



NC LAKES DISTRICT



REGIONAL BIKE PLAN

ACKNOWLEDGEMENTS

SPECIAL THANKS

The NC Lakes District Regional Bike Plan could not have been developed without assistance from a wide range of individuals including interested citizens, municipal staff, and the NCDOT staff. In particular, the involvement and participation of members of various NCLD Core Steering Committees and other interested parties was essential to the development of this plan.

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EXECUTIVE SUMMARY

The NC Lakes District Regional Bike Plan proposes a vision for a system of interconnected bicycle routes creating a means for bicycling in the Lakes District region. The plan is envisioned to guide the development of the regional bike system around the region's myriad of lakes, linking counties, towns, local parks, and other significant features. The NCDOT contracted with Kerr Tar Regional Council of Government (KTCOG) in May 2012 to write a comprehensive regional bike plan for the Kerr-Tar Lakes District region. Planning area for the study encompassed:

- | | | |
|--------------------|--------------|---------------|
| • Person County | • Stem | • Norlina |
| • Granville County | • Stovall | • Warrenton |
| • Vance County | • Butner | • Centerville |
| • Warren County | • Middleburg | • Louisburg |
| • Franklin County | • Henderson | |
| • Roxboro | • Kittrell | |
| • Oxford | • Macon | |

Collaboration was also done with the East Coast Greenway. Finally, NCDOT Division of Bicycle and Pedestrian Transportation participated in the development process.

Planning for a more bicycle friendly region helps to address issues such as mobility, economic development, and environmental and human health while also harnessing opportunities inherent in the region's wealth of natural and historic features, principally the region's lakes.

The plan outlines a range of recommendations to facilitate accomplishing the plan's goals of linking the region's lakes through on and off road trails, linking network of parks and locally significant features along the proposed bike routes and adjacent to the regional lakes, improving mobility and livability options in the region.

EXECUTIVE SUMMARY

The recommendations include a proposed network of interconnected bicycle routes, bicycle infrastructure improvements, implementation strategies, and policy and design guidelines. The plan was written in 2014 with adoption pending. Kerr Tar staff created a master steering committee of around 35-40 representatives from a broad range of organizations and interests representing the region to guide the plan's development. These representatives included local planning, parks and recreation, administrative, economic development, tourism, and cyclist and interested parties from the region. Public surveys were distributed and advertised and public meetings were also held to allow interested citizens to participate in the plan's development. A smaller core steering committee was established from the larger committee to meet regularly to discuss development. The Core Steering Committee held five meetings between October 2012 and January 2014. They assisted by offering review of plan proposals as well as questions, ideas, and recommendations for the plan. Kerr Tar staff also met with individuals across the region for additional recommendations and information.

The routes for the plan are divided into three main categories: Lake Routes, Lake to Lake Routes, and Town to Lake Routes. The Lake routes are considered primary routes and navigate around the region's lakes. These routes overlap with potential East Coast Greenway routes, the Virginia Tobacco Heritage Trail, and other significant features such as state parks. Lake to Lake routes serve as connection segments linking the region's lakes to each other. Finally, Town to Lake Routes serve as connector segments linking the region's lakes to towns in the area. Lake Routes and Lake to Lake routes will serve a more recreational and economic purpose where Town to Lake routes will serve recreational and utilitarian purpose for users.

These routes total to: four main Lake Routes, four connecting Lake to Lake Routes and seventeen Town to Lake Routes. With such an expansive amount of routes in the region the plan will prioritize routes using a route ranking and scoring criteria to focus resources on high priority routes and continue developing routes as funding allows. The plan includes a range of funding strategies to implement the routes. Some of these funding sources include coordination with NCDOT road widenings and resurfacings, grant applications, and local funding.

EXECUTIVE SUMMARY

In order to continue the plan's development and sustainment a group will be developed from interested NCLD Bike committee members. This group will handle future efforts to continue implementing the bike plan and adjusting proposed and existing routes as well as recommending new ones as they are suggested. The group will include representatives of organizations affected by the bike plan such as local governments and other interested organizations.

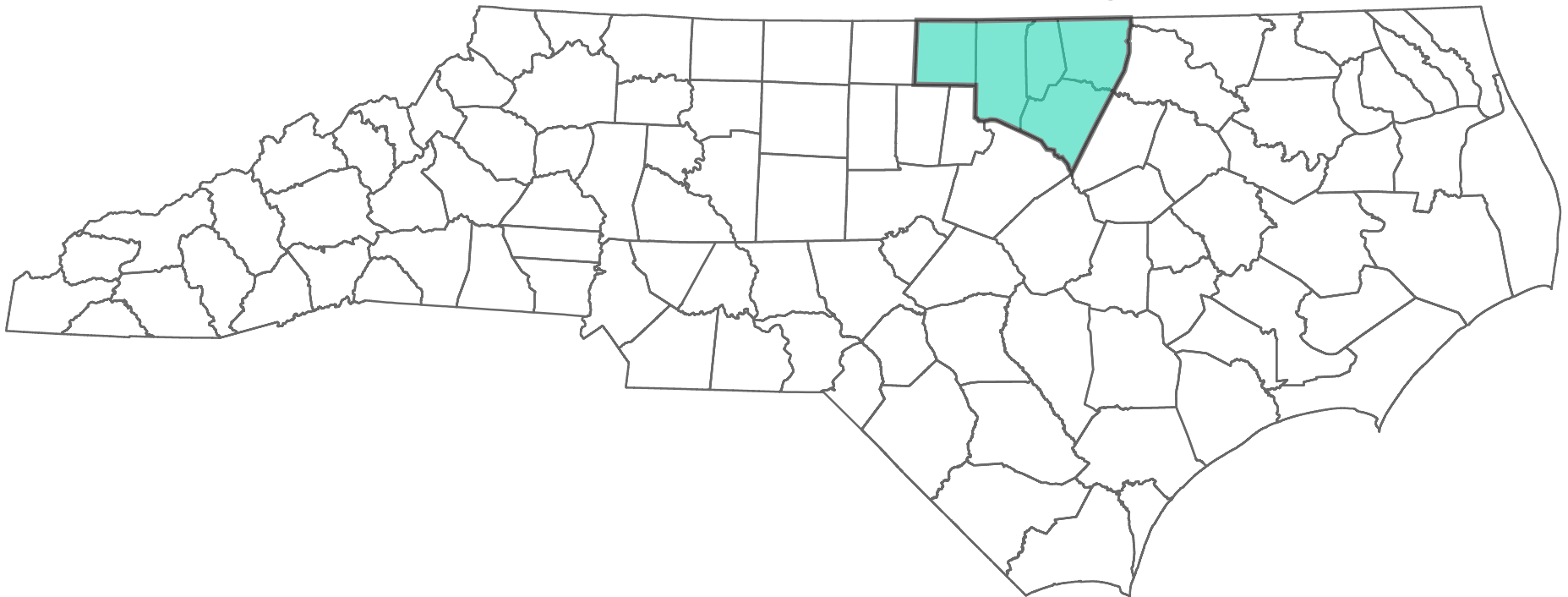
The NC Lakes District Bike Plan could not have been established without assistance and participation from individuals of communities and involved organizations. Their aide helped to create an exciting and practical bicycle route plan that lends opportunity for recreational activity, economical development, and new transportation options for communities in the Lakes District region.

BACKGROUND

NCLD BIKE PLAN HISTORY

The NC Lakes District Regional Bike Plan originated as a component of a broader plan, the NC Lakes District Plan (NCLD). Conceived as an economic development tool, NCLD includes the Kerr-Tar region of the Northern Piedmont. The NCLD Plan was initiated by the Kerr-Tar Regional Transportation Organization (KTRPO); encompassing five counties: Person, Granville, Franklin, Vance, and Warren.

Kerr-Tar Region



BACKGROUND

NCLD BIKE PLAN HISTORY

NC Lakes District

The Lakes District name, focuses on the major lakes in the region including Hyco, Mayo, Kerr, and Lake Gaston. The area possesses a wealth of outdoor recreation opportunities including biking, boating, camping, hiking, hunting and paddling. The NCLD Plan emphasizes three main components: bike ways, blue ways, and a pedestrian plan for the region. The NCLD Bike Plan makes up a major portion of the overall NCLD plan and focuses on developing connections of the region's lakes, parks, and other significant features utilizing an integrated system of bike trails. As a demand for more bicycling routes in NC increases, multimodal means of transportation become increasingly important to communities, including plans that offer bicycle routes.



METHODOLOGY

Mission Statement:

The North Carolina Lakes District Regional Bike Plan began with a mission to link the regions lakes utilizing proposed bike routes along and adjacent to the regional lakes. The plan aims to develop connections of the region's lakes, parks, and other significant features utilizing an integrated system of bike trails. The plan hopes identify and provide a method to create bike routes within the NCLD region. The plan intends to advance and enhance the unique, natural, and historic qualities of the region including public facilities within regional towns and cities, historic sites and landscapes, and natural and recreational areas.

Vision Statement:

The NCLD Regional Bike Plan envisions a viable and vibrant bicycle plan around a core of issues including mobility, economic development, and environmental and human health. The plan pursues to develop bicycle routes that circle the regional lakes and act as a connection between lakes and communities as well as other significant features in the region. The route would offer a planned course to residents, visitors, and other users providing a beneficial and appealing new means of recreation and mobility. The plan seeks to act as a catalyst for realizing solutions to some of the regions issues and to harness the opportunities inherit in the region's wealth of natural and historic features, principally, the region's lakes and riparian corridors.

METHODOLOGY

Goals:

1. To create links to the region's lakes Hyco, Mayo, Kerr, and Lake Gaston using a system of proposed bike routes, offering bike routes to and around the lakes as well as connections to area communities, and other significant destination points in the region.
2. To link and incorporate regional and locally significant features including public facilities, other greenways and trails, other transportation facilities, historic sites and landscapes, and natural and recreational areas located in adjacent towns and communities. The plan hopes to highlight these significant features that fall along the proposed bike routes and incorporate connection opportunities to them into the plan.
3. Increase new mobility options for people living in or visiting the area by offering bicycle routes that serve as a means for recreation as well as practical mobility purposes.
4. To promote recreational and economic growth in the region by attracting local users and visitors and stimulating new investments in the region.

METHODOLOGY

Key Strategies:

In preparing this plan and endeavoring to accomplish the vision, mission, and goals set forth, the following strategies were utilized to accomplish these objectives.

1. Proposed routes will be primarily on roads and improvements made for routes will try to be incorporated into existing projects already planned for roads in the region.
2. Incorporate and overlap routes with connections to existing and proposed trails such as:
 - Rails to trails plans and links
 - Tobacco Heritage Trail (VA)
 - East Coast Greenway Trail
 - Safe Routes to Schools
 - Southeast High Speed Rail corridor's proposed Bike & Pedestrian Trail
 - Area Greenways and Pedestrian plans
3. Promote bicycle education and safety to encourage knowledgeable riders and also sharing the road with cars
4. Set a soft boundary along the region to focus planning efforts, but also extend outside that boundary as needed for important connections such as links into VA.
5. Work with regional partners to gather input from a variety of viewpoints and interests in the region to ensure the plan is comprehensive and benefits a wide variety of users.
6. Receive endorsement from participating communities and agencies.

METHODOLOGY

ROUTE IDENTIFICATION PROCESS:

Identifying Routes

The route identification process began with the development of a steering committee made up of a wide range of members who worked with Kerr-Tar planning staff to determine the ideal location for routes. A number of resources were considered for route identification. These included but were not limited to: proximity to lakes, connections to significant features, connections to communities, connection to natural areas, lower traffic volumes, lower accident rates, regional comprehensive transportation plans, and existing and proposed greenways and trails within the region. Committee members and staff worked together to develop recommended routes within the planning area that included these different elements. Overlapping with routes such as the existing NC bike routes and the Virginia Tobacco Heritage Trail as well as proposed routes including the East Coast Greenway trail was also considered. Proximity to lakes was considered and several routes were identified running along and around the regional lakes. Other recommended routes were identified based on existing ridership and knowledge of the area by cyclists and other members of the steering committee.

Route Prioritization

Following the identification of many potential routes, a criteria was set to enable evaluating and ranking of the routes identified. The route criteria were established to help staff evaluate and rank routes for funding prioritization and for additional planning. This enabled staff to determine what routes would be considered with a higher priority. After researching similar ranking and criteria for bike plans, staff developed draft route criteria that was reviewed by the steering committee. Following their comments and feedback the criteria was revised to this final version:

To help us evaluate and rank routes for funding prioritization and for additional planning, the NCLD Steering Committee has discussed and is recommending the following route selection and scoring criteria. Minimum and maximum values will be assigned to these criteria and then applied to each proposed route within that range. (continued)

METHODOLOGY

These include the following criteria:

1. **Safety** focuses on factors that contribute to a safe environment for bicyclists. Such factors include, but are not limited to, low to no crime reports, lower speed limits, decent road surface conditions, and corridors with low to no bike crash reports, lower traffic volumes (lower truck traffic also), adequate space for accommodating cyclists, adequate visibility for users, minimal crossings and curb cuts. (0 – 40 points)
2. **Scenic Quality** is the heightened visual experience derived from the view of natural and manmade elements of the visual environment of the corridor. The characteristics of the landscape are strikingly distinct and offer a pleasing and most memorable visual experience. Scenic quality looks at how interesting the route will be to the rider. (0 – 30 points)

The evaluation of these is based on the following characteristics:

- o **Historic** encompasses legacies of the past that are distinctly associated with physical elements of the landscape, whether natural or manmade, that are of such historic significance that they educate the viewer and stir an appreciation for the past. The historic elements reflect the actions of people and may include buildings, open fields, forest edges, walls and fences, settlement patterns, and other examples of human activity.
 - o **Natural** applies to those features in the visual environment that are in a relatively undisturbed state. These features predate the arrival of human populations and may include geological formations, topography, landform, water bodies, vegetation, and wildlife. There may be evidence of human activity, but the natural features reveal minimal disturbances.
3. **Amenities** include accommodations for users such as restaurants, camping, bicycle shops, convenience/grocery store, public restrooms, drinking fountains, public telephone, seating, shade, bicycle racks, waste receptacles, or access parking, campgrounds, parks, lakes, recreational areas. (0 – 15 points)

METHODOLOGY

4. **Economic Development Potential** involves the potential to promote increased spending in the region. It encompasses the potential to boost local economies by enhancing overall tourism promotion of the area. This could include the potential to attract events such as festivals or races. (0-15 points)

*Please refer to Appendix E for a full Table of the NC Lakes District Route Categorization Evaluation and Prioritization.

Public Input

The NCLD Regional Bike Plan was developed utilizing input from a wide range of people. Public outreach was completed using surveys distributed through steering committee members and other publishings including the NCLD website and local newspapers. Kerr-Tar staff also met with Parks and Recreation directors from each of the five counties in the plan area boundary.

Public Hearings/ Outreach?

- Public survey distributed: 6 local newspapers, email distribution, NCLD website and steering committee members (March 2013)
- 45 initial responses reviewed and used to determine goals and objectives for NCLD plan
- Public input was solicited via a map my ride account set up to allow for public to submit route inputs. Input was recorded and routes were identified. Web map for public input was also put up on the NCLD website to allow input about areas of interest, hazards and amenities.

Steering Committee

A master steering committee of around 34-40 individuals was created to represent a broad range of organizations and interests to best represent the region in this plan. Representatives included: local government planning, parks and recreation, administrative, economic development, NC DOT, tourism, cyclists, and other interested parties from the region. A smaller core committee was created from the larger master committee to meet more frequently. Over the course of the project, the large committee and a smaller core committee met several times to facilitate an opportunity

METHODOLOGY

MEETING DATES

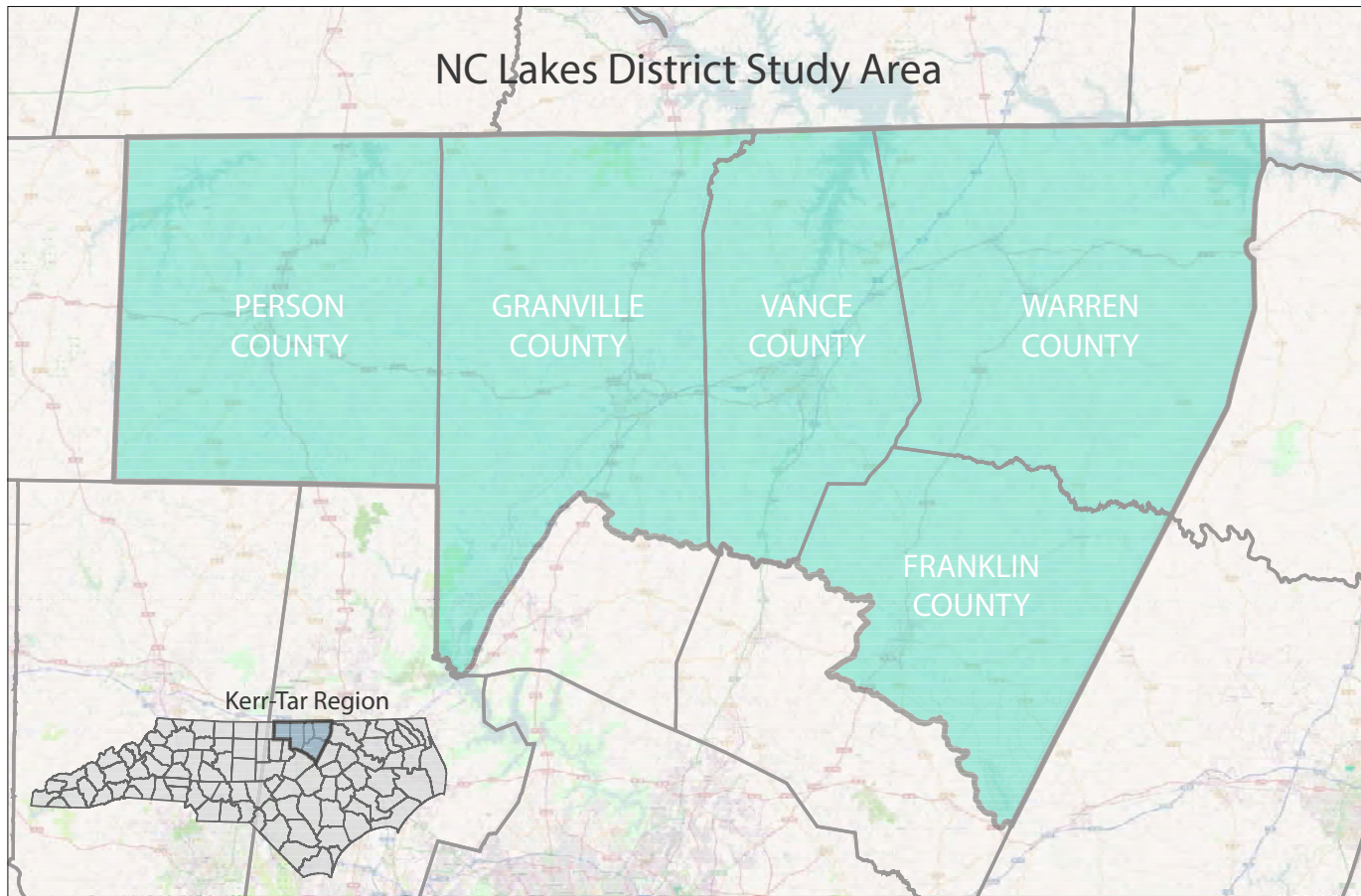
DATE	MEETING
3/15/12	Gina Parham-COG
8/21/12	Warren County Parks and Recreation
8/28/12	Franklin County Parks and Recreation
9/6/12	Vance County Parks and Recreation
9/12/12	Person County Parks and Recreation
9/17/12	Granville County Parks and Recreation
9/24/12	Kerr Lake State Park
12/3/13	East Coast Greenway
2/26/13	East Coast Greenway
10/4/12	1st Kick off NCLD Steering Committee
12/12/12	2nd NCLD Steering Committee
3/26/13	3rd NCLD Steering Committee
8/22/13	4th NCLD Steering Committee
1/23/14	5th NCLD Core Steering Committee

*MORE MEETING DATES
TO BE ADDED FOLLOWING
DRAFT PLAN

EXISTING CONDITIONS

OVERVIEW

In the creation of this plan the Kerr-Tar planning staff looked at different factors including land use, support, related plans in the region, recreational opportunities, as well safety issues including crash data. Included in this section are maps that take a look at these factors for the Kerr-Tar region. The NC Lakes District study area includes the five Kerr-Tar counties, Person, Granville, Vance, Warren, and Franklin. In order to establish a study area boundary, the Rural Planning Organization boundary was used to define the main focus of the study area. However, staff also considered adjacent areas as well.



EXISTING CONDITIONS

EXISTING AND PROPOSED ROUTES AND TRAIL FACILITIES

Within the five counties of the Kerr-Tar Region, there are current and proposed bicycle routes and trail facilities at the local and regional level. Also found within the Kerr-Tar region are state and local parks with trail facilities that can be used for cycling. State parks with hiking trails that are bike friendly include: J.C. Cooper campground and Hibernia Park. Other parks in the region that have trail facilities include Mayo Park, Diamonds at Oxford Park, Granville Street Park, Lake Delvin Park, Granville County Environmental Park, Stovall Park, and Fox Pond Park. Regional routes include the North Carolina State Bike routes, the proposed East Coast Greenway Trail, the future Southeast High Speed Rail Corridor, and bordering the region is the Tobacco Heritage Trail in Virginia.

NC Bike Routes

The NC Bike routes that run through the Kerr-Tar region include: the North Line Trace/NC Bike Route 4 and the Carolina Connection/ US Bike Route 1. More information about NC Bike routes can be found on NCDOT's website here: <http://www.ncdot.gov/travel/mappubs/bikemaps/default.html>

East Coast Greenway

The East Coast Greenway (ECG) currently has a temporary on road route that will serve as the part of the main route through NC until alternative off road trails are developed. The ECG spine route runs through the Kerr-Tar region passing through Granville County and then connecting to Durham. There is also another route identified that would pass through Warren and Vance counties and then connecting to Raleigh. The ECG route has been identified in the Kerr-Tar region, but is not yet complete. More information about the NC ECG route can be found on their website here: <http://www.greenway.org/explore-by-state/nc>

Southeast High Speed Rail Corridor

There is a proposed Southeast High Speed Rail Corridor (SEHSR) that will pass through the Kerr-Tar region, running through Warren and Vance counties. The SEHSR project includes the evaluation of a parallel multipurpose trail concept that would run along the SEHSR corridor. More information about the SEHSR corridor greenway trail can be found on their website here: <http://www.sehsr.org/faq.html>

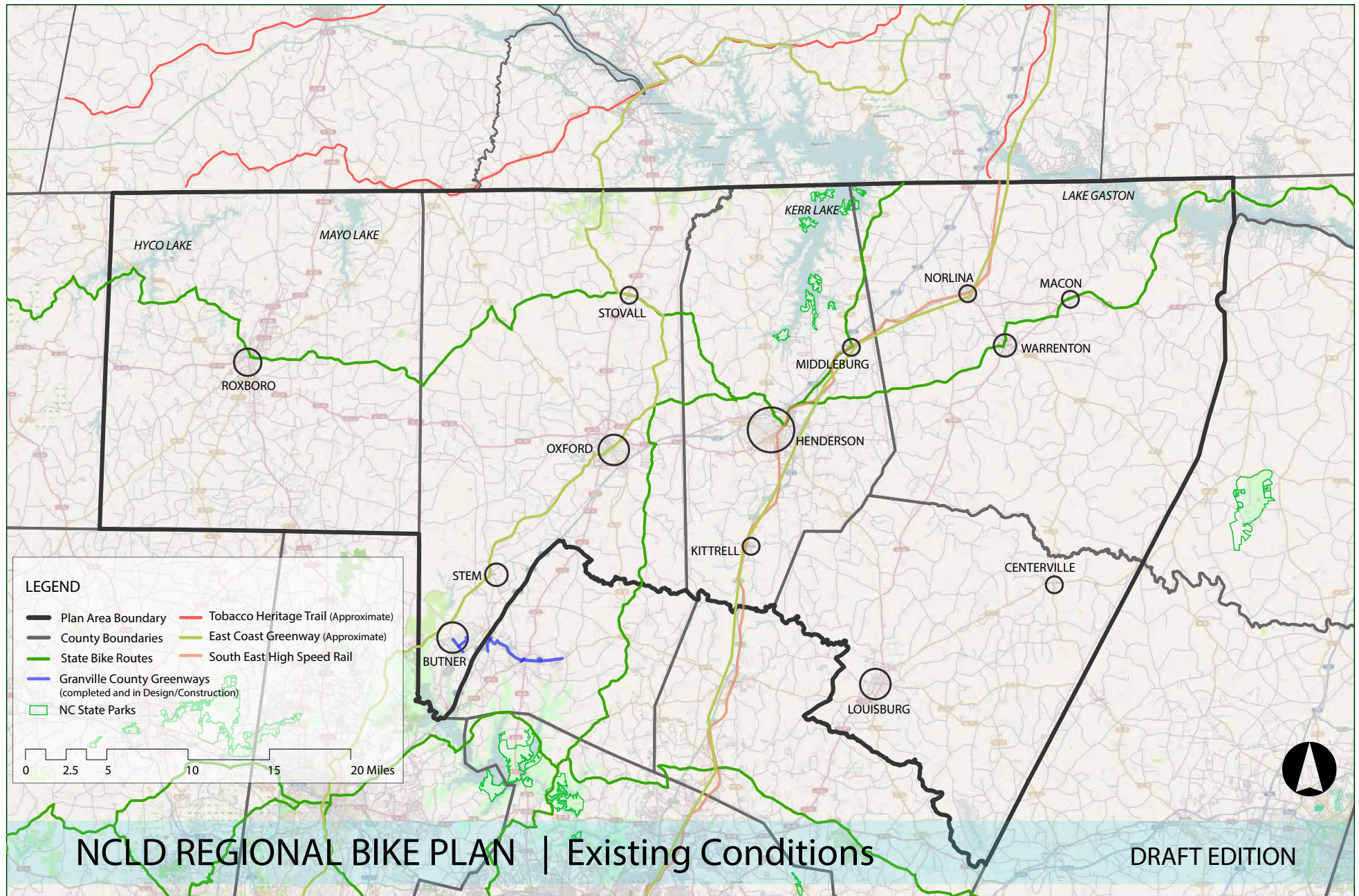
Tobacco Heritage Trail

The Tobacco Heritage Trail is a regional network of off road trails in the Virginia counties of Halifax, Mecklenburg, Lunenburg, and Brunswick County. While not in North Carolina, this trail was included in the existing conditions because of its direct adjacency to the Kerr-Tar region. A brief section of the trail dips into the northern portion of Granville County. More information about the Tobacco Heritage Trail can be found here: <http://tobaccoheritagetrail.org/>

Local Trails

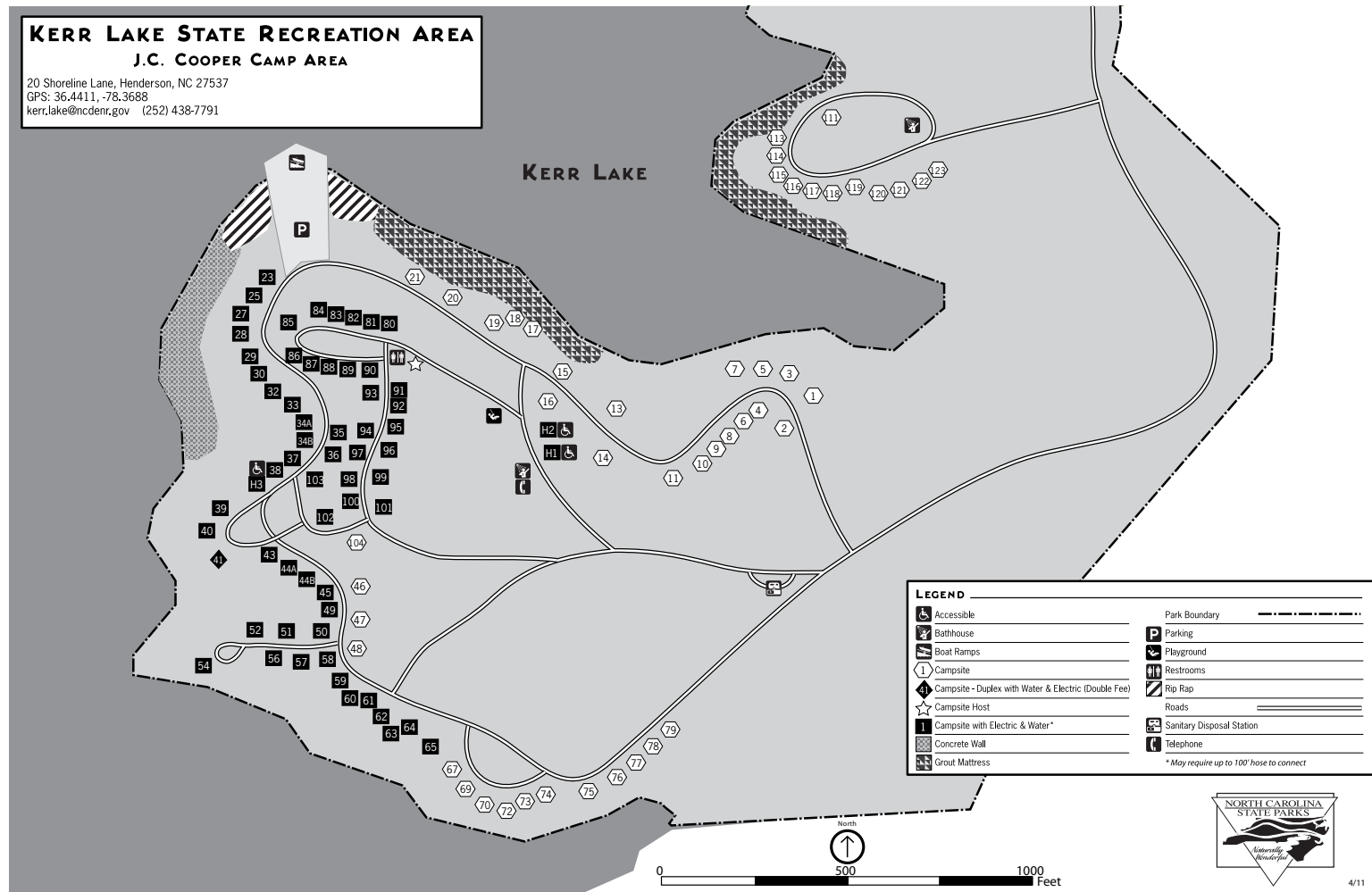
Local trails included the Butner and Creedmoor greenways, some of which have been built as well as other portions that are in design or construction. While Granville County does have other proposed trails as part of a Greenway Master plan for the area, these were not included in the existing conditions study. More information about Granville County Greenways can be found on their website here: <http://granvillegreenways.org/>

