BREVARD

PEDESTRIAN *and* BICYCLE PLAN

ACKNOWLEDGMENTS

Thank you to the local residents, community leaders, and government staff that participated in the development of this plan through meetings, workshops, comment forms, and plan review. Special thanks to those who participated as steering committee members, listed below.

PROJECT STEERING COMMITTEE

The Steering Committee is made up of the City Council Parks, Trails, & Recreation Committee (CCPTRC), as well as representatives from regional planning agencies. The members include:

Mac Morrow, CCPTRC Chair
Aaron Baker, CCPTRC Vice Chair
Steve Harrell, Interim City Manager
David Lutz, Public Works Director
Paul Ray, Planning Director
Nancy DePippo, CCPTRC Citizen Member
Matt Christian, CCPTRC Citizen Member
Howie Granat, CCPTRC Citizen Member
Tim Robinson, CCPTRC Citizen Member
Ryan Olson, At-Large Member
Denise Hodsdon, City Manager's Executive Assistant
Maureen Copelof, Mayor, Ex Officio Member
Jared Mull, Ex Officio Member
Erik Emaus, former CCPTRC Citizen Member
Jim Fatland, former City Manager and CCPTRC Member
Jimmy Harris, former Ex Officio CCPTRC Member
Aaron Bland, Assistant Planning Director
Vickie Eastland, Land of Sky Rural Planning Organization
Lonnie Watkins, NCDOT District 1
Stephen Williams, NCDOT Division 14
John Vine-Hodge, NCDOT IMD

Prepared for the City of Brevard, North Carolina

Prepared by Alta Planning + Design

Reviewed by Alexius Farris, NCDOT IMD

Adopted by the City of Brevard on *date* _____

Integrated Mobility Division
N.C. DEPARTMENT OF TRANSPORTATION

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EXECUTIVE SUMMARY

WHY SHOULD WE PLAN FOR BICYCLING AND WALKING IN BREVARD?

The City of Brevard is quickly gaining recognition as a top small city in the nation due to its unique combination of a robust downtown, college town setting, and access to surrounding mountains, trails, and parks. With this recognition, the City faces challenges and opportunities for retaining the small city character and quality of life that is attracting a growing number of people, most notably retirees. One essential aspect of small city living is the freedom and ability to walk out of your front door, and get where you want to go on foot or by bicycle. When residents have the ability to participate in these simple activities, the community often experiences a remarkable set of positive benefits related to public health and safety, recreation, transportation, local economy, and tourism.

As Brevard grows, its roads are not designed to accommodate vehicular traffic AND walkers and bicyclists. City roadways, in their current condition, feel unsafe for many experienced bicyclists, and intimidating for people who would otherwise consider bicycling and walking. Brevard residents have long supported the idea of creating a safer and more connected network of bicycle facilities, as is well documented in many of the City's past and current plans and initiatives. The City has responded by investing in its initial greenways and side paths. What has been missing, that this plan provides, is a comprehensive analysis of the City's opportunities for creating such a network, and a strategic set of recommendations to successfully make it happen.

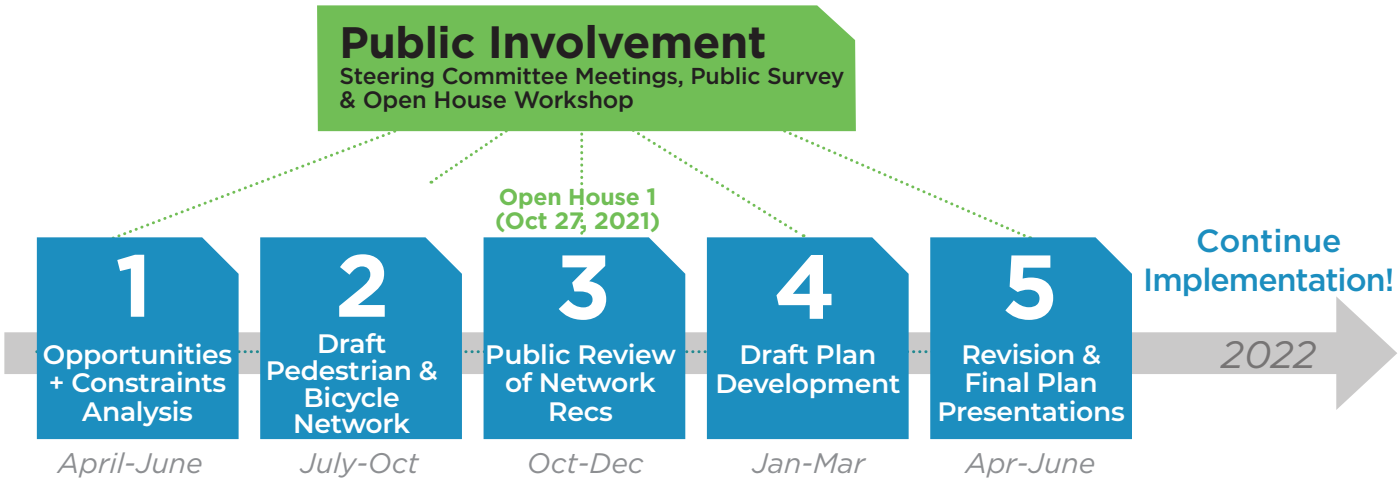
WHAT DOES THIS PLAN RECOMMEND?

The Brevard Pedestrian and Bicycle Plan features policy, program, and infrastructure recommendations that, if adopted, funded, and implemented, will create the walk- and bicycle-friendly community that residents have long supported.

This plan documents the past and current support for a walk- and bicycle-friendly Brevard, and highlights the current conditions impacting walking and bicycling in the city today (see Chapter 2).

Attendees of the Public Meeting in October 2021 review the bicycle and pedestrian network maps, and offer their feedback.

KEY STEPS IN THE PLANNING PROCESS:



PUBLIC INPUT RESPONSE HIGHLIGHTS:

How do you rate the overall walking conditions in Brevard?

9% EXCELLENT

36% GOOD

41% FAIR

14% POOR

How do you rate the overall biking conditions in Brevard?

8% EXCELLENT

22% GOOD

48% FAIR

22% POOR

What are your top priorities for walking + biking improvements

81% NEW SIDEWALKS, CROSSWALKS, + BIKEWAYS

BASIS OF RECOMMENDATIONS:

Public & Steering Committee Input
Mapping exercises, workshops, group discussions, and survey forms (p.22)

+

Connections to Key Destinations
Downtown, parks, schools, neighborhoods, commercial areas, and surrounding communities (p. 9)

+

Current Conditions
Roadway maintenance jurisdiction and Collision Analysis (p. 8, 11)

+

Existing Plans & Projects
Existing and in-development roadway, greenway, side path, and bicycle lane projects (p. 18)

+

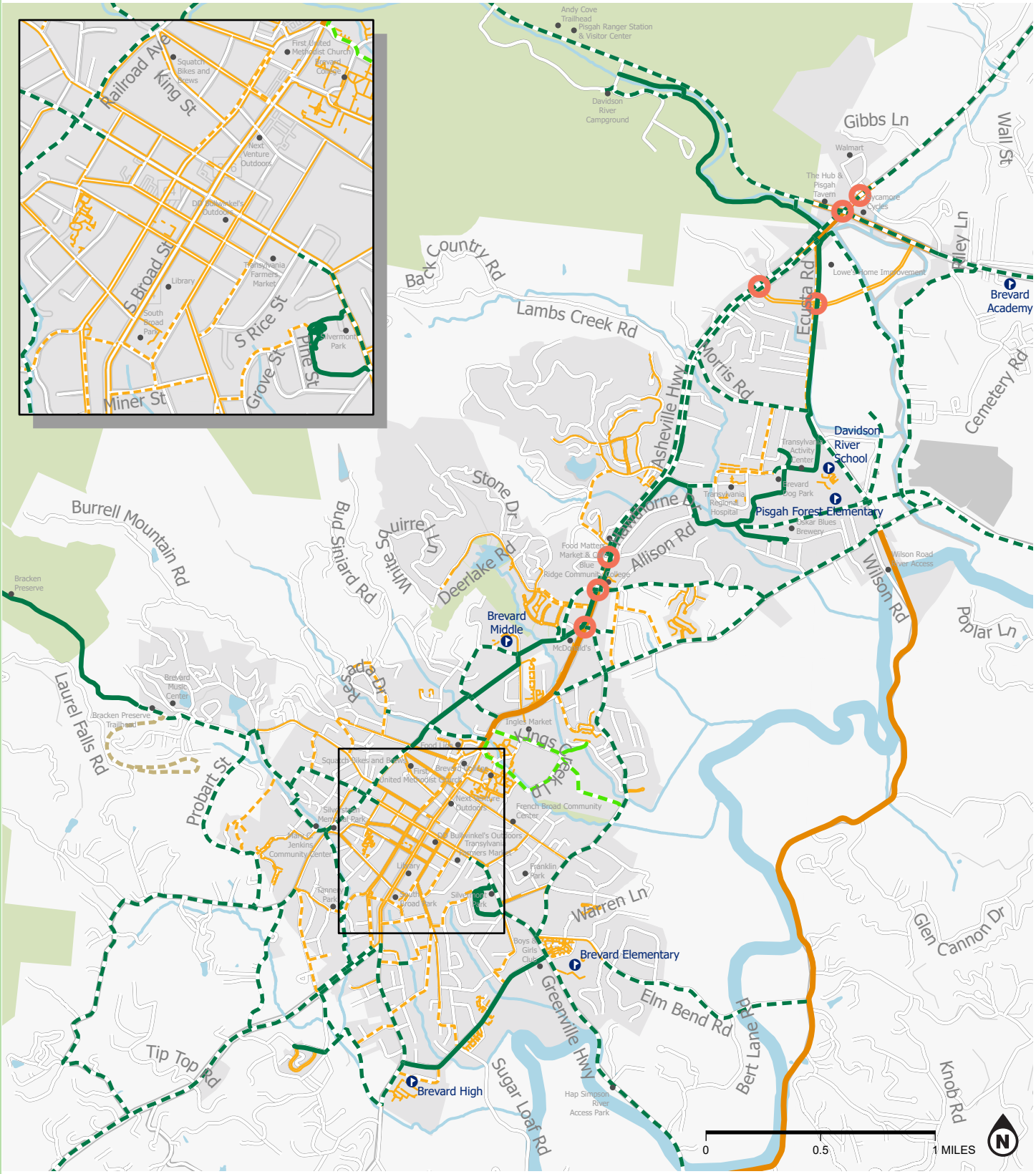
Priority Project Analysis
A priority project checklist taking into account nearly 4 unique factors (p. 42)

