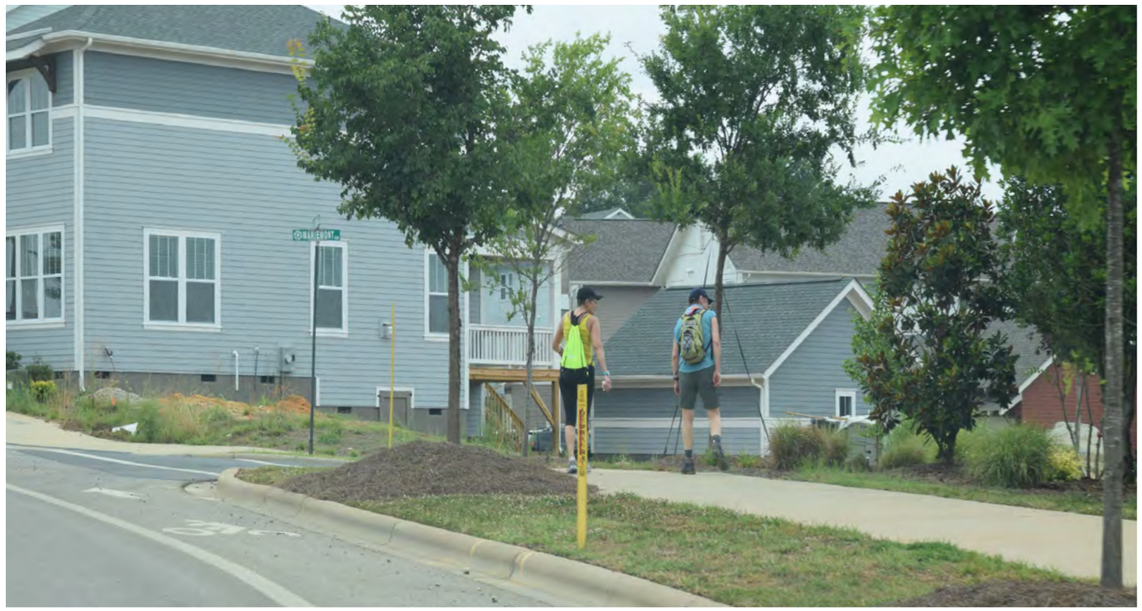


bike RFATS walk

› ROCK HILL - FORT MILL AREA TRANSPORTATION STUDY ‹

Planning for a Bikeable & Walkeable Region

RFATS Rock Hill - Fort Mill Area Transportation Study

alta PLANNING + DESIGN

ACKNOWLEDGEMENTS

PUBLIC PARTICIPANTS

Thank you to the residents of the RFATS community for their participation in this planning process and their passion for improving the place they call home.

PUBLIC SECTOR PARTNERS

Rock Hill - Fort Mill Area Transportation Study

Catawba Indian Nation

Town of Fort Mill

City of Rock Hill

City of Tega Cay

Lancaster County

York County

Catawba Regional Council of Governments (COG)

South Carolina Department of Transportation

Federal Highway Administration (FHWA)

RFATS TECHNICAL TEAM AND PROJECT ADVISORY GROUP

Thank you to the engaged leaders of the region, local and county staff, and community partners for their continued participation throughout the planning process and for their commitment to furthering the efforts of this Plan.

PROJECT CONSULTANTS

Alta Planning + Design
638 East Washington Street
Greenville, SC 29601

Kimley-Horn and Associates

The Dodd Studio

Lake Wylie Trail, a 5.2 mile loop, is one of many recreational and scenic trails RFATS residents use to be active and spend time in nature.

Winthrop University's relatively high density of destinations makes active transportation viable and enjoyable for students and others on campus.

Table of Contents

VISION STATEMENT

Bike Walk RFATS envisions a region of ***healthy, vibrant, and prosperous communities*** *that support residents' daily mobility and access needs efficiently and effectively. A* ***connected, convenient, and safe network*** *of sidewalks, shared-use paths, transit, and on-street bicycle connections* ***link people of all ages and abilities locally and across the region.*** *The network serves* ***residents, commuters, students, and visitors*** *alike. Walking, biking and transit are valued transportation modes, priorities for investment, and integral to regional strategies for congestion reduction,* ***improved air quality, and economic opportunity.***

"Safe biking areas would be good for the general public. It is good for the community. The more traffic we get, the more difficult it will be to bike and walk to places."

-Marilyn, RFATS resident

SECTION 1

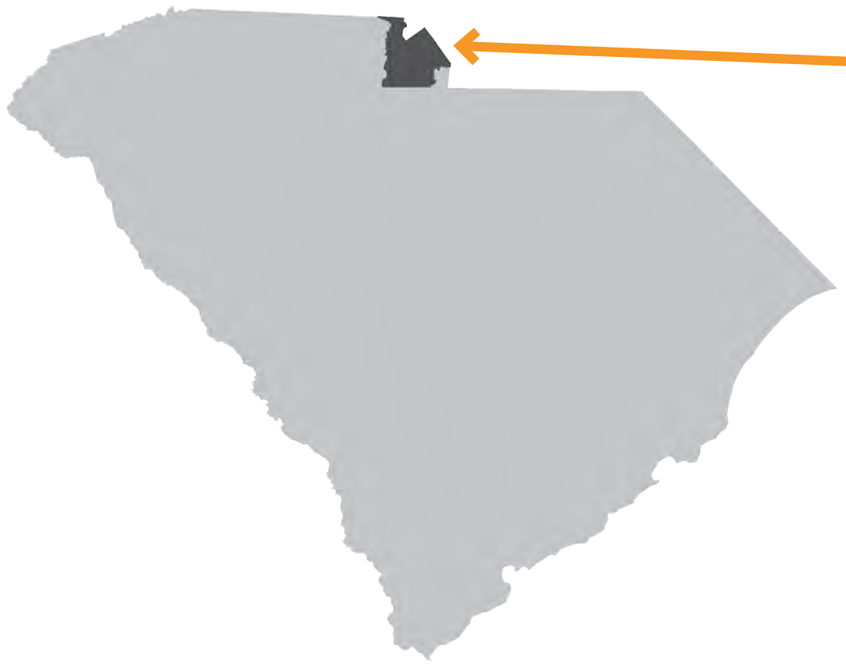
WHAT

PROJECT PURPOSE AND RECOMMENDATIONS

CHAPTER 1

Project Purpose

In 2016, the Rock Hill-Fort Mill Area Transportation Study (RFATS) commissioned the development of a RFATS Regional Bicycle and Pedestrian Connectivity Plan. The purpose of the Plan, named Bike Walk RFATS, is to guide short and long-term transportation and land use planning decisions for a safer, more accessible bicycling and walking environment. The central goal of this plan is to develop a more complete, functional network of biking and walking routes that connect residents and visitors to the destinations that matter to them. Additionally, it is expected that this plan will serve as a common work plan across the region while also providing action-oriented guidance for local communities to advance their own goals of walkability and bikeability.



WHAT IS RFATS?

RFATS stands for the Rock Hill-Fort Mill Area Transportation Study, which is an intergovernmental transportation planning organization for **eastern York County and the panhandle of Lancaster County, South Carolina**. RFATS coordinates continuing, cooperative, and comprehensive transportation planning activities within the urbanized area, in cooperation with the South Carolina Department of Transportation, the Federal Highway Administration, and the Federal Transit Administration. Its overall goal is to plan the most efficient, responsive, and cost effective transportation system for the movement of people and goods in the urbanized area.

CHAPTER 2

Project Partners

Bike Walk RFATS is a collaboration between both local and regional government bodies. York County, Lancaster County, the Catawba Indian Nation, City of Tega Cay, City of Rock Hill, and the Town of Fort Mill are all key partners in the Plan's development.

Throughout the planning process, a community-based Project Advisory Group and the RFATS Technical Team provided guidance and feedback. The RFATS Technical Team includes staff from each of the municipalities within the RFATS Study Area, York County, Lancaster County, as well as the South Carolina Department of Transportation (SCDOT), the Federal Highway Administration (FHWA), the Catawba Regional Council of Governments (CRCOG) and the Catawba Indian Nation. The RFATS Administrator serves as chair of the Technical Team.

Project Advisory Group Members
Citizen-At-Large, Ben Ullman
York County Economic Development
Eat Smart, Move More Lancaster County
Rock Hill/York County Convention & Visitors Bureau
Lindsay Pettus Greenway
York County Bicycle Pedestrian Task Force
Active Community Environments subcommittee of Eat Smart, Move More York County
South Carolina Safe Routes to Schools

In August 2016, the Advisory Group conducted fieldwork to assess opportunities and constraints to better understand the sidewalk and handlebar perspective.

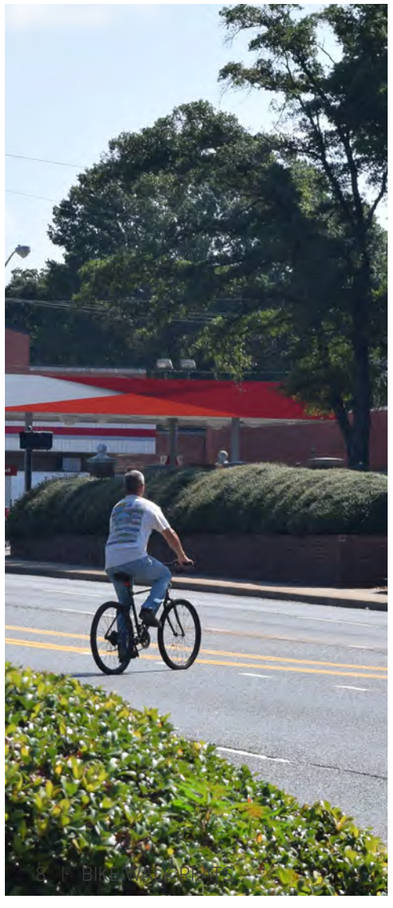
CHAPTER 3

Vision, Goals & Objectives

The infrastructure improvements, policies, and programs recommended in Bike Walk RFATS are shaped by the Plan's vision, goals and objectives. The vision, goals and objectives are developed through input from the RFATS Technical Team, the Project Advisory Committee, agency staff as well as on:

- input received during broad public outreach,
- existing vision and goal statements of prior planning efforts, and
- nationally-recognized performance measures for pedestrian and bicycle planning.

The following is a unique vision statement and related goals and objectives for Bike Walk RFATS. The objectives provide a basis for establishing performance measures, allowing RFATS and its member jurisdictions to evaluate progress towards implementing the Plan's recommendations. Objectives directly linked to goals of the adopted RFATS LRTP are noted with an asterisk.



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GOALS AND OBJECTIVES

Choice & Access: *Residents and visitors of all ages, abilities, and socioeconomic status, can safely and conveniently access places to live, work, play, and learn in RFATS.*

- Prioritize mode choice enabling more trips to occur without the use of a car.
- Prioritize multi-modal connections that leverage investments by linking modes.
- Create seamless active transportation connections to regional destinations including current and future employment/commercial centers, educational institutions, and recreation/civic venues.
- Leverage the existing walkway, bikeway, and trail facilities by creating connections to residential areas and to one another.
- Support the implementation of transit plans and strategies to provide a more comprehensive transit system and accommodate more riders.*
- Invest in a transportation system that includes equitable options for low-income and minority populations.*
- Connect bicycling and walking infrastructure improvements with existing and future express bus transit stops and park and ride locations for last-mile linkages and bike and ride opportunities.
- Establish short-term and long-term bicycle parking at major destinations, employment centers, educational institutions, and park & ride locations in the RFATS region.
- Prioritize walking and bicycling improvements near schools, health services, and sources of healthy foods.

Economic Advancement: *People choose to live, visit, and spend money in RFATS communities.*

- Leverage trails and other facilities as both transportation linkages and recreational and visitor attractions, including the Carolina Thread Trail, York County Bike Routes, Riverwalk, Velodrome, and Anne Springs Close Greenway.
- Support active transportation strategies to improve air quality for the RFATS region for maintenance of the current ozone attainment status.

- Couple downtown and commercial corridor revitalization efforts with improvements to pedestrian safety and comfort to bolster vibrant retail-friendly spaces and attract foot traffic, such as proposed along the Cherry Road corridor.
- Incorporate walkability, outdoor recreation, active lifestyles, and bicycle tourism within local and regional branding and marketing campaigns.

Growth & the Built Environment: *RFATS communities welcome investment that contributes to the local character and quality of life, preserves scenic qualities and natural resources, and provides practical and sustainable transportation solutions.*

- Support the implementation of land use policies to encourage transit supportive development patterns along the rapid transit corridor (US 21).*
- Promote better integration of land use and transportation planning that will support sustainable growth patterns and maximize the transportation system.*
- Encourage efficient and compact growth in urban areas to support walkable, bikeable distances to destinations.*
- Seek consistency in land use and growth strategies among counties and municipalities within RFATS.
- Prioritize community character and quality of life as a critical outcome of growth strategies and development regulations.
- Support member jurisdictions in developing and enforcing policies to require pedestrian and bicycle facilities and connections in private developments.

Excellence in Design: *RFATS communities recognize the value of placemaking through design, the cost-effectiveness of getting it right the first time, and the critical need to design safe and inviting spaces that will attract users.*

- Capitalize on Pennies for Progress project investments through incorporating high quality streetscapes and pedestrian and bicycle facilities.
- Incorporate intersection safety and accessibility improvements for pedestrians and bicyclists within corridor improvement projects.
- Establish a regional network of urban and suburban trails and shared-use paths that meet current best practices for safe, comfortable, and inviting design.
- Create consistency in the design, look, and feel of the walkway, bikeway, and trail network across RFATS.
- Establish design guidelines for walkways, bikeways, and trails that reflect national best practices and are available to all RFATS member jurisdictions and implementation partners.
- Design bikeways to meet the needs of and encourage use by the “interested but concerned” type of bicyclists.
- Meet ADA/PROWAG guidelines for accessibility of all sidewalk, intersection, and shared-use path development and improvements.

Encouragement, Education, and Enforcement: *Bicycling and walking activity levels increase as a result of community awareness of biking and walking opportunities, fun and inclusive programs, educational campaigns, and effective enforcement strategies.*

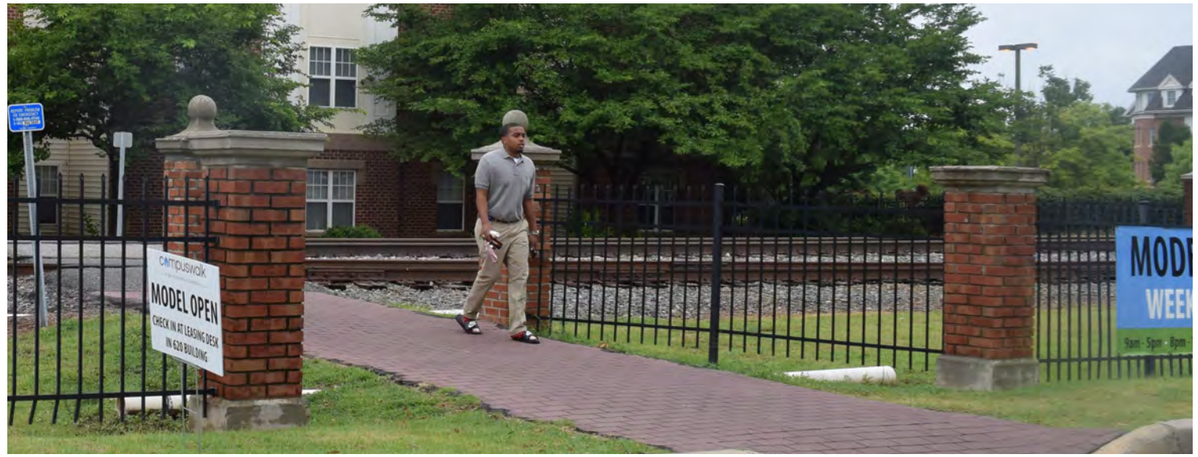
- Establish programs that increase citizen and visitor knowledge of existing walkway, bikeway, and trail facilities.
- Identify non-profit and private sector partners to lead community-based education and encouragement programs.
- Develop travel demand management programs to encourage and incentivize trips made through modes other than the single occupancy vehicle.
- Support the SCDPS and SCDOT Target Zero program with identified strategies for eliminating all traffic fatalities, across all transportation modes.

This corridor, with its planting strip and wide sidewalk, is one example of the region’s areas where walking feels comfortable and safe.

- Provide a range of technical training opportunities for local, county, regional and state staff members, as well as elected officials, related to the benefits of multi-modal transportation and successful strategies for implementation.
- Generate awareness among motorists, bicyclists, and pedestrians of their rights related to safe and courteous use of roadways.
- Provide educational opportunities and encouragement programs specifically targeted to the “interested but concerned” group of existing and potential bicyclists, including families and children.
- Ensure that education and encouragement programs for transit, walking, and biking reach all socioeconomic groups, geographic locations, genders, races, and walks of life.
- Expand safe routes to school efforts coupling programs with travel plans and infrastructure improvements.
- Educate the public of the range of people who engage in walking and bicycling.

Evaluate & Measure Impacts: *Data and community-wide impacts related to walking and bicycling activity and the active transportation environment are collected, measured, evaluated, and communicated.*

- Maintain a region-wide GIS database of existing and proposed pedestrian, bicycle, and trail facilities.
- Conduct an analysis of pedestrian and bicycle collisions every three (3) years to identify trends or changes in safety-based planning and priorities.
- Connect health, equity, pedestrian and bicyclist safety, and quality of life with the RFATS project selection process.
- Evaluate bicycle and pedestrian activity annually, including site-specific studies of active transportation improvements.



Safe crossings across active rail lines are an important element of the pedestrian network.

- Produce annual reports summarizing progress towards implementation of Bike Walk RFATS programmatic, policy, and infrastructure recommendations.
- Inform elected officials of measured impacts and trends.
- Work with Chambers of Commerce, Convention & Visitors Bureaus, Parks & Recreation, Economic Development agencies and other partners to evaluate the economic and hospitality industry benefits from active transportation and outdoor recreation investments.

Funding & Implementation: *Bike Walk RFATS is a dynamic plan with a committed team of staff and officials actively promoting its vision, identifying funding and partners, and incrementally implementing its recommendations.*

- Identify temporary demonstration projects and near-term feasible improvement projects that can be implemented within 18 months of plan adoption to serve as catalysts for further investment.
- Work across jurisdictions, departments, and organizations to achieve coordination on short-, medium-, and long-term transportation-related goals and plans.
- Improve coordination among municipalities and counties for transportation planning, design, and investment.
- Establish dedicated funding amounts and fundraising goals for implementation of the Plan.
- Incorporate pedestrian and bicycle accommodations in planned improvements to roads and corridors.*
- Incorporate bicycle facilities in state and local maintenance and pavement marking projects, where feasible.*

CHAPTER 4

Bike and Walk Friendly Community Assessment

WHAT IS A BIKE- AND WALK-FRIENDLY COMMUNITY?

A Bike- and Walk- Friendly Community Assessment provides a cumulative, succinct picture of a region's overall friendliness to active transportation and recreation. It is based on the inputs and analysis detailed in this report and offers a reference point for evaluating the current state-of the-practice in RFATS.

The Bicycle Friendly Community (BFC) and Walk Friendly Community (WFC) programs are two national initiatives designed to encourage cities and towns across the country to improve the bicycling and walking environments in their communities and to recognize communities that are successfully doing so. The programs provide communities with invaluable resources related to bicycle and pedestrian planning, help communities identify projects and programs to improve the bicycling and walking environment, and also generate positive media attention at the national and local level for communities that earn a designation.

The BFC program is administered by the League of American Bicyclists and is part of a Bicycle Friendly America program that also considers Bicycle Friendly Businesses, Universities, and States. The WFC is administered by the Pedestrian and Bicycle Information Center. Both the WFC and BFC program use the five "E's" of bicycle and pedestrian planning as the framework for identifying successful biking and walking communities. The five "E's" are: Engineering, Encouragement, Education, Enforcement, and Evaluation. Each program has its own detailed questionnaire that a city or town must complete online in order to apply for recognition. Five levels of award designation are possible in the BFC program: Bronze, Silver, Gold, Platinum, and Diamond. The WFC program offers four award levels: Bronze, Silver, Gold, and Platinum. Both programs offer an Honorable Mention category, as well.

Currently, the City of Rock Hill is a bronze-level Bicycle Friendly Community. Designated in 2012, Rock Hill is one of only 6 BFCs in the state. Currently, no jurisdictions within the RFATS region have earned a Walk Friendly Community designation.

SCORECARD ASSESSMENT

While the programs do not specifically recognize regions as bike-friendly and walk-friendly, the Five E's framework provides a useful set of criteria to evaluate the existing environment for biking and walking across RFATS. The following scorecard serves as a snapshot of strengths and weaknesses of the RFATS region and its member jurisdictions. The findings of this assessment inform the infrastructure, programmatic, and policy recommendations of this planning process.

By allocating 0 points for items checked as "No" and a half point for items checked as "Partial" and 1 point for items checked as "Yes," we can determine a relative score for the five "E" categories, as shown in Table 1.

The assessment identifies the RFATS region's efforts and successes in the realms of evaluation and planning as well as education, encouragement, and enforcement programs. **The critical need for improvement of infrastructure investments and advancement in design is underscored through this exercise.**

Table 1. Bike and Walk Friendly Community Scorecard Summary

Category	Points Scored	Points Available	Percent
Engineering	0.5	10	0.05%
Education & Encouragement	3.5	10	35%
Enforcement	3	6	50%
Evaluation & Planning	6	13	46%
Total	**13**	**39**	**33%**

Table 2. Bike and Walk Friendly Community Scorecard

1. Engineering	Yes	Partial	No	Description
1.1 Does RFATS and/or its jurisdictions have a complete streets policy or other policy that requires the accommodation of pedestrians and cyclists in all new road construction and reconstruction projects?			x	None.
1.2 Does RFATS and/or its jurisdictions have guidelines for pedestrian and bicycle facility design or provide regular training to engineers and planners regarding pedestrian and bicycle facility design?			x	None adopted beyond SCDOT/AASHTO standards.
1.3 Does the region have a comprehensive, connected and well-maintained bicycling network?			x	
1.4 Does the region have a connected network of sidewalks, trails, and/or paths in the region?		x		Fort Mill and Rock Hill downtown centers have connected sidewalk networks.
1.5 Does RFATS and/or its jurisdictions have a sidewalk condition and curb ramp inventory process?			x	
1.6 Is bike parking readily available throughout the region?			x	
1.7 Are all bridges accessible to pedestrians and bicyclists?			x	
1.8 Are crosswalks provided at all street intersections and at areas with high demand for pedestrian traffic?			x	
1.9 Are accommodations for persons with disabilities, such as curb ramps or audible signals, provided in the region?		x		Curb ramps only.
1.10 Does RFATS and/or its jurisdictions employ traffic calming measures to slow motor vehicle traffic on city streets (such as road diets, ≤20 mph speed limits, speed tables, etc.)?			x	No regional policy exists. Implementation of traffic calming is limited.

2. Education & Encouragement	Yes	Partial	No	Description
2.1 Have Safe Routes to School (STRS) programs been implemented in any of the region's schools within the last 18 months? Does it include both bicycle and pedestrian education?		x		Northside Elementary SRTS Travel Plan + 11 SRTS Safety Assessments within the region, but limited implementation of SRTS encouragement and education programs
2.2 Are there bicycling education courses available for adults in the region?			x	Children's bike rodeos only
2.3 Does RFATS and/or its jurisdictions educate motorists, pedestrians and cyclists on their rights and responsibilities as road users (e.g., as part of drivers education curriculum, test manual or bus driver training)?		x		Alive at 25 provides some of this.
2.4 Does RFATS and/or its jurisdictions have an up-to-date bicycle map?		x		Yes, but primarily created for recreational, touring routes. RFATS has maps for York County routes and Rock Hill area but not an overall bicycle map
2.5 Does RFATS and/or its jurisdictions celebrate bicycling during national Bike month with community rides, Bike to Work Day or media outreach?		x		Yes, but not in all RFATS communities
2.6 Is there an active bicycle or pedestrian advocacy group in the region?	x			Eat Smart Move More York County
2.7 Has RFATS and/or its jurisdictions implemented any education and training programs related to pedestrian education, safety, or design for staff?			x	No, but identified as a goal of ESMM York County (new goal)
2.8 Does your community promote the health and environmental benefits of walking?		x		ESMM promotes health benefits and Rock Hill has addressed it in Comp plan.
2.9 Does your community offer walking route maps, guides, or tours for residents and visitors?			x	No, though the City of Rock Hill is developing one for Old Town/Downtown using ARCGIS story maps.
2.10 Does your community host any events that promote walking (such as car-free streets)?			x	

3. Enforcement	Yes	Partial	No	Description
3.1 Does RFATS and/or its jurisdictions have Traffic Safety officers that are trained in traffic law as it applies to pedestrians and bicyclists?	x			Bike and Pedestrian Task Force members participated in training with officers in York County and Rock Hill.
3.2 Does RFATS and/or its jurisdictions have law enforcement or other public safety officers on bikes?		x		Yes, but not all communities.
3.3 Do local ordinances treat bicyclists equitably?		x		City of Rock Hill ordinances specify bicyclists' right to the road and protection from harassment.
3.4 Does RFATS and/or its jurisdictions use targeted enforcement programs to promote pedestrian safety in crosswalks (such as a "crosswalk sting", media campaign regarding pedestrian-related laws, progressive ticketing, etc.)?		x		Rock Hill is very strict about enforcing state law about cars yielding to pedestrians, and pursues supporting media coverage to reinforce this emphasis.

3. Enforcement	Yes	Partial	No	Description
3.5 Does RFATS and/or its jurisdictions have a systematic strategy for selecting locations and countermeasures for traffic and pedestrian safety?			x	Bike Walk RFATS provides a tool for this. Based on DOT strategy.
3.6 Do police work regularly with traffic engineers and planners to review sites in need of safety?		x		

4. Evaluation & Planning	Yes	Partial	No	Description
4.1 Is there a Bicycle Advisory Committee or Pedestrian Advisory Committee that meets regularly?	x			Bicycle & Pedestrian Task Force is de facto committee for the region (should consider formal expansion of mission)
4.2 Is there a specific plan or program to reduce cyclist/motor vehicle crashes?			x	SCDOT Vision Zero exists at the state level but does not provide a plan or program. No local or regional plan exists.
4.3 Does RFATS and/or its jurisdictions have an ongoing pedestrian/bicycle counting and/or survey program that allows for long-term benchmark analysis of walking and bicycling mode share?			x	City of Rock Hill monitors counts at Riverwalk and Piedmont Trail, but no regional program exists and counts are not conducted citywide or in other jurisdictions.
4.4 Does RFATS and/or its jurisdictions collect data related to pedestrian/bicycle-vehicle crashes, traffic volumes and motor vehicle speeds on existing or future corridor improvement projects?		x		Collision data not routinely collected for corridor improvement project development.
4.5 Does RFATS and/or its jurisdictions have a pedestrian master plan or pedestrian safety action plan?	x			Bike Walk RFATS serves as the pedestrian master plan.
4.6 Does RFATS and/or its jurisdictions have a bicycle master plan?	x			Bike Walk RFATS serves as the bicycle master plan.
4.7 Has RFATS and/or its jurisdictions adopted an ADA Transition Plan for the public right of way?			x	There are no adopted ADA Transition Plans in the region.
4.8 Do RFATS jurisdictions have a policy requiring sidewalks on both sides of arterial streets?		x		York County Code of Ordinances does, but Lancaster County does not.
4.9 Has RFATS and/or its jurisdictions established a connectivity policy, pedestrian-friendly block length standards and connectivity standards for new developments, or convenient pedestrian access requirements?		x		
4.10 Does RFATS and/or its jurisdictions have a trails plan?	x			Master Plans for Carolina Thread Trail of York and Lancaster Counties
4.11 Does RFATS have a Pedestrian Coordinator or staff person responsible for pedestrian-related issues?			x	
4.12 Does RFATS have a bicycle program manager?			x	
4.13 Is the region served by public transportation?		x		A demand response program is operated in both York and Lancaster counties. Additionally, there is an express bus service initiated within the region (CATS 82X), connecting to the Charlotte Transportation Center

CHAPTER 5

Programs and Policy Recommendations

INTRODUCTION

The BFC and WFC Assessment described in Chapter 4 provided an overview of the 5 E's approach to bicycle and walk-friendliness (with Equity providing an overarching sixth E). The recommendations of Bike Walk RFATS address "Engineering" through a proposed active transportation network and design guidelines described in subsequent chapters. Program and policy recommendations specific to the role of RFATS as a regional planning agency address Education, Encouragement, Enforcement, and Evaluation. These efforts are critical for a balanced approach to improving active transportation.

A "top ten" list of priority Program and Policy recommendations for RFATS are outlined here, and are tailored to meet the unique needs of the region. Recommendations build upon the findings of the BFC and WFC Assessment, public input, and Bike Walk RFATS analysis and are intended to be supported and complemented by a broader range of programs and policies developed at the municipal and county level.

PROGRAMS

ANNUAL ACTIVE TRANSPORTATION SUMMIT

An Active Transportation Summit can promote safer, healthier, and more vibrant communities across the RFATS region. In its role as regional convener, **RFATS can host a half- to full-day workshop that provides a venue for dialogue related to designing and building Complete Streets, local active transportation initiatives, and funding opportunities and strategies**. The summit can be held annually providing an opportunity to share an annual benchmarking report of Plan implementation and measured outcomes. The event is oriented towards city and county officials, staff, planning commission members, citizen advocates, local public health professionals, and community members of the RFATS region.

REGIONAL COORDINATION OF SAFE ROUTES TO SCHOOL

Safe Routes to School (SRTS) is a national effort to encourage students and families to walk and bicycle to school, improving transportation safety through targeted infrastructure improvements and enforcement, walking and biking safety education, and encouragement programs.

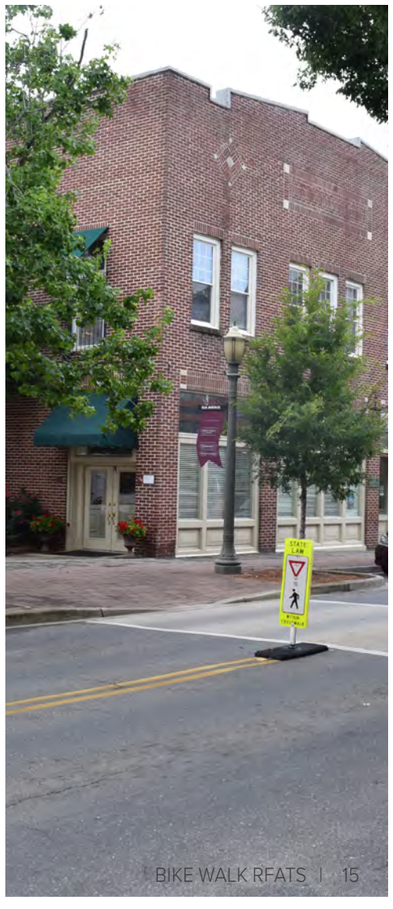
While SRTS efforts focus on transportation and behaviors at individual schools, a regional approach for SRTS can help practitioners coordinate their efforts better, establishing best practices and reducing administration and program development costs.

Regional support for SRTS by RFATS could take the form of:

- Coordinating efforts between jurisdictions and districts, helping practitioners build on lessons learned from work being done in similar communities
- Developing a central repository of information about SRTS, from mapping, planning efforts, and funding to participation in activities

SAMPLE PROGRAM: BROWARD COUNTY SAFE STREETS SUMMIT

For the past three years, the Broward County, Florida MPO has partnered with local governments and the Florida Department of Transportation to host a Safe Streets Summit to encourage and advance Complete Streets projects. Each year the Safe Streets Summit selects a theme. The 2016 summit highlighted the benefits of walking for everyday transportation and the impacts of Complete Streets on regional equity. Local and national experts were selected to speak on topics such as evolution of complete streets, the forgotten steps of street design, and the fiscally conservative case for multimodal street design. Awards are given to a local municipality and a Complete Streets champion for outstanding work in promoting and implementing safe streets.



- Providing guidance for consistent SRTS data collection and reporting throughout the region, enabling local programs to quickly and efficiently collect data and report back to the public
- Supporting local efforts by promoting SRTS, whether via a regular progress report, outreach/informational materials, or campaign materials
- Providing technical assistance to the schools or districts with the most disadvantages, to ensure that all students have access to resources and can take advantage of them
- Building local capacity for implementation by creating template materials and guidebooks and/or providing trainings to help local programs understand the toolkit of SRTS activities

Sample program:

- Bay Area Safe Routes to School (MTC): http://www.sparetheairyouth.org/

REGIONAL ACTIVE TRANSPORTATION SAFETY PLAN

The collision analysis and regional network recommendations of Bike Walk RFATS provide a baseline for development of a Regional Active Transportation Safety Plan. An RFATS Active Transportation Safety Plan would build upon this work by **establishing internal processes for evaluating safety needs of people walking, bicycling, and using transit, addressing unsafe conditions, identifying unsafe behaviors of all roadway users, and prioritizing roadway investments based on safety improvements for vulnerable roadway users**. This effort can be dovetailed with the incorporation of health and equity into project prioritization (see policy recommendation below).

A Bicycle and Pedestrian Safety Action Plan can identify crucial safety needs and develop clear actions to improve safety in the RFATS region. Additionally, since pedestrian and bicycle crashes tend to occur along corridors and infrequently occur at the same location more than once, RFATS is well-suited to addressing safety concerns on a system-wide basis.

Many regional safety plans focus on proven safety countermeasures for walking and biking. However, plans may also incorporate recommendations for improving land use, regional transportation access, or other elements to create a comprehensive approach to pedestrian and bicycle safety. A regional safety plan should be data driven, with clear goals and performance measures to frequently evaluate progress. A safety analysis should assess regional crash distribution, risk factors, crash types, and disproportionately affected geographic areas. Recommendations should outline best practices for improving safety at crash hotspots and on dangerous corridors.

Resources:

- PedSafe: Pedestrian Safety Guide and Countermeasure Selection System (FHWA, 2004). www. walkinginfo.org/pedsafe
- How to Develop a Pedestrian Safety Action Plan. www.walkinginfo.org/library
- BikeSafe: Bicycle Countermeasure Selection System (FHWA, 2006a). www.bicyclinginfo.org/bikesafe
- Pedestrian and Bicyclist Intersection Safety Indices (FHWA, 2006c). www.bicyclinginfo.org/library

REGIONAL PEDESTRIAN & BICYCLE COUNT PROGRAM

Understanding existing demand, trends in activity, and user needs is critical to improving the environment for active transportation. Count technology has rapidly advanced in recent years. Cameras, infrared sensors, inductive loops,

thermal imaging, and pneumatic tubes are all used frequently to conduct counts in various contexts.

Bicycle and pedestrian counts will allow RFATS to use hardline data to determine how the roadways within the region currently serve the needs of bicyclists and pedestrians. RFATS should conduct bike and pedestrian counts to establish a baseline and install permanent bike and pedestrian counters to monitor changes over time. Having count data can inform prioritization of investments, measure the impact of improved bicycle and pedestrian facilities, and provide a useful tool for communicating the need for additional improvements.

Examples of count program ideas at the regional level include:

- Providing bike and pedestrian count training manuals
- Creating funding incentives to communities that include permanent counters in project application scopes
- Collaborations with local organizations to enlist volunteers for count deployment
- Loaning count equipment to local governments
- Coordinating annual counts on regionally significant trails

The Mid-Ohio Regional Planning Commission Bicycle and Pedestrian Count Program includes:

- Eight infrared TrailMaster counters + two EcoCounter pneumatic tube bike counters that are loaned out for doing bicycle and pedestrian counts
- Resources for local municipalities such as counts and data
- Intercept surveys, stakeholder surveys, and property value analyses that are combined with count data to produce an impact of trails report

More about Pedestrian & Bicycle Counts: http://bikepeddocumentation.org/

Innovations in Bicycle and Pedestrian Counts: http://altaplanning.com/wp-content/uploads/Innovative-Ped-and-Bike-Counts-White-Paper-Alta.pdf

REGION-WIDE USER MAPS & GUIDES

York County has successfully led a collaborative effort to develop and promote countywide bicycling routes. Outdoor recreation destinations (such as the Velodrome, Game On, Riverwalk, and others) serve as key attractions across the RFATS region. RFATS has the opportunity to build upon this

SAMPLE PROGRAM: THE MID-OHIO REGIONAL PLANNING COMMISSION BICYCLE AND PEDESTRIAN COUNT PROGRAM:

- *Eight infrared TrailMaster counters + two EcoCounter pneumatic tube bike counters that are loaned out for doing bicycle and pedestrian counts*
- *Resources for local municipalities such as counts and data*
- *Intercept surveys, stakeholder surveys, and property value analyses that are combined with count data to produce an impact of trails report*

and **develop public-facing materials that reflect the existing active transportation and outdoor recreation network and describe comfortable and inviting routes to local and visitor destinations**. As a regional planning agency, RFATS can convene municipal and county agencies across the area, as well as economic development and tourism partners.