EXISTING & PROPOSED BICYCLE ROUTES AND TRAILS | KERR-TAR REGION



RELEVANT LOCAL, REGIONAL AND STATEWIDE PLANS

Kerr Lake State Recreation Area | J. C. Cooper Camp Area

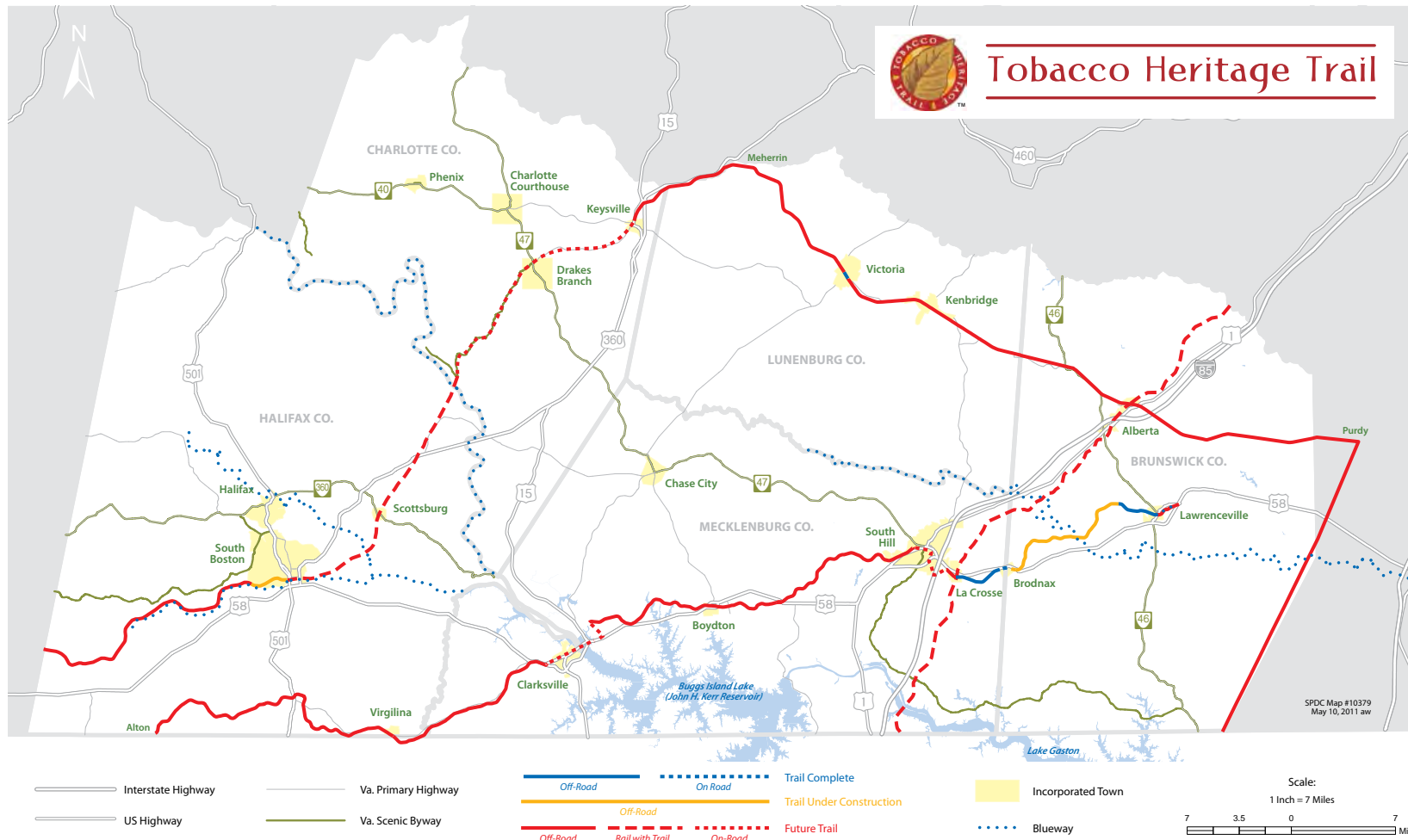


Off-Road Facilities

The J.C. Cooper Camp Area has trail that can be utilized by cyclists. While the other Kerr Lake state park area trails are primarily for hiking, the park roadways are open to bicycling. The parks also offer parking and restroom facilities as well as other amenities for visitors.

RELEVANT LOCAL, REGIONAL AND STATEWIDE PLANS

Tobacco Heritage Trail



Off-Road Facilities

The Tobacco Heritage Trail is a regional network of off road trails in the Virginia counties of Halifax, Mecklenburg, Lunenburg, and Brunswick County. While not in North Carolina, this trail is directly adjacency to the Kerr-Tar region. A short section of the trail dips into the northern portion of Granville County. Eventually, the trail (a mixture of off-road and on-road sections) will total 150 miles and connect the counties of Brunswick, Charlotte, Halifax, Lunenburg and Mecklenburg. The network will incorporate historical sites and local points of interest, including natural and recreational areas. More information about the Tobacco Heritage Trail can be found here: <http://tobaccoheritagetrail.org/>

RELEVANT LOCAL, REGIONAL AND STATEWIDE PLANS

NC State Bike Routes



On-Road Facilities

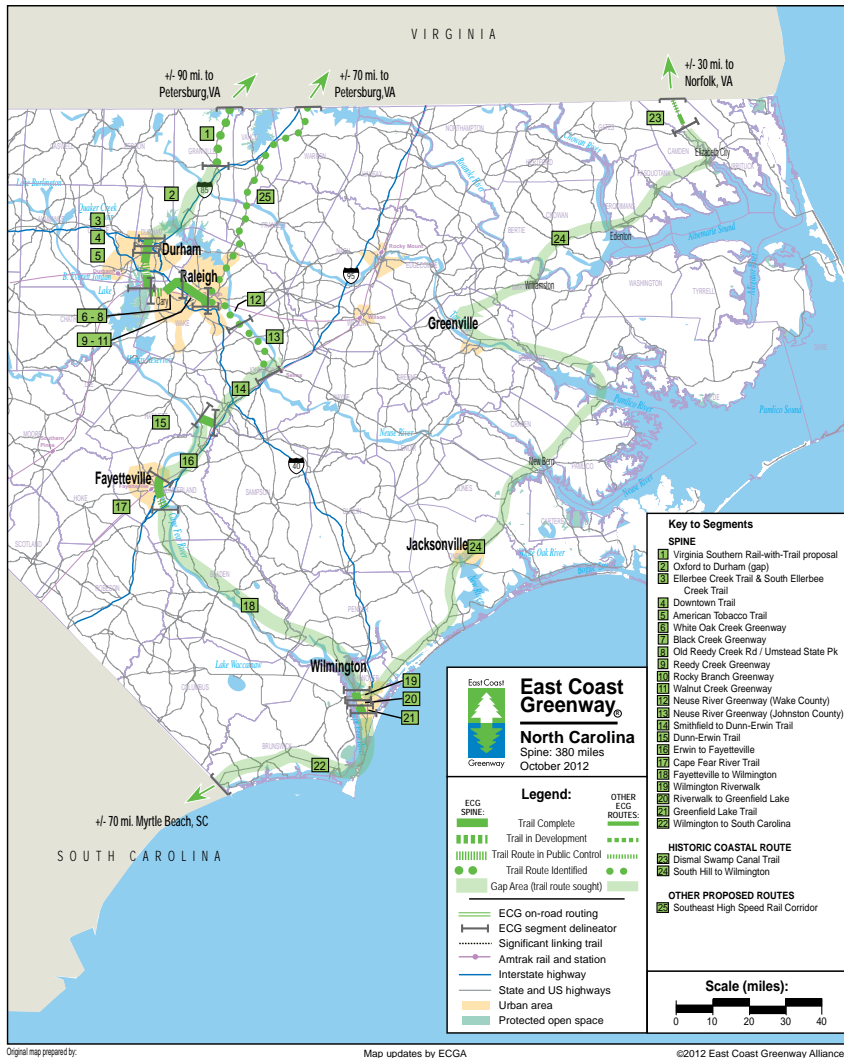
NC Bike Route 4 travels along Hyco Reservoir, Kerr Lake and Lake Gaston Recreation Areas, and the US Bike Route 1 links Kerr Lake with Raleigh and capital/city areas farther south.

RELEVANT LOCAL, REGIONAL AND STATEWIDE PLANS

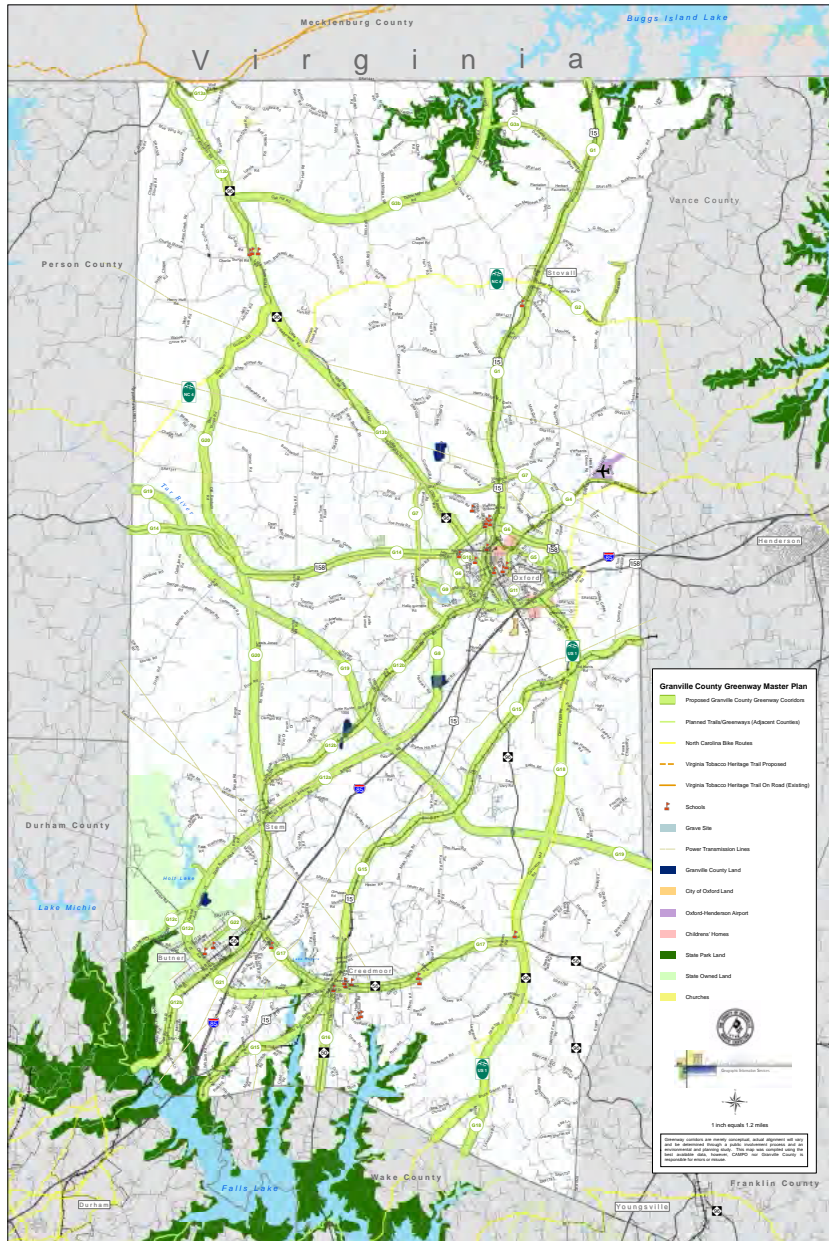
East Coast Greenway

On-Road Facilities

The East Coast Greenway is a developing trail system traveling from Maine to Florida. The the proposed trail spine route within the North Carolina portion of the trail travels through Granville County and is currently an on road facility. The trails passing through the Kerr-Tar region are currently on-road, but the on-road portion of the ECG is converted to trail as new segments are constructed. For more information visit the ECG website here: <http://www.greenway.org/explore-by-state/nc>



RELEVANT LOCAL, REGIONAL AND STATEWIDE PLANS



Off-Road Facilities

There is an existing adopted Granville County Greenway Master Plan that includes 22 proposed trails throughout Granville County in addition to recommendations for funding, land development, easement acquisition, and connectivity. A new section of the greenway was recently completed and opened in Butner on April 22, 2015. There are also other completed and under construction greenway projects underway in Creedmoor. For more information visit the Granville County Greenways website here: <http://granvillegreenways.org/>

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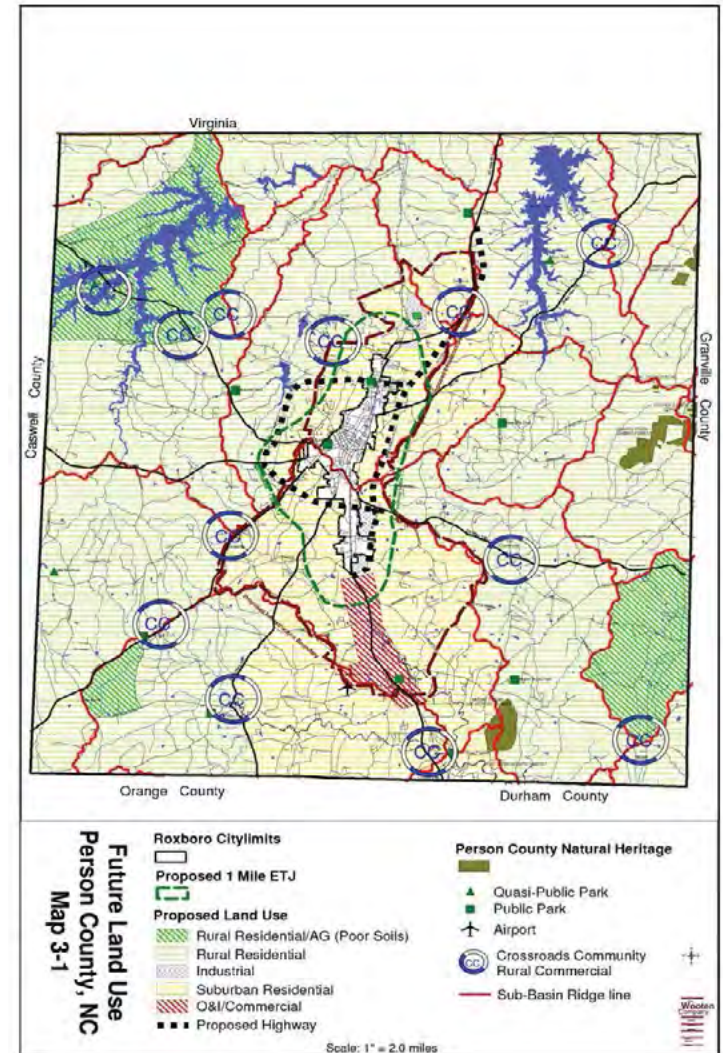
REGIONAL SUPPORT & FUTURE LAND USE

Person County Regional Support

Currently in Person County, there are annual bike races including the Mayo Lake Sprint Triathlon and the Rural Heritage Tour, a BikeFest put on by the Carolina Tarwheels in August. Person County parks and recreation also hosts other bike rides throughout the year. There is currently one facility that is part of the State designated bicycle routes in Person County, the North Line Trace (NC Bike Route 4). Also, a small portion of the adopted Tobacco Heritage Trail dips into northern Person County.

Person County Future Land Use

To the right is a map detailing Person County's future land use plan. Land use categories include: Rural Residential/Agricultural, Suburban Residential, Crossroad Community/Rural Commercial, Office and Institutional/Commercial, and Industrial. A goal included in the Person County Future Land Use Plan includes: "Protect public investment in community infrastructure—transportation facilities, water and sewer systems, school system and parks and recreational sites."



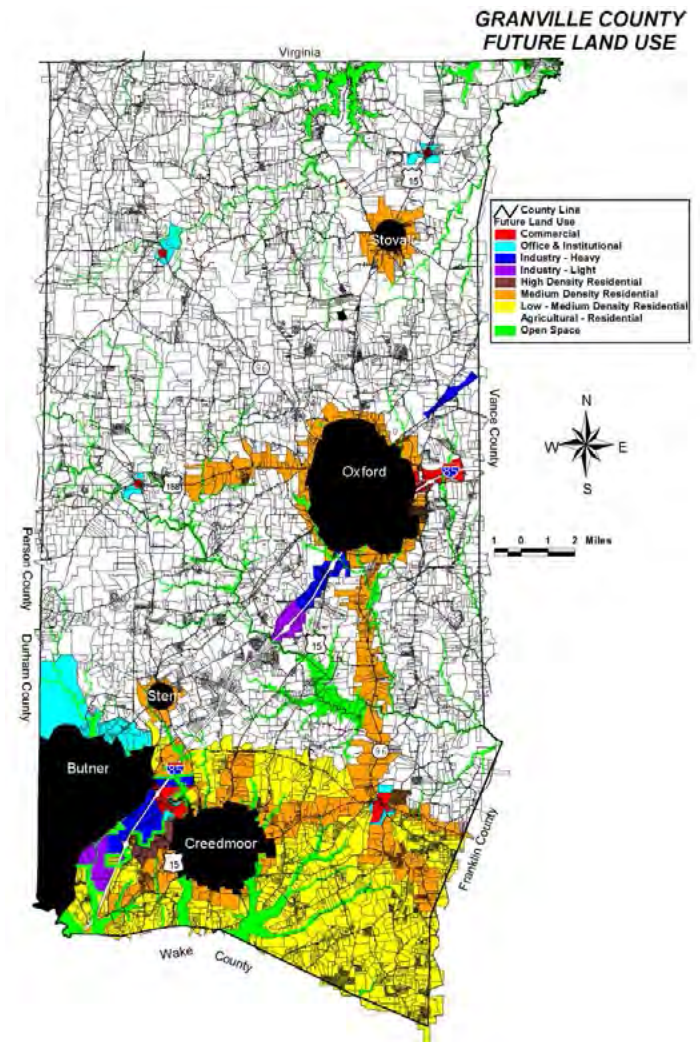
REGIONAL SUPPORT & FUTURE LAND USE

Granville County Regional Support

There are currently two facilities that are part of the State designated bicycle routes in Granville County and have sub-standard widths. Those include Carolina Connection (US Bike Route 1) and North Line Trace (NC Bike Route 4). Granville County also has a Greenway Master Plan that was adopted in 2006. The plan includes 22 proposed trails throughout Granville County as well as provides recommendations of funding, land development, easement acquisition, and connectivity.

Granville County Future Land Use

The current land use for Granville County is a mix of residential, agricultural and commercial with most of the development in the central and southern portion of the county. Major routes include I-85, US 15, US 158, NC 96, and NC 50. Within the Granville County Comprehensive Transportation Plan (CTP), one of the three main goals is to provide a comprehensive multi-modal transportation network that provides transit, bicycle, and pedestrian options for transportation within the county. Another objective of that goal includes educating the public about transportation options including the benefits of choosing alternative modes of transportation. All of the on-road bicycle routes are identified in the CTP Bicycle map legend and are shown as “Needs Improvement”. Due to this shared, or multi-modal, use of these facilities, it is recommended that sub-standard roadway sections be widened to a standard 24-foot cross section with 4-foot paved shoulders. These improvements should enhance safety and the functional design of the facility. Granville County’s code of ordinances includes a land development code that determines that an interconnected street system is necessary in order to protect the public health, safety, and welfare in order to ensure that streets will function in an interdependent manner, to provide adequate access for emergency and service vehicles, to enhance non-vehicular travel such as pedestrians and bicycles, and to provide continuous and comprehensible traffic routes.



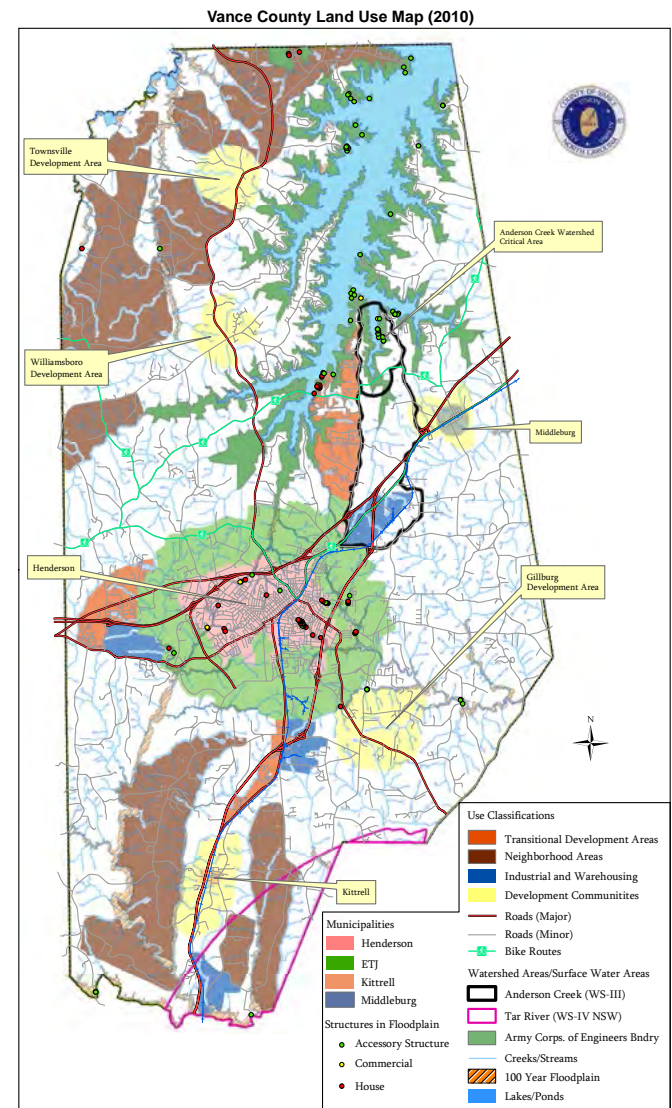
REGIONAL SUPPORT & FUTURE LAND USE

Vance County Regional Support

There are currently two facilities that are part of the State designated bicycle routes in Granville County and have sub-standard widths. Those include the Carolina Connection (US Bike Route 1) which runs from Maine to Florida covers 200 miles in North Carolina and traverses Vance County. The North Line Trace (NC Bike Route 4) is a 400 mile bike route that runs through Vance County and is just south of the Virginia border from the mountains to the coast of North Carolina.

Vance County Future Land Use

Vance County 2010 Land Use plan: "The development of multi-use trails should be encouraged and the use of abandoned rail corridors explored. Additionally, the county should participate and fully cooperate with the plan for a multi-purpose greenway paralleling the proposed high speed rail corridor."



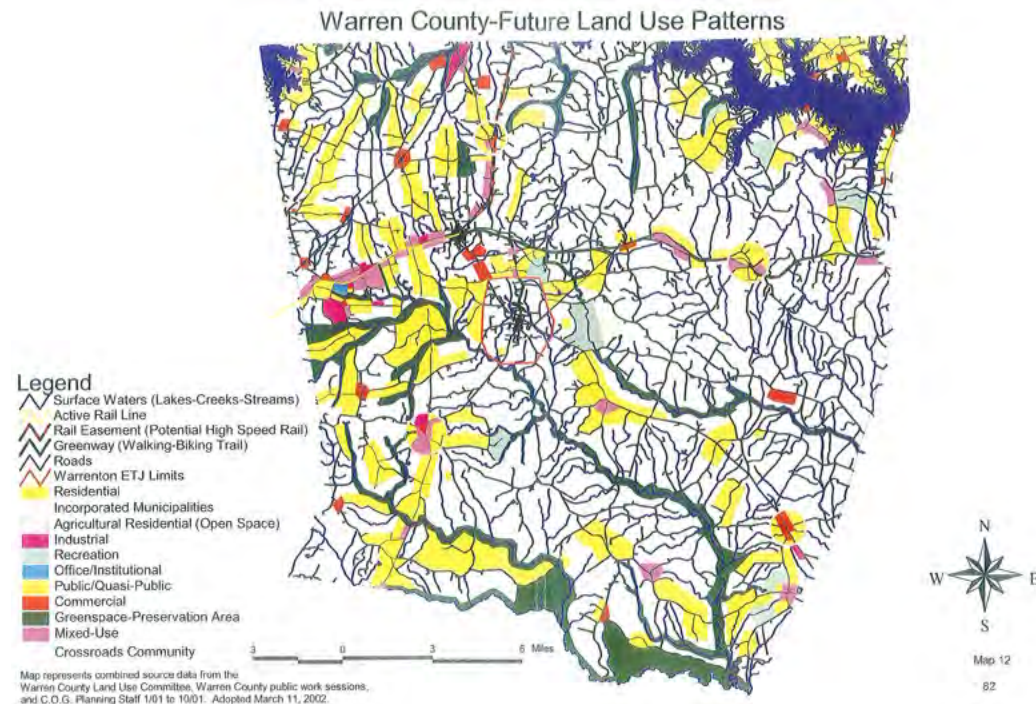
REGIONAL SUPPORT & FUTURE LAND USE

Warren County Regional Support

Warren County has one existing trail; the Sabina Gould Walkway is a short rail-trail that runs through Littleton, NC, on the Roanoke Valley Trail corridor. It has a length of 1.2 Miles and has asphalt and crushed stone trail surface. Activities include biking, walking, and others. Until recently, Warren County, and the Town of Warrenton in particular, were active participants in the annual “AIDS Ride” – opening their hearts and homes to hosting and providing assistance to bicycle riders who travelled the county when event was operated between Raleigh and Washington. Warren and Vance counties’ tourism and economic development offices, in conjunction with local bicycle enthusiasts, have also hosted a “Ride between the Lakes” bicycle race.

Warren County Future Land Use

The Warren County Future Land Use Plan includes a recommendation of a Natural Resources Protection Ordinance. To protect the natural resources of Warren County and incorporate practices that will allow managed development. Sections included would be best management practices (control storm water runoff), erosion and sediment controls ordinance, floodplain regulations (NFIP Program), and creation/ incorporation of a countywide greenway (hiker/biker trails) system.



REGIONAL SUPPORT & FUTURE LAND USE

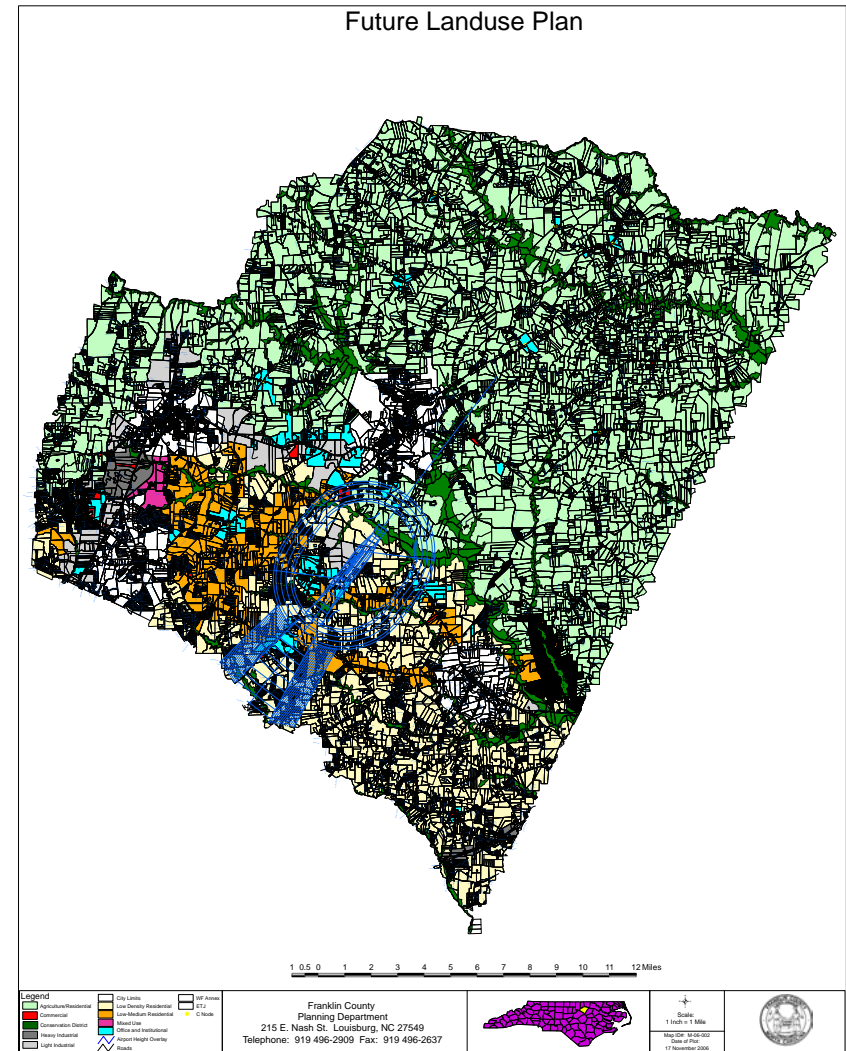
Franklin County Regional Support

Franklin County currently contains the Louisburg Bike Trail, a 2.2 mile paved bicycle trail that was created through the Rails-to-Trails program and other grants.