Top Priority Projects:

Completing the Estatoe Trail is the #1 overall Priority for the City of Brevard.

In addition to the Estatoe Trail, the following five projects were chosen to be representative of the types of bicycle and pedestrian project recommendations in the Plan:

1. **Shared Use Path on Osborne Road**
2. **Shared Use Path on Neely Road**
3. **Separated Bicycle Lanes on Broad Street + Caldwell Street**
4. **Bicycle Boulevards on Morgan Street + Caldwell Street**
5. **Shared Lane Markings on French Broad Street**



PEDESTRIAN FACILITY RECOMMENDATIONS

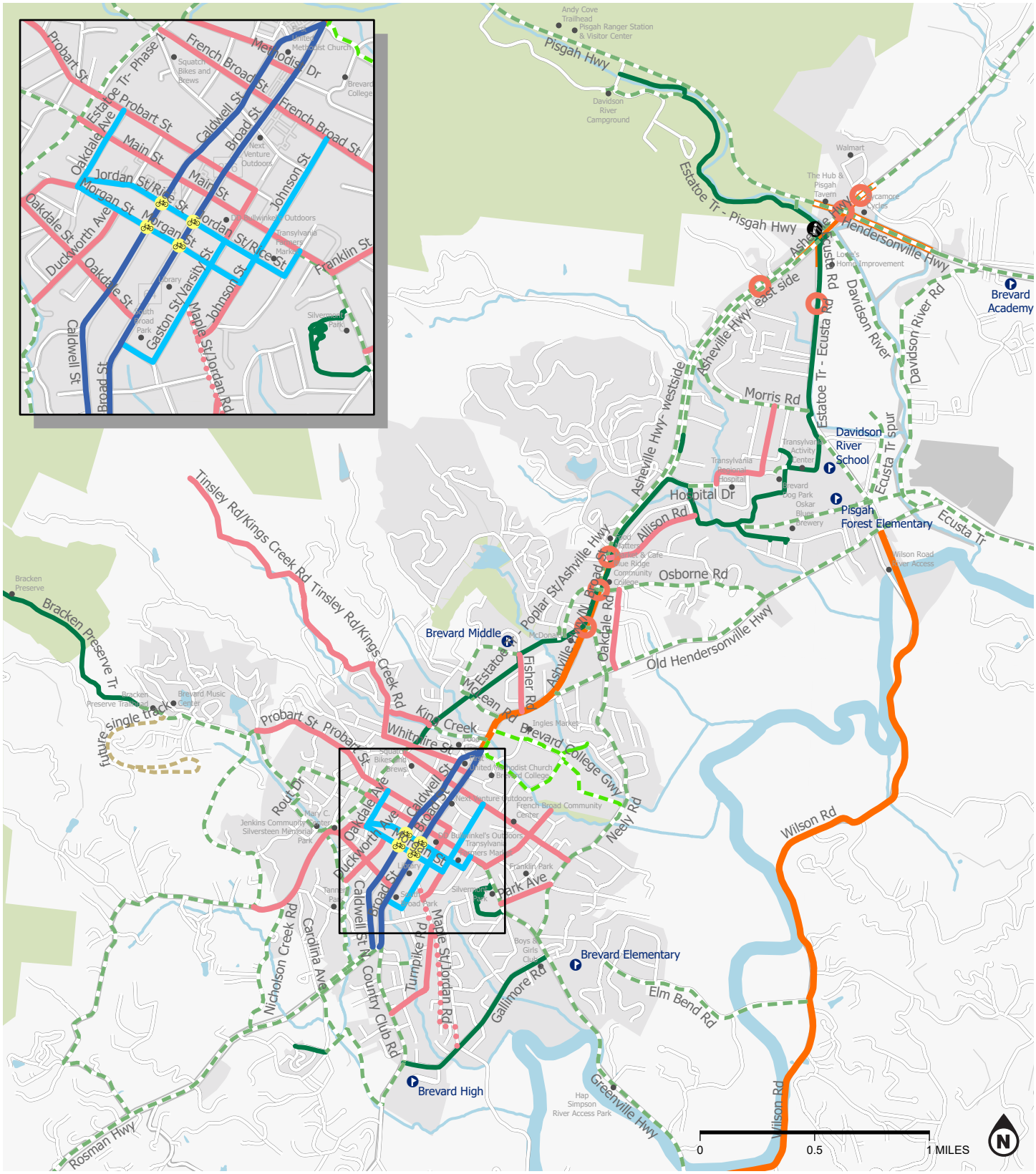
CITY OF BREVARD
PEDESTRIAN & BICYCLE PLAN

PEDESTRIAN FACILITIES

- Sidewalks- Existing
- Sidewalks- Proposed
- Shared-Use Path- Existing
- Shared-Use Path- Proposed
- Natural Surface Trail- Existing
- Natural Surface Trail- Proposed
- Shared Use Path- private, existing
- Shared Use Path- private, proposed
- Planned Roundabout
- Funded Roadway Projects

DESTINATIONS + BOUNDARIES

- Public Schools
- Railroad
- Streets
- Transylvania County
- Parks
- Brevard City Limits



BICYCLE FACILITY RECOMMENDATIONS

CITY OF BREVARD PEDESTRIAN & BICYCLE PLAN

BICYCLE FACILITIES

- Bike Crossing Signal
- Separated Bike Lane (SBL)- Proposed (long-term)
- Bike Boulevard- Proposed
- Shared Lane Markings (SLM)- Existing
- SLM- Proposed
- Shared-Use Path- Existing
- Shared-Use Path- Proposed
- Natural Surface Trail- Existing
- Natural Surface Trail- Proposed
- Shared Use Path- private, existing
- Shared Use Path- private, proposed
- Information Kiosk/Map- proposed
- Planned Roundabout
- Funded Roadway Projects

DESTINATIONS + BOUNDARIES

- Public Schools
- Railroad
- Streets
- Transylvania County
- Parks
- Brevard City Limits

01 INTRODUCTION

HISTORY & PROJECT BACKGROUND

In 2021, the City of Brevard began developing a comprehensive pedestrian and bicycle plan that synthesizes years of previous planning efforts to create a more walkable and bikeable Brevard. In 2018, the City passed a Complete Streets resolution to create a street network that integrates all modes of travel, including walking and biking. That same year, the City updated its Comprehensive Pedestrian Plan that was originally adopted in 2006. This update was followed by the 2019 Transylvania County Bicycle Plan and the Downtown Master Plan and Streetscape of 2021.

The Brevard Pedestrian + Bicycle Plan updates and combines these previous pedestrian and bicycle planning efforts, and others, into a single planning document with a cohesive network of infrastructure recommendations and related program and policy recommendations to support walking and biking in Brevard. Funded by the NCDOT Integrated Mobility Division Multimodal Planning Grant Program, this plan provides a framework for the City and its residents, the Blue Zones Project, developers, NCDOT, and other local and regional planning partners to strategically build better connections for walking and biking throughout the city.

Vision Statement

Brevard will be a premier destination for biking and walking, with a safe and expansive network of bicycle and pedestrian facilities connecting the city to the surrounding outdoor recreation and cultural destinations.

PROJECT GOALS

With this plan, the City of Brevard has a guide for infrastructure, program, and policy improvements that can lead to a robust citywide active transportation network. The City of Brevard will use this plan to:

Create safer conditions for walking and biking

Increase overall quality of life/ livability/community health

Create more choices for transportation, recreation, and exercise through walking and biking

Generate a positive economic impact and increase tourism related to active living

Protect the environment and promote environmental stewardship

THE VALUE OF ACTIVE COMMUNITIES

Developing a robust network of pedestrian and bicycle infrastructure can provide many benefits to a community. Improvements can be seen in the safety, health, economy, environment, accessibility and mobility of a city and its residents. The following section provides examples of potential benefits in each of these areas.

