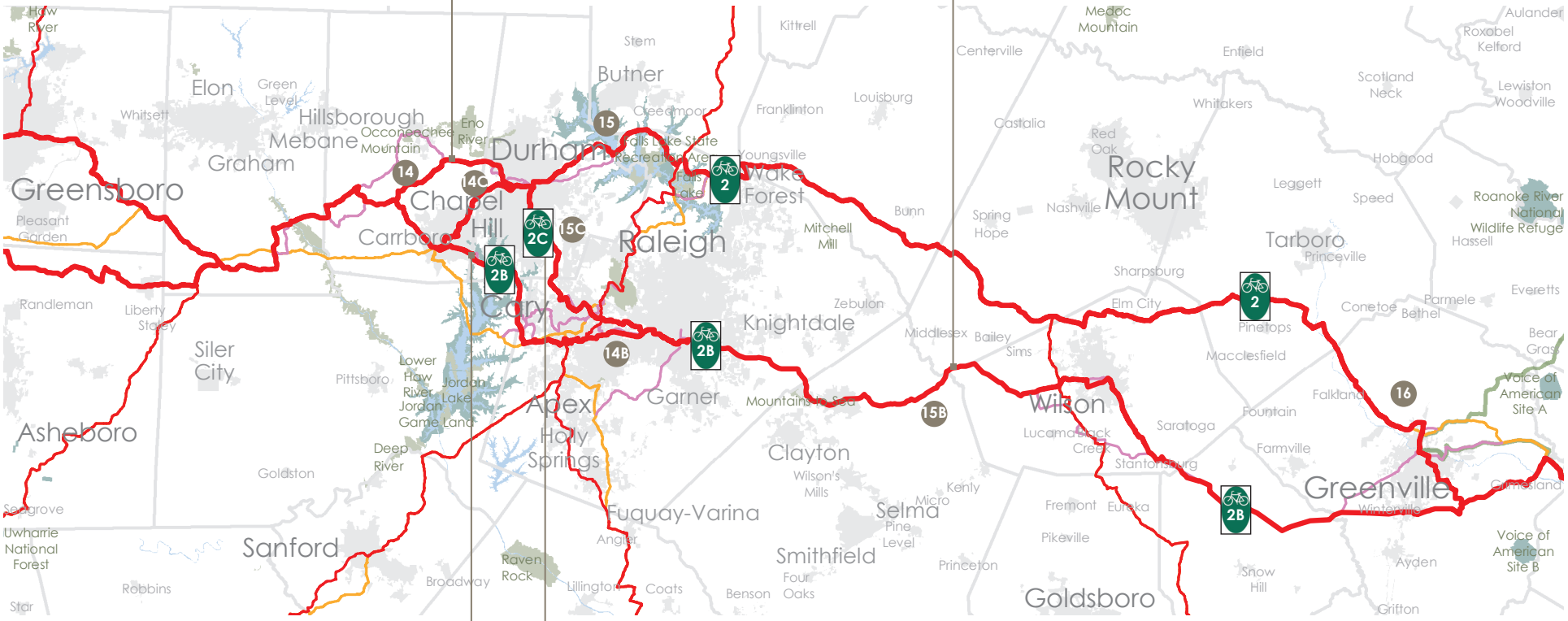
9.3

ID	Segment	Current Condition	Recommendation	Improvement Sections	Input Source(s)
11	Lewisville to Snow Camp	These roads are still bicycle friendly and well selected; preserve as a complementary rural option to the urban business route.	Re-route section on NC 62 south of Greensboro using Groomtown Rd to Snow Camp via the town of Liberty.		Aaron Daniel and the Greensboro Velo Club team; input map comments
11B	Business Route: Lewisville to Snow Camp	This route links the hearts of downtown Winston-Salem, High Point, and Greensboro. Improvements will be needed to ensure safe passage through these urban centers.	Connect Lewisville to downtown Winston-Salem, downtown High Point, and downtown Greensboro. This Business route criss-crosses NC 2 twice before reconnecting near Snow Camp in Alamance County.	*Prioritize improvements to the urban center segments-particularly S Main in W.S., Lexington Ave through downtown High Point, and sections of Market St, McConnell Rd, and Alamance Church Rd in and around Greensboro.	Clemmons Bicycle; Zach Lail – Mock Orange Bikes, Winston-Salem; Aaron Daniel – Greensboro Velo Club president; Bicycle Toy and Hobby, High Point; Bike Maps - Winston-Salem, High Point, Greensboro, Davidson County, Randolph County
12	Triad Connector: downtown Winston-Salem to downtown Greensboro	This will serve as a direct connection between downtown Winston-Salem and Greensboro. However, it will need improvements to provide an appropriate bicycle level of service.	Make this connection between the downtown urban centers; prioritize improvements to make safe connection through Kernersville	*Prioritize improvements to Old Greensboro Rd, Mountain St, and W Market St.	
13	Snow Camp to Carrboro	Old Greensboro Rd is the most direct route to Carrboro/the Triangle from the Snow Camp area. This route is scenic, but carries higher traffic with limited shoulder and misses the rural destination of Saxapahaw. The section closer to Carrboro was recently resurfaced with 1-2 feet of shoulder added.	Re-route to the village of Saxapahaw along country roads that carriy less vehicular traffic, including Dairyland Rd. Proposed route is more scenic and connects to the popular rural cycling destinations of Saxapahaw and Maple View Farm while adding minimal distance.	*Prioritize section of Old NC 86 between Calvander and Hillsborough Rd northwest of Carrboro - this is a dangerous pinch point for bicyclists. Add paved shoulders generally, especially Sax-Beth Rd leading into Saxapahaw	Jeremy Pinkham; Eric Wiebe; Tamara Sanders – The Clean Machine bike shop in Carrboro; Dave Connelly; input map comments

NC 2 - MOUNTAINS TO SEA ROUTE

Re-route to downtown Durham and connect to Orange County routes that link historic Hillsborough

Business route continues out to Greenville and the main NC 2 route, linking NC 5 along the way, to provide a more direct alternative for cyclists heading east toward the coast from Raleigh