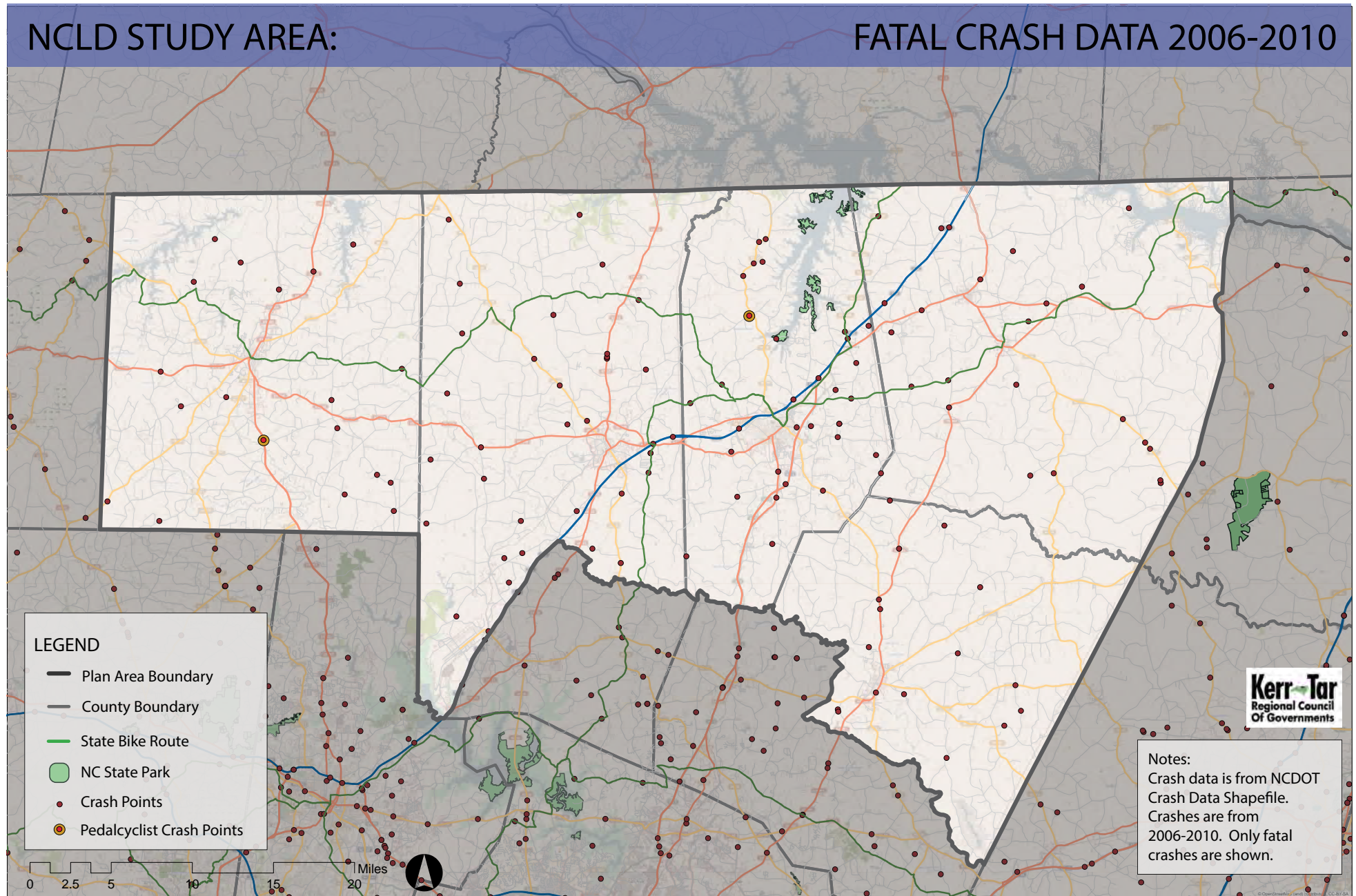
Franklin County's Code of Ordinances includes an article addressing minimum standards of design for streets and this includes: "to enhance non-vehicular travel such as pedestrians and bicycles..."

Franklin County Future Land Use

The Franklin County Comprehensive Parks and Recreation Master Plan includes a recommendation for trails and greenways: Identify and plan for greenways and open space: Implement planning strategies to identify trail corridors and greenway links throughout Franklin County that gives particular attention to abandoned rail corridors, utility easements, and the State Bike Trail; Develop bikeways and walking trails along the old CSX rail corridor from Louisburg to Franklinton that would run from the site of the Old Louisburg Depot to Vance-Granville Community College to the newly proposed park in Franklinton and on to the Old Depot in Franklinton; Provide enhancements to the State Bike Trail that runs from Nash County across southern Franklin County, through Youngsville to Wake County;



Existing Conditions | Fatal Crash Map Pedalcyclist and Non-Pedalcyclist



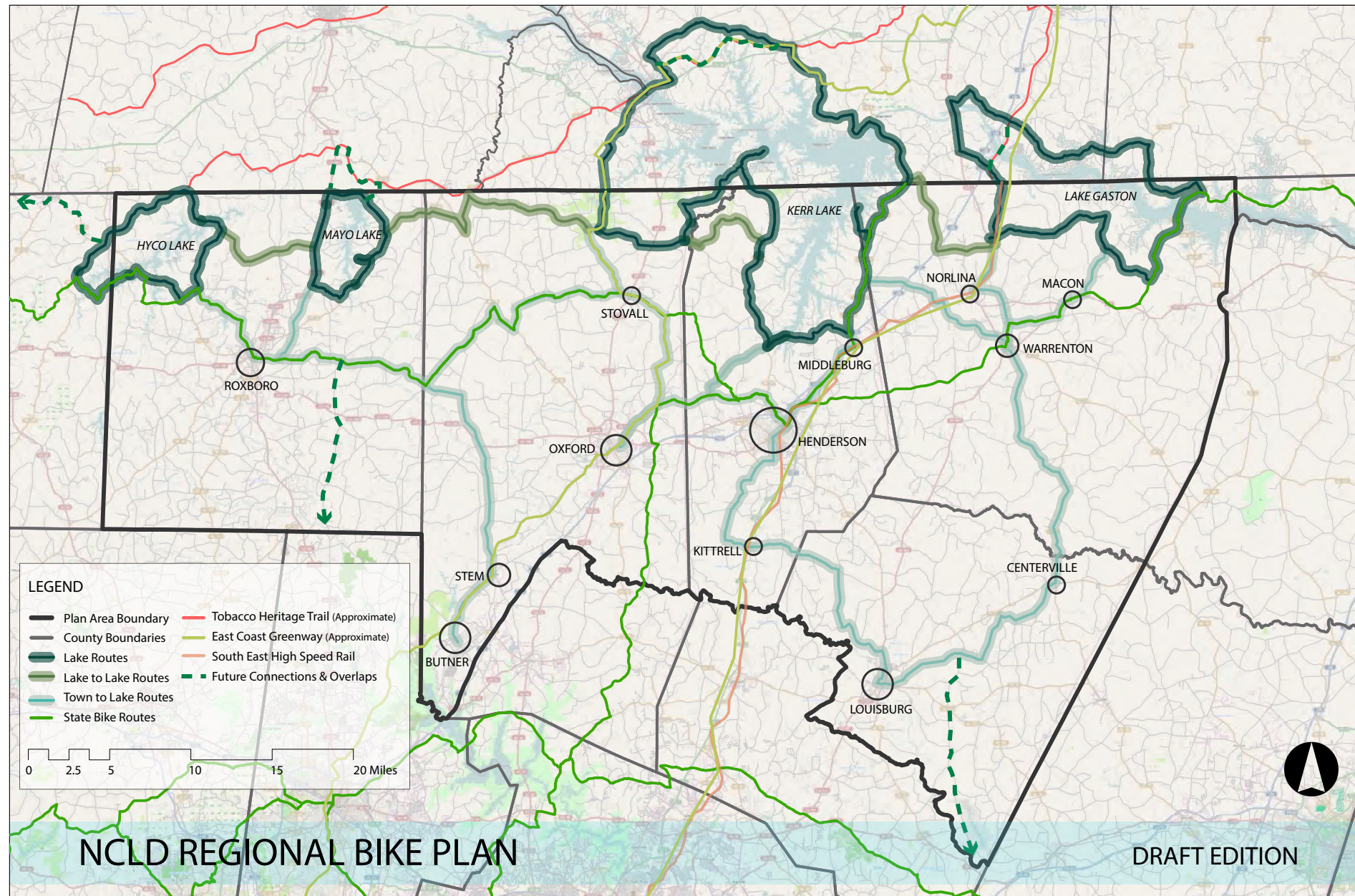
THE ROUTES

OVERVIEW

The proposed North Carolina Lakes District (NCLD) routes were developed through extensive staff research and collaboration with the NCLD Steering committee. Staff examined the existing conditions in the Kerr-Tar region looking at a range of data including road conditions, potential greenway corridors, existing bicycle and greenway plans, bicycle accident data, significant parks and recreation facilities, and other data. Initial routes were developed through the input of the NCLD Steering committee. Routes identified by steering committee members and other interested parties were reconnoitered and recorded for final route determination.

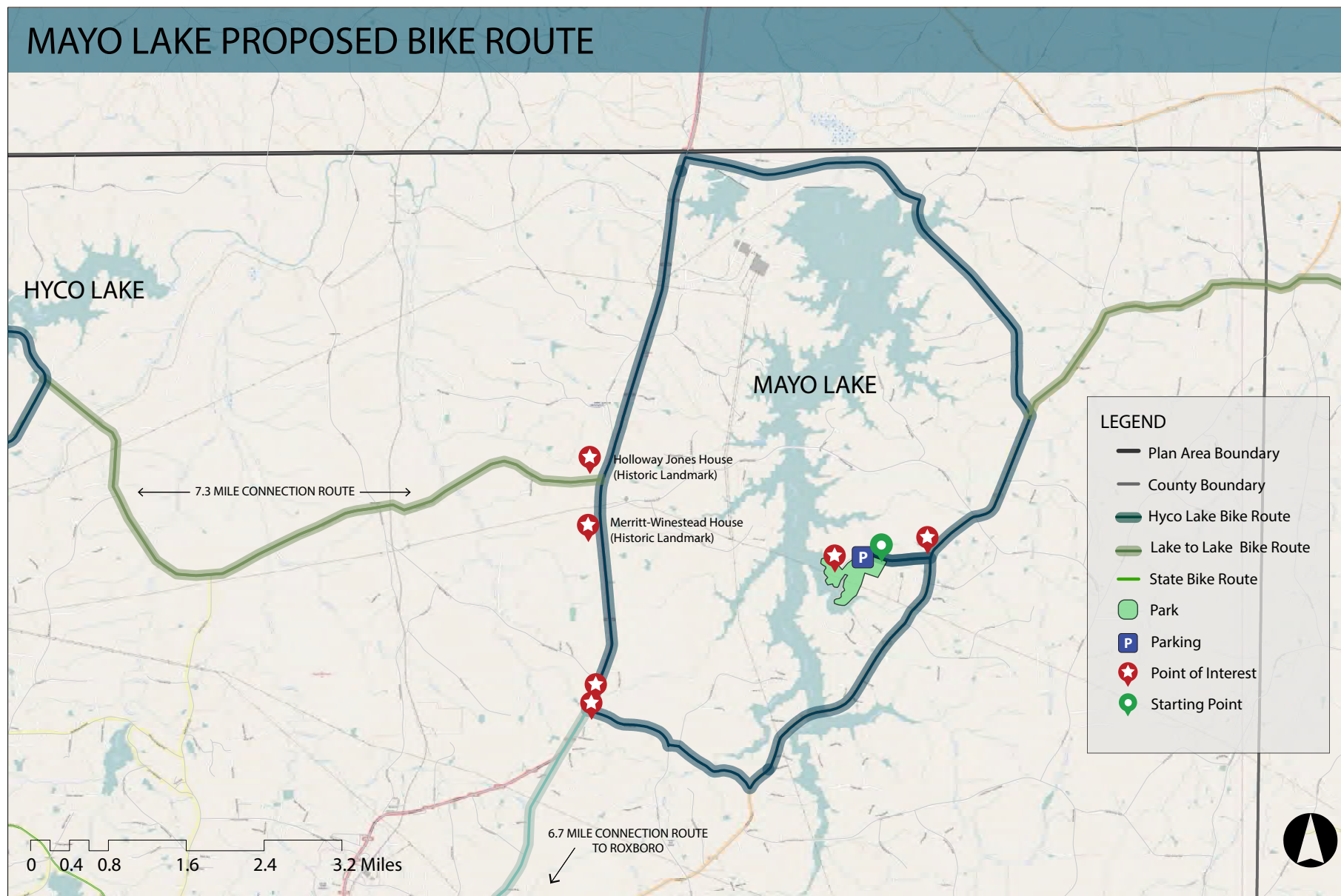
The proposed NCLD routes were selected with a goal to develop bicycle routes that circle the regional lakes and act as a connection between lakes and communities as well as other significant features in the region. The routes would offer a planned course to residents, visitors, and other users providing a beneficial and appealing new means of recreation and mobility. The proposed NCLD regional bike plan includes Lake Routes, Lake to Lake Routes, and Town to Lake Routes.