Safety Benefits

Dedicated infrastructure for walking and biking, combined with measures to reduce vehicle speeds, help prevent crashes and save lives. Additionally, through an increased number of trail users, natural surveillance for trails and greenways creates a safer environment.

Bicycling infrastructure (specifically separated and protected bike lanes) significantly reduce fatalities and improve road-safety outcomes for all road users, not just cyclists.

Marshall, W. and Ferenchak, N. 2019 - Why cities with high bicycling rates are safer for all road users, Journal of Transport & Health

"Communities designed to be walkable can **improve safety** not only for people who walk but for **all community members."**

U.S. Department of Health and Human Services, 2015. Step It Up! The Surgeon General's Call to Action To Promote Walking and Walkable Communities

A pedestrian hit by a vehicle traveling at **25 MPH**

has a **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

Rosén, E., & Sander, U. (2009). Pedestrian fatality risk as a function of car impact speed. Accident Analysis & Prevention, 41(3), 536-542.

Health Benefits

Walking & biking trails offer safe and accessible opportunities for physical activity. People who utilize trails are able to connect with places that they want or need to go, and realize the health benefits of active transportation.

For every 0.6 MILES **WALKED** there is a **5%** **REDUCTION** IN THE LIKELIHOOD OF **OBESITY.**

Frank, 2004. Obesity relationships with community design, physical activity, and time spent in cars.

Obesity in Transylvania County = 32% of adults

Physical Activity* in Transylvania County = 72%

**% of adults who participated in the recommended physical activity*
Source: 2019, CDC PLACES, https://www.cdc.gov/places/

Those who are **physically active** generally have **long-term benefits**, such as **lower risk for heart disease, stroke, and type-2 diabetes.**

CDC, 2021. Health Benefits of Physcial Activity for Adults

20 MINUTES WALKING OR BIKING each day is associated with a

29% LOWER RISK OF HEART FAILURE

Rahman, 2014. Relationship Between Physcial Activity and Heart Failure Risk in Women

Economic Benefits

Connected walking and biking trails often yield high returns on investment through economic diversification, recreational tourism, increased property values, and small business opportunities.

A 2018 study looking at the economic impact of four greenways in North Carolina (Brevard Estatoe Trail, Little Sugar Creek Greenway, American Tobacco Trail, and Duck Trail) found that **every $1.00** spent on trail construction **supports $1.72 annually** from local business revenue, sales tax revenue, and benefits related to health and transportation.

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

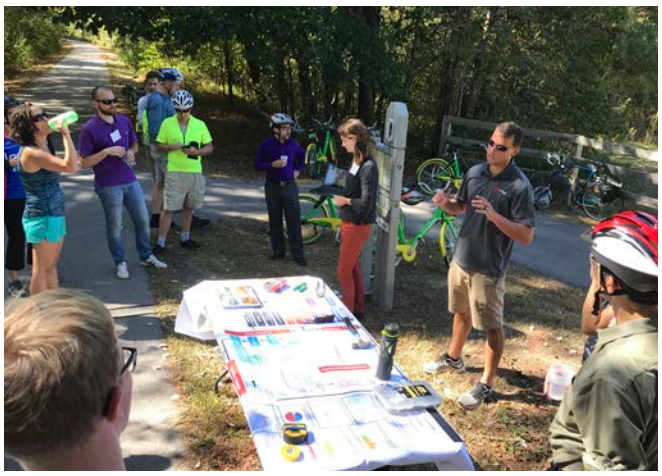
Estimated **business revenue** from greenway construction

790 JOBS

Are supported annually through **greenway construction**

Source: Institute of Transportation Research and Education. (2017). Evaluating the Economic Impact of Shared Use Paths in North Carolina. https://itre.ncsu.edu/focus/bike-ped/sup-economic-impacts/

The study included extensive trail user surveys for each of the four greenways over a three year period..



Economic Benefits - Recreation Economy and Rise in Walking/ Biking Trail Use

"Outdoor Recreation is a $28 Billion industry in NC. Our greenways and blueways are the infrastructure that supports that industry. Outdoor recreation is going to play a huge role in the COVID recovery process." Amy Allison, NC Outdoor Recreation Industry Office

Trail counts across the country were at all-time highs in 2020, largely due the impact of COVID-19 and the changes in lifestyle during the pandemic. This could be for a number of reasons. Many gyms have been closed for a large portion of the year, forcing people to find new ways to exercise. Many people are telecommuting, meaning they have more time in the day to use trails. Options for long-distance vacationing and entertainment generally are limited, making people look for closer-to-home activities that still allow them to get out of the house. Whatever the reason, the data is clear: Trail use is at an all time high, and the associated benefits of trails stand to rise with increased trail use. As people form new habits, and as they invest in bicycles and gear associated with hiking, biking, and water trails, the increase in trail use and associated economic benefits may be sustained well after the pandemic.

THERMAL BELT RAIL TRAIL - RUTHERFORD COUNTY, NC

The Thermal Belt Rail Trail has seen tremendous growth in the number of visitors since it installed a counter and began keeping track. The Isothermal Planning & Development Commission estimated that as many as 20,000 trips per month were supported along the trail in the month after the trail was fully opened in 2020.,

Isothermal Planning & Development Commission; Preliminary Analysis of Counts from the Thermal Belt Rail-Trail (May 2020)

EAST COAST GREENWAY - MAINE TO FLORIDA

The East Coast Greenway is a walking and biking route stretching 3,000 miles from Maine to Florida, including through the Triangle Region of NC. Since the COVID-19 pandemic, trail counts along existing sections of the East Coast Greenway have recorded a significant rise in trail users.

Economic Benefits (continued)

Job creation and savings in transportation costs are supported in multiple studies analyzing the economic impacts of walking and biking facilities.

In 2020, outdoor recreation generated $688 billion in economic output and created nearly 4.3 million jobs.

West, A. et al. (2022). Advancing Trails to Support Multimodal Networks. Pedestrian and Bicycle Information Center.

DRIVING 4 MILES/DAY COSTS

$905/ year

in fuel and vehicle wear and tear

AAA, 2019

while...

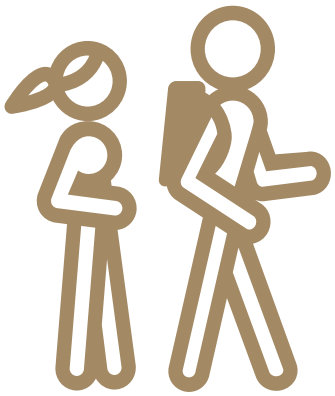
WALKING AND BICYCLING COSTS

$0-350/ year

Your driving Costs: How Much are you really Paying to Drive? (2019). https://exchange.aaa.com/wp-content/uploads/2019/09/AAA-Your-Driving-Costs-2019.pdf

Environmental Benefits

Decreasing reliance on automobiles and reducing congestion by utilizing walking & biking trails will lead to improved air quality. Trails and greenways serve as a tool for conserving open space and preserving wetlands.



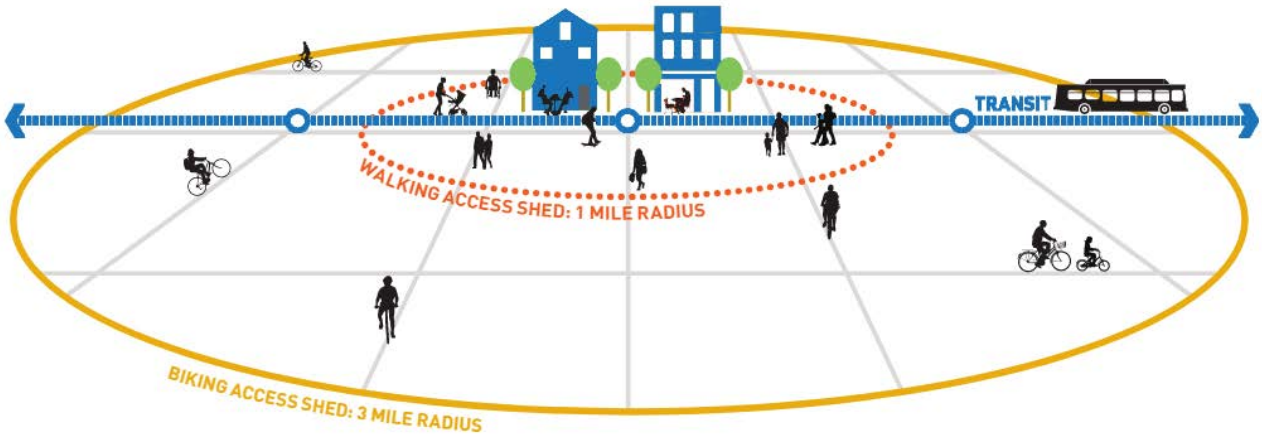
Research has shown that people who bicycle everyday had 84% lower carbon dioxide emissions from all daily travel than non-bicyclists.

Brand, C. et al., 2021, The climate change mitigation effects of daily active travel in cities. Transportation Research Part D: Transport and Environment

Accessibility and Mobility Benefits

A robust active transportation network can capture a high percentage of 0-5 mile trips, helping to maximize transportation efficiency, and provide greater choice for residents and visitors.

