



Transylvania County

B I C Y C L E P L A N



ACKNOWLEDGEMENTS

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*Cover photos courtesy of Carmichael Training Systems
(upper left and bottom photo)*



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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2019

TRANSYLVANIA COUNTY BICYCLE PLAN EXECUTIVE SUMMARY

planning.transylvaniacounty.org

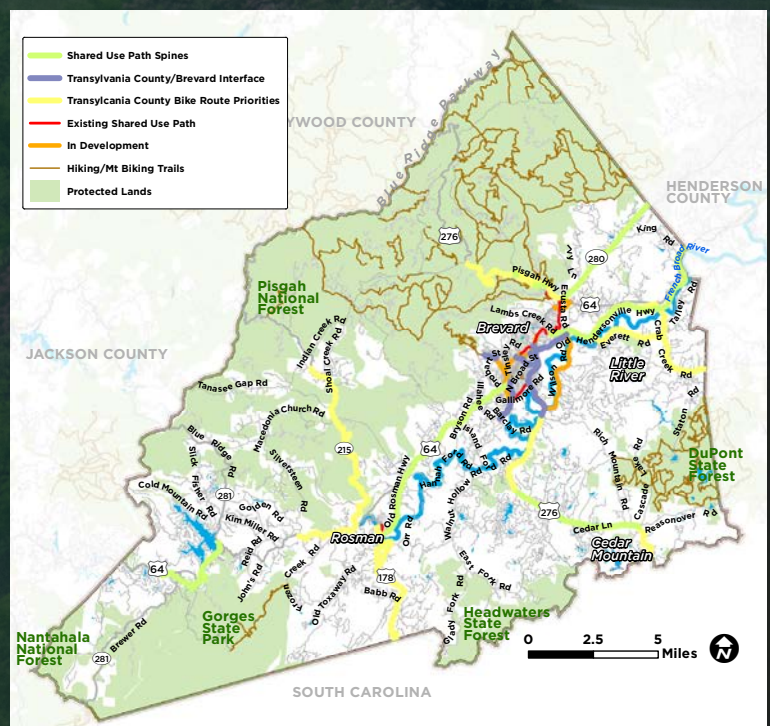
In 2017, Transylvania County was awarded a grant from the North Carolina Department of Transportation (NCDOT), Division of Bicycle and Pedestrian Transportation (DBPT), to develop a comprehensive bicycle plan. The local match for the grant was provided by the Blue Ridge Bicycle Club. This was only the third time a North Carolina county received such an award to-date.

The Transylvania County Bicycle Plan provides a framework for the county, residents, developers, NCDOT, and other regional planning partners to strategically build better connections for bicycling in the county. The plan provides detailed recommendations for bicycle facilities, policies, programs, and implementation. This plan aims to use bicycling as a tool for improvements in mobility, safety, health, economy, environment, and overall quality of life.

PLAN VISION

Transylvania County will have an interconnected network of paved paths, bike lanes, and other bike infrastructure that will provide greater safety, health, connectivity, and alternative transportation routes between communities and destinations in Transylvania County and throughout the region.

PRIORITY NETWORK: MAP 3.2



INFRASTRUCTURE

This map shows an overview of the priority network recommendations for bicycle infrastructure in Transylvania County. For details, please see Chapter 3 of the full plan; available at: planning.transylvaniacounty.org

GOALS



INCREASE SAFETY

Address the safety and level of comfort of the transportation system for bicyclists and motorists; Reduce the number of bicycle crashes, injuries, and fatalities over time.



ENHANCE HEALTH

Provide transportation options and recreational opportunities that promote an active lifestyle.



ENHANCE CONNECTIVITY

Create a well-connected network of bicycle-friendly streets and paths as part of a diverse network of transportation options in Transylvania County.



INCREASE LIVABILITY THROUGH ALTERNATIVE TRANSPORTATION

Implement infrastructure to accommodate all modes of transportation to improve the overall quality of life in Transylvania County.



POSITIVELY IMPACT ECONOMIC HEALTH

Recognize the economic benefits of a bicycle-friendly community, and capitalize on the return on investment for bikeways and greenways.



PROMOTE EQUITY

Create a network of bike routes that allow ALL county residents to access parks and activity centers by biking.



PROTECT THE ENVIRONMENT

Promote access to natural resources through strategic implementation of future shared use paths.

PROGRAMS AND POLICIES

Program and policy recommendations are essential and complementary to improvements in infrastructure. For details, please see Chapter 3 of the full plan; available at: planning.transylvaniacounty.org



POLICY CONSIDERATIONS

The policy considerations presented in the tables on the following pages were developed through the lens of the project vision and goals, specifically, the vision of making Transylvania County a place where: *Transylvania County will have an interconnected network of paved paths, bike lanes, bike lanes, and other bike infrastructure that will provide greater safety, health, connectivity, and alternative transportation routes between communities and destinations in Transylvania County and throughout the region.*

TABLE 4.1

Topics/Strategies	General Recommendations
Support bike accommodations by roadway type	See Chapter 4 of the NACTO Complete Streets Planning and Design Guidelines for recommendations of bikeway type by roadway type. Consider including these guidelines by reference in local design guidance or requirements. The NACTO Urban Bikeway Design Guide provides additional design details for various on-street bikeway treatments and could be adopted by reference in regional ordinances and/or engineering standards. Many cities have taken this approach. Resources: FHWA Small Town and Rural Multimodal Network Guide: http://ruraldesignguide.com/ NACTO Urban Bikeway Design Guide: http://nacto.org/ctsc-for-cycling/design-guide/ FHWA Separate Bikeway Planning and Design Guide: https://www.fhwa.dot.gov/environment/bicycles_publication/separate_bikeway_guide/page00.cfm
During the future amendments to the subdivision ordinance consider requiring dedication, preservation or development of greenways with new development, redevelopment, and roadway projects for subdivisions with over 20 lots.	Consider requirements for greenway reservation, dedication, or provision in new developments where a greenway or trail is shown on an adopted plan or where a property connects to an existing or proposed greenway. Where greenway construction cannot practically be required, consider offering incentives in the form of reduced fees, cost sharing, density bonuses, or reduction in other open space requirements when adopted greenway alignments are constructed through private developments. See the incentives offered by the City of Asheville to promote public policy goals. For example: http://www.ashevilleinc.gov/department/sustainability/resources.htm For additional examples of incentives, see also: https://www.law.ufl.edu/_pdf/academics/centers-clinics/conservation/resources/incentive_strategies.pdf Ideally, development regulations should require the construction and maintenance of greenways to local standards unless a maintenance agreement is established with a local government. See requirements in Wake Forest, NC UD, Section 8.2 Greenways: "When required by Wake Forest Open Space & Greenways that or the Wake Forest Transportation Plan, greenways and multi-use paths shall be provided according to the provisions [that follow in the section cited above]." http://www.wakeforestinc.gov/iso.aspx Good Model: (New Hanover County Zoning Ordinance) The Rowcroft Mixed Use District includes the following provision: "Rowcroft facilities shall provide multi-modal transportation opportunities, including public biking, walking, bicycling, and public bus or water taxi uses and the facilities necessary for such uses."
Require new bike lanes, greenways, etc., to connect to existing facilities when located along a priority project identified in Chapter 3.	Connectivity of facilities is critical for walking and biking conditions. New commercial development should be required to connect to or extend existing bicycle and pedestrian facilities. See: Chapters 6 of Wake Forest, NC UD for recommendations for bikeways and greenways, esp. sections 6.5.3, 6.8.2, 6.5.3 (D) http://www.wakeforestinc.gov/iso.aspx Chapter 7 of the Wilson, NC UD regarding greenways. http://www.wilsonnc.org/wp-content/uploads/2014/12/Ch-7-Active-Open-Space.pdf Good Model: (New Hanover County Zoning Ordinance) The EZDZ Zoning District provides points for new developments that connect to the existing bikeway network and key destinations and provides a good definition of the bikeway network. (Section 54.2.1.4 and following.)
Adopt traffic calming programs, policies, and standards in areas of the county where the community has identified this as a need	Traffic calming tools are especially important where bike routes or bike boulevards are proposed on local residential or sub-collector streets. The National Complete Streets Coalition provides good guidelines for traffic calming through their best practices manual: https://www.nactonyc.org/resources/ See also NACTO Urban Bikeway Design Guide section on Bicycle Boulevards and the FHWA Traffic Calming Primer: https://www.fhwa.dot.gov/development/traffic_calming.cfm Consider requiring other traffic calming measures that improve the pedestrian and biking environment such as street trees, narrow street width standards, and T-intersections.



CHAPTER 1: INTRODUCTION

Photo courtesy of Carmichael Training Systems

PROJECT BACKGROUND

In 2017, Transylvania County was awarded a grant from the North Carolina Department of Transportation (NCDOT), Division of Bicycle and Pedestrian Transportation (DBPT), to develop a comprehensive bicycle plan. The local match for the grant was provided by the Blue Ridge Bicycle Club. This was only the third time a North Carolina county received such an award to-date.

The Transylvania County Bicycle Plan provides a framework for the county, residents, developers, NCDOT, and other regional planning partners to strategically build better connections for bicycling in the county. The plan provides detailed recommendations for bicycle facilities, policies, programs, and implementation. This plan aims to use bicycling as a tool for improvements in mobility, safety, health, economy, environment, and overall quality of life.

Transylvania County has long supported the goal of improving bicycle transportation and recreation as evident in formally adopted plans, hosting events such as the 2011 Southern Regional Mountain Biking Summit, and in public feedback. World class mountain biking in Transylvania County has been featured in numerous publications including Bike Magazine's Bible of Bike Tests.

Most importantly, the recent [2025 Transylvania County Comprehensive Plan](#) identified the themes of economic health, environment, land use and livability, and health/culture/equity as priorities for the county. This bicycle plan and its recommendations support each of these themes. One of the Comprehensive Plan's action steps is to: "Develop appropriate infrastructure and educational programs for bikes and pedestrians to ensure safer roads." This action step supports Objective 2 under Land Use and Livability that states "Ensures public safety efforts are financially supported, well-coordinated and prepared for future growth."

[The Transylvania County Strategic Plan](#) outlines six goals with implementation strategies. While this plan supports all six goals in some manner, Goal #5 would be most directly supported by this bicycle plan, with Goal #5 stating that "The community's quality of life includes resources that promote health, transportation connectivity, a sense of place, cultural heritage and public safety."

Lastly, the provision of more walking, biking trails, and greenways was the number one priority that came out of the stakeholder engagement process for the [Transylvania County Parks & Recreation Plan](#).

PLANNING PROCESS

The planning process for the bike plan began in early 2018 with a project kickoff meeting. A Stakeholder Group, formed of representatives from multiple agencies, along with citizens, guided the process and provided input and critical feedback. The public was invited to participate through multiple events, including public open house workshops, stakeholder group meetings, and the county's website.

Project planners collected local data and analyzed existing conditions. From there, the team developed a draft bicycle network, based on past plans, existing conditions analysis, and initial public feedback. The proposed network was refined through a process of multiple draft reviews and revisions, with feedback from county staff, NCDOT, a public workshop, and review by the Stakeholder Group.

The Stakeholder Group met at key stages throughout development of the plan, with members representing multiple perspectives. The full list of Stakeholder Group members can be found in the acknowledgments section of this plan. The bicycle planning process flowchart is found on page 6.

STUDY AREA

The Transylvania County Bicycle Plan focuses on unincorporated portions of Transylvania County. However, the county worked closely with the incorporated communities of Brevard and Rosman to ensure that efforts were tied together and compatible. The county also includes large sections of Pisgah National Forest. Again, the county worked closely with representatives from the NC and US Forest Service to understand the need and opportunities for bikeway improvements.

The county includes some of the most beautiful areas of North Carolina, from rural rolling hills and farms, to small towns, to stunning mountains, with abundant recreational activities. With unique topography and high elevations, the study took into account the significant constraints that exist for expanding a bicycle network in the rural portions of the county.

VISION AND GOALS

Using the 2025 Comprehensive Plan as a foundation, the vision and goals were developed through a combination of Stakeholder Group input and public input. The vision statement and goals are found on page 7.

TRANSYLVANIA COUNTY BICYCLE PLAN PLANNING PROCESS FLOWCHART

Community Outreach Stakeholders and General Public



Public engagement took place throughout the county to ensure geographic representation and ease of the local populations to attend. These photos feature one of the events held at the Little River Community Center.



TRANSYLVANIA COUNTY BICYCLE PLAN VISION STATEMENT

Transylvania County will have an interconnected network of paved paths, bike lanes, and other bike infrastructure that will provide greater safety, health, connectivity, and alternative transportation routes between communities and destinations in Transylvania County and throughout the region.

GOALS:



INCREASE SAFETY

Address the safety and level of comfort of the transportation system for bicyclists and motorists; Reduce the number of bicycle crashes, injuries, and fatalities over time.



ENHANCE HEALTH

Provide transportation options and recreational opportunities that promote an active lifestyle.



ENHANCE CONNECTIVITY

Create a well-connected network of bicycle-friendly streets and paths as part of a diverse network of transportation options in Transylvania County.



INCREASE LIVABILITY THROUGH ALTERNATIVE TRANSPORTATION

Implement infrastructure to accommodate all modes of transportation to improve the overall quality of life in Transylvania County.



POSITIVELY IMPACT ECONOMIC HEALTH

Recognize the economic benefits of a bicycle-friendly community, and capitalize on the return on investment for bikeways and greenways.



PROMOTE EQUITY

Create a network of bike routes that allow ALL county residents to access parks and activity centers by biking.



PROTECT THE ENVIRONMENT

Promote access to natural resources through strategic implementation of future shared use paths.

THE VALUE OF BIKEABLE COMMUNITIES

Potential benefits for Transylvania County in supporting and implementing this plan include improvements in safety, health, economic impact, mobility, and environmental stewardship.

SAFETY

Trends and Challenges

According to a survey of 16,000 North Carolina residents for the 2011 North Carolina Bicycle and Pedestrian Safety Summit, the most commonly reported safety issue for walking and bicycling was inadequate infrastructure (75%).¹ A lack of bicycle facilities, such as bicycle lanes, sidepaths, greenways, and safe crossings, lead to unsafe conditions for bicyclists.

- From 2007-2015, there were 17 documented bicycle crashes within Transylvania County. This leaves Transylvania County 49th out of 100 NC counties in bicycle crashes per capita (lowest to highest).
- In 2017, 15% of all traffic fatalities in North Carolina were bicyclists and pedestrians.²
- North Carolina is ranked as one of the least safe states for bicycling (44th).³

Improving Safety

Separate studies conducted by the Federal Highway Administration and the University of North Carolina Highway Safety Research Center demonstrate that installing pedestrian and bicycle facilities directly improves safety by reducing the risk and severity of pedestrian-automobile and bicycle-automobile crashes (see examples to the right). Some facilities improve safety for both bicyclists and pedestrians, such as sidepaths, paved shoulders, bicycle/pedestrian overpasses or underpasses, and intersection crossing improvements. The following web addresses link to more comprehensive research on safety.

- <http://www.walkbikenc.com/>
- http://www.pedbikeinfo.org/data/factsheet_crash.cfm



193

Average number of bicyclists and pedestrians killed each year in North Carolina (169 pedestrians & 24 bicyclists)

Source: National Highway Traffic Safety Administration: Fatality Analysis Reporting System (FARS). (American Community Survey 3-yr estimates for 2007, 2010, and 2013).

60%



Shared use paths (like the Brevard Greenway) reduce injury rates for cyclists, pedestrians, and other nonmotorized modes by 60% compared with on street facilities.

Source: Teschke, Kay. "Route Infrastructure and the Risk of Injuries to Bicyclists". (2012). American Public Health Association.

Bicycle Facilities with Bicyclist/Pedestrian Crash Countermeasures

FACILITY TYPE	PEDESTRIAN/ BICYCLIST CRASH REDUCTION FACTOR
Install bicycle & pedestrian overpass/underpass	90%
Install sidewalk or sidepath (to avoid walking along roadway)	88%
Provide paved shoulder (of at least 4 feet)	71%
Install raised median at unsignalized intersection	46%
Install bike lanes	35%
Install separated bike lanes	74%

Source: Federal Highway Administration. Desktop Reference for Crash Reduction Factors. <http://safety.fhwa.dot.gov/>

HEALTH

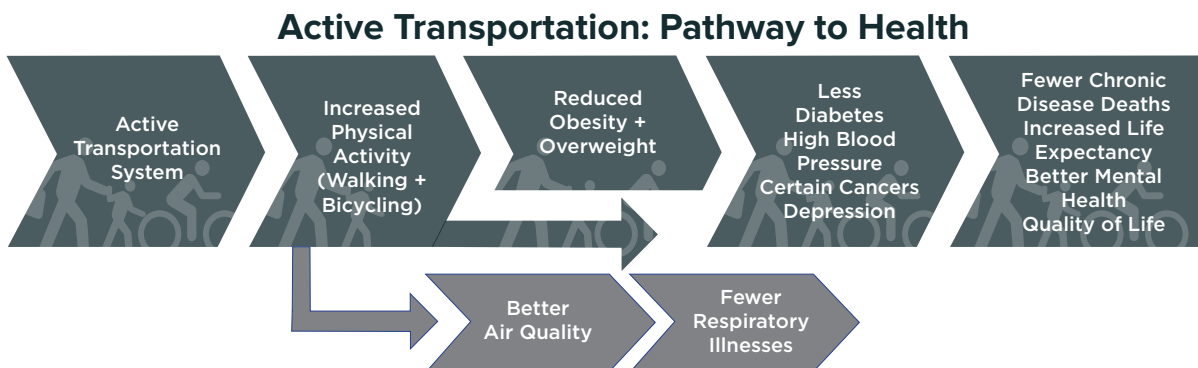
North Carolina ranks 33rd compared to other states in core determinants of health.⁴ Two key measures in that ranking are cardiovascular deaths and obesity, for which North Carolina is ranked 30th and 35th, respectively. Other key trends and challenges related to health and transportation in North Carolina and Transylvania County:

- 66% of North Carolina adults are either overweight or obese.⁵ The state is also ranked 5th worst in the nation for childhood obesity.⁶
- The annual direct medical cost of physical inactivity in North Carolina is estimated at \$3.67 billion, plus an additional \$4.71 billion in lost productivity.⁷ However, every dollar invested in pedestrian and bicycle trails can result in a savings of nearly \$3 in direct medical expenses.⁸
- Of North Carolinians surveyed, 60% would increase their level of physical activity if they had better access to sidewalks and trails.¹
- Nutrition, physical activity, and weight was a priority issue identified in the Transylvania County Community Health Assessment (2015). According to the assessment, only half of county residents say they get the recommended amount of daily physical activity.⁹

Better Health through Active Transportation

Transylvania County can make strides to support community health by developing bicycle lanes and shared use paths to increase safe opportunities for recreation and active transportation. Using active transportation to and from school, work, parks, restaurants, and other routine destinations is one of the best ways that children and adults can lead measurably healthier lives. Increasing one's level of physical activity through bicycling reduces the risk and impact of cardiovascular disease, diabetes, chronic disease, and some cancers. It also helps to control weight, improves mood, and reduces the risk of premature death.¹⁰

- Two 14-year studies of more than 60,000 people investigated if total physical activity, as well as different types of physical activity, were associated with heart failure risk. It found that walking or bicycling at least 20 minutes per day was associated with the largest risk reduction of heart failure.¹¹



Source: Alta Planning + Design; WalkBikeNC



20 MINUTES WALKING OR BIKING
each day is associated with a

21% LOWER RISK OF HEART FAILURE FOR MEN
and
29% LOWER RISK FOR WOMEN

Rahman, 2014 and 2015

ECONOMIC HEALTH

The economic benefits of active transportation come in the form of increased property values, tourism, sales, and infrastructure savings. Many people today move to where they want to live, and bicycle infrastructure and trails are an increasingly important part of that decision.

There are many examples, both nationally and in North Carolina, that affirm the positive connection between trails, active transportation, and property values. Studies have demonstrated a range of increases in property values, from 2% up to 20%. For example, a study from Asabere and Huffman, "The Relative Impacts of Trails and Greenbelts on Home Price", analyzed 10,000 home sales and found that trails, greenbelts/greenways, and trails with greenbelts/greenways were associated with roughly 2, 4, and 5 percent price premiums, respectively.