THE ROUTES



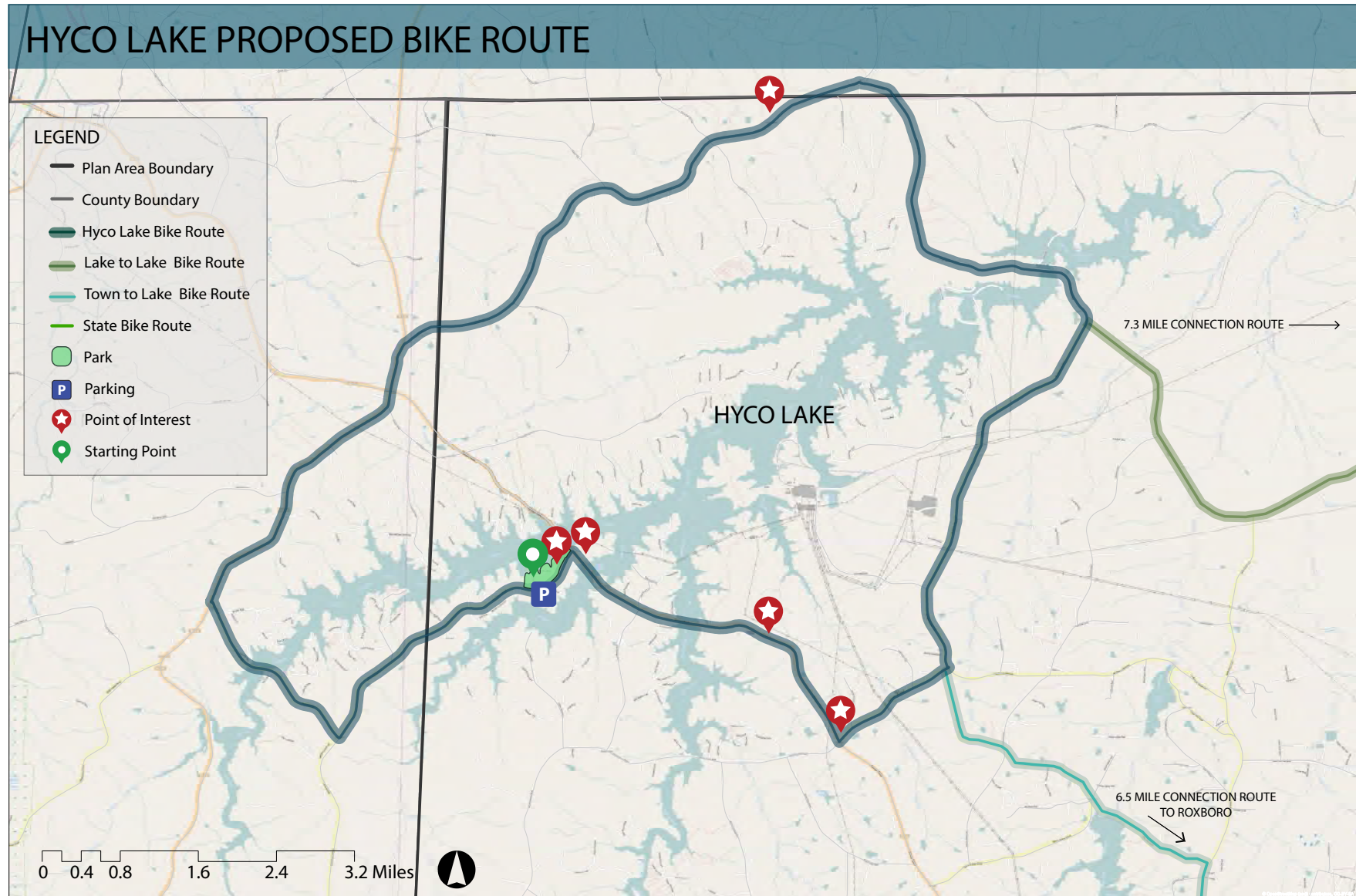
THE ROUTES

Individual Route Segments | Lake Routes



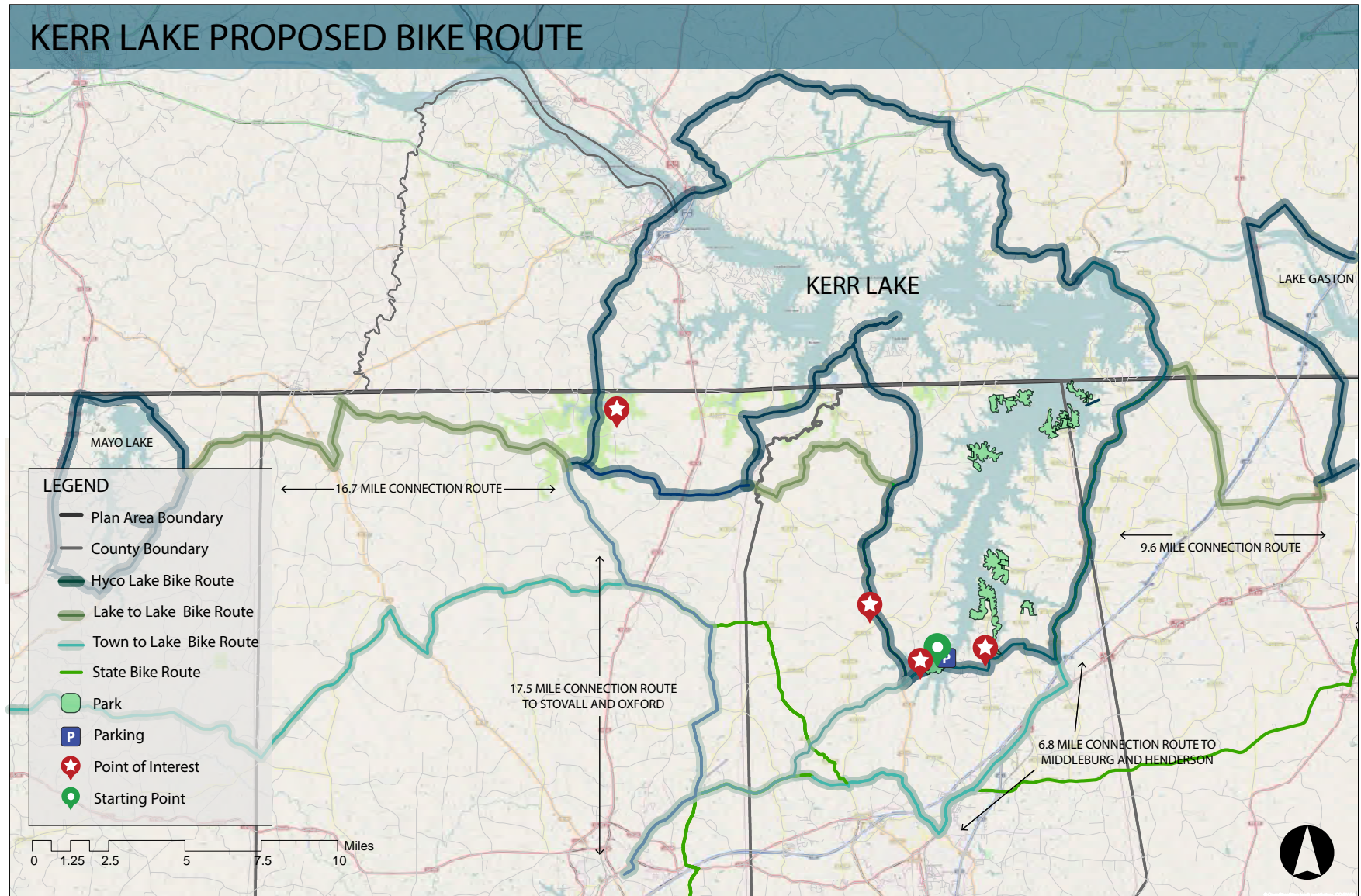
THE ROUTES

Individual Route Segments | Lake Routes



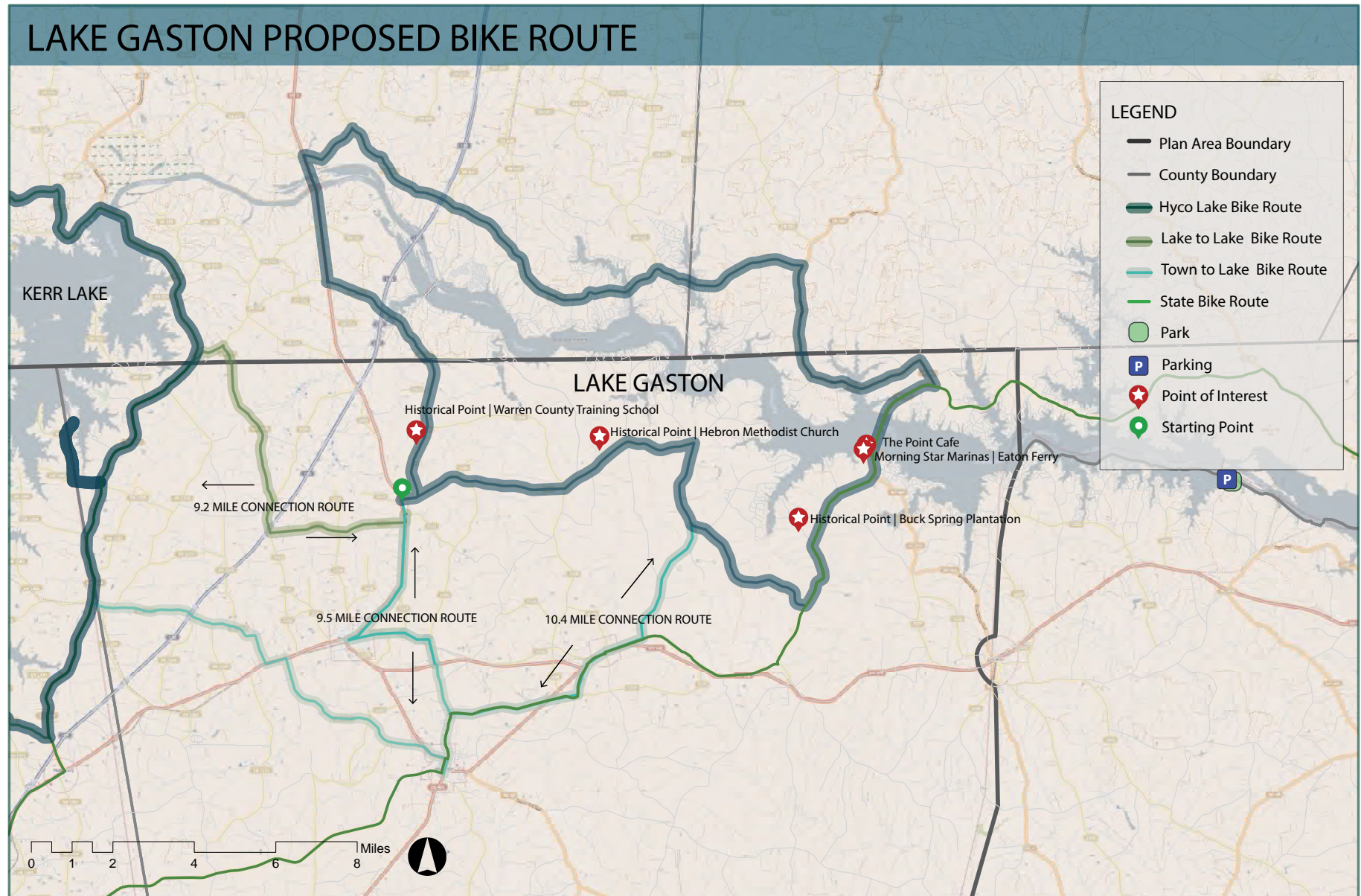
THE ROUTES

Individual Route Segments | Lake Routes



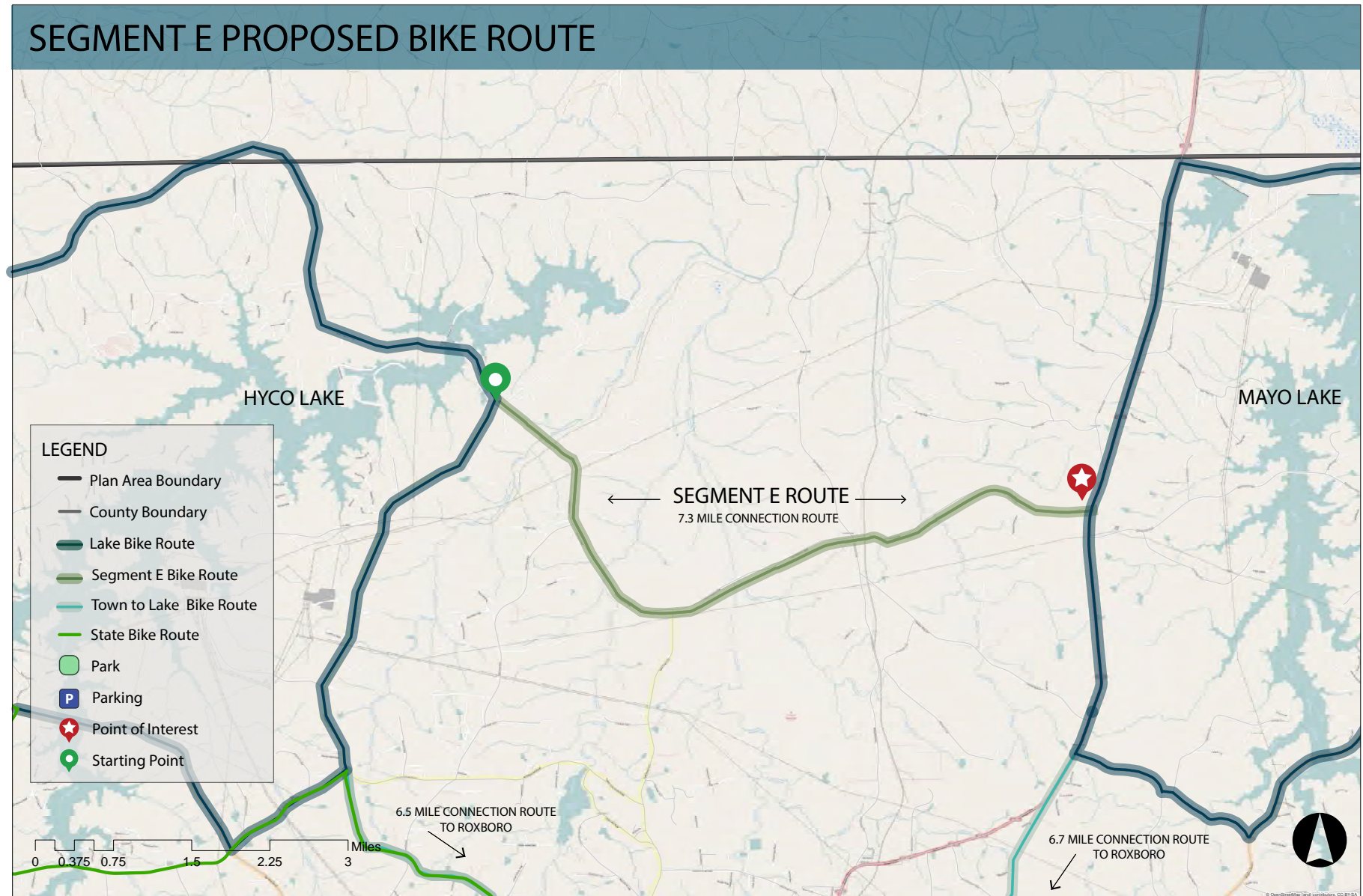
THE ROUTES

Individual Route Segments | Lake Routes



THE ROUTES

Individual Route Segments | Lake to Lake Routes



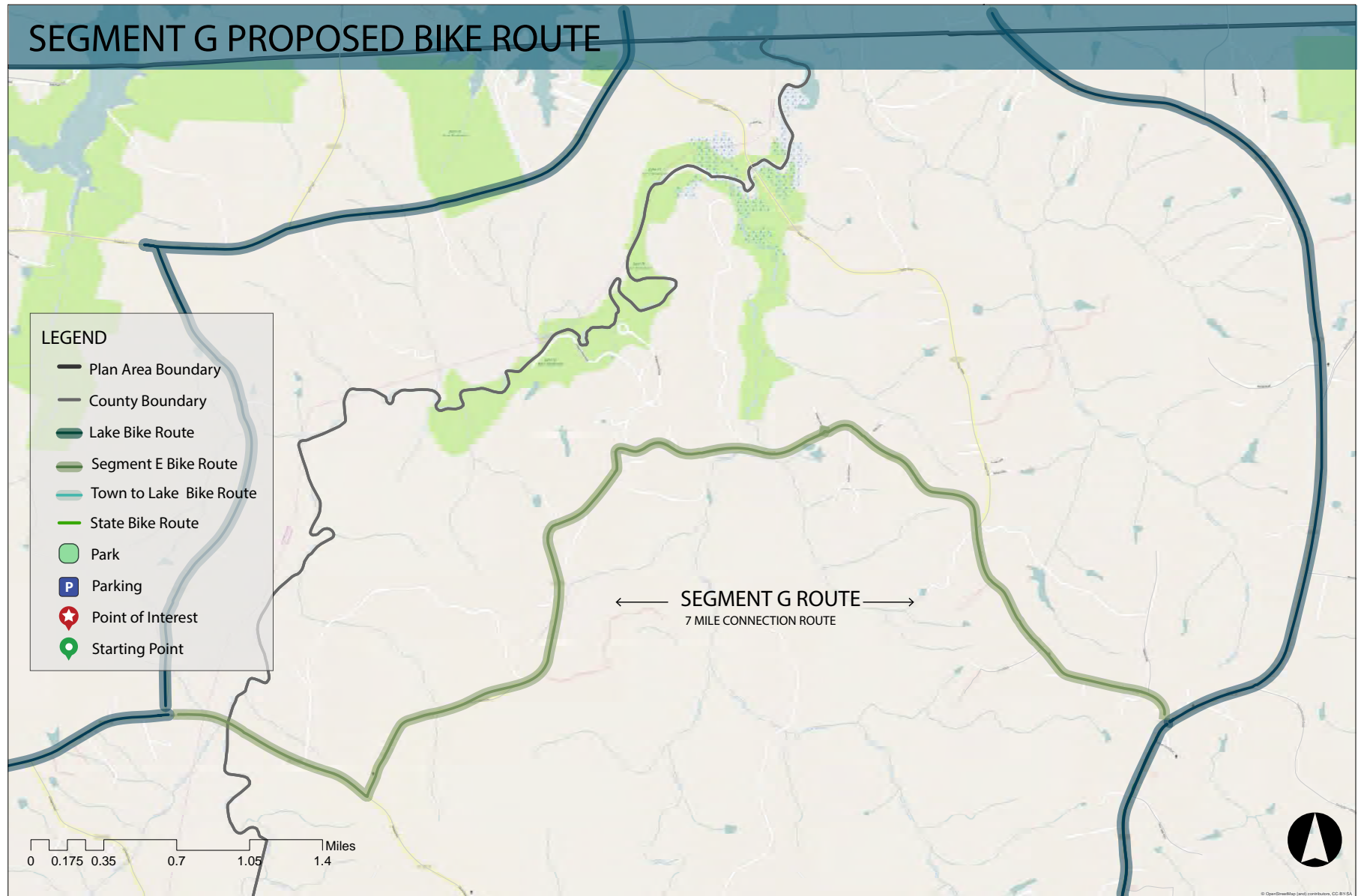
THE ROUTES

Individual Route Segments | Lake to Lake Routes



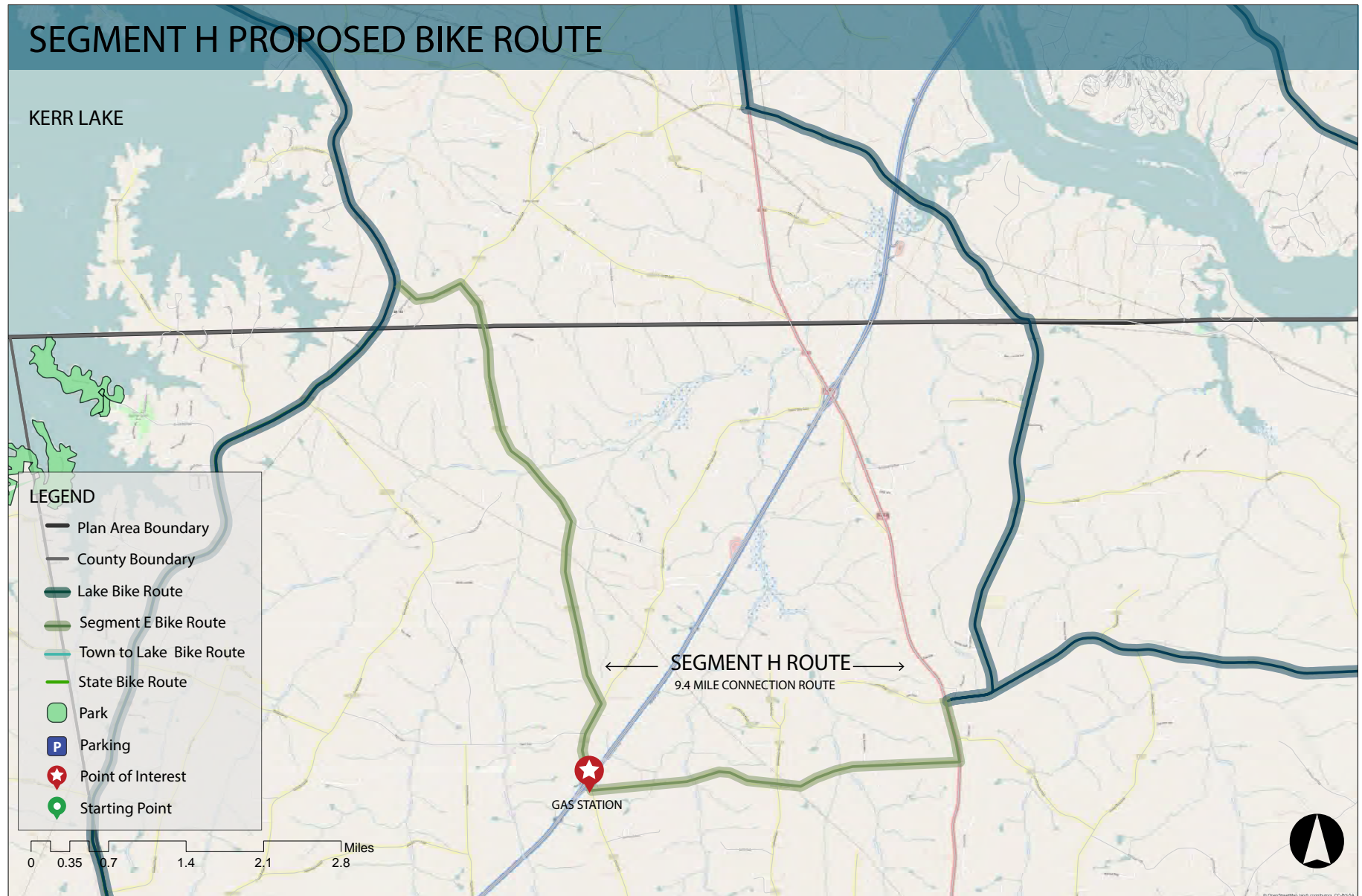
THE ROUTES

Individual Route Segments | Lake to Lake Routes



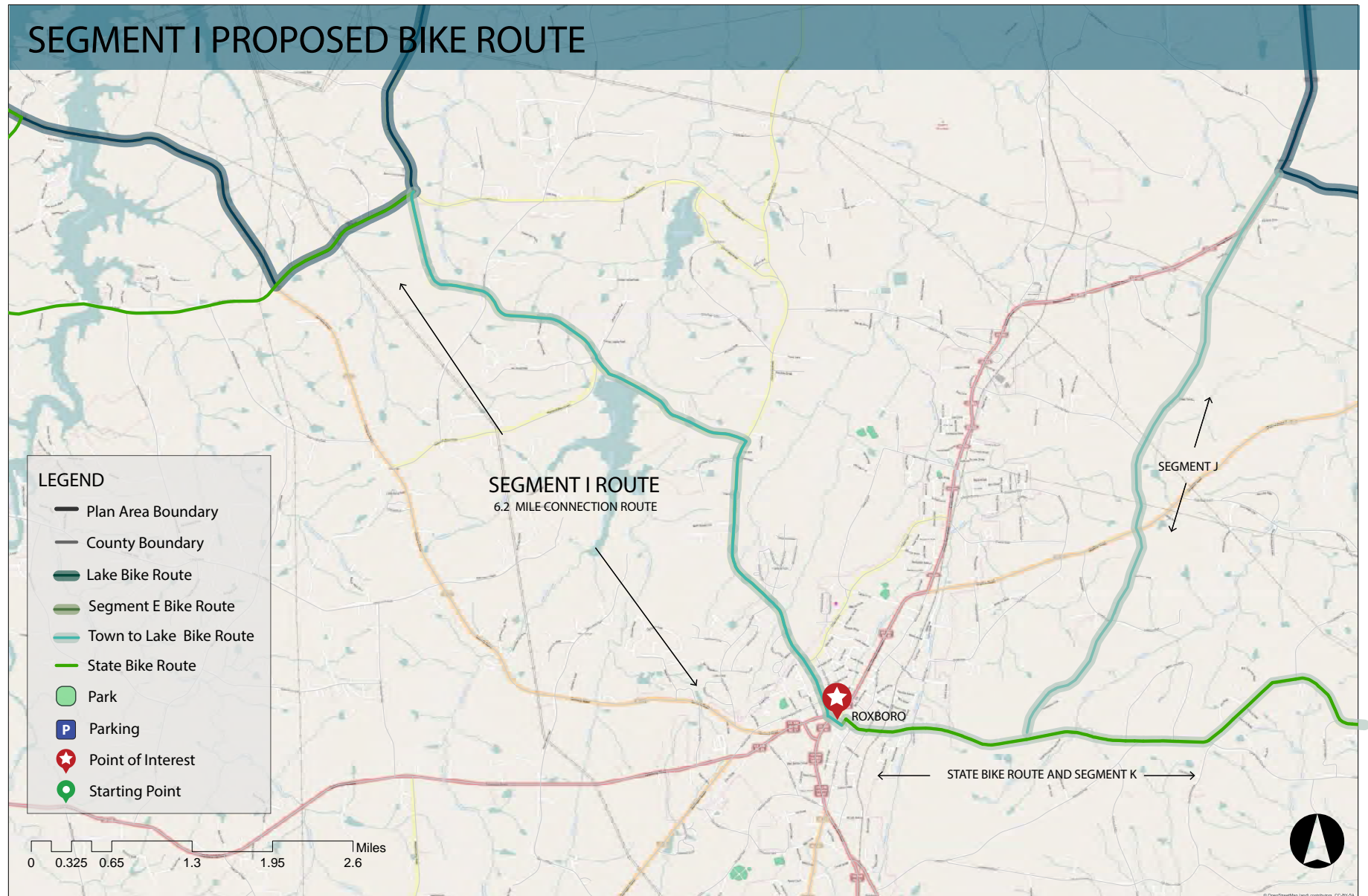
THE ROUTES

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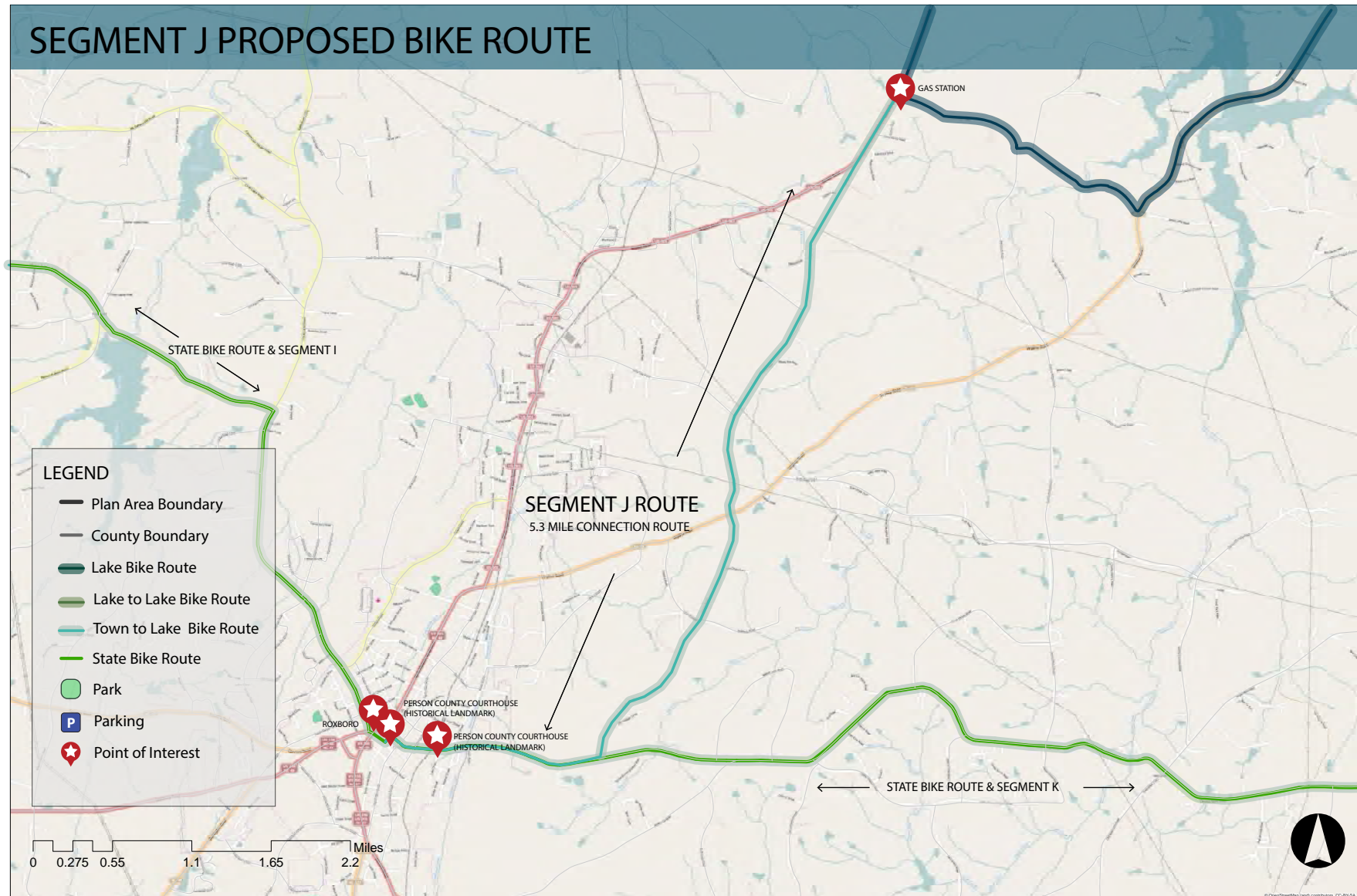
THE ROUTES

Individual Route Segments | Town to Lake Routes



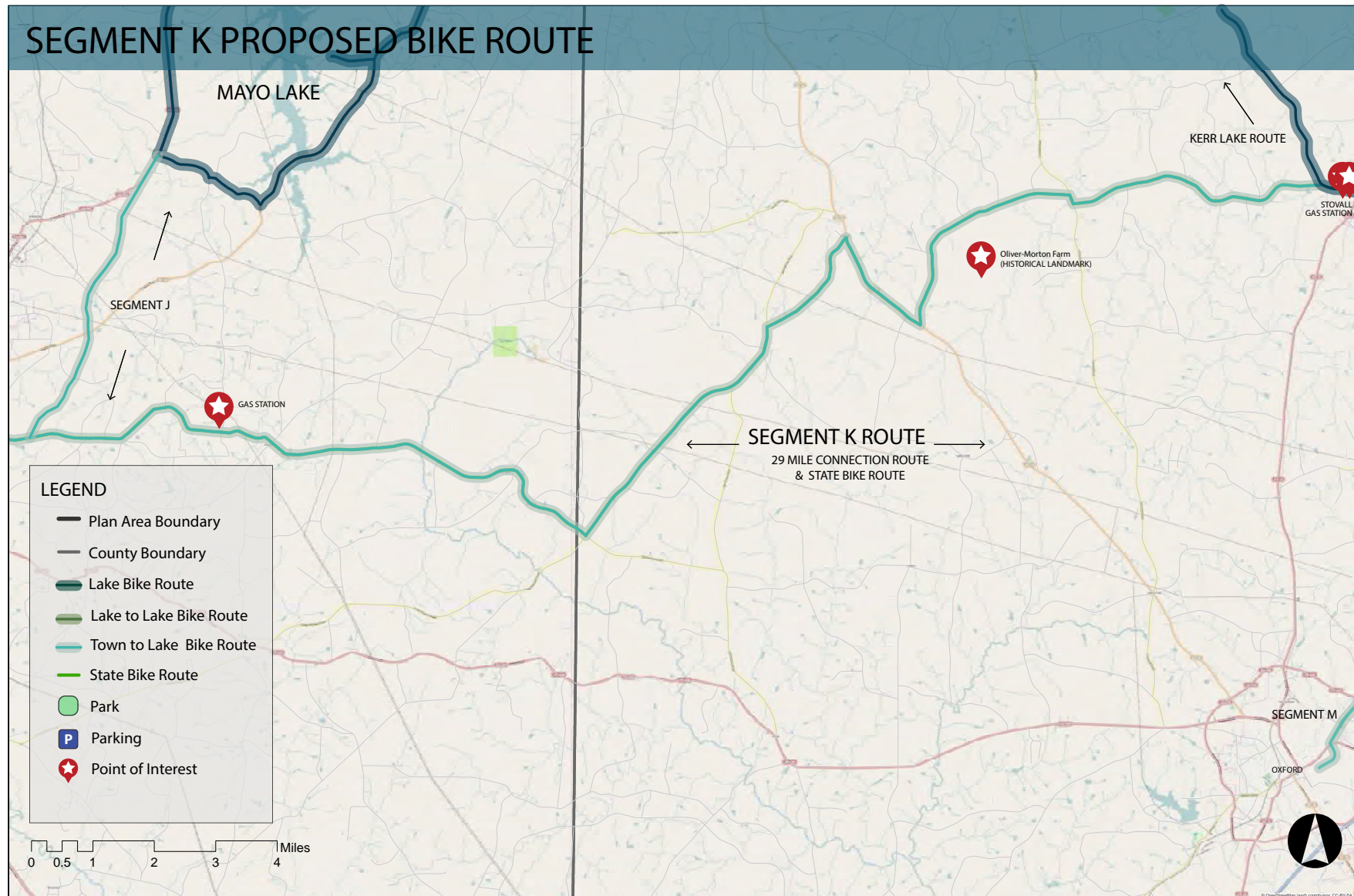
THE ROUTES

Individual Route Segments | Town to Lake Routes



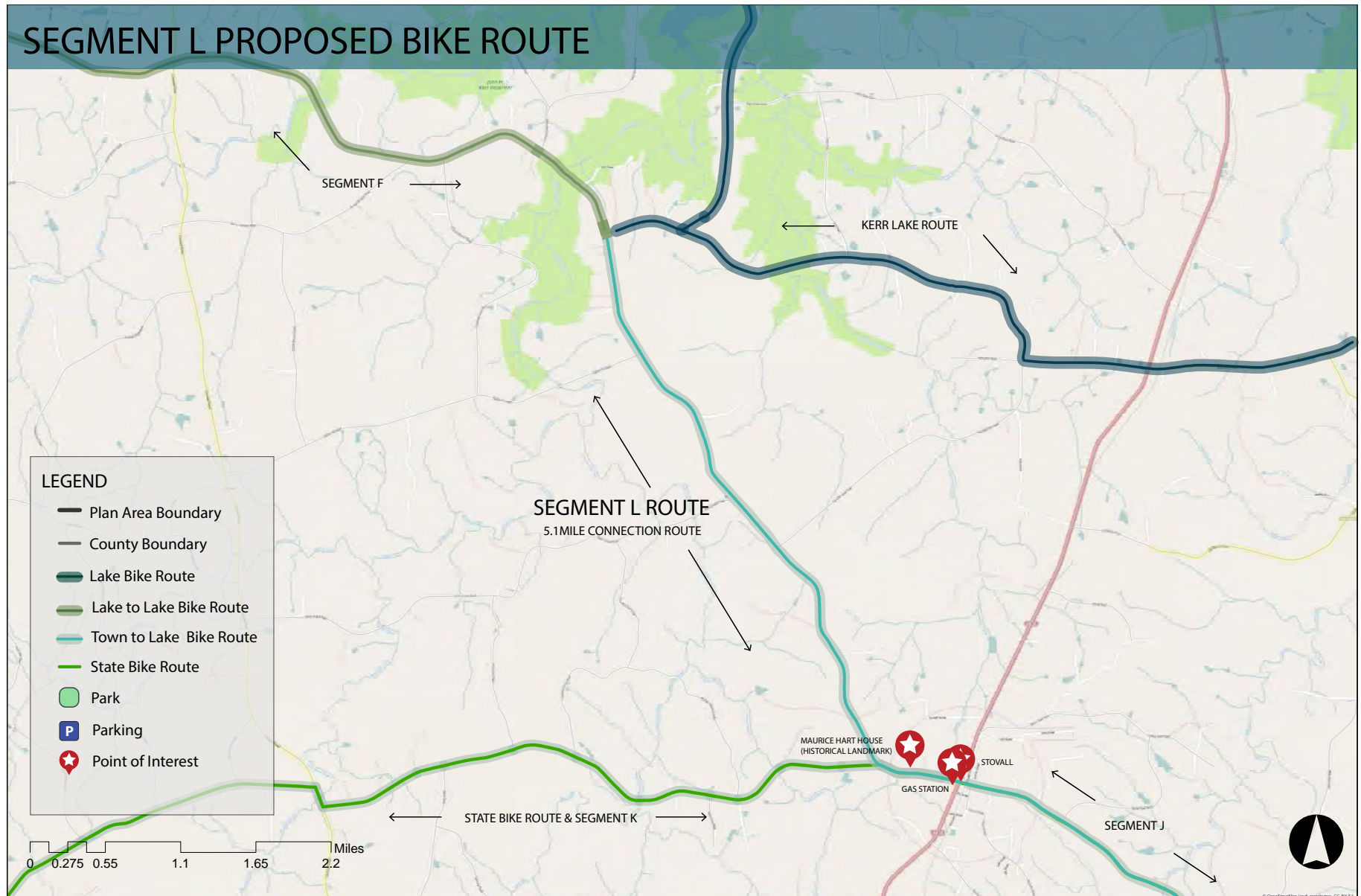
THE ROUTES

Individual Route Segments | Town to Lake Routes



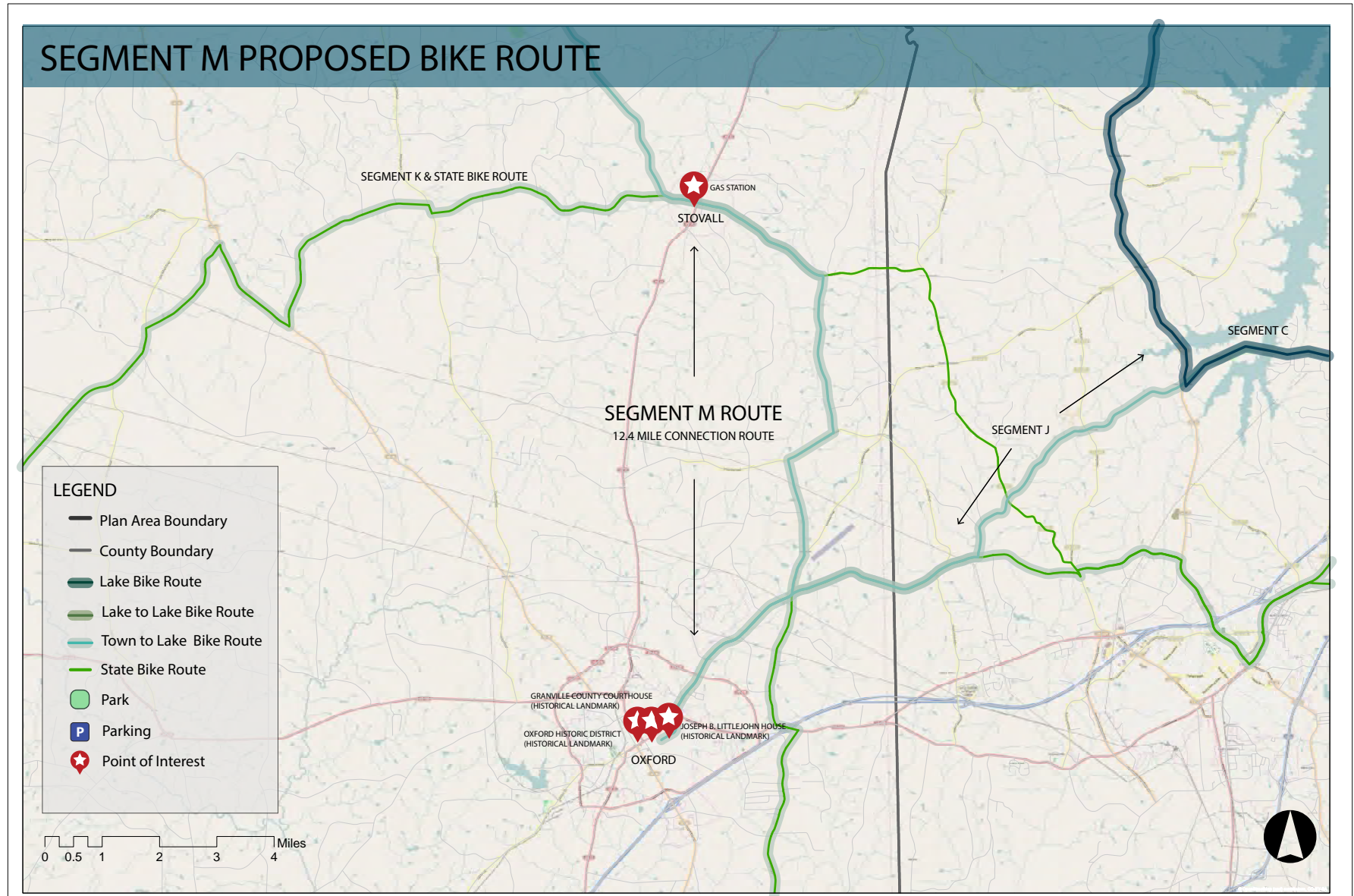
THE ROUTES

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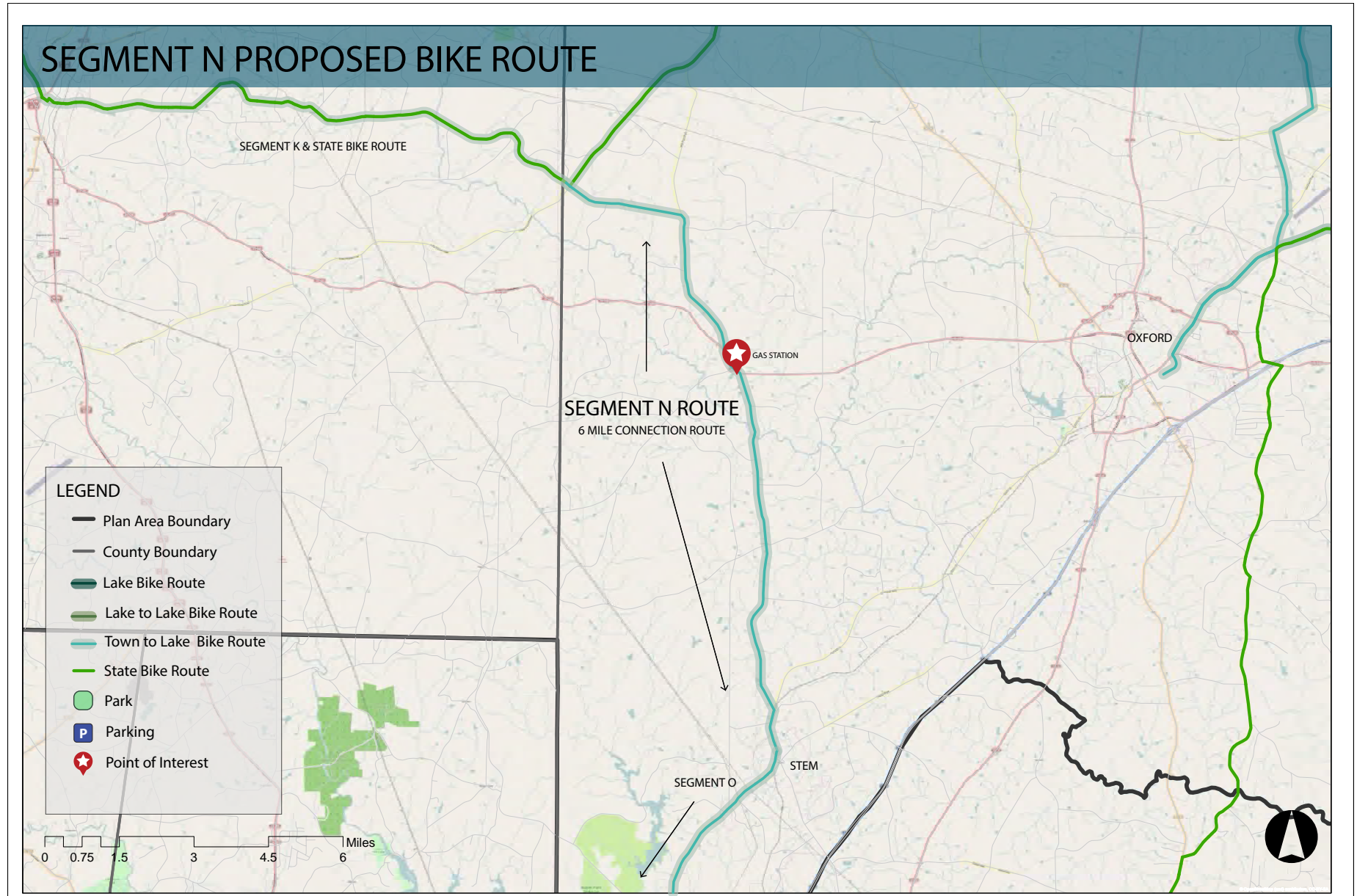
THE ROUTES