ON AVERAGE, 40% OF ALL TRIPS WE MAKE ARE FOR A DISTANCE OF **TWO MILES OR LESS**—A DISTANCE THAT CAN EASILY BE COVERED BY A 10 MINUTE BICYCLE RIDE OR A 30 MINUTE WALK.



02 CURRENT CONDITIONS

COMMUNITY CONTEXT

Since 2010, the population of Brevard has grown by 4.5%.[1] The 2020 Census reports that there were an estimated 7,824 people living within Brevard city limits.[2]

The population is well-educated, with over 35% of residents over 25 years of age having a Bachelor's degree or higher, compared to 31% for the state of North Carolina; however, the median income for the area ($42,213) is about 75% of the median income of North Carolina as a whole ($54,602).[2] The city also has a poverty rate that is 1% higher than that of the state, with approximately 16% of persons below the federal poverty level.

Approximately 14% of the population is under the age of 18, while 31% are age 65 or older.[2] The proportion of residents who are over 65 is approximately twice that of the state. Opportunities to provide safe routes to access schools, services, and other key destinations for these particular demographic groups should be a priority.

TRANSPORTATION OVERVIEW

The transportation system in Brevard consists of its roads, sidewalks, and multi-use paths. Public transportation is available in the form of fixed route bus services provided by Transylvania in Motion, formerly Transylvania County Public Transportation. This transit service and name are new to the county, having started in early 2021. Along the new service route, transit vehicles stop at 27 designated stops along the path from Brevard to Pisgah Forest.

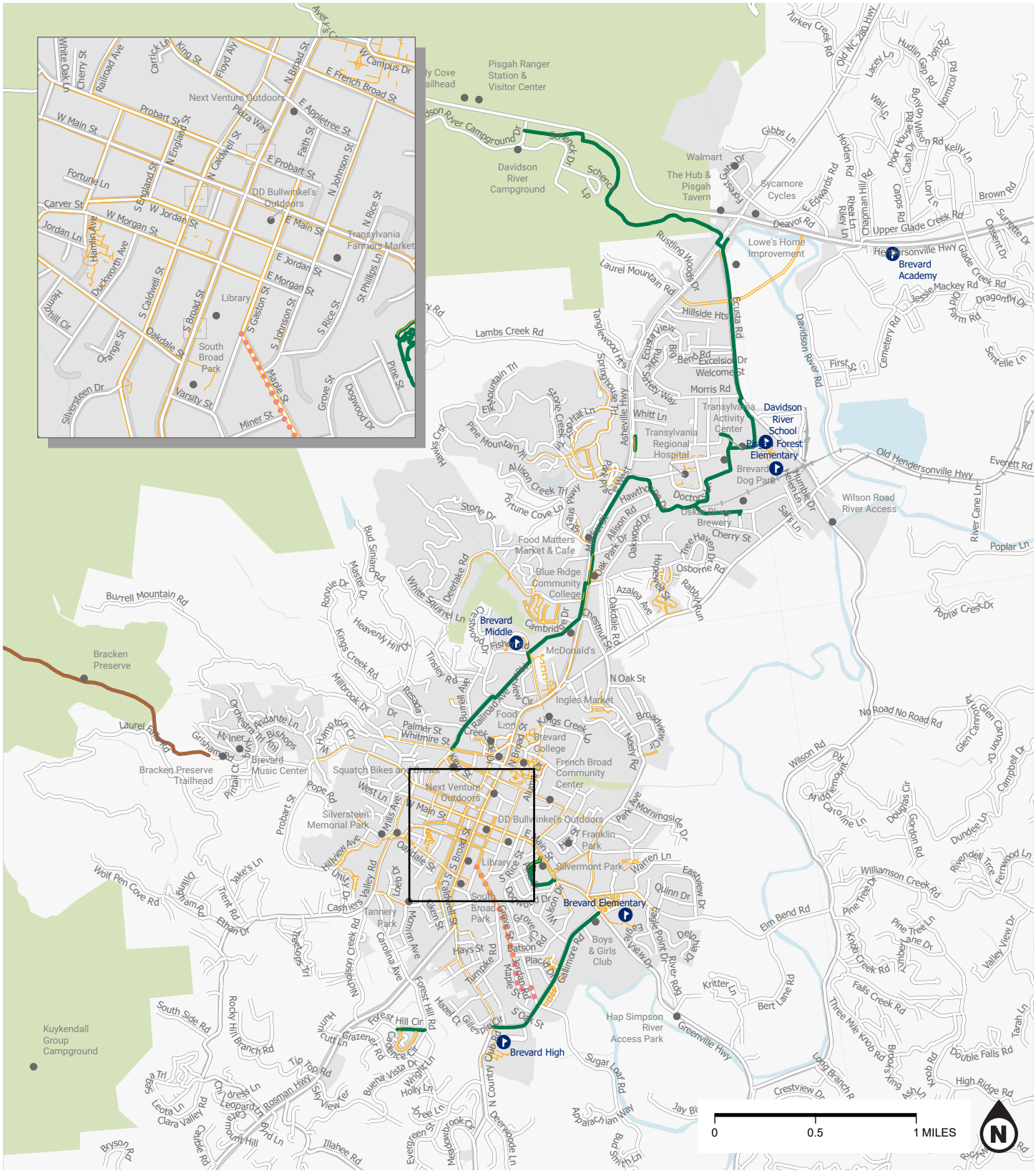
The roadway network in Brevard includes several major highways that are regionally significant. US Highway 64 is the major north-south route, while US Highway 276 provides east-west connectivity. US Highway 64, which is also Broad Street, runs the length of the city, and carries a large majority of traffic. With five lanes, it also stands as a significant barrier to pedestrian and bicycle travel, has only short stretches of sidewalks or shared-use paths along it, and has limited crossing opportunities.

Brevard's greenway system provides some important connectivity for pedestrians and bicyclists. The sections of shared-use paths along US Highway 64 mentioned above, as well as sections along Railroad Avenue and Ecusta Road, and off-road path connections between these roadways create the spine of a greenway network that measures approximately 6 miles. The greenway connects important destinations in Brevard, including the Depot Railroad Avenue Park, Blue Ridge Community College, the Brevard Sports Complex, Pisgah Forest Elementary School, the Brevard Dog Park, Lowes shopping center, the Art Loeb Trail, and a number of mixed use trails in the Pisgah National Forest. However, connections to other important destinations are missing in the greenway network, including connections to Downtown Brevard, Brevard High School, and Main Street.

In addition to paved shared-use paths, there is an extensive network of unpaved, natural surface trails in the national public forests surrounding Brevard that are significant destinations and attractions for bicyclists and hikers alike. The greenway network connects to Pisgah National Forest, but does not connect to Bracken Preserve and the nearby Brevard Music Center. Connecting to these and other local trail heads, including the future Ecusta Trail to the east are important goals for the City of Brevard.

Given the extensive roadway network relative to the limited existing greenways and lack of dedicated bikeways, it is not surprising that the majority of workers in Brevard (74%) commute to work solely by driving by themselves[2]. Another 7% carpool to work. Still, the walking and biking commute rates (9% and 5%, respectively) are significantly higher than statewide trends (2% and 0.2%, respectively).

1 2020 Decennial Census
2 2019 ACS 5-year estimate



EXISTING CONDITIONS & KEY DESTINATIONS

CITY OF BREVARD
PEDESTRIAN & BICYCLE PLAN

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EXISTING PLAN REVIEW

The following section summarizes the recommendations in previously adopted plans for the City and County as they relate to the future of walking and bicycling in Brevard.

Transylvania County Comprehensive Transportation Plan (CTP) (2021)

The CTP bicycle and pedestrian recommendations map specifies where bicycle, pedestrian, and multi-use path facilities are recommended. These recommendations were reviewed and incorporated into the recommendations of this plan, with updates based on the context, where necessary.

Brevard Downtown Master Plan and Streetscape (2021)

The Downtown Master Plan and Streetscape is an update to the Downtown Streetscape Plan of 2012, and it provides a vision for the future of downtown to address the issue of aging infrastructure and the need for improved bicycle and pedestrian circulation. The recommendations from the Streetscape Plan include improvements to crosswalks downtown and the creation of bicycle boulevards on secondary streets downtown. These recommendations have been reviewed, updated/modified where appropriate, and included in this plan.

Brevard Blueprint (2020)

In 2019, Brevard was chosen as the fiftieth Blue Zone Project demonstration community in North America, and began working to improve the well-being of the Brevard community. Through this program, Brevard's Blue Zones Project Team conducted a comprehensive analysis of the community's well-being, and has identified challenges and opportunities for improvement. Brevard has now proceeded to develop implementation plans to address the challenges and opportunities identified in the initial discovery phase. Goals, objectives, and strategies have been identified to address thirteen pillar areas focused on people, places, and policies. One such pillar area is the built environment and active living, which has direct relevance to this Pedestrian and Bicycle Plan.