Along with re-routing of current NC 2 through the triangle, additional business and connector routes between each of the urban centers would provide more choice for riders interested in visting city centers

NC 2 - Proposed Route
NC 2 - Alternative Considered
Proposed Route System
Current Route System
East Coast Greenway
State Park
Federal Land
Miles 0 10 20

9.3

ID	Segment	Current Condition	Recommendation	Improvement Sections	Input Source(s)
14	Maple View Farm to downtown Durham	Scenic route with lower traffic volumes through rural parts of Orange and Durham Counties leading to downtown Durham.	Re-route NC 2 to connect through the northern Triangle area and downtown Durham. Proposed business route (see below) replaces original route and connects Chapel Hill and Raleigh.	Paved shoulder generally	Eric Wiebe; Casey Collings; Dave Connelly; Orange County bike map
15	Durham to Youngsville area	Main route continues through Durham to current NC 2 crossing Falls Lake	Make this connection continuing east, north of Raleigh to the bicycle friendly sections of current NC 2 heading east from Youngsville	Improvements needed in Youngsville	Mike Dayton; Eric Wiebe
16	Youngsville area to Greenville area	Generally pleasant riding conditions; low bicycle level of service along Old River Rd and US 264	Retain majority of route, except the section east of Greenville - Old Creek Rd and US 264; connect this route south through downtown Greenville toward Washington	*Prioritize improvements to Old River Rd northwest of Greenville	Mike Dayton; Ryan Danell (EC Velo Team)
14B	Triangle Business Route: Carrboro/ Chapel Hill to Raleigh via Cary	Current NC-2 was once a great route but bicycle facility improvements have not kept pace with development; Proposed NC-2 Business utilizes a combination of recent greenway developments and on-road connections to replace this route.	Eliminate current NC 2 from Carrboro to the intersection of Purnell Rd and Stony Hill Rd near Youngsville. Add business route that connects Chapel Hill; utilizes greenways along 54, a significant paved section of the American Tobacco Trail, and a developing greenway system in Cary; aligns with the East Coast Greenway; and connects to downtown Raleigh via the NC State campus and greenways	*Prioritize improvements to Raleigh Rd/54 leaving Chapel Hill, Barbee Chapel Rd, and Stagecoach Rd	Dave Connelly; Durham bike commuters meet-up; Larry Sams; Mike Dayton; Branson Kimball; input map comments; Durham, Cary Bike Maps; BLOS
15B	Triangle Business Route: Downtown Raleigh to Greenville area	Pleasant riding conditions east of Poole Rd; lower bicycle level of service through Wilson and Winterville; connects to ECG and Neuse River Greenway	Include this direct route for bicyclists not wanting to route north to connect with NC 2 main route (Current NC 2) heading east; cross the Tar River after Grimesland heading east	*Prioritize improvements to Poole Rd (Raeligh area) NC 42 through Wilson; improve Worthington Rd through Winterville; Improve Covered Br Rd (Wilson County)	Mike Dayton; Ryan Danell (EC Velo Team); Jimmy Eatmon
14C	Triangle Connector: Carrboro/Chapel Hill to Durham	Erwin Rd currently provides a low level of bicycle service	Utilize Erwin Rd as the main connection from Chapel Hill to Durham. This road needs improvements to serve as this connection and should be highly prioritized.	*Prioritize improvements to Erwin Rd	Eric Wiebe; Casey Collins; Tamara Sanders; input map comments
15C	Triangle Connector: Durham to Raleigh	This route utilizes greenway connections and on-road facilities, but also includes a few sections that provide a low bicycle level of service	Utilize the American Tobacco Trail, Davis Dr, Cornwallis Rd, and other connectors before linking with the Carrboro/Chapel Hill-to-Raleigh connector route northeast of Cary en route to downtown Raleigh	*Prioritize Davis Dr, Aviation Pkwy, Evans Rd, and Trinity Rd	Mike Dayton; BLOS data

NC 2 - MOUNTAINS TO SEA ROUTE

The current route ends before officially hitting the 'sea'. The trail end should be shifted either to the fishing pier in Nags Head or another significant destination along the Outer Banks.

Main route and business route meet up west of Washington, where proposal re-routes around US 264 to connect downtown Washington

The current route goes past Lake Mattamuskeet, the largest natural lake in NC and a wildlife-viewing destination

NC 2 - Proposed Route
NC 2 - Alternative Considered
Proposed Route System
Current Route System
East Coast Greenway
State Park
Federal Land

0 10 20 Miles

9.3

ID	Segment	Current Condition	Recommendation	Improvement Sections	Input Source(s)
17	Washington Area	US 264 provides low bicycle level of service	Re-route to avoid 264 west of downtown Washington; use Grimes Rd, Plymouth St, and W 3rd St; Through downtown, use W. Stewart Pkwy		Mike Dayton and Jonathan Kuhn
18	Washington to Manteo	Generally good section	Re-route NC 2 bridge into Manteo: southern bridge is preferable because of limited shoulder on northern bridge. However, northern bridge may be decommissioned in the future and become bike/ped only - adjust accordingly		Mike Dayton, Albemarle Bike Plan Existing Conditions, and Steve Lambert
19	Eastern terminus	Currently ends in Manteo	Consider shifting finish to the Outer Banks. Options: Continue straight across Virginia-Dare Trail bridge to Nags Head, finish at fishing pier; finish at Hatteras Island destination; tie into regional Outer Banks		

NC 3- PORTS OF CALL

Re-route to scenic roadways along the Chowan River, connecting to the Arrowhead Beach community

The NC 32/94 bridge over the Albemarle Sound has limited shoulder space and low walls - improvements needed

Routing via the NC 32/94 bridge and Mackeys Rd will benefit the many local cyclists who use this connection to begin loops out of Plymouth, while avoiding the current higher-traffic route

The East Coast Greenway follows a similar corridor but takes a less direct route in order to connect existing trails. NC 3 and the ECG can benefit from clear wayfinding where they cross and overlap.