Bicyclists, pedestrians, and trail users can also add real value to local economies:

- The five-mile Brevard Greenway in the City of Brevard in Transylvania County, according to a three year study (2015-2017) by the NCDOT Division of Bicycle and Pedestrian Transportation, generates approximately \$1.5 million annually in business output. See Executive Summary of the full study on the following page.¹²
- The Greenville Health System Swamp Rabbit Trail Year 3 Findings by Furman University (Clemson International Institute for Tourism & Research & Development), has demonstrated that the 20-mile Swamp Rabbit Trail's economic impact in the county is approximately \$6.7 million per year.¹³
- In Damascus, VA, the self-proclaimed 'Friendliest Trail Town', features 34 miles of trail, where approximately \$2.5 million is spent annually related to recreation visits according to a US Forest Service study, The Virginia Creeper Trail: An Assessment of User Demographics, Preferences, and Economics.¹⁴
- Blood, Sweat, and Gears is an annual long distance ride in Valle Crucis, NC, with over 1,000 participants. According to an Appalachian State University Department of Economics study, "Economic Impact of the 2015 Blood, Sweat, and Gears", the 2015 event had an over \$1 million economic impact on the local economy.¹⁵

- The cost of purchasing and maintaining a bicycle to an individual, and the cost of building and maintaining bicycle facilities to a community, is negligible compared to those same costs for cars and highways.
- Bicycling, when it can be used in a community as a viable form of transportation, can at least partially replace car use and maintenance, keeping household disposable income available for other important wants and needs.



\$8,220

**Average Cost of
Operating a Car Per
Year**



\$308

**Average Cost of
Operating a Bike
Per Year**

Source: Mohn, T. "Pedaling to Prosperity: Biking Saves U.S. Riders Billions a Year." (2012). Forbes. <goo.gl/YX2r1R>



**Bikes
in Beds** How to maximize bicycle
tourism in Haywood County
and Western North Carolina

March 2015

A recent report conducted for nearby Haywood County identifies the significant potential for bicycle tourism in Western North Carolina.

EXECUTIVE SUMMARY

Evaluating the ECONOMIC IMPACT of SHARED USE PATHS in North Carolina

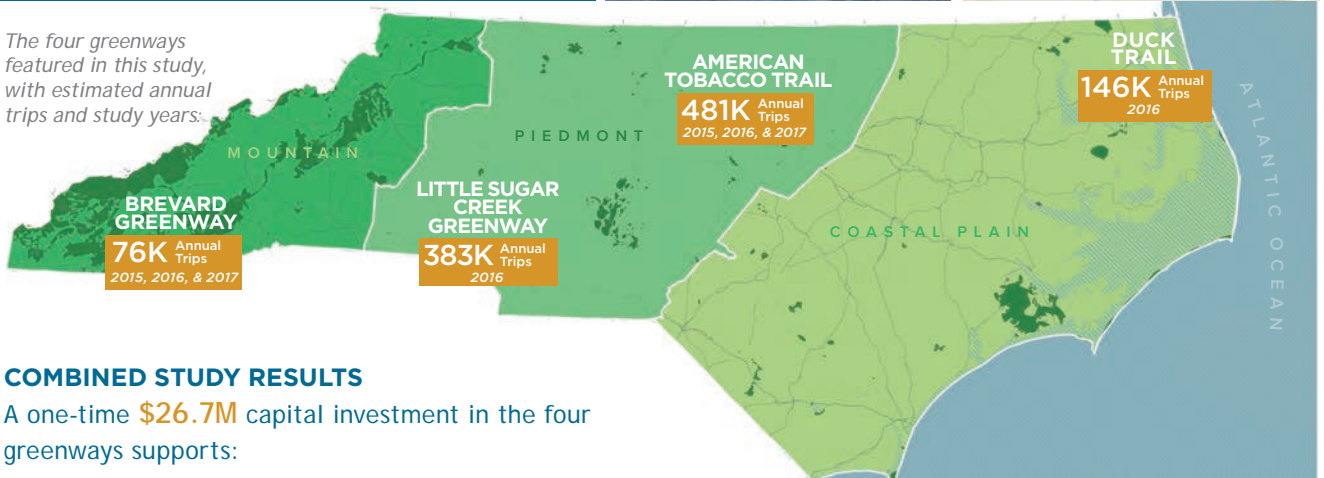
MARCH 2018



Shared use paths, also known as GREENWAYS, provide a shared space for bicycle and pedestrian travel outside of the roadway. This project's objective was to design and test an approach for measuring the economic contributions of greenways in North Carolina.



The four greenways featured in this study, with estimated annual trips and study years:



COMBINED STUDY RESULTS

A one-time **\$26.7M** capital investment in the four greenways supports:



\$19.4M

Estimated annual sales revenue at local businesses along the four greenways



\$684K

Estimated annual local and state sales tax revenue from businesses along the greenways



\$25.7M

Estimated annual savings due to more physical activity, less pollution and congestion, and fewer traffic injuries from use of the greenways



\$48.7M

Estimated business revenue from greenway construction



790 JOBS

Are supported annually through greenway construction

RETURN ON INVESTMENT: Every **\$1.00** of trail construction supports **\$1.72 annually** from local business revenue, sales tax revenue, and benefits related to health and transportation.



By: The Institute for Transportation Research and Education and Alta Planning + Design

For: NCDOT Division of Bicycle and Pedestrian Transportation

FULL REPORT: go.ncsu.edu/sharedusepaths

MOBILITY

Opportunity to Increase Bicycling Rates

According to the 2011 Bicycle and Pedestrian Safety Survey, at least 70% of North Carolinians would walk or bike more for daily trips if walking and bicycling conditions were improved.¹ Furthermore, public input during the development of the Transylvania County Parks and Recreation Plan also shows walking is the number one recreational activity needed by Transylvania County residents. With appropriate accommodations, walking and bicycling can provide alternatives to driving for commuting to work, running errands, or making other short trips.

Commute rates for bicycling in Transylvania County are currently above the statewide average, with 0.5% of Transylvania County commuters bicycling to work and 0.2% commuters bicycling to work statewide. The nationwide average is 0.6% and North Carolina ranks 43rd for bicycling commute rates in nationwide state rankings.³

There are local residents who commute by bike in Transylvania County, and the potential for more people to enjoy a safe bicycle commute could really benefit area households, schools and colleges, and businesses.

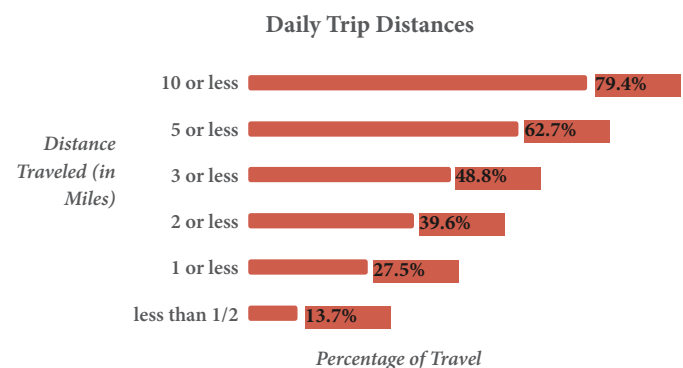
These mobility benefits go beyond commuting as well. Transylvania County has numerous destinations that are accessible, and residents can benefit from safe facilities that increase the rate of walking and biking for short trips to these destinations. Furthermore, other aspects of mobility and accessibility also apply to children and those who can no longer drive due to advanced age. Moreover, improved walking/biking paths benefit those who use wheelchairs or scooters, as well as people who have visual impairments. Currently, Transylvania County has 0 miles of greenways outside of the City of Brevard and the Town of Rosman.

Reduced Vehicle Miles Traveled (VMT) & Congestion

Taking short trips by foot or by bike can help to greatly reduce motor vehicle miles driven and traffic congestion. **Under the Nonmotorized Transportation Pilot Program, walking and bicycling investments contributed to an estimated 23% increase in the number of walking trips and an estimated 48% increase in the number of bicycling trips in four pilot communities between 2007 and 2013.**¹⁶ These individual changes in travel behavior can add up to produce significant societal benefits. Traffic on arterials and other streets can be mitigated as people use bike lanes, paths, and other alternatives to get around. Parking areas can also be made less congested by reducing crowding, circling, and waiting for open spots.

The following web addresses link to more comprehensive research on transportation efficiency.

- <http://www.walkbikenc.com/>
- http://www.pedbikeinfo.org/data/factsheet_general.cfm



Most driving trips in the U.S. are for a distance of five miles or less. Chart from the Bicycle and Pedestrian Information Center, www.pedbikeinfo.org

ENVIRONMENT

Environmental stewardship addresses the impact that transportation decisions (both at the government/policy level and individual level) can have on the land, water and air that Transylvania County residents and visitors enjoy.

Below are some key trends and challenges related to stewardship and transportation in North Carolina:

- According to the National Association of Realtors and Transportation for America, 89% of Americans believe that transportation investments should support the goal of reducing energy use.¹⁷
- North Carolina's 2009-2013 Statewide Comprehensive Outdoor Recreation Plan (SCORP) found "walking for pleasure" to be the most common outdoor recreational activity, enjoyed by 82% of respondents, and bicycling by 31% of respondents.¹⁸
- Public input during the development of the Transylvania County Parks and Recreation Plan also shows that walking is the number one recreational activity needed by Transylvania County residents.

Providing safe accommodations for walking and bicycling in Transylvania County can help to reduce automobile dependency, which in turn leads to a reduction in vehicle emissions – a benefit for County residents and visitors and the environment. As of 2016, 28.5% of U.S. greenhouse gas emissions are attributed to the transportation sector, and personal vehicles account for almost two-thirds (60%) of all transportation emissions.¹⁹ Primary emissions that pose potential health and environmental risks are carbon dioxide, carbon monoxide, volatile organic compounds (VOCs), nitrous oxides (NOx), and benzene. Children and senior citizens are particularly sensitive to the harmful affects of air pollution, as are individuals with heart or other respiratory illnesses. Increased health risks such as asthma and heart problems are associated with vehicle emissions.²⁰

Even a modest increase in walking and bicycling trips (in place of motor vehicle trips) can have significant positive impacts for the environment. For example, replacing two miles of driving each day with walking or bicycling will, in one year, prevent 730 pounds of carbon dioxide from entering the atmosphere.²¹

The following web addresses link to more comprehensive research on active transportation and stewardship.

- <http://www.walkbikenc.com/>
- http://www.pedbikeinfo.org/data/factsheet_environmental.cfm



IF 8% MORE CHILDREN LIVING WITHIN 2 MILES OF A SCHOOL WERE TO WALK OR BIKE TO SCHOOL, THE AIR POLLUTION REDUCED FROM NOT TAKING A CAR WOULD BE EQUIVALENT TO REMOVING 60,000 CARS FROM THE ROAD FOR ONE YEAR, NATIONALLY.

Pedroso, 2008, SRTS

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CHAPTER 2: EXISTING CONDITIONS

EXISTING CONDITIONS

Transylvania County is located in the mountains of Western North Carolina and is situated between Asheville to the northeast, Hendersonville to the east, and Greenville, South Carolina to the southeast. Transylvania County is bisected by the French Broad River valley, flowing from the southwest to northeast toward Asheville - this valley and tributary valleys are where most of the development lies, including the City of Brevard and the Town of Rosman. The Blue Ridge Parkway, a major bicycling destination, follows the ridge line and border of Transylvania County to the northwest, and elevations climb as one travels in Transylvania County to the west and south.

The recently completed 2025 Transylvania County Comprehensive Plan includes detailed insight to existing conditions. Several are highlighted below, pointing to the unique character of the rural, mountainous nature of Transylvania County:

- Nearly half of Transylvania County lies in public/conservation lands, including Pisgah National Forest, DuPont State Forest, Headwaters State Forest, Gorges State Park, Nantahala National Forest, and other protected lands.
- When considering the amount of land that is already developed, publicly owned, in the floodplain, or with slopes of over 25%, it is estimated that there is less than 20% of the County that can be developed.
- As several large manufacturers left in the early 2000's, tourism, outdoor related businesses, and many of the County's smaller manufacturers have experienced steady growth in the past two decades.
- Transylvania County continues to grow steadily, with population growth rates projected anywhere from 7% (low estimate), 15% (moderate estimate), and 20% (high estimate) between now and 2030, adding to the approximately 33,000 full-time residents. Another 7,000 seasonal residents add to the year-round population, pointing to the high quality of life that draws many people to Transylvania County throughout the year.

The 2025 Transylvania County Comprehensive Plan can be found on the County's website here - <https://www.transylvaniacounty.org/departments/planning-and-community-development/2025-comprehensive-plan>.

BICYCLING IN TRANSYLVANIA COUNTY TODAY

Transylvania County attracts a thriving outdoor industry, including recreational mountain biking and road bicycling - 8 mountain and road bicycling races were scheduled in or through the County in 2018. With hundreds of miles of stunning mountain biking trails and scenic, lower traffic volume mountainous roads used by recreational bicyclists, a culture supportive of bicycling not just for recreation, but also for transportation, is emerging in the county.

NCDOT designated bike routes, the 2017 *Ride Transylvania County* bike map, and Strava heat maps indicate popular routes used mostly by recreational bicyclists across the County. Many of these are highlighted in yellow in the Existing Facilities & Destinations maps beginning on page 18.

The 4.8 mile Brevard Greenway is one of the highlights of the existing bicycle network, connecting downtown Brevard and Pisgah National Forest (Davidson River Campground), and many local destinations in-between. With 0 miles of bike lanes in Transylvania County and only another 1.4 miles of shared use path (1 mile along Gallimore Road, and 0.4 miles in downtown Rosman), the Brevard Greenway serves as the longest segment of paved, dedicated bicycle facility in Transylvania County. The 2015-2017 bicycle counts as part of the "Evaluating the Economic Impact of Shared Use Paths" study by NCDOT on the Brevard Greenway estimated 76,000 annual trips along the greenway, which averages out to 208 trips per day.

Unlike automobile traffic volume counts, relatively few bicycle traffic volume counts are conducted across North Carolina (and the US), including Transylvania County. However, the Land of Sky RPO has initiated a counting system that includes bicycles, conducting counts in three separate locations in Brevard over a one week period in late winter/early spring 2018. The percentages below provide a snapshot of the portion of all vehicular traffic that were bicycles at these locations.

Railroad Avenue near McLean Road	4.5%
Parkview Drive near Park Ave	5%
Park Avenue near Parkview Drive	2%

Average percentage of traffic that are bicycles at these locations, counted over a one week period in early 2018 by the Land of Sky RPO.

These relatively high proportions of bicyclists are likely due to the fact that these are popular commuting and recreational bicycle routes in Brevard as a result of their lower automobile traffic volumes, generally lower speed limits, and connectivity to other locations in Brevard.

Traffic counts from 2016 and 2017 as part of upcoming roadway improvement projects at the US 64/US 276/NC 280 intersection, as well as along Wilson Road, counted a very small percentage of bicyclists at 0.3% of total traffic or less. This is likely related to the low bicycle comfort levels at these

locations due to higher automobile traffic volumes and speeds combined with no dedicated space for bicyclists.

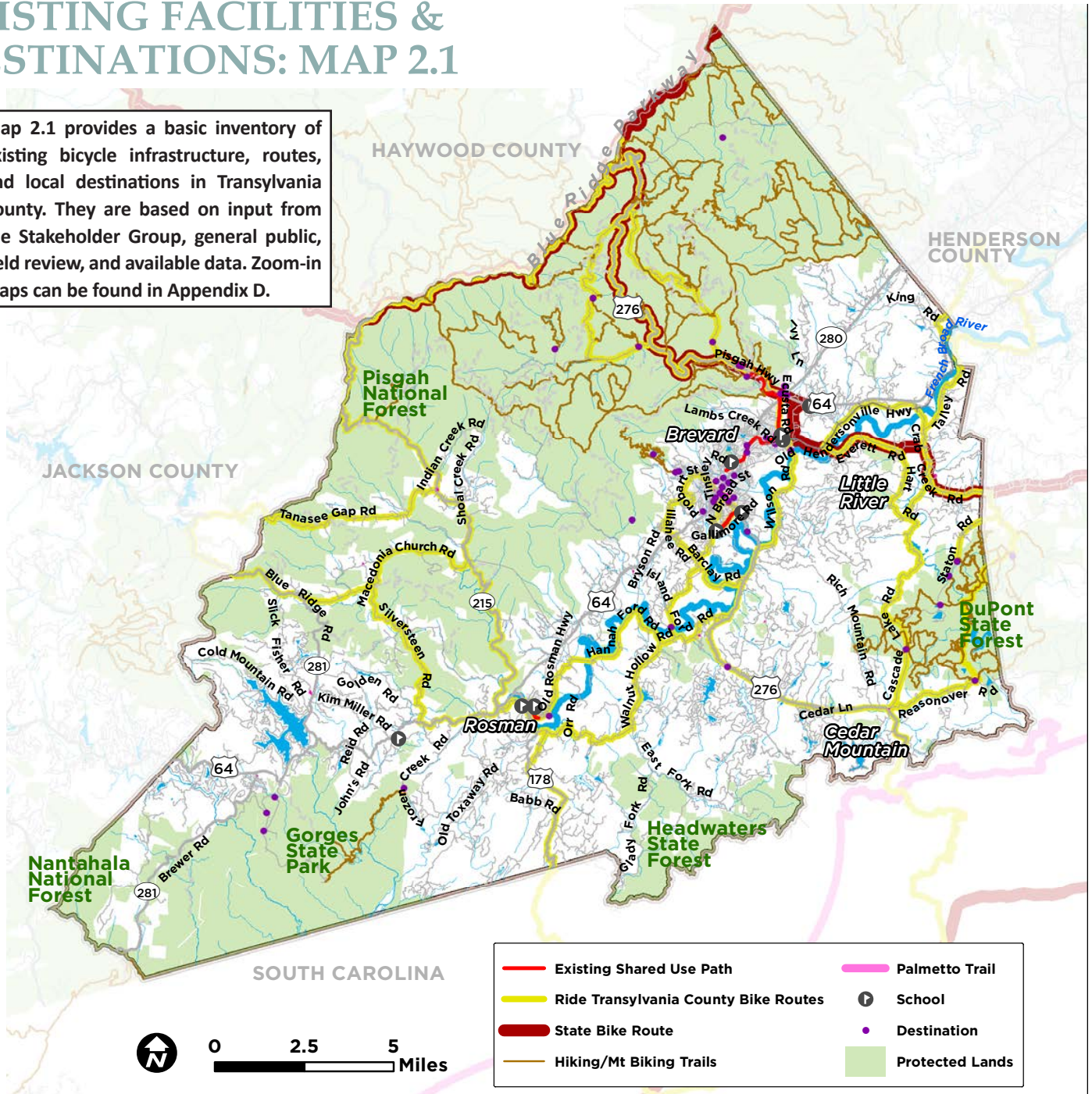
As highlighted in Chapter 1, the US Census also collects commuting statistics by mode of travel to work. The table below highlights the relatively low levels of bicyclists currently commuting to work by bicycle in Transylvania County, North Carolina, and nationwide.