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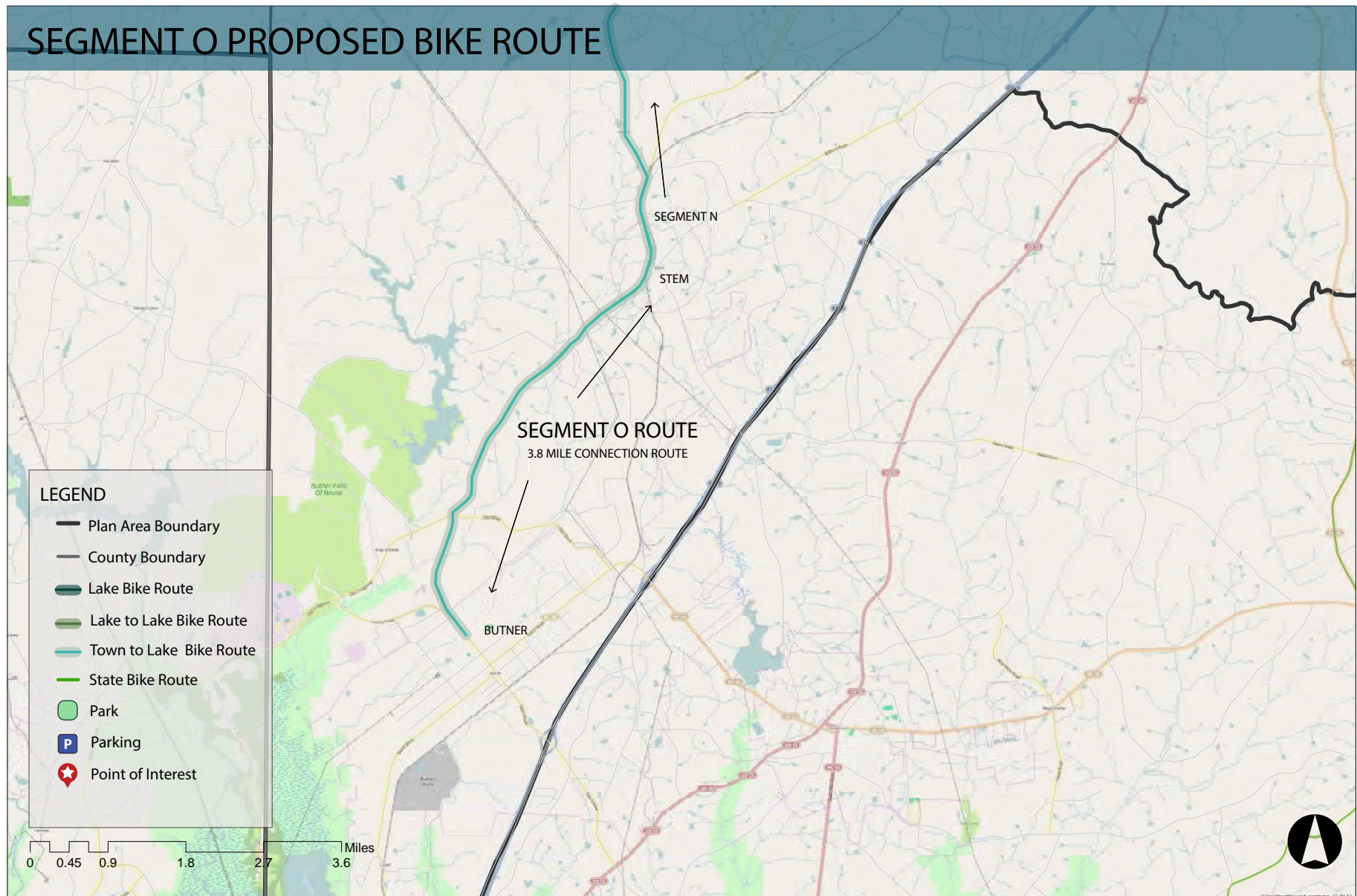
THE ROUTES

Individual Route Segments | Town to Lake Routes



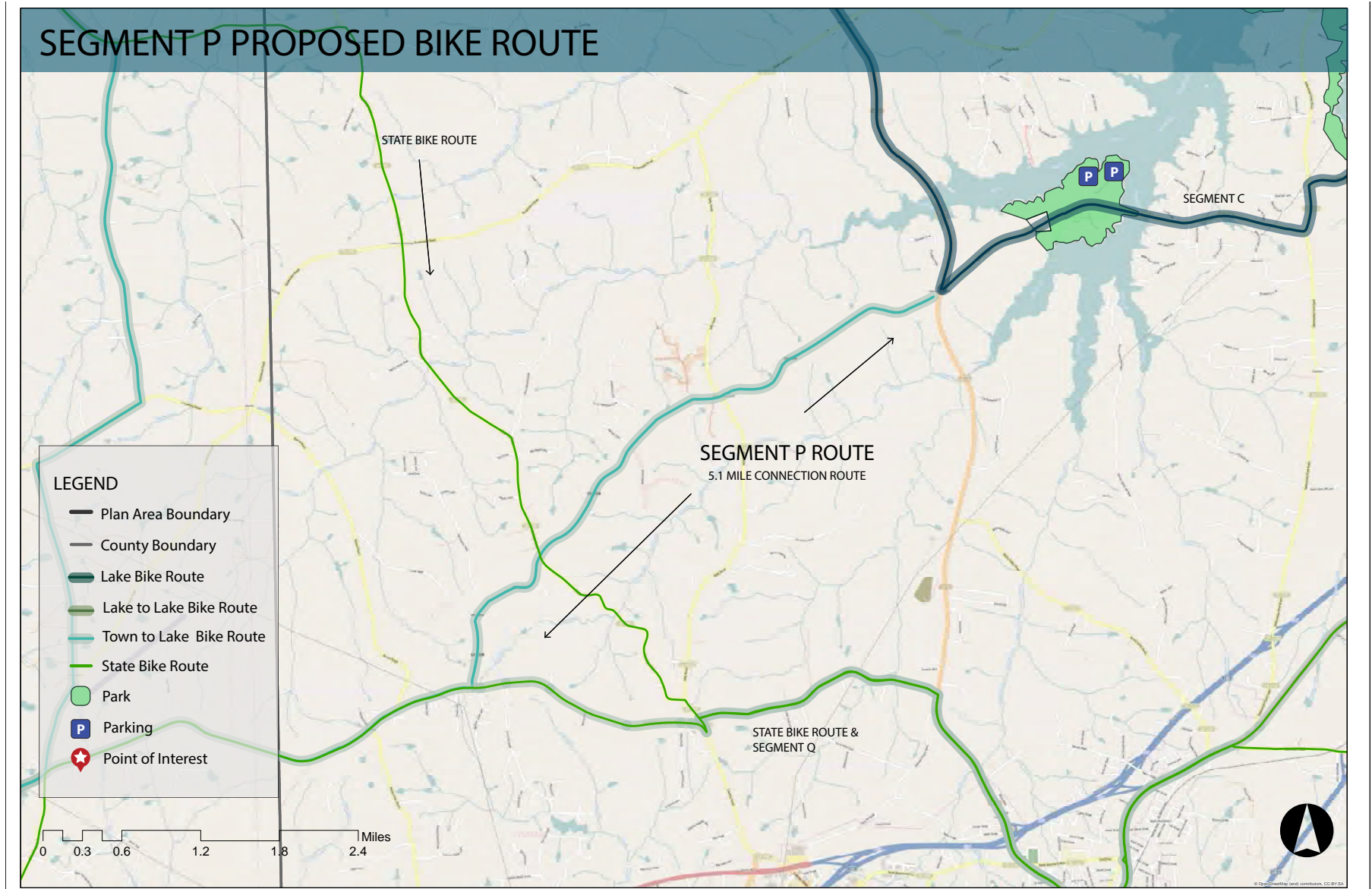
THE ROUTES

Individual Route Segments | Town to Lake Routes



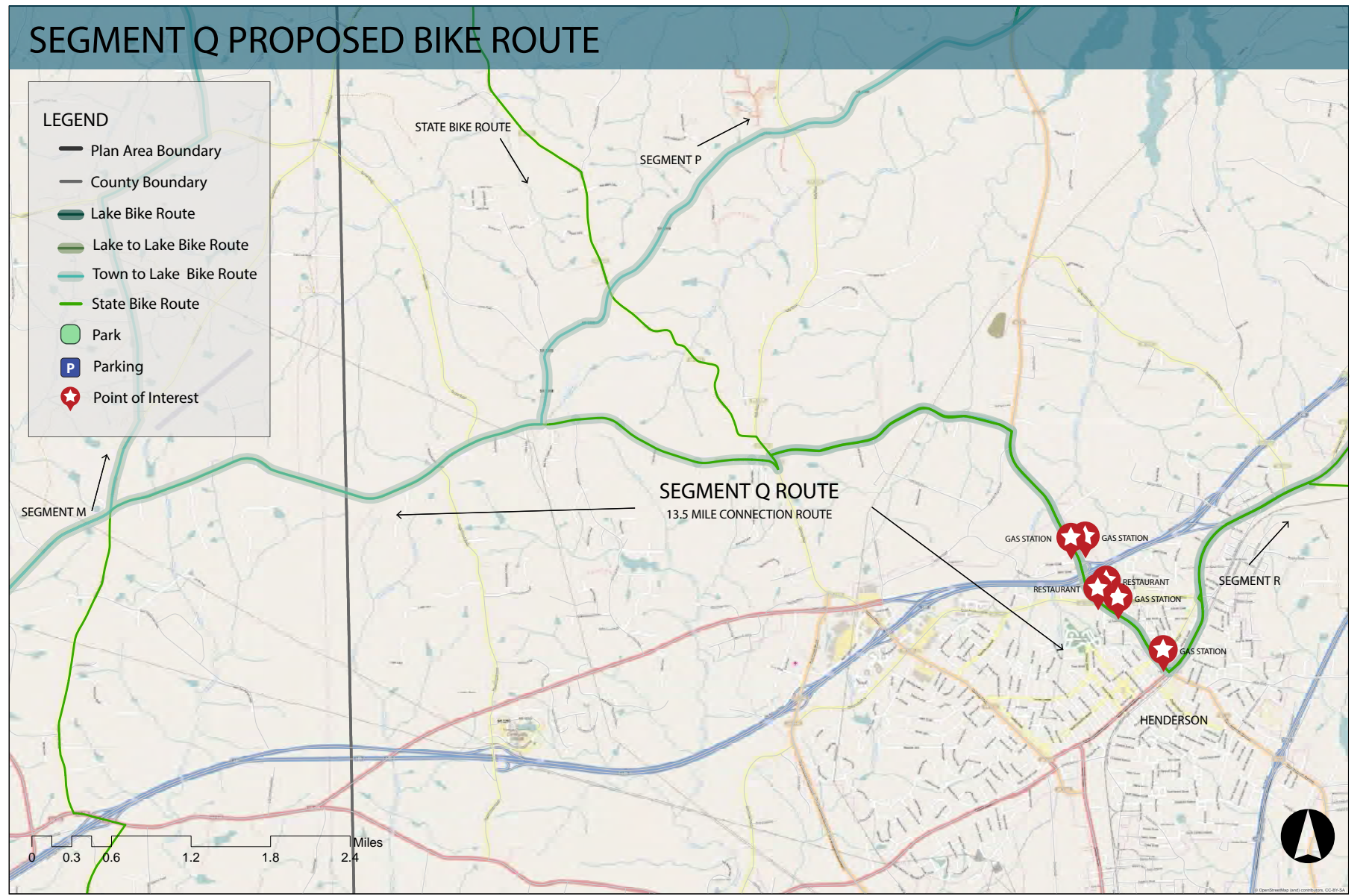
THE ROUTES

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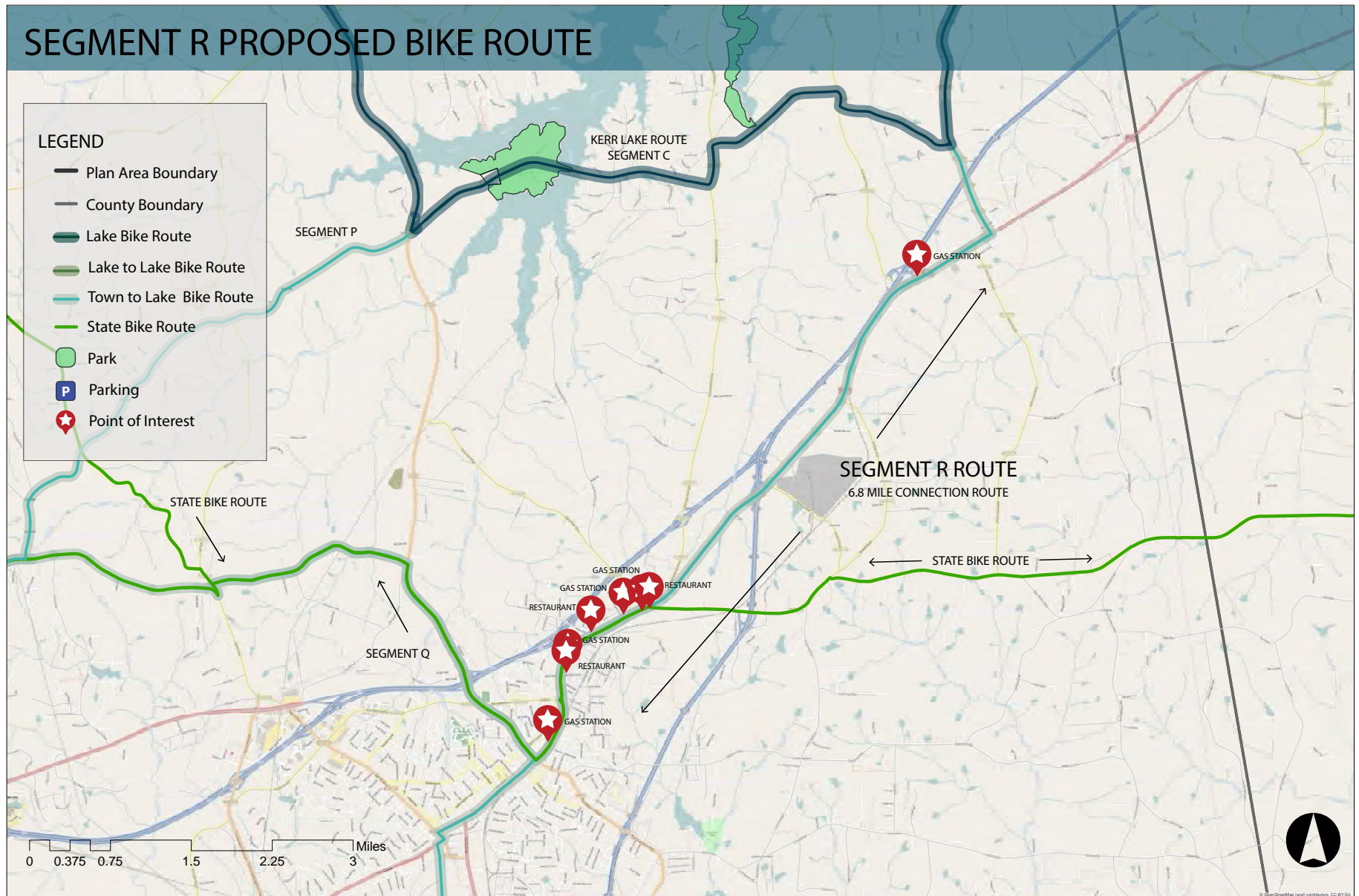
THE ROUTES

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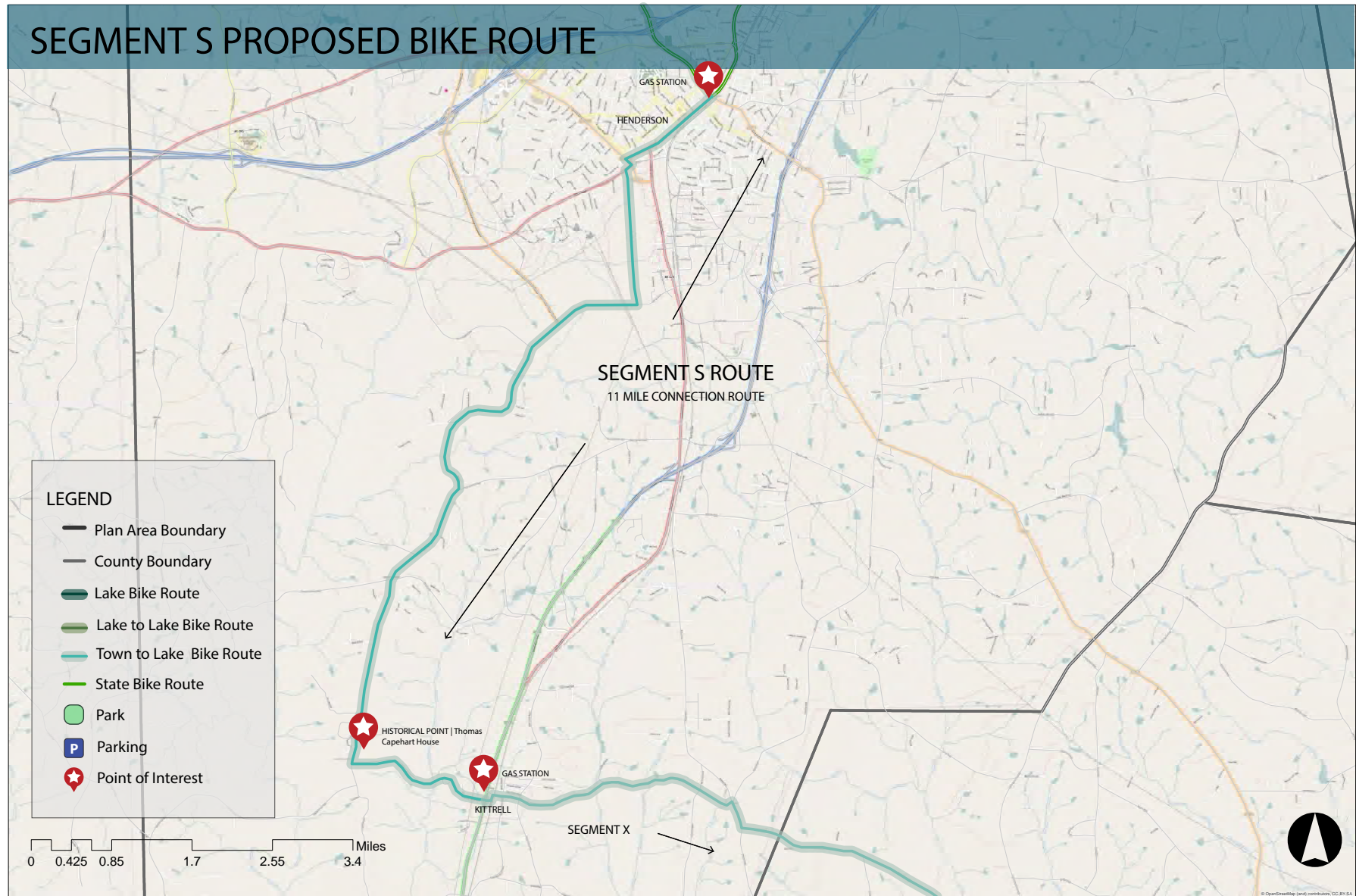
ROUTES

Individual Route Segments | Town to Lake Routes



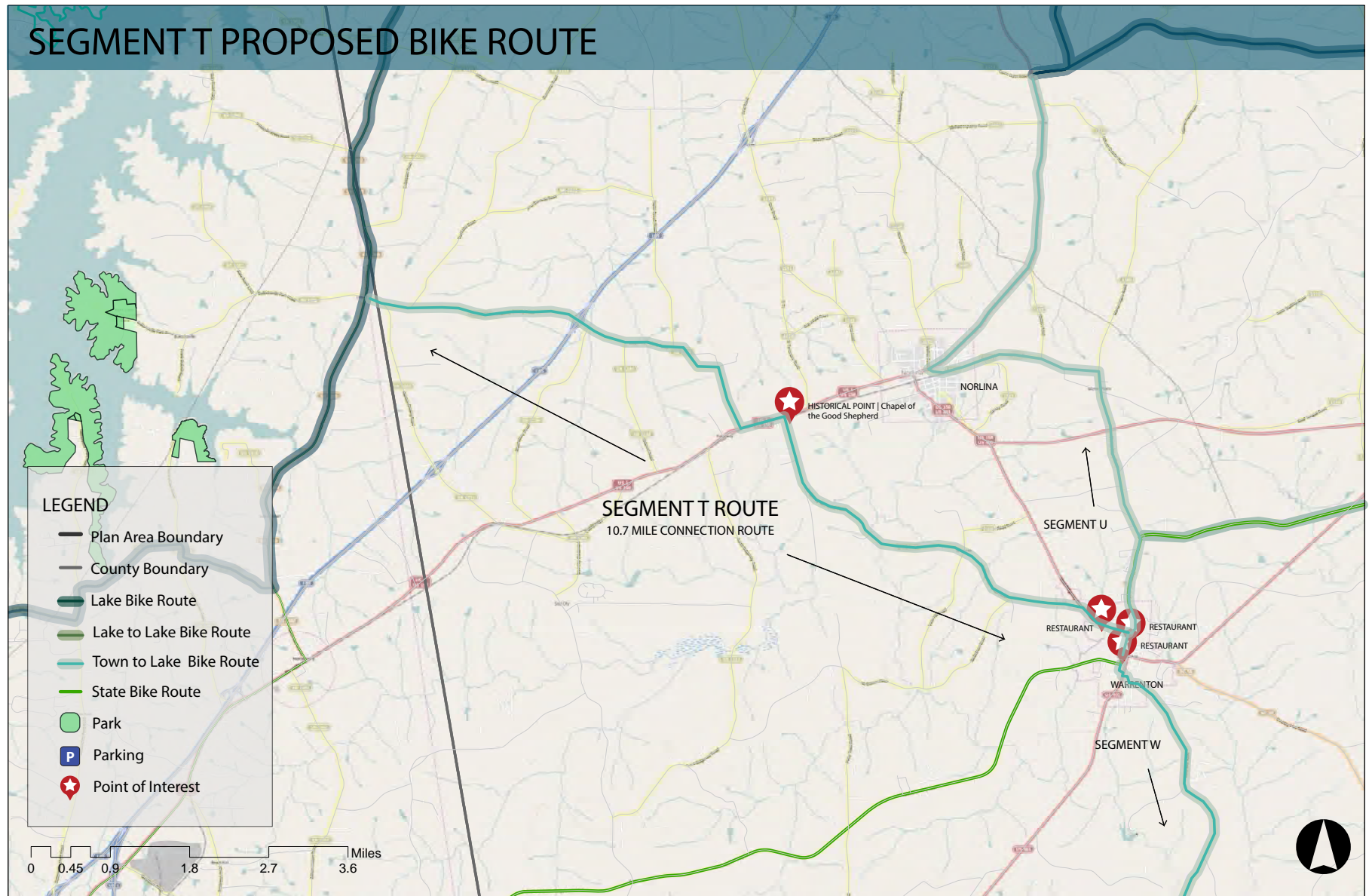
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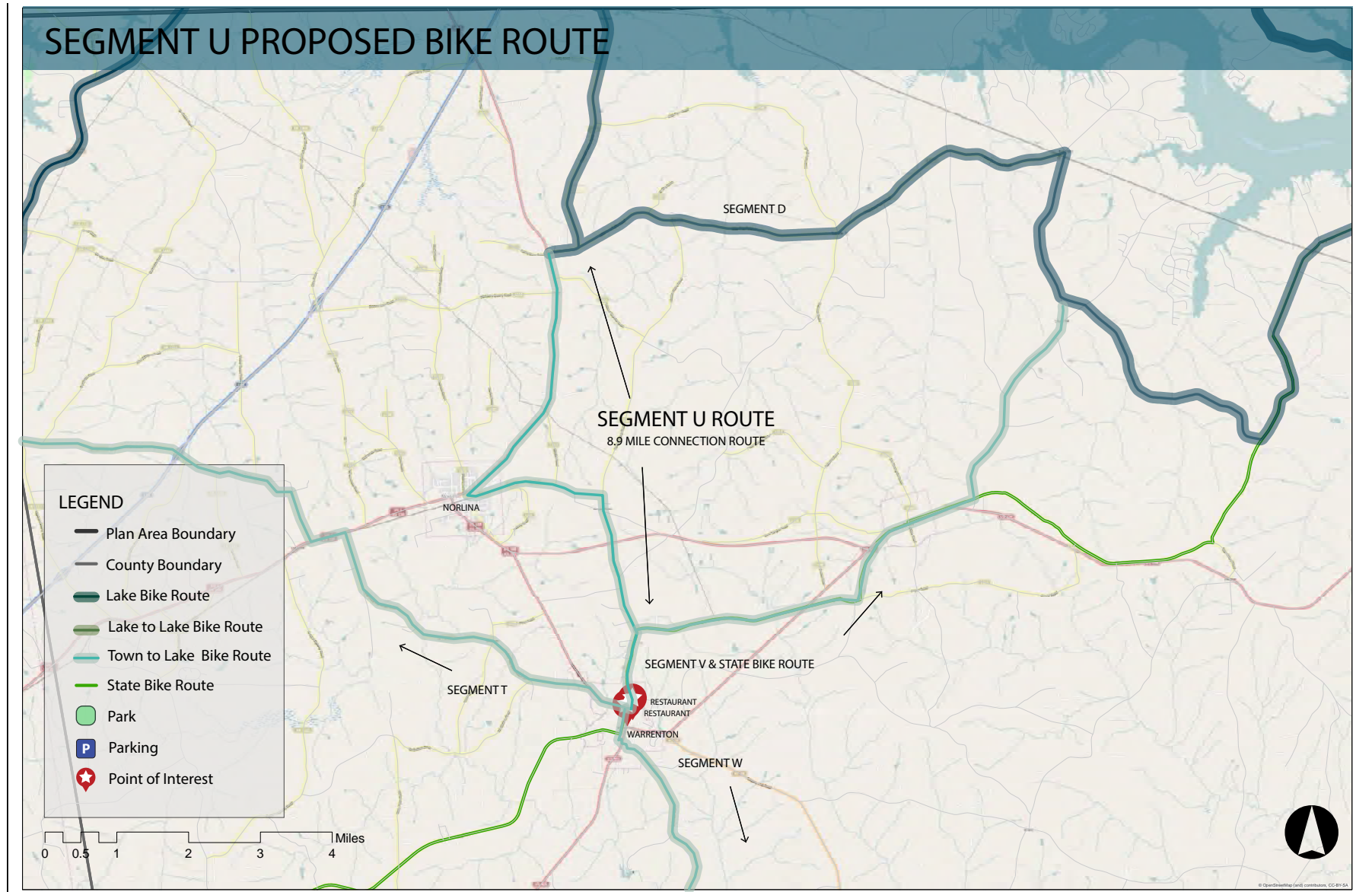
THE ROUTES