As the RFATS region grows its network of facilities for bicycling and walking, RFATS should develop an active transportation map and distribute it to residents and visitors both in print and online; hard copies could be available for free or for a small charge at civic buildings, local bike shops, gyms and recreation centers, and at other businesses. The map should show where existing bike lanes, sidewalks, trails, and other facilities are located and help to guide people to enjoyable routes and destinations; safety tips and links to local resources are also valuable additions. The map should be updated on a regular basis to reflect the most current facilities. An online route planning tool could be integrated with the map data of existing facilities and routes to help citizens plan trips on foot, by bike, and by transit. As transit services in the region increase, these resources could be developed as part of or as a complement to local transit-planning resources (e.g. a smartphone application or online route-planning tool).

Sample walk/bike maps:

- Durham, NC: http://durhamnc.gov/ich/op/dot/Pages/Durham-Bike--Hike-Map.aspx
- Portland, OR: https://www.portlandoregon.gov/transportation/39402
- Raleigh, NC: http://www.raleighnc.gov/government/content/PWksTranServices/Articles/BicycleProgram.html
- Charlotte, NC MPO: http://www.crtpo.org/resources/maps

Tega Cay promotes active transportation among children with designated Walk-to-School days.

PROFESSIONAL TRAINING OPPORTUNITIES

Professional development courses provide training to transportation and other professionals who may not have received extensive experience or training in pedestrian and bicycle facilities. Educating professional staff about bicycle and pedestrian issues helps staff understand why and how to include bicycle and pedestrian accommodations in roadway projects and developments. Some trainings have already been offered by RFATS and its member jurisdictions and partners. Expanding professional training opportunities is a recently adopted goal of the York County Eat Smart Move More Active Environments Committee.

New professional training opportunities for RFATS staff and city and county engineers, planners, police, and other staff should be pursued to build off of this progress and teach local professionals about current trends in bicycle and pedestrian design, planning, and implementation. Webinars and courses are available through the Association of Bicycle and Pedestrian Professionals (APBP), the Pedestrian and Bicycle Information Center (PBIC), and others. Sample topics include bicycle and pedestrian design standards, complete streets concepts, how to coordinate with other departments on bicycle and pedestrian projects, and funding opportunities.

Sample programs:

- Institute for Bicycle and Pedestrian Innovation: http://www.ibpi.usp.pdx.edu/
- http://www.pedbikeinfo.org/training/webinars.cfm
- Greenville-Pickens Area Transportation Study (GPATS) hosts and promotes APBP webinars to a large audience of professionals and citizen advocates.

POLICIES

ADOPTION

Development of Bike Walk RFATS provides active transportation design guidelines for adoption by the RFATS Policy Committee. York and Lancaster counties and each municipality within RFATS should also seek council-adoption of the design guidelines. This step reinforces the value of best practices in pedestrian and bicycle facility design and helps to ensure that roadway and streetscape design, engineering standards, land use regulations, and development requirements reflect the region's vision for walkable and bikeable communities.

Adoption of design guidelines is especially urgent given the high growth rates in the region and funding available for capital transportation projects such as Pennies for Progress. The guidelines provide the foundation for a high-quality network of pedestrian and bicycle facilities. This will create enormous cost-savings for counties and municipalities in the region by incorporating pedestrian and bike accommodations in new roadway projects and planned repaving, resurfacing, and restriping programs. Additionally, applying identical design guidelines throughout the region allows for efficient coordination between municipalities and continuity of active transportation improvement projects across jurisdictional boundaries.

RFATS can advance these standards further by creating a regional Complete Streets typology that provides recommended roadway cross-sections based on land use context, functional classification, traffic volumes, planned development, and transit access. Adoption of the design guidelines and development of a Complete Streets typology can be complemented by adopting a regional Complete Streets Policy.

Examples and resources for typology-based design manuals include:

- Cleveland Complete and Green Streets Typology Manual: http://www.city.cleveland.oh.us/CityofCleveland/Home/Government/CityAgencies/OfficeOfSustainability/SustainableMobility
- Charlotte Urban Street Design Guidelines and related development standards: http://charmeck.org/city/charlotte/transportation/plansprojects/pages/urban%20street%20design%20guidelines.aspx
- Raleigh Street Design Manual: http://www.raleighnc.gov/content/extra/Books/PlanDev/StreetDesignManual/#1
- NACTO Urban Street Design Guidelines: http://nacto.org/usdg/
- Birmingham MPO Active Transportation Policy Plan (2015): http://www.rpcgb.org/download/active/Active%20Transportation%20Plan.pdf

REGIONAL COMPLETE STREETS POLICY

The RFATS agency should adopt a Complete Streets policy to ensure all roadway users are considered in the planning, design, engineering, and funding of capital projects. Complete Streets include safe, accessible, and enjoyable conditions for all ages and abilities, whether travelling by foot, bike, transit, or vehicle. With development of the Bike Walk RFATS Plan and adoption of the design guidelines, a Complete Streets Policy will affirm the conviction and readiness of the agency to implement the Plan's recommendations. RFATS should take the following steps to develop a Complete Streets Policy:

1. Build a coalition
2. Undertake extensive outreach
3. Identify a policy champion

The RFATS agency should adopt a Complete Streets policy to ensure all roadway users are considered in the planning, design, engineering, and funding of capital projects. Complete Streets include safe, accessible, and enjoyable conditions for all ages and abilities, whether travelling by foot, bike, transit, or vehicle.

4. Develop the policy
5. Adopt the policy

Building a coalition will require identifying a broad and diverse base of supporters from multiple jurisdictions. Successful coalitions include local bicycling and walking advocates, public health officials, the business community, transportation departments, transit organizations, and elected officials. This group can be an extension of existing coalitions like the Eat Smart Move More York County Active Environments Committee and the Project Advisory Group assembled for this Plan. Outreach should educate the public and stakeholders on the benefits of Complete Streets and utilize resources such as the National Complete Streets Coalition. The policy itself should be built around the "10 Essential Elements of a Complete Streets Policy" and should also reflect local needs. A clear implementation plan, with a timeline and oversight committee should be established.

Resources

- National Complete Streets Coalition https://smartgrowthamerica.org/resources?resource_type=&authors=&audience=&project_type=&category_name=complete-streets&s=

SAMPLE PROGRAM: HEALTH AND EQUITY-BASED EVALUATION IN NASHVILLE

The Nashville MPO implemented a project evaluation process that emphasized active transportation for quality of life and personal health. Sixty percent of the evaluation criteria for the regional plan are related to health, equity, and active transportation.

Through the process, points are awarded to transportation projects that include:

- *Bikeway, sidewalk, or transit elements*
- *Bicycle and pedestrian safety countermeasures*
- *Opportunities for physical activity in active transportation facilities*
- *Biking or walking improvements in High Health Impact Areas*
- *Additional health-related criteria*

As a result, in the final Regional Transportation Plan, nearly 70 percent of adopted roadway projects include active transportation infrastructure, up significantly from the estimated 2% of projects in the 2030 plan.

- UCLA Institute of Transportation Studies www.lewis.ucla.edu/completestreets/
- Complete Streets Resource List, American Planning Association www.planning.org/research/streets/resources.htm

Regional-level examples of Complete Streets Policies

- Complete Streets Resource Toolkit, Sacramento Area Council of Governments www.sacog.org/complete-streets/toolkit/START.html
- New Orleans RPC Complete Streets Advisory Group http://www.norpc.org/pedestrian_and_bicycle_program.html#csac

HEALTH AND EQUITY-BASED PROJECT PRIORITIZATION

The RFATS region should develop a health and equity-based approach to evaluating and prioritizing transportation projects. Such policies will reflect the need for healthy transportation options, including safe and convenient opportunities to walk or bike for short, routine trips. This effort can be linked to existing initiatives in the community to consider active living and access to healthy foods, such as the programs of Eat Smart Move More York County, South Carolina Department of Health & Environmental Control regional strategies, and the work of the City of Rock Hill to incorporate health directly into its comprehensive plan. The project prioritization approach can also be linked to a regional active transportation safety plan (another recommended program), recognizing injury prevention and reducing traffic deaths as one aspect of community health.

REGIONAL TARGET ZERO POLICY ENDORSEMENT

Vision Zero is based on the idea that traffic deaths are unacceptable and preventable. With the goal of zero fatalities, a Vision Zero policy for the RFATS region can take a comprehensive approach to protecting vulnerable road users like people bicycling and walking through street design, legislation, education, and enforcement, while making the roads safer for every user. A Vision Zero policy should include an overarching vision for zero traffic fatalities as well as identified action steps to achieve that goal.

SCDOT, in conjunction with the South Carolina Department of Public Safety, has established a Target Zero initiative (as part of the state Highway Safety Improvement Plan). An effective RFATS Vision Zero policy will support state efforts outlined within the Target Zero Plan. The RFATS region should work with local municipalities and counties and SCDOT to target the most dangerous corridors and crash hotspots for safety improvements.

More about Vision Zero: http://centerforactivedesign.org/visionzero

SCDOT Target Zero: http://www.scdps.gov/tz/

Example program: http://www.austintexas.gov/visionzero

CHAPTER 6

Network Recommendations

APPROACH TO NETWORK RECOMMENDATIONS

The network recommendations of Bike Walk RFATS establish a regional vision for active transportation mobility, a network of primary routes for regional biking and walking connectivity, and a set of near-term, mid-term, and long-term projects for implementation. Developing the recommendations included a multi-step process involving ongoing dialogue with RFATS staff, county and municipal staff, the RFATS Technical Team, and other stakeholders (as shown in the following graphic). The process relies upon field work, community outreach, and data-driven analysis, which is further detailed in Section 2: Why of this Plan

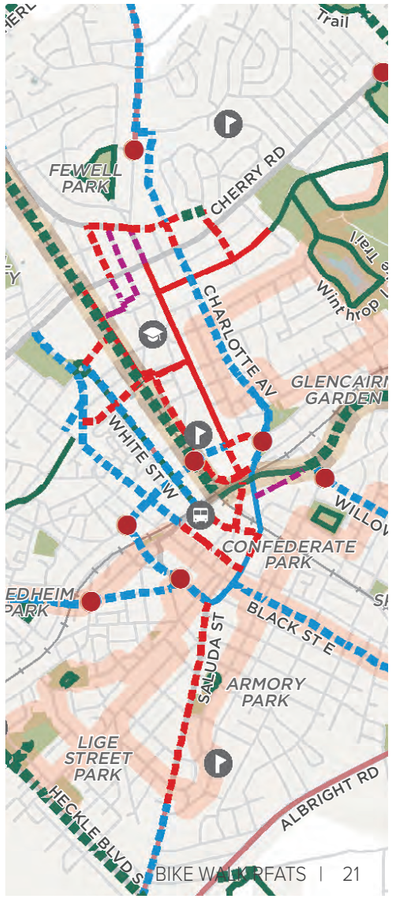
NETWORK GOALS

The proposed network seeks to:

- Reflect the Plan vision, goals, and objectives
- Address the needs of **all ages and abilities**
- Respond to the region's rapid growth, investment, and change in the built environment
- Integrate appropriately with **future land uses**
- Balance the transportation system through **considering all roadway users**, including motor vehicles, freight, and future transit
- Develop **appropriate parallel routes** wherever major arterials do not allow for near- or mid-term inclusion of safe and comfortable bicycling or walking facilities
- Identify an **active transportation system** and capital projects of regional significance which are aligned with RFATS planning and funding

Beyond the mapped infrastructure improvements, **the Plan also recommends the following guiding principles**, which are especially relevant to RFATS given the rate of new development, roadway capital projects, and planning for the construction of new collector roads in the future:

- Every arterial and collector road in developed or developing areas should include at a minimum a continuous, buffered sidewalk or shared-use path serving pedestrians on one (collectors) or both sides (arterials).
- Every bridge (including interstate, railroad, and highway overpasses) should provide passage for persons traveling on bike and on foot
- Intersection and crossing improvements to provide safe access for active transportation users should be made a part of all non-interstate roadway projects where sidewalks are planned or exists.
- Land use and subdivision regulations at the county and local level will remain critical to successfully establishing a bike- and walk-friendly environment and infrastructure.
- Expanded local and regional transit service will be an important component of an effective and balanced transportation system supporting active transportation



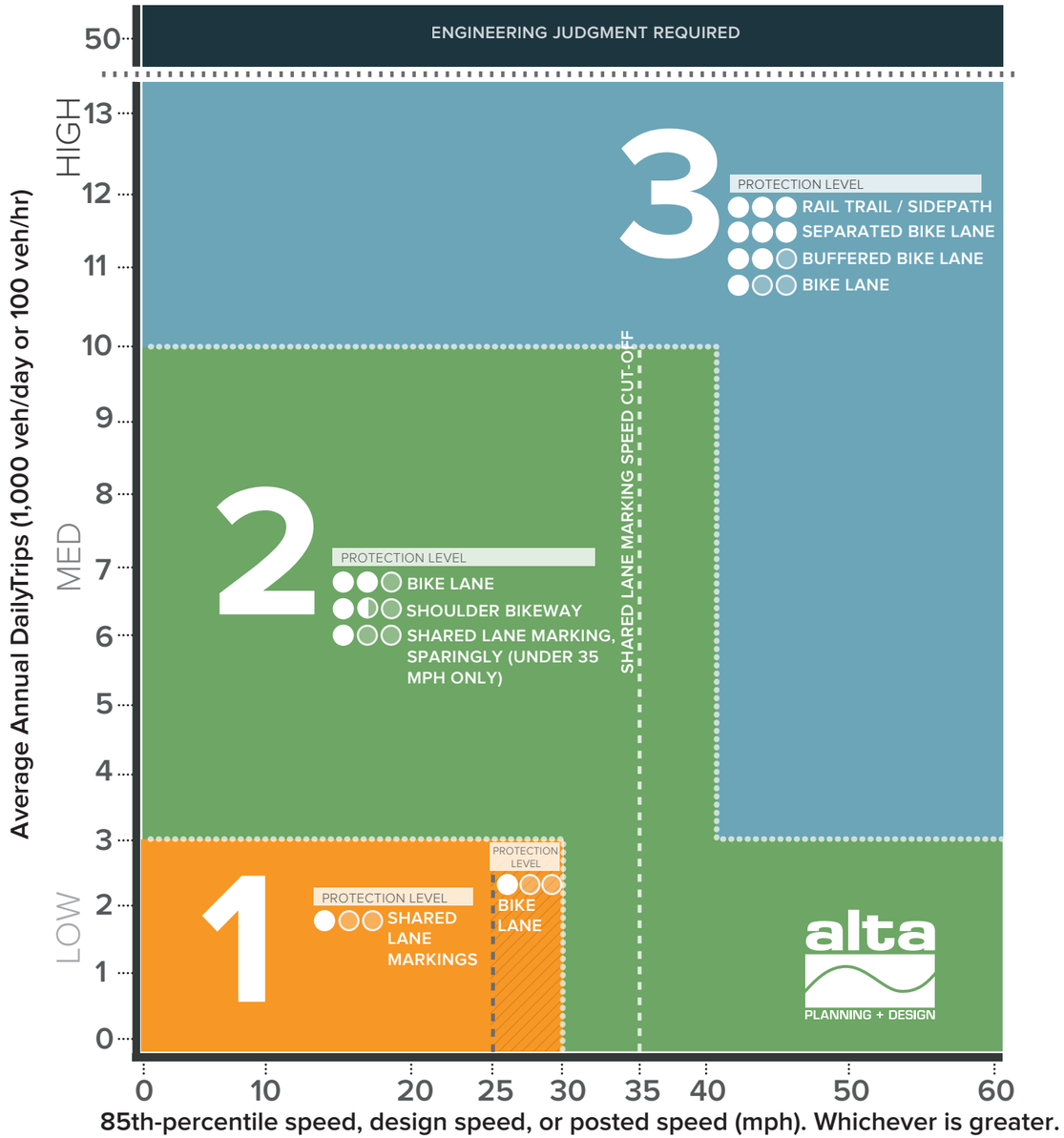
CAROLINA THREAD TRAIL

The proposed Carolina Thread Trail route is an important part of the long-term vision for active transportation and outdoor recreation in the region. For the purposes of Bike Walk RFATS, a specific facility type is proposed on a segment of the Carolina Thread Trail route where the project team identified a direct nexus with Plan goals, access to regional destinations, community-identified needs, or other similar signifiers. Providing specific recommendations along some segments underscores their importance to the RFATS network and should not reduce the value of these segments as pursued at the local, county, and larger regional scale.

CONSIDERATIONS FOR FACILITY TYPE

All recommendations are feasible based on the information the planning team had available during Plan development and reflect national best practices in urban roadway design. These recommended practices have been proven in numerous cities across the US and should be followed to create an active transportation network that best fulfills multiple user needs based on a given corridor context (as illustrated in Figure 1). However, due to a host of possible constraints, it may not be possible for these recommendations to be followed in all instances. If a facility cannot be implemented as recommended, RFATS, its member jurisdictions, and SCDOT should strive to implement an equivalent facility type for the roadway or corridor. Some recommended improvements may require unique or tailored implementation strategies. For example, this could include constructing a shared-use path by expanding an existing 5 foot sidewalk, or developing an enhanced shared roadway by establishing traffic calming and diversion. Implementation strategies for the proposed network are further discussed in Section 3: How and the Design Guidelines of this Plan.

Figure 1. Bicycle facility protection level by speed and traffic volume



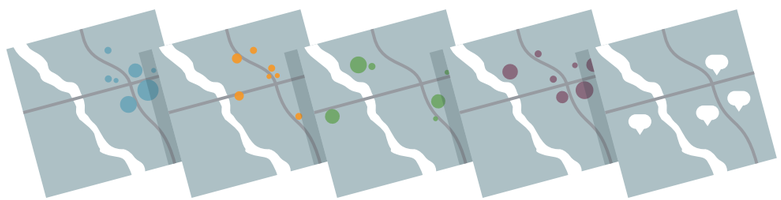
NETWORK DEVELOPMENT

Development of the network recommendations is an iterative and collaborative process. The active transportation system must establish seamless, connected routes that link people to their destinations and across long-distances within the region. Recommended linear and spot improvements must consider the existing environment, as well as the planned or expected future context. The needs of all roadway users, including the safety and comfort of people traveling on foot and by bike, must be balanced with roadway characteristics and corridor constraints. The outcome of this collective process, which necessarily involves allocating a finite amount of shared space among roadway users that are at times incompatible, is a practical approach to establishing a network over time. Recognizing constraints that may arise within a fast changing environment, Bike Walk RFATS should be viewed as a dynamic planning document. Each project should be evaluated to best meet the intent of the recommendation as it moves from concept to design, engineering, and implementation..

1 DATA COLLECTION & FIELDWORK

EXISTING FACILITIES | PREVIOUSLY PROPOSED FACILITIES | DESTINATIONS | BARRIERS | TRANSIT ACCESS

2 NEEDS ANALYSIS



DEMAND FOR WALKING & BIKING | WALKING & BIKING CRASH RISK | EQUITABLE TARGET AREAS | WALK- AND BIKE-FRIENDLY COMMUNITIES | COMMUNITY IDENTIFIED NEEDS

3 SUPPLY ANALYSIS

ROADWAY CONNECTIVITY GAPS | LEVEL OF SERVICE /LEVEL OF TRAFFIC STRESS ANALYSIS | LAND USE & NEW DEVELOPMENT | CAPITAL PROJECTS

4 SYSTEM DEVELOPMENT

PRIORITIZE ACCESS | REVISE PREVIOUSLY PROPOSED | PRIORITIZE GAPS | CONNECT EXISTING FACILITIES | IDENTIFY PARALLEL ROUTES | ADDRESS BARRIERS

5 DESIGN DEVELOPMENT

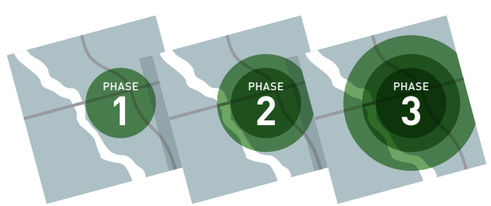
USER NEEDS | BUILT FORM | ROADWAY CHARACTERISTICS

- SPEED LIMIT
- TRAFFIC VOLLUME
- CURB CUTS
- FUNCTIONAL CLASS
- TRUCK TRAFFIC
- # TRAVEL LANES

6 FEASIBILITY

POLITICAL WILL | FUNDING | ENVIRONMENTAL CONSTRAINTS | RIGHT OF WAY ETC.

7 PROPOSED PLAN



SHORT TERM | MEDIUM TERM | LONG TERM

PROPOSED NETWORK MAPS

The following maps illustrate the recommended pedestrian and bicycle network as a regional system of sidewalks, on-street bikeways, shared-use paths, and greenways connecting communities, key destinations, and surrounding areas. The recommendations included in this chapter are based on the types of bikeways, walkways, off-street shared facilities, and crossing improvements described in the design guidelines, found in the Appendices. The maps included in this chapter are described below.

PRIMARY ROUTES NETWORK MAP:

Bike Walk RFATS identifies a network of primary routes for active transportation across the region. The primary routes network highlights corridors of regional significance and, where possible, suitable to an all-ages-and-abilities user group. The Primary Routes network consists of proposed improvements identified in the more broadly-focused Vision Maps (see below). These improvements provide the county-to-county and community-to-community connectivity that RFATS supports as the regional transportation planning agency. The Primary Routes network includes:

Table 3. Total Mileage by Facility Type for Primary Routes

Facility Type	Miles
Shared Use Path	120.1
Sidewalk	27
Bike Lane	32.7
Sharrow	2.04
Paved Shoulder	25.7

REGIONAL VISION MAPS:

Beyond the primary routes network, Bike Walk RFATS establishes a long-term regional vision for a seamless and comprehensive active transportation network. This long-term vision is illustrated in two maps: Regional Bicycle Vision Map and Regional Pedestrian Vision Map. The more broadly-focused Vision Maps reflect regional connectivity as well as access at the local level. Local recommendations are based on needs identified through this planning process. The Vision Maps are not a substitute for locally-directed planning for active transportation, but providing an important springboard for that continued effort.

REGIONAL PAVED SHOULDER ANALYSIS MAP:

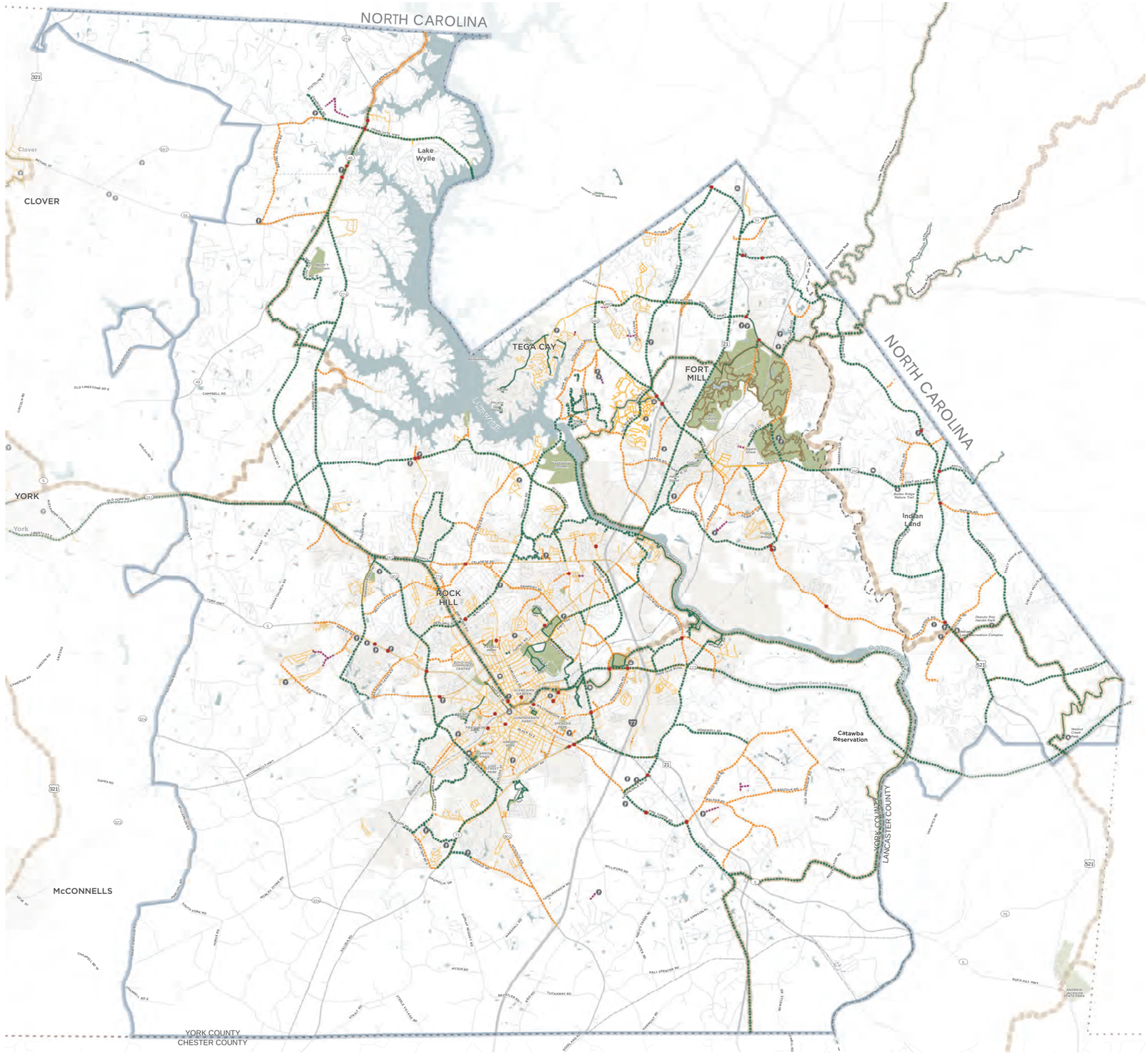
The recommended network includes proposed paved shoulders on rural roadways. Recommended shoulder widths vary between 2 feet, 4 feet, and 6 feet depending on roadway characteristics. Based on the thresholds established through SCDOT's Engineering Directive Memorandum 22, the Paved Shoulder Analysis Map provides a specific recommended pavement width. Many of these projects will likely be implemented in coordination with SCDOT's standard maintenance and repaving schedule.

PHASED IMPLEMENTATION MAPS:

Through a prioritization methodology outlined in Section 3 (How) of this Plan, the project team scored each segment of the Primary Routes network. The results of this scoring process and factors related to project feasibility and geographic equity informed the development of a phased implementation plan. A full list of prioritized projects is provided in Section 3.

PRIORITY ROUTES NETWORK MAP

REGIONAL PEDESTRIAN VISION MAP



Pedestrian Network

Existing	Proposed
	Shared Use Path
	Natural Surface Trail
	Carolina Thread Trail
	Sidewalk
	Pedestrian Connection
	Spot Improvement

Background

- College
- School
- Park and Ride
- Park
- Park
- Water Body
- Municipality
- County Boundary
- RFATS Boundary

0 1 2 3 MILES

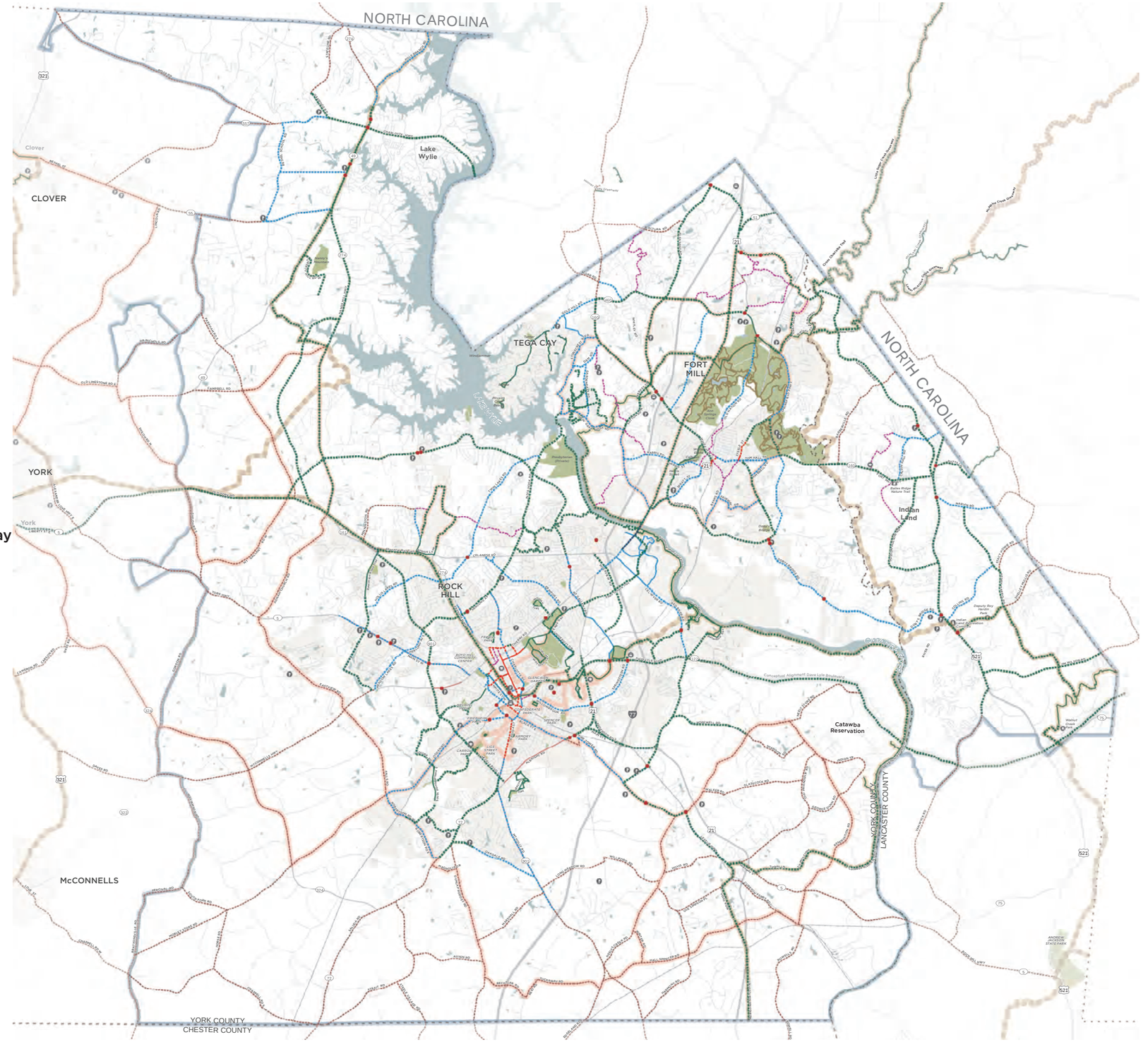
REGIONAL BICYCLE VISION MAP

Bikeway Network

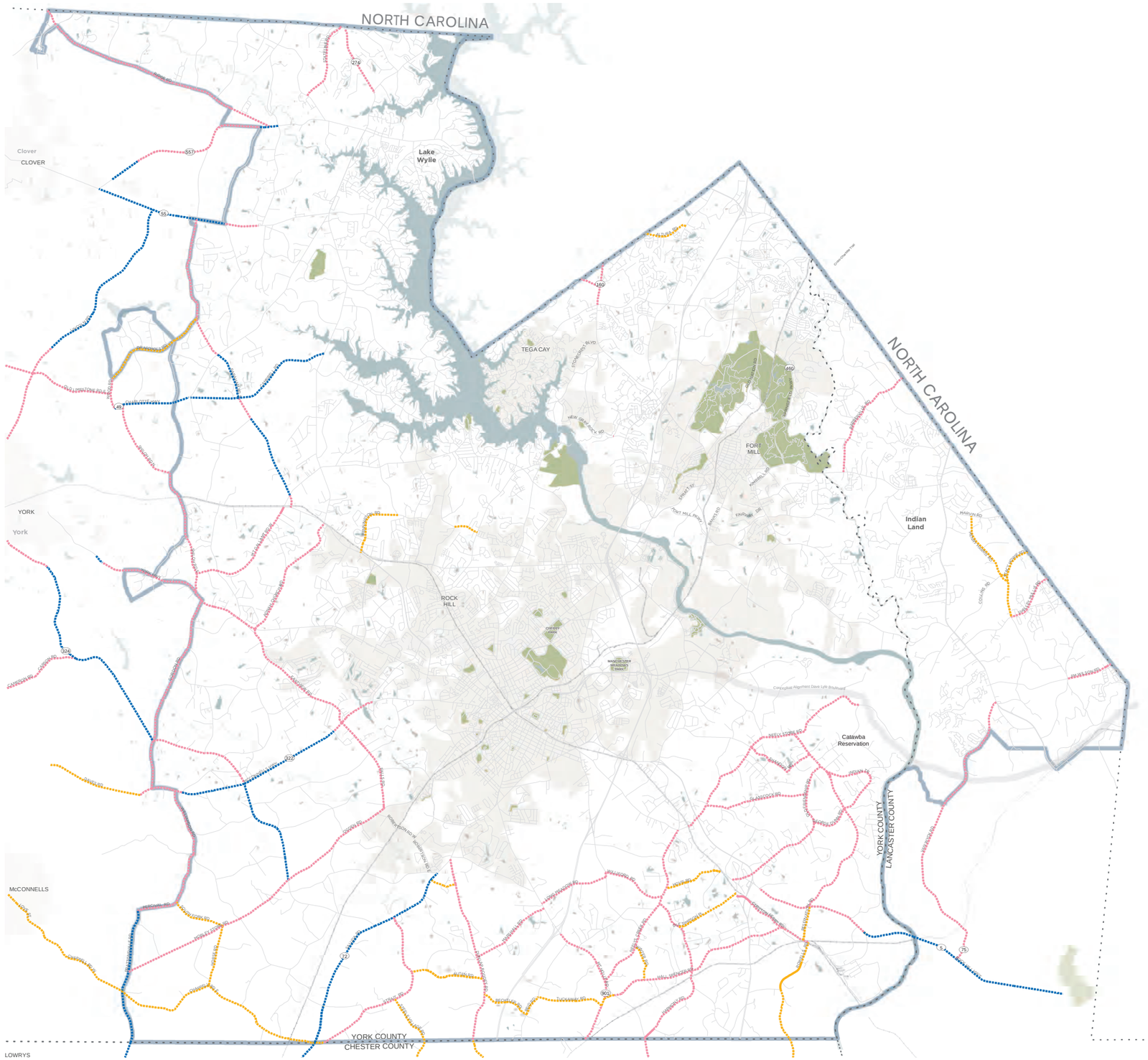
Existing	Proposed	
		Shared Use Path
		Natural Surface Trail
		Carolina Thread Trail
		Buffered Bike Lane
		Bike Lane
		Sharrows
		Enhanced Shared Roadway
		Paved Shoulder
		Signed Route
		Wide Outside Lane
		Spot Improvement

Background

- College
- School
- Park and Ride
- Park
- Park
- Water Body
- Municipality
- County Boundary
- RFATS Boundary



REGIONAL PAVED SHOULDER ANALYSIS MAP



Recommended Shoulder Width

- Rural, 6 ft paved shoulder
- Rural, 4 ft paved shoulder
- Rural, 2 ft paved shoulder