Transylvania County	0.5%
NC Average	0.2%
US Average	0.6%

*% Bike to Work:
US Census
Bureau, 2012-
2016 American
Community Survey*

EXISTING FACILITIES & DESTINATIONS: MAP 2.1

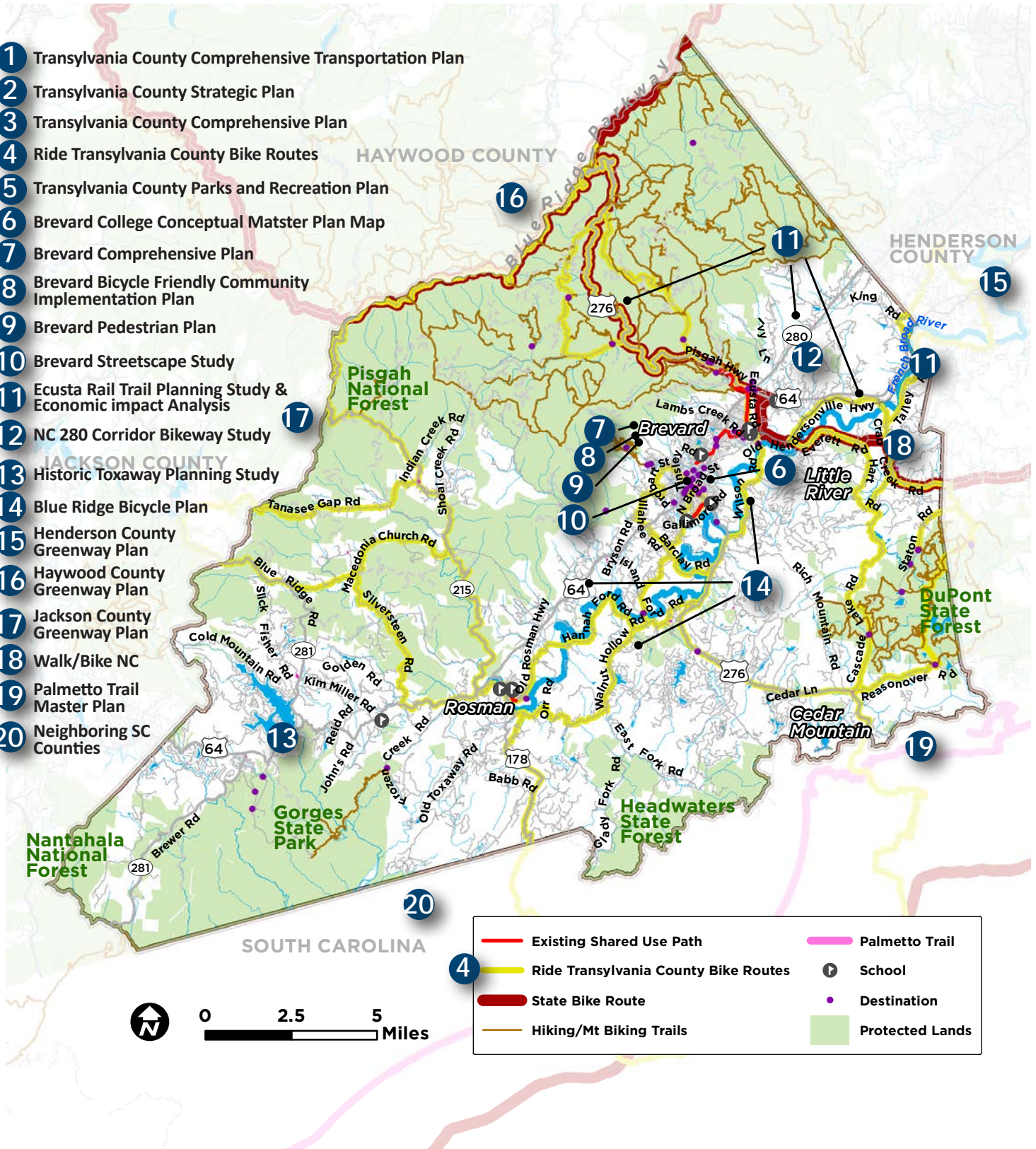
Map 2.1 provides a basic inventory of existing bicycle infrastructure, routes, and local destinations in Transylvania County. They are based on input from the Stakeholder Group, general public, field review, and available data. Zoom-in maps can be found in Appendix D.



PLAN REVIEW: MAP 2.2

This map highlights past planning efforts and key recommendations from those plans that are relevant to this planning process. These are important elements from which to build recommendations for Transylvania County. Further plan review detail can be found in Appendix D.

- 1 Transylvania County Comprehensive Transportation Plan
- 2 Transylvania County Strategic Plan
- 3 Transylvania County Comprehensive Plan
- 4 Ride Transylvania County Bike Routes
- 5 Transylvania County Parks and Recreation Plan
- 6 Brevard College Conceptual Master Plan Map
- 7 Brevard Comprehensive Plan
- 8 Brevard Bicycle Friendly Community Implementation Plan
- 9 Brevard Pedestrian Plan
- 10 Brevard Streetscape Study
- 11 Ecusta Rail Trail Planning Study & Economic impact Analysis
- 12 NC 280 Corridor Bikeway Study
- 13 Historic Toxaway Planning Study
- 14 Blue Ridge Bicycle Plan
- 15 Henderson County Greenway Plan
- 16 Haywood County Greenway Plan
- 17 Jackson County Greenway Plan
- 18 Walk/Bike NC
- 19 Palmetto Trail Master Plan
- 20 Neighboring SC Counties



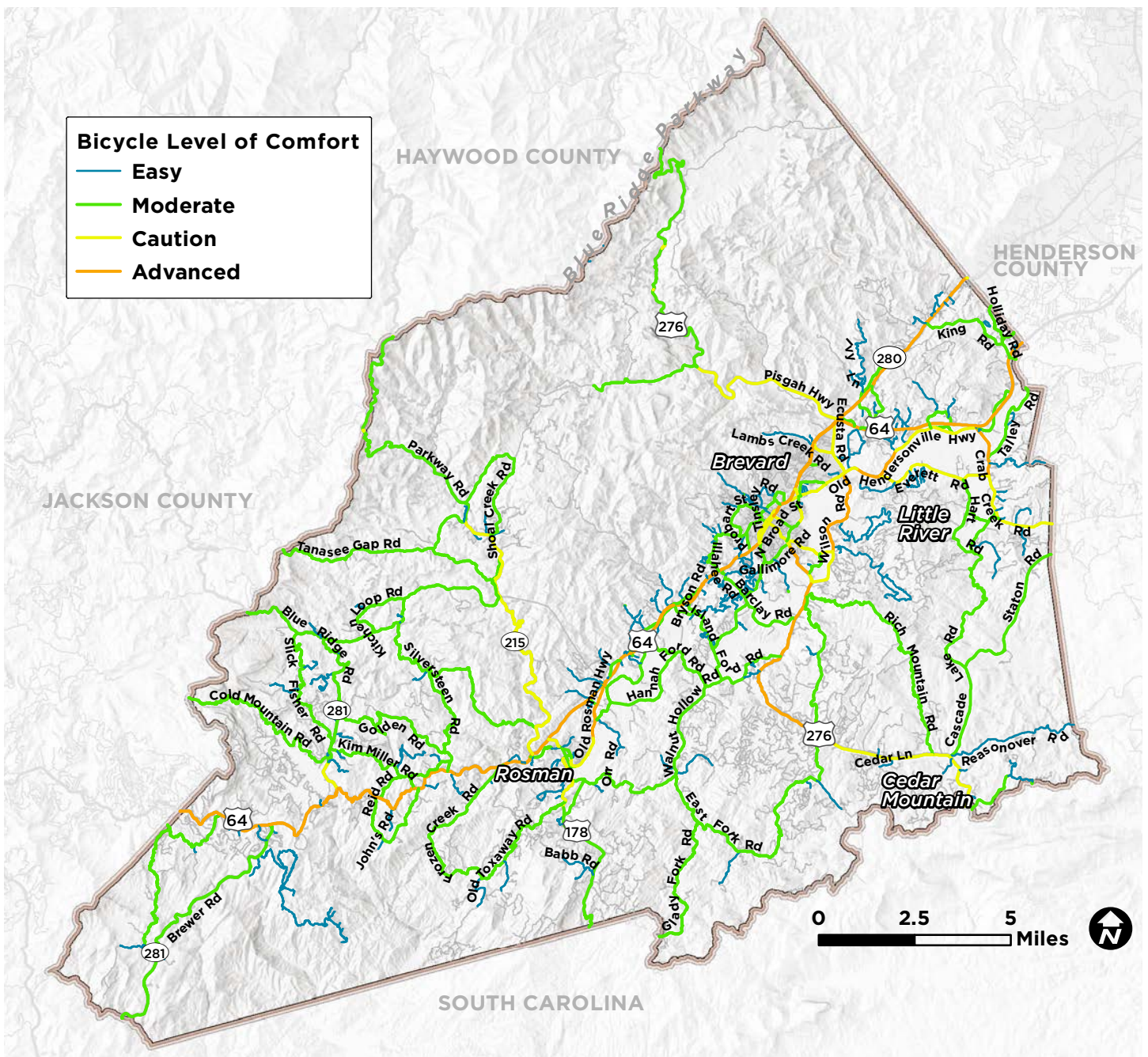
BICYCLE LEVEL OF COMFORT: MAP 2.3

The project team developed a rating system to evaluate roads across Transylvania County to determine biking suitability. In addition to using this data in developing recommendations, this system was used to create a suitability map, classifying each roadway by comfort level for a moderately experienced bicyclist. The data available to classify those roadways includes traffic volumes, speed limits, presence of 4' or wider paved shoulder or bike lane, and designated truck routes.

Much of Transylvania County is covered by easy and moderate (blue and green) routes - generally, these are relatively lower traffic volume/speed neighborhood streets (blue) or low traffic volume/higher speed rural roadways such as East Fork Road (green). The majority of the roadways that provide lower comfort levels are found along Transylvania County's arterial roadways that separate most areas of Transylvania County from one another and carry the highest traffic volumes and speeds.

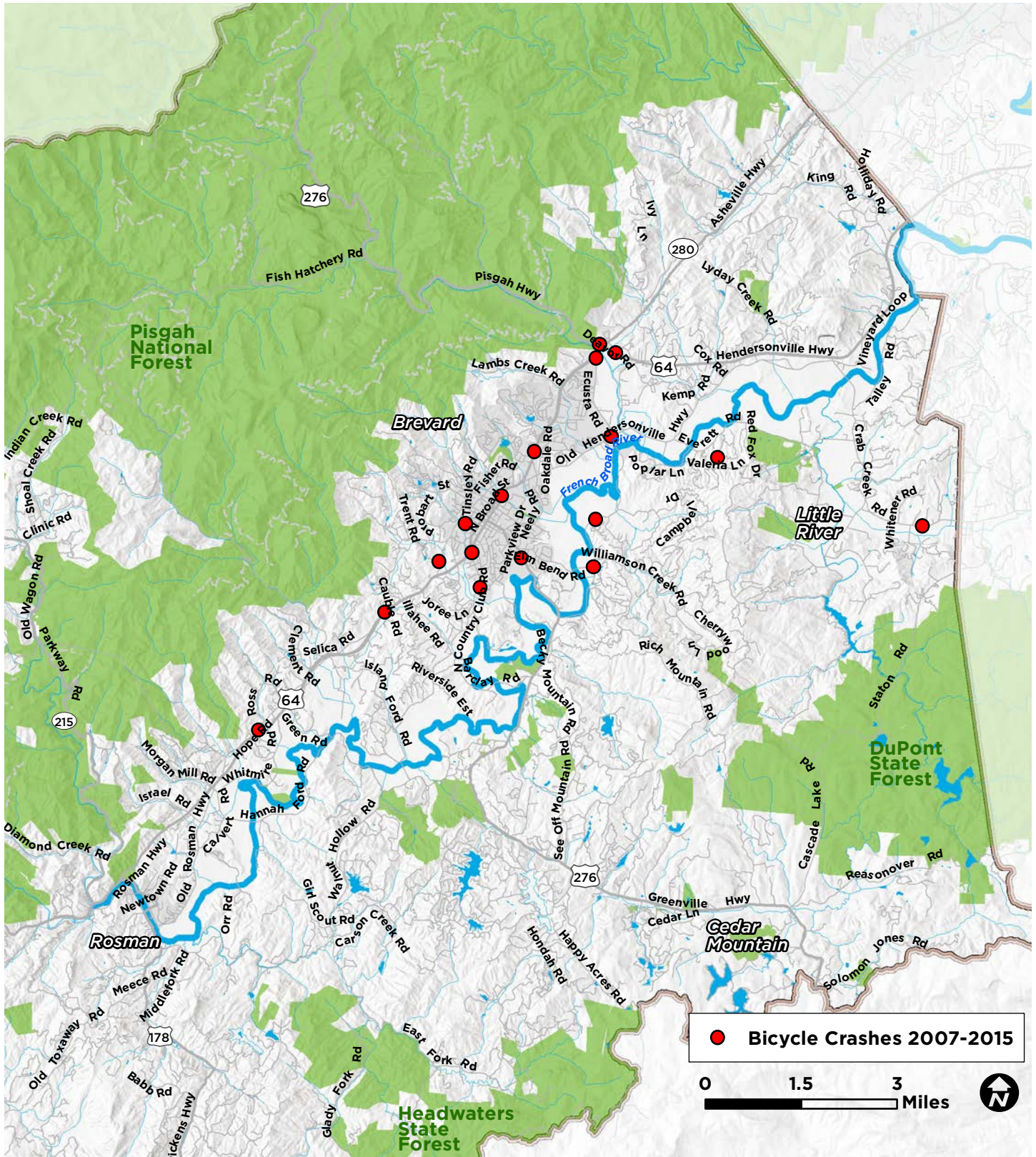
Topography also plays a key role in Transylvania County. While topography is not directly included in this analysis, many roadways in Transylvania County have steep hills that impact a bicyclist experience. Particular examples include Pisgah Highway (US 276), Parkway Road (NC 215), Walnut Hollow Road, and Rich Mountain Road.

See Appendix D further detail to the characteristics of key roadways across Transylvania County.



BICYCLE CRASHES 2007-2015: MAP 2.4

This map examines the most recently available bicycle crash data for Transylvania County from 2007-2015. During this time period, 17 crashes were reported, eight of which were either along or very close to US 64 and US 276. Three out of the 17 crashes were along Wilson Road.



PUBLIC INPUT SUMMARY

Public input during this planning process was recorded and incorporated into this document. Stakeholder group members helped spread the word about the plan in order to garner responses about existing conditions and areas for improvement. During public meetings, stakeholder group members and residents marked up maps and completed open comment sheets to share their ideas and preferences with respect to bicycling in Transylvania County.

Feedback was incorporated from the following:

- Existing Conditions and Draft Plan public open house workshops for the Transylvania County Bicycle Plan
- SPOT 5.0 Bicycle and Pedestrian Project survey results
- Brevard College Bicycle Survey
- Transylvania County/City of Brevard Parks & Recreation Master Plan Survey Results
- 2025 Transylvania County Comprehensive Plan survey results



Photo from the open house workshop at the Little River Community Center.

TRANSYLVANIA COUNTY OPEN HOUSE WORKSHOPS

Four open house workshops were held during the existing conditions phase of the Transylvania County Bicycle Plan to gather input from the public specific to bicycle infrastructure, programming, and the bicycle planning process in general. After the release of the draft plan, four additional workshops were held for comment and review of the draft plan. These workshops were advertised through social media, flyers, and a press release. All of the public input sessions were drop-in formats. Below are the dates and locations of the eight public open house workshops. The following pages provide a summary of the workshop feedback received. All comments received are compiled in Appendix C.

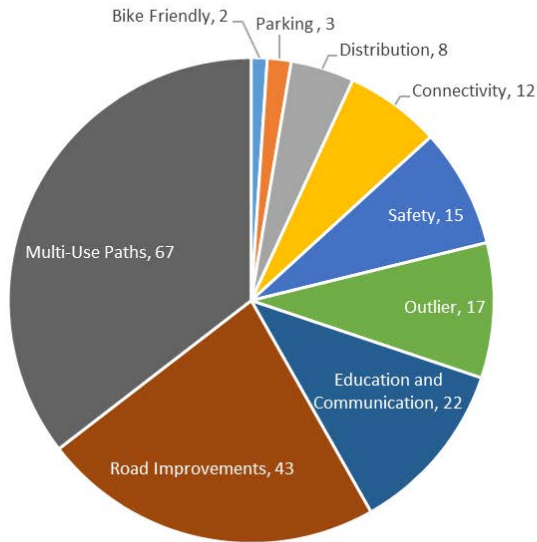
<p>Public Input Wanted!</p> <p>Future Bicycle Infrastructure to be Determined</p>  <p>828.884.3205 http://planning.transylvaniacounty.org/</p>	<p>Drop-In Sessions will be held:</p> <ul style="list-style-type: none"> • June 26th 6:30-8:30 Little River Community Center, • June 28th 4:30-6:30 Rosman Town Hall, • July 9th 4:30-6:30 Rogow Room of the Transylvania Library • July 16th 4:30-6:30, Cedar Mountain Community Center
<p>Transylvania County Planning and Community Development is working with Alta Planning and Design to develop a Comprehensive Bicycle Plan for the County</p>	

Four public open house workshops were held in different parts of Transylvania County during the existing conditions phase of the planning process. Four open house workshops were also held in January, 2019 to review and comment on the draft plan.

<p>Public Input Wanted!</p> <p>Draft Bicycle Plan Ready for Your Review</p>  <p>828.884.3205 http://planning.transylvaniacounty.org</p>	<p>Drop-In Sessions will be held:</p> <ul style="list-style-type: none"> January 7th 6:30- 8:30 County Library, Rogow Room January 10th 4:30-6:30 Little River Community Center January 14th 4:30-6:30 Cedar Mountain Community Center January 15th 4:30-6:30 Quebec Community Center
<p>The Transylvania County Bicycle Plan is an effort by the Transylvania County Planning and Community Development Department & Alta Planning, funded by a grant from the NC DOT</p>	

Open Ended Response Question about Share your Thoughts, concerns, priorities and results

What would you like to see?
189 open ended responses



For data categorization purposes, the term "multi-use paths" includes greenways, trails, bike paths, shared use paths, Ecusta Trail and NC280 Trail



TYPES OF BICYCLE INFRASTRUCTURE

Which do you like best? Vote with your dots & leave comments below.



Shared Lanes*	Bicycle Passing Lane	Paved Shoulder	Bicycle Lane	Buffered Bicycle Lane	Separated Bicycle Lane	Shared Use Path: Sidepath	Shared Use Path: Greenway
<p>With shared right lane, narrow roadway width, steep grades, and geographical constraints, opportunities for pass a cyclist or group of cyclists can be dangerous. Cyclist passing lanes or periodic segments of paved shoulder along the course of steep roads are solutions that can provide temporary relief where cyclists will be able to shift further to the right or pull over.</p> <p>Travel Lane: 4' Side-Walk: 4'</p>	<p>Travel Lane: 11-17' 4'</p>	<p>Travel Lane: 4'-7'</p>	<p>Travel Lane: 5'-7' Side-Walk: 4'</p>	<p>Travel Lane: 2' 5'-7' Side-Walk: 4'</p>	<p>Travel Lane: 2' 5'-7' Side-Walk: 4'</p>	<p>Travel Lane: 3-5' 10'-12'</p>	<p>10'-12'</p>
3	19	38	13	15	8	39	74

A child wearing a blue helmet and a dark shirt is riding a blue and white bicycle on a paved path that winds through a forest. The path is covered with fallen leaves. The trees are mostly bare, suggesting a late autumn or winter setting. The overall tone of the image is somewhat muted and overcast.

CHAPTER 3: RECOMMENDATIONS

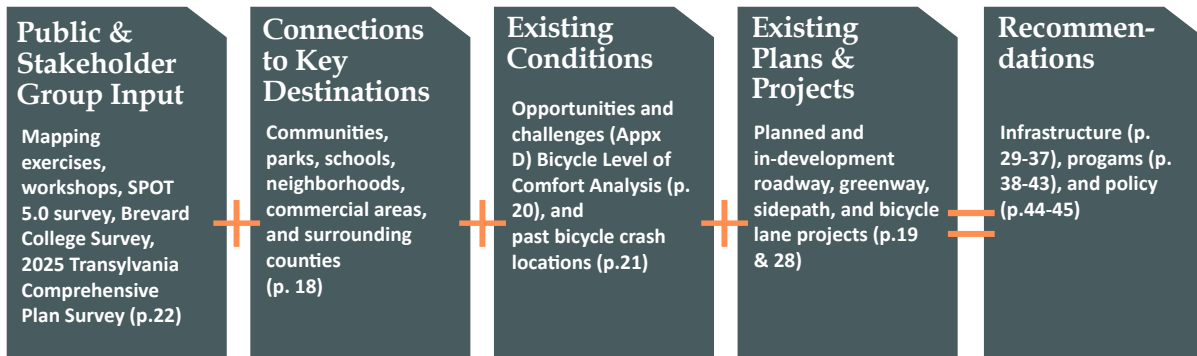
OVERVIEW

This chapter outlines the recommendations for making Transylvania County safer and more enjoyable for bicycling, with improved connections across the county. A diverse mix of bicycle facilities (such as different types of bike lanes, paved shoulder, shared lanes, and shared use paths) are recommended to make these connections, taking into account the needs of different types of bicyclists. In addition to the infrastructure recommendations that make up the bulk of this chapter, program and

policy recommendations are also included to further meet the goals of this plan. These recommendations also promote greater positive relations between bicyclists and motorists.

Recommendations were developed based on information from several sources: Public and stakeholder group input, in-person public open house workshops; connectivity to destinations; review of current roadways and bicycle facilities; existing plans and projects, and a prioritization process combining these inputs.