Much of the current alignment is scenic and should remain but requires improvement, such as the Neuse River Bridge Connection

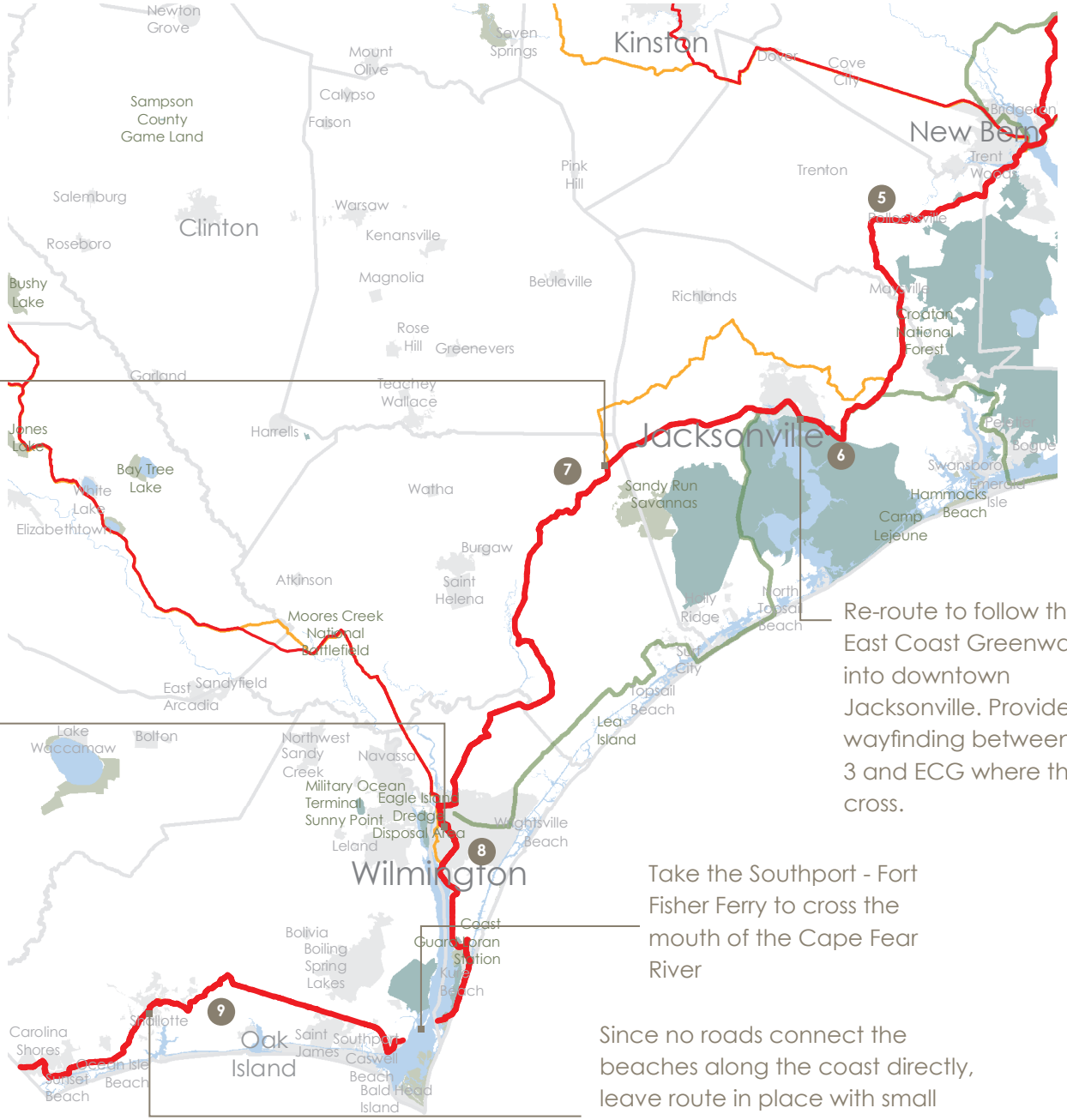
NC 3 - Proposed Route
Proposed Route System
NC 3 - Alternative Considered
East Coast Greenway
Current Route System
State Park
Federal Land

0 10 20 Miles

9.3

ID	Segment	Current Condition	Recommendation	Improvement Sections	Input Source(s)
1	VA border to Edenton	Current NC 3 parallel to the Arrowhead Beach area uses higher traffic roads while skipping the Arrowhead Beach community and the Chowan River en route to Edenton.	Utilize the Arrowhead Beach option along quieter roads that offer a more scenic option along the Chowan River. It connects to the Arrowhead Beach community en route to Edenton. The ECG represents an alternative north/south route east of the Great Dismal Swamp, utilizing the Dismal Swamp Canal en route to Elizabeth City and further south through this area.	Current NC 3 north of the Arrowhead Beach area to the VA border is narrow - recommend paved shoulder in future road upgrades; *Prioritize NC 32 into Edenton	Sam Barrow, Planner, Edenton; Albemarle Field Work Team
2	Edenton to Plymouth	Current NC 3 crosses the Chowan River and uses US 17 and NC 45 to the Plymouth area. These roads have truck traffic and limited space for cyclists	Re-route heading east southeast from Edenton, more enjoyable riding conditions exist before and after the Albemarle Sound bridge - this bridge does not provide a high comfort level for a cyclist; however NC 32 and Mackeys Rd provide a good option into Plymouth	*Prioritize Albemarle Sound bridge improvements - add higher railing, limited shoulder and debris are also concerns	Inner Banks Cycles bike shop - Plymouth; Albemarle Field Work team; Mike Wright, Plymouth, General Services Director
3	Plymouth to Bath	Current NC 3 on Long Ridge Rd contains truck traffic and limited space for a cyclist	Current NC 3 on Long Ridge Rd is the preferable option to parallel side roads, but should be improved	*Prioritize Long Ridge Rd improvements - needs paved shoulder	Inner Banks Cycles bike shop - Plymouth; Albemarle Field Work team; Mike Wright, Plymouth, General Services Director
4	Bath to New Bern	Current NC 3 aligns with the East Coast Greenway (ECG) and Adventure Cycling Association (ACA) routes and connects with the Croatan Plan route in this area - lower traffic volumes; bridge crossing over the Neuse River should be improved	Keep current alignment	Neuse River bridge improvements needed - has some shoulder but also has debris and high speed traffic	Inner Banks Cycles bike shop - Plymouth; Albemarle Field Work team

NC 3- PORTS OF CALL



Reconnect to the existing NC 3 west of Jacksonville. The current route from this junction to Wilmington is scenic and pleasant to ride

Re-route through downtown Wilmington utilizing a route selected by the Cape Fear Cyclists and a Cycle NC ride

Re-route to follow the East Coast Greenway into downtown Jacksonville. Provide wayfinding between NC 3 and ECG where they cross.