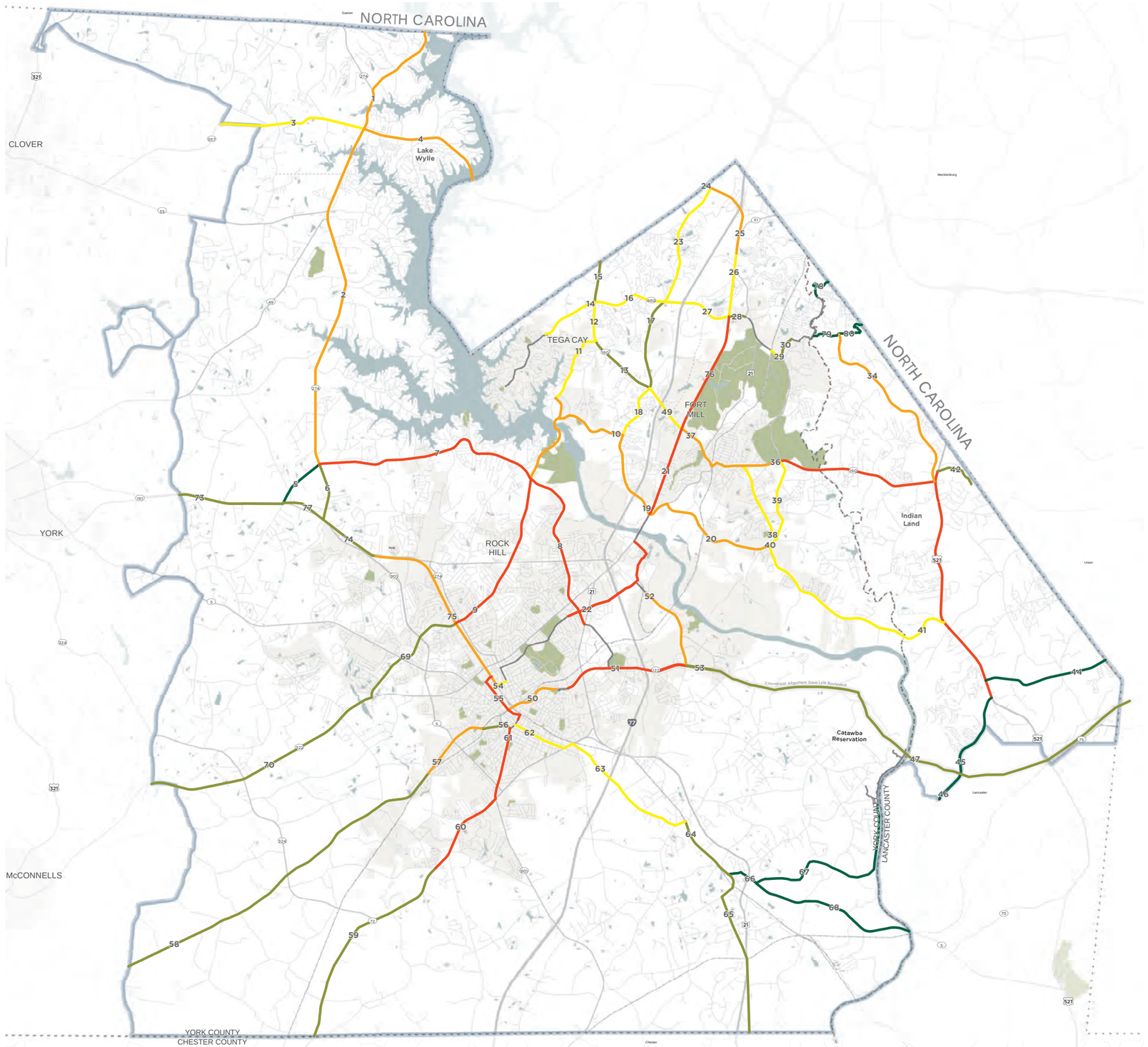
Background

- Park
- Water Body
- Municipality
- County Boundary
- RFATS Boundary

N

0 1 2 3 MILES

REGIONAL NETWORK PRIORITIZATION MAP



Prioritization Score

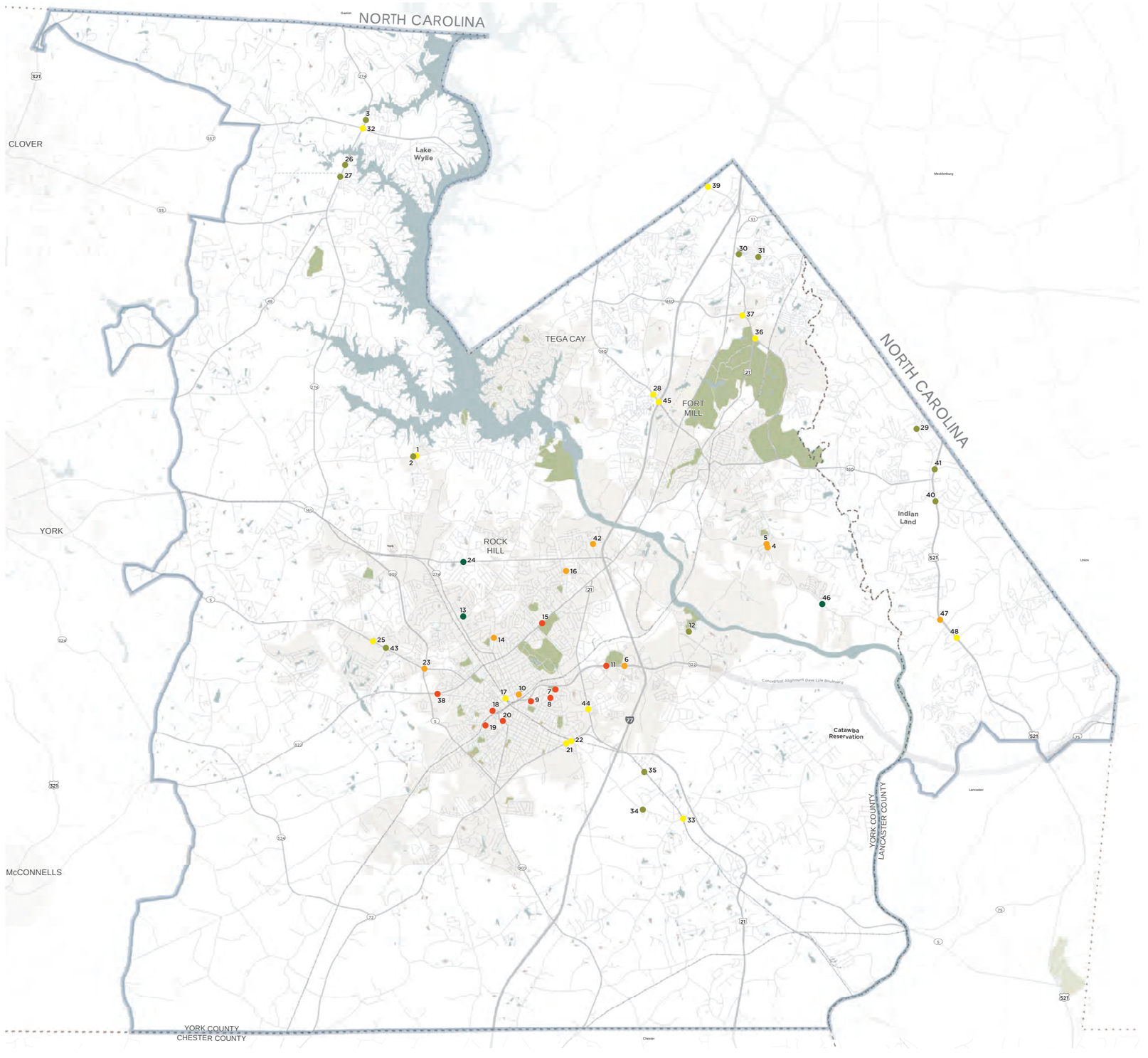
- 106 - 155
- 86 - 105
- 66 - 85
- 36 - 65
- 10 - 35
- 22 Project ID

Background

- Existing Facility
- Park
- Water Body
- Municipality
- County Boundary
- RFATS Boundary

0 1 2 3 MILES

SPOT IMPROVEMENTS PRIORITIZATION MAP



Prioritization Score

- 71 - 90
- 51 - 70
- 41 - 50
- 31 - 40
- 25 - 30
- 22 Project ID

Background

- Park
- Water Body
- Municipality
- County Boundary
- RFATS Boundary

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“I like biking because it promotes a healthier lifestyle and keeps me fit.”

-Dequincey, RFATS resident

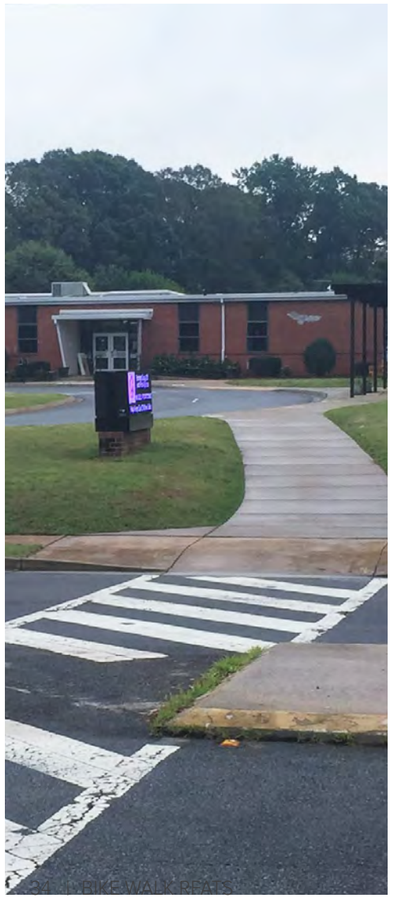
SECTION 2

WHY

STUDY AREA ANALYSIS AND FINDINGS

CHAPTER 7

Introduction



RFATS encompasses two of the fastest growing counties in South Carolina,[1] both of which are experiencing rapid economic and population growth.[2] This type of growth brings new investment, rising incomes, increases in property values, and often, new jobs. It has provided new opportunities for establishing RFATS communities as regional destinations, such as with the investment in Riverwalk and the Velodrome, as well as vibrant and desirable places to call home.

The region boasts walkable downtowns and new developments like Baxter Village, Winthrop University's picturesque town/gown campus, a small but growing network of shared-use paths and trail segments, and a successful focus on bicycle recreation and tourism. A limited amount of walking and bicycling projects and supporting programs have been implemented locally, and a strong community-based structure of partners and volunteers is in place to grow this effort. RFATS communities prioritize multi-modal transportation options and consistently plan for these investments. Yet, despite this history of planning, the physical infrastructure to support a more vibrant range of multi-modal choices continues to need further development so that improvements in health, air quality and sustainability can be more properly and fully realized.

Beyond the walkable town centers, the broader physical landscape reflects a combination of established and newer developments where subdivision connections are not consistently linked, arterial roadways are auto-centric, and overall suburban development patterns are not sufficiently encouraging of bicycling and walking. The two largest communities—the City of Rock Hill and the Town of Fort Mill—were founded in an era that preceded the car, but continued to develop across decades where the centrality of the automobile shaped transportation investment and design planning.

Several RFATS communities, such as the City of Tega Cay and the unincorporated Lake Wylie area, developed as Charlotte metro commuter suburbs – attractive to Charlotte professionals based on a high quality of life and scenic environment. **Yet, the RFATS region is increasingly characterized by sprawling commercial and residential development creating unsustainable travel behaviors; and therefore, an important need to give increased emphasis to multi-modal planning and supporting infrastructure investment.**

For many of the region's most vulnerable citizens, unsustainable travel behaviors become impossible travel mandates. With longer distances between affordable housing and employment opportunities, schools, and services, the **young, very old, low-income, medically constrained (such as epilepsy or poor eyesight), or otherwise transit-dependent members of the RFATS community have few options.**

The region's pattern of growth has created an environment where residents and visitors are faced with limited options for safe and convenient transportation. This limits the region's economic potential and ability to capitalize on the communities' character and quality of life. As RFATS grows over the next 10 years, **maintaining a high quality of life and functioning transportation system will hinge on the region's capacity to connect land use and development decisions with transportation planning, creating a community that is safe and accessible for ages 8 to 80, and connecting a signature network of trails with on-street bikeways, walkways, and community destinations and transit**.

Bike Walk RFATS seeks to understand how people live, work, play, and learn in RFATS communities and how that impacts region-wide needs and opportunities for active transportation and recreation, for an efficient and effective transportation system. To that end, this chapter provides a profile of RFATS' current population demographics and trends, coupled with an analysis of the region's bicycle and pedestrian environment. A baseline assessment of the current transportation system provides a vital step towards developing feasible, context-sensitive, and meaningful recommendations for active transportation.

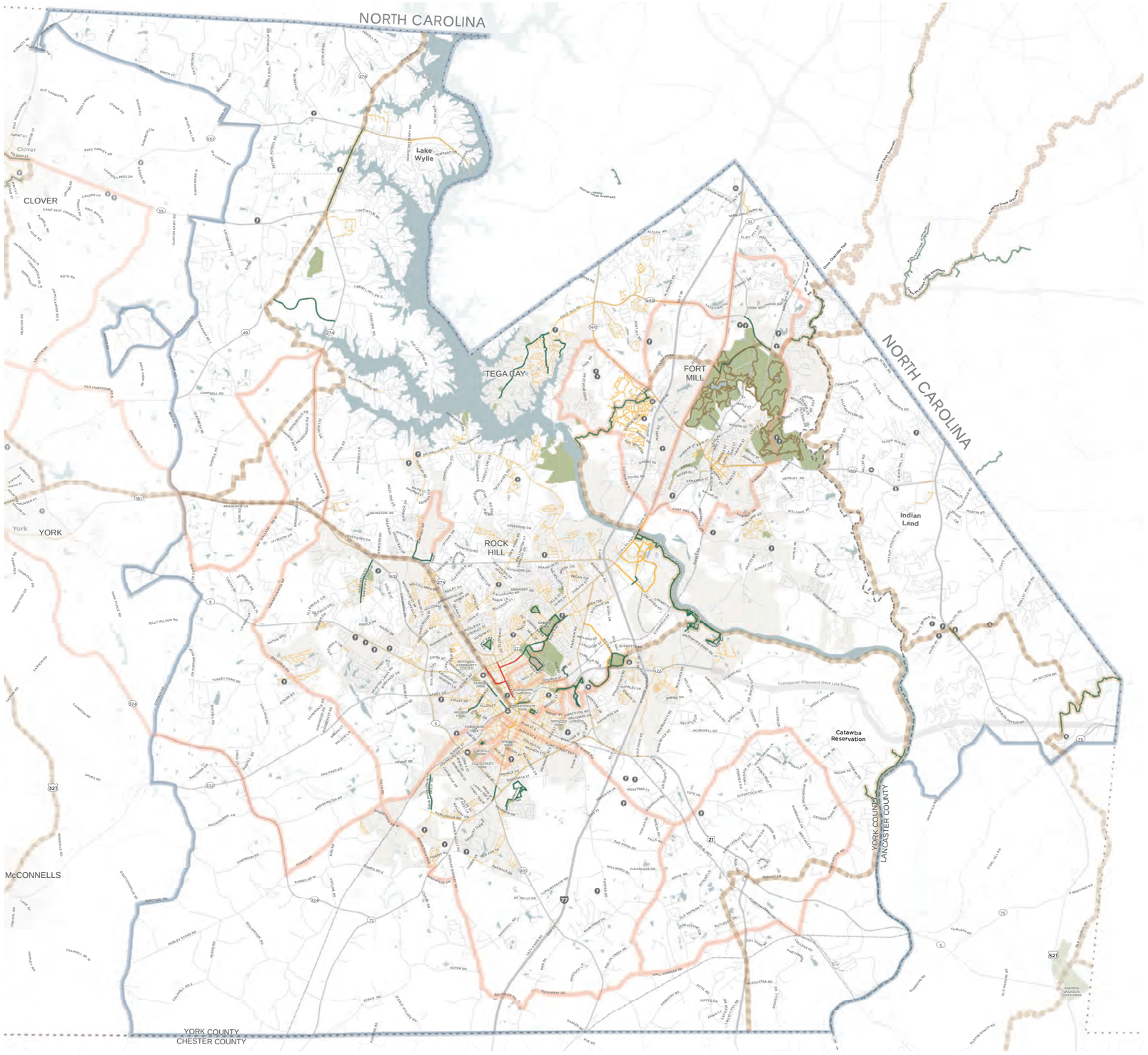
The existing conditions analysis is based on a variety of sources for information and data, including: US Census data, traffic data from RFATS and SCDOT (such as vehicle volumes and crashes), stakeholder and public input, GIS analysis, and field work.

The existing conditions report consists of the following sections:

- Who Lives, Works, Plays, and Learns in RFATS?
- Regional Mobility
- Regional Economic Profile
- Health & Safety

1 Source: http://www.heraldonline.com/news/local/article16438016.html
2 Source: https://wallethub.com/edu/fastest-growing-cities/7010/

BASE MAP



Bicycle and Pedestrian Facilities

- Sidewalk
- Existing Bike Lane
- Existing Sharrows
- Bike Route
- Existing Greenway
- Natural Surface Trail
- Existing Carolina Thread Trail
- Planned Carolina Thread Trail

Background

- College
- School
- Park and Ride
- Park
- Park
- Water Body
- Municipality
- County Boundary
- RFATS Boundary

0 1 2 3 MILES

CHAPTER 8

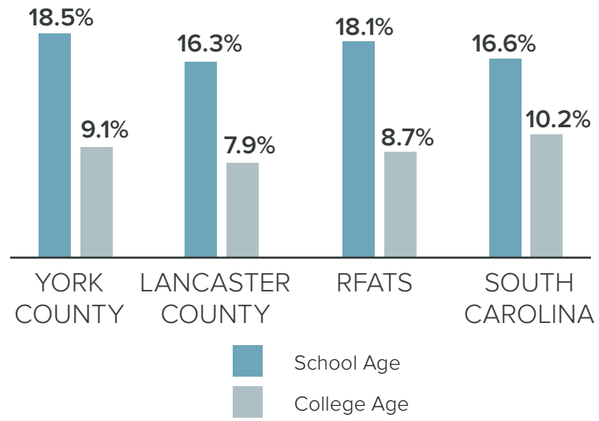
Who Lives, Works, Plays, and Learns in RFATS?

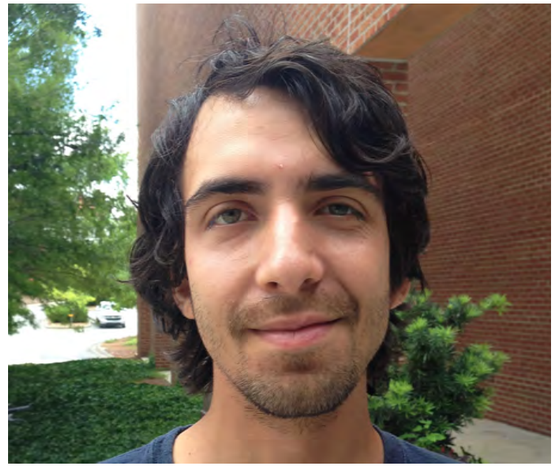
The RFATS region is part of the Charlotte-Concord-Gastonia, NC-SC Metropolitan Statistical Area (MSA), which, with a population of 2.46 million, is the twenty-second largest MSA in the United States.[1] RFATS comprises the southernmost portion of that defined area. At the center is the City of Charlotte, the second largest city in the southeast and one of the fastest growing cities in the U.S.

The population within the RFATS region has grown tremendously over the past three decades, including the eastern urbanized portion of York County and the panhandle of Lancaster County. The **population of the RFATS region grew from approximately 133,000 people in 2000 to over 200,000 in the year 2010, to nearly 217,000 in 2014.[2]**

In terms of age and income, the RFATS region features a higher median household income and a lower median age than the South Carolina median.[3] The RFATS region has a significant share of school age residents and college students – 18.1% and 8.7%, respectively. See Figure 2 for a specific break down of the two groups across geographies. These age categories (5 to 17 and 18 to 24) represent a user group likely to bike or walk if safe and comfortable infrastructure exists. Recognizing this demographic allows for the development of targeted bicycle and pedestrian infrastructure and programmatic investments.

Figure 2. School- and college-age populations as percent of total





"I bike to work and feel pretty safe. I will ride just about anywhere."

-Jon, RFATS resident

1 U.S. Census Bureau (2015). Selected population characteristics, 2014-2015, American Community Survey 5-year estimates. Retrieved from http://factfinder.census.gov/bkmk/table/1.0/en/PEP/2015/PEPANNCHG.US24PR.

2 RFATS Urbanized Area Transit Implementation Study (2015). p. 1-1.

3 U.S. Census Bureau (2015). Selected population characteristics, 2014-2015, American Community Survey 5-year estimates.

Regional Mobility

COMMUTE MODE SHARE

Approximately 92% of residents in the RFATS region drive to work, while 0.6% of residents use transit, 1.2% walk, and 0.1% bike to work.[1] This commute mode share is comparable to MPOs of similar size and context in the southeastern U.S.

Figure 3 includes mode shares for transit use, walking, and biking that were calculated for three similar-sized MPOs in the south that are adjacent to major urban areas and include a mix of small towns, suburban, and rural areas: the Anderson County MPO (located near Greenville, SC); the Floyd County MPO (located near Atlanta, GA); and the Cabarrus-Rowan MPO (outside Charlotte, NC). A fourth MPO – the Skagit County MPO, near Seattle, WA – shares similar attributes but was selected as an example from outside the southeast.

As Figure 3 demonstrates, transit, walk, and bicycle commute rates are similar to the Anderson County MPO and the Cabarrus-Rowan MPO. However, walk and bike mode shares are significantly lower than the Floyd County MPO and the Skagit County MPO. The Floyd County and Skagit County walk shares are 2.6% and 2.9%, respectively. The bicycle commute share is 0.6% in Floyd County and 0.7% in Skagit County. Both the Floyd County MPO and the Skagit County MPO represent feasible walking and biking target rates for the RFATS region. Mode share numbers are also included for South Carolina to provide statewide context. It is important to note, however, that mode share data is collected through an American Community Survey (ACS) question which asks residents for the "primary" way they get to work. This excludes walking or bicycling commutes that occur as a secondary mode (walking to a bus stop, for example) and also excludes destinations other than work.

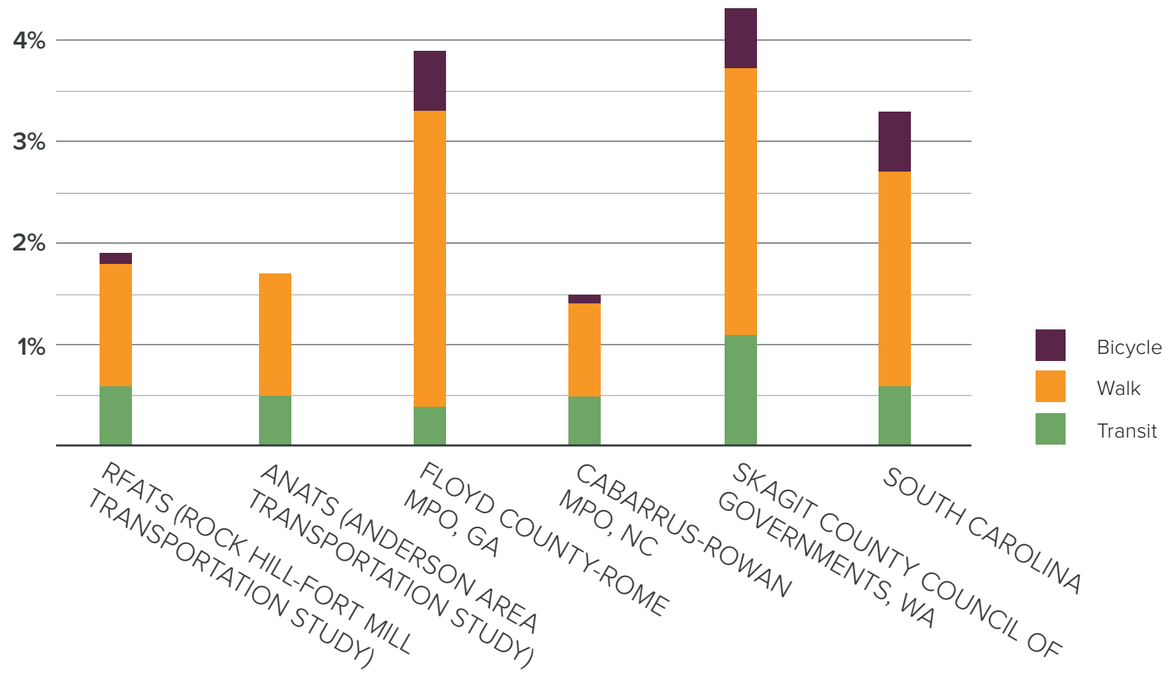
1 U.S. Census Bureau (2014). Selected economic characteristics. 2010-2014 American Community Survey 5-year estimates.

The mode share maps on the following pages depict the percent of the work force who commute to work by walking or bicycling by census tract. The greatest share of commuting to work by walking or bicycling is clustered around the City of Rock Hill. Downtown Rock Hill's comfortable scale and dense network of well-connected streets with sidewalks encourage both walking and bicycling. The presence of greenways, shared lane markings (sharrows), bike lanes, and quiet neighborhood streets abutting commercial corridors may also attract bicyclists.

Professors and staff at Winthrop University also undoubtedly play a role in this high rate of walking and bicycling as they may live in the nearby neighborhoods and walk or bike to work. College students are counted as residents, allowing that those who walk or bike to a job on campus also add to this figure. Other trip purposes by students, such as walking to class, are not counted.

Census data across the nation reveals high rates of walking and bicycling to work are typical for college towns. Places like Ithaca, NY and Athens, OH (home of Cornell University and Ohio University) have comparable walking rates of

Figure 3. Commute mode share comparison



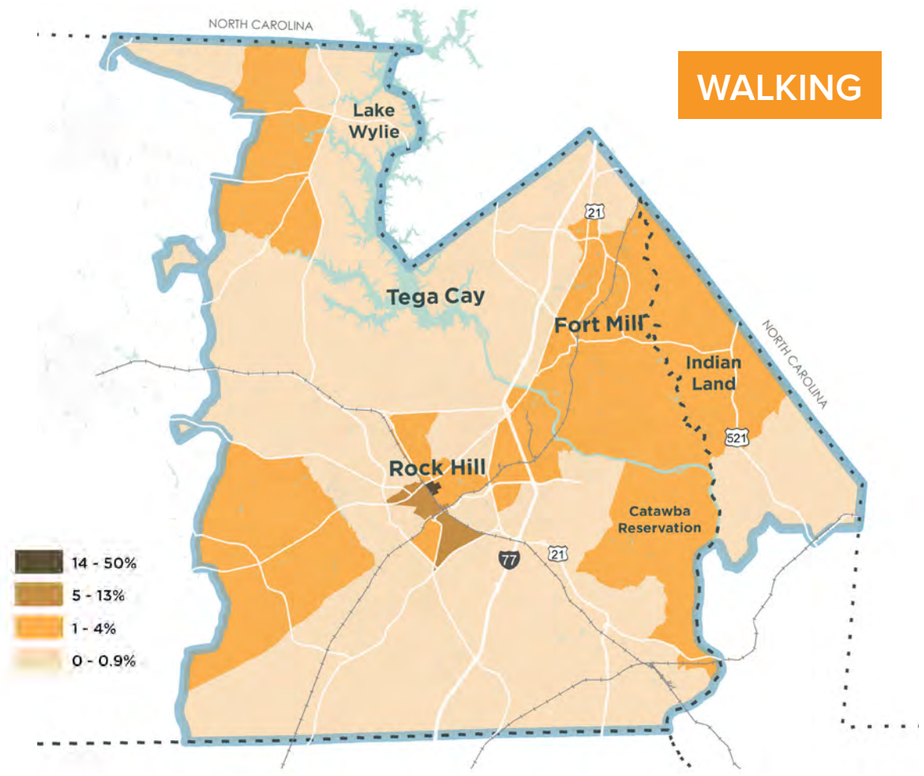
CHAPTER 9

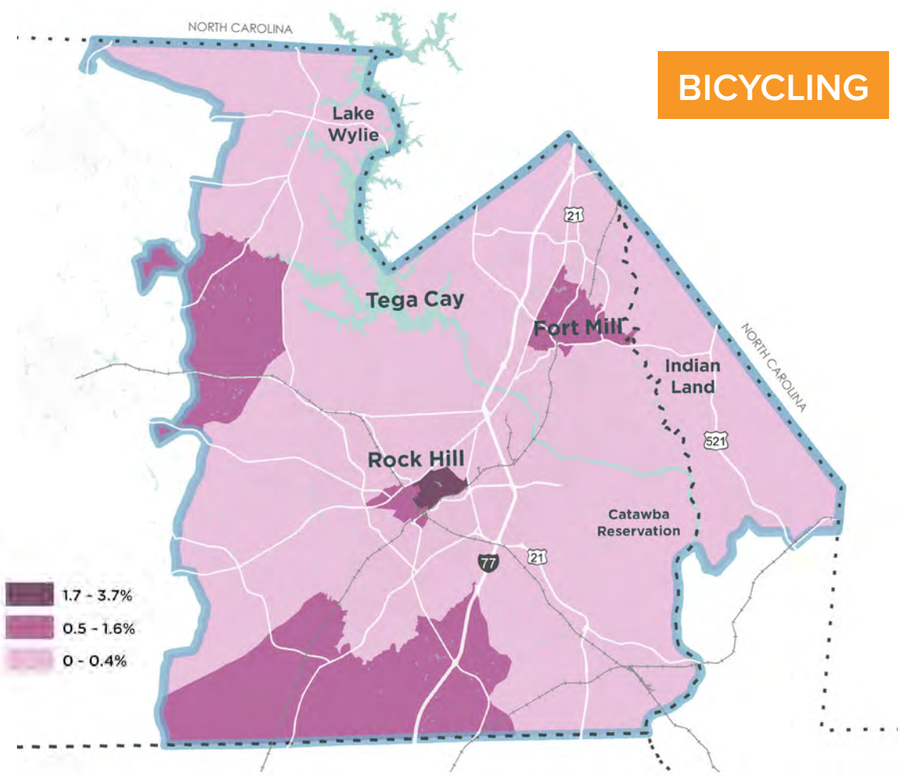
42% and 37% respectively, compared to Rock Hill's census tract that includes Winthrop, which has a 49.2% walking rate.[2] These figures are well above walking and bicycling commuting averages for the nation as a whole (2.8% and 0.6%, respectively). This reflects the complementary relationship between college campuses and active transportation – a dynamic that can be further fostered and expanded beyond campus limits by investing in infrastructure and programs.

2 U.S. Census Bureau, American Community Survey Reports, May 2014, Modes Less Traveled – Bicycling and Walking to Work in the United States: 2008 – 2012. https://www.census.gov/prod/2014pubs/acs-25.pdf

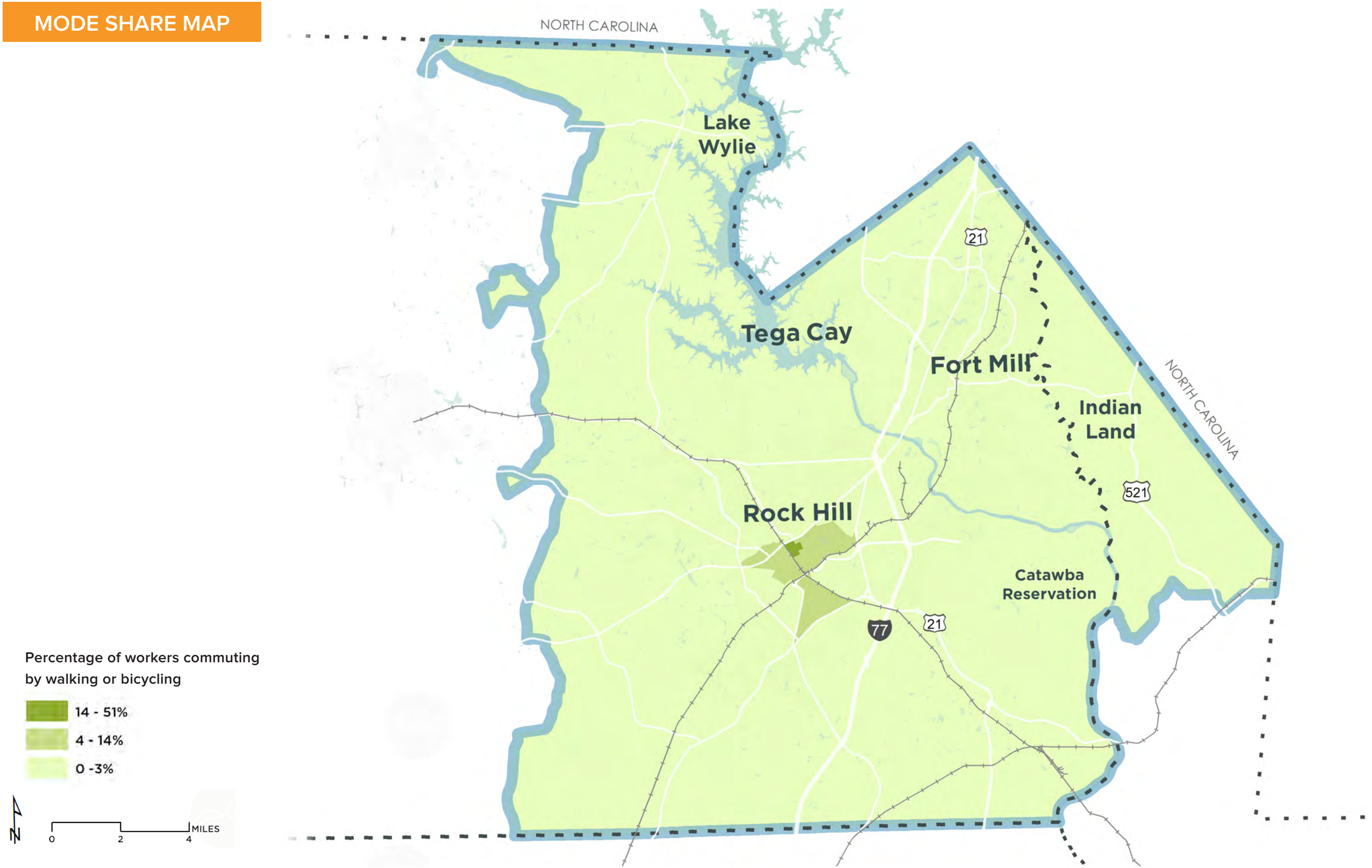
There are several potential reasons for the low percentage of bicycling and walking to work trips outside of the City of Rock Hill. Convenient and safe connections between residential areas and major employment centers are critical to supporting active transportation. Outside of Rock Hill, distances between housing and amenities are greater, and connections are fewer.

The maps highlighting walking and bicycling paint a slightly different picture. Fort Mill, Indian Land, and Rock Hill residents walk at higher rates than the rest of the region. There are also two pockets of slightly higher rates of walking to work along the western border of the region. The greatest concentration of walking to work exists inside downtown Rock Hill. The greatest concentrations of bicycling to work trips exist in two rural pockets at the western and southern edges, and two urban/suburban pockets around downtown Rock Hill and Fort Mill. The rural areas may use signed bike routes to reach nearby localities like Rock Hill and York.





MODE SHARE MAP



COMMUTE TIME MAP

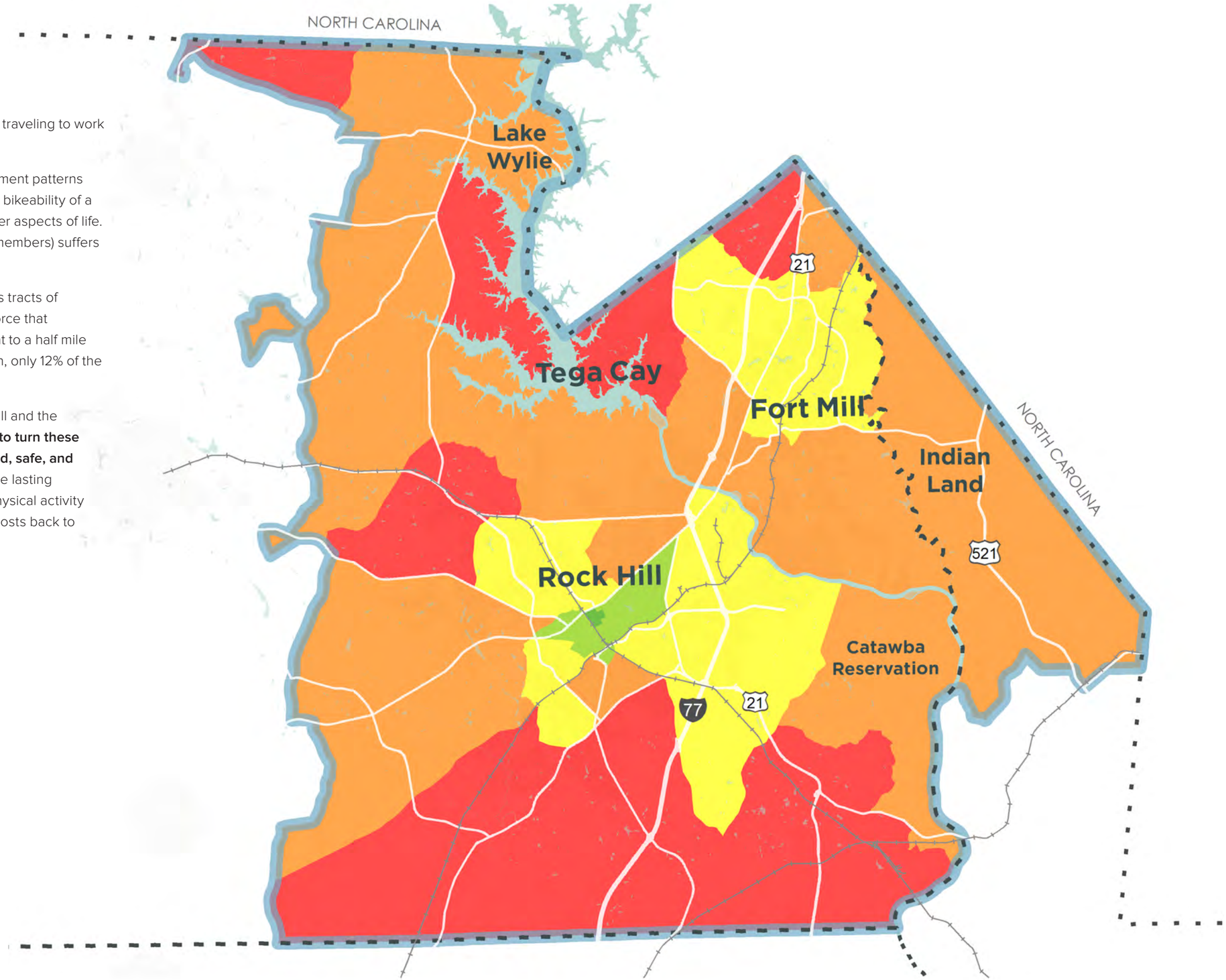
COMMUTE TIME AND PATTERNS

There is a known inverse relationship between time spent traveling to work and one's health and quality of life.