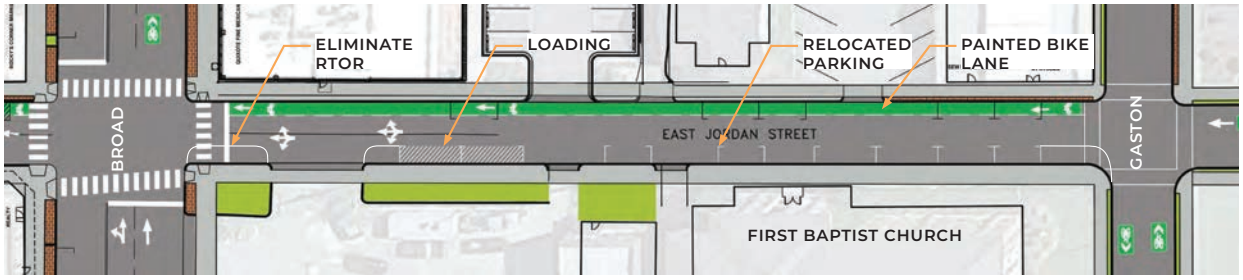
The Brevard Blueprint report includes goals related to the built environment and active living, most notably the following goal that speaks directly to the goal of this Bicycle and Pedestrian Plan:

> Create safer, more accessible connections between businesses, service providers, schools, and recreation opportunities by utilizing existing roads, sidewalks, and trail networks and identifying and prioritizing new linkages or routes to better connect all of Brevard community.

This plan view of proposed bicycle boulevards on Jordan and Morgan Streets were reviewed, updated, and incorporated into the recommendations of this plan.

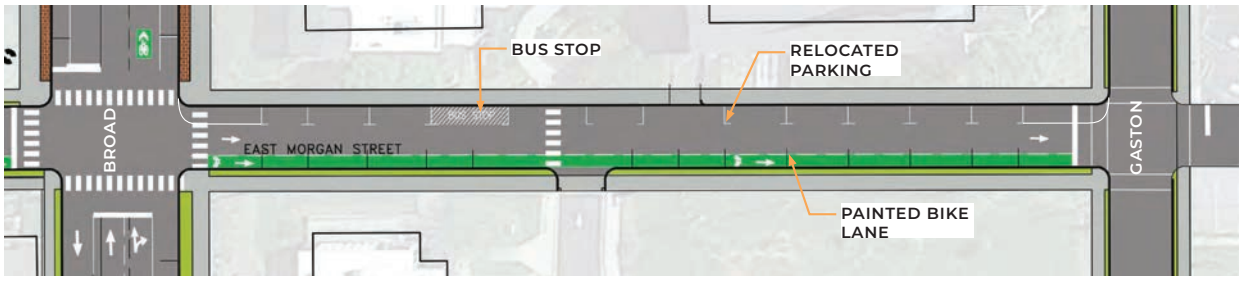
TYPICAL 'BIKE BOULEVARD' STREET

BROAD TO GASTON



EAST JORDAN STREET

$12,000 - TOTAL BIKE BOULEVARD



EAST MORGAN STREET

$22,000 - TOTAL BIKE BOULEVARD

Transylvania County Bicycle Plan (2019)

The Transylvania County Bicycle Plan was adopted in November of 2019, and it provides a framework for the county and its regional partners to build better connections for bicycling throughout the county. The plan provides detailed recommendations for bicycle facilities, policies, programs, and implementation. The recommendations pertaining to Brevard have been incorporated into this plan's recommendations, with modifications and updates where necessary. The bicycle facility recommendations from the Transylvania County plan, especially recommendations for shared use facilities, like greenways, were compared with the pedestrian facility recommendations from the City's Pedestrian Plan of 2018 (see next column for summary) in order to synthesize a cohesive bicycle and pedestrian network for the purposes of this combined Pedestrian and Bicycle Plan effort.

Brevard Bicycle-Friendly Community Implementation Plan (2018)

The City of Brevard applied for Bicycle-Friendly Community Status in 2018 and received honorable mention. The recognition came with recommendations for how to improve bikeability in Brevard in order to reapply and improve its rating. Some of the recommendations in the Improvement Plan include:

- Investing in infrastructure to make transportation and utility bicycling safe and comfortable
- Working with law enforcement to improve bicycle-related training for law enforcement officers
- Expanding bicycling events to include Bike to Work Day and Bike to School Day event
- Using wayfinding improvements to create a low-stress network that uses existing low-speed streets

Brevard Comprehensive Pedestrian Plan (2018 update)

The Comprehensive Pedestrian Plan was originally written in 2006, and was then updated in 2018 to include the prioritization of multi-use path and sidewalk projects. The prioritization methodology from that 2018 update serves as the basis for prioritizing multi-use path projects recommended in this plan, and the top priority multi-use paths identified in the 2018 update are included in the recommendations in this plan.

The sidewalk recommendations in the Pedestrian Plan were reviewed and updated for this planning effort, and in some cases the recommended facility was changed to multi-use path recommendations along corridors where bicycle facilities were needed as well. Maps depicting the priority multi-use paths and sidewalks from the Pedestrian Plan update are included in the appendix.

2025 Transylvania County Comprehensive Plan (2017)

The 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. Included under Action Step G under Objective 2 of the Land Use and Livability theme is to: "Develop appropriate infrastructure and educational programs for bikes and pedestrians to ensure safer roads."

Transylvania County Strategic Plan (2016-2021)

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 pedestrian and 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."

Brevard Comprehensive Plan (2015)

The Brevard Comprehensive Plan specifically cites improving sidewalk, greenway, and bicycle infrastructure, policies, and programming as part of several objectives in the plan. These include increasing the connectivity of pedestrian and bicycle infrastructure, becoming a Bicycle Friendly Community by the League of American Bicyclists, and improving the greenway system.

Ecusta Trail Planning Study and Economic Impact Analysis (2012)

The Ecusta Trail is a project aimed at creating a multi-use trail along a former rail line that runs from Hendersonville to Brevard, NC. In this plan, existing conditions, opportunities and constraints, potential economic impacts , and recommendations for implementation are discussed. This trail creates recreational opportunities for residents and visitors in this region, as the trail connects many destinations throughout Henderson and Transylvania counties.

EXISTING PROGRAMS & POLICIES REVIEW

Programs

Pedestrian and Bicycle Counts

In 2015, Brevard joined several other towns and cities in North Carolina as part of a study by North Carolina State University's Institute for Transportation Research and Education to monitor bicycle and pedestrian traffic. A permanent, continuous count station was installed along Brevard's Estatoe Trail, near the Dog Park. This count station has been recording pedestrian and bicycle traffic along the greenway ever since, providing both ITRE and many others with valuable data on bicycle and pedestrian travel data. Details on ITRE's studies related to this counter and access to the counter's data can be accessed on the ITRE website, here: https://itre.ncsu.edu/focus/bike-ped/nc-nmvdp/

Watch For Me NC Program (2016)

Brevard was selected to participate in the North Carolina Department of Transportation's Watch for Me NC program in 2016. Through this program, partner communities receive printed materials and media advertisements to help improve public awareness about bicycle and pedestrian safety. The city's police officers also receive specialized training as part of the program.

Policies

A comprehensive review of Brevard's Unified Development Ordinance as it pertains to sidewalks and other pedestrian and bicycle facilities is included in Chapter 4 and Appendix C. Below, current policies related to biking and walking in Brevard are summarized.