Take the Southport - Fort Fisher Ferry to cross the mouth of the Cape Fear River

Since no roads connect the beaches along the coast directly, leave route in place with small tweaks and wayfinding to beaches

NC 3 - Proposed Route
NC 3 - Alternative Considered
Proposed Route System
East Coast Greenway
Current Route System
State Park
Federal Land

0 10 20 Miles

9.3

ID	Segment	Current Condition	Recommendation	Improvement Sections	Input Source(s)
5	New Bern to Maysville	Current NC 3 runs on scenic, low-traffic roads; NC 3 also loosely aligns with the ACA and ECG routes	Keep current alignment	Paved shoulder generally	Croatan Plan; Steve Bzomowski
6	Maysville to Jacksonville	Current NC 3 east and north of Jacksonville was flagged as dangerous by several people on the online input map; this route also avoids downtown Jacksonville	Re-route following ECG route through downtown Jacksonville utilizing greenway into downtown; highlight connections to the ECG which also provides alternative links to Emerald Isle and Beaufort	Improvements needed on Old 30 Rd; Rocky Run Rd; and NC 24	Bicycle Gallery bike shop - Jacksonville; ECG route; statewide input map comments
7	West of Jacksonville en route to Wilmington	Current NC 3 routes north and west of Jacksonville, missing the town	Re-route through downtown Jacksonville to the Burgaw Hwy/53 and further west to Old Maple Hill Rd and current NC 3; current NC 3 is good from there to Wilmington, pleasant riding conditions; ECG and ACA also provide busier, but interesting beach route alternative from Jacksonville	Improvements needed to US 17; Richland Hwy; and NC 53 heading west out of downtown Jacksonville	Tony Goodnight; Eileen McConville - president of the Cape Fear Cyclists; Bicycle Gallery bike shop - Jacksonville; statewide input map;
8	Downtown Wilmington	Market St should be avoided: busy road with little room for cyclists; Port Authority does not want Front St to be used for bicycle routes (large truck traffic shipping goods from port); the route into town is okay	Re-route utilizing route selected by the Cape Fear Cyclists and Cycle NC for the Fall 2012 Cycle NC ride. Improvements through downtown Wilmington needed. Highlight connections to local routes such as the River to Sea trail connecting downtown to Wrightsville Beach.	*Prioritize N 23rd St; S 5th St; 17th St; Independence Blvd; River Rd; Carolina Beach Rd bridge	Eileen Mcconville - president of the Cape Fear Cyclists; Cycle NC; field review
9	New Hanover County to the South Carolina border	Limited options - beach towns divided by inlets that are not connected by bridges or regular ferries; ACA and ECG routes are mostly similar through here	Use current route; small change at intersection near Shallotte - combines with ECG; short spurs or appropriate signage to beach towns/beaches are recommended	*Prioritize improvements to 211, important connector but not bicycle friendly	Tony Goodnight; Cape Fear Cycling Club

NC 4- NORTH LINE TRACE

9.3

Policy Support

North Carolina's Complete Streets policy recommends a multi-modal transportation network that safely accommodates access and travel for all users including bicyclists. However, legislation supported by this policy does not exist in North Carolina's General Statutes. Such a law, supported by the Complete Streets policy, is critical to the development of the statewide bicycle route system given the significant mileage of that system in need of improvement.

Wisconsin, Illinois, Florida, Oregon, and Massachusetts have all passed state laws that require transportation projects to safely accommodate access and travel for all users including bicyclists.[4] Wisconsin's Department of Transportation has conducted several studies finding that the benefits of paved shoulder bicycle facilities to both motorists and bicyclists outweigh the costs. They've since established a policy of including 5' paved shoulders on roads with ADT of 750 or more. These findings should guide improvements to North Carolina's statewide bicycle route system. For all state bicycle routes, as well as regional, county, and local routes, North Carolina should aim to have paved shoulder widths of 5 feet or greater on roads where ADT is 750 or greater. When funding resources are limited, roads where ADT is 1,200 (consistent with the goals of the original route system) or greater should be prioritized. While North Carolina's Complete Streets policy provides existing support for these recommendations, the state should consider their incorporation into transportation legislation. These improvements will enhance safety for both motorists and bicyclists, and it is recommended to include highway safety funds as a resource for implementation.