Low-density, single-use land uses, and sprawling development patterns negatively influence commute times and the walkability or bikeability of a place. Reliance on a car to go to work then diminishes other aspects of life. In particular, social capital (connectedness of community members) suffers a 10% decrease for every 10 minutes spent commuting.

As depicted in the Commute Time Map at right, the census tracts of downtown Rock Hill have a significant share of the work force that experiences a commute of less than 10 minutes (equivalent to a half mile or less walk or a 2 mile or less bike ride). Across the region, only 12% of the work force in RFATS has a less than 10-minute commute.

The next tier of neighborhoods around downtown Rock Hill and the suburbs north of Fort Mill (yellow) present an **opportunity to turn these car trips into walking or bicycling trips if a well-connected, safe, and convenient network existed**. Such investment will have the lasting positive effect of reducing traffic congestion, improving physical activity rates, strengthening community ties, and returning travel costs back to individuals and families.



TODAY'S TRANSPORTATION NETWORK

The primary road network is composed of major State and US highways that run throughout the RFATS region. Key routes that exist within RFATS include Interstate 77 and US Highways 21 and 521. Other major arterials identified as heavily traveled corridors within the RFATS Long Range Transportation Plan are: Celanese Road, SC 160, Gold Hill Road, and Dave Lyle Boulevard.

Transit service within the RFATS region features the following three services:

- York County Access, a demand response transportation service (sometimes referred to as Dial-a-Ride), provides basic mobility services to those with special transportation needs as well as area seniors. Common trip destinations include medical appointments, personal care shopping and recreation. This service is supported by the City of Rock Hill and York County.
- York County Access (Ride-To-Work Service), provides peak period transportation service for employment oriented trips within the Rock Hill Urbanized Area. Rides must be scheduled at least one day in advance.
- The Charlotte Area Transit System (CATS) offers weekday express bus service to Uptown Charlotte with stops at White Street in downtown Rock Hill, Manchester Village, Baxter Village, and Cabela's Drive.

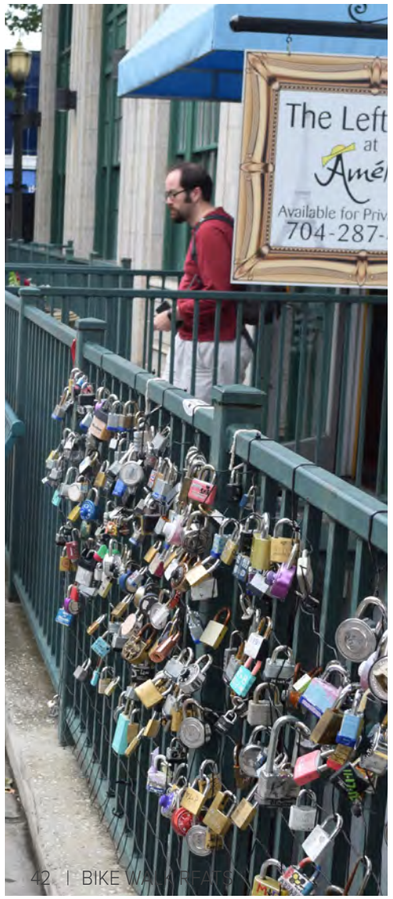
There is not currently an Amtrak station in the RFATS region, although the Amtrak Crescent Line, which runs from New Orleans to New York, has a stop in the City of Charlotte.

The opportunities and constraints section of this report provides an evaluation of the existing walkway, bikeway, and trail system and its role within the larger transportation network.

The current RFATS transportation network has to support all modes of transportation, including walking, biking, transit, motor vehicles and freight.

CHAPTER 10

Regional Economic Profile



The RFATS region has successfully leveraged bicycle and pedestrian infrastructure to attract visitors and create a growing tourism market. Partners in the RFATS region have invested millions of dollars into facilities and events that showcase the area and strengthen the local economy. Additionally, the region features master-planned mixed-use developments such as Baxter Village and Riverwalk, both of which market their pedestrian and bicycle infrastructure and walkable community design as key marketing points.

Bicycle tourism and events have developed rapidly in the RFATS region in recent years. The development and promotion of county-wide bicycle touring routes, based in part on a county-wide survey of bicyclists, has expanded interest in biking as an activity and visitor attraction. A dedicated website and marketing platform for bicycle tourism in York County (http://www.visityorkcounty.com/bike-york-county) has catalyzed bike-visitor spending. In recent years, two key facilities, the Giordana Velodrome and the Novant Health BMX Supercross Track, have expanded the breadth of the bicycle-related economy. Both are world-class facilities that provide a platform for races and tournaments as well as year-round training for professional and amateur athletes. Both facilities also provide education and outreach initiatives to the local community and contribute to the local and regional bicycle culture as well as broader economic development objectives within the region.

Existing research indicates the following:

Walkable and bikeable communities are a magnet for millennials and boomers

Millennials will dominate the real estate market for many years to come. Boomers have the most disposable income of any age group, and make up an increasingly large proportion of the population. Both generations prefer walkable communities and accessibility to amenities such as restaurants, shopping, and nightlife. Communities that can provide such convenience and access are better positioned to benefit economically from these large demographic groups. A 2014 poll by the American Planning Association found that 81% of millennials and 77% of active boomers believe affordable and convenient alternatives to the car is at least somewhat important when deciding where to live and work.

Walkable and bikeable communities can improve economic mobility and equity

Places that value walkability can also achieve equity objectives. By balancing transportation needs, job opportunities and other basic needs so that they are accessible to people with disabilities and/or who are economically disadvantaged, will provide substantial financial savings for these residents while also preventing social isolation.

Walking and biking are inexpensive forms of transportation. While traffic volume is not usually an issue in smaller communities and rural areas, the ability to walk or bike rather than drive to basic needs and destinations creates environmental benefits and fuel savings while reducing costs from traffic accidents and lost time. According to one study, households in walkable communities spend 50% less on transportation costs than households in auto-dependent communities.[1] These personal savings come from reduced vehicle operating costs, parking fees, vehicle ownership costs, and long-term mileage related costs from crashes, tickets, and vehicle depreciation.

Walkable and bikeable communities attract visitors and recreation spending

Districts and destinations that are walkable and bikeable are more likely to draw tourists, residents, and even some employers and businesses due to the sense of place and interactive uses in places that are easily traversed on foot or by bike. Visitors and locals alike enjoy vibrant public spaces with a unique and diverse mix of businesses, and walkable areas provide a safe and comfortable environment for all road users, including those on bike, and for people of all ages and abilities.

By building walkable and bikeable infrastructure for transportation and basic needs such as multi-use trails, recreation opportunities also expand. According to the Outdoor Industry Association, outdoor recreation generates more annual consumer spending than motor vehicles and parts, pharmaceuticals, and household utilities, and creates more jobs than the construction industry. South Carolina's outdoor recreation generates $18 billion in consumer spending, 201,000 directly related jobs, $4.7 billion in wages and salaries, and $1.0 billion in state and local tax revenue. Commercial and residential properties also often benefit economically when trails are built nearby.

A 2014 poll by the American Planning Association found that 81% of millennials and 77% of active boomers believe affordable and convenient alternatives to the car is at least somewhat important when deciding where to live and work.

1 Litman, Todd (2014), The Economic Value of Walkability, The Victoria Transport Policy Institute; at http://www.vtpi.org/walkability.pdf

CHAPTER 11

Regional Health and Safety

The economic vitality of a region is inextricably linked to the health, welfare, and safety of its citizens. This section provides a picture of health and safety priorities of the RFATS region.

An equity analysis of vulnerable populations in RFATS identifies concentrations of community members most likely to suffer health disparities or who may be forced to walk or bike for daily transportation in conditions that are unsafe, and in some cases deadly. The collision analysis provides further insight into areas that experience walking and bicycling activity and that are unsafe for these roadway users. This not only identifies areas that need design improvements for safety, but also sheds light on the role that unsafe conditions (and perceptions of safety) play in deterring walking and biking activity. Perceptions and conditions that deter active transportation and recreation further reduce health outcomes by negatively impacting levels of physical activity.

According to the County Health Rankings program of the Robert Wood Johnson Foundation, 29 percent of York County and 33 percent of Lancaster County adults are obese. This correlates to the 22 and 24 percent of adults in each county (respectively) that is not meeting minimum recommendations for physical activity. The report also finds that 77 percent of the York County population and 55 percent of Lancaster County residents have adequate access to locations for physical activity.[1]

1 Source: (2016) http://www.countyhealthrankings.org/

EQUITY ANALYSIS

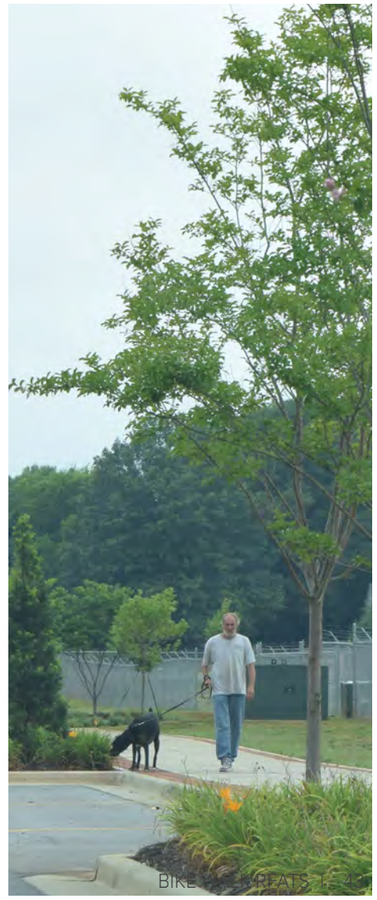
An equity analysis illustrates areas of the RFATS region that have higher concentrations of vulnerable populations. This analysis brings attention to neighborhoods or corridors which may be most in need of improvements and provides a starting point for identifying priority areas.

The equity analysis uses a combination of six socioeconomic characteristics as proxies for identifying vulnerable populations:

- Seniors
- Children
- Non-White populations
- Low-income households
- No motor vehicle access
- Linguistic isolation

"I like walking in Manchester Park and Cherry Park with my daughter... We like to walk because it is exercise."

-Debbie, RFATS resident



SENIORS

Metric: Consistent with the U.S. Census Bureau, senior citizens are defined as those who are 65 years old and older.[2]

Rationale: Senior citizens are considered a vulnerable population due to their decreased access to a private vehicle and/or driver's license as well as their declining mobility related to the aging process. These primary vulnerabilities in turn put seniors at secondary risk for reduced access and opportunities for physical activity, and tertiary risk of poor health outcomes related to inactivity.

First, the reduced access to a private vehicle, whether by choice or otherwise, limits their freedom and mobility to access basic services and daily needs in terms of grocery stores, medical facilities, opportunities for socialization, and religious activities. Over half of senior citizens who do not drive stay home on any given day, partially because they lack access to other transportation options. This decreases their ability to participate in community activities and the local economy. Compared to their driving counterparts, non-driving senior citizens make 15% fewer trips to the doctor, 59% fewer trips to stores and restaurants, and 65% fewer trips for social, family, and religious activities. Senior citizens living in built environments conducive to walking and biking are more likely to be engaged in community activities, with 57% of older non-drivers in walkable and bikeable neighborhoods leaving home compared to just 39% in less walk- and bike-friendly areas.[3]

Second, reductions in access to personal vehicular transportation can result in an increased reliance on walking, biking (for those who are physically capable), and public transportation in order to meet their daily needs. However, walking and bicycling present unique challenges to the senior population, as they have an increased prevalence of mobility constraints related to the aging process, and are more likely to require the use of walkers, canes, wheelchairs, and other similar devices to walk. Given that, built environments that lack sidewalks, where sidewalks are not continuous, or where sidewalks have cracks, uneven surfaces, or lack curb ramps present real obstacles and/or barriers to safe walking, bicycling, and access to public transit. Walkable and bikeable neighborhoods and communities ensure that seniors are able to remain active, healthy, social, mobile, and safe even as their mobility needs and abilities change.

Third, the built environment where senior citizens live can have a large impact on their ability to be physically active. A 2007 study in the American Journal of Public Health found areas that were highly rated for their walkability were linked with increased levels of physical activity among older residents.[4] To create walkable neighborhoods that meet the needs of senior citizens requires understanding what issues prevent older adults from walking. According to a 2004 Surface Transportation Policy Project report, senior citizens perceive poor sidewalks, the absence of resting places and dangerous intersections as barriers to walking.[5] Furthermore, a survey conducted by the American Association of Retired Persons (AARP) found that 39% of respondents did not feel their neighborhood had adequate sidewalks or crosswalks, and dissatisfaction with transit and bicycle facilities was even higher.[6]

While walking is a more common activity among senior citizens,[7] bicycling rates among people between the ages of 60 and 79 increased rapidly between 1995 and 2009,

Bicycling is a good way for senior citizens to get exercise and stay active, which supports overall health.

2 U.S. Census Bureau. November 2011. "The Older Population: 2010." <https://www.census.gov/prod/cen2010/briefs/c2010br-09.pdf>l

3 Bailey, Linda. "Aging Americans: Stranded without Options" (2004). Surface Transportation Policy Project. < http://transact.org/wp-content/uploads/2014/04/Aging_Americans.pdf>

4 Stein, Jeannine. "'Carmageddon' can be motivation to get out and move" (July 12, 2011). Los Angeles Times, Booster Shots blog. < http://articles.latimes.com/2011/jul/13/news/la-heb-carmageddon-exercise-20110713>

5 Bailey, Linda. "Aging Americans: Stranded without Options" (2004). Surface Transportation Policy Project. < http://transact.org/wp-content/uploads/2014/04/Aging_Americans.pdf>

6 Shinkle, Douglas and Anne Teigen. "Encouraging Bicycling and Walking: The State Legislative Role" (2008). National Conference of State Legislatures. < http://www.ncsl.org/documents/transportation/encouragingbicyclingwalking.pdf>

7 *In 2009, 6.0% of senior citizens walked for at least 30 minutes per day compared to 0.5% that bicycled for at least 30 minutes.*

Pucher, John, Buehler, Ralph, Merom, Dafna, and Adrian Bauman. "Walking and Cycling in the United States, 2001-2009: Evidence From the National Household Travel Surveys" (December 2011). American Journal of Public Health. 101 (Suppl 1): S310-S317. < https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3222478/>

accounting for 37% of the total nationwide increase in bicycle trips.[8] Expanding transportation options for the senior population is important to retaining and improving their quality of life, mobility, and independence as they age, and increasingly bicycling is representing a larger share of trips taken by senior citizens.[9] Providing safe and comfortable infrastructure that encourages both walking and bicycling will be key to support those who already walk or bike, as well as to encourage those who may be interested in walking and bicycling.

Finally, there are many health benefits of walking and biking, especially for people over the age of 65; however, 31.2% of senior citizens did not take part in regular physical activity,[10] according to a survey from the Centers for Disease Control and Prevention (CDC). Senior citizens who walk or bike are less likely to suffer mental deterioration or dementia to their non-active counterparts.[11] The CDC notes that exercise through activities such as walking and biking reduces the risk of coronary heart disease, high blood pressure, colon cancer, and diabetes; helps control the pain associated with arthritis; helps maintain healthy bones, muscles, and joints; and reduces symptoms of anxiety and depression.[12]

8 People for Bikes, June 2014. Retrieved here: http://www.peopleforbikes.org/blog/entry/bike-use-is-rising-among-the-young-but-it-is-skyrocketing-among-the-old

9 Pucher, John, Buehler, Ralph, Merom, Dafna, and Adrian Bauman. "Walking and Cycling in the United States, 2001-2009: Evidence From the National Household Travel Surveys" (December 2011). American Journal of Public Health. 101 (Suppl 1): S310-S317. < https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3222478/>

10 "Percent of adults who engage in no leisure-time physical activity by Age" (2014). Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention. < https://nccd.cdc.gov/NPAO_DTM/DetailedData.aspx?indicator=36&statecode=94&int_type=3>

11 Erickson, Kirk, Gildengers, Ariel, and Meryl Butters. "Physical activity and brain plasticity in late adulthood" (March 2013). Dialogues in Clinical Neuroscience. 15(1): 99-108. < https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3622473/>

12 "Physical Activity and Health: A Report of the Surgeon General" (1999). Centers for Disease Control and Prevention. < http://www.cdc.gov/nccdphp/sgr/olderad.htm>

CHILDREN

Metric: Children are defined as individuals 14 years old and younger. This threshold was determined based on the legal age for driving in South Carolina. At age 15, young adults are eligible for a learner's permit, and after 180 days young adults are eligible for a provisional driver's license. While conditional, even a permit and provisional driver's license broaden a young person's mode of choice, and significantly increase their mobility.

Rationale: Children are considered a vulnerable population for reasons similar to those described above for senior citizens. First, they have limited mobility options- they cannot drive themselves and are thus subject to any restrictions in vehicle access that their parents or guardians may have. Second, while walking and biking can offer excellent forms of physical activity and transportation access to school and extracurricular activities, children's cognitive ability to assess risk and to make safe choices is not fully developed so they are more vulnerable to dangerous traffic and safety conditions. As such, children face more barriers and obstacles to walking and bicycling- physical barriers such as lack of sidewalks or other safe facilities, as well as imposed barriers in terms of parental restrictions on walking or biking due to safety concerns. These issues together amount to a scenario where children are vulnerable to limitations in their ability to walk or bike for transportation or for exercise, as well as a vulnerability to safety concerns while doing so. Secondarily, they are vulnerable to limitations to their physical activity levels, and subsequently to the adverse health outcomes related to decreased physical activity.

As parents, physicians and policy makers look for ways to curb childhood obesity, they may need to look no further than a child's own backyard. Studies show that children are less likely to be obese if they live in a neighborhood that is safe and within walking or bicycling distance of parks and retail services. The U.S. has been experiencing a growing trend in overweight

Children are considered a vulnerable population because they have limited mobility options and their cognitive ability to assess risk and to make safe choices is not fully developed.

and obesity among youth and children and recent evidence shows that approximately 13.9% of adolescent s are obese[13] and 16.6% are overweight.[14]

Physical inactivity impacts weight, and in an effort to curb the growing obesity epidemic there is an increasing body of research that has examined associations between local area environmental factors and physical activity among youth. Greater availability of outdoor play and sports areas, parks, and commercial physical activity-related facilities have been associated with higher levels of physical activity in children and youth.[15,16] In addition to the physical environment, a child's social environment, such as perceptions of neighborhood safety and cohesion, was positively associated with several measures of physical activity and negatively associated with obesity.[17] Together, improved walking and biking infrastructure, as well as community programs all contribute to increased levels of physical activity and improved health outcomes.

NON-WHITE POPULATIONS

Metric: Non-white is measured as the percentage of all individuals not identifying as white and not of Hispanic origin. This includes people identifying as Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, or some other race.

13 "Percent of students in grades 9-12 who are obese" (2013). Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention. < https://nccd.cdc.gov/NPAO_DTM/DetailedData.aspx?indicator=63&statecode=121>

14 "Percent of students in grades 9-12 who are overweight" (2013). Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention. < https://nccd.cdc.gov/NPAO_DTM/IndicatorSummary.aspx?category=28&indicator=64>

15 Alexander, Dayna, Huber, Larissa, Piper, Crystal, and Amanda Tanner. "The association between recreational parks, facilities and childhood obesity: a cross-sectional study of the 2007 National Survey of Children's Health" (January 30, 2013). Journal of Epidemilology & Community Health. 67:427-431. < http://jech.bmj.com/content/67/5/427>

16 Qazi, Hammad. "Childhood obesity and parks and playgrounds: A review of issues of equality, gender and social support" (April 2011). Journal of Research in Medical Sciences. 16(4): 553-558.

17 Franzini, et al. "Influences of Physical and Social Neighborhood Environments on Children's Physical Activity and Obesity" (February 2009). American Journal of Public Health. 99(2): 271-278. < https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2622771/>

Rationale: Urban communities with more racial and ethnic minority and lower-income residents often lack specific features that support walking and bicycling. Clean and well-maintained sidewalks, trees, nice scenery, and safety are necessary for residents to take advantage of a walkable neighborhood design. The presence of parks, open space, and other recreational facilities is consistently linked with higher physical activity levels among children and adolescents. However, many studies show that lower income groups, as well as racial and ethnic minorities have limited access to well maintained and safe parks and recreational facilities. Moreover, their communities experience more crime and traffic, all of which adversely impacts safety and a resident's willingness to walk and bike.

In a 2008 study published in the American Journal of Preventative Medicine, neighborhoods with high minority populations were significantly less likely to have access to recreational facilities than neighborhoods with high white populations, except both groups appeared to have equal access to public parks.[18] A 2013 study on the quality of parks found that while there may be equal access to parks, the amenities included in those parks differ.[19] Parks in areas with high minority populations were more likely to have basketball courts and less likely to have trails. Access to parks and other recreational facilities such as walking and bicycling paths has been found to be associated with lower rates of youth and adult obesity and the incidence of disease.[20]

18 Moore, et al. "Availability of Recreational Resources in Minority and Low Socioeconomic Status Areas" (January 2008). American Journal of Preventative Medicine. 34(1): 16-22. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2254179/>

19 Vaughan, Katherine, Stanis, Sonja, and Ryan Bergstrom. "Exploring the Distribution of Park Availability, Features, and Quality Across Kansas City, Missouri by Income and Race/Ethnicity: an Environmental Justice Investigation" (2013). Annals of Behavioral Medicine. 45 (Suppl 1):S28-S38. <http://activelivingresearch.org/files/ABM2013_Vaughan.pdf>

20 Blank, et al. "Let's Go to the Park Today: The Role of Parks in Obesity Prevention and Improving the Public's Health" (October 2012). Childhood Obesity. 8(5): 423-428. <http://www.nrpa.org/uploadedFiles/nrpa.org/Publications_and_Research/Research/Papers/Role-Parks-Obesity-Prevention.pdf>

Many studies show that lower-income groups and racial and ethnic minorities have limited access to well-maintained, safe parks and recreational facilities, and their communities experience more crime and traffic, all of which impacts safety and the residents' willingness to walk and bike.

LOW-INCOME HOUSEHOLDS

Metric: Low-income is measured as the percent of the population living below two times the federal poverty level or roughly $50,000 and below in 2015 dollars.

Rationale: Low-income populations are more likely to depend on walking or bicycling to reach work, school, public transportation, or other destinations[21] and were found to be 4.5 times more likely not to have access to recreational facilities compared to higher-income areas.[22] A 2013 study found that while the rate of walking and bicycling was highly associated with "attractive" neighborhoods, how people defined attractive varied by income. The factors significantly associated with an increase in how often people in lower-income households walked or biked in a week included: higher neighborhood density, easy access to destinations, a younger average household age, having access to bicycles, and lower rates of automobile ownership. "What drives these two groups of people to walk or bike is quite different," said study author Cynthia Chen of the University of Washington. "For higher-income people, walking and biking is largely the result of choice. For the lower-income group, walking and bicycling appears to be the result of constraints, in which case higher neighborhood density and easy access to destinations are positively associated with more walking or bicycling."[23]

Additionally, access to a bicycle rises with household income. According to a government survey of nearly 10,000 Americans: just 29% of those with household incomes less than $15,000 had regular access to a bicycle, 47% with incomes $30,000-$49,000 had access, and 65% with incomes $75,000 or more had access.[24]

VEHICLE ACCESS

Metric: Motor vehicle access is measured from a question on the American Community Survey about whether a household has access to one or more cars, trucks, or vans.

Rationale: Households with limited or no access to motor vehicles by necessity have to take advantage of other transportation options such as walking, bicycling, and transit. A 2013 study by PolicyLink, a national research and action institute that advocates for economic and social equity, found that a lack of transportation options to grocery stores presents a serious barrier to accessing healthy food options, noting "About 2.1 million households do not own a vehicle and live more than one mile from the nearest supermarket." This is especially exacerbated by individuals living in rural and suburban communities with limited access to transit. Lack of transportation options is frequently cited as a barrier to accessing full-service supermarkets and grocery stores.[25]

LINGUISTIC ISOLATION

Metric: Linguistic isolation is measured as percentage of households in which those over the age of 5 speak English "not well" or "not at all".

Rationale: Households that are linguistically isolated may have greater difficulty accessing services that are available to fluent English speakers, such as transportation services and social services.

This side path in Tega Cay is a safe and comfortable place for residents and visitors to walk or bike.

21 Lachapelle, U. "Walk, Bicycle, and Transit Trips of Transit-Dependent and Choice Riders in the 2009 United States National Household Travel Survey" (August 2015). Journal of Physical Activity and Health. 12(8):1139-1147. < https://www.ncbi.nlm.nih.gov/pubmed/25347916>

A U.S. Census Bureau report of bike and walk commute trips from 2008 to 2012 shows that low-income people bike and walk to work the most. Of those who make less than $10,000 a year, 8.2% commute by foot and 1.5% by bike. In the $25,000-$35,000 range, those numbers are halved. Then at the highest earning levels, active commuting rates start to increase back up. This provides evidence that safe walking and bicycling infrastructure isn't mainly the concern of middle-income and the wealthy:

"Walking and Bicycling to Work by Household Income" (May 9, 2014). < http://www.bicyclemobile.org/walking-and-bicycling-to-work-by-household-income/>

22 Moore, et al. "Availability of Recreational Resources in Minority and Low Socioeconomic Status Areas" (January 2008). American Journal of Preventative Medicine. 34(1): 16-22. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2254179/>

23 Langston, Jennifer. "What motivates people to walk and bike? It varies by income" (January 6, 2016). UWToday. < washington.edu/news/2016/01>

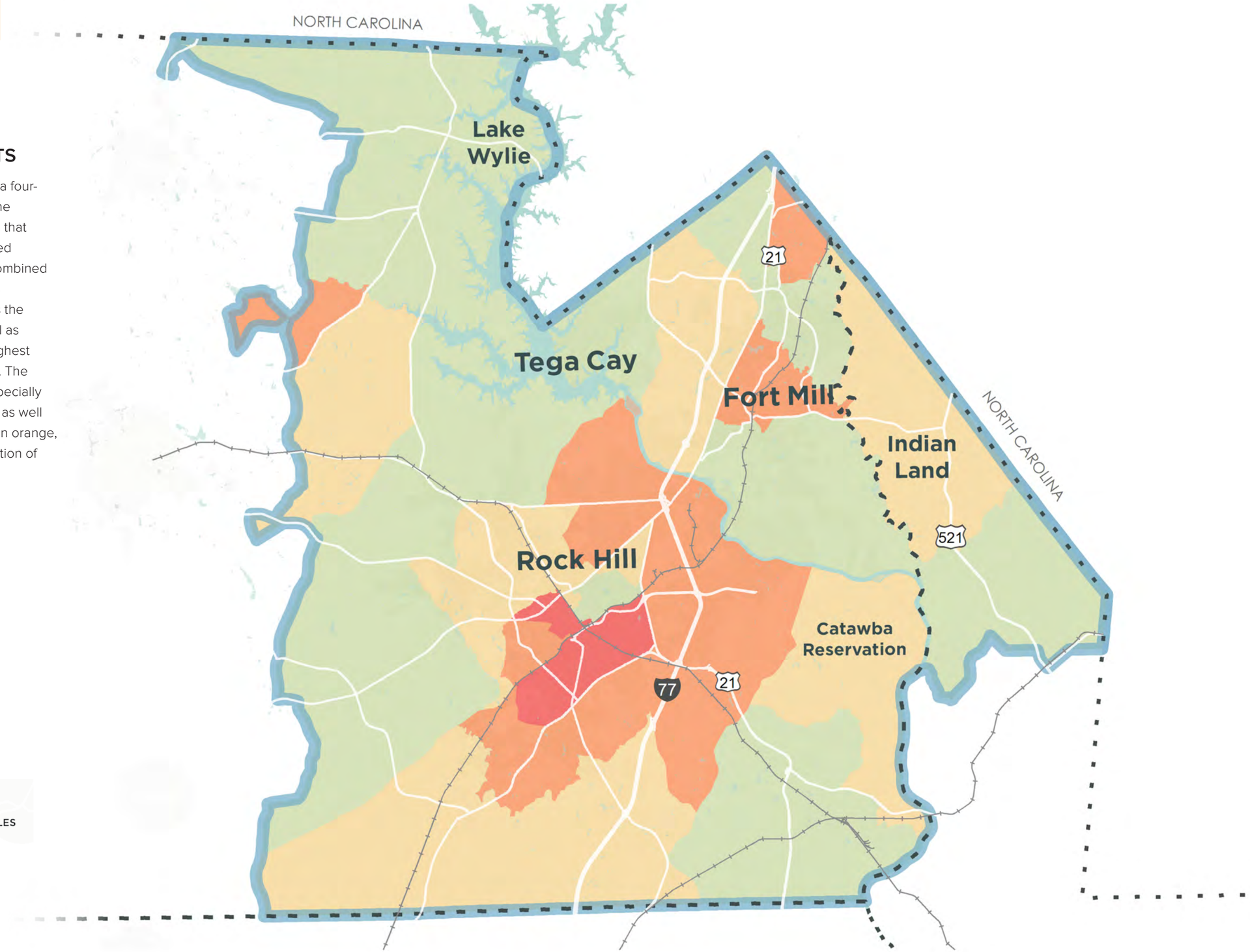
24 Royal, D., and D. Miller-Steiger. "National Survey of Bicyclist and Pedestrian Attitudes and Behavior" (2008). National Highway Traffic Safety Administration

25 Bell, Judith, et al. "Access to Healthy Food and Why It Matters: A Review of the Research" (2014) Policy Link. < http://thefoodtrust.org/uploads/media_items/access-to-healthy-food.original.pdf>

EQUITY MAP

EQUITY ANALYSIS: RESULTS

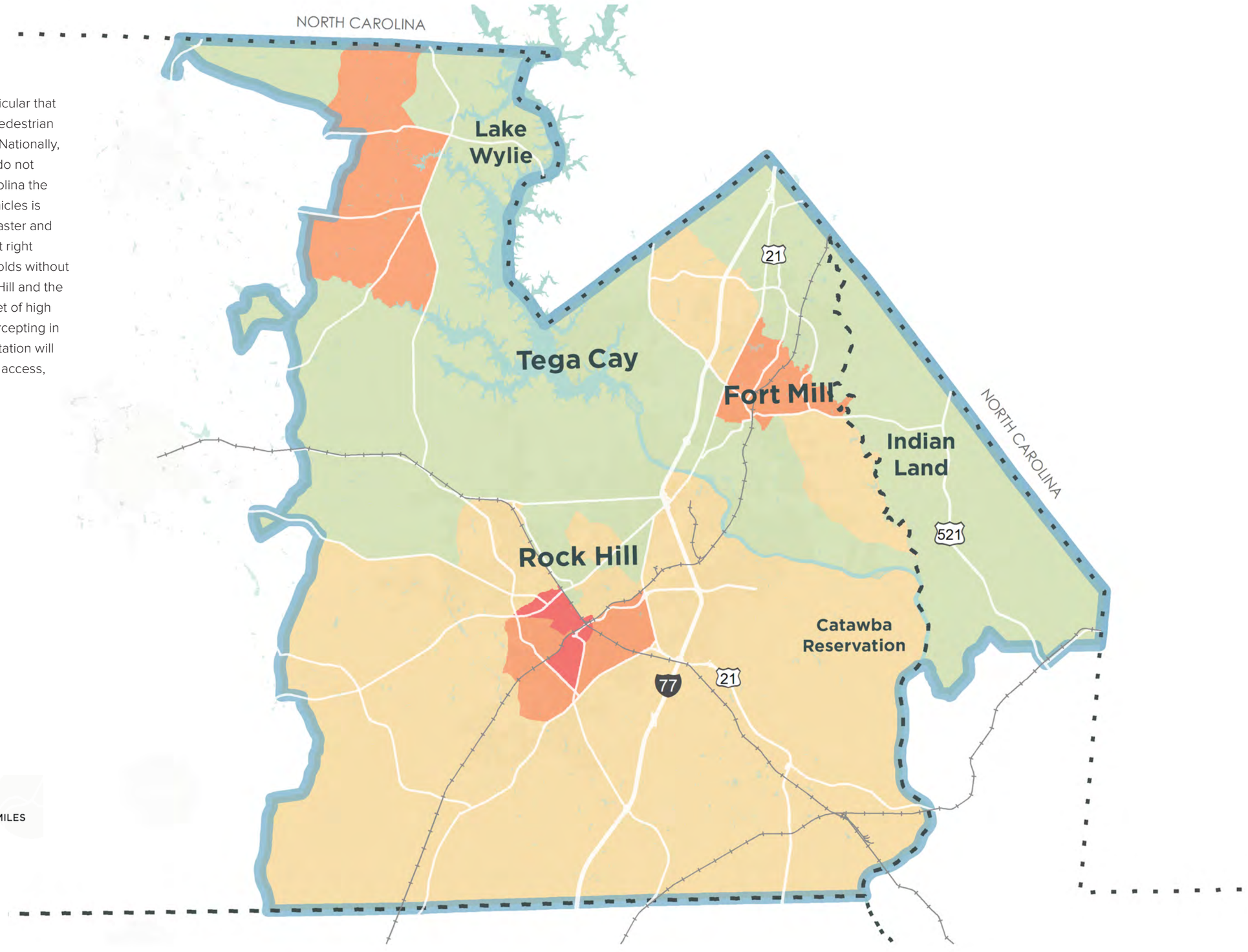
The composite equity map at right uses a four-tiered scale to show concentrations of the six vulnerable population characteristics that are described on the previous pages. Red represents high concentrations of the combined six characteristics and green represents low concentrations. The analysis reveals the downtown district of the City of Rock Hill as the area in the RFATS region with the highest concentration of vulnerable populations. The area in and around the City's border, especially heading east toward the Catawba River, as well as downtown Fort Mill, are represented in orange, depicting the second-highest concentration of vulnerable populations.



Source: United States Census Bureau; American Community Survey 2014 ACS 5-Year Estimates

VEHICLE ACCESS

This map highlights one criteria in particular that is especially relevant for bicycle and pedestrian planning – household vehicle access. Nationally, approximately 4.5% of all households do not have access to a vehicle. In South Carolina the percentage of households without vehicles is 2.6%, and the rate is 2.1% in both Lancaster and York counties. However, as the map at right shows, high concentrations of households without vehicles are found in the City of Rock Hill and the Town of Fort Mill. There is also a pocket of high concentration west of Lake Wylie. Intercepting in these areas to provide active transportation will be key for improving and transforming access, mobility, and quality of life.



Source: United States Census Bureau; American Community Survey 2014 ACS 5-Year Estimates

SAFETY SUMMARY

This section reviews bicycle and pedestrian-involved collisions in Lancaster and York counties from January 1, 2010 to December 31, 2014. The data is derived from crash reports submitted to the Department of Public Safety by local police agencies. As such, this count likely underestimates the total number of pedestrian- and bicyclist-related collisions that have occurred due to underreporting, near misses, and incidents where only minor injuries occurred.

From 2010 to 2015, 364 pedestrian- and bicyclist-involved collisions occurred in York and Lancaster counties. Almost three quarters of these were pedestrian-involved collisions (Figure 4).

The vast majority of all 364 collisions — 95% — resulted in a fatality, injury, or possible injury of the pedestrian or bicyclist (Figure 5). Collisions were almost evenly split between occurring at night (45%) and during the day (51%). Only 4% of all crashes occurred during dawn or dusk (Figure 6). The high percentage of collisions that occurred at night indicate a need for various countermeasures, such as safety education concerning visibility and lights, motorist education regarding being aware and looking for people walking and on bikes, or other means to improve visibility like reflective signage and lighting at intersections and pedestrian scale lighting.

The vast majority of all 364 collisions involving a bicyclist or pedestrian— 95% — resulted in a fatality, injury, or possible injury of the pedestrian or bicyclist

People of all ages were involved in collisions, particularly those between the ages of 10 and 54, though 20-24 year olds were involved most-frequently (Figure 7). Age is an important consideration to note. Ages 15 - 24 are significantly less likely to report a collision even after controlling for location and severity. The 20-24 year old age group may also indicate university student involvement.

Older adults require more time to cross a roadway, are more vulnerable to injury when collisions occur, and are more susceptible to other non-collision events which can cause injury but may not involve a vehicle, like tripping on sidewalks and slipping on curbs. Further, children are disproportionately affected by unsafe walking conditions too. They often walk to schools built along busy arterial or major roads, putting them at higher risk. Children also use neighborhood streets as areas to ride bikes and play games. They can go unseen by drivers, especially those backing out.

State traffic collision data show that Lancaster County has a pedestrian fatality rate of 0.70 per 100,000 population, and that York County has a rate of 1.49 per 100,000. These rates are lower than the state average (2.29 per 100,000) and the U.S. (1.56 per 100,000). However, finding ways to draw this rate closer to zero will be an important goal for promoting pedestrian safety in the RFATS region.