Electric Bicycles Policy

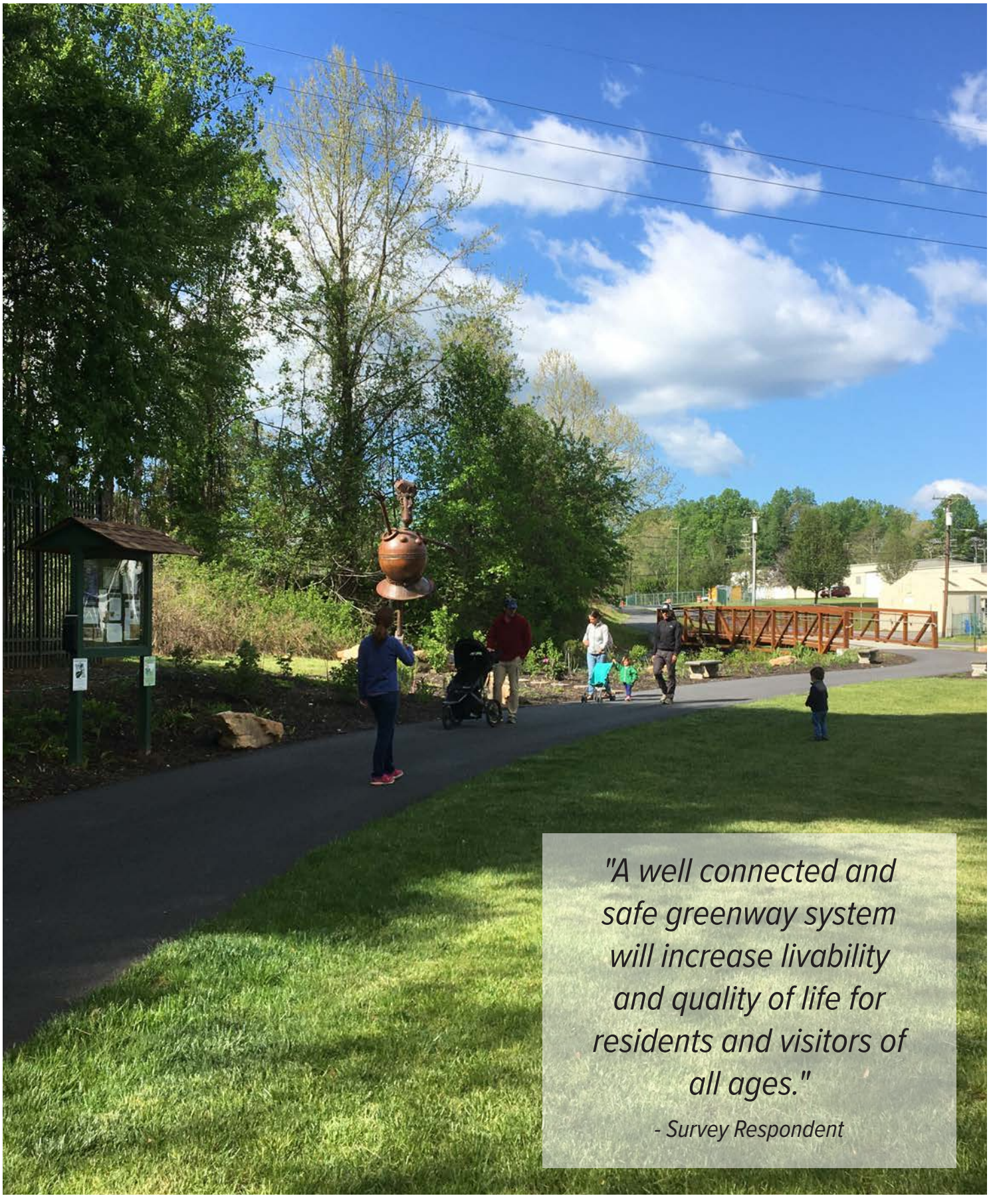
In 2020, Brevard passed a resolution to allow Class 1 and Class 3 electric bicycles (also referred to as e-bikes) on their multi-use paths. These classes of e-bikes are electrically assisted bicycles that require the user to pedal in order to make them move. The resolution restricts the use of Class 2 e-bikes, which are throttle-assisted bicycles that do not require pedaling or other human powered conveyance.

Complete Streets Policy

In 2018, and again in 2019, the City of Brevard passed resolutions endorsing and then adopting a Complete Streets approach to transportation planning within the City. The 2018 resolution states, in part:

> *The City of Brevard shall, to the maximum extent practical, plan, design, construct, operate, and maintain all City streets to provide a comprehensive and integrated street network for people of all ages and abilities traveling by foot, bicycle, automobile, and commercial vehicle.*

This resolution, and the subsequent 2019 resolution to formally adopt the Complete Streets policy, establish that Brevard will plan for a more balanced and active transportation system in the City.



"A well connected and safe greenway system will increase livability and quality of life for residents and visitors of all ages."

- Survey Respondent

COLLISION ANALYSIS

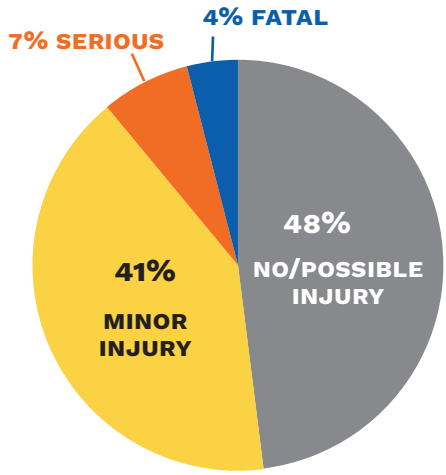
This map examines the most recently available NCDOT bicycle and pedestrian collision data for Brevard, North Carolina (2007-2019). During this time frame, 54 pedestrian collisions were recorded, two of which were fatal, and 27 bicycle collisions were recorded. Analysis of the contributing factors and patterns is provided on the following pages.

The majority of the pedestrian-involved collisions occurred along two-way, undivided roads, with speed limits of 25 miles per hour or less. The majority of bicyclist-involved collisions also occurred along two-way, undivided roads, but the speed limits on those roadways ranged from 20-45 mph (see following pages for more details).

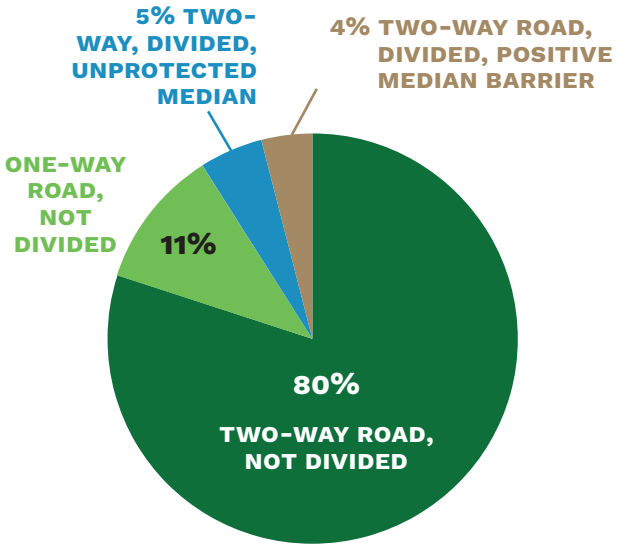
At least 21 bicyclist and pedestrian collisions, were reported along Broad Street/Asheville Highway. Seven collisions were reported along Old Hendersonville Highway, and five along Main Street in the downtown area.