BASIS OF RECOMMENDATIONS

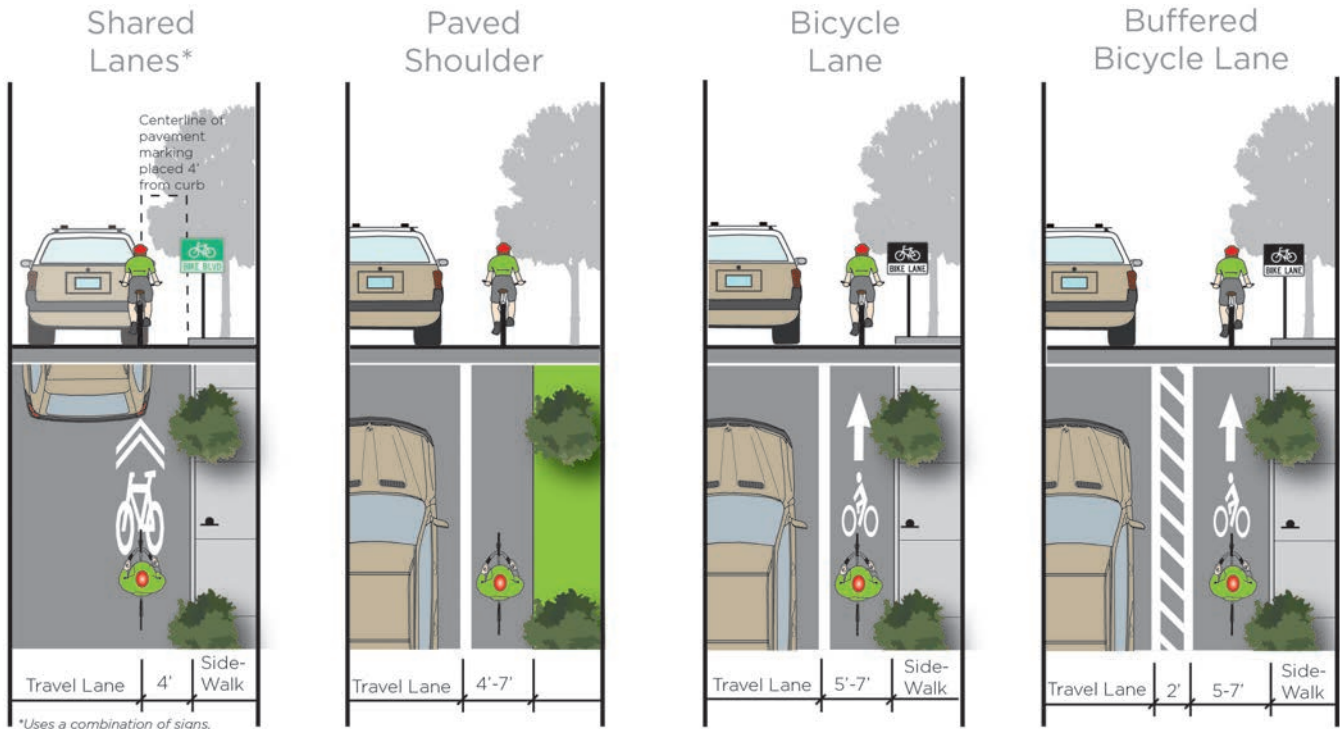


Bicyclists along Pisgah Hwy/US 276 - this section of road between US 64 and Avery Creek Rd connects several popular Pisgah National Forest destinations and the northern limits of Brevard and is a key corridor needing improvement.

BICYCLE FACILITY TYPES

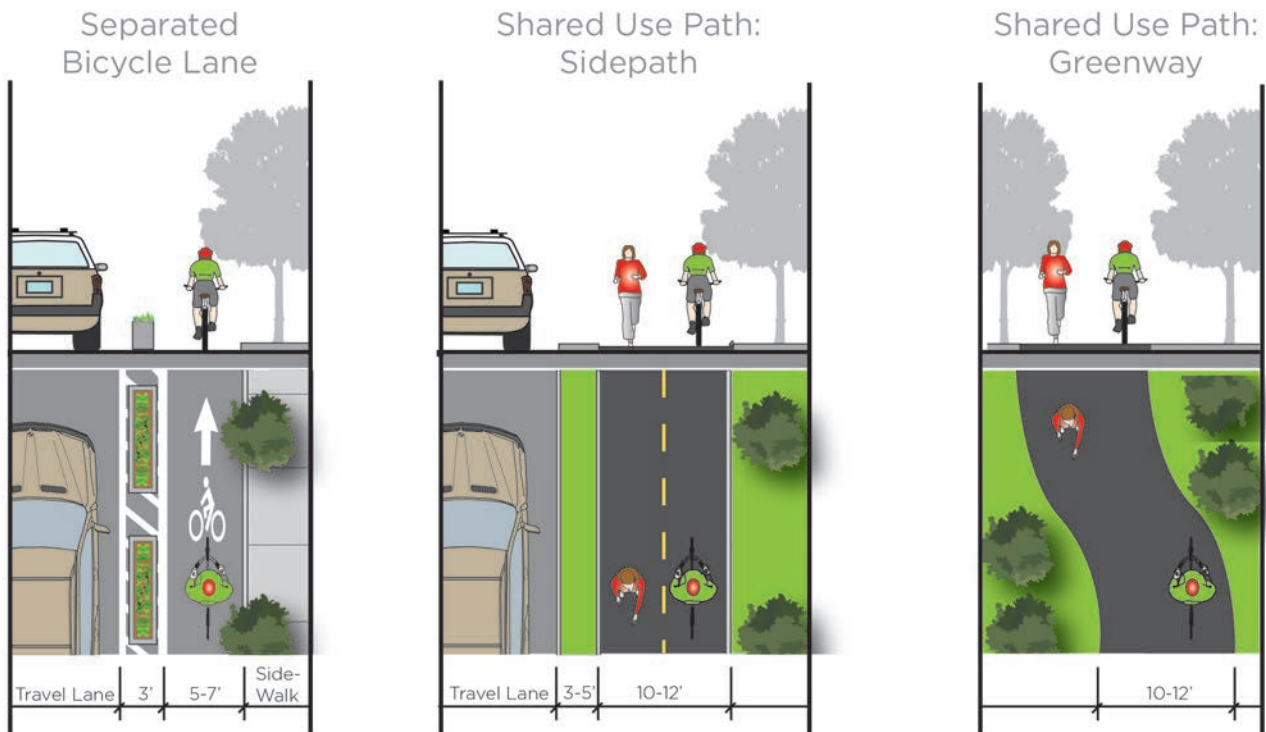
These are the primary facility types recommended in this plan. See the maps (and legends) in this chapter to see where these different types of facilities are recommended in Transylvania County. For roadway corridors in general, as traffic volumes and speeds increase, greater separation is needed for bicyclists and motorists. For more information on facility design, please see Appendix A.

least separated



*Uses a combination of signs, pavement markings, and speed and volume management measures to create safe bicycle travel.

most separated





KEY RECOMMENDATIONS:

- 1 KEEP MOMENTUM ON BICYCLE PROJECTS THAT ARE ALREADY IN-DEVELOPMENT.**

Map 3.1 features existing facilities along with projects that have some level of funding, design, or construction in progress. These “in-development” projects should be fully funded first, as the lowest hanging fruit for new bicycle infrastructure.
- 2 STRATEGICALLY AND PROACTIVELY FUND AND BUILD THE PRIORITY NETWORK.**

Map 3.2 features a priority network developed out of this planning process and previous planning processes. The priority network is displayed in three cutsheets (starting on page 30) that summarize why each element is a priority, and what the key opportunities and challenges are to its development.
- 3 USE THE COMPREHENSIVE NETWORK OF RECOMMENDATIONS TO BUILD OTHER PROJECTS INCREMENTALLY OVER TIME.**

As Transylvania County continues to grow, new development and roadway construction projects should incorporate facilities recommended in Map 3.3. As progress is made on the priority network, new priorities should be selected from this comprehensive map of recommendations.
- 4 IMPLEMENT NEW PROGRAMS AND POLICIES THAT SUPPORT AND ENCOURAGE BICYCLING.**

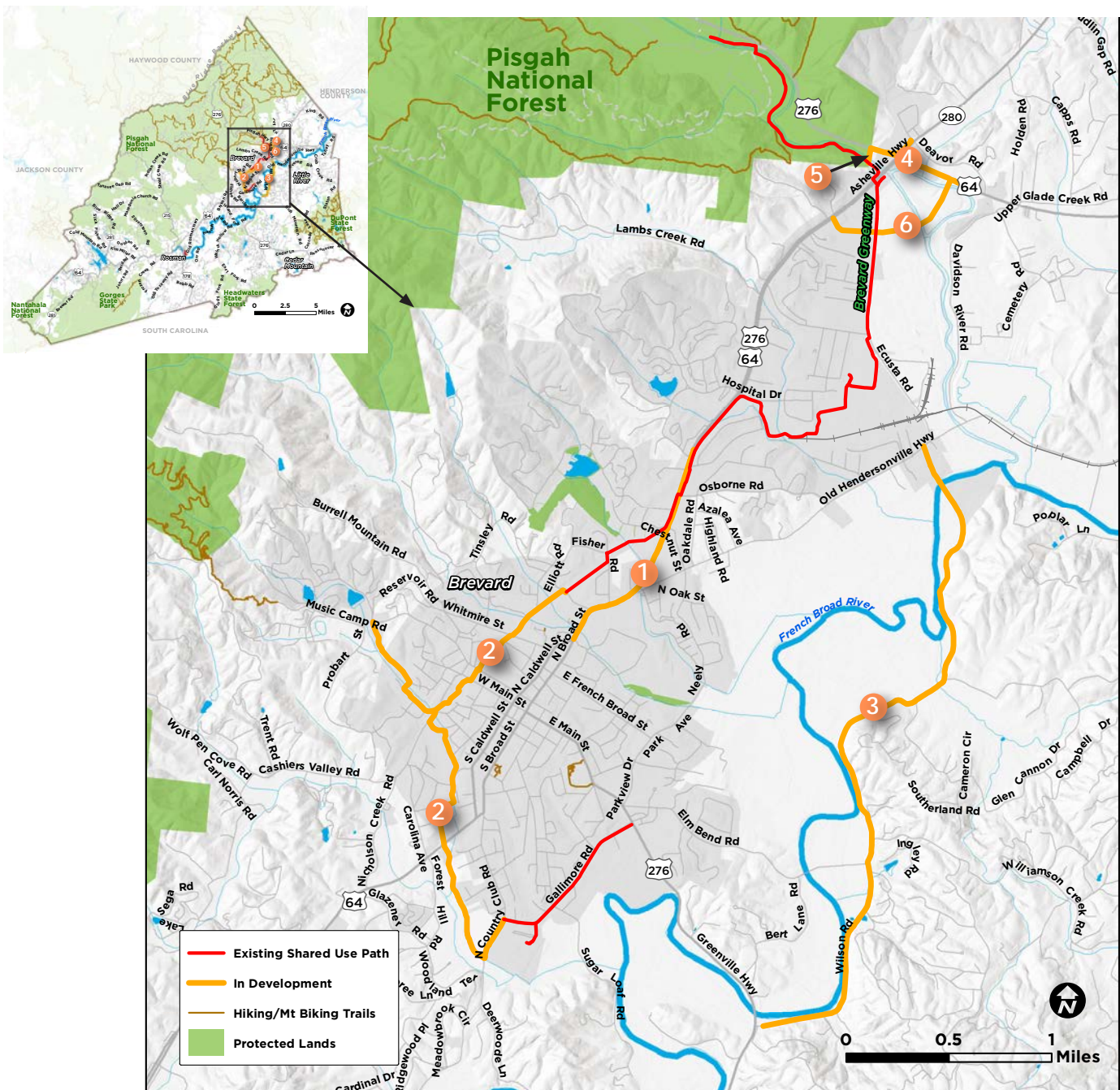
As new facilities are built, they will need to be maintained with coordination between agencies for multi-jurisdictional projects; strategically lowering posted speed limits, identifying solutions for steep hills, capitalizing on numerous bicycle-related events and continuing the Watch for Me NC educational campaign will add to a comprehensive effort toward both bicyclist and motorist safety.

Together, these recommendations make up the core of this plan, as featured in Chapter 3. They are supplemented by detailed implementation guidance in Chapter 4, including a list of resources for the latest information on bicycle facility design and bicycle-related policy.

PROJECTS IN DEVELOPMENT: MAP 3.1

This map features existing facilities along with key projects that have some level of funding, design, or construction in progress. These “in development” projects should be fully funded first, and are critical to improving bicycle infrastructure connectivity in Transylvania County:

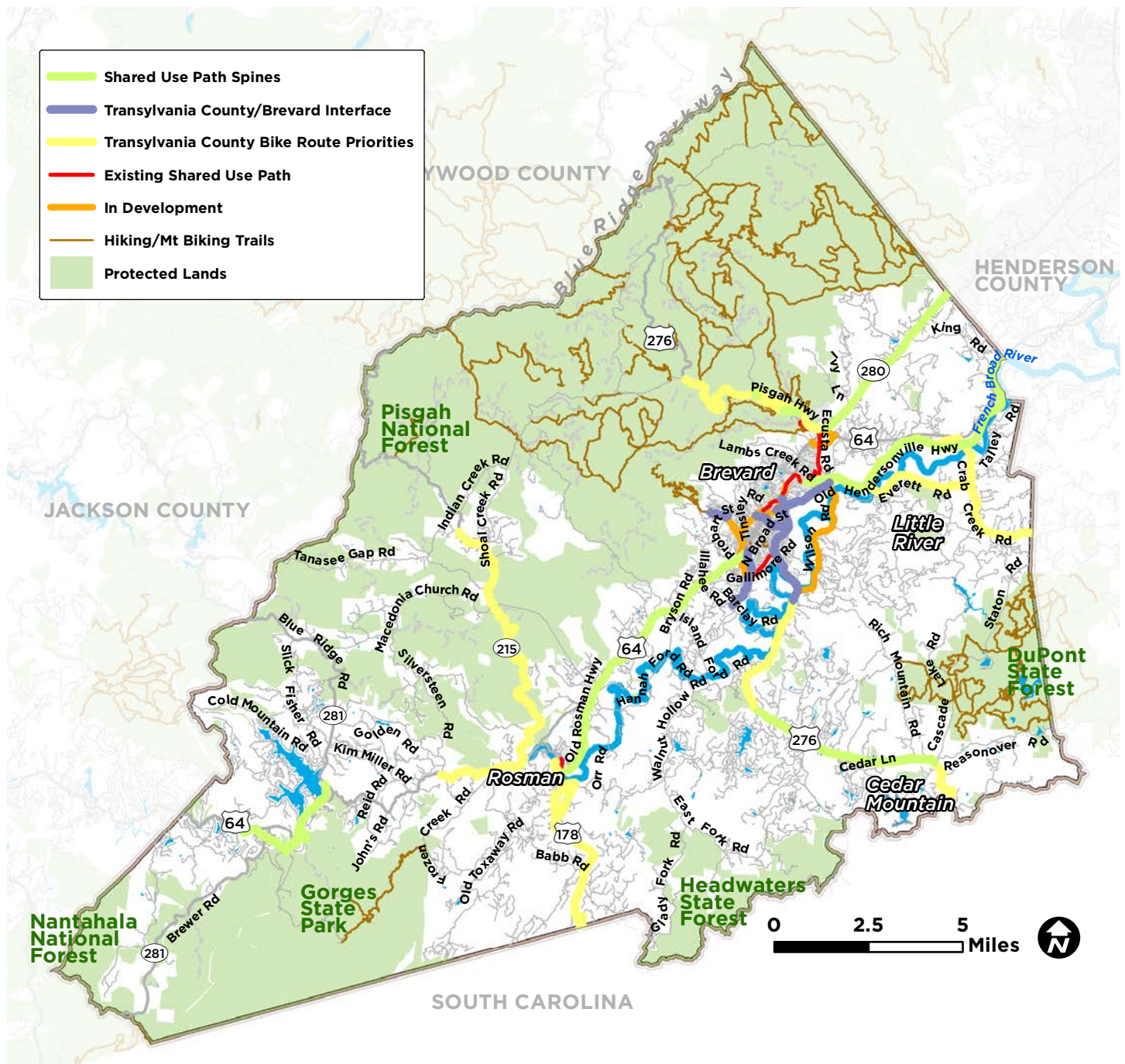
- 1 N. Broad Street from Fortune Cove Road to North Caldwell Street bike lanes and sidepath (R-5800)
- 2 Brevard priority greenway development, committed to completion in summer 2021
- 3 Wilson Road improvements, paved shoulders (R-5763)
- 4 US 64/US 276/NC 280 intersection improvements, including bicycle and pedestrian accommodations (R-5799)
- 5 Davidson River bicycle/pedestrian bridge from Brevard Greenway across Davidson River to businesses at the US 64/US 276/NC 280 intersection (EB-5858)
- 6 Davidson River Village Connector to include bike lanes (new road construction from Asheville Hwy (US 64/US 276) to Hendersonville Hwy (US 64) (R-5605)



PRIORITY NETWORK: MAP 3.2

Over time, opportunities to implement this priority network will involve multiple jurisdictions and funding sources. The elements of this priority network were the most consistently mentioned in stakeholder group meetings and public outreach, and each component strategically adds value by connecting key destinations across Transylvania County. This map includes the following elements.

- Shared Use Path 'Spines' - These projects reach out in each direction of Transylvania County, providing a physically separated 'spine' that can form the key building blocks for comprehensive connectivity between or through Transylvania communities.
- Transylvania County/Brevard Interface - As the Brevard bicycle network continues to develop, multijurisdictional efforts will be needed to connect this network beyond the City of Brevard municipal limits.
- Transylvania County Bike Route Priorities - Higher traffic volume, higher speed sections of these routes should be improved first with higher degrees of separation from automobile traffic to the extent possible.



PRIORITY PROJECTS - TRANSYLVANIA COUNTY SHARED USE PATH SPINES:

Several shared use path connections were identified in this planning process and previous planning processes that can serve as 'spines' of connectivity through or between Transylvania communities. These projects provide physical separation between bicyclists and motorists, providing options for all ages and abilities of bicyclists (and pedestrians). The priority spines are not ranked against each other and will be developed as resources and funding allow.

Brevard to Rosman - This connection includes a proposed shared use path between Brevard and Rosman along the US 64 corridor. This would provide a link between the two incorporated population centers in Transylvania County, and serve as an essential passageway to the southwestern portion of Transylvania County, including Gorges State Park and the Lake Toxaway community. This corridor is also identified as a designated growth area in the 2025 Transylvania County Comprehensive Plan.

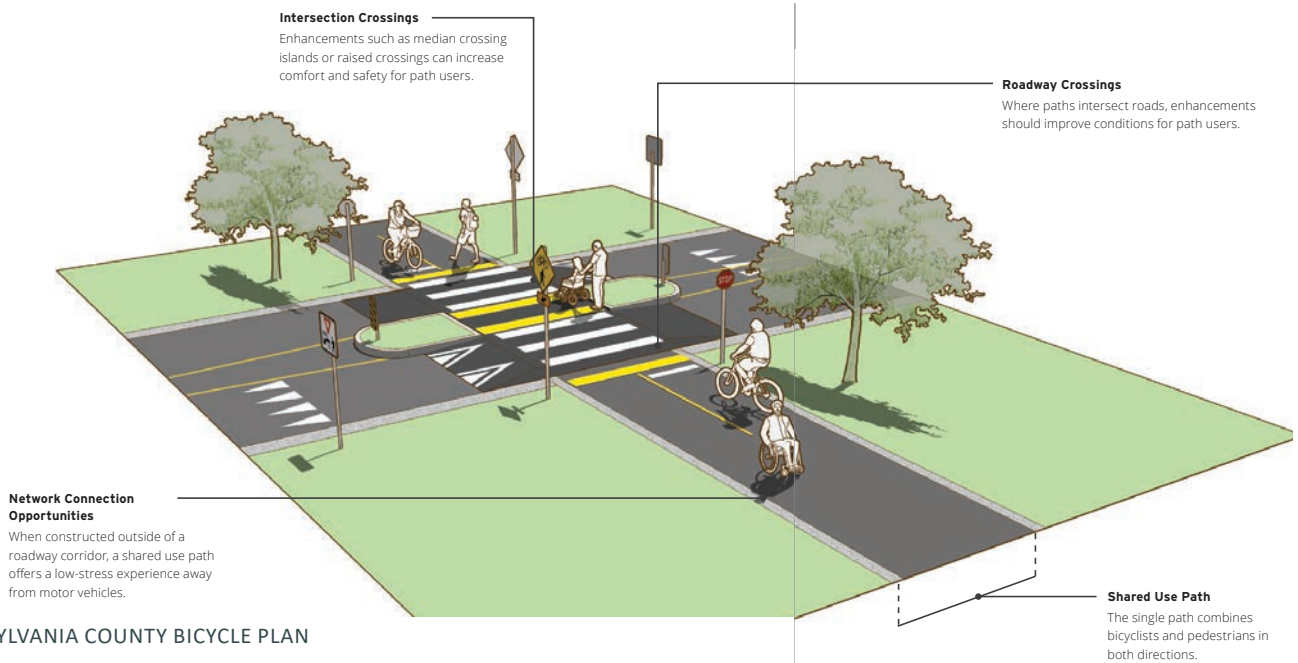
Brevard to Mills River - NC 280 serves as a direct commercial link from Brevard through the northern/northeastern end of Transylvania County to Mills River, and eventually Asheville. This project would consist of a shared use path along or near the NC 280 corridor as identified in the 2014 Mills River NC 280 Corridor Study. This corridor also serves as a gateway into Transylvania County and Pisgah National Forest from the north. The southern terminus of this project could connect into the future NC 280/US 64/US 276 intersection improvements and Davidson River bike/ped bridge that will also connect to the Brevard Greenway and Pisgah National Forest.