PEDESTRIAN AND BICYCLIST COLLISIONS IN RFATS (2010-2014)

Figure 4. Collision type

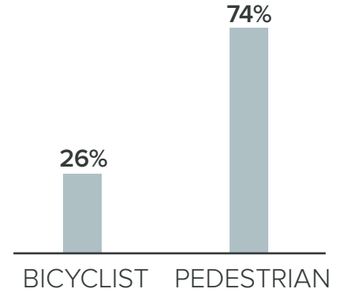
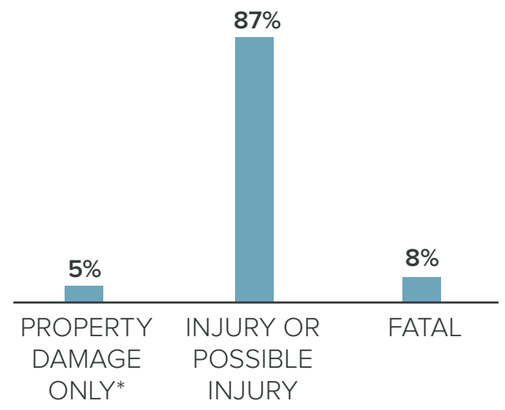
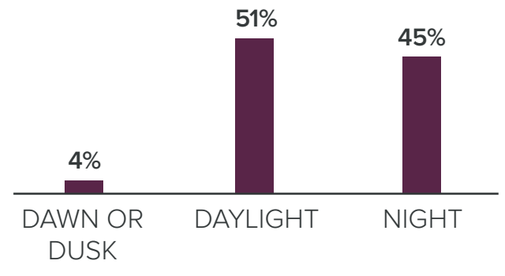


Figure 5. Collision severity for bicyclist and pedestrian collisions



*e.g. Only damage to bicycle, vehicle, fence.

Figure 6. Time of day for bicyclist and pedestrian collisions



The map on the following page shows the geocoded locations of York and Lancaster County collisions. The map reveals clusters of collisions, especially in the City of Rock Hill. These crashes are heavily concentrated around the downtown business district.

Specific corridors in Rock Hill where collisions are concentrated include:

- N. Anderson Road
- N. Cherry Road
- Celanese Road
- Heckle Boulevard

Specific intersections in Rock Hill where collisions are concentrated include:

- Celanese Road and Mount Gallant Road
- Cherry Road and Mount Gallant Road
- N. Anderson Road (Route 21 Bypass) and Nations Ford Road
- Cherry Road and Oakland Avenue
- Cherry Road and Riverview Road

In the Town of Fort Mill, collision hotspots are:

- Harris Street/Harris Road crossing the 21 Bypass
- SC 160 crossing I-77

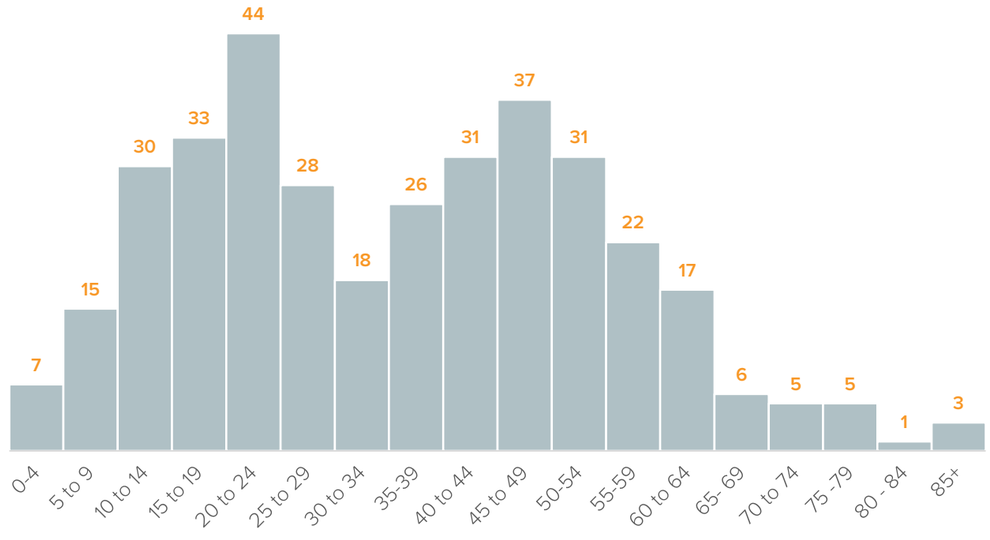
Outside of these two centers, collisions have most frequently occurred at the following intersections and corridors:

- Gold Hill Road
- Carowinds Boulevard and Festival Drive
- Charlotte Highway (SC 49)
- Hands Mill Highway (SC 274)

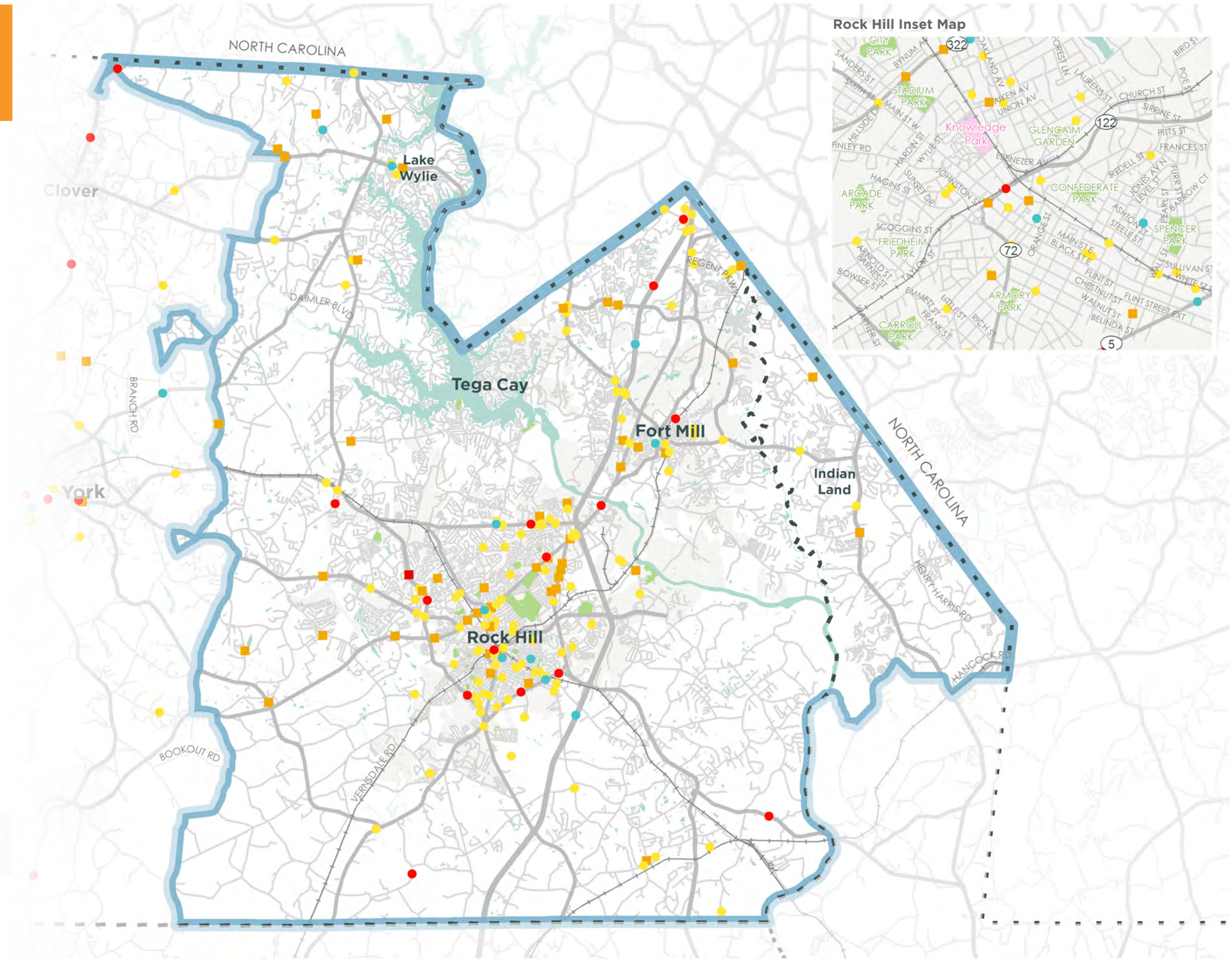
"There needs to be more driver awareness about cyclists and pedestrians. Two kids biking on my street have been hit by a car."

-Nancy, RFATS resident

Figure 7. Frequency of bicyclist and pedestrian collision by age group (2010-2014)



BICYCLIST AND PEDESTRIAN COLLISION MAP (2010-2014)



Bicyclist Collision Severity

- Fatality
- Injury
- Property Damage Only*

*e.g. Only damage to bicycle, vehicle, fence.

Pedestrian Collision Severity

- Fatality
- Injury
- Property Damage Only*

*e.g. Only damage to bicycle, vehicle, fence.

N

0 2 4 MILES

Source: Department of Public Safety

CHAPTER 12

Pedestrian and Bicycle Suitability Analysis

ANALYSIS SUMMARY

The consultant team conducted a Pedestrian Suitability Analysis (PSA) and Bicycle Suitability Analysis (BSA) for the RFATS region. This analysis identifies areas where demand for walking and bicycling trips is high, and compares these locations with supply model outputs (Pedestrian Level of Service and Bicycle Level of Traffic Stress) that estimate pedestrian and bicyclist comfort along each roadway segment. This comprehensive look at comfort, safety, demand, and infrastructure supply for people walking and people on bikes can be used to identify areas in need of improvement, and to prioritize projects where infrastructure needs meet trip demands.

SUPPLY MODEL — PEDESTRIAN LEVEL OF SERVICE AND BICYCLE LEVEL OF TRAFFIC STRESS ANALYSES (PLOS & BLTS)

The Pedestrian Level of Service (PLOS) and Bicycle Level of Traffic Stress (BLTS) analyses provide objective, data-driven scores of roadway comfort for pedestrian and bicycle travel. The results of these models are incorporated into Alta's Pedestrian and Bicycle Suitability Analyses (PSA and BSA) to identify pedestrian and bicycle network gaps and potential projects and aid in system-wide prioritization.

Each analysis incorporates the recent research on factors that impact pedestrian and bicycle comfort and safety, and was tailored to the RFATS region using the data available. Each model analyzed the full roadway network within the RFATS region, excluding limited access highways, to provide a full picture of connectivity around the region.

PLOS ANALYSIS

The goal of the Pedestrian Level of Service Analysis was to understand the level of comfort that pedestrians experience throughout the street network in the RFATS region. The main unit of analysis is the street segment. A level of service was identified for each roadway segment in the study area, except for limited access highways, which were excluded from the analysis.

The segment-based Pedestrian Level of Service Analysis (PLOS) measures pedestrian safety using three factors: posted speed limit, number of travel lanes, and the presence of sidewalks. The PLOS follows a four-point scale, with 1 representing the highest comfort level. Generally, more pedestrian space, such as sidewalks, correlates to a higher comfort level. If sidewalks are provided on only one side of a multi-lane street, pedestrian comfort degrades since pedestrians are forced to cross the street to reach that sidewalk.

A full explanation of methodology and results can be found in the Appendix.

PLOS ANALYSIS RESULTS

The results of the pedestrian segment-based supply analysis can be seen in the map on the following page. Low speed roadways with buffers and sidewalks, the links with the highest level of pedestrian comfort, are shown in dark green. Roads with a higher level of stress for pedestrians are shown in orange and red. The highest levels of comfort are found in downtown Rock Hill and Fort Mill, as well as the neighborhoods of Tega Cay and Fort Mill. This is largely due to the extensive sidewalk network that already exists and the low-speed and low-volume neighborhood streets. Some collector and arterial streets have medium comfort levels due to the presence of sidewalks and moderate speed limits. Comfort decreases on these thoroughfares as speed limits and number of lanes increases, and as the sidewalk network dissipates. Looking at the region as a whole, there are clusters of high-comfort pedestrian networks along local roads, but these safe walking environments are isolated from one another and bisected by low comfort links.

PEDESTRIAN LEVEL OF SERVICE ANALYSIS RESULTS

Least Comfortable

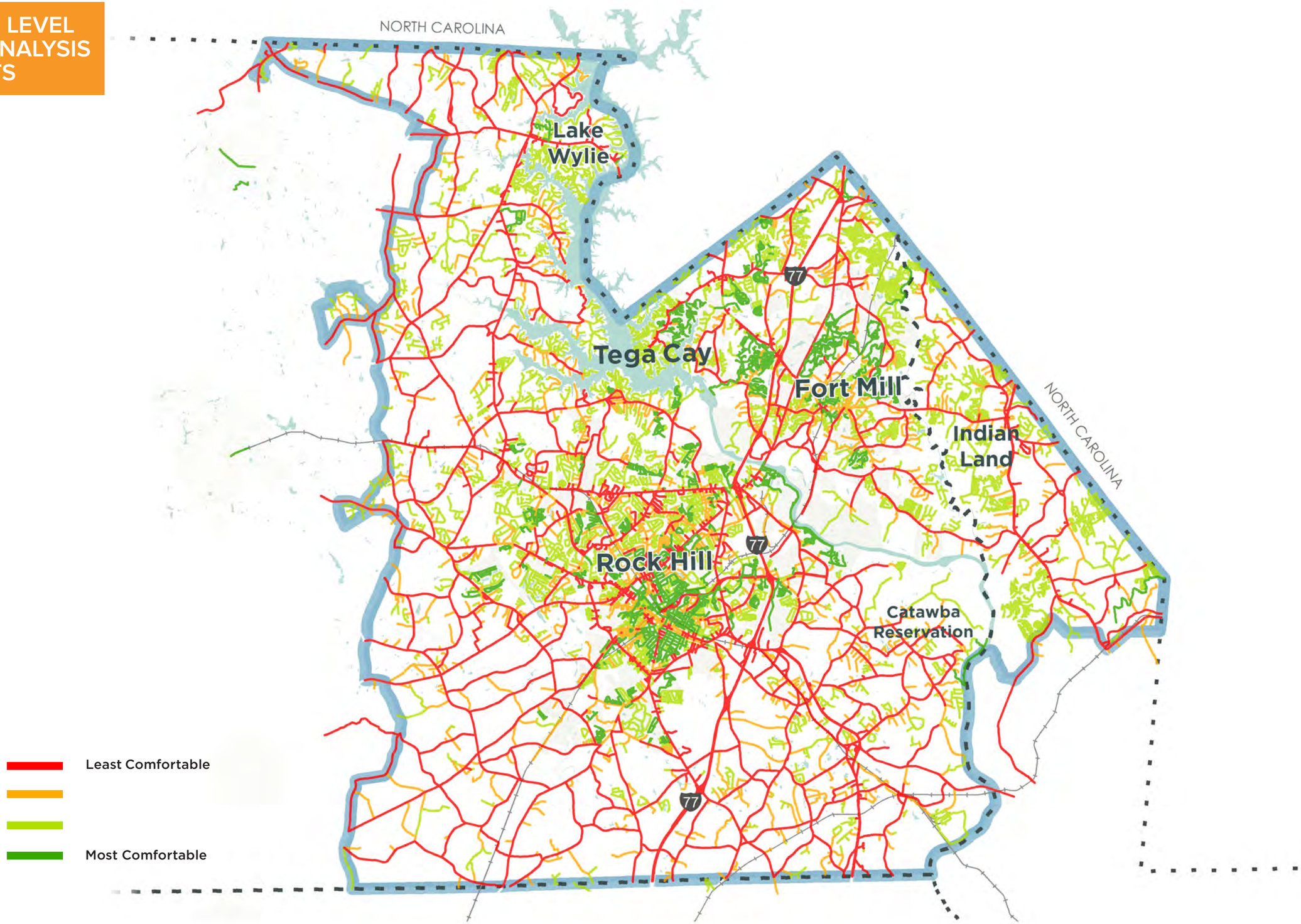
33%
206 miles

19%
119 miles

35%
215 miles

13%
79 miles

Most Comfortable



BLTS ANALYSIS

The methods used for the Level of Traffic Stress Analysis were adapted from the 2012 Mineta Transportation Institute's (MTI) Report 11-19: Low-Stress Bicycling and Network Connectivity. The approach outlined in the MTI report uses roadway network data - including posted speed limit, the number of travel lanes, and the presence and character of bicycle lanes - as a proxy for bicyclist comfort level. Road segments are classified into one of four levels of traffic stress based on these factors. The definitions of each level of traffic stress are shown in Table 4. Generally, the lowest level of traffic stress, LTS 1, is assigned to roads that would be tolerable for most children to ride, and also to multi-use paths that are separated from motorized traffic; LTS 2 roads are those that could be comfortably ridden by the mainstream adult population; LTS 3 is the level assigned to roads that would be acceptable to current "enthused and confident" cyclists; and LTS 4 is assigned to segments that are only acceptable to "strong and fearless" bicyclists, who will tolerate riding on roadways with higher motorized traffic volumes and speeds.

The Level of Traffic Stress analysis completed for the RFATS area builds on the MTI approach, expanding it to incorporate the impact on comfort of traffic volumes and the presence of sharrows. The resulting categorization of each segment of the RFATS road network is termed 'Level of Traffic Stress Plus', to highlight its divergence from the original model.

A full explanation of methodology, including the scoring matrix, and results can be found in the Appendix.

BLTS ANALYSIS RESULTS

The results of the segment-based Level of Traffic Stress Plus Analysis are shown on the map on the following page. As was the case for the pedestrian level of service, the major regional links of the RFATS area – the collector and arterial corridors – present the biggest challenge for bicyclists both to traverse and cross. A significant share of the network consists of low-stress (LTS 1 to 2) streets though, shown in green and light green.

Individually, these islands of low-stress streets are comfortable to ride for most adults, but they are isolated from one another by larger roads with higher traffic speeds that disrupt bicycle mobility. Perhaps most notable of these disruptions is the low-comfort connection between Fort Mill and Rock Hill.

Table 4. Level of Traffic Stress Descriptions

LTS 1	Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bike ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
LTS 2	Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a right-turn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults.
LTS 3	More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians.
LTS 4	A level of stress beyond LTS 3

BICYCLE LEVEL OF TRAFFIC STRESS ANALYSIS RESULTS

Most Stress

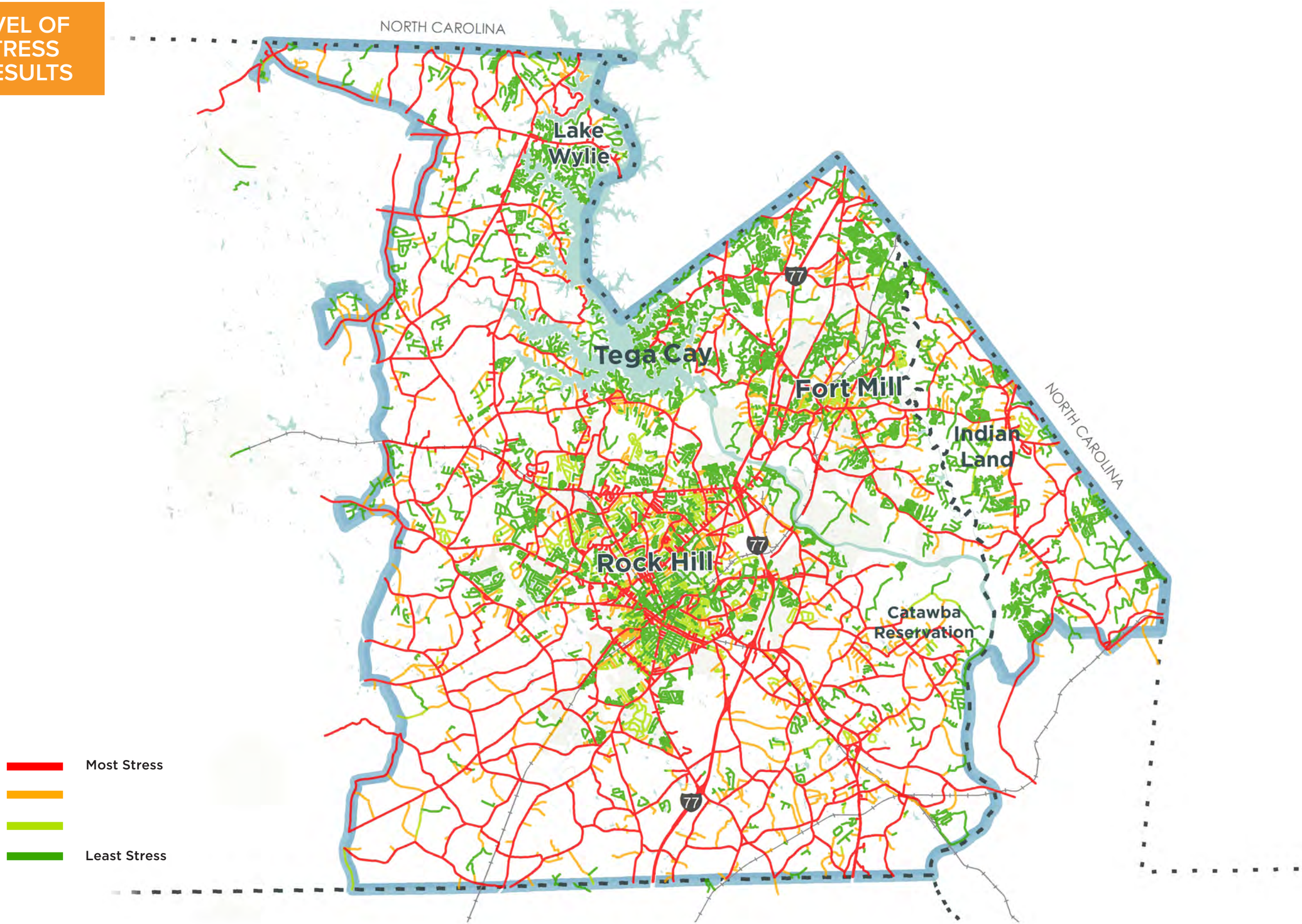
36%
220 miles

17%
107 miles

8%
49 miles

39%
243 miles

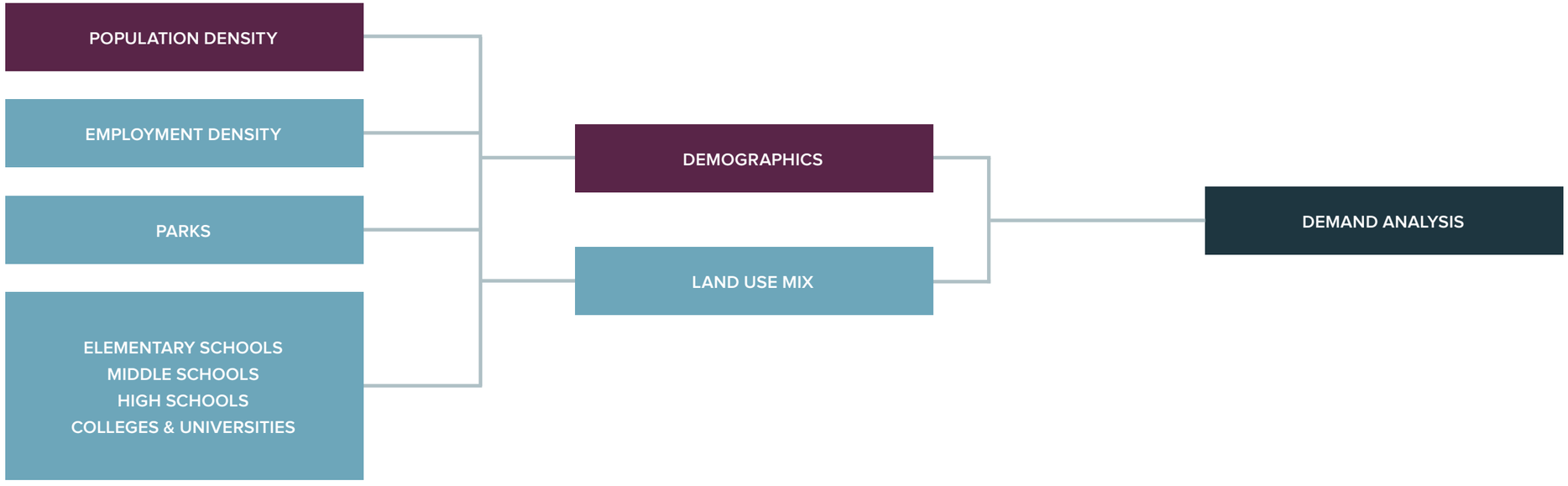
Least Stress



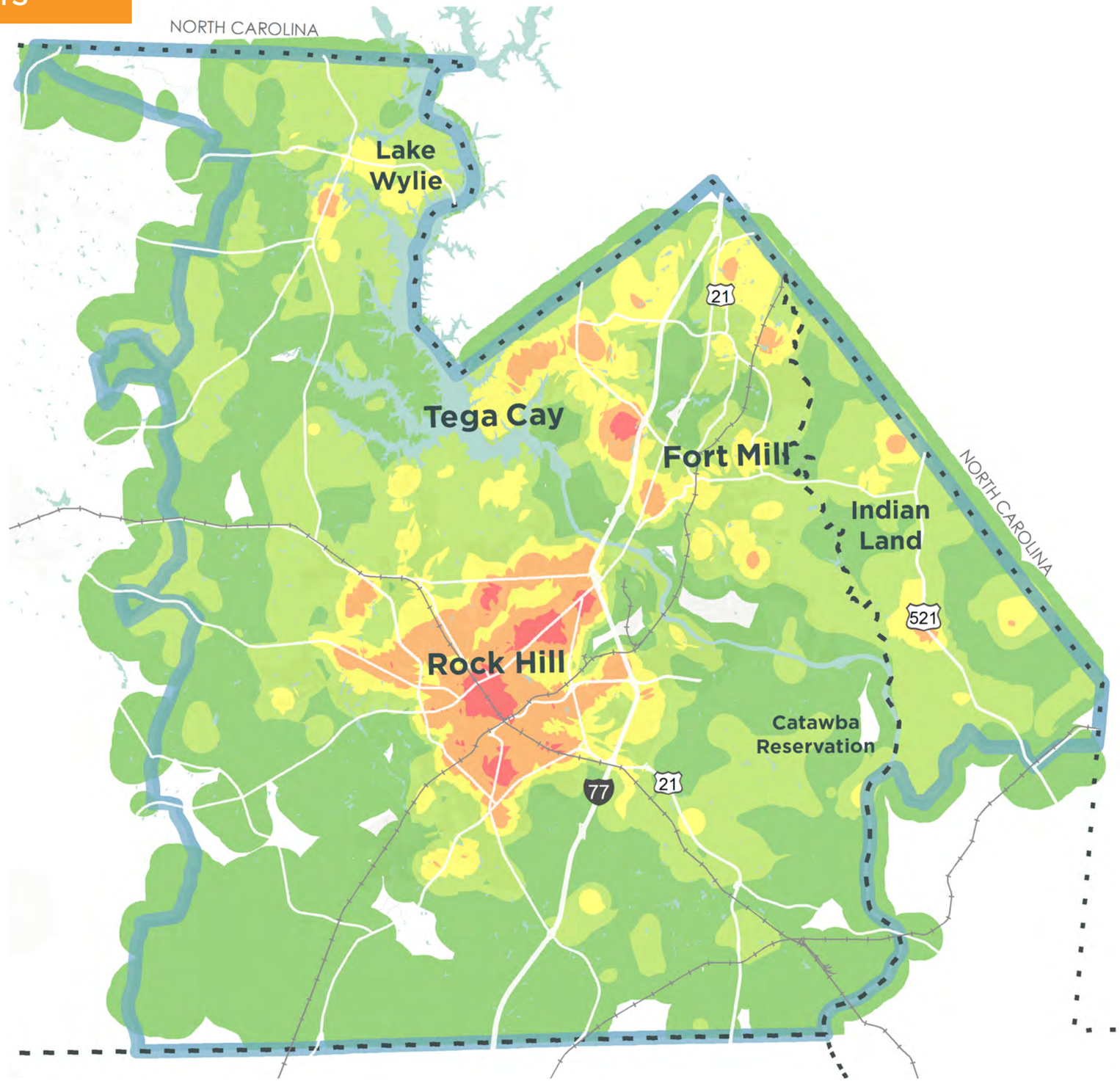
DEMAND MODEL

The demand model identifies expected pedestrian and bicycle activity by overlaying the locations where people live, work, play, and learn into a composite sketch of regional demand. Figure 8 summarizes this approach.

Figure 8. Demand Model Composite Sketch

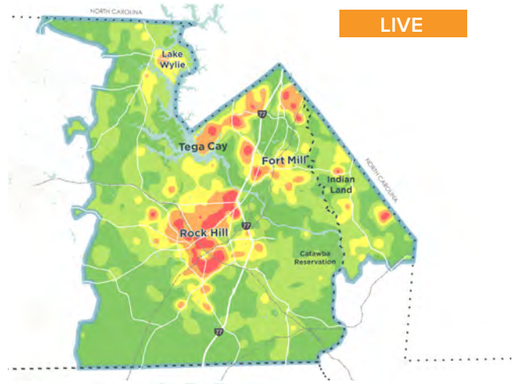


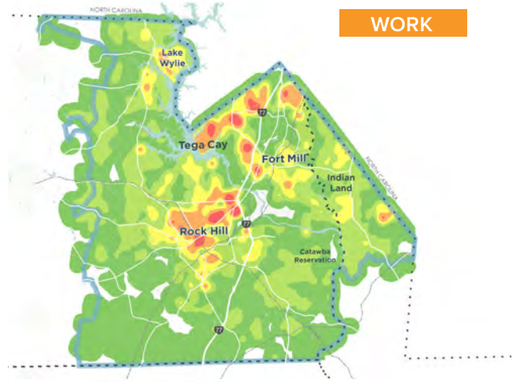
DEMAND MODEL RESULTS

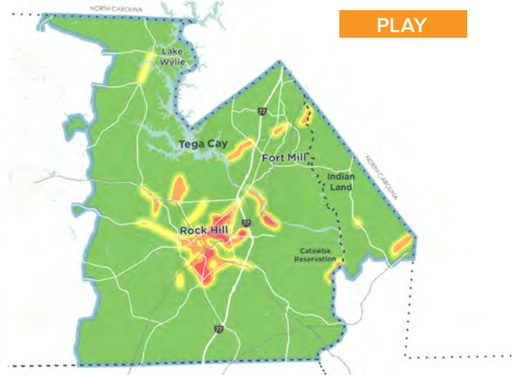


Demand for Active Transportation

- Highest
- Lowest







PEDESTRIAN AND BICYCLE SUITABILITY ANALYSIS (PSA & BSA)

To build upon the level of service analyses presented in the previous section, the consultant team conducted a Pedestrian Suitability Analysis (PSA) and Bicycle Suitability Analysis (BSA) for Bike Walk RFATS. The PSA and BSA build on the Pedestrian Level of Service and Bicycle Level of Traffic Stress models completed previously. These models identify areas of demand for pedestrian and bicycle travel, and then overlay supply (Pedestrian Level of Service and Bicycle Level of Traffic Stress) and demand.

The Pedestrian and Bicycle Suitability Analysis is an objective, data-driven process to identify network gaps as potential projects in areas of high pedestrian and bicycle activity. In the first step, the quality of the user experience along and across the existing network of roadways and trails was measured and termed supply. Next, the potential for walking trips was measured based on the proximity and density of trip generators (such as homes and workplaces) and trip attractors (such as shopping centers and parks) and termed demand. Supply and demand were then overlaid to identify priority areas for infrastructure improvements.

A summary of the findings from this analysis are presented in the following section. A detailed report explaining the suitability analysis methodology and full results can be found in the Appendix.

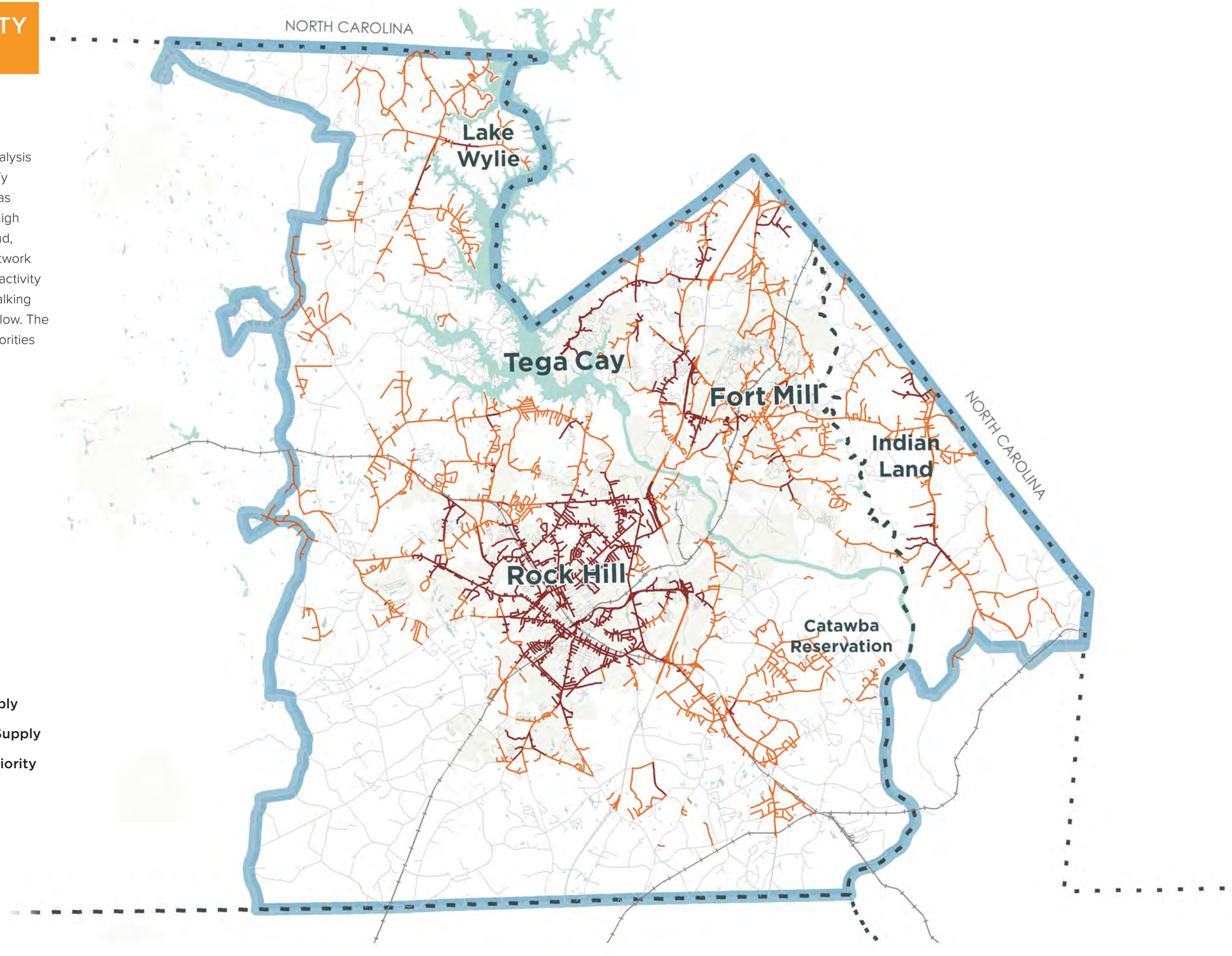
Lack of pedestrian facilities such as gaps in the network decrease comfort and safety for people walking.