Individual Route Segments | Town to Lake Routes



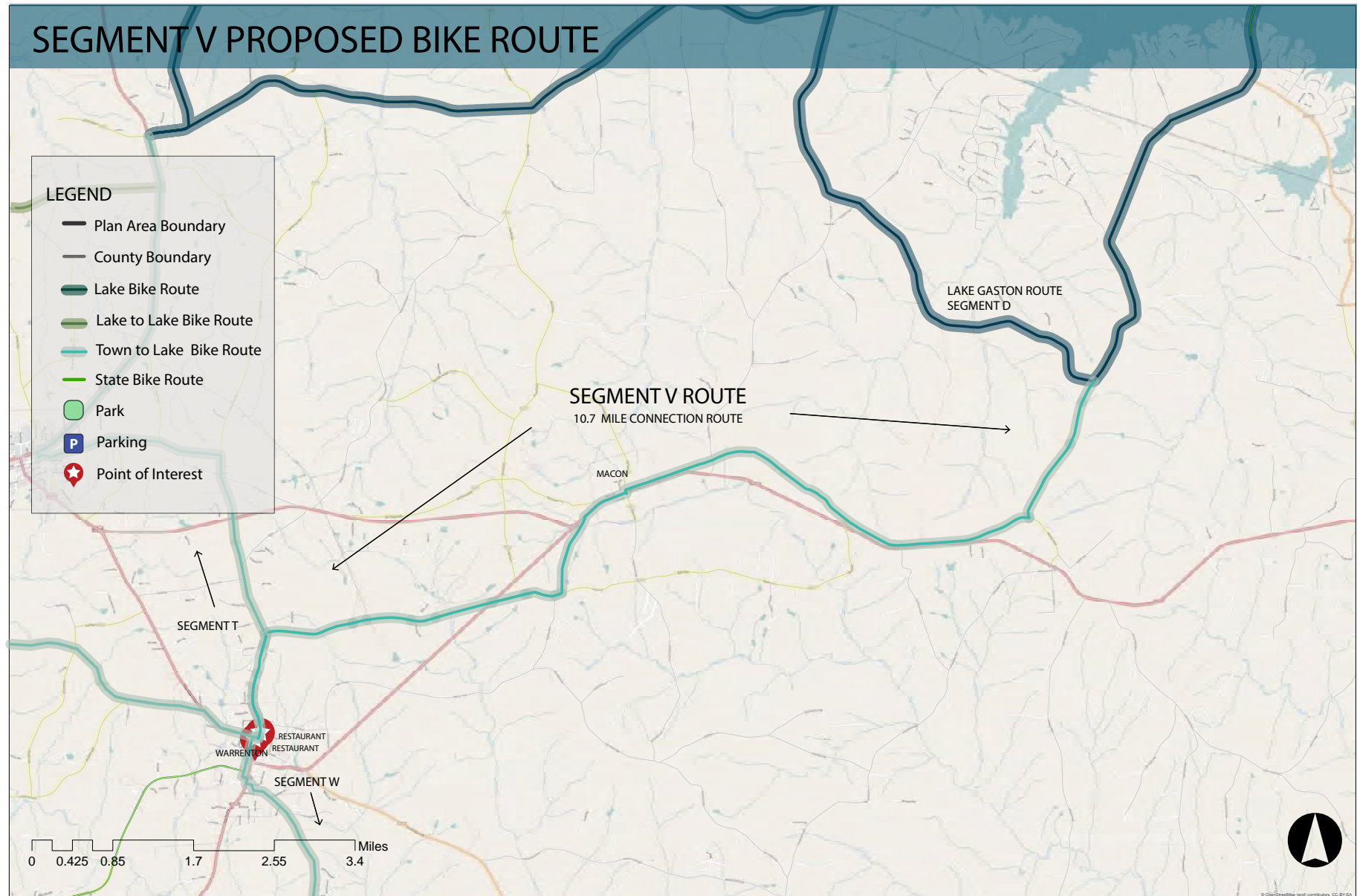
THE ROUTES

Individual Route Segments | Town to Lake Routes



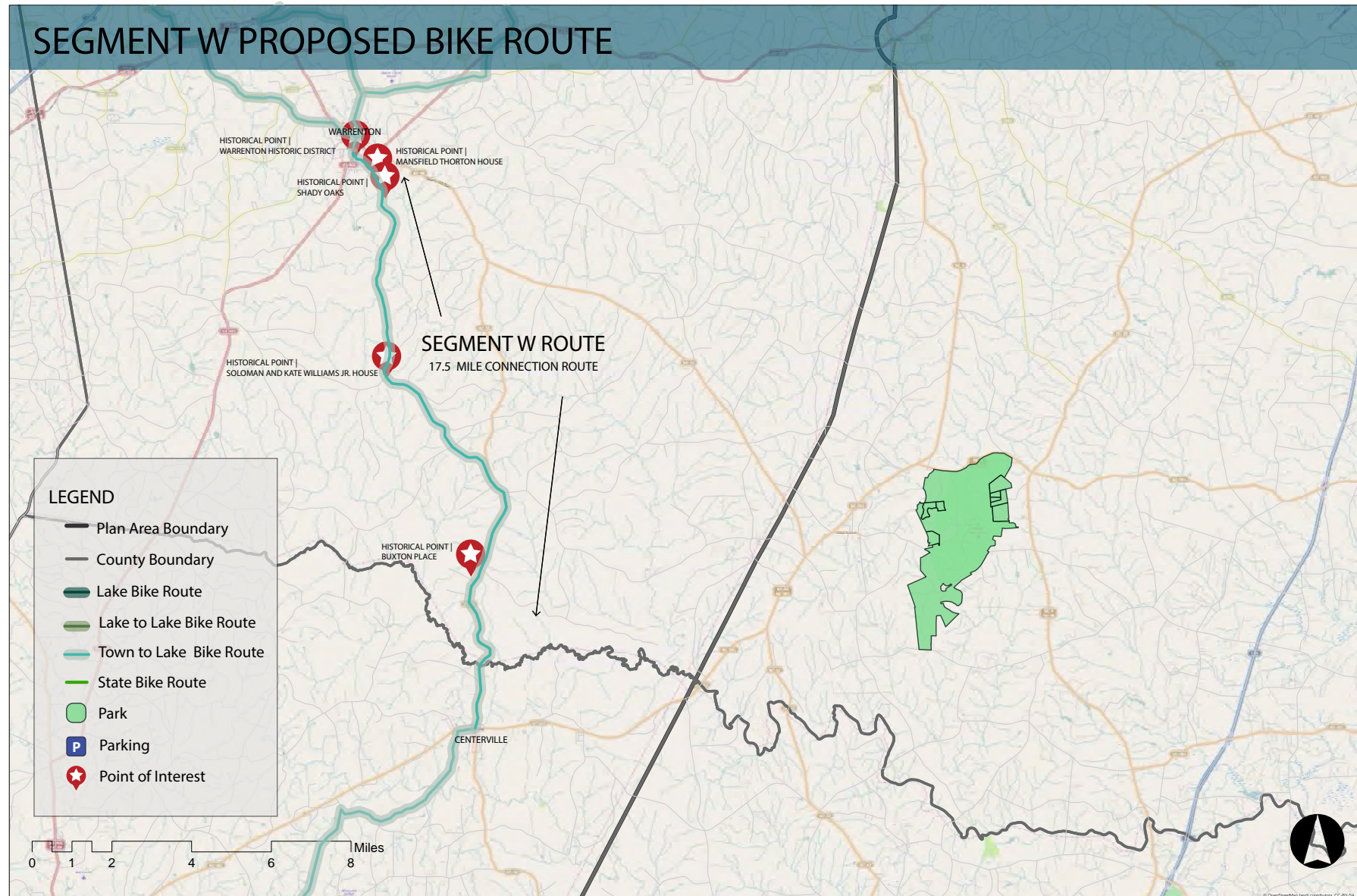
THE ROUTES

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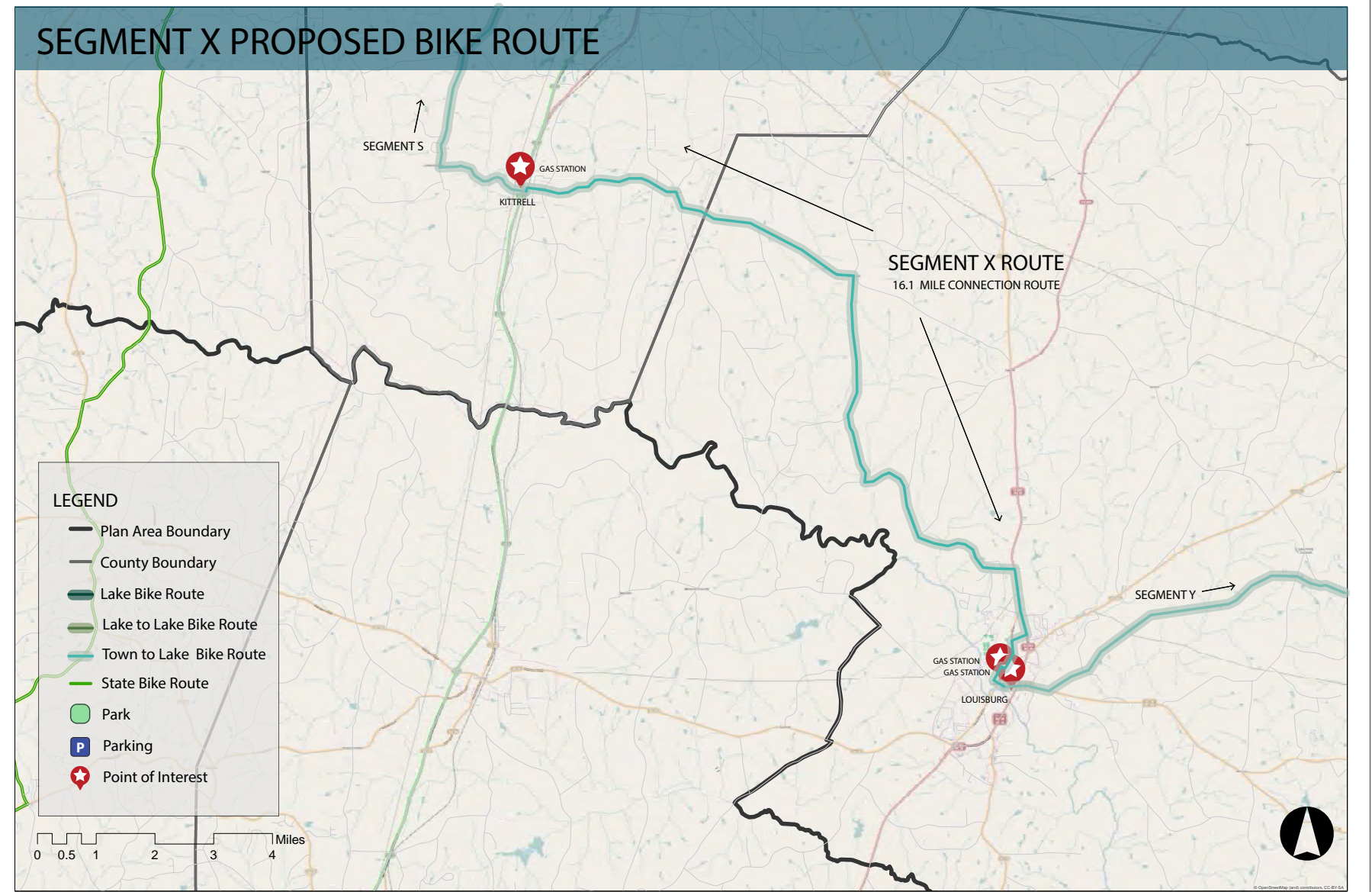
THE ROUTES

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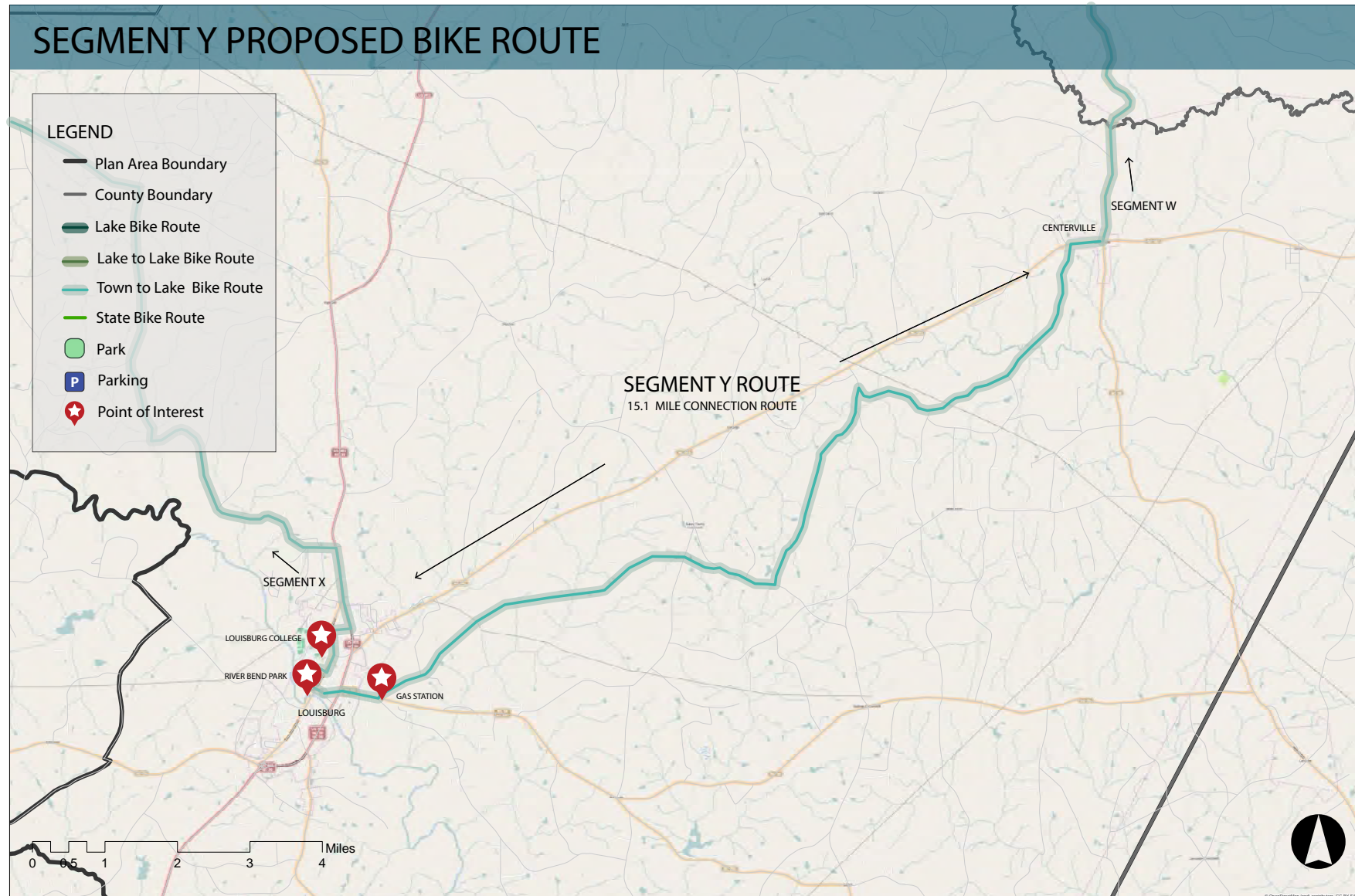
THE ROUTES

Individual Route Segments | Town to Lake Routes



THE ROUTES

Individual Route Segments | Town to Lake Routes



IMPLEMENTATION PLAN

Project Priorities & Recommendations

NCLD Project Recommendations Overview:

These project recommendations were developed to be used as a guide for future improvements to routes as roads are repaved or other opportunities arise. As situations and conditions of proposed routes change over time, the most suitable project recommendation may become different than what is suggested in this plan. The communities and planning agencies implementing and impacted by these routes should use their best judgment to determine the ultimate road improvements that work for them and the users of the routes. The on-road improvement recommendations generally consist of paved shoulders of varying width, bike lanes, or sharrows. Staff looked at roadway characteristics including roadway speed and existing curb and gutter to calculate project recommendations. Roadway speed was calculated by field work data and NCDOT Roadway Characteristic Shapefile as well as the Virginia Base Mapping Program Road Centerline Program Shapefile. Curb and gutter was determined by field work data and Google Street View. Initial project recommendations were made based on guidance from 2012 Guide for the Development of Bicycle Facilities by the American Association of State Highway and Transportation Officials (AASHTO). For road segments with a speed limit of 50 mph and higher a recommendation of a paved shoulder of 5-6 feet range is preferred. For road segments with a speed limit of 45 mph or lower a recommendation of a paved shoulder of 4-6 feet range is preferred. For areas with curb and gutter a Shared-Lane Marking or Bike lane is recommended.

Shared Lanes:

Shared Lanes can be marked with Shared-Lane Markings such as sharrows. According to the 2012 Guide for the Development of Bicycle Facilities, “Roadways that carry very low to low volumes of traffic, and may also have traffic typically operating at low speeds, may be suitable as shared lanes in their present condition. Rural roadways with good sight distance that carry low volumes of traffic and operate at speeds of 55 mph or less may also

IMPLEMENTATION PLAN

Project Priorities & Recommendations

NCLD Project Recommendations:

Bicycle Lanes:

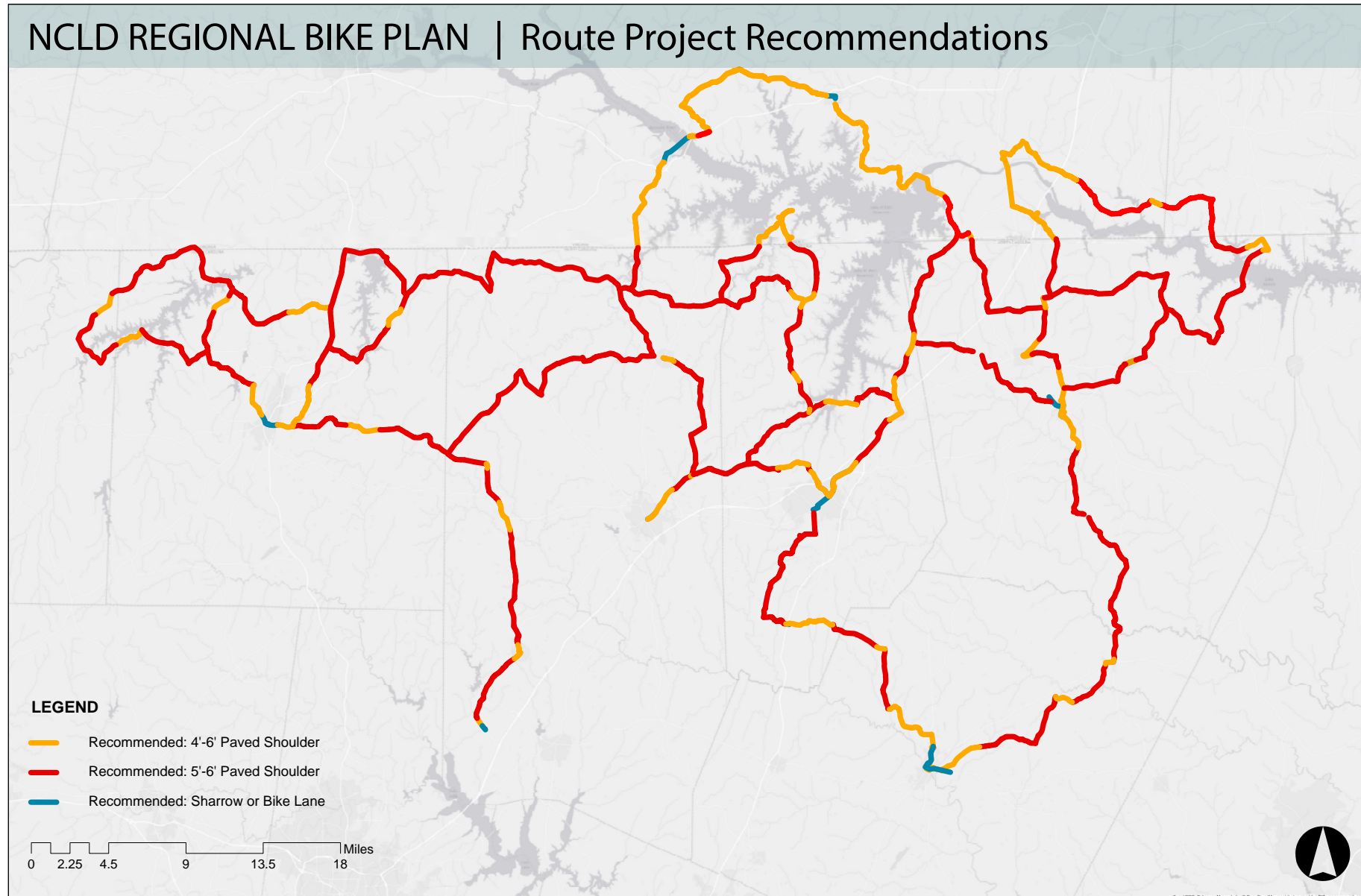
According to the 2012 AASHTO Guide for the Development of Bicycle Facilities: “Bike lanes are the appropriate and preferred bicycle facility for thoroughfares in both urban and suburban areas.”

Paved Shoulders:

The 2012 AASHTO Guide for the Development of Bicycle Facilities recommends that: “On uncurbed cross sections with no vertical obstructions immediately adjacent to the roadway, paved shoulders should be at least 4 ft. wide to accommodate bicycle travel. Shoulder width of at least 5 ft. is recommended from the face of a guardrail, curb, or other roadside barrier to provide additional operating width....Additional shoulder width is also desirable if motor vehicle speeds exceed 50 mph; if use by heavy trucks, buses, or recreational vehicles is considerable; or if static obstructions exist at the right side of the roadway.”

IMPLEMENTATION PLAN

Project Priorities & Recommendations



Temporarily Blank

CONCLUSION

The recommendations included in this plan form the basis for the development of a vibrant and viable bicycle plan that act as a connection between the lakes and communities as well as other significant features in the region. The network will provide the option of bicycling as a practical mode of transportation. This plan is meant to serve as a working document to guide transportation planning decisions made over time in the region.

In order to continue the plan's development and sustainment a group will be developed from interested NCLD Bike committee members. This group will handle future efforts to continue implementing the bike plan and adjusting proposed and existing routes as well as recommending new ones as they are suggested. The group will include representatives of organizations affected by the bike plan such as local governments and other interested organizations. For more information and updates on the NC Lakes District Regional Bike Plan, please visit the website: <http://www.nclakesdistrict.com/bikeways.html>



Existing US Bike Route 1
Proposed Kerr-Lake Segment C Route

FUNDING SOURCES

AVAILABLE FUNDING SOURCES

Safe Routes to Schools

<http://saferoutespartnership.org/state/srts-in-your-state/northcarolina>

Transportation Alternatives

Rails to Trails

http://trade.railstotrails.org//page.php?identifier=10_definitions

NC Dedicated funding sources

Highway fund and Highway Trust fund

Recreational Trails program

http://www.ncparks.gov/About/trails_RTP.php

Congestion Mitigation and Air Quality Program (CMAQ)

Specifically non recreational bike transportation infrastructure

Community Development Block Grant Program (CDBG)

Low and moderate income communities

People for Bikes Community Grants

<http://www.peopleforbikes.org/pages/community-grants>

NCDOT State Transportation Improvement Program

<http://www.ncdot.gov/bikeped/funding/projects/>

APPENDIX A

DESIGN GUIDELINES

1.Facility Type: On-Road Facilities

As the project is implemented, bike path designs, paving type and/or width could change because of alterations in traffic patterns, changes in land use or local interest. Below are the on-road facilities recommended in our plan. Please refer to the NCDOT Complete streets Planning and Design Guidelines, 2012.

Sidepath (Multi-Use Trails Along Roadways):

Sidepaths are multi-use paths that are exclusively located adjacent to a roadway, typically within the road right of way. This type of trail may be utilized by pedestrians, joggers, wheelchair users, and other non-motorized users as well as allowing for two-way, off-street bicycle use. Sidepath provide available space for bicycle and pedestrian travel where on-road bicycle facilities are not feasible due to traffic volumes, speeds, and/or roadway configuration.



Figure 1: Sidepath (Multi-Use Trails)

APPENDIX A

DESIGN GUIDELINES

Sidepath (Multi-Use Trails Along Roadways):

Below is a description of the surface, width, and available uses for sidepath:

- Surface: Asphalt or Concrete
- Width: 8-10 Feet
- Uses: Bicycling or Walking

Design Considerations for Sidepaths: Sidepaths for the North Carolina Lakes District Regional Bicycle Plan will have a regional economic impact in areas where most individuals frequent, especially near Lake Gaston, Kerr Lake, Hyco Lake, and Mayo Lake. Initially, sidepath options can include the following:

- A 10 – foot wide, detached two-way multi-use path.
- An 8 – 10 foot wide, one-way multi-use path.
- A combination of detached and attached multi-use path.

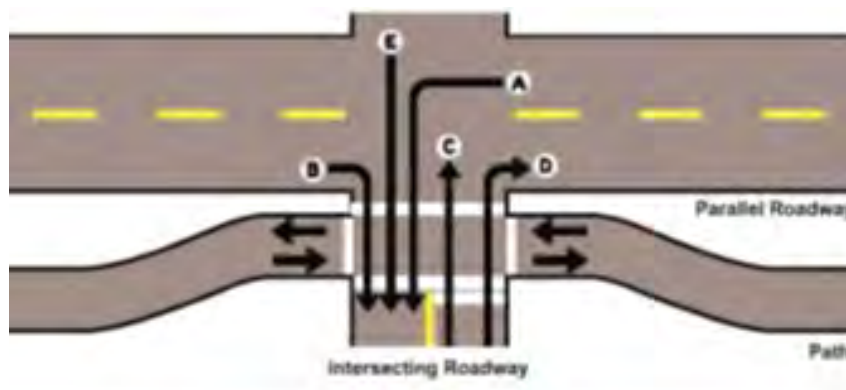


Figure 2: Sidepath diagram

APPENDIX A

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Paved Shoulder:

A paved shoulder refers to the part of the highway that is adjacent to the regularly traveled portion of the highway that is on the same level as the highway. In rural areas with low volumes of traffic, paved striped shoulders of at least 4 feet are enough for bicycle and pedestrian travel. Paved shoulders provide the operating space for bicyclists and pedestrians as well as space for emergency vehicles. When curb and gutter is completed on a new roadway, paved shoulders should be rehabbed to full bicycle lanes.



Figure 3: Pedestrian riding his bicycle on a paved shoulder

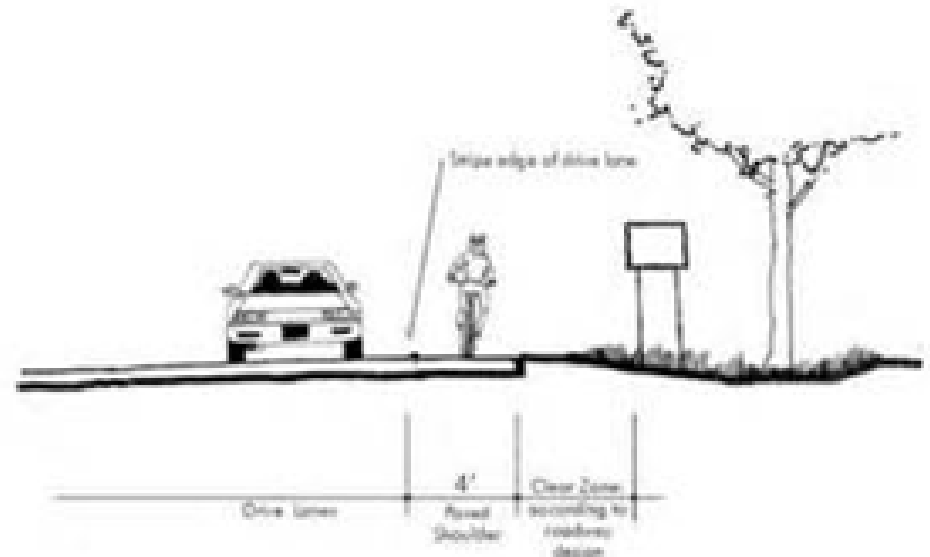


Figure 4: Paved shoulder diagram

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DESIGN GUIDELINES

Paved Shoulder:

Below is a description of the surface, width, and available uses for paved shoulder:

- Surface: Asphalt
- Width: 4-6 Feet
- Uses: Bicycling

Design Considerations for Paved Shoulders: Paved Shoulders for the North Carolina Lakes District Regional Bicycle Plan will provide considerable benefits to bicyclists and pedestrians in the region. Paved shoulders will reduce the amount of maintenance needed on roads; it will increase safety issues by providing additional space and recovery area for motorists, maintenance crews, and emergency responders in case of mechanical difficulty, a flat tire or other emergency. Initially, paved shoulders can include the following:

- Make all paved shoulders for bicycle, pedestrian, and motor vehicle use a minimum of 4 feet.
- Make paved shoulders 6 feet which bicyclists and pedestrian can avoid debris and vehicle conflicts.

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Bicycle Lane:

A bicycle lane is a portion of the roadway designated for preferential and exclusive use of individuals who cycle to various locations. Bicycle Lanes are most commonly used in urban and village settings which aid the orderly flow of bicycle traffic. Located next to motor vehicle travel lanes, bike lanes move in the same direction as vehicular traffic and are designated by paving markings as only for cyclists.



Figure 5: Bicyclist utilizing the bicycle lane



Figure 6: Bicycle Lane signage in a rural community

APPENDIX A

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Bicycle Lane:

Below is a description of the surface, width, and available uses for paved shoulder:

- Surface: Asphalt
- Width: 4-6 Feet
- Uses: Bicycling

Design Considerations for Bicycle Lane: Bicycle Lane for the North Carolina Lakes District Regional Bicycle Plan will enable bicyclists to travel at their preferred speed. Bicycle Lane can facilitate predictable behavior and movements in the region. They can provide safety benefits to individuals, particularly in congested areas. Bike lane presence also visually narrows the roadway travel lanes to encourage lower vehicle speeds. Initially, bicycle lanes can include the following:

- Bicycle lanes should be one-way facilities.
- Bicycle lanes should carry bike traffic in the same direction as adjacent traffic.
- Pavement surfaces should be level and smooth.

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Sharrows (Shared Lane Marking):

Sharrows markings align cyclists and remind motorists the potential presence of cyclists and their right to travel with automobile traffic. A general purpose travel lane delineated by shared lane markings. The markings are utilized to establish the correct positioning within the lane and to encourage bicycle travel. A representation of a bicycle with two chevrons above it to symbolize motor vehicles and bicycles can share the same lane.



Figure 7: Sharrows marking



Figure 8: Bicyclist and motor vehicles riding in the same lane

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Sharrows (Shared Lane Marking):

Below is a description of the surface, width, and available uses for sharrows:

- Surface: Asphalt
- Width: Please see AASHTO Guide for the correct placement
- Uses: Bicycling

Design Considerations for Sharrows: Sharrows for the North Carolina Lakes District Regional Bicycle Plan will advertise the presence of bikeway routes to all users. It will indicate the safest path for bicycle users through difficult situations, such as adjacent to parked cars, or through busy intersections. Sharrows also alerts drivers to the potential presence of bicyclists and shows the lateral position bicyclists are likely to occupy within the street. Initially, sharrows can include the following:

- 35 mph maximum speed for sharrow use.
- Sharrows should be placed 4 ft. from curb face or edge of pavement in locations without on-street parking.

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Buffered Bike Lane:

Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and parking lane. Buffered bike lane increases the space between the travel lane or parked cars and the bike lane. In areas with high volumes and speed of motor vehicle traffic, the buffered bike lane is a good choice. The buffer allows for a safer and more comfortable ride for more types of bicyclists.



Figure 9: Buffer Bike Lane



Figure 10: Buffer Bike Lane with Bike Lane signage

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Buffered Bike Lane:

Below is a description of the surface, width, and available uses for buffer bike lane:

- Surface: Asphalt
- Width: At least 7 feet wide for the bicycle travel area, with at least a 2 foot buffer. Mark with a chevron or diagonal hatching if the buffer is 3 feet or wider, with dotted lines inside the buffer boundary where cars cross.
- Uses: Bicycling

Design Considerations for Buffer Bike Lane: Buffer Bike Lanes for the North Carolina Lakes District Regional Bicycle Plan will provide space for cyclists to pass one another without encroaching into the travel lane. This provides motorists greater distance from cyclists in a bike lane. Buffer bike lanes also provide a cushion of space with motor vehicles on streets with narrow bike lanes. By providing the additional space, cyclists can avoid potential obstacles such as debris. Initially, buffer bike lanes can include the following:

- Buffer shall be marked with 2 solid white lines with diagonal hatching if 3 feet in width or wider.
- Buffer bike lane shall have bicycle lane word and arrow markings that symbolize preferential use

APPENDIX A

DESIGN GUIDELINES

2.Facility Type: Off-Road Facilities

Off-Road Facilities

As the project is implemented, the majority of facilities in the current plan are on-road, but as the NC Lakes District Regional Bicycle Plan moves forward, off-road facilities can be incorporated. Off-road facilities have access across natural barriers and trails that are free of debris, grass, and snow. Planning for off-road facilities in the NC Lakes District Region will ensure residents in the region have viable choices for personal transportation now and in the future. The following off-road facilities types may vary in development in width depending on funding availability. Below are the off-road facilities recommended in this plan.