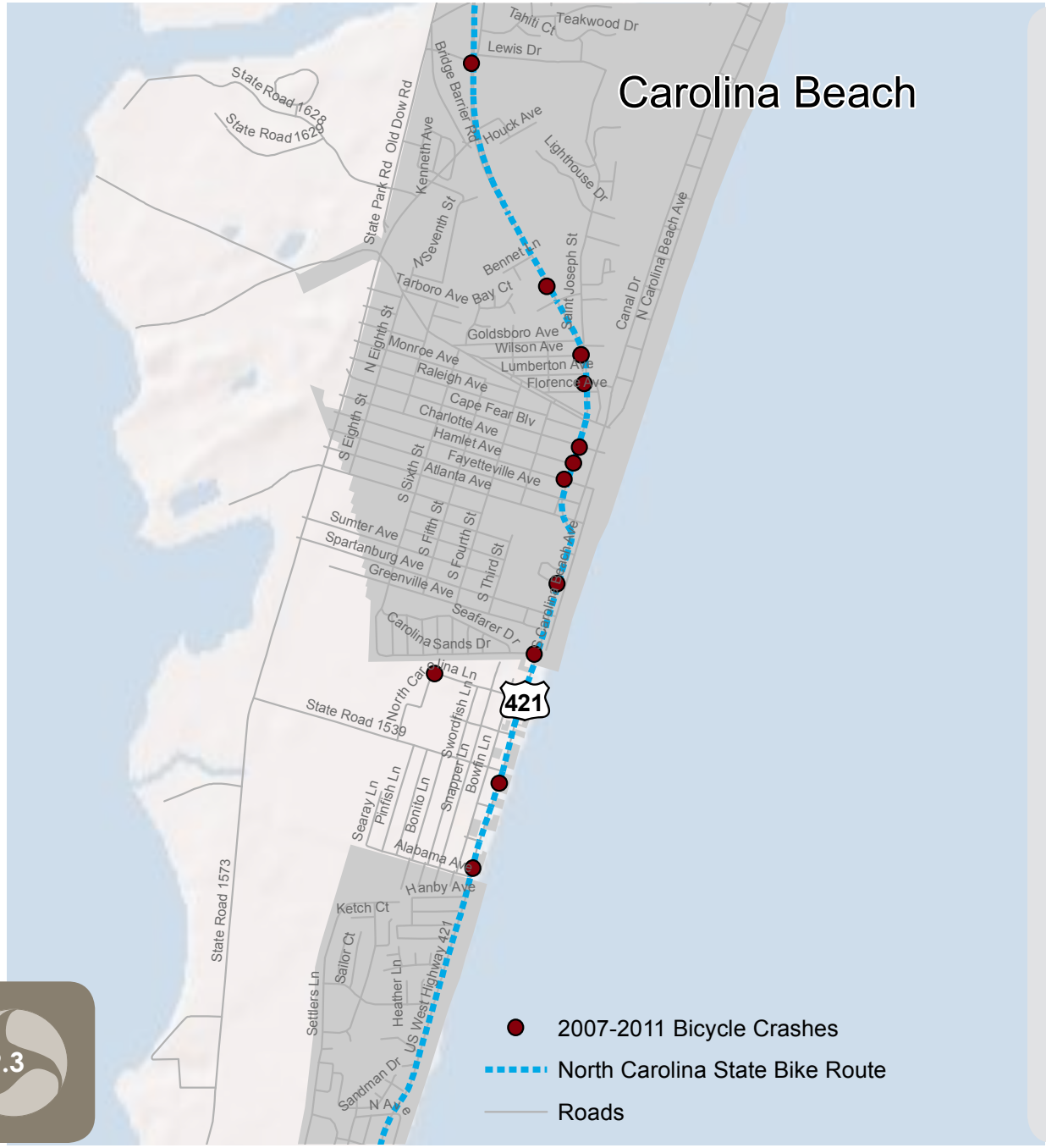
The Evolution of Wisconsin's Shoulder Paving Policy

Wisconsin's Department of Transportation (WisDOT) conducted a study in the 1980's to determine the fiscal and safety impacts of providing paved shoulders, citing benefits for cyclists as a secondary benefit. The findings of that study indicated that the addition of three-foot paved shoulders would be cost beneficial for roadways with ADT of 1,250 and above; savings are due to reductions in motor vehicle crashes and maintenance costs. This finding led to widespread shoulder paving in Wisconsin.[1]

In the 1990s, Wisconsin's shoulder paving policy was amended to paved shoulder widths of 5 feet or greater for highways exhibiting a need to accommodate bicyclists. Wisconsin then adopted a version of Complete Streets legislation in 2009 that requires bicycle and pedestrian facilities on all new and reconstructed projects and most pavement replacement projects.[2] This legislative effort is helping to drive the continued development of bicycle facilities across the state.

Due to the increased benefits of paved shoulders to both bicyclists and motorists, Wisconsin is now modifying its paved shoulder policy to include roads with ADT of 750 or more. Findings from WisDOT's bicycle level of service models point to the significance of these numbers; the doubling of ADT has about a 10-fold negative impact on bicycle level of service.[3]

1 NCDOT case study PDF
2 http://www.smartgrowthamerica.org/documents/cs/policy/cs-wi-legislation.pdf
3 http://www.dot.wisconsin.gov/projects/state/docs/bicycle-rural-guide.pdf