PEDESTRIAN SUITABILITY ANALYSIS RESULTS

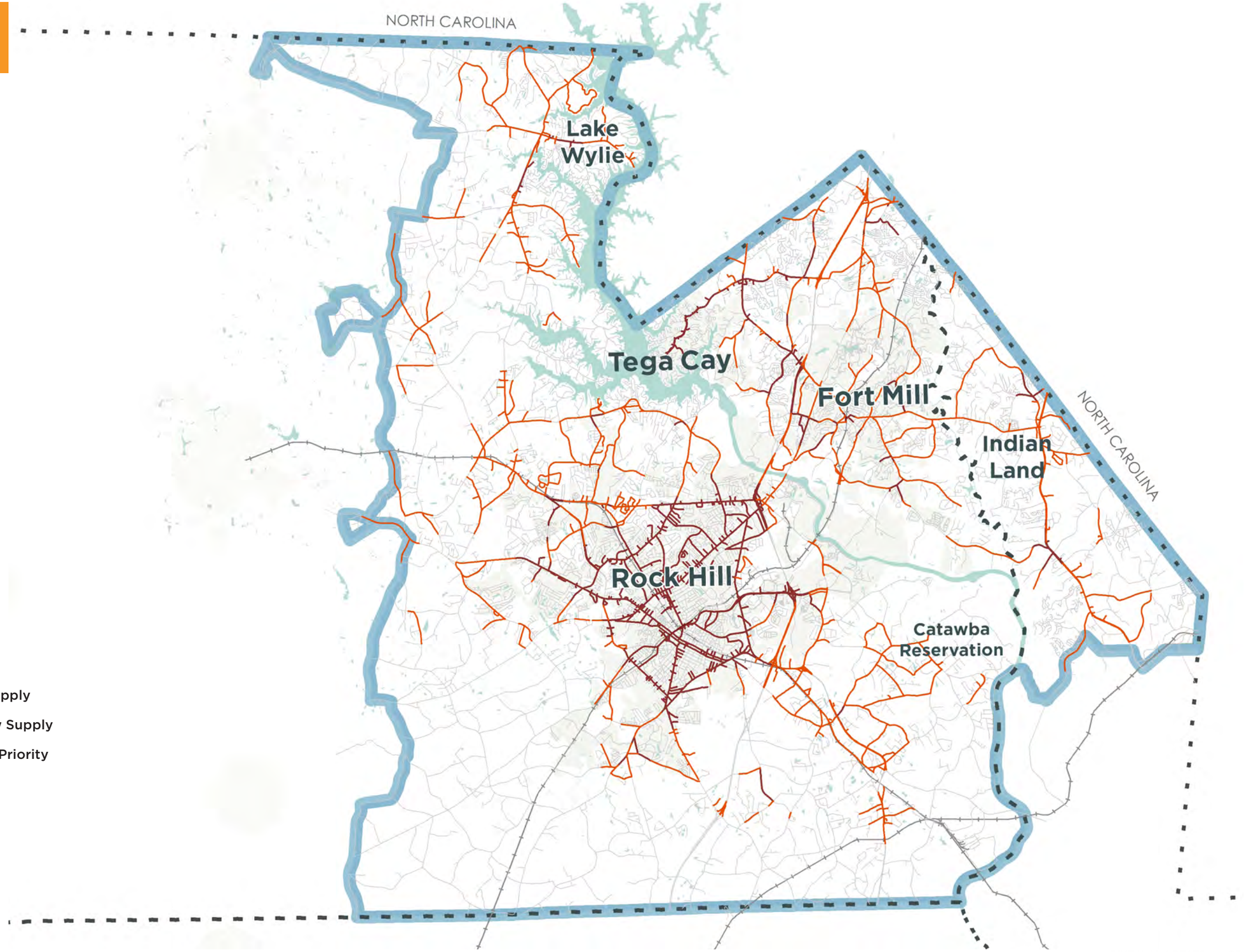
BICYCLE SUITABILITY ANALYSIS RESULTS

PEDESTRIAN PRIORITY AREAS

The Pedestrian and Bicycle Suitability Analysis (P/BSA) is a data-driven process to identify network gaps as potential projects in areas where pedestrian and bicycle activity is high but infrastructure supply is low. To that end, the following maps show the roadway network where demand for walking and bicycling activity is either high or medium and supply of walking and bicycling infrastructure is medium or low. The analysis identifies these areas as high priorities for improvement.



BICYCLE PRIORITY AREAS



- High Demand, Low Supply
- Medium Demand, Low Supply
- Not a Recommended Priority

CHAPTER 13

Community-Identified Needs

PUBLIC MEETINGS

The project team held two concurrent public workshops during the existing conditions assessment phase of the RFATS Regional Bicycle and Pedestrian Connectivity Plan to collect input from different resident stakeholders around the region. The meetings were held on the evening of June 27, 2016 at the Lake Wylie Public Library and the Spratt Building in downtown Fort Mill. Both meetings were set up as a drop-in format where participants arrived and participated in the exercises at their leisure. The team set up several display boards with information, as well as maps of existing bikeways and walkways in the RFATS region, and conducted exercises to help determine preferred infrastructure types.

WALKING AND BIKING NETWORK MAPS

During the meetings, participants identified the following observations, challenges, and potential improvements to the pedestrian and bicycle infrastructure in the RFATS region:

- Walk to school—numerous opportunities throughout the region
- Explore an alternative route for York County Bike Route #4
- Ride to work: downtown Fort Mill from nearby neighborhoods
- A desire for additional bike/pedestrian connectivity to downtown Rock Hill from Winthrop University, in-town neighborhoods
- A potential Rails-to-Trails connection between Rock Hill and York
- On SC 49 in the Lake Wylie area, bike/pedestrian connections to parks and between residential subdivisions are needed to facilitate safe transportation for children and seniors
- Connectivity between Riverwalk and downtown Rock Hill
- Neighborhood-to-park connections across the region
- Expand buffer zones to incorporate trails along major arterials
- Incorporate bike facilities along Charlotte Highway (US-521)
- Ensure future connectivity by working with developers and major employers to build interconnected paths and bike facilities

PREFERRED INFRASTRUCTURE IMPROVEMENTS AND POLICIES

Attendees were asked to vote with a fixed number of stickers on pedestrian and bicycle infrastructure improvements that they'd like to see made in the RFATS region. As seen in Figure 9, shared-use side paths and greenways were the most favored improvements with shared lane markings, pedestrian crossing islands and bicycle boulevards being the least requested.

Attendees were also asked to vote with a fixed number of stickers on preferred policy concepts that should receive priority in the RFATS region. As seen in Figure 10, funding/policies, pedestrian/bicyclist education, and motorist education/enforcement were the most favored concepts.

VOTING RESULTS FROM PUBLIC MEETING POSTERS

Figure 9. Preferred pedestrian and bicyclist infrastructure improvements

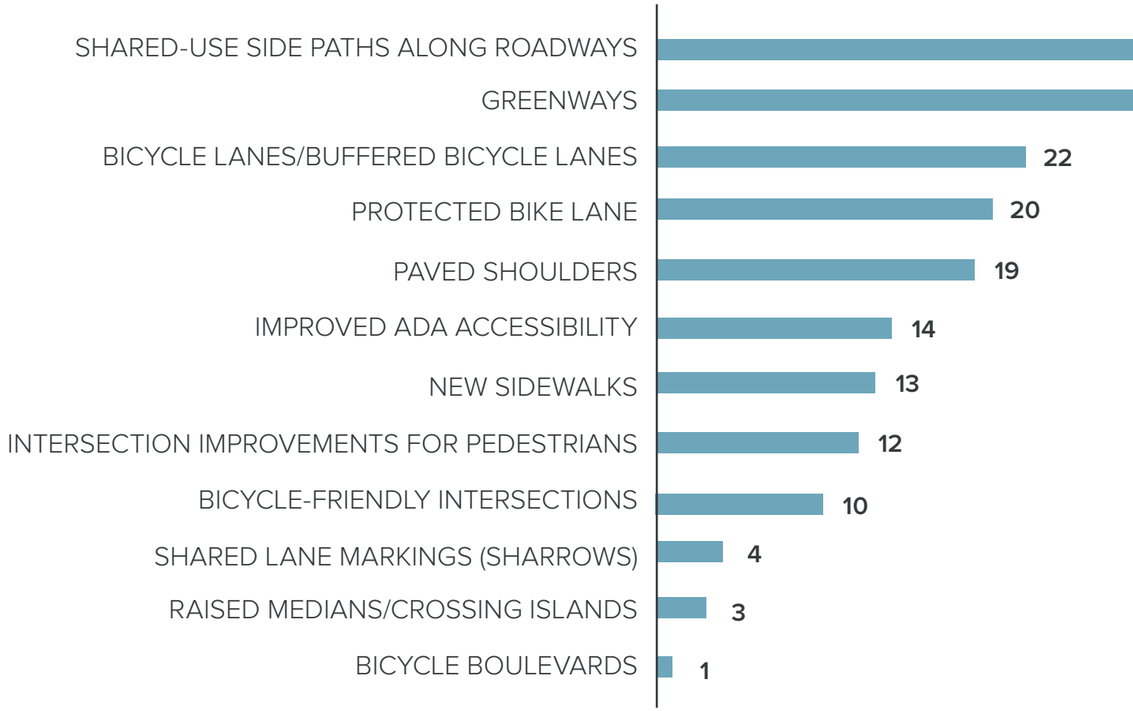
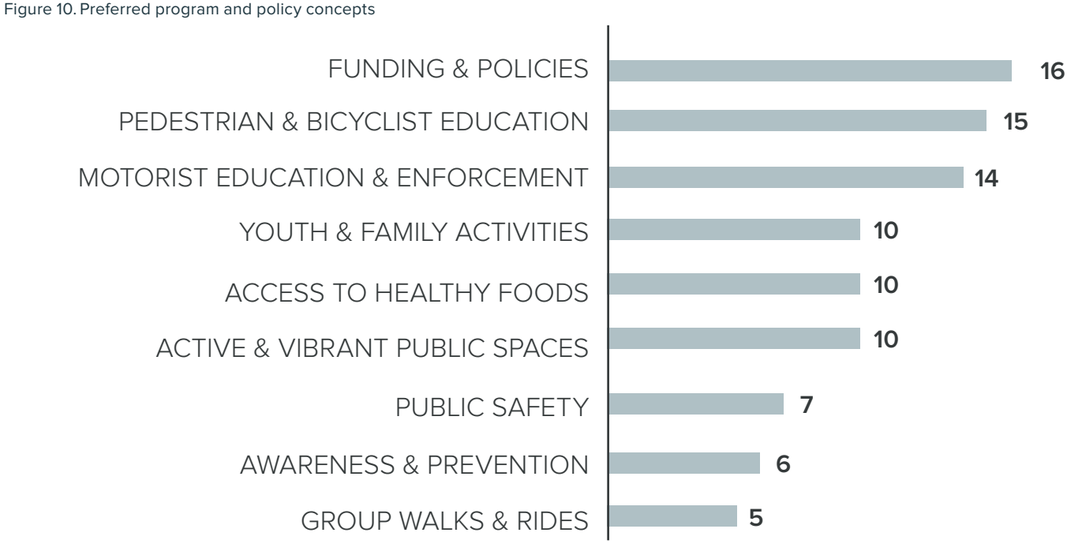


Figure 10. Preferred program and policy concepts



Public meeting participants vote on various types of pedestrian and bicycle infrastructure.

A public meeting participant votes on various types of pedestrian and bicycle programs and policies.

CITIZEN SURVEY

Outreach for Bike Walk RFATS included a citizen survey promoted in both hardcopy and online form. The purpose of the survey was to gain a better understanding of the walking and bicycling behavior of residents of RFATS communities; their opinions on existing walking and bicycling conditions in the RFATS region; and their thoughts on how walking and bicycling in the region could be improved. The comment form was **available online for two months, from June to August 2016.** To maximize the responses to the online form, the web address was distributed at steering committee meetings, public workshops, to local interest groups, in newsletters, in newspaper public service announcements, on the RFATS website and through social media, and on flyers throughout the region. Staff provided hard copy surveys at the public workshop events and at multiple locations in the region. **Over 300 people completed the citizen survey.**

SURVEY RESPONDENTS

The survey included several questions to gather information about the survey respondents. Participants were asked about their age range, gender, where they live, where they work, and ethnic background.

A wide range of age groups were represented:

- 2% of respondents were age 16-24
- 11% were age 25-34
- 28% were age 35-44
- 26% were age 45-54
- 20% were age 55-64, and
- 13% were age 65 or older.

Men and women were evenly represented, with 51.4% female respondents and 48.3% male respondents.

Most participants reported living in the City of Rock Hill (37%), the Town of Fort Mill (22%), or York County (15%). Most participants reported working in Rock Hill (24%), Charlotte/ Mecklenburg County, NC (20%), or Fort Mill (18%). Over 12% of participants were retired. Eighty-nine percent of participants identified as White.

SURVEY RESPONSES – WALKING AND BICYCLING CONDITIONS

Overall, walking and bicycling conditions in the RFATS area are not viewed as safe, practical, or convenient. Survey participants view the existing bicycling conditions more negatively than the existing walking conditions. **Over 62% of respondents disagree with the statement that "Biking in RFATS is a safe, practical, and convenient way to get from one place to another,"** Only 17% agree with the statement, and 21% were neutral or had no opinion. For walking conditions, 56% of participants disagreed with the statement "Walking in the RFATS area is a safe, practical, and convenient way to get from one place to another." Only 24% of participants agreed with the statement, while another 20% were neutral or had no opinion.

Walking is not a widely used mode of transportation for survey respondents, with only 5% of participants reporting walking often to get somewhere (as opposed to walking for exercise or recreation). Twenty-six percent report walking sometimes, while over 28% of participants never walk, and another 41% rarely do so.

Bicycle ridership trends differ from walking, with fewer participants reporting that they never ride a bicycle (22%), and many people riding often (29% ride three or more times a week). In an average week, 69% of survey participants reported riding up to 19 miles on a bicycle. Fourteen percent of respondents report riding between 20 and 49 miles in an average week, while 10% ride 50 to 99 miles and 6% ride 100 or more miles.

Figure 11. Survey responses: Do you walk to get from one destination to another in RFATS?

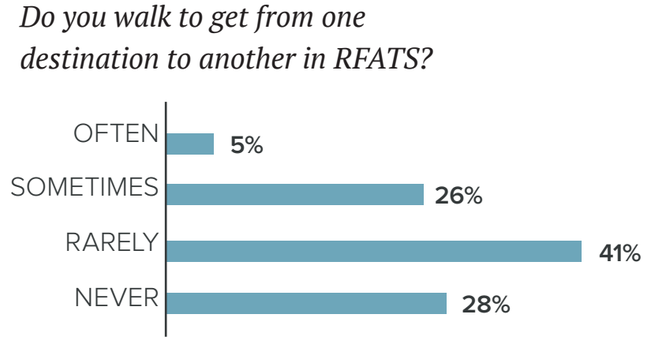
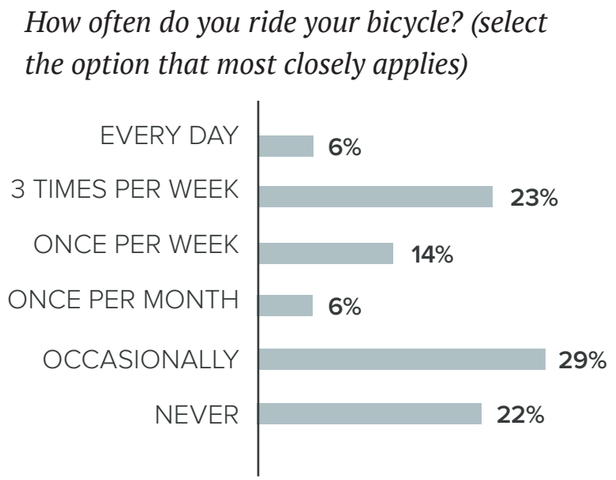


Figure 12. Survey responses: How often do you ride your bicycle? (select the option that most closely applies)



SURVEY RESPONSES – FACTORS THAT IMPROVE WALKING AND BICYCLING

Survey participants were asked to identify factors that would make their community safer and friendlier for walking. The factors that were most highly selected for improving walking conditions were **extending the sidewalk network (76%), filling in gaps in the existing network (69%), and providing more trails and greenways (72%)**. Other popular factors included making intersections and crossings safer (57%), street lighting and benches (52%), pedestrian wayfinding signage (27%), increased law enforcement of drivers yielding to pedestrians (33%), lower speed limits (22%), and media education campaigns (59%). Factors that were not popular included better ADA accessibility and increased law enforcement of jaywalkers.

Respondents were asked a similar question about bicycling facilities, in which they had to select factors that would make their community safer and friendlier for bicycling. The factors that were most highly selected for improving bicycling conditions included: adding bike lanes or shared lane pavement markings (“sharrows”), adding wide (14-foot) outside lanes, adding 2- to 4-foot paved shoulders (without rumble strips), and adding more multi-use trails.

Survey participants were also asked to rank their preferences for the type of bicycle facilities. Respondents strongly preferred separated facilities like separated bike lanes and trails/ greenways, followed closely by regular bike lanes. Bicycle boulevards were less preferred, while the choice for “no facilities” or on-road cycling was ranked lowest.

A survey of York County residents about bicycling conditions and needs was previously conducted through Eat Smart Move More York County, and the results of this survey reflect similar perceptions in bicycling behavior and in the preferred strategies for improving bicycling conditions in the area. The consistency between the two surveys lends strength to the validity of the results and also reveals a clear message from residents regarding priorities for improving bicycling in the area.

SURVEY RESPONSES – WALKING DESTINATIONS

The top destinations that people in the RFATS area would most like to walk: **parks (79%), grocery stores (59%), downtown districts (44%), commercial districts (43%), schools (36%), and libraries (25%).**

SURVEY RESPONSES – BICYCLING DESTINATIONS

The top destinations that people in the RFATS area would most like to bike are very similar to the walking destinations, with an increased emphasis on being able to bike to work: **parks (84%), grocery stores (59%), downtown districts (44%), commercial districts (43%), work (39%), schools (36%), and libraries (25%).**

Survey participants were also asked whether they have traveled to other communities to use a trail or go for a bike ride. **A majority of respondents (71%) have traveled outside the RFATS area to use a trail or ride their bike**, and their destinations have ranged from nearby trails in the Charlotte/ Mecklenburg area and the South Carolina coast to Oregon, and Florida. Respondents also reported the types of expenditures made while on such trips including those at hotels (56%), restaurants (90%), and local shops (82%). These responses reflect the type of economic activity that quality bike facilities and greenways can attract.

SURVEY RESPONSES – TRANSPORTATION FUNDING PRIORITIES

Survey participants were asked about local funding priorities for transportation improvements. The **majority of participants (91%) agreed that road enhancement tax dollars should include pedestrian and bicycle investments**. Less than 4% disagreed, while another 5% were neutral or had no opinion.

The majority of participants (91%) agreed that road enhancement tax dollars should include pedestrian and bicycle investments.

Greenspace and public art are great ways to enhance public space and imrpvove the experience of walking and biking.

ONLINE WIKIMAP

The project website, www.bikewalkrfats.weebly.com, provided information to the public about the Bike Walk RFATS plan and the planning process. The website included information on upcoming public workshops and meetings, a link to the online survey, informational videos and links, and relevant planning documents.

The website also included a link to the project's online mapping tool, which provided an interactive map of the study area to invite public input. Web users were able to place points with comments to identify areas of safety concern; destinations where one would like to walk or bike; walking and biking routes that are safe and comfortable; and routes that need improvement.

PROPOSED PROJECTS FROM MAPPING TOOL

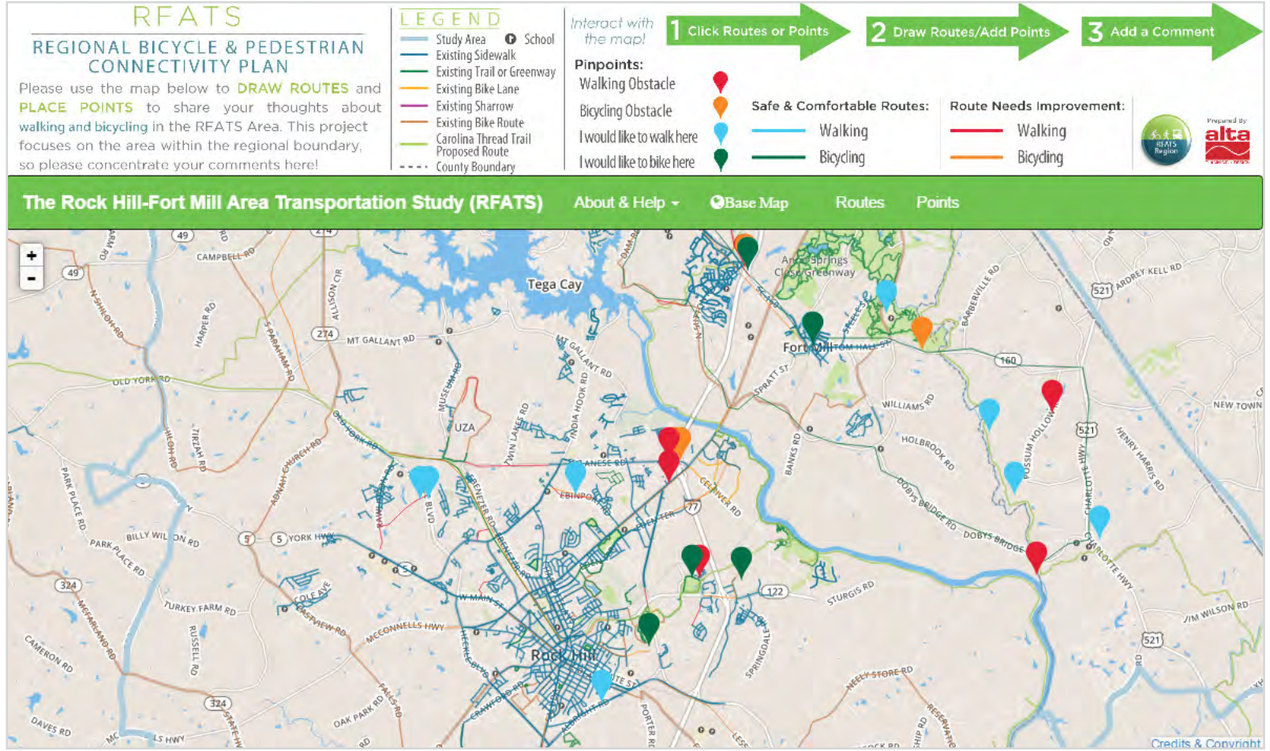
Users added 30 point destinations and 33 paths that need improvements for walking and biking. Many of the path improvements suggested were neighborhood connections to key destinations, such as business centers, shopping centers and parks. Other popular path suggestions were those that reinforced proposed trail alignments, such as the Carolina Thread Trail and trail connections between the Tech Park Trail and the Hood Center Trail.

Key destinations that were identified as places people would like to walk and/or bike include:

- Main Street, Fort Mill
- Fort Mill schools along Springfield Parkway
- Publix Super Market at Cross Creek Shopping Center (Dobys Bridge Road & Highway 521)
- Lesslie Highway
- Saluda Trail Middle School and South Pointe High School
- Manchester Meadows Park
- Rock Hill Galleria

For a full picture of the proposed improvements, visit the online mapping tool, at http://wikimapping.com/wikimap/RFATS.html.

Community members provided feedback on their priorities for walking and biking infrastructure via this online map.



TARGETED INTERCEPT SURVEYS

Transportation is a daily decision. The physical landscape, community culture, trip purpose, perceptions of safety, and many other factors inform everyday choices for mobility. Highlighting the personal element of that choice sheds light on the human side of transportation planning and the impact of infrastructure investments. The following are portraits of RFATS citizens who shared stories of day to day interactions with the RFATS transportation system and opportunities for active transportation.

"When I walk, I feel like I have done something good for myself."

-Marilyn, RFATS resident

"I feel like it is too dangerous to walk and bike to destinations because drivers do not understand how to share the road."

-Raquel, RFATS resident

“Safe biking areas would be good for the general public. It is good for the community. The more traffic we get, the more difficult it will be to bike and walk to places.”

-Greg, RFATS resident

“I was on a medicine that caused me to gain weight. I have lost 25 pounds by walking every day at the Riverwalk Trail.”

-Susan, RFATS resident

“I would love to have bike lanes to do errands and access nearby shops.”

-Alejandra, RFATS resident

“I like riding my bike because it is fun and cheap. I have cut cars out of my life because of how expensive they are. Biking is cheap.”

-Jon, RFATS resident

“Everybody needs to be aware of each other and share the road.”

-Nancy, RFATS resident

“More sidewalks and trails would be great for this Area.”

-Debbie, RFATS resident

“Walking is a simple pleasure. It is good for your health and you use a lot less energy.”

-Jeff, RFATS resident

“I walk daily with my daughter in our neighborhood.”

-Dequincey, RFATS resident

CHAPTER 14

Opportunities & Constraints Analysis

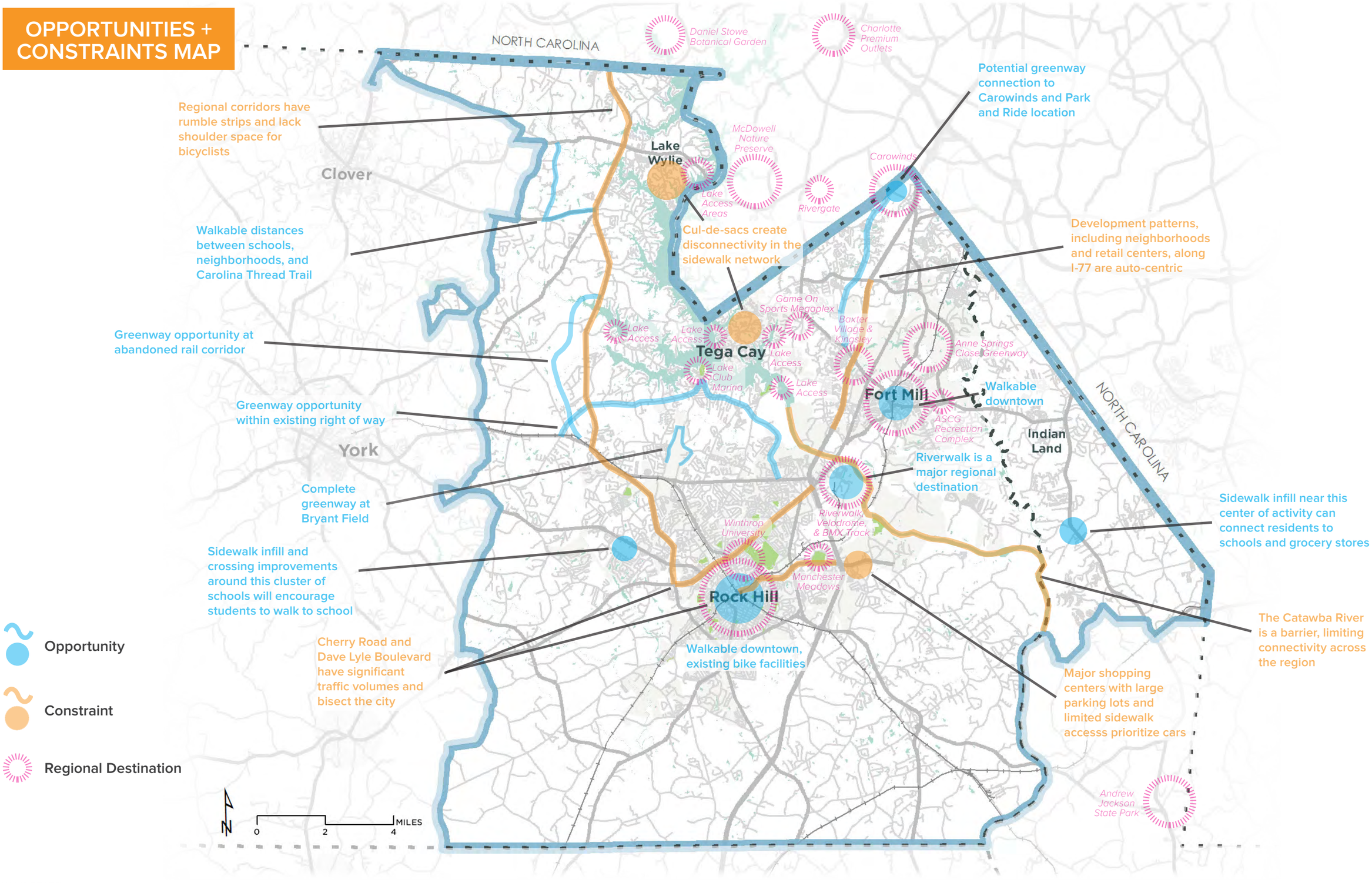
The RFATS area welcomes active transportation. The local greenway and trail network, coupled with the Carolina Thread Trail and on-street bicycle facilities, demonstrate a commitment to advance bicycle culture in particular. The continually improving and expanding sidewalk network also contributes to a more accessible place that considers all road users. With this foundation, the RFATS area is positioned to continue to raise residents' quality of life and generate new investments in walking and bicycling.

However, initial fieldwork research, network analysis, and safety analysis, have revealed significant safety concerns as well as physical barriers and gaps in network connectivity that must be addressed in order to create a seamless, inviting network for pedestrians and bicyclists. The following section presents the current strengths and challenges of the transportation network for walking and bicycling. A detailed summary of regional opportunities and constraints for walk- and bicycle-friendliness is provided in Appendix 1.

Highly visible crossings make pedestrians feel more safe and comfortable crossing the street.

Highly visible crossings make pedestrians feel more safe and comfortable crossing the street.

OPPORTUNITIES + CONSTRAINTS MAP



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“I see cyclists out on roads near my house but since there is no real room to share the road, I know that drivers get frustrated and I feel like it is unsafe for the cyclists.”

- Alejandra,RFATS resident

SECTION 3

HOW

PRIORITIZING PROJECTS FOR IMPLEMENTATION

CHAPTER 15

Prioritization Strategy

Project prioritization is a tool for not only providing clear guidance toward implementation, but also for ensuring that implementation provides the highest value on investment and best meets Plan goals.

The goals of prioritization are to ensure that:

- projects of greatest need and benefit are implemented first,
- implementation capitalizes on programmed investments and leverages new infrastructure, and
- improvements are distributed equitably.
- This chapter summarizes the methodology used to prioritize Plan recommendations, provides planning-level cost estimates for prioritized projects, and offers a phased near-term, mid-term, and long-term implementation plan.

PRIORITIZATION FRAMEWORK

The framework for the prioritization process is anchored within the following key parameters:

- Prioritizing projects of regional significance
- Prioritizing pedestrian and bicycle projects together, rather than separately
- Using the same prioritization methodology for linear improvements as for spot improvements
- Using prioritization criteria that are data-driven and measurable within GIS

To provide RFATS with a clear path for advancing regional infrastructure projects, the Primary Routes network, as presented in Section One (What) of this Plan, is the basis for the prioritization process. The Primary Routes network provides an important, seamless network for active transportation connecting the region. All proposed linear improvements within the Primary Routes network are segmented based on logical start and end points. These project segments are then individually scored based on a set of project criteria and associated weights. Prioritization factors and weights are based upon input that the project team received from the RFATS Technical Team, the Project Advisory Group, the public, and other key project stakeholders. The same factors and weights are used to score and rank spot improvements identified across the RFATS region.

PRIORITIZATION METHODOLOGY

Bikeway network development utilized a number of different analyses, described in the Existing Conditions section of this plan, and planning judgement to determine what project types are warranted along roadways throughout RFATS. These recommendations also include some new off-street bicycle accommodation recommendations where they serve a major connectivity function in the network. The ultimate goal of the bikeway network is providing connectivity to destinations such as retail centers, job centers, schools and recreation opportunities for all residents.

Prioritization looked at similar considerations to determine the need, cost and feasibility of implementing all on street and adjacent-to-street recommendations. The project team developed prioritization criteria and collectively determined the importance of each consideration by assigning each category an appropriate weight. These criteria and weights can be seen in Table 5.

"We need to maintain the existing facilities and roadways we have so it is safe for everyone. As this area continues to grow, how will we balance building new infrastructure and maintaining the existing?"

-Marilyn, RFATS resident

Table 5. Prioritization criteria and weights

Criteria	Description	Input Source	Measurements	Points	Maximum Possible
Safety	Improves high crash corridor or intersection	Pedestrian and Bicycle Collision Analysis	More than one collision has occurred at the segment or intersection in the last five years for which there is data (SC DPS 2011-2014)	25	30
	Serves most vulnerable road users	Bike Walk RFATS Recommended Network	Project is pedestrian-only improvement	5	
Economic Development & Tourism	Provides direct access to regional attractions	Opportunities & Constraints Analysis and Mapping; RFATS GIS data of regional routes	Project touches an identified regional attraction such as Carowinds, GameON, Cross-Charlotte Trail, Anne Springs Close Greenway, or the Rock Hill Outdoor Center and Giordana Velodrome	15	25
			Project is on a designated York County Bike Route or Carolina Thread Trail Route	10	
Leveraging Investments	Closes a gap in the existing sidewalk, bikeway, and/or trail network	RFATS GIS data of existing facilities	Project touches two existing sidewalk, bicycle, and/or trail facilities	25	25
	Connects to a programmed project	RFATS GIS data of Pennies for Progress and TIP projects	Project segment or intersection touches a funded project with sidewalk, bicycle, and/or trail facilities	5	5
	Provides direct access to areas of planned commercial and retail investment	County Comprehensive Plans	Project touches York County or Lancaster County Comprehensive Plan designated “centers and corridors”	10	10
Active Transportation Demand	Within a corridor of high demand for walking and bicycling trips	Composite Analysis of Bicycle and Pedestrian Demand	Project segment is designated as high demand	15	15
			Project segment is designated as medium demand	10	
Network Supply	Within a corridor of high demand for walking and bicycling trips	Composite Analysis of Bicycle Level of Traffic Stress (BLTS) and Pedestrian Level of Service (PLOS)	Project segment is designated as medium supply	10	15
			Project segment is designated as low supply	15	
Local Access	Provides direct access to local schools and parks	RFATS GIS data of all public schools and city or county parks	Project is within 0.25 mile of a public elementary, middle, or high school or city or county park facility (cumulative score up to 2 locations)	10	20
	Provides direct access to a community downtown	Opportunities & Constraints Analysis and Mapping	Project is within 0.25 mile of the central point of a municipality	10	10
Equity & Transit Access	Impacts areas with high concentrations of vulnerable populations	Equity Analysis & Mapping	Project is within highest two tiers of composite equity analysis	15	15
	Improves access to current transit and proposed future BRT	RFATS GIS data of designated park & ride facilities; RFATS BRT study	Project is within 0.25 mile of a park & ride location	5	10
			Project touches US 21 proposed bus rapid transit corridor	5	
Feasibility	Relative ease of implementation based on planning-level factors available in GIS	RFATS GIS data of Pennies for Progress and TIP projects; RFATS GIS data of previously proposed facilities; SCDOT GIS data of road ownership	Programmed for funding through Pennies for Progress or TIP	10	20
			Proposed improvements are previously proposed (not including CTT route)	5	
			Project is off-street or road is not owned by SCDOT	5	
					200

CHAPTER 16

Project Phasing and Cost Estimates

PHASED IMPLEMENTATION PLAN

Based on the results of the prioritization methodology, the project team developed a Capital Improvement Plan. Table 6 provides a phased implementation plan for all recommended spot improvements in the study area and all linear improvements within the prioritized primary routes network.

The phasing plan serves as a guide for proactively moving towards funding, design, engineering, and further stakeholder engagement. It does not preclude implementing projects on an opportunistic basis, where cost-efficiencies or new project partnerships become available.

Additionally, it is important to keep in mind broader principles and strategies for implementation of the active transportation network:

- All projects within the proposed network have merit and should be implemented as timely and cost-effective opportunities arise. The results of the prioritization process are not intended to preclude projects from receiving funding or from being incorporated into a new development or other roadway project. The prioritization framework is a flexible approach, intended to provide clear direction for proactively seeking project funds and completing design and engineering of the most critical projects, while still allowing for opportunistic implementation of the entire network. This framework recognizes that grant funding, roadway reconstruction projects, and other implementation factors may influence a more nuanced final prioritization.
- Identified projects should be implemented using local judgment and may require important next steps like identifying project-specific funding, land acquisition, and communicating with other partners along proposed alignments (such as utility companies, impacted neighborhoods, and large tract property owners).
- Jurisdictional partners within RFATS should take a complementary approach to developing a local and county-based active transportation network. Spur connections, local access points, and a growing off-road greenway system will dramatically leverage the investments of RFATS.

The results of the prioritization scoring are shown in two maps: one for linear improvements and one for spot improvements. On the maps, prioritization scores are illustrated in five tiers.

The phasing plan serves as a guide for proactively moving towards funding, design, engineering, and further stakeholder engagement. It does not preclude implementing projects on an opportunistic basis, where cost-efficiencies or new project partnerships become available.

COST ESTIMATE METHODOLOGY

Planning-level cost estimates provide a useful metric for assessing relative cost of implementing priority project segments. Cost estimates for projects were generated from a variety of sources including national datasets such as the 2013 Costs for Pedestrian and Bicyclist Infrastructure Improvements, Conducted by the University of North Carolina, the NCDOT Bicycle and Pedestrian Facility Cost Tool, and recent, regional implementation experience.