Crushed Stone Trails:

Crush Stone Trails can provide individuals an all-weather surface. This type of trail is mostly utilized by pedestrians, bicyclists, and joggers. Wheelchair users and other non-motorized users can benefit from using crushed stone trails. Crushed Stone Trails provide available space for bicycle and pedestrian travel where off-road bicycle facilities are not directly in the way of traffic configuration.



Figure 9: Crushed Stone Trail



Figure 10: Crushed Stone Trail

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Crushed Stone Trails:

Below is a description of the surface, width, and available uses for crushed stone trails:

- Surface: Crushed stone or granite dust
- Width: 6 Feet
- Uses: Walking or Bicycling

Design Considerations for Crushed Stone Trails: Crushed Stone Trails for the North Carolina Lakes District Regional Bicycle Plan will provide enough space for cyclists and pedestrians right-of-way share. This gives individuals a rustic approach to the natural environment. Crushed stone trails provide a cushion of space for mobility travel options. By providing a rustic approach to the natural environment, individuals and cyclist can avoid potential obstacles such as debris. Initially, crushed stone trails can include the following:

- All trail construction shall include standard clearing limits as follows: brush and branches shall be removed to a height of 8 feet within 3 feet of the trail.
- Remove all roots and organic debris to a depth of 4 inches, where appropriate.

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Natural Surface Trail:

Natural surface trails are unpaved trails that serve a variety of recreational groups, walkability, and local connectivity. This type of trail designed can accommodate multiple uses, such as hiking, equestrians, and bicycling than trying to adapt existing trails for multiple uses. For the North Carolina Lakes District Regional Bicycle Plan, natural surface trails will be beneficial around Lake Gaston, Kerr Lake, Hyco Lake, and Mayo Lake.



Figure 11: Natural Surface Trail



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Natural Surface Trail:

Below is a description of the surface, width, and available uses for crushed stone trails:

- Surface: Natural
- Width: 2 – 4 Feet
- Uses: Walking or Mountain Biking

Design Considerations for Natural Surface Trails: Natural surface trails for the North Carolina Lakes District Regional Bicycle Plan will accommodate the widest range of users among trail types presented. These paths, while constructed with native surface materials or compacted, can provide wide treads and clearances potentially accommodating significant volumes of hikers, equestrians and bicyclists. Initially, natural surface trails can include the following:

- Tread width varies from four to eight feet.
- Obstacles occasionally present with native materials.

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Boardwalk:

Boardwalk is a constructed walkway for pedestrian use. In the North Carolina Lakes District Regional Bicycle Plan, boardwalks will be an important factor for encouraging people to walk and bike. Boardwalks provide available space for bicycle and pedestrian travel that will be suitable for safety and convenience by providing designs of significant sections that will be suitable for transportation purpose.



Figure 11: Boardwalk during the fall season



Figure 12: Boardwalk during the spring season

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DESIGN GUIDELINES

Boardwalk:

Below is a description of the surface, width, and available uses for boardwalk:

- Surface: Wood or Manufactured Decking
- Width: 8 feet +
- Uses: Walking/Bicycling

Design Considerations for Boardwalk: Boardwalks for the North Carolina Lakes District Regional Bicycle Plan will be a viable assess for providing individuals more walkability opportunities in the region. Boardwalks will have a realistic trail system that will effectively meet the needs for residents and tourist who visit the region. Initially, boardwalks options can include the following:

- Boardwalks should be utilize that the trail experiences for individuals traveling are enjoyable, safe, and minimize impacts to the natural environments.

APPENDIX A

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Bridge:

- Bridges are structures providing passages over a river or a roadway. Bridges for the North Carolina Lakes District Regional Bike Plan will be utilized by pedestrians, bicyclists, joggers, wheelchair users, and other non-motorized users. Bridges in the region will provide enough space for multi uses purposes that individuals can travel freely in the region.



Figure 13: Bridge during the spring season



Figure 14: Foot Bridge during the spring season

APPENDIX A

DESIGN GUIDELINES

Bridge:

Below is a description of the surface, width, and available uses for bridges:

- Surface: Varies
- Width: 8 feet +
- Uses: Walking/Emergency Access/Bicycling

Design Considerations for Bridges: Bridges for the North Carolina Lakes District Regional Bicycle Plan will promote transportation opportunities in the region. Bridges will serve the connections for the pedestrian and bicycle networks. Initially, boardwalks options can include the following:

- Improve the existing bridge networks over river crossing locations that will create the largest impact.

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3. Retrofitting Road to Add Bikeways

The opportunity may arise to better accommodate a bicycle route through retrofitting. This can be accomplished by roadway widening or reconfiguring the lanes. In addition, a travel lane in a roadway may be narrowed to accommodate a bike lane. When retrofitting roads to accommodate bicycle facilities, the width recommendations in AASHTO Sections 4.5 and 4.6 for paved shoulders and bicycle lanes should be followed.

Roadway Widening:

If the roadway is wide enough or if additional right-of-way can be acquired, paved shoulders or bike lanes can be added. Care needs to be taken in roadway widening projects to make sure that rough joints are not created on the shoulder where cyclists ride (AASHTO P. 4-29).



Paved shoulders or bike lanes can be added

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Lane Reconfiguration-

Bicycle lanes can be created on both sides of the street if a single lane can be removed. For example, a four-lane road with two lanes in each direction might be modified to allow for a bike lane on either side of the road with one lane in each direction with a central turn lane.



Lane Reconfiguration-Before



Lane Reconfiguration-After

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Lane Narrowing:

If the existing lane width is 14 feet, a bicycle lane can be added using the existing road, thus allowing for a 10 -11 foot wide lane for vehicles and a 3-4 foot wide bicycle lane. The width allowed should be dependent on engineering judgement which considers traffic speed, road curvature and other factors (AASHTO Pp. 4-28 through 4-30).



Bike Lane Added to Existing Road, Creating a Cycle

APPENDIX A

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Transition from Gutter to Pavement

It is much safer for cyclists if the inlet grate is not extended out into the traveled route and located totally within the street gutter. The travel area width for bicycles should exclude the gutter width, since the joint is not always smooth and is often difficult to ride along. Pavement should be maintained so that a ridge does not build up at the gutter to pavement transition.



Example of Travel Area Allowing for Gutter

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Rumble Strips

Rumble strips are a road safety feature designed to alert inattentive drivers that they are drifting from the roadway. The noise created rouses drivers and allows them to return safely to the roadway. The rumble strips can be difficult for cyclists to traverse and can cause the bicycle to shudder vigorously. Cyclists are forced to share the travel lane with motorists. If rumble strips are placed along the right side of a road with a narrow shoulder or no shoulder space. In order to accommodate both cyclists and motorists, a minimum clear path of four feet from the rumble strip to the outside edge of the paved shoulder is recommended. Another alternative is to place a rumble strip under the edge line to reduce the impact on the road shoulder and also providing the advantage of increasing the edge line's visibility at night.

Gaps in the rumble strips placed at 40 to 60 foot intervals allow cyclists to travel across the strip pattern. A gap of 12 feet allows cyclists to enter the shoulder without having to cross the rumble strip (AASHTO, P.4-9).



Rumble Strips Allowing for Cycle Travel

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Roadway surfacing

Bicycles are more susceptible to changes in the roadway surface than motor vehicles. Bicycling conditions can be degraded by bumps, potholes, cracks and other surface defects. As was seen in the rumble strip section above, a smooth surface is important to the safety and comfort of the cyclist. Compaction and uneven settlement after trenching and construction can also present hazards for cyclists if this work affects the roadway surface near the curb where cyclists normally travel. Road overlay projects can improve conditions for cyclists, but care must be taken not to leave a ridge partially in the shoulder where cyclists travel (AASHTO, Pp.7-2 and 7-3).



Roadway Surfacing Creating a Potential Hazard for

APPENDIX A

DESIGN GUIDELINES

Landscaping

Landscaping can enhance the appearance and appeal of a cycle route, but should be designed and maintained to ensure that roots and overgrowth do not impede cyclists by making the path hazardous. Sight lines should be maintained at intersections and driveways (AASHTO, P.7-4).



Route Maintained to Minimize Overgrowth and Keep Sight

APPENDIX A

DESIGN GUIDELINES

Maintenance Management Plan

In order for the facilities to be maintained properly, a maintenance program is needed for the cycle routes. Sufficient funds should be budgeted, with neighboring jurisdictions joining forces for reduced cost and greater efficiency. A maintenance program should be established with practices that benefit the environment such as using recyclable materials and reducing impervious surfaces in order to develop a sustainable bike route infrastructure. The maintenance program should include the establishment of maintenance standards and a schedule for carrying out the maintenance activities and inspections (AASHTO, P.7-1).



Cycle Routes Should have a Maintenance Manage-

APPENDIX A

DESIGN GUIDELINES

5. Signage

On-Road Facilities:

The routes for the NC Lakes District Regional Bicycle Plan are currently on-road and some signage will of necessity need to be placed in the public roadway rights of way. Future federal transportation funding to purchase and/or install signs is also a distinct possibility. Therefore any signage required for NC Lakes District Regional Bicycle Plan in the public roadway rights of way or where federal transportation funding is sought for signage would need to adhere to the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices(MUTCD), Part 9(currently Pp. 789-816 of the 2009 edition). Certain experimental treatments for bike-related signage, pavement markings and traffic signals are subject to approval by the FHWA and can be used once approved.

http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_guidance/mutcd/ is a FHWA link that can help determine what can be implemented and what is currently experimental.



Examples of Regulatory Signs and Plaques



Examples of Guide Signs and Plaques

APPENDIX A

DESIGN GUIDELINES

Off-Road Facilities:

More flexibility regarding signage is allowed for our future off-road routes. For example, trail heads and routes can be marked and identified by a trail post with directional signage, name of trail, and the difficulty of the route attached thus minimizing visual clutter and intrusion into the natural environment.



Smithfield Trail, near Cairns, Queensland, Australia



East Coast Greenway, White Oak Trail, Cary, NC-
Dave Connelly in photo

APPENDIX A

DESIGN GUIDELINES

6. Resources

Bikeways/Trails

- Albemarle Regional Bike Plan, 2013. <http://www.albemarlebikeplan.com/>
- Central Park NC Regional Bike Plan, Draft June, 2014
- East Coast Greenway <http://www.greenway.org/>
- Granville County Greenway Master Plan <http://granvillegreenways.org/>
- Mountains to the Sea Trail <http://www.ptrc.org/modules/showdocument.aspx?documentid=775>
- <http://www.ptrc.org/modules/showdocument.aspx?documentid=774>
- Virginia Tobacco Heritage Trail www.virginia.org/biketobaccoheritagetrail

APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

Overview:

The five counties comprising the Lakes District Bikeways do not have a reputation for a bike and pedestrian culture. Contemporary local land use policies and regulations are proponents more for planning vehicle inclusion for development than bike and pedestrian facilities. Thus, to encourage more bike mobility and safety throughout the Lakes District Bikeways, regulatory guidelines are needed for safe interaction between cyclists and motorists in a predominately rural setting.

Modern roadways in North Carolina are not principally built for cycling; therefore, recognizing the distinct, but sometimes aligned functional needs of motorized and non-motorized travel, is vital for successful use. Rural bikeways and cyclists should expect not only a different travel setting, but also to consider rural area safety considerations. Some recommendations are listed below:

- Rethinking the “far right” rule, or encouragement of cyclists to ride as far right of the roadway. Rural roadway travel speeds make it hazardous for vehicles passing that do not slow down first.
- Understand right-of-way rules for stopping and continuing, particular at wide or multi- area intersections.
- Stopping vs. yielding. The appropriate choice for cyclists should be considered based on road speeds and sight lines in rural settings.
- Lighting on bikes. A white light on the front and a red light in the rear is obligatory between one hour before dusk and one hour after dawn. Best practice would be to have these illuminating at all times on a rural bikeway – See and be seen.
- Helmets and other body protection layers are advised whenever riding. Guidelines for reflective and bright clothing are equally as important in rural settings as they are in urban places.

APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

Overview Continued:

The rest of this section highlights prescriptive best practices that may apply to unincorporated areas, although, will generally apply more to municipal boundary areas. Some Kerr-Tar Local Governments have guidelines or plans for bike and pedestrian transportation facility improvements, nevertheless, 50 plus year of automobile focused development and redevelopment in small North Carolina towns has done little to encourage bicycle land use regulations.

The following information covers nine regulatory and policy interests, applicable to ordinances in both cities and counties, available to use as ordinance language in local development regulations.

Zoning:

- Bicycle Facilities – All new development, except single family dwellings, shall provide at a minimum a five space bicycle rack within 50 feet of a building entrance.



APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

Zoning Continued:

- Bicycle Parking – The development shall provide secure, integrated bicycle parking at a rate of one bicycle rack space for every 50 vehicle parking spaces. One indoor bicycle storage space shall be provided for every two dwellings in townhome and apartment residential uses, unless individual garages are provided for each unit.



- Bicycle Lanes (municipalities) – Wide outside lanes shall be incorporated into the design of all new and/or improved arterial streets. Bicycle lanes shall be incorporated in the design of all minor collector streets. Local streets shall have low traffic speeds and volumes allowing cyclists and motorists to safely share the road.



Arterial Bike Lane



Collector Bike Lane



Shared Bike Lane

APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

Zoning Continued:

- Mixed-Use Districts – A planned development district shall provide carefully planned spaces to promote efficient use of the land and roadway. A characteristic of mixed-use is access to good pedestrian, bicycle, and transit oriented shared sites. Therefore, new and redeveloped spaces that propose mixed-use tenants should be incentivized to offer multi-modal accessibility.



Overlay Zones:

- Access Requirements – Site plans shall include specific provisions for incorporating pedestrian and bicycle access, circulation and linkage amenities into adjacent development. Proposal and alternative proposals for pedestrian and bicycle access shall include a summary of connectivity into the overall system of on-road and off-road trails and pathways.



APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

Subdivision Regulations:

- Site Plan Requirements – The development shall include the number and type of bicycle parking facilities. The location and design of bicycle parking facilities shall be indicated on this site plan. If a traffic circulation plan is required, pedestrian and bicycle facilities' information shall be included.
- Accessways – The design of local subdivision streets shall provide for non-motorized travel and encourage slow auto speeds. Streets shall be designed to accommodate any required bike route or lanes
- Paths – When there is evidence that a pedestrian/cyclist would otherwise be forced to travel alongside a designated arterial roadway, or other roadway that may be hazardous for non-motorized forms of travel, a separate path may be required to connect site plans.



APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

Subdivision Regulations:

- Street Design – Street patterns in residential neighborhoods shall be designed for the needs of the bicyclist, pedestrian and motor vehicle alike. Private streets, or those not publicly dedicated, must be constructed in compliance with municipal specific street standards in order to be permitted.



Stand Alone Street Standards Ordinance

- Applicability - City streets that are shared bikeways shall create a safe and pleasant environment for all citizens. County roads that are shared bikeways shall consider adequate right-of-way width and road shoulder pavement to enhance safety for cyclists and pedestrians alike.

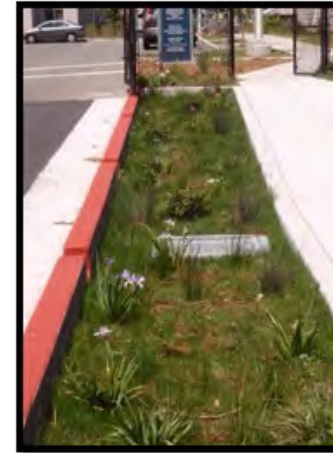


APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

Stand Alone Street Ordinance

- Street Design – Streets shall be designed in light of topography and existing and planned street patterns. Bike facilities planning will be a required element for street improvement planning.
- Right -of-Way – Wider ROW shall be encouraged when feasible at the discretion of the city, county, or department of transportation traffic engineer.
- Bicycle Network – Bicycle facilities shall be employed where designated in the North Carolina Lake District Regional Bike Plan. Bike facilities include shared-use pathways, shared-use lanes, bike pathways, and paved shoulders.



APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

Stand Alone Street Ordinance

- For new development, signage shall be provided by the project sponsor for designated routes.
- The usable width for bicycle facilities is normally from face of curb to lane stripe. Secondary roads usable width is normally from lane stripe to edge of pavement.



Development Review

- General Procedures – A non-auto analysis of access to alternative modes of transportation available in a study area for pedestrian and bicycle facilities shall undergo technical review for multi-modal development and redevelopment planning

APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

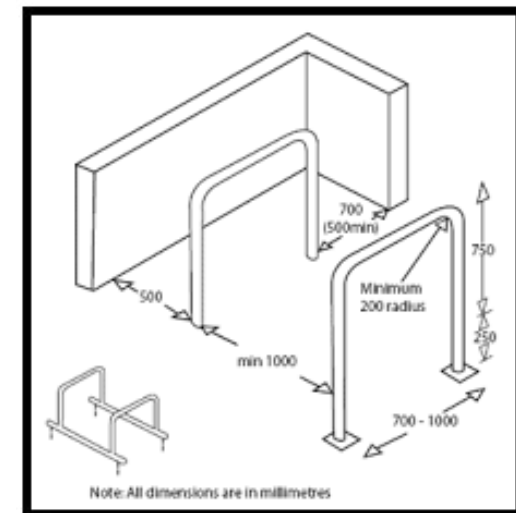
Annexations

- Adequate Transportation – Annexed properties shall require safe and accessible bicycle facilities to exist, or can and will be constructed. Bicycle destinations from the annexed site shall be determined and safe and accessible bicycle facilities serving those destinations shall be mapped.



Stand Alone Bicycle Facilities Ordinance

- Purpose – Bike facilities regulations ensure adequate bicycle parking based on the demand generated by the different use categories and the level of safety necessary to encourage the use of bicycles.
- Parking Requirements – The required number of bicycle parking spaces shall be based on the primary uses on a site. Exemptions to property accessory uses may apply.



APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

- Standards – A bicycle parking space required by this ordinance shall be at least 6 feet long and 2 feet wide with a 5 foot access aisle. In all cases where bicycle parking is required, no fewer than two spaces shall be required.



- Signs – If required bicycle parking is not visible from the street or main entrance, a sign must be posted at the main entrance indicating the parking location



Bicycle and Pedestrian Spending Ordinance

- Purpose – An allocated percentage of local revenues shall be used for bicycle facility enhancement purposes, separate from designated recreation and park appropriated funds. Actions related to construction activities, including planning, environmental review, and design costs shall be primary uses for bicycle and pedestrian facilities revenue. Additional revenue sources will be explored for construction and maintenance of new and existing facilities

APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

Bicycle and Pedestrian Spending Ordinance

- Purpose – An allocated percentage of local revenues shall be used for bicycle facility enhancement purposes, separate from designated recreation and park appropriated funds. Actions related to construction activities, including planning, environmental review, and design costs shall be primary uses for bicycle and pedestrian facilities revenue. Additional revenue sources will be explored for construction and maintenance of new and existing facilities.

Committee Ordinance

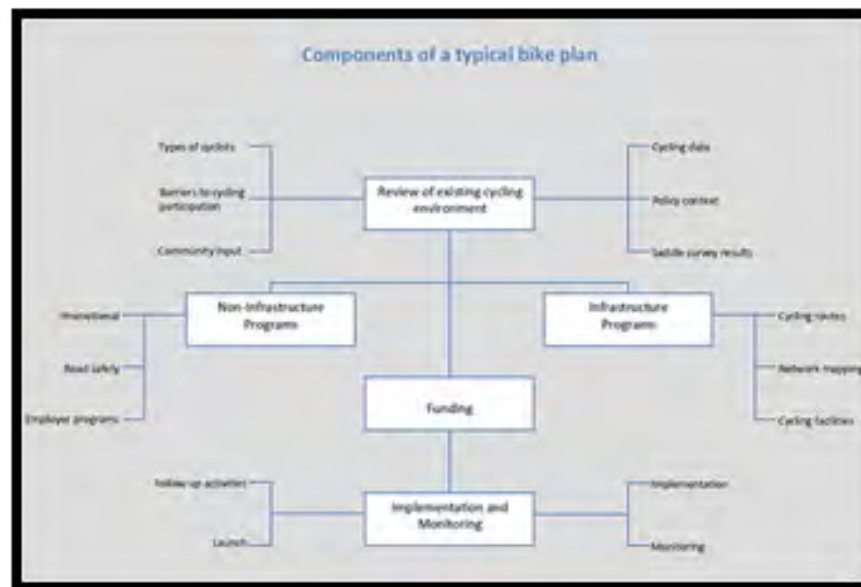
- Bicycle and Pedestrian Standing Committee – North Carolina Lakes District communities shall nominate and appoint members to serve two year terms. A regional transportation planner will coordinate and announce meetings, in addition to assisting the committees' chosen work.
- Purpose – The Bicycle and Pedestrian Advisory Committee shall serve to promote non-automotive forms of travel and the development of safe facilities into an integrated transportation network for all Kerr-Tar Region citizens.

APPENDIX B

REGULATORY & POLICY RECOMMENDATIONS

Committee Ordinance Continued

- Duties – Responsibilities of the committee shall be as follows:
 1. To promote walking, bicycling, and people-powered transportation.
 2. To review and make recommendations on long-range transportation plans as related to pedestrian and bicycle issues.
 3. To promote safety education programs.
 4. To serve in a liaison capacity between local governments, the Kerr-Tar Rural Planning Organization, the Kerr-Tar Region, special interest/advocacy groups, and North Carolina Department of Transportation.



APPENDIX C

EDUCATION PLAN

Bicycle Strategies and Programs to Facilitate Cycling in the NCLD Region

Introduction:

In addition to the physical infrastructure, the North Carolina Lakes District (NCLD) Regional Bicycle Plan must include programs and strategies for success that target efforts to improve the populations' safety and health as well as providing ways to promote and incorporate cycling along the NCLD routes into everyday life. In our region, bicycle tourism provides an economic development opportunity and programs and strategies within the NCLD Regional Bicycle Plan should seek to advance this aspect as well. These programs and strategies are vital for the success of pedestrian and bicycle projects and should encompass all age groups, abilities and cultures as well as including pedestrians, cyclists and potential cyclists and motorists

The five "E" strategies and programs promoted by the American League of Cyclists focuses on creating great places for cycling. If these strategies are successfully promoted and implemented in the region, they will greatly contribute to the health and safety of the population in addition to encouraging people to incorporate cycling into their lifestyle. Such strategies and programs are critical to the success of pedestrian and cycling projects. These strategies and programs fall under the main headings of Evaluation, Enforcement, Encouragement, Education, and Engineering and all contribute to a successful bicycle plan. The Engineering portion is covered in the Facilities Guidelines chapter earlier in the NCLD Regional Bicycle Plan and comprises the physical structure and design of the routes.

APPENDIX C

EDUCATION PLAN

Strategies and Programs Explained:

Evaluation: Evaluation is a necessary component that ensures that facilities are monitored and maintained. In addition, evaluation is necessary to make sure that motorists and cyclists are obeying the law.

Enforcement: The focus of the enforcement element is to make sure that the roads are safe for all users-not only motorists, but cyclists and pedestrians as well. Motorists, cyclists and pedestrians must know and respect one another's rights. Law enforcement must understand the law as it applies to all modes of transportation and know how to apply it fairly to keep the public safe. Enforcement programs also improve bicyclists' safety and perceptions of safety.

Encouragement: In order to promote and increase cycling, people of all ages need encouragement. Opportunities and incentives can be created to help get people on a bike. Bike maps, signage and bicycle-themed celebrations structured around the NCLD routes can all contribute towards encouraging people to try a short trip by bike.

Education: The aim of the education component is to enable people of all abilities and skills to cycle. In order to facilitate this, it is important for all sectors of the population to learn about the rights and responsibilities of road users including motorists, cyclists and pedestrians. This knowledge includes not only educating the public at large, but also acquainting law enforcement agencies with their responsibilities as well as increasing the expertise of professionals such as planners, transportation engineers and landscape architects who will be designing greenways and bikeways.

Engineering: The physical environment is a key element in determining whether or not a person will ride a bike. In addition to having a network of well-connected bike routes, the design, surfacing and signage are also important (Please see the Facilities Guidelines chapter).

APPENDIX C

NCLD STRATEGIES & PROGRAMS IN PLACE

Policy or Program in Place (● = In place)	Person	Roxboro	Granville	Stovall	Oxford	Stem	Butner
EVALUATION							
1. Does your county/ town have a program or plan to reduce motor vehicle/cyclists crashes?	●		●	●	NR	●	
2. Does your county/town have a comprehensive bicycle plan?	●		●	●	NR	●	
3. Does your county/town have a greenways plan?	●		●	●	NR	●	●
4. Does your county/town have a Greenways Commission or Bicycle and Pedestrian Advisory Committee or similar group that meets on a regular basis and provides input into local cycling related policies?	●		●	●	NR	●	●
5. Does your county/town have a "Complete Streets" policy or ordinance allowing for the accommodation of cyclists on all road projects?	●		●		NR		
ENFORCEMENT							
6. Does your county/town allow two cyclists to ride side-by-side (two abreast)?	●		●	●	NR	●	*
7. Does your county/town have public safety officers or law enforcement officers on bikes?	●		●		NR		
8. Are the rights and responsibilities of all road users included in the law enforcement training in your county/town?	●	●	●	●	NR	●	●
ENCOURAGEMENT							
9. Does tourism promotion in your county/town include bicycling?	●	●	●	●	NR	●	●
10. Is there a bicycle shop in your county/town?	●		●		NR		
11. Does your county/town have a group that promotes and encourages cycling (a bicycle advocacy group)?	●		●	●	NR	●	
12. Does your county/town have any rides or major community cycling events?	●		●		NR		●
13. Does your county/town participate in National Bike Month by celebrating cycling with community rides, media outreach or Bike to Work Day?	●		●		NR		
14. Does your county/town have an up-to-date bicycle map?	● (CTP)		●		NR		
EDUCATION							
15. Are educational opportunities available to planners and engineers in your county/town for bicycle facilities design?	●		●	●	NR	●	●
16. Are motorists and cyclists trained on their rights and responsibilities as road users in your county/town?	●		●		NR		
17. Does your county/town have bicycling education classes for adults available?	●		●		NR		
18. Is there a "Watch for Me NC" safety campaign in your county/town?	●		● currently applying	● currently applying	NR	● currently applying	● next year
19. Does your county/town have a "Safe Routes to School" program that also includes bicycle education elements for children such as bicycle rodeos?	●		●		NR		

Note: Underlined towns indicate where county planners responded, since these towns have no planning related staff.

NR=No Response to 3/12/15 questionnaire

APPENDIX C

NCLD STRATEGIES & PROGRAMS IN PLACE

Policy or Program in Place (● = In place)	Vance	Middleburg	Henderson	Kittrell	Warren	Norlina
EVALUATION						
1. Does your county/ town have a program or plan to reduce motor vehicle/cyclists crashes?						NR
2. Does your county/town have a comprehensive bicycle plan?					● (CTP)	NR
3. Does your county/town have a greenways plan?					● (CTP)	NR
4. Does your county/town have a Greenways Commission or Bicycle and Pedestrian Advisory Committee or similar group that meets on a regular basis and provides input into local cycling related policies?			In progress			NR
5. Does your county/town have a "Complete Streets" policy or ordinance allowing for the accommodation of cyclists on all road projects?						NR
ENFORCEMENT						
6. Does your county/town allow two cyclists to ride side-by-side (two abreast)?					●	NR
7. Does your county/town have public safety officers or law enforcement officers on bikes?			●			NR
8. Are the rights and responsibilities of all road users included in the law enforcement training in your county/town?						NR
ENCOURAGEMENT						
9. Does tourism promotion in your county/town include bicycling?					●	NR
10. Is there a bicycle shop in your county/town?						NR
11. Does your county/town have a group that promotes and encourages cycling (a bicycle advocacy group)?						NR
12. Does your county/town have any rides or major community cycling events?	●					NR
13. Does your county/town participate in National Bike Month by celebrating cycling with community rides, media outreach or Bike to Work Day?						NR
14. Does your county/town have an up-to-date bicycle map?	● (CTP)	● (CTP)		● (CTP)		NR
EDUCATION						
15. Are educational opportunities available to planners and engineers in your county/town for bicycle facilities design?						NR
16. Are motorists and cyclists trained on their rights and responsibilities as road users in your county/town?						NR
17. Does your county/town have bicycling education classes for adults available?						NR
18. Is there a "Watch for Me NC" safety campaign in your county/town?						NR
19. Does your county/town have a "Safe Routes to School" program that also includes bicycle education elements for children such as bicycle rodeos?			●		●	NR

Note: Underlined towns indicate where county planners responded, since these towns have no planning related staff.

NR=No Response to 3/12/15 questionnaire

APPENDIX C

NCLD STRATEGIES & PROGRAMS IN PLACE

Policy or Program in Place (● = In place)	Macon	Warrenton	<u>Franklin</u>	Centerville	Louisburg
EVALUATION					
1. Does your county/ town have a program or plan to reduce motor vehicle/cyclists crashes?					
2. Does your county/town have a comprehensive bicycle plan?	●(CTP)				
3. Does your county/town have a greenways plan?	●(CTP)				
4. Does your county/town have a Greenways Commission or Bicycle and Pedestrian Advisory Committee or similar group that meets on a regular basis and provides input into local cycling related policies?					
5. Does your county/town have a "Complete Streets" policy or ordinance allowing for the accommodation of cyclists on all road projects?					
ENFORCEMENT					
6. Does your county/town allow two cyclists to ride side-by-side (two abreast)?	●				●
7. Does your county/town have public safety officers or law enforcement officers on bikes?					●
8. Are the rights and responsibilities of all road users included in the law enforcement training in your county/town?		●			●
ENCOURAGEMENT					
9. Does tourism promotion in your county/town include bicycling?	●				
10. Is there a bicycle shop in your county/town?					
11. Does your county/town have a group that promotes and encourages cycling (a bicycle advocacy group)?					
12. Does your county/town have any rides or major community cycling events?					
13. Does your county/town participate in National Bike Month by celebrating cycling with community rides, media outreach or Bike to Work Day?					
14. Does your county/town have an up-to-date bicycle map?					●
EDUCATION					
15. Are educational opportunities available to planners and engineers in your county/town for bicycle facilities design?		●			
16. Are motorists and cyclists trained on their rights and responsibilities as road users in your county/town?					
17. Does your county/town have bicycling education classes for adults available?					
18. Is there a "Watch for Me NC" safety campaign in your county/town?					
19. Does your county/town have a "Safe Routes to School" program that also includes bicycle education elements for children such as bicycle rodeos?	●	●			

Note: Underlined towns indicate where county planners responded, since these towns have no planning related staff.