Strengthening Safety: Carolina Beach Crash Study

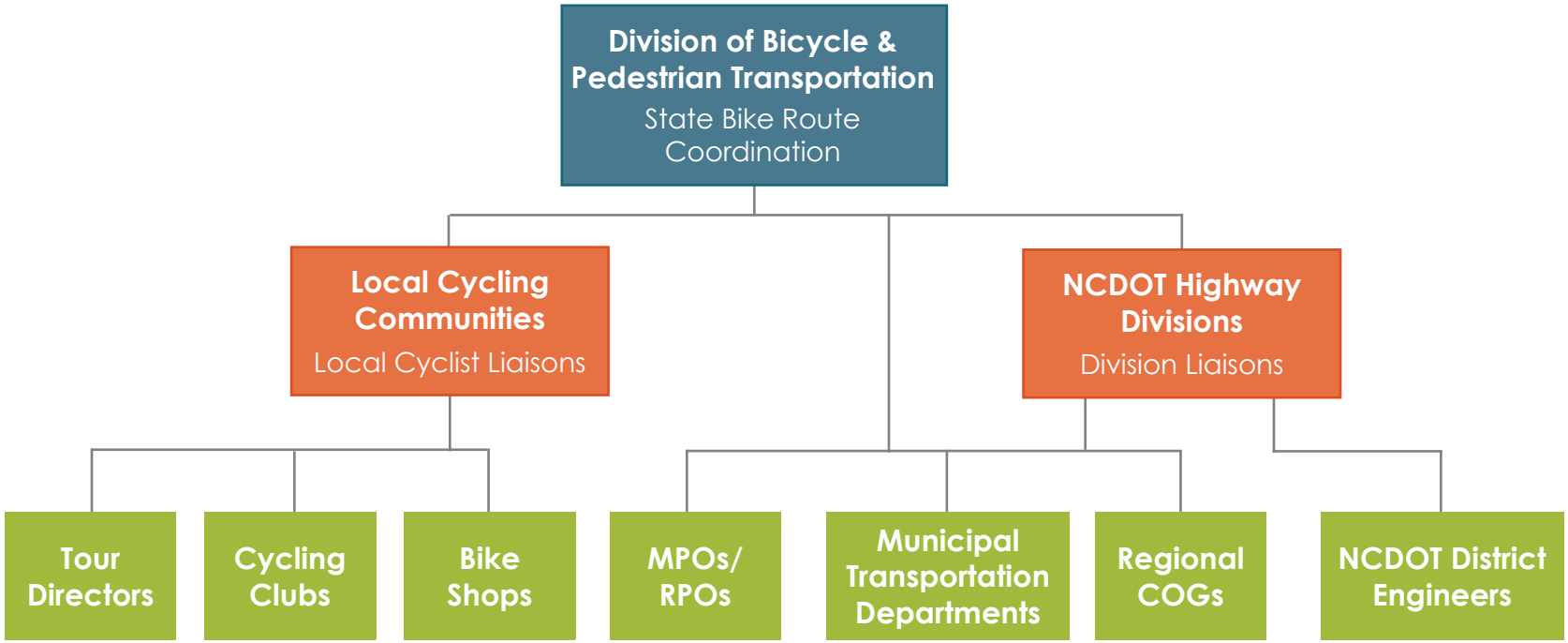
Improving North Carolina's state bicycle routes can have a measurable, positive impact on bicycle safety. Bicycle crash data can be displayed on top of the proposed routes to determine high priority corridors that improve the safety of the state bicycle route system. For example, there were 11 bicycle crashes along US 421 (State Bike Route #3) in Carolina Beach from 2007-2011 (see map at left). As described in Chapter 4, the addition of bicycle lanes creates a 36% reduction in bicycle crashes (FHWA). In addition, other research shows similar positive impacts for the addition of paved shoulders, sharrows, protected bicycle lanes, and cycle tracks. NCDOT should consider making improvements first along priority state bike routes indicated in this appendix and where high incidences of crashes occur.

IMPLEMENTATION OF STATE BIKE ROUTE UPDATES

Administrative Framework

Local experts including cyclists, planners, bicycle shop owners, bicycle tour directors, and many others provided invaluable input that guided the recommendations of this chapter. Continuing communication with these local experts throughout North Carolina is critical to the maintenance of a high-quality statewide bicycle route system. As a starting point for implementation, assign state bike route coordination responsibilities within the Division of Bicycle and Pedestrian Transportation (DBPT).

DBPT should then identify a point person in the bicycling community within each NCDOT highway division to act as a local cyclist liaison for that division. This can be the president of a bicycle club, bike shop owner, avid cyclist, or other involved person or organization in the area. This person can be a direct link to on-the-ground cycling conditions and communicate regularly with the cycling community. Similarly, the DBPT should identify a liaison within each NCDOT highway division itself. Because state bike routes cross NCDOT highway division lines, cooperation and communication across NCDOT highway divisions will be critical. Upon acceptance of their roles, these liaisons will play important roles in driving implementation.

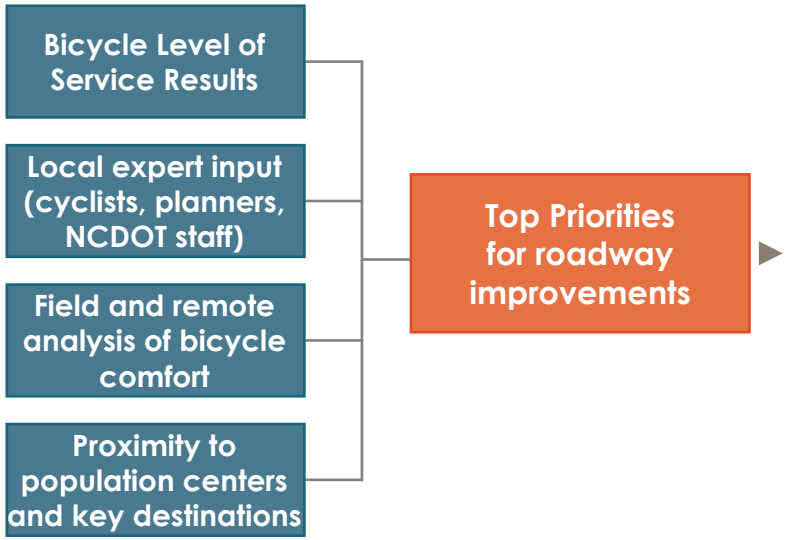


Prioritization of Facility Improvements

95% of the portion of the current statewide bicycle route system lying along roads with traffic volumes of 750 ADT or greater does not have paved shoulders of 5 feet or greater. Given the scope of additions necessary to meet the goal stated above, the policy recommendations of this chapter will play a critical role in ensuring that state bike routes are improved as roadways are repaved or rebuilt. Certain improvements should take place as stand-alone projects as well, however, to address critical pinch points in the system. These projects should be prioritized with the following process.

SHORT TERM IMPROVEMENTS (2017)

First, the top priorities identified through this planning process should be implemented where feasible. Top priority projects are summarized in the following table. These priority projects were selected using several inputs.