Cost estimates and assumptions are presented in the table below. While these costs represent averages for pedestrian and bicycle projects in 2016 dollars, note that individual project costs can vary widely based on a number of conditions which are not reflected in estimated unit costs. This includes, but is not limited to:

- Facility design (width, frequency of material placement, demolition)
- Temporary traffic control requirements
- Environmental requirements
- Utility relocation
- Required right of way acquisition
- Contractor experience and material availability
- Project length or grouping

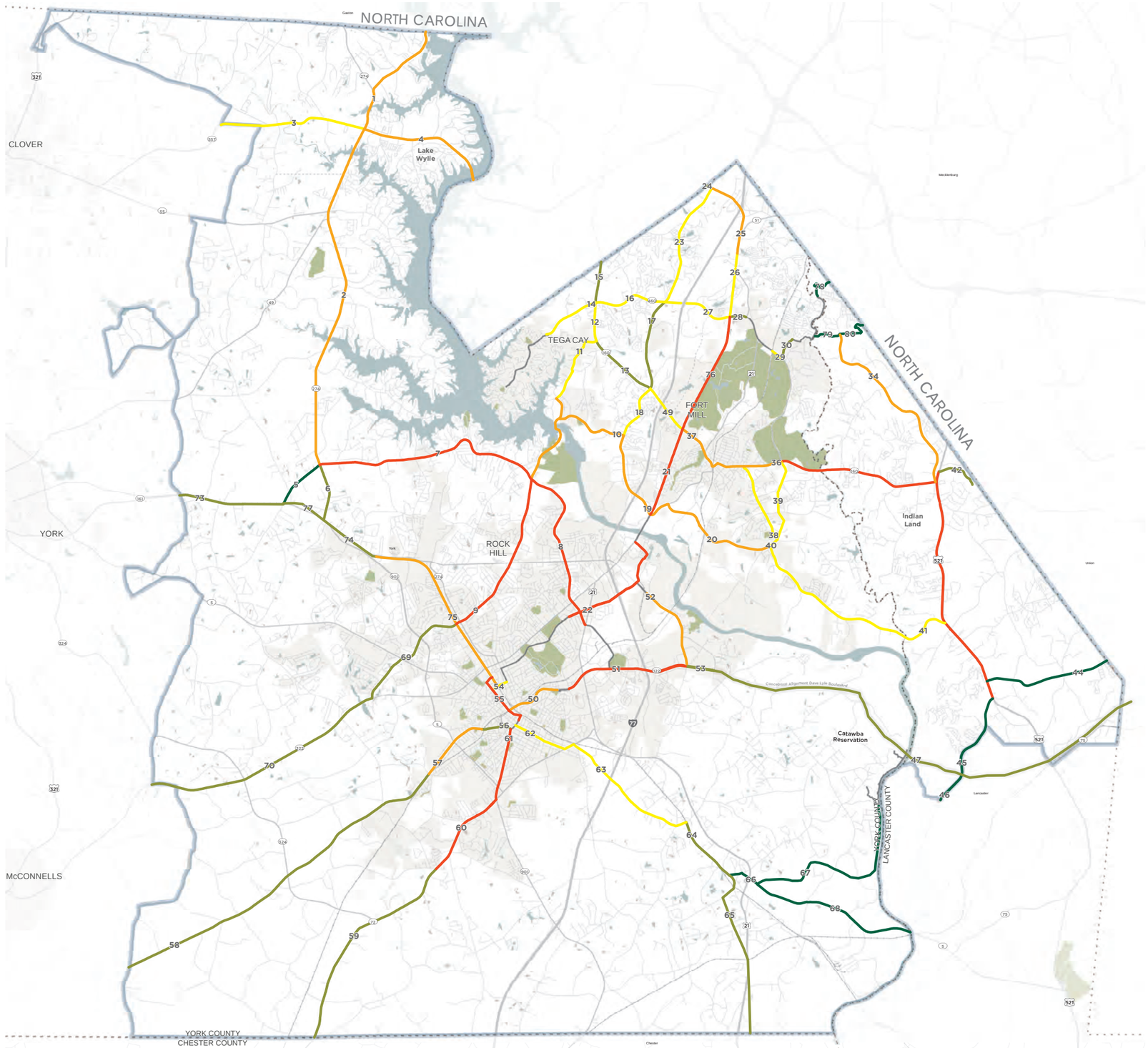
These do not include additional considerations such as project design, engineering, permitting, or contingency costs. Additionally, the use of federal funds can increase project costs by as much as 30 percent.

Table 6. Prioritization criteria and weights

Facility Type	Planning-Level Average Cost per Unit	Assumptions*
Buffered Bicycle Lane	$113,600/mile	Striping, stencil, signage; Thermoplastic; both directions of travel
Bicycle Lane	$71,000/mile	Striping, stencil, signage; Thermoplastic; both directions of travel
Paved Shoulders	$400,000/mile	4 foot width (Note: Narrowing roadway lane widths can lower project costs by lowering the amount of additional pavement needed. This should be evaluated in project design on a case by case basis.)
Enhanced Shared Roadways	$25,070/mile	Signage; design complexity varies
Shared Lane Markings	$16,000/mile	Thermoplastic; 200 foot spacing for pavement markings and 600 foot spacing for sign
Shared-use Path	$600,000/mile	11 foot wide asphalt; design complexity varies
Sidewalk	$70/linear foot	5 foot wide concrete; with curb and gutter
Spot Improvement	$60,000/each	High-visibility crosswalks, median refuge, and pedestrian signalization

*Design, engineering, permitting, utility relocation, and right-of-way acquisition not included

REGIONAL NETWORK PRIORITIZATION MAP



Prioritization Score

- 106 - 155
- 86 - 105
- 66 - 85
- 36 - 65
- 10 - 35
- 22 Project ID

Background

- Existing Facility
- Park
- Water Body
- Municipality
- County Boundary
- RFATS Boundary

0 1 2 3 MILES

SPOT IMPROVEMENTS PRIORITIZATION MAP

Prioritization Score

- 71 - 90
- 51 - 70
- 41 - 50
- 31 - 40
- 25 - 30
- 22 Project ID

Background

- Park
- Water Body
- Municipality
- County Boundary
- RFATS Boundary

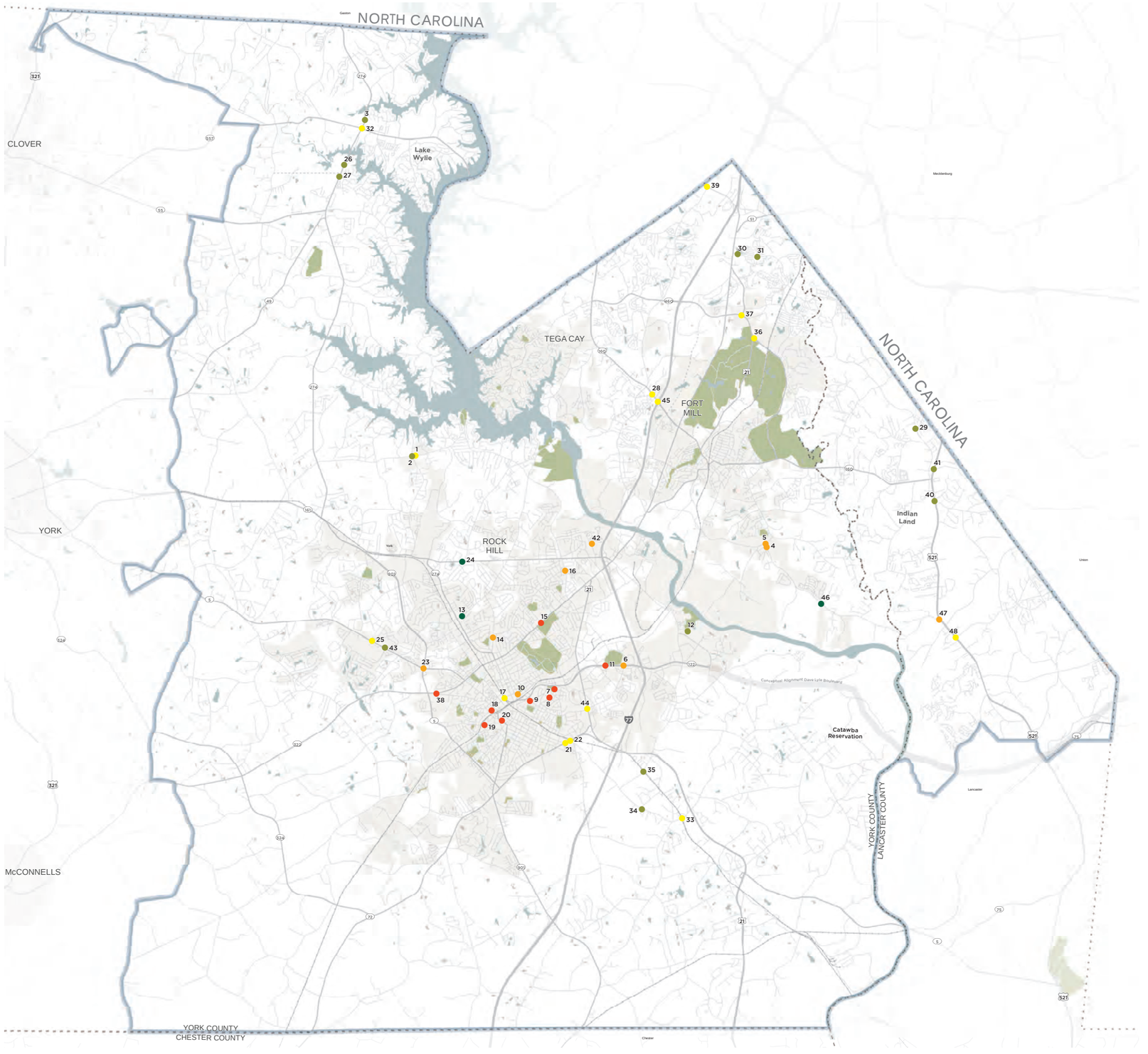


Table 7. Phase 1 (0-5 Years): Linear Improvements

Project Id	Prioritization Score	Project Name	Start	End	Proposed Facility Type	Length (Mi)	Total Estimated Segment Cost
22	155	Eden Terrace Trail – Dunkins Ferry Road at Riverwalk	Cherry Road	Nations Ford Road	Shared-Use Path (Bike Lane + Sidewalk west of Cel-River Road)	2.87	$1,722,179
8	140	Mt Gallant Rd	India Hook Road	Celanese Road	Shared-Use Path + Sidewalk	2.3	$3,189,040
			Celanese Road	Anderson Rd	Bike Lane (with Shared-Use Path from Eden Terrace to Anderson Rd)	1.28	
55	135	Columbia Av	White Street	Alumni Dr	Sharrows + Sidewalk	0.18	$154,550
		White St E/W	Columbia Ave	Elizabeth Lane	Sharrows	1.11	
21	125	US 21	Sutton Road	SC 160	Shared-Use Path	2.07	$1,242,618
61	125	Saluda St	Albright Road	Heckle Boulevard	Bike Lane	0.38	$55,234
		Saluda St	Heckle Boulevard	Johnston Street	Sharrows	1.26	
		N Elizabeth Ln	White Street	Main Street (End Of Existing Bike Lane)	Bike Lane	0.12	
76	125	US 21	Springfield Parkway	SC 160	Shared-Use Path	2.78	$1,670,380
9	120	Herlong Av - India Hook Rd	Mt Gallant Road	Rail Trail	Shared-Use Path	3.86	$2,315,989
7	115	Mt Gallant Rd	Hands Mill Highway	India Hook Road	Shared-Use Path	5.29	$3,172,729
51	110	Dave Lyle Blvd	Gateway Boulevard	Apex Drive	Shared-Use Path + Sidewalk	2.87	$3,843,504
60	110	Albright Rd - Saluda Rd/St	Mt Holly Road	Rambo Road	Shared-Use Path	2.25	$1,350,523
35	105	Fort Mill Hwy	Harrisburg Road	Fort Mill Southern Parkway	Shared-Use Path	3.60	$2,160,845

Project Id	Prioritization Score	Project Name	Start	End	Proposed Facility Type	Length (Mi)	Total Estimated Segment Cost
43	105	Charlotte Highway (US 521)	Potts Lane	Dobys Bridge Road	Shared-Use Path	3.46	$2,076,988
48	105	Charlotte Highway (US 521)	Dobys Bridge Road	Van Wyck Road	Shared-Use Path	2.06	$1,236,636
9 Spot Improvements (See Table 8)							$540,000
						Phase 1 Total	$24,731,215

Table 8. Phase 1 (0-5 Years): Intersection and Crossing Improvements

Spot Project Id	Prioritization Score	Project Name	Start	End
7	90	Spot Improvement	Iredell St	150 ft south of Montford Ave
8	90	Spot Improvement	Iredell St	Dunlap St
20	90	Spot Improvement	Hampton St	Johnston St
38	90	Spot Improvement	SC 322	Finley Road
9	85	Spot Improvement	N Confederate Ave	Willowbrook Ave
11	85	Spot Improvement	Mt Gallant Road	Dave Lyle Blvd
15	85	Spot Improvement	N Cherry Road	Deas Street
18	80	Spot Improvement	N Wilson St	W Johnston St
19	80	Spot Improvement	S Dave Lyle Blvd	Hampton St

Table 9. Phase 2 (6 To 10 Years) Linear Improvements

Project Id	Prioritization Score	Project Name	Start	End	Proposed Facility Type	Length (Mi)	Planning-Level Estimate
10A	105	New Gray Rock Rd	Dam Road	Sutton Road	Bike Lane + Sidewalk	2.16	$1,753,094
10B	105	India Hook Rd	Mt Gallant Road	New Gray Rock Road	Shared-Use Path (with Trail Bridge)	1.76	$7,057,046*
37	105	Tom Hall St	Dobys Bridge Road	Main Street	Bike Lane	0.61	$1,428,237
		SC 160 - N. White Street	Main Street	US 21	Shared-Use Path	1.11	
		Main St	Tom Hall Street	White Street	Sharrows	0.15	
50	105	Jack White Trail - Northside Trail Ext	E White St	Iredell Street	Shared-Use Path	1.27	$1,527,006
4	100	Charlotte Highway (SC 49)	Pole Branch Road	Buster Boyd Bridge	Shared-Use Path	3.25	$1,948,835
20	100	Spratt St	US 21	Fort Mill Southern Parkway	Shared-Use Path + Bike Lane	0.46	$1,970,314
		Brickyard Rd	Fort Mill Southern Parkway	Dobys Bridge Road	Shared-Use Path	0.32	
		Whites Rd - Fort Mill Southern Parkway	Spratt Street	Holbrook Road	Shared-Use Path	2.45	
36	100	Tom Hall St	Fort Mill Southern Parkway	Dobys Bridge Road	Bike Lane	0.86	$61,063
57	100	Ogden Rd	Heckle Boulevard	Squire Road	Sidewalk	1.08	$916,400
		Ogden Rd - Friedheim Rd	Wilson Street	Squire Road	Bike Lane	1.65	
75	100	Ebenezer Rail Trail	Rail Trail (Near Big Oak Lane)	Dave Lyle Boulevard	Shared-Use Path	9.83	$5,897,145
25	95	Carowinds Blvd - US 21	Pleasant Road	Regent Parkway	Shared-Use Path	1.86	$1,114,581
52	95	Cel-River Rd - Red River Rd	Dave Lyle Boulevard	Paragon Way (End Of Existing Bike Lane)	Bike Lane + Sidewalk	1.98	$1,600,606
2	90	Hands Mill Hwy	SC 557	Mt Gallant Road	Shared-Use Path	7.98	$4,785,747
1	90	Pole Branch Road - Hwy 274	State Border	Landing Pointe Dr	Bike Lane + Sidewalk	2.27	$2,235,795
		Hwy 274	Landing Pointe Dr	SC 557	Shared-Use Path + Sidewalk	0.54	

*Includes high level estimate of walking and bicycling bridge at dam.

Project Id	Prioritization Score	Project Name	Start	End	Proposed Facility Type	Length (Mi)	Planning-Level Estimate
19	90	Sutton Road	New Gray Rock Road	US 21	Bike Lane + Sidewalk	1.84	$1,614,104
		Sutton Road	Sam Smith Road	New Gray Rock Road	Shared-Use Path + Sidewalk	0.09	
34	90	Harrisburg Rd	Carolina Thread Trail	Fort Mill Highway	Shared-Use Path	4.50	$ 2,697,827
9 Spot Improvements (See Table 10)							$540,000
						Phase 2 Total	$37,147,800

Table 10. Phase 2 (6 to 10 Years): Intersection and Crossing Improvements

Spot Project Id	Prioritization Score	Project Name	Start	End
16	70	Spot Improvement	Mt Gallant Road	Marrett Blvd
4	65	Spot Improvement	Dobys Bridge Road	Dobys Bridge Elementary School
5	65	Spot Improvement	Fort Mill Southern Parkway	Dobys Bridge Road
10	65	Spot Improvement	Charlotte Ave	N Wilson St
14	65	Spot Improvement	India Hook Drive	Glendale Dr
6	60	Spot Improvement	Dave Lyle Blvd	John Ross Pkwy
23	60	Spot Improvement	Heckle Blvd	SC 5 W Main St
42	60	Spot Improvement	Lexington Commons Dr	Lexington Blvd
47	60	Spot Improvement	Dobys Bridge Road	US 521

Table 11. Phase 3 (11 To 15 Years)

Project Id	Prioritization Score	Project Name	Start	End	Proposed Facility Type	Length (Mi)	Total Estimated Segment Cost
14	85	Gold Hill Rd - Tega Cay Dr	End Of Sidepath Near Shoreline Parkway	SC 160	Bike Lane	1.36	$96,721
18	85	Sutton Road	New Gray Rock Road	Willowbrook Drive	Shared-Use Path + Sidewalk	0.12	$872,515
		Sutton Road - Market St	SC 160	New Gray Rock Road	Shared-Use Path	1.18	
38	85	Dobys Bridge Rd	Tom Hall Street	Fort Mill Southern Parkway	Shared-Use Path	1.86	$1,117,258
54	85	Stewart Av	W. White Street	Oakland Avenue	Sharrows	0.38	$6,019
63	85	Fire Tower Rd	E Main Street	Porter Road	Enhanced Shared Roadway + Sidewalk	0.12	$2,476,438
		Fire Tower Rd	Porter Road	Castle Heights School	Bike Lane + Sidewalk	1.47	
		Fire Tower Rd - Neelys Creek Rd	Castle Heights School	Lesslie Highway	Shared-Use Path	1.68	
62	85	E Black St	S Elizabeth Ln	Albright Rd	Bike Lane	1.24	$88,155
		Albright Rd – E Main St	E Black St	Firetower Rd	Shared-use Path + Sidewalk	0.23	$309,090
11	80	Dam Rd	New Gray Rock Road	Stonecrest Boulevard	Bike Lane + Sidewalk	0.69	$1,188,444
		Stonecrest Blvd	Dam Road	Hubert Graham Way	Bike Lane + Sidewalk	0.75	
		Stonecrest Blvd	Hubert Graham Way	SC 160	Bike Lane	0.26	
23	80	Pleasant Rd	Gold Hill Road	Carowinds Boulevard	Shared-Use Path	2.91	$1,748,696
39	80	Tom Hall St To Holbrook Rd	Tom Hall Street	Holbrook Road	Bike Lane + Sidewalk	1.87	$1,512,468
12	75	SC 160	Gold Hill Road	Stonecrest Boulevard	Shared-Use Path	0.87	$522,826
16	75	Gold Hill Rd	SC 160	Pleasant Road	Shared-Use Path	1.68	$1,006,601
26	75	US 21	Regent Parkway	Springfield Parkway	Shared-Use Path	1.39	$834,268
49	75	SC 160	Pleasant Road	US 21	Shared-Use Path	1.18	$710,138
3	70	SC 557	Charlotte Highway (SC 49)	Oakridge Road	Shared-Use Path	0.93	$1,969,049
		SC 557	Oakridge Road	Riddle Mill Road	Bike Lane + Sidewalk	1.11	
		SC 557	Riddle Mill Road	Cross Road (RFATS Border)	Wide Paved Shoulder	1.29	

Project Id	Prioritization Score	Project Name	Start	End	Proposed Facility Type	Length (Mi)	Total Estimated Segment Cost
27	70	Springfield Pkwy - Gold Hill Rd	Pleasant Road	US 21	Shared-Use Path	1.49	$891,526
29	70	Springfield Pkwy	Railroad	A O Jones Boulevard	Shared-Use Path	0.24	$144,467
40	70	Fort Mill Southern Parkway	Holbrook Road	Dobys Bridge Road	Shared-Use Path	0.23	$136,182
41	70	Dobys Bridge Rd	Fort Mill Southern Parkway	US 521	Bike Lane + Sidewalk	5.09	$4,120,228
12 Spot Improvements (see Table 12)							$720,000
						Phase 3 Total	$20,471,089

Table 12. Phase 3 (11-15 Years) Intersection and Crossing Improvements

Spot Project Id	Prioritization Score	Project Name	Start	End
17	50	Spot Improvement	N. Wilson St	Railroad (near Ebenezer Ave)
22	50	Spot Improvement	Firetower Road	E Main St
25	50	Spot Improvement	SC 5	Meadowlark Drive
28	50	Spot Improvement	SC 160	Carolina Place Dr (at Baxter Village)
33	50	Spot Improvement	Neelys Creek Road	Lesslie Hwy
36	50	Spot Improvement	US Bus 21/Old Nation Road	Springfield Parkway
39	50	Spot Improvement	Carowinds Blvd	Pleasant Road
44	50	Spot Improvement	Princeton Road	S Anderson Road
45	50	Spot Improvement	SC 160	I-77 Interchange
48	50	Spot Improvement	US 521	Shelley Mullis
1	45	Spot Improvement	Mt Gallant Road	Museum Road
21	45	Spot Improvement	Albright Road	E Main St

Table 13. Phase 4 (16 - 20 Years)

Project Id	Prioritization Score	Project Name	Start	End	Proposed Facility Type	Length (Mi)	Total Estimated Segment Cost
17	65	Pleasant Rd	Gold Hill Road	SC 160	Shared-Use Path	2.10	$1,258,363
28	60	Springfield Pkwy	US 21	Old Nation Road	Shared-Use Path	0.37	$223,562
30	60	A.O. Jones Blvd	Springfield Parkway	Carolina Thread Trail - Nation Ford Greenway	Shared-Use Path	0.50	$300,614
47	60	Dave Lyle Blvd Ext	Current End Of Dave Lyle Blvd	End Of Dave Lyle Boulevard Ext	Shared-Use Path	10.88	$6,530,519
53	60	Dave Lyle Blvd	Red River Road	Waterford Park Drive	Shared-Use Path + Sidewalk	1.22	$1,284,072
70	60	Mcconnells Hwy	Meadow Lakes Road	RFATS Boundary	Wide Paved Shoulder	5.60	$2,238,191
13	55	SC 160	Stonecrest Boulevard	Sutton Road	Shared-Use Path	1.65	$987,271
15	55	SC 160	Gold Hill Road	State Border	Wide Paved Shoulder	0.94	$375,249
24	55	Carowinds Blvd	Pleasant Road	State Border	Shared-Use Path	0.14	$82,798
58	55	Ogden Rd	Squire Road	Falls Road	Bike Lane + Sidewalk	1.32	$3,836,855
		Mobley Store Rd - Ogden Rd	Falls Road	RFATS Boundary	Wide Paved Shoulder	6.91	
59	55	Saluda Rd	Rambo Road	RFATS Boundary	Wide Paved Shoulder	5.00	$2,000,906
69	55	Meadow Lakes Rd	Mcconnells Highway	W Main St	Bike Lane + Sidewalk	1.15	$1,536,974
		Herlong Av S	W Main St	Heckle Boulevard	Bike Lane	0.66	
		Herlong Av S	Heckle Boulevard	Rail Trail	Shared-Use Path	0.93	
65	50	Rail Corridor - Lesslie Hwy - Ole Simpson - Utility Row	Planned Carolina Thread Trail - Old Friendship Trail	RFATS Boundary	Shared-Use Path	3.85	$2,307,477
73	50	Ebenezer Rail Trail - Old York Rd	Mt Gallant Road	RFATS Boundary	Shared-Use Path	2.37	$1,423,404
74	50	Ebenezer Rail Trail	Hands Mill Highway	Rail Trail (Near Big Oak Lane)	Shared-Use Path	1.46	$875,456
77	50	Ebenezer Rail Trail	Mt Gallant Road	Hands Mill Highway	Shared-Use Path	1.04	$622,491
6	45	Hands Mill Hwy	Mt Gallant Road	Old York Road	Shared-Use Path	1.29	$775,116

Project Id	Prioritization Score	Project Name	Start	End	Proposed Facility Type	Length (Mi)	Total Estimated Segment Cost
42	45	Potts Ln	US 521	State Border	Shared-Use Path	0.94	$564,479
64	40	Lesslie Hwy	Neelys Creek Road	Planned Carolina Thread Trail - Old Friendship Trail	Shared-Use Path	1.58	$949,568
13 Spot Improvements (See Table 14)							$780,000
						Phase 4 Total	$28,953,365

Table 14. Phase 4 (16-20 Years) Intersection and Crossing Improvements

Spot Project Id	Prioritization Score	Project Name	Start	End
2	40	Spot Improvement	Mt Gallant Road	Mt Gallant Elementary School
3	40	Spot Improvement	Landing Pointe Dr	SC 274
12	40	Spot Improvement	Red River Road	Carolina Thread Trail (at River Park)
26	40	Spot Improvement	SC 49	Marlin Dr
27	40	Spot Improvement	SC 49	Autumn Cove Dr
29	40	Spot Improvement	Harrisburg Road	Kariker Ct
34	40	Spot Improvement	Firetower Road	Edenvale Road
35	40	Spot Improvement	N Springdale Road	Lesslie Hwy
40	40	Spot Improvement	US 521	Marvin Road
43	40	Spot Improvement	SC 5	The Crossing
30	35	Spot Improvement	Regent Parkway	Township Drive
31	35	Spot Improvement	Regent Parkway	Hadden Hall Blvd
41	35	Spot Improvement	US 521	Potts Lane

Table 15. Phase 5 (21 + Years)

Project Id	Prioritization Score	Project Name	Start	End	Proposed Facility Type	Length (Mi)	Total Estimated Segment Cost
44	35	Jim Wilson Rd	US 521	State Border	Shared-Use Path	2.86	$1,718,689
67	35	Catawba River Ext-Six Mile Creek - Turkey Ln	Turkey Lane	Existing Carolina Thread Trail - Catawba Indian Nation - Greenway Trail	Shared-Use Path	4.5	$2,702,414
5	30	Mt Gallant Rd	Hands Mill Highway	Old York Road	Shared-Use Path	1.24	$742,430
45	30	Van Wyck Rd	US 521	Sun City Boulevard	Shared-Use Path	0.63	$925,603
		Van Wyck Rd	Sun City Boulevard	W Rebound Road	Wide Paved Shoulder	1.37	
66	30	Old Friendship Road - SC 5	Old Friendship Road	Turkey Lane	Shared Use Path	0.72	$434,114
78	25	Little Sugar Creek	Nations Ford Greenway	State Border	Shared-Use Path	0.75	$449,292
46	20	Van Wyck Rd	Sun City Boulevard	W Rebound Road	Wide Paved Shoulder	0.76	$304,129
68	15	SC 5	Turkey Lane	Catawba River	Wide Paved Shoulder	3.82	$1,528,040
79	10	New Trail	Nations Ford Greenway	Harrisburg Road	Shared-Use Path	0.61	$364,031
80	10	McAlpine Creek - New Trail	Harrisburg Road	State Border	Shared-Use Path	0.93	$559,380
3 Spot Improvements (See Table 16)							$180,000
						Phase 5 Total	$9,908,122

Table 16. Phase 5 (21 + Years) Intersection and Crossing Improvements

Spot Project Id	Prioritization Score	Project Name	Start	End
13	30	Spot Improvement	Herlong Dr	Estes Dr
24	25	Spot Improvement	Twin Lakes Road	Celanese Road
46	25	Spot Improvement	Dobys Bridge Road	Kingston Way

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SHARE
THE ROAD

APPENDICES

APPENDIX 1

Opportunities & Constraints Analysis

INTRODUCTION

The RFATS region welcomes active transportation. The local greenway and trail network, coupled with the Carolina Thread Trail and on-street bicycle facilities, demonstrate a commitment to advance bicycle culture in particular. The continually improving and expanding sidewalk network also contributes to a more accessible place that considers all road users. With this foundation, the RFATS region is positioned to continue to raise residents' quality of life and generate new investments in walking and bicycling.

However, initial fieldwork research, network analysis, and safety analysis, have unveiled significant safety concerns as well as physical barriers and gaps in network connectivity that must be addressed in order to create a seamless, inviting network for pedestrians and bicyclists. The following section presents the current strengths and barriers of the transportation network for walking and bicycling.

PEDESTRIAN NETWORK

The existing and proposed pedestrian network has many **strengths and opportunities:**

- The street and sidewalk network of downtown Fort Mill and Rock Hill is well connected. There are mid-block crossings, bicycle parking, pedestrian lighting, and traffic calming elements that make these areas enjoyable and easy to use.
- These respective downtown districts have a walkable scale. Historic buildings with attractive storefronts and short setbacks register as a people-oriented space, rather than a car-centric place.

Highly visible crossings make pedestrians feel more safe and comfortable crossing the street.

- Recent efforts such as Riverwalk and the local option sales tax projects (Pennies for Progress Program) which incorporate bicycle and pedestrian facilities show momentum for active transportation in ongoing development and planning efforts.
- There are a number of schools situated within and adjacent to residential neighborhoods. A seamless, safe sidewalk network near children means more walking to school opportunities. These schools also present partnership opportunities and SRTS programming opportunities.
- Other civic destinations such as libraries and parks are also within walking distance of where homes are concentrated.
- The abandoned railway corridor between Herlong Avenue and Concord Road presents a viable regional, greenway connection opportunity. There are opportunities to link this trail to the sidewalk network, greatly expanding the pedestrian network.
- There are several opportunities for walking around the region including neighborhood streets, local park trails, the Carolina Thread Trail, the Bryant Field Multi-Use Trail, and the Piedmont Medical Center Trail.
- Unprecedented growth in the region has produced high traffic volumes and congestion during peak hours. This frustration has created a climate where residents are seeking out alternative transportation options that alleviate traffic issues and enhance the character of their home.

However, there are **many physical barriers currently present for pedestrians as well:**

- Large roadway corridors such as (but not limited to) Interstate 77, Highway 21/Cherry Road, Dave Lyle Boulevard, and Heckle Boulevard are barriers for pedestrians trying to cross or traverse these roads due to large distances between safe crossings, long distances across roadways

and long wait times for traffic signals to change. Also, several of these corridors have gaps in sidewalk coverage adding an additional challenge.

- Many of the region's busiest retail centers are difficult to access by foot due to their location along high-traffic, high-speed and wide roadways. Also, the low density of development, high-frequency of curb-cuts and large parking lots in front of businesses along these corridors decreases walking comfort and increases walking distances and potential safety issues. Even in the downtown cores of Rock Hill and Fort Mill, building footprints accommodate large parking lots which erode valuable, productive spaces creating a void in walkability and vibrancy.
- Developers are building sidewalk infrastructure at new developments, however the sidewalk network is disconnected from outside destinations creating an overall network that is fragmented. This piecemeal process is cost-effective for the local jurisdiction but not time effective and does not consider foot traffic demand.
- Similarly, private and gated neighborhoods that are built on a tentacle or cul-de-sac model rather than a grid pattern create isolated pockets of walkability, typically for exercise. Those sidewalks are only accessible for property owners and do not integrate into the greater network.
- As one moves away from the city and town centers, the presence of sidewalks, sidewalk connectivity and street connectivity worsens, rendering many areas outside these centers un-walkable.
- Where sidewalks do exist along major corridors, the sidewalk zone lacks design features that make for a safe and enjoyable experience. Sidewalks are narrow, adjacent to fast moving traffic, or constrained by obstructions such as utility poles or maintenance issues; sidewalks lack landscaping or greening elements; sidewalks lack ADA compliance; sidewalks lack street furniture and pedestrian-scale lighting; sidewalks lack features of charm that add a sense of place like banners or flags on light poles, decorative pavers, and public art.
- While improvements have been made recently, a significant share of crosswalks are unmarked and/or lack curb cuts throughout the region.

BICYCLING NETWORK

The existing and proposed bicycling network has many **strengths and opportunities:**

- Low-volume neighborhood streets bordering the downtown core offer route alternatives from streets with higher vehicular traffic volumes and speeds.
- A substantial amount of long-distance touring cycling and long-distance recreational bicycle riding are attracted to the region, especially the signed bicycle routes. Improving facilities and outreach can attract more bicycle tourism to the region. Other recreational facilities include local mountain biking trails, local park trails, Rock Hill Blackjacks Heritage Preserve, and the Piedmont Medical Center Trail. There are opportunities to create spur routes that better connect these facilities into downtown to promote local tourism and economic development.
- There are several streets in the roadway network with available space for adding bikeways within the existing curb-lines, either through lane width reduction or road diet projects such as Highway 160, Highway 21, Mt. Gallant Road, Main Street, and Constitution Boulevard in Rock Hill.
- Destinations are fairly well dispersed throughout the region, and density and street connectivity are supportive of bicycling near the downtown cores.
- The abandoned railway corridor between Herlong Avenue and Concord Road presents a viable regional, greenway connection opportunity. There are opportunities to link this

Bicycle parking is an important but often overlooked part of the bicycle network.

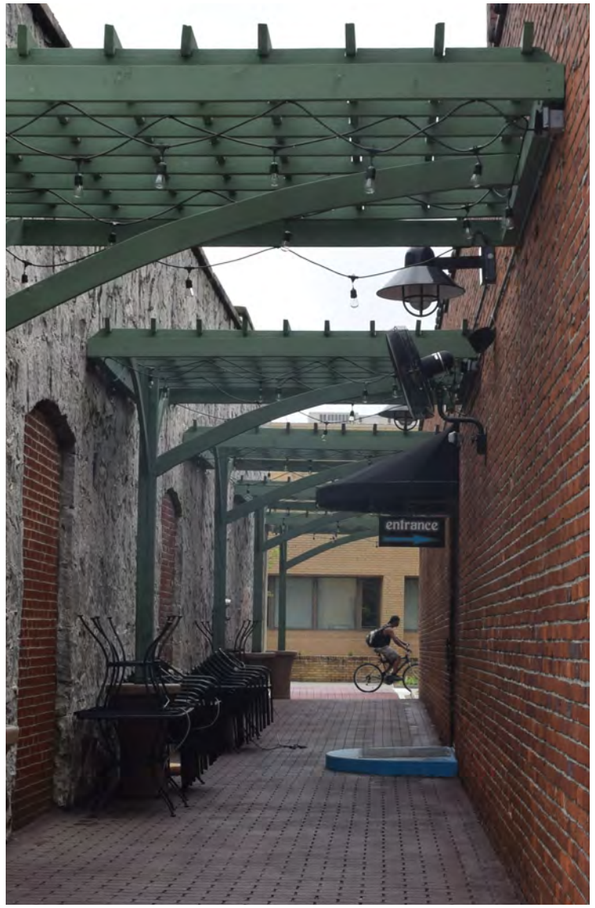
trail to on-street facilities, greatly expanding the bicycle network.

- Completed portions of the Carolina Thread Trail, the Anne Springs Close Greenway, and Riverwalk are tremendous assets in attracting active transportation users to the area and situating the RFATS area as a significant regional destination. Continuing to foster this dynamic, support the effort of the CTT, and expand connections to Riverwalk can bring renewed investments and interests to the region.
- Other utility corridors throughout the region offer opportunities for potential greenway connections to destinations.
- The Giordana Velodrome and Rock Hill Bike Club host events like the weekly Friday Night Races and Sunday Social Ride, which attract a number of cyclists to the region. Existing programs like Eat Smart, Move More York County, Tega Cay Healthy Kids, and the Rock Hill Community Gardens group encourage healthy and active lifestyle choices for residents.

However, there are **many physical barriers currently present for bicyclists as well:**

- Wide roadway corridors are barriers for bicyclists trying to ride along or cross these roads. Vehicles traveling in wide travel lanes on higher speed roads leave bicyclists exposed
- Most roadways outside of the Fort Mill town limit and Rock Hill city limit do not have bicycle-friendly shoulders. Reaching Indian Land and Lake Wylie are particularly challenging as rumble strips create an additional deterrent for bicyclists.
- Major regional attractors like Carowinds, the proposed Nation Ford Land Trust, and the riverfront portion of the CTT will need improved bicycle and pedestrian facilities and connections. Their current inaccessibility will promote car-dependence and exacerbate congestion issues.
- There are very few delineated on-street bicycle facilities in the region despite ample roadway width, as well as the need and demand for a well-connected bicycle network.
- Bicycle parking is limited throughout jurisdictions, even in bike-friendly areas such as downtown retail locations and key destinations.
- Street connectivity and neighborhood density worsens as one moves out from town and city centers. This results in longer distances and the necessity to travel on higher speed and volume roadways for those travelling by bicycle.
- The poor surface condition and debris on some roadways make it difficult for bicyclists, who are more susceptible to poor maintenance conditions.
- Growth in the area is a double-edged sword. It has likely impacted some of the population's decision to forego car use, but also likely discouraged bicycling (and walking) due to feeling unsafe or unwanted on roadways.

The Opportunities and Constraints Map in Chapter 14 highlights some of these opportunities and constraints as well as the major regional destinations.



Cut-throughs like this one improve connectivity and access for bicyclists and pedestrians.