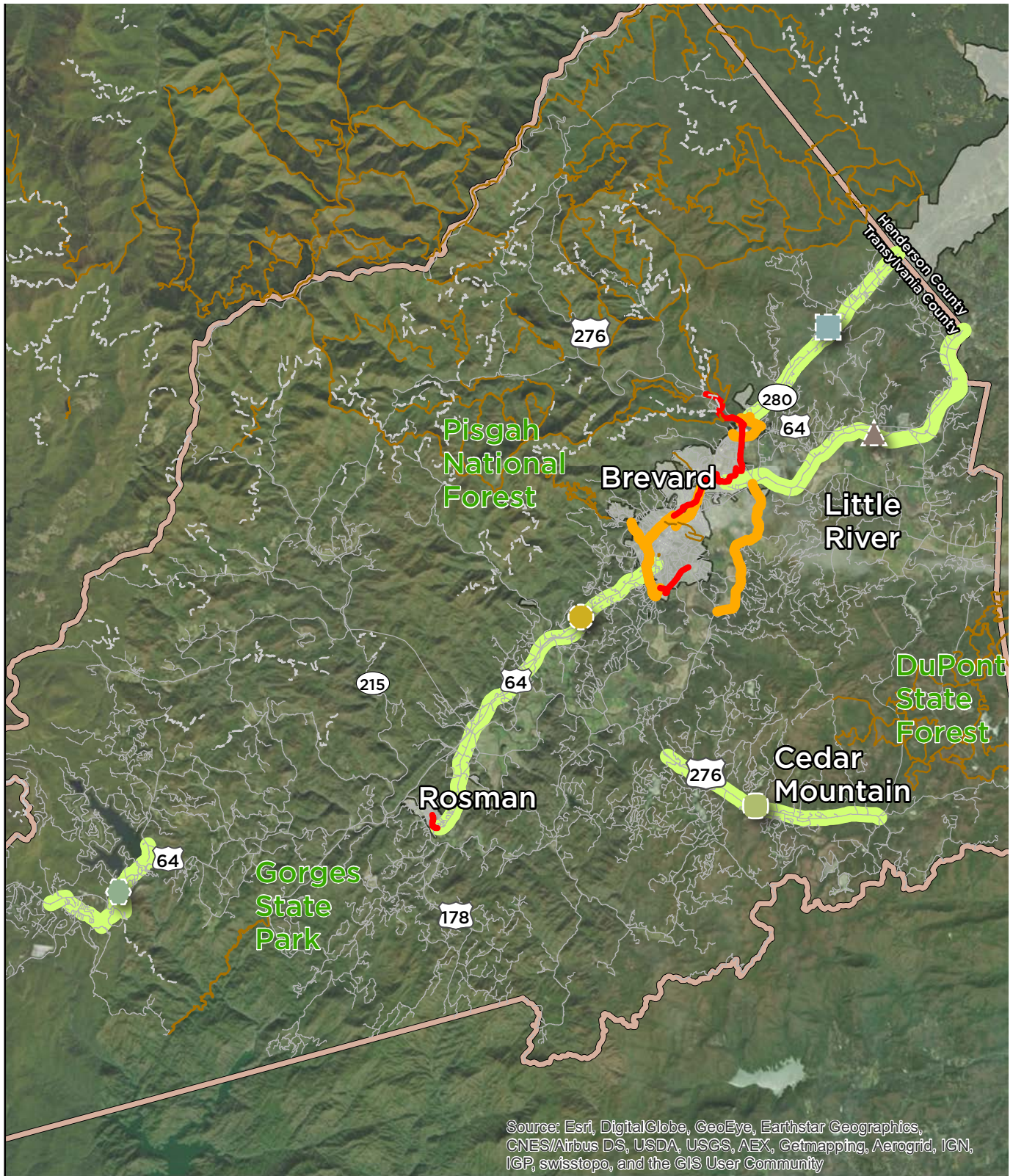
Ecusta Rail Trail - The proposed Ecusta Rail Trail was the most often cited improvement needed for bicycling in Transylvania County during this planning process. Completely separated from roadways, this project would utilize the former Norfolk Southern railroad corridor that is currently owned by Watco Transportation Services. It provides a flat, direct connection from the Brevard Greenway through north-eastern Transylvania County, Little River, and eventually Hendersonville. US 64, Old Hendersonville Hwy, Crab Creek Road, and Everett Road, which carry high traffic volumes and speeds, provide a low level of comfort for the average bicyclist and are currently the only bicycling alternatives through this part of the County.

Lake Toxaway Trail - The proposed shared use path through Lake Toxaway highlights an opportunity to create a spine through the heart of the community as identified in the Historic Toxaway Planning Study. This project would connect businesses, residential areas, Lake Toxaway dam, and Gorges State Park, along or near the US 64 corridor. This corridor is also identified as a designated growth area in the Transylvania County Comprehensive Plan.

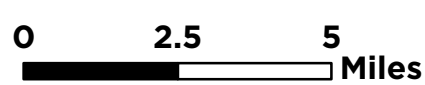
Cedar Mountain Trail - This proposed shared use path would connect from the Connestee Falls Overlook to Cascade Lake Road along US 276. This project would connect businesses, the Cedar Mountain Community Center, and residences through the heart of the Cedar Mountain community. This trail could also serve as a connection to Cascade Lake Road toward DuPont State Forest trails. This corridor is also identified as a designated growth area in the Transylvania County Comprehensive Plan.

See the *Small Town and Rural Multimodal Networks design guide* for further detail regarding design best practices and options: shared use paths and sidepaths - <http://ruraldesignguide.com/physically-separated>





- Priority Shared Use Path Projects
- Existing Shared Use Path
- Hiking/Mt Biking Trails
- In Development






PRIORITY PROJECTS - TRANSYLVANIA COUNTY/ BREVARD INTERFACE:


As the Brevard bicycle network continues to develop, multijurisdictional efforts will be needed to connect this network to other areas beyond the City of Brevard's municipal limits. Aside from the Greenville Hwy segment connecting to Hap Simpson Park and the French Broad River Greenway, all of these projects are currently under consideration for Strategic Transportation Investments funding in SPOT 5.0 and could be completed as part of future roadway improvement projects. Incorporating bicycle facilities into the design of these projects now will save significant money down the road, due to the high degree of difficulty in adding bicycle facilities after a roadway corridor has been improved.


While all of these projects will not be funded during this round of SPOT 5.0, the remaining unfunded projects should remain on the priority list to create a comprehensive bicycle network over time. The priority projects are not ranked against each other and will be developed as resources and funding allow.


These projects include:


-  **Greenville Hwy/US 276** - link from Gallimore Road sidepath/Brevard High School and Elementary to Hap Simpson Park/Wilson Road/Rich Mountain Road: This stretch of Greenville Hwy is a critical link between neighborhoods and schools in southeastern Brevard to Hap Simpson Park, Wilson Road, Rich Mountain Road, and eventually Cedar Mountain and DuPont State Forest. Bicycle improvements should include physical separation from automobile traffic as a sidepath along the roadway or along a potential future sewer easement away from the roadway. One of the key challenges for this segment is the likely need for constructing a bike/ped bridge across the French Broad River.
-  **Old Hendersonville Hwy** - links to northeast Transylvania County: This link would provide a significant improvement in connectivity between the Brevard Greenway, future improvements to N. Broad Street, Wilson Road, and the neighborhoods, businesses, schools, and recreation opportunities in the immediate area (in addition to the northeastern portion of Transylvania County). Because these segments carry higher traffic volumes and speeds, physical separation from the roadway is recommended (consider sidepath and separated bike lane options during the design phase).

 **N. Country Club Road from S. Broad Street to Illahee Road** - links to south/southwest Transylvania County: These short links would provide a significant improvement in connectivity from the southern part of Brevard to county bike routes and destinations to the south including Rosman. This is a key pinch-point for bicyclists heading south because of the relatively higher traffic volumes and narrow roadway corridor. Because these segments carry higher traffic volumes and speeds, physical separation from the roadway is recommended where possible.

 **Parkview Dr/Park Ave/Neely Rd from US 276 to Old Hendersonville Hwy** - links north/south along the east side of Brevard/Transylvania County boundary: This corridor would provide a direct link from the Brevard Greenway and future bike lanes along N. Broad Street to the Gallimore Road sidepath. Part of Neely Road is currently 35 mph - it is recommended to lower this to 25 mph. Buffered bike lanes are recommended due to higher traffic volumes.

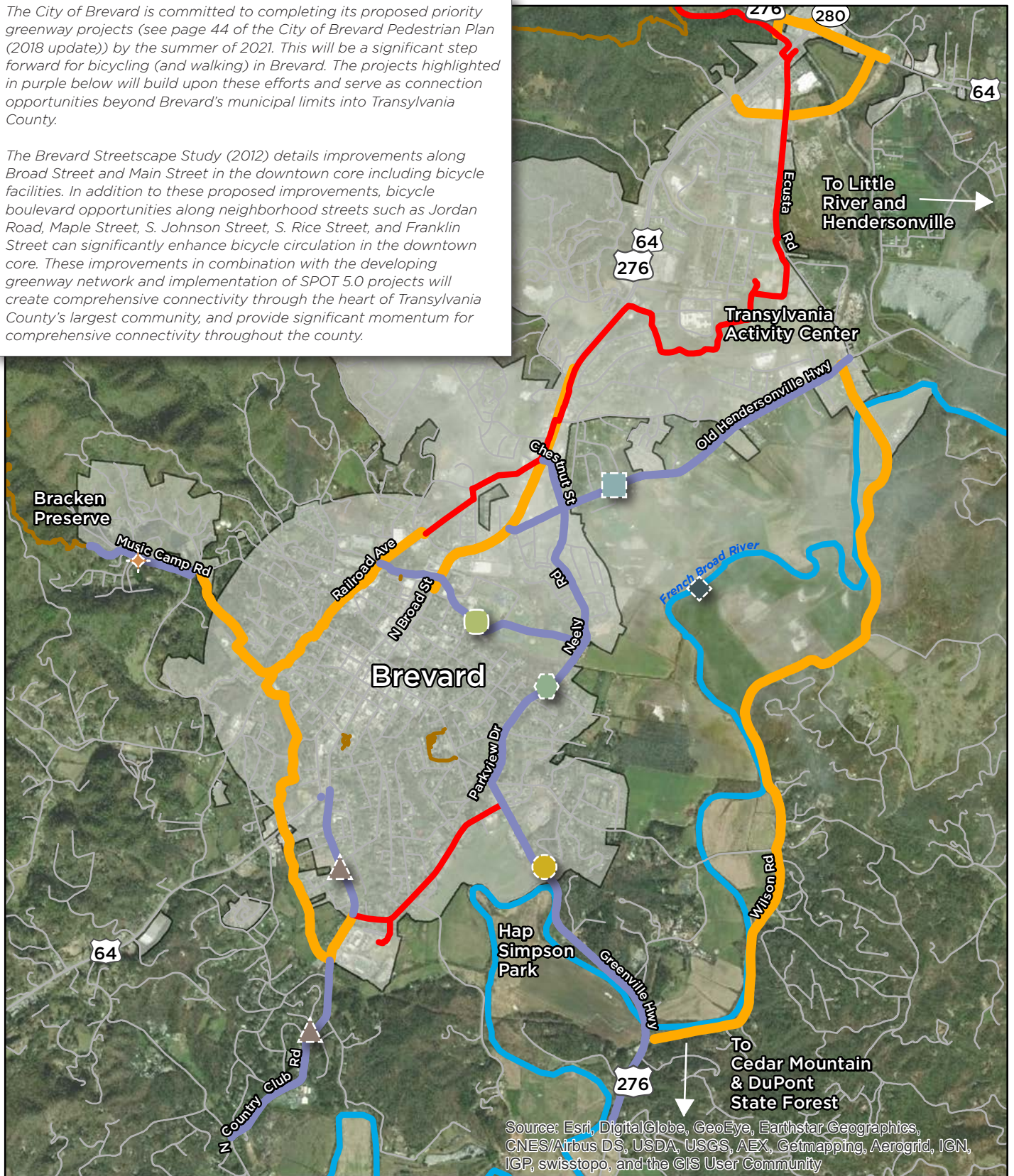
 **Brevard College Greenway** - links Brevard College campus to the developing Brevard bike network as well as potential future connectivity to Neely Road and the French Broad River corridor. The Brevard College greenway through the heart of campus is a top priority for Brevard College.

 **Music Camp Road** - link to Bracken Preserve: Music Camp Road is a low traffic volume roadway that provides the final, steep link from the developing Brevard greenway system to Bracken Preserve. Bicycle improvements along Music Camp Road should include shared lane markings and wayfinding signage. Traffic calming elements such as speed tables should be considered as well.

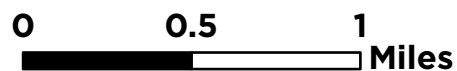
 **French Broad River Greenway** - the French Broad River Greenway should be developed over time through Transylvania County. A potential first phase could be developed as part of a linear park in the floodplain area between Wilson Road and the river. Access to the French Broad River and trail development along the river is recommended in the Transylvania County/City of Brevard Parks and Recreation Strategic Plan (2016). Furthermore, it is a priority for Henderson County in the Henderson County Greenway Plan (2018).

The City of Brevard is committed to completing its proposed priority greenway projects (see page 44 of the City of Brevard Pedestrian Plan (2018 update)) by the summer of 2021. This will be a significant step forward for bicycling (and walking) in Brevard. The projects highlighted in purple below will build upon these efforts and serve as connection opportunities beyond Brevard's municipal limits into Transylvania County.

The Brevard Streetscape Study (2012) details improvements along Broad Street and Main Street in the downtown core including bicycle facilities. In addition to these proposed improvements, bicycle boulevard opportunities along neighborhood streets such as Jordan Road, Maple Street, S. Johnson Street, S. Rice Street, and Franklin Street can significantly enhance bicycle circulation in the downtown core. These improvements in combination with the developing greenway network and implementation of SPOT 5.0 projects will create comprehensive connectivity through the heart of Transylvania County's largest community, and provide significant momentum for comprehensive connectivity throughout the county.



- Transylvania County/Brevard Interface
- Existing Greenway
- Hiking/Mt Biking Trails
- In Development



PRIORITY PROJECTS - TRANSYLVANIA COUNTY BIKE ROUTES:

The Transylvania County bike routes recently updated in 2017 and presented in the *Ride Transylvania County* bike map connect much of Transylvania County. These roadways should be standardized, ideally with physically separated bicycle lanes. At a minimum, they should include paved shoulders/dedicated bike lanes. Higher traffic volume, higher speed sections of these routes (highlighted in dark green in map on the following page), should be improved first with higher degrees of separation from automobile traffic, to the extent possible. Wide paved shoulders/bike lanes with bicycle friendly rumble strips may be the best option for improving comfort along these corridors and should be explored further during the design phase.

These higher traffic volume sections include the following (note: N. Country Club Road, and Greenville Hwy/US 276 north of Rich Mountain Road are included in the previous priority project page). These priority sections are not ranked against each other and will be developed as resources and funding allow.

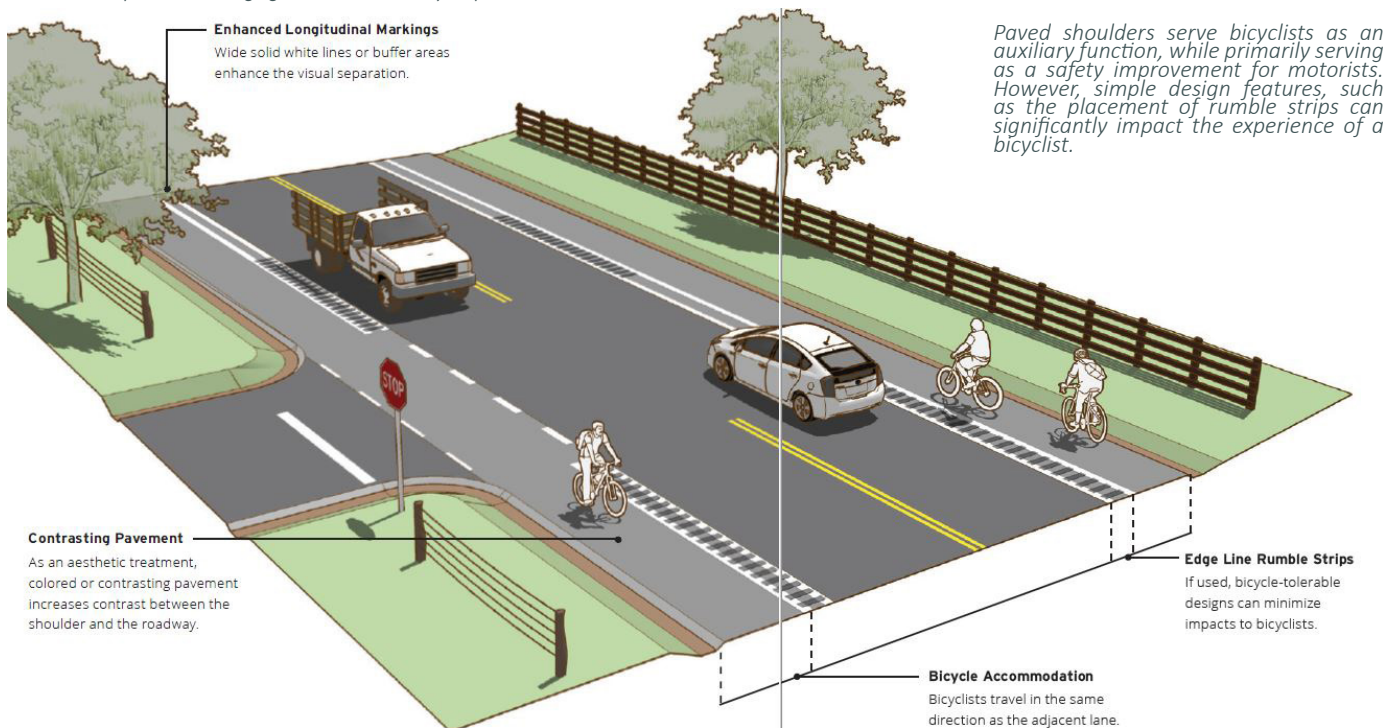
Greenville Hwy/US 276 - from Rich Mountain Road to the South Carolina border (note: section north of Rich Mountain Road to the Gallimore Road sidepath is covered in the Brevard/Transylvania County Interface project sheet above): This section of US 276 provides the flattest, direct link to Cedar Mountain, with further connectivity to DuPont State Park.