**Additional collision analyses are provided in the Appendix.*

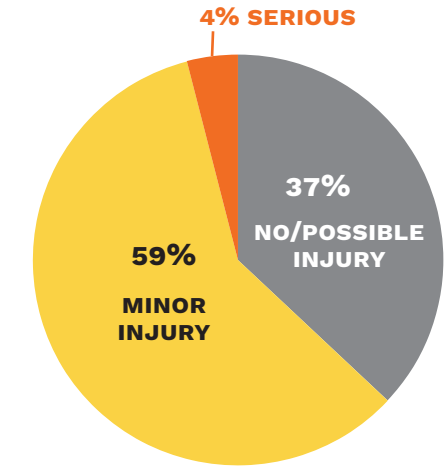
Pedestrian Crashes by Severity



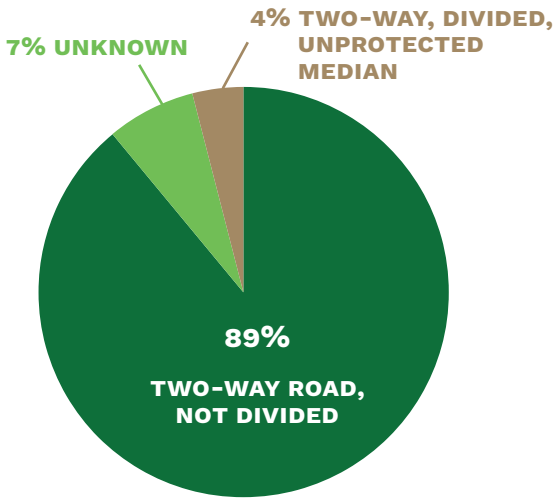
Pedestrian Crashes by Roadway Type



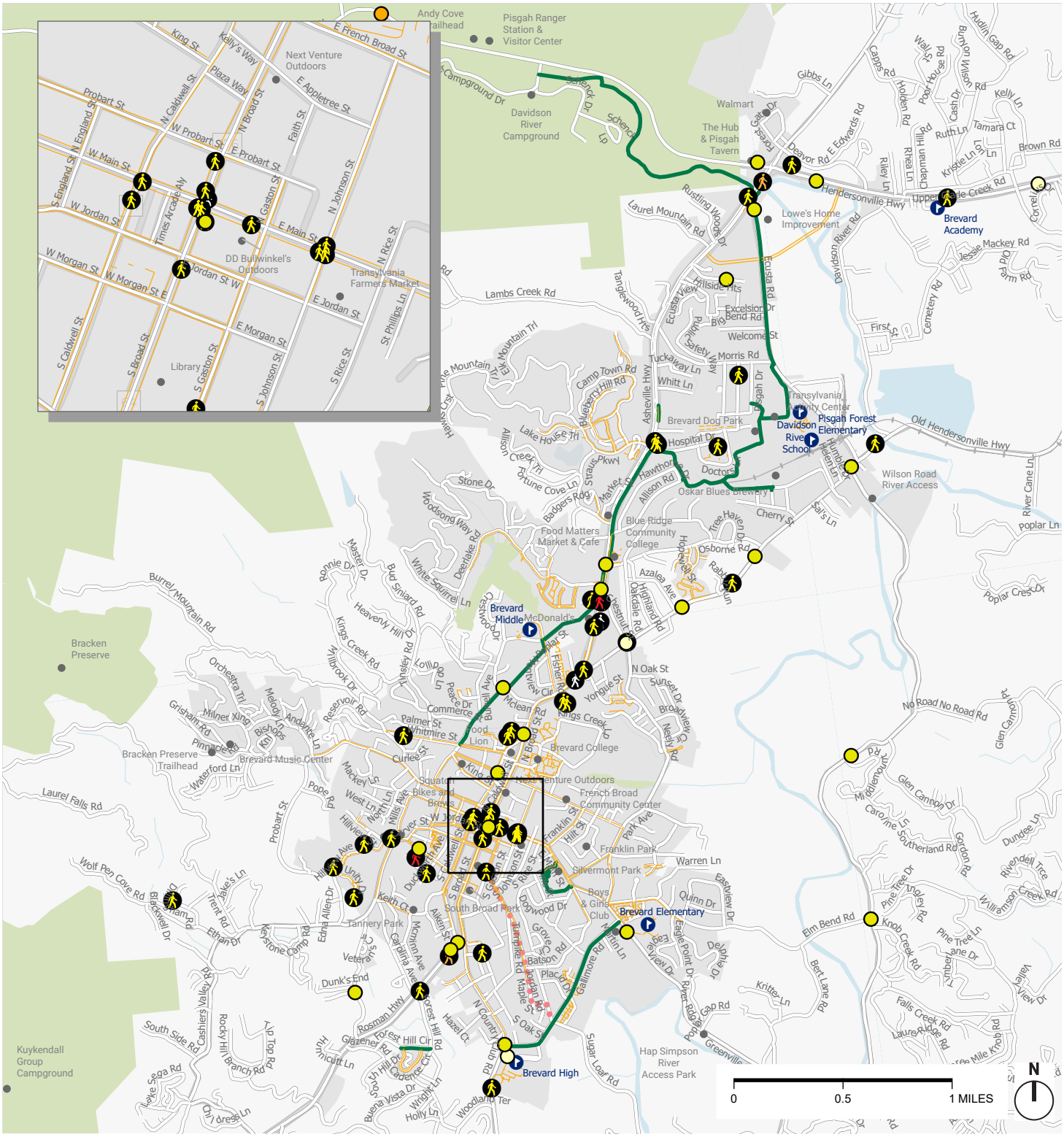
Bicycle Crashes by Severity



Bicycle Crashes by Roadway Type



Source: North Carolina Department of Transportation. Bicyclist and pedestrian crashes 2007-2019. Available at www.arcgis.com/home/item.html?id=b4fcdc266d054a1ca075b60715f88aef



SAFETY ANALYSIS: PEDESTRIAN- & BICYCLIST-INVOLVED COLLISIONS (2007-2019)

CITY OF BREVARD
PEDESTRIAN & BICYCLE PLAN

Pedestrian Injury Severity
- Fatality
- Serious Injury
- Minor/Possible Injury
- No Injury

Bicyclist Injury Severity
- Fatality
- Serious Injury
- Minor/Possible Injury
- No Injury

Existing Pedestrian & Bike Facilities
- Sidewalk
- Shared Use Path (SUP)
- SUP- natural surface
- Shared Lane Markings

- Public Schools
- Key Destinations
- Railroad
- Parks
- Brevard City Limits

Key Safety Improvement Areas (High Crash Corridors)

Thirty-five percent (35%) of bicyclist and pedestrian crashes during the 2007-2019 period happened along two roadways, Broad Street/Asheville Highway/US Highway 64 and Old Hendersonville Highway. Two of the four serious/fatal injuries happened along these corridors. These two roadways carry significant traffic volumes and higher speeds, creating safety concerns for pedestrians and bicyclists.

Broad Street/Asheville Highway

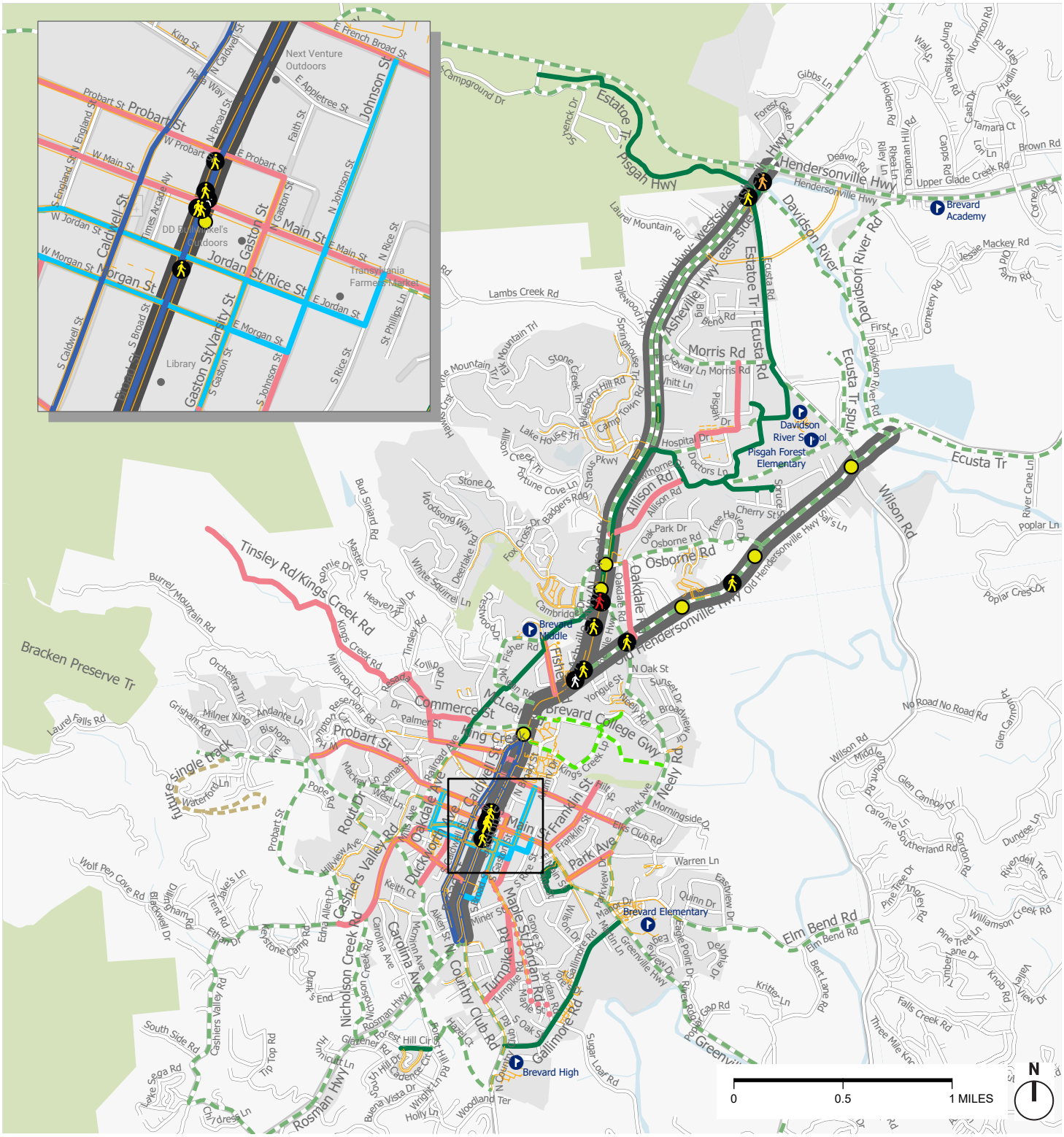
This roadway carries the heaviest amount of traffic through Brevard and has numerous destinations, places of employment, and institutions. As a five-lane highway entering into town with significant traffic, roadway crossings for pedestrians and bicyclists are challenging. Future roundabouts and bicycle lanes will help to calm and slow traffic, but additional attention to slowing traffic and improving pedestrian crossings (through the use of operational treatments such as lead pedestrian intervals) are important to prevent crashes, injuries, and fatalities.

Old Hendersonville Highway

This roadway is a two-lane rural roadway that provides no paved shoulder. Despite its rural characteristic, there are numerous residential areas and commercial destinations. Bicyclist crashes are actually more common than pedestrian crashes because it is another option for a transportation and recreation route. The plan recommends a sidepath to provide separation for bicyclists and pedestrians. To address safety, a sidepath is ideal but future development or roadway reconstruction should also consider/include paved shoulders to provide separation until funding for a sidepath can be provided.