NR=No Response to 3/12/15 questionnaire

APPENDIX C

EDUCATION PLAN

Recommendations:

As can be seen in the above table, outreach is needed in many of our counties and towns to further the objectives of the NCLD Regional Bicycle Plan. A few suggestions of existing programs that have been successfully used in other parts of the state are listed below:

- Programs from other jurisdictions to develop best practices
 - Professional Development Courses- teaching how to implement, such as “Complete Streets”
- Programs that address both cyclist and motorist behavior
 - National Program
- League of American Bicyclists training course
 - State Programs
 - » Watch for Me NC
 - » Safe Routes to School
 - » Walk/Bike NC
 - State Event
 - » Cycle North Carolina
 - Local Programs
 - » Open Streets Event-See Carrboro’s Open Streets event (Walk , Bike ,Play, Skate)as a sample program



APPENDIX C

EDUCATION PLAN

Potential partners and support groups: Ideas of where to start

In addition to town, county and regional planners, the following local organizations are among those that can be engaged in order to utilize some of the programs above to help facilitate conditions advancing the objectives in the NCLD Regional Bicycle Plan:

- School districts and local PTA's
- Local police and sheriffs' departments
- Municipal and county park and recreation departments
- Local Chambers of Commerce
- Tourism and business groups
- Area merchants (including any local bicycle shops)
- District and division NCDOT
- Public health agencies
- Senior centers and retirement communities

Conclusion:

In North Carolina, almost 200 bicyclists and pedestrians are killed each year as a result of being struck by an automobile. The Alliance for Biking and Walking ranked North Carolina 42nd and 46th worst for pedestrian and bicyclist fatality rates per capita, respectively (Alliance for Biking and Walking, 2014 Benchmarking Report, <http://www.walkbikenc.com/pillars-of-plan/safety/>). The League of American Bicyclists ranks all states in the USA in terms of their bicycle friendliness. North Carolina currently ranks 23rd in 2014, achieving 39.5 points out of a possible 100. Through the implementation of the strategies and programs mentioned in this chapter, the NCLD Regional Bicycle Plan will do its part to contribute to improving the bicycle friendliness of the state, improving the health and increasing the safety of the population, as well as increasing opportunities for tourism and economic development.

APPENDIX C

EDUCATION PLAN

Sources:

- Albemarle Regional Bicycle Plan, Executive Summary, 2013, P.11.
- Blue Ridge Bike Plan, Policy and Program Tables, 2013, Pp.22-23.
- The League of American Cyclists, "The Essential Elements of a Bicycle Friendly America," Copyright 2000-2013, <http://bikeleague.org/content/5-es>
- The League of American Cyclists, "2014 Report Cards," <http://bikeleague.org/content/report-cards>
- WalkBikeNC Plan. "Programming for Health, Safety and Active Living," October 2013, P.7-29 to 7-32 (the Table shows Education Efforts).

APPENDIX D

SIGNAGE PLAN

Introduction:

The ability to navigate through a community or a region is vitally important for its economic prosperity. Visitors to a region need to be able to find local services, points of interest, and feel that they can safely travel to their destination by whatever transportation mode they select. The North Carolina Lake District route totals 425 miles of on-road and non-road rustic scenic segments that encompasses multitude of recreation opportunities in Vance, Granville, Franklin, Warren, and Person counties.

The North Carolina Lakes District (NCLD) Signage Plan will served as a framework for implementing an attractive and effective signage system that directs individuals to key destinations within the lakes district. The NCLD Signage Plan will enhance and improve the pedestrian and bicycle realm and make the choice of using nonmotorized transportation an easier choice to make. This plan has been created specifically for the pedestrian and bicycle realm and does not include vehicular wayfinding.

Implementation:

The first phase of implementing the North Carolina Lakes District Regional Bicycle Plan is to install wayfinding/directional signage along segments of the initial route that will be display at pivot points throughout the region. The Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices indicates that signage may be provided at decision points along designated routes, including signs to inform bicyclists of bicycle route direction changes and confirmation signs for route direction, distance and destination. Guide and informational signs are intended to help cyclists and pedestrian find their way in unfamiliar areas and provide insight into the coherence of a network of routes. NCDOT's Division of Bicycle and Pedestrian Transportation (DBPT) has the necessary funding to designate the promotion and facilitation to construct signage for installation as well as hardware purchases. Placing signs throughout the lakes district region will indicate to bicyclists, tourists, and citizens their direction of travel, the location of destinations, and the riding distance to those destinations makes the bicycle system more accessible to all individuals.

APPENDIX D

SIGNAGE PLAN

Overview:

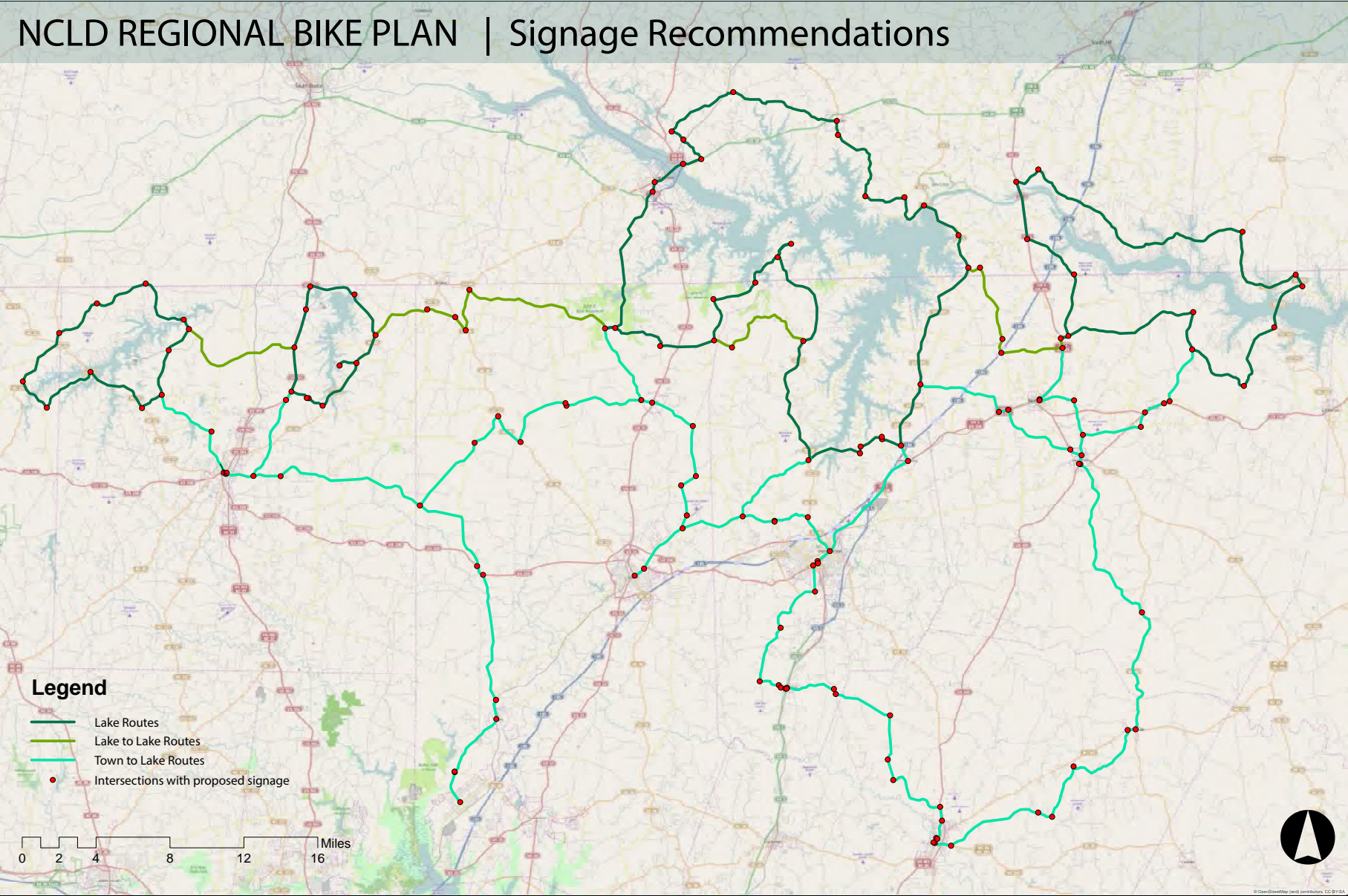
The NCLD Regional Bicycle Plan includes 25 Route Segments totaling an estimated 425 miles and connecting 4 area lakes and 13 small towns and cities in Person, Granville, Vance, Warren, and Franklin counties. The routes highlight the region's lakes as well as connect communities, natural, and recreational areas.

General Signing Instructions

The signage plan provides general intersection layouts and sign locations. The following map includes recommended signage at street intersections along proposed routes where major decision points occur along the route.

APPENDIX D

SIGNAGE PLAN



APPENDIX D

SIGNAGE PLAN

Signage Best Practices:

Signage is defined as all of the visual graphics (public advertisements, billboards, etc.) or groups of graphics that communicate information to the public. Directional signage in general helps individuals navigate to and through the proximity of any given location. This type of signage is typically referred to as wayfinding, which allows individuals to follow an intended route. The following types of signage will provide a recognizable 'look and feel' for the NCLD signage plan. The signs are separated into relevant categories and comprise a full range of signage required to develop a comprehensive wayfinding system that will be user-friendly throughout the North Carolina Lakes District.

Community Trail Logo:

A community trail logo for the North Carolina Lakes District can provide a unifying element that can appear on proposed signage and can be used for other printed materials, such as maps or promotional brochures. The logo can provide a simple identifier for the overall system and can be representation of the various modes of non-motorized transportation typical for NCLD. Community trails improve the economy through tourism and civic improvement; preserve and restore open space; and provide opportunities for physical activity to improve fitness and mental health. Below is example of a community trail logo:



Figure 1: Foothills Rails to Trails Coalition community trail logo illustration.
Adapted from City of Bonney Lake, WA website: www.ci.bonney-lake.wa.us

APPENDIX D

SIGNAGE PLAN

Map Based Signs:

Map based signage for the NCLD will be the main orienting element for pedestrian wayfinding system. This is the walking map and shows detailed information about the local precinct such as landmarks, suggested walking routes, and recreational areas as well as relevant pedestrian detail such as safe road crossings, public toilets and seating. Map based signage will indicate to an individual where they are within the lakes district and how they can position themselves based upon their preferred destination or recreational activity.

Map based signage will:

- Allow for a larger area to be illustrated
- Allow for more destinations to be included
- Allow for the use of symbols to indicate the approximate locations of amenities and facilities
- Allow the individual to estimate travel time and to comprehend a larger area

APPENDIX D

SIGNAGE PLAN

Map Based Signs:

Below are illustrations of map based signage:



Figure 2: Women viewing map to see the location of her next destination
Adapted from Visual Voice website:
www.visualvoice.com.au



Figure 3: RHS Garden Harlow Carr illustration
Adapted from Merritt Cartographic:
www.merrittcartographic.co.uk

APPENDIX D

SIGNAGE PLAN

Directional signage:

Directional signage for the North Carolina Lakes District will play an integral part of success for tourism. Directional signage will indicate the name of major destinations and points to the direction of a primary destination for individuals and groups trying to locate their point of interests. Directional signs offer complete information about various directions and locations. Directional signs are also utilized to help individuals or groups when they are unfamiliar with an area. In areas that gain a significant amount of visitors, implementing directional signage will be a good way to make sure tourists can find the attractions they're looking for; especially on main roads and highways where there are multiple directions, these signs enable travelers to reach their desired destination. Below are examples of directional signage:



Figure 4: Outdoor signage illustration.
Adapted from www.cias.rit.edu website

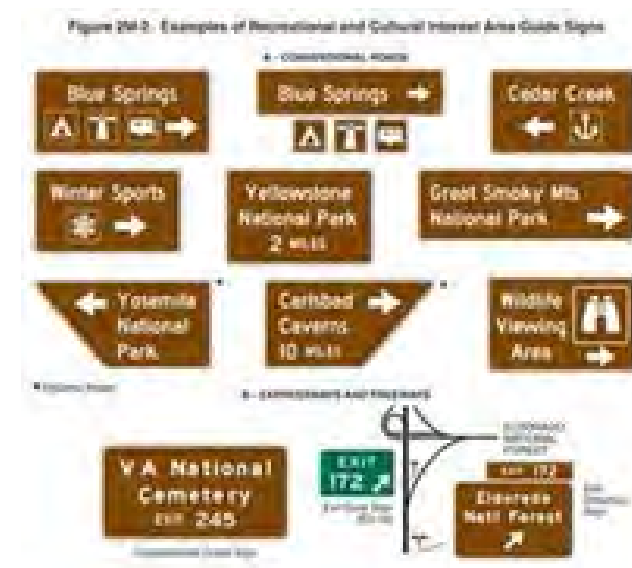


Figure 5: Recreational directional signage illustration
Adapted from: www.mutcd.fhwa.dot.gov website

APPENDIX D

SIGNAGE PLAN

Trail maker signage:

Trails are pathways that have strong linkages with natural environment, open space networks, and cultural heritage in the region. For the North Carolina Lakes District, trail marker signage will be along main recreational marks and routes that will provide individuals and groups reassurance that they are on track while contributing to the recognizable look and feel of the community trails system. Individuals walking on an identified trail route will follow the trail markers that have been developed for the hiking trails. Trail signage can:

- Provide a recreational and educational experience
- Improve recreational access
- Increase visitors' understanding of the local environment
- Promote an area's history and heritage
- Add to an area's tourism potential
- Decrease risk to visitors.

Below are examples of directional signage:



Figure 6: Trail maker signage illustration
Adapted from www.drphoto.com website



Figure 7: Trail maker directional signage illustration
Adapted from: www.pinterest.com/pin/27866091416530521 website

APPENDIX D

SIGNAGE PLAN

Bicycle route marker signage:

Bicycle route guide signage informs bicyclists of bicycle route direction changes and confirms distances and directions. Bicycle route marker signage will direct bicyclists along designated routes throughout the lakes district. The ability to navigate will help familiarize individuals to identify the best routes to distances. Specific guidance of bicycle signage will provide individuals and groups to desirable destinations such as parks, recreation areas, trails, historic and cultural sites, and other important places. Bicycle route marker signage can serve both wayfinding and safety purposes that will help individuals address misperceptions about time and distance. An ideal spacing interval for bicycle route marker signage will be displayed where they are most visible and do not interfere with other regulatory signage.

Bicycle route marker signage will provide bicyclists:

- Direction of travel
- Location of destination
- Travel time/distance to those destinations

Below are examples of bicycle route marker signage:



Figure 8: Optional bike signage illustration
Adapted from www.bikepgh.org website













Figure 9: Optional bike signage illustration
Adapted from: www.jbarcycling.blogspot.com website

APPENDIX D

SIGNAGE PLAN

General Signing Instructions:

The North Carolina Lakes District signage plan will provide intersection layouts and signs that will be feasible for pedestrian use. The dark green bicycle route signage is intended to be close to intersections throughout the lakes district. New signage will replace existing signage that is unsuitable and unreadable. Directional signage will be placed away from intersections that reduce sign clutter at intersections with current route signage and give motorists a fair warning of higher speed locations. Below are potential signage that will be suitable for the North Carolina Lakes District region:

Sign Graphic										
MUTCD Code	M1-8a	M6-3	M6-1	M5-1L	M5-1R	M5-2L	M5-2R	W16-1P	W16-1P	M6-4
# of signs	To be determine.	To be determine.	To be determine.	To be determine.	To be determine.	To be determine.	To be determine.	To be determine.	To be determine.	To be determine.
Notes						L - Arrow needs to point left	R- Arrow needs to point right			

APPENDIX E

ROUTE CATEGORIZATION EVALUATION & PRIORITIZATION

Route Prioritization

As outlined in Section 3 Methodology of the NCLD Bike Plan, following the identification of many potential routes, a criteria was set to enable evaluating and ranking of the routes identified. The route criteria was established to help staff evaluate and rank routes for funding prioritization and for additional planning. This enabled staff to determine what routes would be considered with a higher priority. After researching similar ranking and criteria for bike plans, staff developed draft route criteria that was reviewed by the steering committee.

To help us evaluate and rank routes for funding prioritization and for additional planning, the NCLD Steering Committee has discussed and is recommending the route selection and scoring criteria as outlined in Section 3 Methodology. Minimum and maximum values were assigned to these criteria and then applied to each proposed route within that range. The following tables show a breakdown of the scoring method along with a final score based on the scoring criteria. The tables also include data that was collected during field route reconnaissance.

APPENDIX E

ROUTE CATEGORIZATION EVALUATION & PRIORITIZATION

NC Lakes District Route Categorization Evaluation and Prioritization

General Route Information						Route Prioritization Scoring								
Route Type	Route Identification	Route Name	Route Length (in miles)	Start Point	End Point	Safety				Scenic Quality		Amenities	Economic Development Potential	Priority Score
						Traffic Volume (0-10)	Speed (0-10)	Shoulder (0-10)	ROW (0-10)	Historical (0-15)	Natural (0-15)	(0-15)	(0-15)	(0-100)
Lake Route	A	Hyc0 Lake	28.2	Hyc0 Lake Public Area & Campsites	Hyc0 Lake Public Area & Campsites	Low-Medium	45-55 mph	low to none paved, mostly grass	60' where data available	Waverly Plantation, House on Wagstaff Farm	Route along lake and rural countryside	Park with parking and restroom facilities, gas stations, historical sites	Close proximity to Roxboro	Range from 0-100
						8	5	5	8	13	13	10	10	72
Lake Route	B	Mayo Lake	19.6	Mayo Park off Neal's Store Road	Mayo Park off Neal's Store Road	Medium	45-55 mph	low to none paved, mostly grass	60-100' where data available	Holloway-Jones-Day House, Merritt-Winstead House	Route along lake and rural countryside	Park with parking and restroom facilities, gas stations, historical sites	Close proximity to Roxboro	Range from 0-100
						7	5	5	8	13	12	10	10	70
Lake Route	C	Kerr Lake	100.5	Nutbush Bridge Kerr Lake State Recreation Area off of Jack Wade Farm Road	Nutbush Bridge Kerr Lake State Recreation Area off of Jack Wade Farm Road	Low-Medium	45-55 mph	low to none paved, mostly grass	60-100' where data available	Lewis Wimbish Plantation, Red Hill, Machpelah, St. John's Episcopal Church, and LaGrange	Route along lake and rural countryside	Park with parking and restroom facilities, gas stations, historical sites	Close proximity to Middleburg, Henderson & Stovall	Range from 0-100
			*57.5 miles (NC) 43 miles (VA)			8	4	5	8	14	14	13	12	78
Lake Route	D	Lake Gaston	53.1	Lake Gaston Day Use Area located on the north end of Jack Brown Road, Littleton	Lake Gaston Day Use Area located on the north end of Jack Brown Road, Littleton	Low	45-55 mph	low to none paved, mostly grass	0-100' where data available	Buck Spring Plantation, Hebron Methodist Church, Warren County Training School	Route along lake and rural countryside	LaKe Gaston Day Use Area with bathrooms and picnic areas, parking at LG Trailrace Fishing Area, gas stations, historical sites	Proximity to Macon, Warrenton, and Norlina	Range from 0-100
						9	4	5	8	14	14	12	12	78
Lake to Lake Route	E	Hyc0-Mayo Connector	7.3	Intersection of McGehees Mill Rd and Edwin Robertson Rd	Intersection of Shiloh Church Rd and Boston Rd	Low	45-55 mph	low to none paved, mostly grass	0-100' where data available	Holloway-Jones-Day House	Route along rural countryside	No amenities along this route	Proximity to Roxboro	Range from 0-100
						9	4	5	8	7	9	0	7	49
Lake to Lake Route	F	Mayo-Kerr Connector	16.7	Intersection of Virgilina Rd and High Plains Rd	Intersection of Grassy Creek Road and Herbert Faucette Road	Low	55 mph	low to none paved, mostly grass	0-60' where data available	Sycamore Valley, Edgewood	Route along rural countryside	Gas station along Virgilina Rd.	Between Roxboro and Stovall	Range from 0-100
						10	4	5	5	9	9	7	5	54
Lake to Lake Route	G	Kerr-Kerr Connector	7	Intersection of Buckhorn Rd and McDuffie Rd	Intersection of Tungsten Mine Rd and NC 39	Low	35-55mph	low to none paved, mostly grass	0' or unavailable	Abrams Plains	Route along rural countryside	No amenities along this route	Proximity to Stovall	Range from 0-100
						9	5	5	1	7	9	0	7	43
Lake to Lake Route	H	Kerr-Gaston Connector	9.4	Buggs Island Rd at the NC/VA Border	Intersection of Michael's Quarry Rd and US-401	Low	55 mph	low to none paved, mostly grass	0-60' where data available	None	Route along rural countryside	Gas station? At Beaver Dam Rd and Oline Rd intersection.	Proximity to Norlina	Range from 0-100
						9	4	5	5	0	8	7	7	45
Town to Lake Route	I	Roxboro-Hyc0 Connector	6.2	Intersection of Concord-Ceffo Rd and Morton-Pulliam Rd	Intersection of Chub Lake St and Madison Blvd	Low-Medium	35-55mph	low to none paved, mostly grass	0-60' where data available	None	Mostly Residential	None	Close proximity to Roxboro	Range from 0-100
						7	5	5	5	0	2	0	8	32
Town to Lake Route	J	Roxboro-Mayo Connector	5.3	Intersection of Boston Rd and Mill Creek Rd	Intersection of Halifax Rd and Mountain Rd	Low-Medium	45-55 mph	low to none paved, mostly grass	0-100' where data available	Person County Courthouse, Roxboro Cotton Mill	Mostly Residential	Gas station along Boston Rd	Close proximity to Roxboro	Range from 0-100
						7	5	5	4	9	2	7	8	47

APPENDIX E

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						Traffic Volume (0-10)	Speed (0-10)	Shoulder (0-10)	ROW (0-10)	Historical (0-15)	Natural (0-15)	(0-15)	(0-15)	(0-100)
Town to Town Route	K	Roxboro-Stovall Connector	29	Intersection of Chub Lake St and Court St	Intersection of Little Mountain Creek Rd and Grassy Creek Rd	Low-Medium	45-55 mph	low to none paved, mostly grass	0- 100' where data available	Oliver-Morton Farm	Rural Residential and city residential	Restaurants and shops, Gas stations	Close proximity to Roxboro and Stem	Range from 0-100
						7	5	5	5	7	5	9	9	52
Town to Lake Route	L	Stovall-Kerr Connector	5.1	Intersection of Cedar Ln and US-15	Intersection of Grasy Creek Rd and Herbert Faucete Rd	Low	55 mph	low paved shoulder, extends past white line	0- 60' where data available	Maurice Hart House	Route along rural countryside and residential	Gas station	Proximity to Stovall	Range from 0-100
						9	4	7	5	7	7	7	7	53
Town to Town Route	M	Oxford-Stovall Connector	12.4	Intersection of Main St and US 15	Intersection of E Spring St and Belle St	Low	35-55mph	low to none paved, mostly grass	0', 60',110', where data available	Joseph B. LittlejohnHouse, Granville County Courthouse, Oxford Historic District	Rural Residential and city residential	Gas station at Stovall	Proximity to Stovall and Oxford	Range from 0-100
						9	5	5	8	11	6	7	8	59
Town to Town Route	N	Stem Connector	6	Intersection of Old Rte 75 and Main St	Intersection of Old Roxboro Rd and Goshen Rd	Low-Medium	35-55mph	low to none paved, mostly grass	0'-80', where data available	None	Rural Residential and city residential	Gas station at 158 and Culbreth Rd	Proximity to Stem	Range from 0-100
						8	5	5	6	0	6	7	7	44
Town to Town Route	O	Stem-Butner Connector	3.8	Intersection of Central Ave and East E St	Intersection of Old Rte 75 and Main St	Medium	35-55mph	some paved shoulders, extends past white line	0' where data available	None	Rural city Residential	None along route, but many options once in Butner	Proximity to Stem and Butner	Range from 0-100
						7	5	7	0	0	6	1	8	34
Town to Lake Route	P	Oxford-Kerr Connector	5.1	Intersection of Dabney Rd and Glebe Rd	Intersection of Glebe Rd and Nutbush Rd	Low	55 mph	low to none paved, mostly grass	0'-60' where data available	None	Route along rural countryside and residential	None	Connection route	Range from 0-100
						10	4	5	5	0	7	0	5	36
Town to Town Route	Q	Oxford-Henderson Connector	13.5	Intersection of W Andrews Ave and N Garnett St	Intersection of E Spring St and Main St	Medium-High	35-55mph	low to none paved, mostly grass	0', 60', 80' where data available	None along route, but some near by	Rural city Residential	Restaurants and Shops, Gas stations off of W Andrews Ave	Proximity to Henderson and Oxford	Range from 0-100
						6	5	5	7	0	6	9	9	47
Town to Lake Route	R	Henderson-Middleburg-Kerr Connector	6.8	Intersection of N Lee Ave and Broad St	Intersection of N Garnett St and E Andrews Ave	Medium-High	35-55mph	low to none paved, mostly grass	0', 60', 80', 100' where data available	None along route, but some near by	Rural city Residential	Restaurants and shops, gas station on US-1/158 near I-85	Proximity to Middleburg and Henderson	Range from 0-100
						6	5	5	8	0	6	9	9	48
Town to Town Route	S	Henderson-Kittrell Connector	11	Intersection of E Andrews Ave and N Garnett Street	Intersection of Kittrell College Rd and US-1	Low-High	20-55mph	low to none paved, mostly grass	0' where data available	Thomas Capehart House	Rural city Residential	Gas Stations	Proximity to Henderson and Kittrell	Range from 0-100
						7	6	5	0	7	6	8	9	48
Town to Lake Route	T	Warrenton-Kerr Connector	10.7	Intersection of N Main St and W Ridgeway St	Intersection of Manson Drewery and Jacksontown Rd	Low-Medium	35-55mph	low to none paved, mostly grass	0', 60', 100' where data available	Chapel of the Good Shepherd,	Rural Residential and city residential	Schools, restaurants	Proximity to Warrenton	Range from 0-100
						8	5	5	7	7	6	8	7	53
Town to Lake Route	U	Warrenton-Norlina-Gaston Connector	8.9	Intersection of N Main St and W Ridgeway St	Intersection of US-1 and Wise-Five Forks Rd	Medium	35-55mph	low to none paved, mostly grass	0', 60', 100' where data available	None	rural residential and city residential, some commercial	Restaurants	Proximity to Warrenton and Norlina	Range from 0-100
						7	5	5	7	0	4	7	9	44
Town to Lake Route	V	Warrenton-Macon-Gaston Connector	10.7	Intersection of W Macon St and Main St	Intersection of Church Hill Rd and Fleming Mill Rd	Low-Medium	35-55mph	low to none paved, mostly grass	0', 60', 100' where data available	None	Rural city Residential	Restaurant	Proximity to Macon, and Warrenton	Range from 0-100
						7	5	5	7	0	6	5	9	44
Town to Town Route	W	Warrenton-Centerville Connector	17.5	Intersection of W Macon St and S Main St	Intersection of NC-58 and 561	Low	45-55 mph	some paved shoulders, extends past white line	0- 60' where data available	Warrenton Historic District, Mansfield Thorton House, Shady Oaks, Solomon and Kate Williams Jr. House, Buxton Place	Rural countryside and rural residential	Restaurant	Proximity to Centerville and Warrenton	Range from 0-100
						8	4	7	5	15	7	5	8	59

APPENDIX E

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NC Lakes District Route Categorization Evaluation and Priortization

General Route Information						Route Prioritization Scoring								
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						Traffic Volume (0-10)	Speed (0-10)	Shoulder (0-10)	ROW (0-10)	Historical (0-15)	Natural (0-15)	(0-15)	(0-15)	(0-100)
Town to Town Route	X	Kittrell-Louisburg Connector	16.1	Intersection of Kittrell College St and US-1	Intersection of E Johnson St and S Main St	Low-Medium	35-55mph	low to none paved, mostly grass	0', 60', 80' where data available	None	Rural countryside and rural residential	Gas Stations (3)	Proximity to Kittrell and Louisburg	Range from 0-100
						7	5	5	7	0	7	8	8	47
Town to Town Route	Y	Centerville-Louisburg Connector	15.1	Intersection of E Johnson St and S Main St	Intersection of NC-58 and NC-561	Low-Medium	35-55mph	low to none paved, mostly grass	0', 60', 100' where data available	None	Rural countryside and rural residential	River Bend Park, shops, Gas station	Proximity to Louisburg and Centerville	Range from 0-100
						7	5	5	7	0	7	8	8	47
Total Miles:						425								
						*Source: AADT 2012 from NCDOT's State Road System ArcGIS layer.	*Source: NCDOT's State Road System ArcGIS layer.		*Source: NCDOT's State Road System ArcGIS layer.	*Source: National Register of Historic Places Listing.				
								*Source: Google Maps						
Notes:						There were no bike related crashes along the routes so this information was not included under the safety prioritization Traffic Volume was divided into three ranges: Low- under 2,000 AADT Medium- 2,000-10,000 AADT High- 10,000 and over AADT								