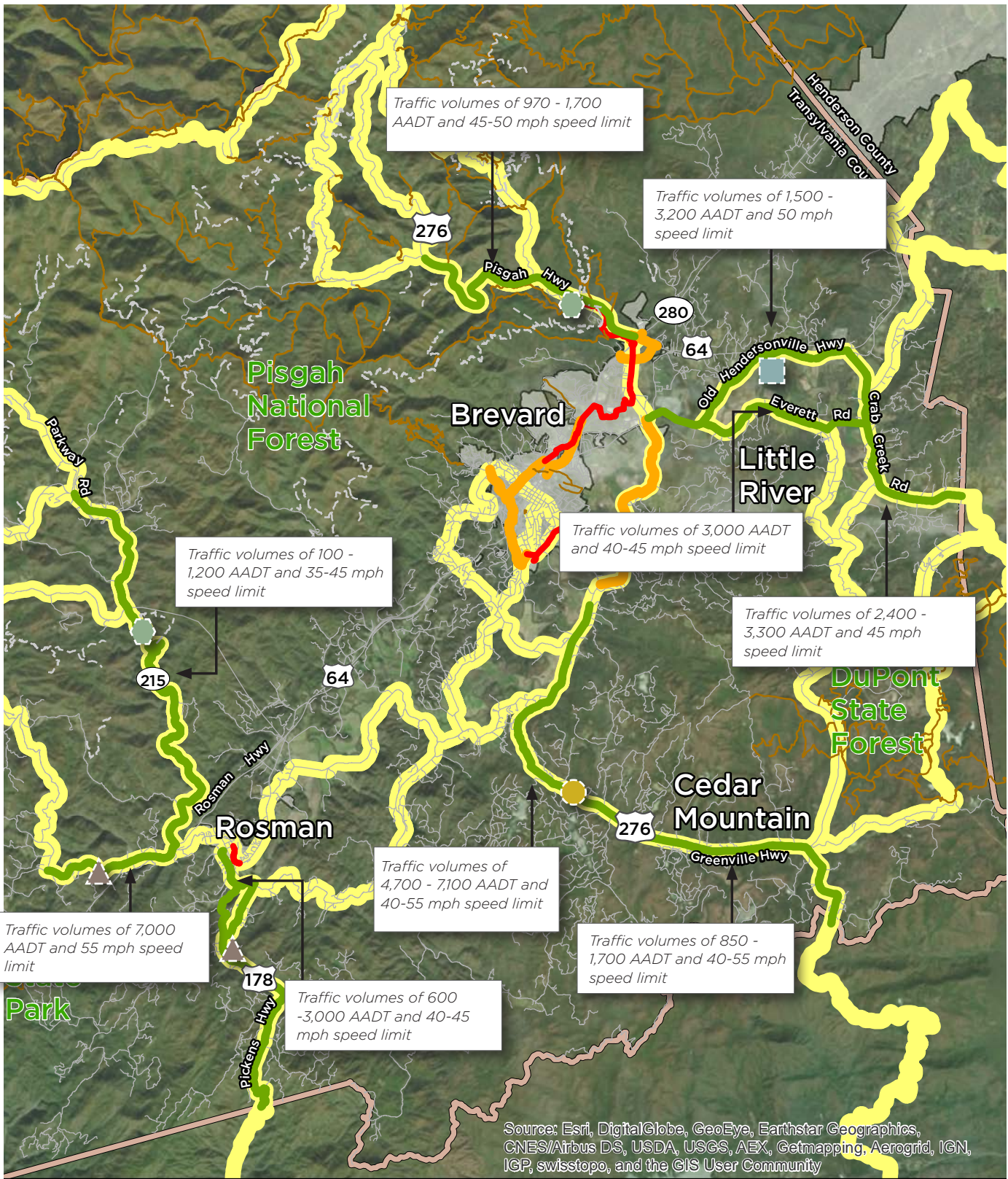
Old Hendersonville Hwy/Everett Road/Crab Creek Road - from the Wilson Road/Ecusta Road intersection, these roads serve as the main arteries to Little River and beyond to DuPont State Forest and Henderson County. Improvements to Everett Rd are currently under consideration in SPOT 5.0.

Rosman Hwy - US 64 southwest of Rosman and US 178 south of Rosman are the main corridors connecting to the south and far southwest sections of Transylvania County. As such, they carry higher traffic volumes and speed limits along these stretches in particular. Improvements to US 178 south of Rosman is currently under consideration in SPOT 5.0.

NC 215/Parkway Dr and US 276 Pisgah Hwy - these two corridors carry higher levels of traffic volumes and speeds. Traffic volumes drop substantially closer to the Blue Ridge Parkway. Furthermore, these roads are very steep and narrow, and are popular bicycling routes due to connectivity to the Blue Ridge Parkway. Improvements to US 276 Pisgah Hwy from the NC 280 intersection to Avery Creek Rd are under consideration for federal funding at this time.

See the *Small Town and Rural Multimodal Networks design guide* for further detail regarding design best practices and options: paved shoulder and bike lanes - <http://ruralsdesignguide.com/visually-separated>





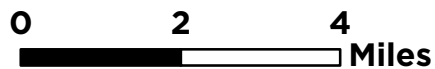
— Ride Transylvania County Routes with Highest Traffic Volumes

— Ride Transylvania County Bike Routes

— Existing Greenway

— Hiking/Mt Biking Trails

— In Development



REGIONAL TRAILS AS AN ECONOMIC DEVELOPMENT OPPORTUNITY

Transylvania County is uniquely positioned as not only part of the NC Statewide Bike Route System (NC 8 Southern Highlands Bike Route), but also the Hellbender Regional Trail that will eventually connect Transylvania County to Asheville. Both NC and SC's Mountains to Sea Trail connect along Transylvania County's border as well. There are several existing features from which to build (the signed NC 8 Southern Highlands Bike Route, the existing NC Mountains to Sea Trail along the Blue Ridge Parkway, and the existing SC Mountains to Sea Trail (Palmetto Trail) that runs along Transylvania County's southeastern border with South Carolina in Headwaters State Forest), but regional bicycle connectivity will only come with connected/continuous, dedicated bicycle facilities. Building dedicated bicycle infrastructure along the NC 8 Southern Highlands Bike Route and working to complete regional links to surrounding counties is critical for the positive economic impact often associated with popular trails. This type of impact can come in the form of increased property values and revenue from increased tourism (in addition to savings associated with health benefits of active living). A research group (Headwaters Economics) compiled 120 studies on the impacts of trails in a single library, searchable by type of benefit, use, year, and region.

For more on this topic, please refer to this research available at: <https://headwaterseconomics.org/economic-development/trails-pathways/trails-research/>.

NC 8 SOUTHERN HIGHLANDS BIKE ROUTE

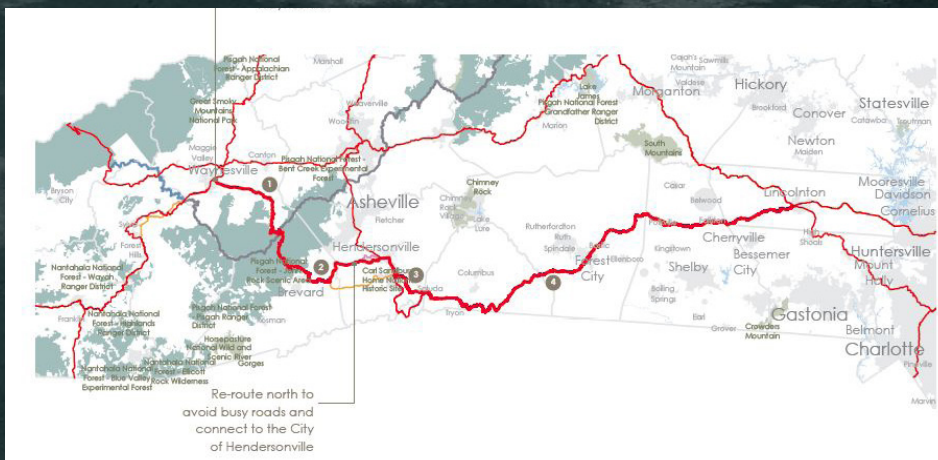
From the NC Bikeways website (<https://www.ncdot.gov/bikeped/ncbikeways/routes/nc8-southern-highlands/default.aspx>):

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

The existing signage for NC 8 Southern Highlands Bike Route follows Pisgah Highway from the Blue Ridge Parkway to US 64, Davidson River Road, Everett Road, and Crab Creek Road through Transylvania County. North Carolina's Statewide Pedestrian and Bicycle Plan (Walk/Bike NC) recommends amending the route to utilize Talley Road into Henderson County to connect directly to Hendersonville.

THE HELLBENDER REGIONAL TRAIL

The Hellbender Regional Trail is a concept that would feature trail connectivity across Western North Carolina counties, including Transylvania County. The Brevard to Mills River (NC 280), Rosman to Brevard, and Ecusta Rail Trail shared use path projects are proposed as part of this regional trail network. These would link into Henderson County's network as identified in the Henderson County Greenway Plan.



NC 8 Southern Highlands Bike Route is detailed in Walk/Bike NC section 9.3.

- <https://www.ncdot.gov/bikeped/walkbikenc/plan-resources/default.aspx#recommendations>

COMPREHENSIVE NETWORK: MAP 3.3

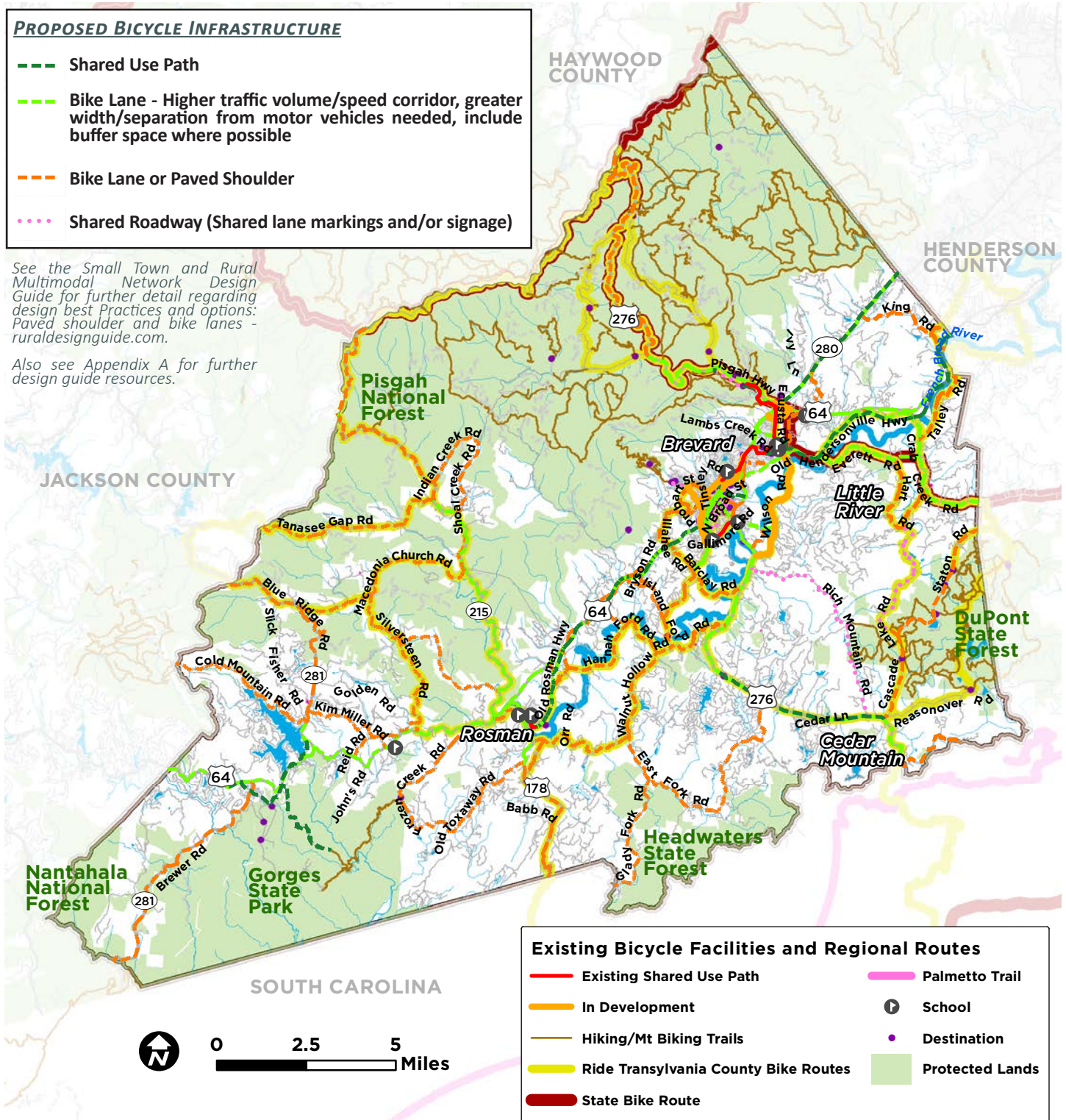
These are long term recommendations for a comprehensive bike network that should be implemented in conjunction with future roadway projects, new development, and/or a myriad of potential public/private/non-profit sector partnerships. While longer term, they are an important vision of this plan, as they show what the potential is for any given future development or roadway construction that may provide an opportunity for incorporating bicycle facilities. As progress is made on the priority network, new or revised priorities should be selected from this comprehensive map of recommendations.

PROPOSED BICYCLE INFRASTRUCTURE

- Shared Use Path
- Bike Lane - Higher traffic volume/speed corridor, greater width/separation from motor vehicles needed, include buffer space where possible
- Bike Lane or Paved Shoulder
- Shared Roadway (Shared lane markings and/or signage)

See the Small Town and Rural Multimodal Network Design Guide for further detail regarding design best Practices and options: Paved shoulder and bike lanes - ruraldesignguide.com.

Also see Appendix A for further design guide resources.



Existing Bicycle Facilities and Regional Routes

- Existing Shared Use Path
- In Development
- Hiking/Mt Biking Trails
- Ride Transylvania County Bike Routes
- State Bike Route
- Palmetto Trail
- School
- Destination
- Protected Lands

PROGRAM RECOMMENDATIONS

These program recommendations are essential and complementary to future infrastructure projects. Each of the following program ideas were presented at stakeholder group meetings and public open house workshops to gauge interest among Transylvania County residents. The program ideas that follow were the highest rated by the public.

BICYCLE FACILITY MAINTENANCE

Bicycle facilities require regular maintenance in order to keep them free of debris and structural deterioration. Bike lanes are especially vulnerable to the accumulation of leaves and gravel as they are blown off the travel lane by automobile traffic. This debris, as well as potholes, cracks, and joints, create serious obstacles and hazards to bicyclists. A good maintenance program is necessary to protect the public investment in bikeways and keep them safe for their users, and separated from automobile traffic.

Currently, Transylvania County does not have any dedicated bicycle lanes. As this plan is implemented, the County in partnership with NCDOT and Transylvania communities should commit to a maintenance program that sweeps its future bicycle lanes and shoulder space (ie: future Wilson Rd improvements) on a regular basis. The American Association of State Highway and Transportation Officials (AASHTO) has provided model maintenance policy language in its Guide for the Development of Bicycle Facilities. At right are examples of recommended maintenance policies. The AASHTO Guide also has policy recommendations for the following areas: surface repairs, pavement overlays, vegetation, traffic signal detectors, signs and markings, drainage improvements, chip sealing, patching activities, utility cuts, snow clearance, and operating bikeways in work zones.



Example Maintenance Policies from the AASHTO Guide for the Development of Bicycle Facilities

- Establish a regular sweeping schedule for roadways and pathways that anticipates both routine and special sweeping needs. This may involve more frequent sweeping seasonally, and also should include periodic inspection, particularly in areas that experience frequent flooding. The sweeping program should be designed to respond to user requests.
- Remove debris in curbed sections with maintenance vehicles that pick up the debris. On roads with flush shoulders, debris can be swept off the pavement.

- Reduce the presence of loose gravel on roadway shoulders by paving gravel driveway approaches, prioritized on corridors that receive the heaviest bicyclist use. Also require parties responsible for debris to contain it; for example, require tarps on trucks loaded with gravel. Local ordinances often require tow-vehicle operators to remove glass after crashes, and contractors are usually required to clean up daily after construction operations that leave gravel and dirt on the roadway.

GREENWAY TRAIL MAINTENANCE

Greenway maintenance is essential to the long-term viability and sustainability of any greenway network in Transylvania County. Construction of greenway trails should not take place without a maintenance plan in place. This Plan recommends a strong, collaborative approach to maintenance.

MAINTENANCE PRINCIPLES

The greenway trail system should be viewed and maintained as a public resource, serving generations to come. The following guiding principles will help assure the preservation of a first class system:

- Good maintenance begins with sound planning and design.
- Foremost, protect life, property and the environment.
- Promote and maintain a quality outdoor recreation and transportation experience.
- Develop a management plan that is reviewed and updated annually with tasks, operational policies, standards, and routine and remedial maintenance goals.
- Maintain quality control and conduct regular inspections.
- Include field crews, police and fire/rescue personnel in both the design review and on-going management process.
- Maintain an effective, responsive public feedback system and promote public participation.
- Be a good neighbor to adjacent properties.
- Operate a cost-effective program with sustainable funding sources.

GREENWAY TRAIL FLOODING

As greenway development along the French Broad River is explored in Transylvania County, flooding considerations will need to be addressed. In general, trail flooding can sometimes be addressed by elevating sections of trail as a boardwalk, but that option may be constrained by floodplain regulations. Another potential solution is to reroute trail alignments further from floodways. When trails are designed to flood, crews should inspect the trail following a flood event. Signage should be used to both caution trail users of flooding potential, and to inform them that the trail is designed to flood periodically.

Longevity of Facilities

- Mulch 2-3 years
- Granular Stone 7-10 years
- Asphalt 7-15 years
- Concrete 20+ years
- Boardwalk 7-10 years
- Bridge/Underpass 100+ years

Range of Trail Maintenance Costs

Reported annual maintenance costs from cities and regions for shared-use trails range widely, from just \$500/mile to over \$15,000/mile. The Town of Cary, NC uses \$6,000/mile for annual mowing and trash pick up, and minor repairs like replacing a fence rail; they budget asphalt and drainage repairs separately on case by case basis. Some key factors affecting these wide ranges include:

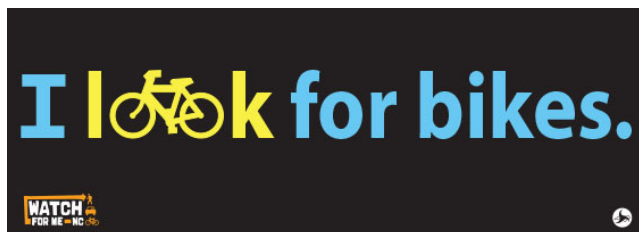
- Quality of materials used, and frequency of sealing and reconstruction of the path
- Amount of leaf drop affecting the trail that requires concentrated sweeping
- Amount of flooding of the trail that has to be cleaned up
- Amount of snow removal/grooming needed
- Whether or not mowing, irrigation, and other care of adjacent open space is calculated in the cost
- Presence of waste receptacles

The largest factor affecting the annual maintenance figures is whether or not the eventual trail reconstruction is accounted for in annual maintenance budgets, as opposed to being considered as separate capital item.

WATCH FOR ME NC: MEDIA CAMPAIGN

In 2018, Transylvania County's Planning Department pulled together a number of organizations to assist with the Watch for Me NC campaign (<https://www.watchformenc.org/>). The City of Brevard's Police Department is a great advocate for the program and the Blue Ridge Bicycle Club works hard to help educate the public. Other Watch for Me NC partners include:

- Brevard College
- Blue Ridge Bicycle Club
- City of Brevard
- Friends of Ecusta Trail
- Land of Sky Regional Council
- Transylvania County Health Department
- Transylvania County Parks and Recreation Department
- Transylvania County Sheriff's Department



"Watch for Me NC" example materials.

EDUCATIONAL AND ENFORCEMENT ACTIVITIES

Watch for Me NC materials were distributed to insurance companies, displayed at local bike shops and outfitters, and made available at Pisgah National Forest, DuPont State Forest, and Gorges State Park. Children and young adults in Transylvania County received information at elementary schools and summer camps.

Transylvania County kicked off their Watch for Me NC campaign at a Fourth of July festival, where thousands of locals and visitors received program materials. Staff were also on hand with a public safety booth at the Oskar Blues Festival in late July. The county worked to introduce the goals of Watch for Me NC to both the area's diverse rural and municipal enforcement agencies, and spent time communicating with the county Transportation Advisory Board and to the regions' Safe Routes to School coordinator.

KEY OUTCOMES

Watch for Me NC billboards created a buzz around Transylvania County. Officials also took an innovative approach to spreading the word about safety by pressure washing stencils into the sidewalk of US 64. Awareness about bicycle and pedestrian safety issues were raised in the county through staff interviews on WSQL and press releases. Two targeted enforcement campaigns were held in the latter part of 2018.

LESSONS LEARNED AND RECOMMENDATIONS

Transylvania County should continue engaging and expanding upon the Watch for Me NC campaign (such as incorporating programmatic elements from Vision Zero (visionzeronetwork.org), Safe Routes to School (saferoutesinfo.org) and Strive Not to Drive (strivenottodrive.org)). Improving bicycle infrastructure will increase the effectiveness of education, as multi-faceted efforts are needed to increase bicycle friendliness of Transylvania County.