Review of Existing Planning Efforts

APPENDIX 2

INTRODUCTION

Local and regional planning establishes a community's vision for the future and the steps needed to advance towards that vision. Bike Walk RFATS builds upon these prior efforts and locally and regionally adopted goals and strategies. The following section provides a summary of relevant plans related to transportation, land use, walkways, bikeways, and trails. Relevant existing plans include:

- York Forward 2035 Comprehensive Plan
- City of Rock Hill Strategic Plan 2016-2018
- RFATS Urbanized Area Transit Implementation Study
- York County Bicycle Route Map
- York County Transportation Update: Pennies for Progress and C-Funds
- City of Tega Cay Comprehensive Plan 2015-2025
- Lancaster County Comprehensive Plan 2014-2024
- City of Rock Hill Focus 2020 Comprehensive Plan
- Rock Hill – Fort Mill Area Transportation Study 2035 Long Range Transportation Plan
- Update to the Town of Fort Mill Comprehensive Plan
- City of Rock Hill College Town Bicycle and Pedestrian Plan
- Carolina Thread Trail Master Plan for Lancaster County Communities
- RFATS Sidewalk and Trail Inventory Map
- Carolina Thread Trail Master Plan for York County Communities
- Rock Hill Trails and Greenways Master Plan Update

The previously listed documents, fifteen (15) in all, reviewed for this plan are listed in Table 17 and are described in subsequent sections.

Table 17. The background document review included an assessment of bicycle and pedestrian planning documents.

Plan	Agency	Year
York Forward 2035 Comprehensive Plan	York County	2016
City of Rock Hill Strategic Plan 2016-2018	City of Rock Hill	2016
City of Rock Hill Focus 2020 Comprehensive Plan	City of Rock Hill	2016
RFATS Urbanized Area Transit Implementation Study	RFATS	2015
York County Bicycle Route Map	York County	2015
York County Transportation Update: Pennies for Progress and C-Funds	York County	2015
City of Tega Cay Comprehensive Plan 2015-2025	City of Tega Cay	2014
Lancaster County Comprehensive Plan 2014-2024	Lancaster County	2014
Rock Hill – Fort Mill Area Transportation Study 2035 Long Range Transportation Plan	RFATS	2013
Update to the Town of Fort Mill Comprehensive Plan	Town of Fort Mill	2012
City of Rock Hill College Town Area Bicycle and Pedestrian Plan	City of Rock Hill	2012
Carolina Thread Trail Master Plan for Lancaster County Communities	Carolina Thread Trail	2011
RFATS Sidewalk and Trail Inventory Map	RFATS	2009
Carolina Thread Trail Master Plan for York County Communities	Carolina Thread Trail	2009
Rock Hill Trails and Greenways Master Plan Update	City of Rock Hill	2008

SUMMARY OF PLANNING EFFORTS

YORK FORWARD 2035 COMPREHENSIVE PLAN

Year: 2016

Description: This plan is the most current update to York County's comprehensive plan, which provides the basis for regulations and policies that guide York County's physical development and investment. The plan serves to align and guide other plans, programs, and policies developed by the County and jurisdictions therein.

The York Forward 2035 Comprehensive Plan identifies development goals for each of the seven (7) elements of the plan:

- Land Use,
- Economic Development,
- Housing,
- Natural Resources,
- Cultural Resources,
- Community Facilities, and
- Transportation

There are many policies and strategies related to biking and walking in the York Forward plan, with at least one in each of the seven above mentioned elements, as these elements and their goals are interrelated. The breadth and diversity of policies and strategies to encourage walking and biking reflects an understanding of the multi-faceted approach that is necessary in order to effectively increase walking and biking as safe and convenient forms of transportation throughout the region.

A sample of policies and strategies from the York Forward plan that promote safe bicycling and walking include:

- Land Use:
  - POLICY LU-2.4 Create a compact, mixed-use zoning district option in the zoning ordinance that allows for more flexibility, encourages pedestrian-friendly development and includes a combination of residential, retail and office components.
- Economic Development:
  - POLICY ED-4.2 Amenitize existing and planned employment cores.
    - » STRATEGY ED-4.2.1: Identify means to provide or encourage the provision of amenities existing and planned industrial and/or business parks via the addition of walking/running trails, small park areas, and other fitness-related amenities.
    - » STRATEGY ED-4.2.2: Encourage opportunities to locate major offices and even light industrial uses close to walkable mixed use centers. These connections can be immediate or, in the case of industrial uses, perhaps through a trail system connecting business parks to mixed-use centers.
    - » Creation of walkable and mixed-use environments will be critical to maintaining a strong position relative to not only today's corporate decision-makers, but to future decision-makers as well, many of whom increasingly value walkable, mixed-use locations.
- Housing:
  - POLICY H-1.2 Ensure housing choices are available that support multi-modal transportation by permitting higher density residential development along transportation corridors and at nodes where transit service is likely.
    - » STRATEGY H-1.4.1: Amend development codes to review parking standards and design standards for walkability to make development and infill housing more desirable and financially viable.
- Natural Resources:
  - POLICY NR-1.1 Review, evaluate, and amend existing ordinances and land use policies to ensure they protect and preserve our natural resources.
    - » STRATEGY NR-1.1.6: Explore re-use or shared use of rail line rights-of-way for trails (Bike, Pedestrian, Equestrian).
- Cultural Resources:
    - » STRATEGY CR-2.1.3: Increase road connectivity in developed areas in order to minimize the need for new rural roads and ensure that any new road connections or improvements have minimal impact on active farmland and other natural assets.
- Community Facilities:
  - POLICY CF-1.4 Ensure the Zoning and Subdivision Codes supports land use and transportation goals as they relate to community facilities.
    - » STRATEGY CF-1.4.2: Require safe and convenient pedestrian, vehicular, and bicycle connections between community facilities and the neighborhoods they serve.
- Transportation:
  - POLICY T-1.1 Review, evaluate, and amend existing ordinances and land use policies to ensure they support the current and future transportation system.
    - » STRATEGY T-1.1.1: Adopt a Complete Streets Resolution to:
      - Support implementation of policies requiring development and transportation projects to provide facilities for all user modes that are appropriate for the context of the site.

Additional policies and strategies exist that support improved facilities and development, especially under the transportation element.

CITY OF ROCK HILL STRATEGIC PLAN 2016-2018

Year: 2016

Description: The City of Rock Hill created a blueprint for strategic goals oriented towards achieving the city vision. This includes defining goals, identifying priorities, and establishing performance measures to measure progress. The Strategic Plan is used by each department within the city, and is organized in three parts; quality services, quality places, and quality community.

Recommendations: Specific performance measures are listed in the Strategic Plan relating to sidewalk infrastructure. Under "quality services" these include:

- Conducting an inventory and conditions assessment of all City sidewalks
- Increasing the repairing/replacing of damaged sidewalk
- Upgrading intersection ramps to comply with ADA requirements
- Increasing the percentage of residents who rate sidewalk maintenance as excellent/good
- "Quality places" recommendations include:
- Providing alternative transportation modes
- Updating the community bike/pedestrian plan (underway)

CITY OF ROCK HILL FOCUS 2020 COMPREHENSIVE PLAN

Year: 2016

Description: The City of Rock Hill's update to the Vision 2020 Comprehensive Plan was completed to achieve four (4) major goals. The goals are: 1) make the plan easy to understand; 2) develop reasonable and realistic recommendations; 3) create a resource that is valuable to decision makers, and; 4) clarify the role of the Comprehensive Plan. Additionally, the update included a public health element integrated with active living principles.

Recommendations: The Comprehensive Plan update makes specific recommendations to support alternative transportation modes and improved public health outcomes. These recommendations include the following:

- Develop a City-wide bicycle and pedestrian plan that balances the needs of all user types and builds upon the College Town Area Bicycle and Pedestrian Plan and the Trails and Greenways Master Plan
- Identify and improve unsafe pedestrian facilities, including those identified through Safe Routes to School assessments
- Create improved pedestrian and bicycle connections between major city attractions such as downtown, Winthrop, parks, and shopping
- Advocate for bike lanes, sidewalks, and trails through existing Pennies for Progress projects, as stand-alone projects, or on future Pennies for Progress referendums
- Develop a plan for maintenance of bicycle and pedestrian facilities
- Improve walkability and bikeability on future transit corridors

RFATS URBANIZED AREA TRANSIT IMPLEMENTATION STUDY

Year: 2015

Description: After adopting previous Master Plans and Transportation Studies, RFATS pursued this study to better assess the demand for transit and to develop transit options that would improve mobility for area residents. This assessment was completed by studying major destinations in the area (population centers, major employers, etc.), the demand for transit, existing transit services, and future transit opportunities.

Recommendations: RFATS is looking to expand access to transit systems for citizens in the following areas to complete access between residential areas, major employers, and activity centers:

- City of Rock Hill
- City of Tega Cay
- Town of Fort Mill
- Panhandle of Lancaster County
- York County

The main focus of expanding transit is in areas with high population and employment densities as well as areas with high poverty, older adults, youth, and those with disabilities. Route opportunities include seven (7) different route options that would serve the City of Rock Hill and three (3) routes that would serve the SC 160 Corridor connecting the Town of Fort Mill to Gold Hill Road near Tega Cay. These recommended routes are further detailed in Chapter Four of the Study where

each route option has its own dedicated section detailing major destinations and transit route.

YORK COUNTY BICYCLE ROUTE MAP

Year: 2015

Description: York County has provided citizens (residents and tourists) with a map of five (5) bicycle routes that extend throughout the county. By doing so, York County seeks to increase use of available bicycle routes and strengthen support for tourism in the area.

Recommendations: The approved routes include Central York County Route, Reservation Route, Kings Mountain Route, Fort Mill Route and Nimitz Route. These five (5) bicycle routes can be seen in Figure 14.

YORK COUNTY TRANSPORTATION UPDATE: PENNIES FOR PROGRESS AND C-FUNDS

Year: 2015

Description: York County has developed a Pennies for Progress and C-Funds Update to inform the public about completed and planned improvements that have been funded by the citizens of York County through the County's sales tax program - which was most recently approved in August 2011. By developing the Pennies for Progress Program, the County seeks to ensure safer roads and faster response times by police, fire, and medical personnel.

Recommendations: In this update, the County focuses on the status and completion of plans for projects of particular interest to area citizens, which include the following:

- Fort Mill Southern Bypass
- Hubert Graham Way Connector
- Gold Hill Road and I-77 Interchange
- SC Highway 160 West from Zoar Road to the NC state line

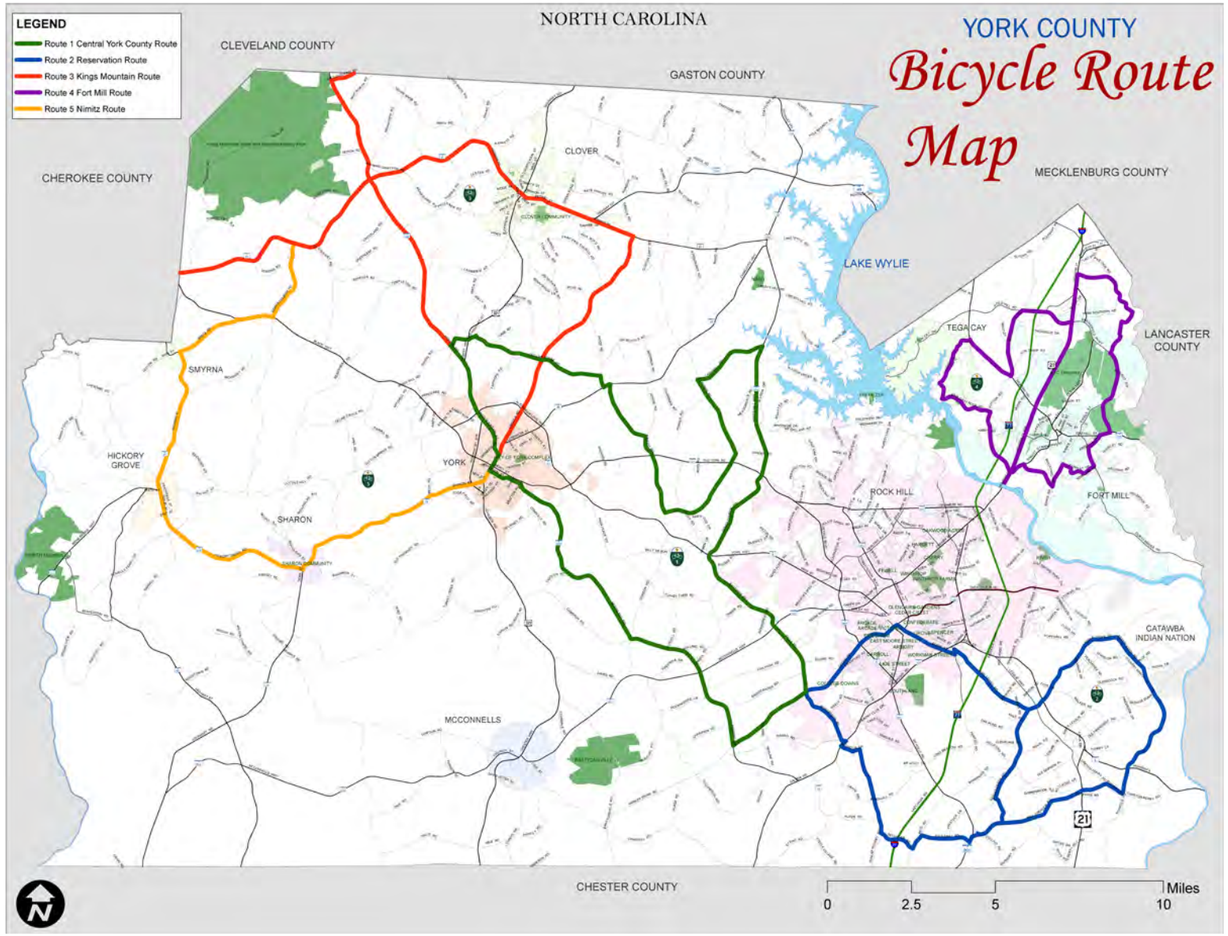


Figure 13. York County Bicycle Route Map

- US 21/SC Highway 51 from Springfield Parkway to the NC state line
- Exit 82, Exit 85, Exit 88, and Exit 90 along I-77

The update also provides an overview of the C-fund Gasoline Tax Program, recent projects completed, and upcoming projects that are to be funded by the program. One of the examples of completed resurfacing projects (Trail Ridge at Tega Cay Drive) incorporated crosswalk improvements. The upcoming projects listed amounted to five miles of road resurfacing, gravel paving, and safety improvements.

Although these improvements do not focus on improving bicycle and walking access, they do provide the County with better roadway conditions and opportunities for incremental pedestrian and bicycle improvements.

CITY OF TEGA CAY COMPREHENSIVE PLAN 2015-2025

Year: 2014

Description: The City of Tega Cay developed their Comprehensive Plan in hopes of defining the local values and the planned development of the City. With an increasing population in the City, planning officials seek to use this Comprehensive Plan to balance economic development, housing, natural resources, cultural resources, community facilities, land use, transportation, and priority investment by stating their ten (10) goals and ideas.

Recommendations: To achieve the goals set aside in the Comprehensive Plan such as enhancing public health, enhancing transportation choices, and increasing transportation mobility, the City is looking to plan and develop streets and roadways that comply with the Complete Streets policy and trails that supports that network. This policy recommends that streets be designed to accommodate all context-appropriate roadway users, including motorists, transit, bicyclists, and pedestrians. These improvements are planned so as to connect citizens and tourists to the following areas:

- Lake Wylie
- Baxter Village
- Anne Springs Close Greenway

Pedestrian and bicycle improvement goals and recommendations/action strategies are listed in further detail in the Transportation Section of the Comprehensive Plan on pages 27-34.

LANCASTER COUNTY COMPREHENSIVE PLAN 2014-2024

Year: 2014

Description: Lancaster County had their Comprehensive Plan developed in a manner that would focus on ideas and policies based on priorities from the public, private, and non-profit sectors within the County. Strategic priorities such as public safety, economic development, roads/infrastructure, financial stability, growth management, and communications would guide any decisions made by planning officials in order to make Lancaster County a great place to live, learn, work, worship, play, and raise a family.

Recommendations: Within the Comprehensive Plan, Lancaster County uses the Transportation Element to discuss existing bicycle routes and improvements to the current trail network. Currently, Lancaster County has the Northern Crescent Route that runs 360 miles providing access to the following:

- Andrew Jackson State Park
- Forty Acre Rock Heritage Preserve
- Cherokee Foothills Scenic Highway

With the aid of the Carolina Thread Trail initiative, Lancaster County is looking to expand their trail and greenway network based on the Lancaster County Greenway Master Plan developed in 2011. With a growing population in Lancaster County, it was recommended to use the Master Plan as a guide to prevent losing public open space to provide recreational, educational, and economic development opportunities.

ROCK HILL – FORT MILL AREA TRANSPORTATION STUDY 2035 LONG RANGE TRANSPORTATION PLAN

Year: 2013

Description: The RFATS 2035 Long Range Transportation Plan covers a planning horizon of 20 to 25 years and provides guidance in a number of critical planning areas, including highways, public transportation, congestion management, freight movement, bicycle/pedestrian travel and aviation, among many others.

Recommendations: With goals of enhancing mobility, reducing congestion, incorporating alternative transportation modes, expanding freight, improving the environment, and informing citizens in the RFATS Study Area, the following recommendations were made:

- Create a user-friendly visual resource of the Plan for the public
- Encourage and promote transit opportunities
- Support bicycle and pedestrian provisions with highway facility improvements (Complete Streets policy)
- Prepare a thorough collector road plan to promote connectivity and efficiency of the of the transportation network
- Pursue SCDOT funding for key safety improvements at identified intersections
- Pursue state, local, and private funding to complete priority segments of the Carolina Thread Trail
- Pursue Safe Routes to Schools funding for bicycling and walking facilities
- Promote and expand transit supportive land uses and site development throughout the RFATS region

TOWN OF FORT MILL COMPREHENSIVE PLAN

Year: 2012

Description: The 2012 update to the Town of Fort Mill Comprehensive Plan was developed for the following reasons: to assess Fort Mill of today and to guide decision makers for developments in the future. With developers/stakeholders in both the public and private sectors, the Town of Fort Mill recognizes and addresses the current issues that are seen as critical to the development of the Town.

Recommendations: The Town uses this Comprehensive Plan to guide planning of bicycle and pedestrian facility improvements. In developing infrastructure, the Town of Fort Mill seeks to incorporate bicycle, pedestrian, and transit facilities along all major roadways where possible. To achieve this goal, the following recommendations resulted:

- Continue to promote connectivity between communities and neighborhoods
- Reduce traffic congestion through improvements and alternative routes
- Continue participation in programs such as RFATS and Pennies for Progress
- Study and communicate the present RFATS Bus Rapid Transit plan and Charlotte Area Transit plans
- Encourage the incorporation of bicycle facilities in the design of roadways and developments
- Assess and determine needed sidewalk improvements throughout the planning area
- Research funding options for the integration of alternative forms of transportation

More recommendations can be seen in the Recommendation and Implementation Strategies section of the Plan on pages 20-48. Recommendations on specific improvements can also be seen on pages 8-19.

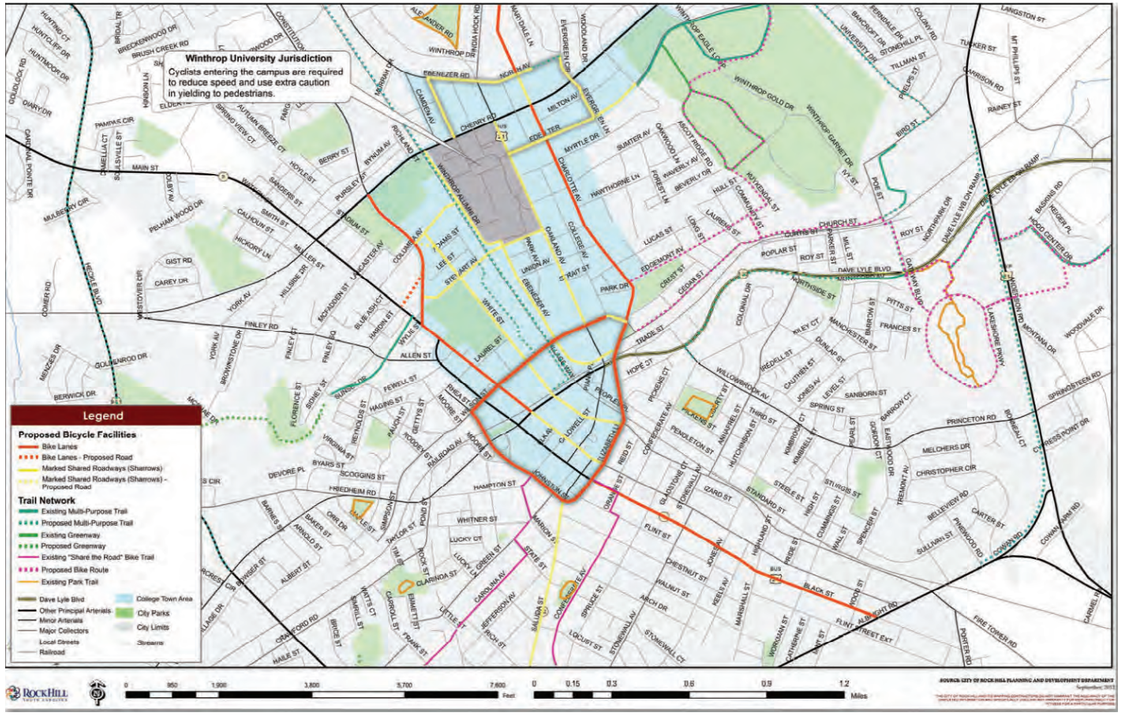


Figure 14. Bicycle Facilities Recommendations Map from the City of Rock Hill College Town Area Bicycle and Pedestrian Master Plan

CITY OF ROCK HILL COLLEGE TOWN AREA BICYCLE AND PEDESTRIAN MASTER PLAN

Year: 2012

Description: As an extension of the broader College Town Action Plan, the City of Rock Hill completed a handle-bar assessment of walking and biking needs in the downtown area. Through field work and an analysis of traffic volumes and collision data, the City and partners developed a network of recommended bicycle and pedestrian infrastructure improvements. Facility recommendations included sidewalk infill and pedestrian and bicycle intersection improvements as well as on-street bikeways implemented through application of shared-lane markings and bike route signage, lane reconfiguration (or road diet), lane narrowing, reallocation of on-street parking, and new pavement and streetscape investments. Since the plan's completion, the City has implemented a number of proposed projects on key corridors in downtown.

Recommendations: The pedestrian and bicycle recommendations included corridor improvements, intersection improvements, wayfinding signage, and general design guidance for bicycle and pedestrian facilities. The proposed network, as identified in 2012, is shown in Figure 14.

CAROLINA THREAD TRAIL MASTER PLAN FOR LANCASTER COUNTY COMMUNITIES

Year: 2011

Description: The Carolina Thread Trail Master Plan was developed for Lancaster County with the purpose of providing planning officials direction related to connecting people, businesses, and communities. With this goal in mind, the Plan also serves as a guide for preserving natural resources and conserving historical sites while providing public facilities through greenway and trail development. The Plan involved outreach to stakeholders and the public and recommends a preferred alignment for the regionally-linked Carolina Thread Trail as it extends through Lancaster County.

Recommendations: To achieve connectivity, collaboration, inclusiveness, and respect for the land and the land owner, the following greenway and trail development recommendations were made to promote health, economic, and environmental benefits:

- 54.7 miles along stream/river corridors
- 52.4 miles along existing road rights-of-way
- 34.3 miles of blueways along the Catawba River and Cane Creek

These recommended greenways and trails are detailed in Chapter Four of the Master Plan. This section of the Master Plan gives detail about individual segments of the proposed trail network.

RFATS SIDEWALK AND TRAIL INVENTORY MAP

Year: 2009

Description: With the aid of York County, RFATS developed a map to show existing trails, greenways, and sidewalks as well as proposed trails, greenways, multi-purpose sidewalks, and sidewalks. The map also shows safe routes to school, gap connections, and long range improvements. By providing this map, RFATS is providing a resource to help familiarize citizens with walking and multi-use facilities.

Recommendations: The 2009 RFATS Sidewalk and Trail Inventory Map is shown in Figure 15, however this map has been continually updated since adoption.

CAROLINA THREAD TRAIL MASTER PLAN FOR YORK COUNTY COMMUNITIES

Year: 2009

Description: The Carolina Thread Trail Master Plan was developed for York County with the purpose of providing planning officials direction related to connecting people, businesses, and communities. With this goal in mind, the Plan also serves as a guide for preserving natural resources and conserving historical sites while providing public facilities through greenway and trail development. The Plan involved outreach to stakeholders and the public and recommends a preferred alignment for the regionally-linked Carolina Thread Trail as it extends through York County.

Recommendations: To achieve connectivity, collaboration, inclusiveness, and respect for the land and the land owner, approximately 225 miles of trails and greenways were recommended to create a comprehensive network in York County. Of these 225 miles, 128 miles were identified as connectors to the following attractions:

- Anne Springs Close Greenway
- Catawba Cultural Center
- Catawba Indian Reservation
- Catawba River
- Kings Mountain State Park and Kings Mountain National Military Park

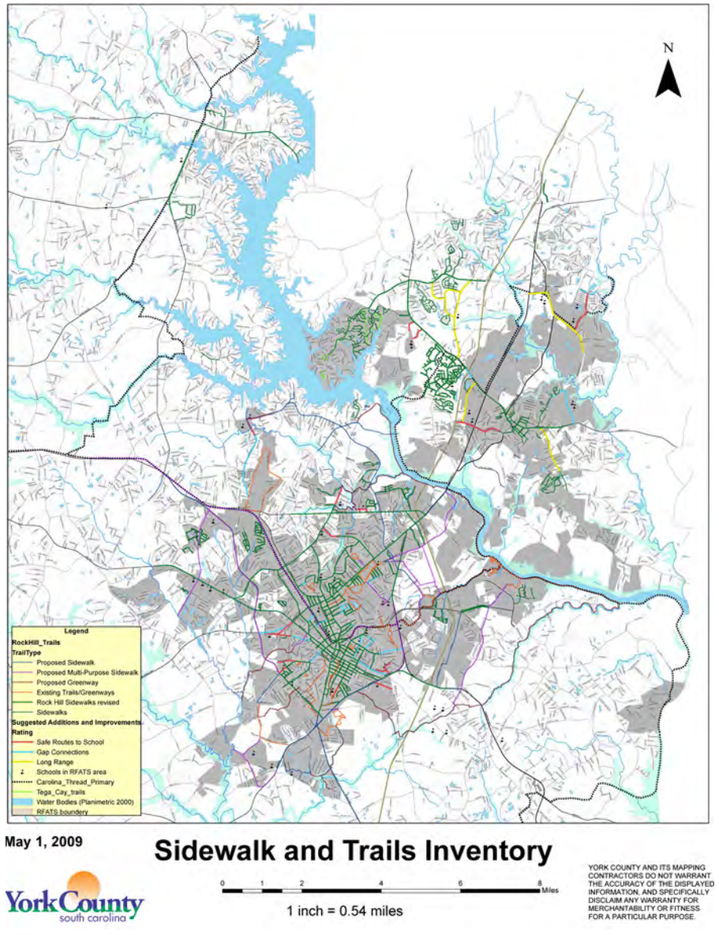


Figure 15. Sidewalk and Trails Inventory Map

These planned trails and greenways comprise the following:

- Eight (8) miles of existing trails
- Fifty (50) miles of previously proposed trails
- Seventy (70) miles of newly proposed trails

These recommendations are further detailed in Chapter Four of the Master Plan and the Proposed Connections Map on Carolina Thread Trail's website (http://www.carolinathreadtrail.org/local-connections/york-county-sc-2/).

CITY OF ROCK HILL TRAILS AND GREENWAYS MASTER PLAN UPDATE

Year: 2008

Description: Starting in 2003, the City of Rock Hill developed a plan to connect major destinations. Sidewalk recommendations would expand the network from 11.16 miles to 46.5 miles. With the success of the Master Plan, the City of Rock Hill developed the Master Plan Update to further expand the existing facilities.

Recommendations: By updating the Trails and Greenways Master Plan in conjunction with several different organizations, community leaders developed the following recommendations to expand the existing network:

- Maximize coordination among agencies, communities, and trail groups
- Assist agencies, communities, and trail groups with trail planning efforts
- Identify additional sources of funding and develop grant applications
- Continue the identification of new trail projects and opportunities
- Support local communities' efforts to preserve and/or create trails
- Ensure that trail projects are under development progress in a timely fashion
- Support the identification and development of new and/or improved trail connections

A detailed inventory of proposed and existing trails is available on page 17 of the Master Plan Update.

KEY FINDINGS

It can be noted that within each plan, providing a range of choices for mode of transportation is a key implementation strategy that could be used to improve transportation, quality of life, recreation, and economic development. Expanding transit services to the urbanized areas of York and Lancaster counties would create higher ridership and better access to different regions of the RFATS Study Area. Expanding bicycle and pedestrian facilities was also a key strategy to providing mode choice. With the expansion of the Carolina Thread Trail in each county, hundreds of trails would be created, providing for recreational opportunities, improvement of health, economic development, and better access to major destinations.

Although each plan incorporates goals and recommendations of providing active modes of transportation, the plans identified funding as a primary challenge. Prioritizing roadway user safety and community access and mobility, as well as seeking cost-efficient strategies for implementation is critical to ensuring that available funding from local, state, federal, and private sources best serves the goals and strategies of existing, adopted plans.

Priority Project Cut Sheets

APPENDIX 3

INTRODUCTION

This chapter presents some of the proposed priority pedestrian + bicycle network improvements that were identified during the design process and supplemented through input from the project team, field work, and the analysis. The proposed improvements are intended to make walking and biking safer and more accessible for everyone in the RFATS area. The recommendations are organized through project cutsheets, which are intended to convey what recommendations can look like to residents and stakeholders, as well as assist in applying for implementation funds. The three projects detailed in individual cutsheets are crucial catalysts for economic development, walkability, and quality of life in the RFATS area.

Intersection Improvements: Dobys Bridge Road + US 521

Project Mileage

- Spot Improvement

Avg. Daily Traffic

- US 521: 25,700 (2015)
- Dobys Bridge: 5,300 (2015)

Recommended Improvements

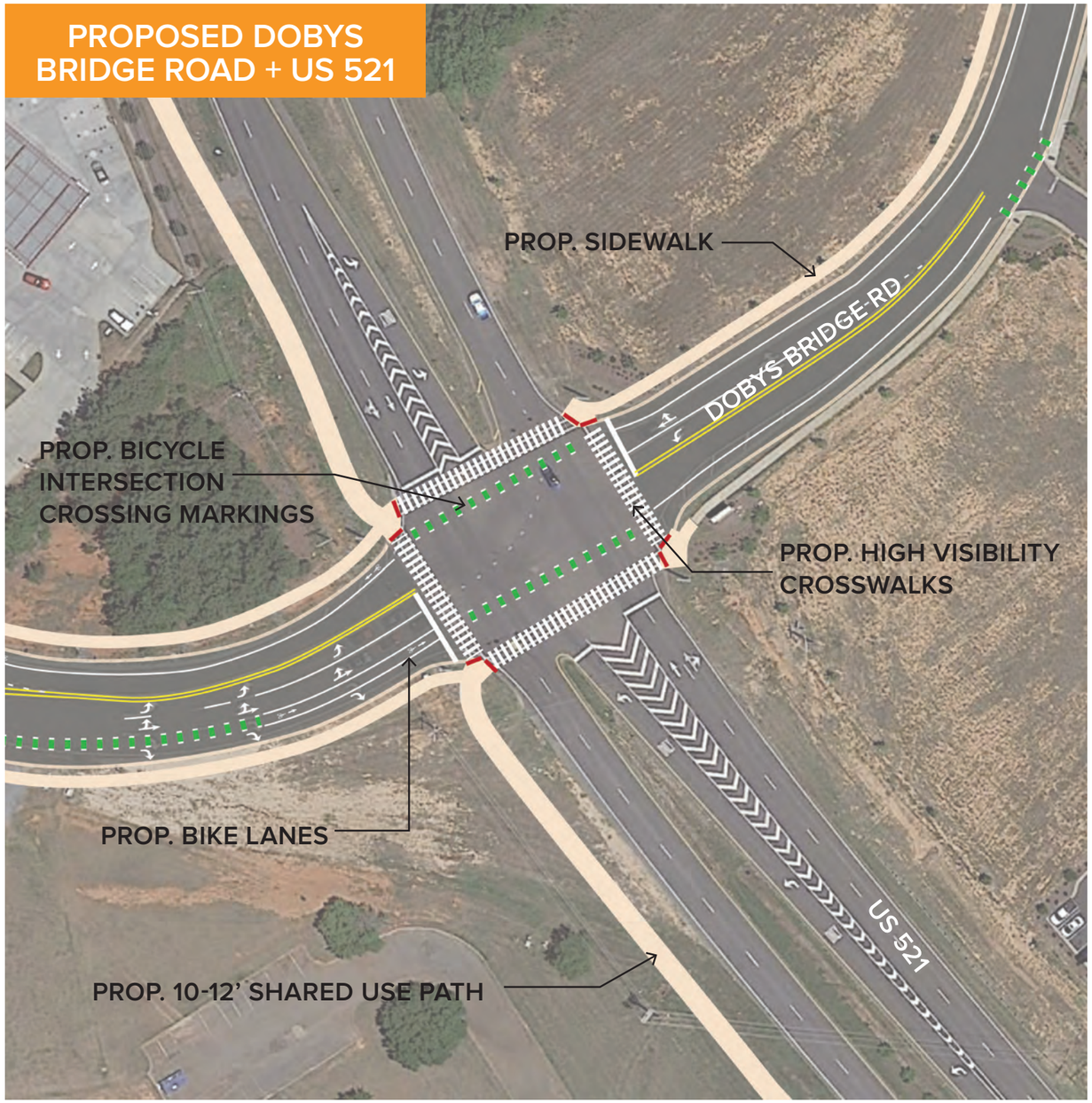
- Shared Use Path on US 521
- Bike lanes and sidewalk on Dobys Bridge Road
- High visibility crosswalks and pedestrian countdown signals at the intersection

Estimated Project Cost

- Construction: $85,000 ($2,000 per curb ramp, $3,000 per crosswalk, $1,200 per pedestrian countdown signal, and $7,500 per ped refuge island)
- Design + Construction Management: $8,500 (10%)
- Shared use paths, sidewalks, bike lanes, traffic calming features and ROW acquisition are not included in this estimate.

PROJECT HIGHLIGHTS

Proposed improvements at US 521 and Dobys Bridge Road focus on pedestrian and bicycle safety at the intersection. A high-visibility crosswalk signals to motorists that they must stop for pedestrians and encourages pedestrians to cross at designated locations. Installing crosswalks alone will not necessarily make crossings safer especially on multi-lane roadways, but should be used in conjunction with traffic signals, ADA accessible sidewalks, and pedestrian refuge islands. Bicycle pavement markings through intersections guide bicyclists on a safe and direct path through the intersection and provide a clear boundary between the paths of through bicyclists and vehicles in the adjacent lane. High visibility white and/or green markings should be used to alert bicyclists and drivers to potential conflict zones.



US 21 Shared Use Path

Project Mileage

- 8.24 miles (Sutton Rd to NC State Line)

Avg. Daily Traffic

- 9,300-38,800 (2015)

Recommended Improvements

- Shared Use Path on US 21
- Improved pedestrian crossings at major intersections and appropriate mid-block locations
- Connections to schools and major retail centers

Estimated Project Cost

- Construction: $4,944,645 ($600,000 per mile)
- Design + Construction Management: $494,464 (10%)
- Traffic calming features and ROW acquisition would add to these costs.
- Cost estimate is based on existing conditions, however implementation may occur as part of future road widening which would impact cost.

PROJECT HIGHLIGHTS

Shared use paths can provide a desirable facility, particularly for recreation, and users of all skill levels preferring separation from traffic. Bicycle paths should generally provide directional travel opportunities not provided by existing roadways. The proposed shared use path along US 21 will offer a separated bicycle and pedestrian pathway, while providing opportunities to engage with existing businesses along the corridor.

Lane Restriping: Gold Hill Road

Project Mileage

- 1.4 miles (Tega Cay Dr. to SC 160)

Avg. Daily Traffic

- 19,800 (2015)

Recommended Improvements

- Reallocate existing pavement (64’ width)
- Dedicated bicycle facility
- Connect gaps in sidewalk
- Improved pedestrian and bicycle crossings at major intersections and appropriate mid-block locations

Estimated Project Cost

- Construction: $1,120,000 ($800,000 per mile)
- Design + Construction Management: $112,000 (10%)
- Traffic calming features and ROW acquisition would add to these costs.

PROJECT HIGHLIGHTS

On roadways with wide lane widths. Most standards allow for the use of 11 foot and sometimes 10 foot wide travel lanes to create space for bike lanes. Research shows that 10 and 11 ft travel lanes have no negative impact on roadway capacity or safety. Roadways where the percentage of trucks, buses, and recreational vehicles is greater than 5 percent of the ADT should have lane widths of 12 feet. Where conditions allow utilizing lane widths narrower than 12 feet to accommodate bicycle facilities, impacts of narrower lane widths to motor vehicle traffic should be determined. (SCDOT)

PROPOSED GOLD HILL ROAD CROSS SECTION

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