Route	Road(s)	Location
US 1	Carpenter Pond Rd and Davis Dr	North Raleigh
US 1	Charlotte Ave and Carthage St	Downtown Sanford
NC 2B	Haywood St	Asheville
NC 2B	Tunnel Rd, US 70, and Swannanoa River Rd heading east from Asheville	Asheville, Buncombe County
NC 2B	Downtown Winston-Salem including S Main St	Winston-Salem
NC 2B	Lexington Ave	High Point
NC 2B	Market St, McConnell Rd, and Alamance Church Rd	Greensboro
NC 2C	Old Greensboro Rd, Mountain St, and W Market St	Winston-Salem, Kernersville, Greensboro
NC 2B	Old NC 86	Calvander, Carrboro - between Dairyland Rd and Hillsborough Rd
NC 2	Old River Rd	Northwest of Greenville
NC 2B	Raleigh Rd/NC Rt 54, Barbee Chapel Rd, and Stagecoach Rd	
NC 2C	Erwin Rd	Chapel Hill to Durham
NC 2C	Davis Dr, Aviation Pkwy, Evans Rd, and Trinity Rd	Durham to Raleigh
NC 3	NC Rt 32	Edenton area
NC 3	Albemarle Sound Bridge - NC Rt 32	Edenton to Plymouth
NC 3	Long Ridge Rd	Plymouth to Bath
NC 3	N 23rd St, S 5th St, 17th St, Independence Blvd, River Rd, Carolina Beach Rd Bridge	Wilmington to Carolina Beach
NC 3	NC Rt 211	Brunswick County
NC 4	Halls Creek Rd, Four Forks Rd, Pitts Chapel toward Elizabeth City	Hertford to Elizabeth City
NC 4	Camden Causeway/US 158, NC Rt 34, US 168	Elizabeth City to Currituck

Route	Road(s)	Location
NC 5	Entire section from Apex to Angier	Apex to Angier
NC 5	US 421	Wilmington to the northwest
NC 5	N 3rd St, S 5th St, 17th St, Independence Blvd, River Rd, Carolina Beach Rd Bridge	Wilmington to Carolina Beach
NC 6	Between NC Rt 16 and NC Rt 49 - northwest Charlotte Area to northeast Charlotte Area	Charlotte area
NC 6 B	Gaston Country through downtown Charlotte generally	Charlotte area
NC 6	NC Rt 24/27 section and bridge over the Pee Dee River	east of Albemarle
NC 7	Neuse Blvd	Downtown New Bern
NC 7	Carey Rd, NC Rt 258	Kinston
NC 7	US 17/NC Rt 55 bridge over the Neuse River	New Bern
NC 8	S Main St, NC Rt 225, and US 176	Hendersonville to Saluda
NC 10	Glenn Ave, Old Rural Hall Rd, Old Hollow Rd, and Baux Mountain Rd	VA border to Winston-Salem
NC 10	US 158 and Yanceyville Rd	VA border to Greensboro
NC 10	S Main St, Leonard Rd, NC Rt 8	Winston-Salem heading south
NC 10	W Market St in Greensboro; Between High Point and Thomasville - NC Rt 68; Burton Ave; another section of NC Rt 68; National Hwy; Unity St; and Salem St (downtown); Between Thomasville and Lexington - highlight roads, especially at the entrance/exit of Thomasville and Lexington (Lexington Ave out of Thomasville, Rt 8/Main St in downtown Lexington)	Greensboro to Lexington
NC 10	Prioritize all of the following: From Pineville to downtown Charlotte - North Polk St/ South Blvd near Pineville, England St, Hebron St, College St through downtown; Downtown to Concord - N Davidson St, Dinglewood/Eastway Dr intersection, Eastway Dr, Old Concord Rd, Grier Rd, Rocky River Rd, Roberta, and Old Charlotte	Charlotte area - Concord to the SC border
NC 11	Brevard/Haywood Rd	Hendersonville to Asheville
NC 11	Broadway and Riverside Dr heading north out of Asheville; 19E in the Burnsville area; Old Mars Hill Hwy north of Weaverville in addition to Weaverville thru-roads.	Asheville through Weaverville
NC 11	US 19E	Burnsville to Spruce Pine
NC 11	King St through downtown Boone and NC Rt 194	Boone and north of Boone
TN Conn.	US 441 and US 19	Waynesville area through the Smokies

◀ *Top Priorities for roadway improvements continued*

MID-TERM IMPROVEMENTS (2020)

In addition to the top priority projects, specific segments were highlighted for facility improvements throughout this chapter. These were identified using a similar approach as that used to select top priority projects, and should be considered the next block of improvements for implementation.

Significant to these types of projects are bridge improvements, which may not be feasible in the short-term. Certain bridges that must be utilized as part of the state bike route system provide very low level of bicycle service (i.e.: the US 17 bridge connecting New Bern and Bridgeton; the NC 32/94 bridge over the Albemarle Sound; the NC 73 bridge south of Lake Norman; and the NC 24/27 bridge connecting into Uwharrie National Forest). Paved shoulders and appropriate railing heights should be essential components of future bridge improvement as soon as resources are available.

The NC 32/94 (Haughton Rd) bridge over Albemarle Sound has low railings and limited shoulder

LONG-TERM IMPROVEMENTS (2030)

In the long-term, the DBPT team should continue to monitor system quality and communicate areas in need of improvement to responsible agencies. Ongoing communication with division and local cyclist liaisons will be critical to continuous maintenance and improvement of the system. The following resources should be maintained and used in this long-term process:

1. Maintain a website and standardized comment form allowing the general public to highlight areas needing attention. This website should also house the reporting feature for missing signs. All comments will be collected by DBPT and reported to the appropriate liaisons.

2. Update the Bicycle Level of Service analysis periodically as data is updated and new data is collected – After each update, Identify the worst segments based on BLOS results. Examine the input variables to determine why each section is receiving a low score.

3. Hold semi-annual meetings with liaisons to check on the status of improvements to priority segments and communicate the findings of Numbers 1 and 2. Re-prioritize outstanding projects accordingly. Discuss funding options at these meetings and coordinate with other stakeholders as appropriate.