COMMUNITY FORUMS FOR EDUCATION AND COMMUNICATION

Education for both bicyclists and motorists should include an open forum for interested citizens (both bicyclists and non-bicyclists) to come together and discuss current challenges regarding bicyclist/motorist safety and behavior. Knowledgeable representatives from the local bicycle industry, law enforcement, and concerned citizens could learn about different perspectives from Transylvania

County's roadway users and explore solutions to problems that are identified. During this planning process, it was clear that both motorists and bicyclists care deeply about the safety and well-being of fellow residents and visitors, and that an open forum would help to create a safer environment for both bicyclists and motorist by identifying issues and solutions.

These meetings could take place quarterly or as deemed necessary by participants. This could also be a regular function of the Bicycle and Pedestrian Advisory committee that is recommended in this plan (see pages 49 & 51).

Information such as traffic laws and safe driving and bicycling behavior (see graphic to the left) should be shared at these meetings. Local bicycle industry professionals and law enforcement can help bicyclists and motorists better understand the rules of the road and the needs of all roadway users, increasing safety across the county.

LET'S RIDE & DRIVE SAFELY in Transylvania County!



Produced by
Alta Planning + Design, 2019

OBEDIENT TRAFFIC SIGNALS & SIGNS

RIDE WITH TRAFFIC

BE BRIGHT AT NIGHT

Motorists & Bicyclists: Be aware of your surroundings. Do not use your phone or headphones while riding or driving.

Motorists & Bicyclists: Watch for turn signals and hand signals, but do not count on them.

Bicyclists: Use the through lane to go straight, not the turn lane.

Bicyclists: Ride in a straight line & avoid weaving.

Bicyclists: When biking on sidewalks, be aware of risks at driveways & intersections.

Bicyclists: Never ride against traffic.

Bicyclists: When necessary, use the entire travel lane. With sharrow markings, ride through the center of the arrows.

LOOK BEFORE ENTERING TRAFFIC & CHANGING LANES

USE HAND SIGNALS

WEAR A HELMET

Bicyclists: A front light & rear red light are required at night in NC. A bright vest can replace a rear light if visible from 300 feet.

Bicyclists: At intersections, use the lane farthest to the right that points where you're going (this keeps you on the right for the next street).

Bicyclists: Watch for cars on your left who might turn right.

Motorists: Yield to bicycles as you would to other vehicles on the roadway.

Motorists: Pass at least two feet away by law in NC, and at least four feet when in a no pass zone.

Use hand signals.

Bicyclists: Watch for people in parked cars. Move outside of the door zone or slow down and pass carefully.

Bicyclists: Be aware. Scan traffic ahead and behind you. Don't use audio devices that limit your hearing.

BICYCLE RIDES AND RACES: CAPITALIZING ON BICYCLE EVENTS

In 2018, there were at least eight bicycle rides and races in Transylvania County. Future race events are excellent opportunities to promote and celebrate bicycling through the communities in which these events cross. The following rides/races were held in 2018 that are within or partially cross through Transylvania County:

- Assault on the Carolinas
- Looking Glass Tour
- Hunter Subaru WNC Flyer
- Etowah Time Trial
- Tour de Cashiers
- White Squirrel Cycling Classic
- Pisgah Monster Cross
- Dirt Diggler

Combined, these events bring thousands of bicyclists and tourists to the county each year, presenting an opportunity for communities and businesses to capture tourism dollars and market local destinations and rural amenities.

“Bikes in Beds”, a 2015 report in Haywood County, NC details bicycle tourists and specifically bicyclists that participate in these types of rides and events. Many cyclists that engage in these types of events:

- Ride on 30-, 50-, or 100-mile single-day or multi-day organized events and may do this with a group, a spouse/partner or friends.
- Seek scenic areas or locations that offer some type of “reward” in terms of scenic beauty or historic value.
- May seek these events in places where they are also planning a vacation.
- Will identify pre-event ride cue sheets from local bike clubs to scout the route.
- Find events that contribute to a charity that matches their values.

Challenges for Event Bicyclists in Western NC include:

- Lack of bike lanes/shoulders
- Lack of signage/wayfinding
- Terrain
- Limited published routes

Event Cyclists’ needs may include:

- Well-organized events
- Convenient access
- Bathrooms and parking
- A safe, dry place to store their bike overnight
- Healthy breakfast at lodging
- Camping near event start
- Scenic vistas or routes
- Cool places to eat and drink
- Maps or cue sheets
- Bike shop for repair or rental

Ways in which communities, partner organizations, and businesses across Transylvania County can expand upon these event-based tourism opportunities include:

- Create a local/regional brand for promotional purposes.
- Develop an education campaign for hospitality industry, cyclists, and motorists.
- Identify/promote bicycle-friendly businesses.
- Cross-market with other outdoor activities.

Transylvania County is well positioned to grow this market opportunity into the local and regional tourism strategies. Combined with bicycle infrastructure improvements, this is a key way in which communities and businesses across Transylvania County can efficiently move towards a more bicycle friendly region and diversified economy. Furthermore, rides and races have an economic impact through lodging, food and supplies in particular. An economic impact study of these events should be conducted to better understand the extent of this impact.

Further Information:

- Assault on the Carolinas - <https://www.assaultonthecarolinas.com/>
- Looking Glass Tour - <https://www.blueridgeadventures.net/looking-glass-tour/race-7/>
- Hunter Subaru WNC Flyer - <http://wncflyer.com/>
- Lung Buster Time Trial Series - <https://idaph.net/events/lung-buster-time-trial-series/>
- Tour de Cashiers - <https://tourdecashiers.com/>
- White Squirrel Cycling Classic - https://www.blueridgeadventures.net/white_squirrel_cycling_classic/race-8/
- Pisgah Monster Cross - <http://www.pisgahproductions.com/events/pisgah-monster-cross-challenge/>
- Dirt Diggler - <https://www.blueridgeadventures.net/dirt-diggler/race-2/>

BIKE

TRANSYLVANIA RIDE GEAR PEOPLE COMMUNITY EVENTS ROUTES

YOU ARE AT: Home » Category: "Races & Events"



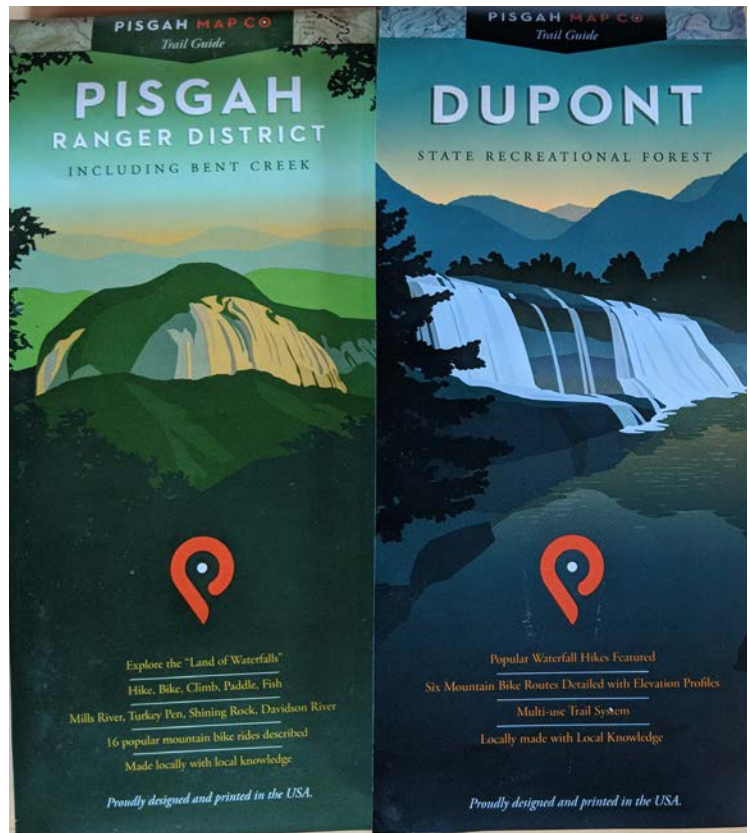
Bike Transylvania is a publication of the Transylvania Times that hosts a website and publishes a yearly magazine in collaboration with the Transylvania County Tourism Development Authority. Both the website and magazine serve as a comprehensive guide to bicycling in Transylvania County, including as a resource for all rides and races in and near Transylvania County.

MOUNTAIN BIKING INFRASTRUCTURE

While Transylvania County includes over 200 miles of mountain biking trails in Pisgah National Forest, DuPont State Forest, and Gorges State Park, additional opportunities for mountain biking trails and parks should be explored and connected through the county. Transylvania County Parks and Recreation should consider including mountain biking trails in future park development and programming. To allow families to enjoy mountain biking together, beginning routes suitable for children and adults need to be added to complement the intermediate and advanced facilities found in the state and national forests.

Infrastructure specific to mountain biking is generally not considered during roadway/transportation improvement projects. However, bicycle infrastructure projects recommended in this plan will enhance connectivity to mountain biking trails and destinations. Transylvania County has become a world class mountain biking destination, and mountain biking infrastructure connectivity should continue to be a priority.

Representatives of the mountain biking industry that have participated in this process should be included on the Bicycle and Pedestrian Advisory Committee recommended in this plan (see pages 49 & 51).



Above: Highly detailed maps, for purchase, have been produced by the Pisgah Map Company showing all mountain biking trails in Pisgah National Forest Ranger District and DuPont State Forest.



Left: The mission of the Transylvania County Schools Cycling Club for middle and high school students, is "To assist kids in finding a lifelong love of the outdoors through mountain biking, within a supportive community." (Image from the Transylvania County Schools Cycling Club website).

Below and to the left: The Brevard College Cycling Team competes at the highest levels collegiately, winning seven team national championships and nine individual national titles since 2007 (Image from the Bike Transylvania website).

Further information on existing programs and resources, including mountain biking, can be found on pages 12 & 13 in Appendix D.



VOLUNTARY FUNDING PROGRAM

Funding for bicycle infrastructure can come from numerous sources. Appendix B details funding sources across different levels of government as well as private/non-profit sector sources. While some bicycle infrastructure projects in Transylvania County could be implemented as part of NCDOT roadway projects (State Transportation Improvement projects - see page 4 of Appendix B), a 20% local match will be required. Creating a voluntary bicycle infrastructure funding program for bicycle infrastructure can help support projects that require a match, or even fully finance independent bicycle infrastructure projects.

An ideal vehicle for managing a voluntary funding pool would be a local non-profit organization. The Blue Ridge Bicycle Club, who supported the local match required for this planning process, or a similar organization, could serve as the manager of a local voluntary funding pool.

With a robust bicycling and outdoor industry in Transylvania County, a voluntary funding program that is well advertised could be successful in creating seed money for bicycle infrastructure projects.

See Appendix B for further information on potential funding sources.

BICYCLE FACILITIES ON STEEP HILLS

Steep hills and mountain roads are often places where limited shoulder and narrow overall road widths occur for significant distances. Bicyclists climbing these sections of road will be traveling at slower speeds. Even with lower traffic volume levels, cars may have difficulty passing bicyclists, and traffic may begin to accumulate behind a bicyclist. Pisgah Highway/US 276 and Parkway Road/NC 215 are salient examples.

Limited sight lines, narrow roadway widths, and steep grades contribute to this problem. Because of steep drop-offs and geographical constraints, a bicyclist may not have a safe opportunity to pull off to the side of the road and allow cars to pass. With cars sometimes traveling at higher speeds downhill in the opposite direction, opportunities to pass a cyclist (or group of cyclists) can be dangerous.

Bicyclist waiting areas/pull-offs or periodic segments of paved shoulder are a potential solution that could ameliorate this problem. This type of roadway feature could provide temporary refuge along the ascent of steep roads where bicyclists will be able to shift further to the right or pull over altogether, allowing a line of cars to pass. These may be more feasible solutions in places where geographical constraints and/or funding may limit the addition of paved shoulder along the entirety of a steep section of roadway.

FURTHER STUDY NEEDED

NCDOT policy (and lack of Federal policy) currently does not allow for periodic segments of paved shoulder along steep sections of roadway to serve as bicycle or automobile pull-offs. Paved shoulder along the length of a steep roadway is permitted. However, very long sections of steep roadway such as Pisgah Highway and Parkway Road in Transylvania County present particular problems since adding shoulder space along the length of the climb will be very difficult to implement due to geographical constraints and expense. Periodic segments of paved shoulder or pull-off areas could present a solution.

Further study is recommended to develop specific guidance for where and when periodic paved shoulder sections or designated bicycle pull-off areas may be appropriate and safe. Current engineering guidance does not specifically address this particular need and further research is needed before NCDOT may be able to apply such facilities.

Numerous mountainous roadways in Western North Carolina could benefit from such guidance and a detailed study should be conducted.



Long, steep, winding climbs can be problematic for both bicyclists and automobiles wishing to pass slower moving traffic. If limited space is available to pass, this can cause significant traffic congestion for faster vehicles wishing to pass. Photo courtesy of Carmichael Training Systems.

SPEED LIMIT REDUCTION AND TRAFFIC CALMING

Lowering speed limits has enormous safety benefits for all users, including bicyclists, by lowering both the rate and severity of crashes. In addition to a media campaign spreading awareness, enforcement of existing speed limits as well as strategic speed limit reduction and traffic calming measures (the latter typically found on local streets), can save lives.

Speed reduction requests can be submitted by citizens and public agencies to the NCDOT Division 14 Traffic Engineer. See NCDOT Division 14 contact information here - <https://apps.ncdot.gov/dot/directory/authenticated/UnitPage.aspx?id=653>

A PEDESTRIAN HIT BY A VEHICLE TRAVELING AT
25 MPH



HAS AN **89%** CHANCE OF SURVIVAL

A PEDESTRIAN HIT BY A VEHICLE TRAVELING AT
35 MPH



HAS A **68%** CHANCE OF SURVIVAL

A PEDESTRIAN HIT BY A VEHICLE TRAVELING AT
45 MPH



HAS A **35%** CHANCE OF SURVIVAL

Tefft, B. C. *Impact speed and a pedestrian's risk of severe injury or death.* Accident Analysis & Prevention 50 (2013) 871-878.



Without dedicated bicycle infrastructure separated from roadways, speed limits become very important for bicyclists (and motorists) wishing to use the roadway.

POLICY CONSIDERATIONS

The policy considerations presented in the tables on the following pages were developed through the lens of the project vision and goals, specifically, the vision of making Transylvania County a place where: *Transylvania County will have an interconnected network of paved paths, bike lanes, and other bike infrastructure that will provide greater safety, health, connectivity, and alternative transportation routes between communities and destinations in Transylvania County and throughout the region.*

TABLE 4.1

Topics/Strategies	General Recommendations
<p>Support bike accommodations by roadway type</p>	<p>See Chapter 4 of the NCDOT Complete Streets Planning and Design Guidelines for recommendations of bikeway type by roadway type. Consider including these guidelines by reference in local design guidance or requirements.</p> <p>The NACTO Urban Bikeway Design Guide provides additional design details for various on-street bikeway treatments and could be adopted by reference in regional ordinances and/or engineering standards. Many cities have taken this approach.</p> <p>Resources: FHWA Small Town and Rural Multimodal Network Guide: http://ruralsdesignguide.com/ NACTO Urban Bikeway Design Guide http://nacto.org/cities-for-cycling/design-guide/ FHWA Separated Bikelane Planning and Design Guide: https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/separated_bikelane_pdg/page00.cfm</p>
<p>During the future amendments to the subdivision ordinance consider requiring dedication, reservation or development of greenways with new development, redevelopment, and roadway projects for subdivisions with over 10 lots.</p>	<p>Consider requirements for greenway reservation, dedication, or provision in new developments where a greenway or trail is shown on an adopted plan or where a property connects to an existing or proposed greenway. Where greenway construction cannot politically be required, consider offering incentives in the form of reduced fees, cost sharing, density bonuses, or reduction in other open space requirements when adopted greenway alignments are constructed through private development. See the incentives offered by the City of Asheville to promote public policy goals. For example: http://www.ashevilenc.gov/departments/sustainability/resources.htm</p> <p>For additional examples of incentives, see also: https://www.law.ufl.edu/_pdf/academics/centers-clinics/clinics/conservation/resources/incentive_strategies.pdf</p> <p>Ideally, development regulations should require the construction and maintenance of greenways to local standards unless a maintenance agreement is established with a local government.</p> <p>See requirements in Wake Forest, NC UDO, Section 6.8.2 Greenways: “When required by Wake Forest Open Space & Greenways Plan or the Wake Forest Transportation Plan, greenways and multi-use paths shall be provided according to the provisions [that follow in the section cited above].” http://www.wakeforestnc.gov/udo.aspx</p> <p>Good Model: (New Hanover County Zoning Ordinance): The Riverfront Mixed Use District includes the following provision: “Riverfront facilities shall provide multi-modal transportation opportunities, including public boating, walking, bicycling, and public bus or water taxi uses and the facilities necessary for such uses.”</p>
<p>Require new bike lanes, greenways, etc., to connect to existing facilities when located along a priority project identified in Chapter 3.</p>	<p>Connectivity of facilities is critical for walking and biking conditions. New commercial development should be required to connect to or extend existing bicycle and pedestrian facilities.</p> <p>See: Chapters 6 of Wake Forest, NC UDO for recommendations for bikeways and greenways, esp. sections 6.5.3, 6.8.2, 6.9, 6.10. http://www.wakeforestnc.gov/udo.aspx Chapter 7 of the Wilson, NC UDO regarding greenways. http://www.wilsonnc.org/wp-content/uploads/2014/12/CH-7-Parks-Open-Space.pdf</p> <p>Good Model: (New Hanover County Zoning Ordinance): The EDZD Zoning District provides points for new developments that connect to the existing bikeway network and key destinations and provides a good definition of the bikeway network. (Section 54.1-14 and following.)</p>
<p>Adopt traffic calming programs, policies, and standards in areas of the county where the community has identified this as a need</p> <p>Traffic calming on local streets increases safety and comfort for all roadway users, including cyclists. It also increases neighborhood livability.</p>	<p>Traffic calming tools are especially important where bike routes or bike boulevards are proposed on local residential or sub-collector streets.</p> <p>The National Complete Streets Coalition provides good guidelines for traffic calming through their best practices manual: (https://smartgrowthamerica.org/resources/).</p> <p>See also the NACTO Urban Bikeway Design Guide section on Bicycle Boulevards and the FHWA Traffic Calming Primer: https://safety.fhwa.dot.gov/speedmgmt/traffic_calm.cfm</p> <p>Consider requiring other traffic calming measures that improve the pedestrian and biking environment such as street trees, narrow street width standards, and T intersections.</p>

Topics/Strategies (continued)	General Recommendations
<p>Adopt bicycle parking requirements for new Parks and open space developments.</p>	<p>Bicycles should receive equal consideration when calculating parking needs with specific calculations provided for determining the amount of bicycle parking provided by district type or land use type. Design and location standards for bicycle parking should be clearly stated to provide for safe and convenient access to destinations. Different standards of bicycle parking are needed for short-term visitors and customers and for longer term users like employees, residents, and students.</p> <p>See City of Wilson UDO, Chapter 9: Parking & Driveways, Section 9.4 and 9.6: http://www.wilsonnc.org/wp-content/uploads/2014/12/CH-9-Parking-Driveways-.pdf</p> <p>Good standards for bicycle parking design can be found through the Association of Pedestrian and Bicycle Professionals' Bicycle Parking Guidelines. (www.apbp.org)</p> <p>Bicycle Parking Model Ordinance, Change Lab Solutions: http://changelabsolutions.org/publications/bike-parking</p>
<p>Consider limiting dead end streets or cul-de-sacs when revising the subdivision ordinance</p> <p>Dead end streets or Cul-de-sacs, while good at limiting motor vehicular traffic in an area, are a severe hindrance to pedestrian and bicycle connectivity and overall neighborhood accessibility, including for emergency access and other services.</p>	<p>Make the maximum length for Cul-de-sacs 250-300 feet to limit the distance that a person would have to travel along a cul-de-sac.</p> <p>For good model language, see City of Wilson, NC UDO, Section 6.4: Connectivity: http://www.wilsonnc.org/wp-content/uploads/2014/12/CH-6-Infrastructure-Standards.pdf</p> <p>Or City of Wake Forest, NC UDO, Section 6.5, Connectivity: http://www.wakeforestnc.gov/udo.aspx</p>
<p>The documents to the right were referenced for this policy and regulatory review.</p>	<p>REFERENCED DOCUMENTS AND RESOURCES:</p> <ul style="list-style-type: none"> • NCDOT Complete Streets Planning and Design Guidelines (July 2012): http://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf • NCDOT Traditional Neighborhood Development (TND) Guidelines: https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Traditional%20Neighborhood%20Development%20Manual.pdf • City of Wilson, NC UDO: https://www.wilsonnc.org/development-services/unified-development-ordinance/ • Town of Wendell, NC UDO: http://www.townofwendell.com/departments/planning/development/zoning/udo-unified-development-ordinance • City of Wake Forest, NC UDO: http://www.wakeforestnc.gov/udo.aspx • Association of Pedestrian and Bicycle Professionals' Bicycle Parking Guidelines. (www.apbp.org) • Making Neighborhoods More Walkable and Bikeable, ChangeLab Solutions: http://changelabsolutions.org/sites/default/files/MoveThisWay_FINAL-20130905.pdf • Getting the Wheels Rolling: A Guide to Using Policy to Create Bicycle Friendly Communities, ChangeLab Solutions http://changelabsolutions.org/bike-policies <p>....And other documents noted in this column in the preceding tables.</p>

SUPPORTIVE STATE AND FEDERAL POLICIES AND GUIDELINES:

These policies describe how bicycle and pedestrian improvements are to be implemented in North Carolina. For full policies, visit: <https://connect.ncdot.gov/projects/BikePed/Pages/Policies-Guidelines.aspxDevelop>.