During long-term implementation, the cities and areas of higher population should continue to be prioritized over other segments that are identified through the BLOS or public feedback. These are areas of the current route system needing the most attention (i.e. northern Charlotte, the Triangle, the Triad, etc). As cities and towns around North Carolina have expanded without incorporating bicycle facilities, these sections have become unsuitable and are therefore avoided and distrusted by local cyclists. Many recreational cyclists drive to rural areas to safely enjoy a bicycle ride, rather than using closer routes. These difficult sections in high population areas do not advertise state bicycle routes well. If these areas are improved and enhanced with new business routes, it will allow cyclists to commute across town, connect to beautiful country routes, and generally rely on the statewide bicycle route system as a viable means of transportation, recreation, and adventure.

Action Steps

The action steps table below summarizes the implementation steps described in this section along with responsible agencies and time frames.

Action Step	Lead	Support	Details	Timeframe
Designate State Bike Route coordination responsibilities	NCDOT Division of Bicycle & Pedestrian Transportation		Establish State Bike Route coordination responsibilities within the Division of Bicycle & Pedestrian Transportation.	Short-Term (2013)
Identify local cyclist liaisons	NCDOT Division of Bicycle & Pedestrian Transportation	Bike shops, Cycling Clubs, Tour Directors, Local Cyclists	Identify a point person within the local cycling community of each division to help guide priority planning	Short-Term (2013)
Identify division state bike route liaisons	NCDOT Division of Bicycle & Pedestrian Transportation	NCDOT Highway Divisions	Identify a point person within the staff of each highway division to help guide priority planning and advocate for improvements to the state bike route system at the division and district levels.	Short-Term (2013)
Establish website	NCDOT Division of Bicycle & Pedestrian Transportation	Local cyclist and division liaisons,	Establish a website displaying the new route system and provide online comment forms for ongoing feedback.	Short-Term (2014)
Communicate top priority projects and identify funding sources	NCDOT Division of Bicycle & Pedestrian Transportation	NCDOT Highway Divisions, Municipal Transportation Departments, MPOs/RPOs, COGs	Identify roadway ownership for each top priority project and communicate projects to the responsible agency. Identify funding sources for projects.	Short-Term (2014)
Finalize signage design	NCDOT Division of Bicycle & Pedestrian Transportation	Local cyclist and division liaisons,	Establish design details for the signage system, building on the recommendations of this plan.	Short-Term (2014)
Generate signage implementation plans	NCDOT Highway Divisions	NCDOT Division of Bicycle & Pedestrian Transportation, Local Cyclist Liaisons, Municipal Transportation Departments	Establish signage plans and associated implementation timelines for each division based on the guidelines recommended in this chapter. Confirm destinations with state bike route coordinator and local cyclist liaisons.	Short-Term (2014)
Modify resurfacing/ reconstruction policy	NCDOT Highway Divisions	NCDOT Division of Bicycle & Pedestrian Transportation	Require the addition of a paved shoulder with any reconstruction or resurfacing project along a designated state, regional, county, or local bike route.	Short Term/ Ongoing (2014)
Introduce legislation requiring bicycle facilities as part of highway safety improvements	NCDOT Division of Bicycle & Pedestrian Transportation	NCDOT Highway Divisions	With the support of NC's Complete Streets Policy and highway safety improvement goals, introduce legislation that requires the inclusion of 5' paved shoulders moving forward on all roadways with ADT 1,200 or greater.	Short-Term (2014)
Address Amtrak bike policy	NCDOT Division of Bicycle & Pedestrian Transportation		Work with Amtrak to allow bicycles on all trains in North Carolina.	Short-Term (2014)

Action Step	Lead	Support	Details	Timeframe
Implement Signage of new route system	NCDOT Highway Divisions	NCDOT Division of Bicycle & Pedestrian Transportation, Municipal Transportation Departments	Implement signage plans. Aim to create a fully signed system by 2015 (sign new segments, remove signage at eliminated segments, and fill in missing signage). Aim to create a fully signed system with all new signage by 2017 (replace all existing signs along route segments that were retained with improved signage based on new design standards). When signage is placed along routes recommended for improvement before those improvements are implemented, post warnings and clear information on the wesbite to notify users.	Short-Term (2015-2017)
Develop downloadable printer friendly route guides	NCDOT Division of Bicycle & Pedestrian Transportation	Local cyclist and division liaisons	After sufficient signing has been completed, develop updated route maps based on best practices outlined in this chapter. Make available, downloadable printer friendly PDFs on state bike route website.	Short-Term (2015)
Develop smartphone application	NCDOT Division of Bicycle & Pedestrian Transportation	Software developer	Develop smartphone application/smartphone friendly map display and information on state bike routes	Short-term (2015-2016)
Build top priority projects	NCDOT Highway Divisions, Municipal Transportation Departments	NCDOT Division of Bicycle & Pedestrian Transportation, MPOs/ RPOs	Complete roadway improvements on top priority segments of the route system.	Short-Term (2017)
Re-evaluate priorities	NCDOT Division of Bicycle & Pedestrian Transportation	Local cyclist and division liaisons	Re-evaluate remaining priorities based on updated Bicycle Level of Service analysis and public input through the website.	Ongoing (semi-annual meetings)
Complete recommended priority improvements	NCDOT Highway Divisions, Municipal Transportation Departments	NCDOT Division of Bicycle & Pedestrian Transportation, MPOs/ RPOs	Complete roadway improvements on the remainder of the segments identified in the column 'Improvement Sections' throughout this chapter.	Mid-Term (2020)
Complete improvements to full system	NCDOT Highway Divisions	NCDOT Division of Bicycle & Pedestrian Transportation	Complete 5' minimum shoulder on all bike route segments with ADT over 1,200.	Long-Term (2030)

Endnotes

1. Service levels were calculated using the model described in the National Cooperative Highway Research Program's Report 616. The model is based on empirical research and has been applied in bicycle route system development at the city, county, and state levels.
2. Levels of service shown can generally be assumed to be low estimates relative to those calculated elsewhere, since paved shoulder width data were not available and were therefore assumed to be zero in most places.
3. http://www.mwcog.org/uploads/committee-documents/t1dZW1k20070516090831.pdf
4. http://www.smartgrowthamerica.org/complete-streets/changing-policy/model-policy/model-state-legislation-options/