- **Complete Streets:** N.C. Department of Transportation policy on when and how planners and designers should design streets and roads to accommodate all users, including accommodations for bicyclists and pedestrians, in transportation projects.
- **Bicycle Policy & Guidelines:** N.C. Department of Transportation policy and guidelines for planning, designing, building, maintaining and operating bicycle facilities and accommodations.
- **Greenway Accommodations Memo:** Approved in 2015, N.C. Department of Transportation guidelines, approaches and cost-sharing recommendations for proposed greenways under bridges.
- **Administrative Action to Include Greenway Plans:** N.C. Department of Transportation administrative guidelines for considering greenways and greenway crossings during the highway planning process to ensure that critical corridors for future greenways are not severed by highway construction.
- **Pedestrian Policy & Guidelines:** N.C. Department of Transportation policy and guidelines for planning, designing, building, maintaining and operating pedestrian facilities and accommodations.
- **Bridge Policy:** N.C. Department of Transportation policy establishing design elements for new and reconstructed bridges on the state's road system, including requirements for sidewalks and bicycle facilities on bridges.
- **Traffic Engineering Policies, Practices and Legal Authority:** N.C. Department of Transportation policies and federal design guidelines for specific pedestrian and bicycle safety accommodations.

A photograph of a cyclist riding away on a paved road that curves through a dense, green forest. The cyclist is wearing a blue helmet and a red top. The road has a double yellow line on the left side. The background is filled with tall trees and bright sunlight filtering through the canopy.

CHAPTER 4: IMPLEMENTATION

OVERVIEW

This chapter defines a structure and the action steps for managing the implementation of the Transylvania County Bicycle Plan. The award-winning 2025 Comprehensive Plan for Transylvania County identified four focus areas: economic health, environment health, land use and livability, and health, culture, and equity. Arguably, a more bikable Transylvania County helps to address all of these focus areas in terms of economy, environment, livability, and health. One of the specific objectives is: “Promote[s] the health and well-being of its citizens, by providing and actively supporting high-quality and well maintained parks, recreational facilities, programs and services throughout the county.” In addition, the Comprehensive Plan states that in and around Brevard has a large bicycling population with higher than typical rates of bicycle commuting.

Currently, the ordinances in place that guide development, zoning, and land use are the County Subdivision Regulations and the Pisgah Forest Community Zoning Ordinance. The zoning ordinance, however, only exists for a very small area in Pisgah Forest and there is no zoning for the rest of the county. Today, within these ordinances, there are no land use and development regulations that promote bikeable new development, programs, and capital projects. See Appendix E for further detail on comprehensive policy considerations related to complete streets and greenways, bicycle-oriented design, and connectivity.

Implementing the recommendations within this plan will require leadership and dedication to bicycle facility and program development on the part of a variety of agencies and partners. Equally critical, and perhaps more challenging, will be meeting the need for a recurring source of revenue. Success will be realized through collaboration with regional and state agencies, local municipalities, the private sector, and non-profit organizations. Funding resources that may be available are presented in Appendix B of this plan.

KEY STEPS

The following represent key, immediate action steps for Transylvania County and its partners:

ADOPT THE PLAN.

Adoption does not obligate the county financially, but signals an intent to support the vision, goals, and projects of this plan in the coming years and decades.

FORM A COUNTY BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE.

The Stakeholder Group, formed for this project, should be maintained to assist in plan implementation and evaluation. The Committee should meet quarterly or biannually to assess and monitor progress. At a minimum, the Committee would have representation from Transylvania County, NCDOT, the Land of Sky RPO, and the municipalities within Transylvania County.

UPDATE COUNTY POLICIES.

Policy recommendations are presented in Table 4.1 in Chapter 3. In their essence, new policies and updated existing policies are low-cost or zero-cost means for the county to influence or enforce bikeable transportation corridors and development. Priority network recommendations should be implemented as part of roadway projects that align with the priority recommendations in Chapter 3.

BEGIN WORK ON PRIORITY PROJECTS.

The implementation of bikeway infrastructure projects will take time and will happen through multiple mechanisms including the NCDOT SPOT process, rails to trails, park and open space development, and incidental improvements that can happen during scheduled roadway reconstruction, resurfacing, or maintenance. Because infrastructure is the high dollar item (and most critical) part of this plan, the county and bicycle advocates should consider setting aside a revenue stream for local match or standalone projects.

ENGAGE NEW PROGRAMS AND RESEARCH.

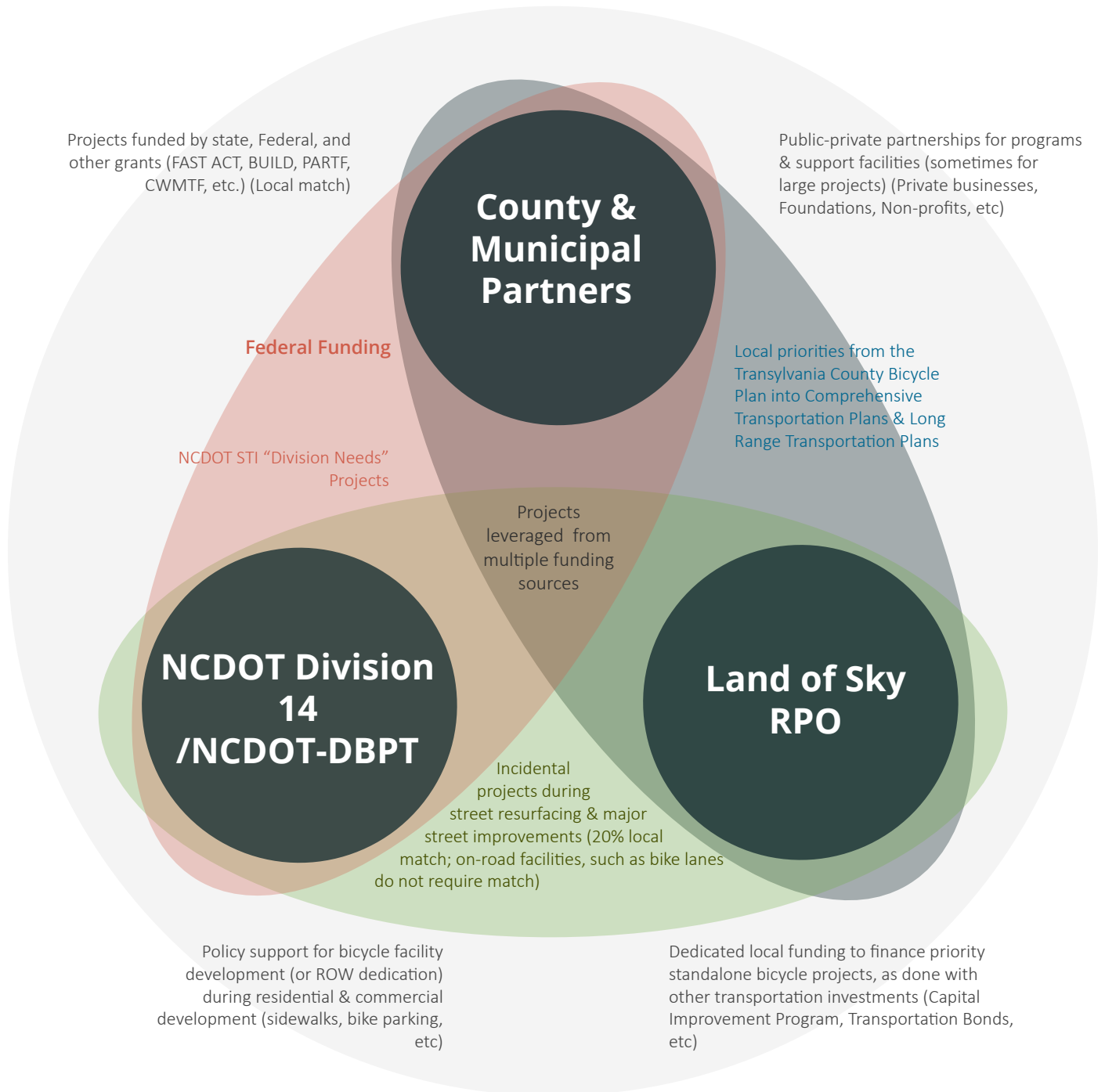
Program recommendations can be found in Chapter 3. The county is already involved in the Watch for Me NC campaign and should begin engaging all program recommendations in 2019, working closely across departments, including Parks and Recreation, Planning, and the Sheriff’s Office. Research bicycle “pull-outs” or respites along bicycle routes, especially where paved shoulder cannot be provided due to topographical or other constraints.

CONTINUE BUILDING COUNTY-MUNICIPAL PARTNERSHIPS.

For Transylvania County to improve bicycle connectivity, coordination will be important with the City of Brevard, Town of Rosman, and others. The City of Brevard, at the time of this study, is pursuing greenway and bikeway development that will feed towards the county. As the region grows and new bike facilities are added, there should be regular coordination in planning and implementation.

PROJECT DEVELOPMENT OPPORTUNITIES FOR IMPLEMENTING THE TRANSYLVANIA COUNTY BICYCLE PLAN

Project development opportunities and key players are summarized in this graphic. To implement the recommendations of this plan will require a comprehensive, well-rounded approach with public and private partnerships.



KEY PARTNERS IN IMPLEMENTATION

ROLE OF THE COUNTY BOARD OF COMMISSIONERS

The County Board should be responsible for understanding and adopting this plan. The Board will ultimately determine the timing of action steps, dedication of resources, and policy updates to implement this plan.

ROLE OF THE CITY/TOWN COUNCILS

Brevard, Rosman, and township leaders should be responsible for understanding and endorsing (or adopting) this plan. Through adoption, the municipalities and townships signal support and cooperation with Transylvania County to assist with plan implementation.

ROLE OF THE TRANSYLVANIA COUNTY PLANNING BOARD

The Planning Board serves as an advisory board to the Board of Commissioners on matters of planning and zoning. The Planning Board should be prepared to:

- Become familiar with the recommendations of this plan, and consider supporting its implementation.
- During subdivision master plan review, ensure required space for priority projects if applicable.
- Consider bicycle infrastructure needs when updating ordinances.
- Learn about bicycle-related policies in North Carolina. (see: <https://connect.ncdot.gov/projects/BikePed/Pages/Policies-Guidelines.aspx>)

ROLE OF THE BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE

The Committee (recommended in this plan) should be prepared to:

- Meet with county and municipal staff and evaluate progress of the plan's implementation and offer input regarding bicycle and trail-related issues.
- Assist county staff in applying for grants and organizing bicycle-related events and educational activities (such as programs recommended in Chapter 3).
- Build upon current levels of local support for bicycle issues and advocate for local project funding.

PARKS AND RECREATION COMMISSION

Supporting this plan will assist the commission in implementing the Parks and Recreation Master Plan.

ROLE OF THE LOCAL NCDOT DIVISION 14

Division 14 of the NCDOT is responsible for the construction and maintenance of bicycle facilities on NCDOT-owned and maintained roadways in Transylvania County, or is expected to allow for the municipalities to do so with encroachment agreements. The county and its communities should be proactive and take the lead in communicating with and working with Division 14, but Division 14 should also be prepared to do the following, as they are able:

- Recognize this plan as not only an adopted plan of the county, but also as an approved plan of the NCDOT.
- Become familiar with the bicycle facility recommendations for NCDOT roadways in this plan (Chapter 3); take initiative in incorporating this plan's recommendations into the Division's schedule of improvements whenever possible.
- Become familiar with the design standards listed in Appendix A of this plan; construct and maintain recommended facilities using the highest standards allowed by the State (including the use of innovative treatments on a trial basis).
- Notify county staff of all upcoming roadway reconstruction or resurfacing/restriping projects in Transylvania County, no later than the design phase. Provide sufficient time for comments from county staff, advisory boards, and elected officials.
- If needed, seek guidance and direction from the NCDOT Division of Bicycle and Pedestrian Transportation on issues related to this plan and its implementation.

ROLE OF THE SHERIFF'S OFFICE

Sheriff and police departments are responsible for providing the community the highest quality law enforcement service and protection to ensure the safety of the citizens and visitors. The Sheriff's Office should be prepared to:

- Become experts on bicycle related laws in North Carolina (see: <https://www.ncdot.gov/divisions/bike-ped/Pages/bike-ped-laws.aspx>).
- Continue to enforce not only bicycle- and pedestrian-related laws, but also motorist laws that affect bicycling, such as speeding, running red lights, aggressive driving, etc.
- Participate in bicycle-related education programs.
- Review safety considerations as projects are implemented.

ROLE OF DEVELOPERS

Developers in Transylvania County can play an important role in facility development whenever a project can include the enhancement of transportation facilities or the dedication and development of on-road bicycle facilities, sidewalks, trails or crossing facilities. Developers should be prepared to:

- Become familiar with the benefits, both financial and otherwise, of providing amenities for biking (including trails) in residential and commercial developments.
- Consider voluntary installation of bike infrastructure and/or contribute in-lieu fees as part of the subdivision review and approval process.
- Be prepared to account for bicycle circulation and connectivity in future developments.

ROLE OF LOCAL & REGIONAL STAKEHOLDERS

Stakeholders for bicycle facility development and related programs, such as Transylvania Transportation Advisory Committee, Land of Sky RPO, Brevard College, Friends of the Ecusta Trail, and other local organizations play important roles in the implementation of this plan. Local and regional stakeholders should be prepared to:

- Become familiar with the recommendations of this plan, and communicate & coordinate with the county for implementation, specifically in relation to funding opportunities, such as grant writing and developing local matches for facility construction.
- Land of Sky RPO should work with the Transylvania County on submitting bicycle infrastructure projects for evaluation within the State Transportation Improvement Program (STIP).
- Transylvania County should coordinate with its municipalities on trail development.
- Business owners and organizations should look for opportunities to partner on specific projects, such as trail connectivity, streetscape improvements, or comprehensive signage and wayfinding projects.

ROLE OF LOCAL RESIDENTS, CLUBS AND ADVOCACY GROUPS

Transylvania County has a solid foundation of local businesses and organizations that support bicycling. This groups will also play a key role in the success of this plan. Bicycle advocates should be prepared to engage local residents and groups by:

- Asking for input regarding bicycling issues
- Enlisting volunteers for bicycle-related events and educational activities and/or to participate in such activities.

- Encouraging people to speak at Board meetings and advocate for local bicycle project and program funding.
- Fundraising for project implementation.
- Attend the Transportation Advisory Committee meetings and encourage transportation projects that are multi-modal.

ROLE OF VOLUNTEERS

Services from volunteers, students, and seniors, or donations of material and equipment may be provided in-kind, to offset construction and maintenance costs. Formalized maintenance agreements, such as adopt-a-trail/greenway or adopt-a-highway can be used to provide a regulated service agreement with volunteers.

Other efforts and projects can be coordinated as needed with senior class projects, scout projects, interested organizations, clubs or a neighborhood's community service to provide for many of the program ideas outlined in Chapter 3 of this plan. Advantages of utilizing volunteers include reduced or donated planning and construction costs, community pride and personal connections to the county's trail, bicycle, and pedestrian networks.

PERFORMANCE MEASURES (EVALUATION AND MONITORING)

Transylvania County should establish performance measures to benchmark progress towards fulfilling the recommendations of this plan. Advocates and advisory boards should play a key role in presenting these performance measures in an annual evaluation update. Performance measures could address the following aspects of bicycle transportation and recreation:

- *Safety.* Measures of bicycle-related crashes and injuries.
- *Facilities.* Measures of how many bicycle facilities have been funded and constructed since the plan's adoption.
- *Maintenance.* Measures of existing bicycle facility deficiency or maintenance needs.
- *Counts.* Measures of bicycle traffic at specific locations.
- *Education, Encouragement and Enforcement.* Measures of the number of people who have participated in part of a bicycle-related program since the plan's adoption.
- The League of American Bicyclists website should be consulted for further information on performance measures - <https://bikeleague.org/content/5-es>.

FACILITY DEVELOPMENT METHODS

This section describes different construction methods for the proposed bicycle facilities outlined in Chapter 3. Note that many types of transportation facility construction and maintenance projects can be used to create new bicycle facilities. It is much more cost-effective to provide bicycle facilities during roadway construction and reconstruction projects than to initiate the improvements later as “retrofit” projects.

To take advantage of upcoming opportunities and to incorporate bicycle facilities into routine transportation and utility projects, Transylvania County should keep track of NCDOT’s projects and any other local transportation improvements. While doing this, county staff should be aware of the different procedures for state and local roads.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) STRATEGIC TRANSPORTATION INVESTMENTS (STI)

The NCDOT’s State Transportation Improvement Program is based on the Strategic Transportation Investments Bill, signed into law in 2013. The Strategic Transportation Investments (STI) Initiative introduces the Strategic Mobility Formula, a way to fund and prioritize transportation projects.

All independent bicycle projects are placed in the “Division Needs” category, and are currently ranked based on 50% data (safety, access, demand, connectivity, and cost effectiveness) and 50% local input. See Appendix B for more information.

RESIDENTIAL AND COMMERCIAL DEVELOPMENT

The construction of bicycle facilities and trails should be considered during structural/commercial development. Construction of facilities that corresponds with site construction is more cost-effective than retrofitting. In commercial development, emphasis should also be focused on safe bicyclist access into, within, and through large parking lots. This ensures the future growth of the bicycle networks and the development of safe communities.

LOCAL ROADWAY CONSTRUCTION OR RECONSTRUCTION

Bicyclists should be accommodated any time a new road is constructed or an existing road is reconstructed that aligns with the priority recommendations in chapter 3. In the longer-

term, all new roads with moderate to heavy motor vehicle traffic should have bicycle facilities and safe intersections. However, sidepaths can be an acceptable solution when a road has few driveways and high-speed, high-volume traffic.

REPAVING

If right of way allows, repaving projects provide a clean slate for revising pavement markings. When a road is repaved, the roadway should be restriped to create narrower lanes and provide space for bike lanes and shoulders, where feasible. In addition, if the spaces on the sides of non-curb and gutter streets have relatively level grades and few obstructions, the total pavement width can be widened to include paved shoulders.

While many roadways in Transylvania County are narrow with little right of way space, this is important to note for roads such as US 64 where the right of way is very wide.

NCDOT provides three-year plans that include resurfacing schedules. Please see the following website - <https://connect.ncdot.gov/resources/Asset-Management/HMIP-Plans/Pages/HMIP.aspx>.

BRIDGE CONSTRUCTION OR REPLACEMENT

Provisions should always be made to include a bicycling facility as a part of vehicular bridges. All new or replacement bridges should accommodate two-way travel for all users. Even though bridge construction and replacement does not occur regularly, it is important to consider these policies for long-term bicycle planning.

EASEMENTS

The county does not own water and sewer infrastructure but should consider encouraging utility companies to allow public use of their easements. Sewer easements are very commonly used for this purpose, offering cleared and graded corridors that easily accommodate trails. This approach avoids the difficulties associated with acquiring land, and it better utilizes the county’s resources.

Transylvania County Bicycle Plan

Prepared for Transylvania County & NCDOT
Prepared by Alta Planning + Design

2019