TABLE 2.1 *High Crash Corridors*

Corridor	Bike Crashes	Pedestrian Crashes
Old Hendersonville Highway	3 Minor Injuries	2 Minor Injuries
	1 No Injury	1 Possible Injury
		1 No Injury
US 64/Asheville Highway, north of Caldwell Street	1 Minor Injury	1 Fatality
	1 Possible Injury	1 Serious Injury
		3 Minor Injuries
US 64/Broad Street, south of Caldwell Street	1 Minor Injury	5 Minor Injury
	1 Possible Injury	1 Possible Injury
		1 No Injury



HIGH CRASH CORRIDORS

CITY OF BREVARD
PEDESTRIAN & BICYCLE PLAN

Pedestrian Injury Severity
- Fatality
- Serious Injury
- Minor/Possible Injury
- No Injury

Bicyclist Injury Severity
- Fatality
- Serious Injury
- Minor/Possible Injury
- No Injury

High Crash Corridors

Existing Pedestrian & Bike Facilities
- Sidewalk
- Shared Use Path (SUP)
- SUP- natural surface
- Shared Lane Markings

Proposed On-Street Facilities
- Separated Bike Lane (SBL)- Proposed (long-term)
- Bike Boulevard- Proposed
- Shared Lane Markings (SLM)- Existing
- SLM- Proposed

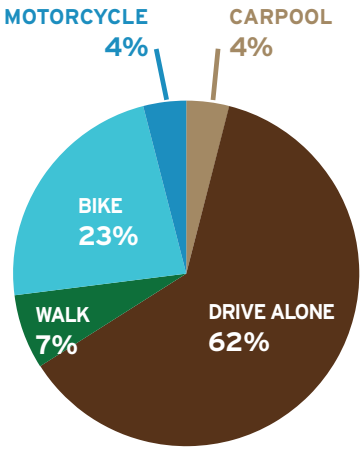
Shared Use Paths
- Shared-Use Path- Existing
- Shared-Use Path- Proposed
- Natural Surface Trail- Existing
- Natural Surface Trail- Proposed
- Shared Use Path- private, existing
- Shared Use Path- private, proposed

PUBLIC INPUT SUMMARY

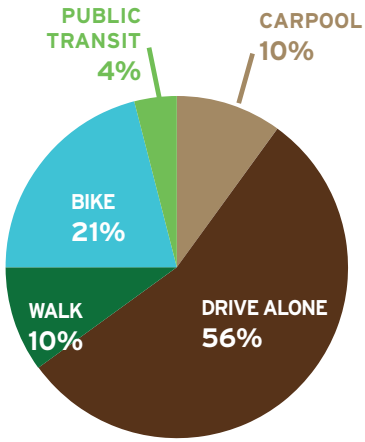
The following is a summary of public input from the public comment survey. There were 103 respondents to the survey.

Travel Mode*

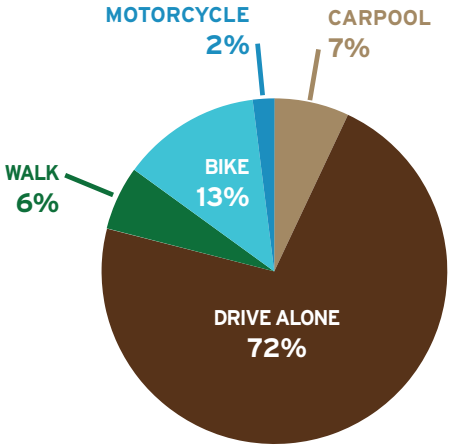
HOW DO YOU GET TO WORK?



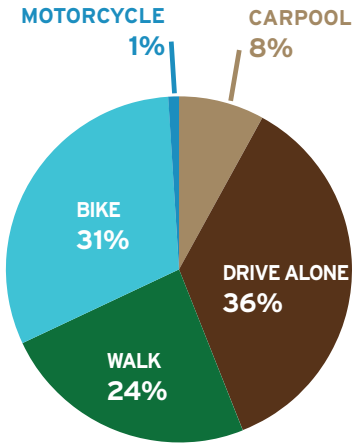
HOW DO YOU GET TO SCHOOL?



HOW DO YOU GET TO SHOPPING CENTERS?



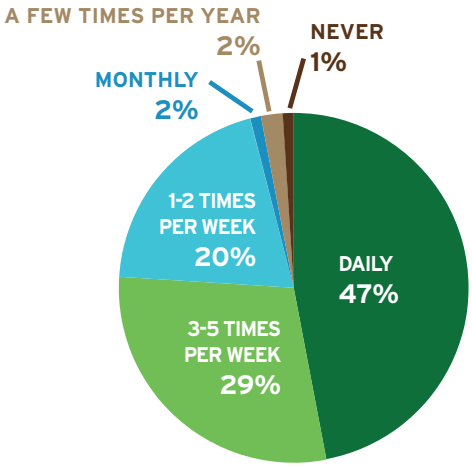
HOW DO YOU GET TO PARKS?



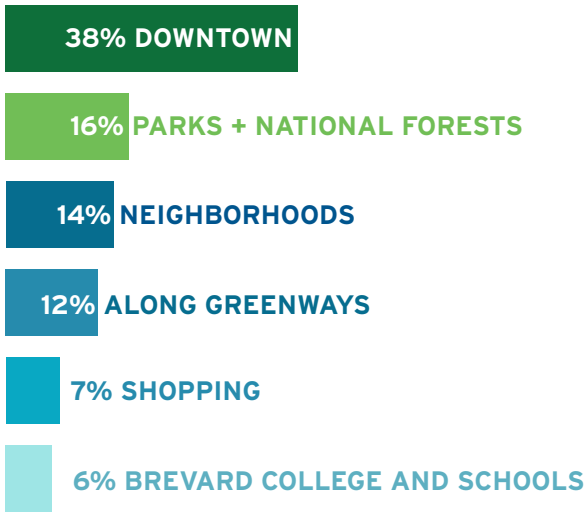
**These survey results are not based on a representative sample of the Brevard population. The 23% of survey respondents who report bicycling is a reflection of sampling bias and over-representation of the bicycling community in this survey, since according to the 2020 American Community Survey, only 3% of Brevard workers bike to work. Regardless of this over-representation of bicyclists, these survey results show that respondents travel by different modes depending on the trip's destination, and that walking and biking are preferred modes when going to parks.*

Walking Habits & Conditions

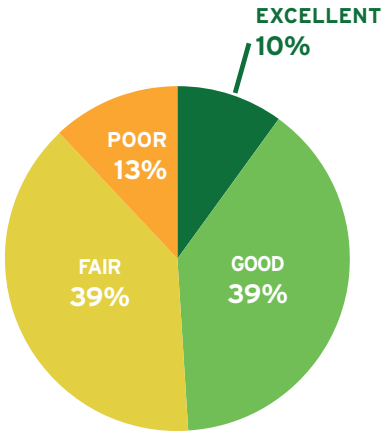
HOW OFTEN DO YOU WALK?



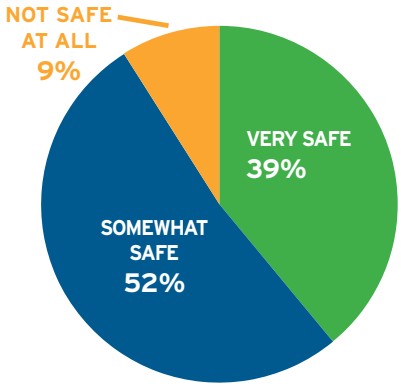
WHERE DO YOU MOST OFTEN WALK?



HOW WOULD YOU RATE THE WALKING CONDITIONS IN BREVARD?

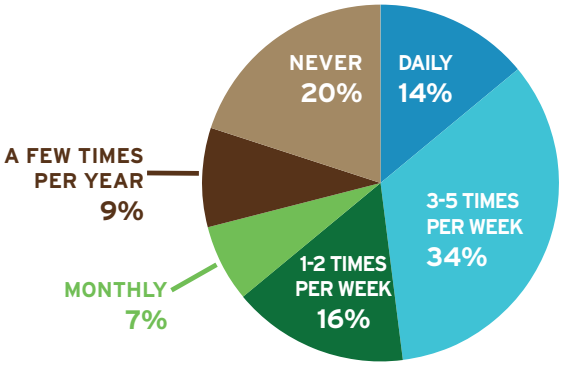


HOW SAFE DO YOU FEEL WALKING?

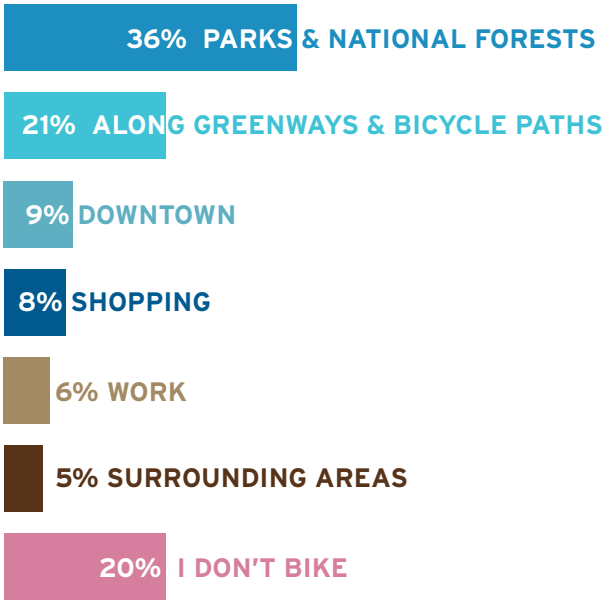


Biking Habits & Conditions

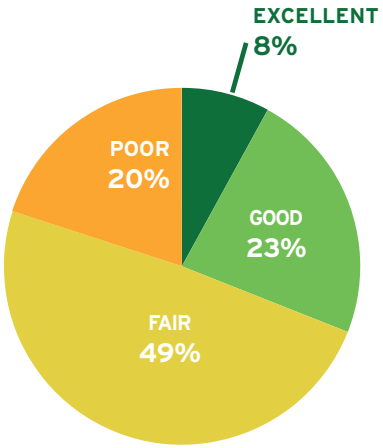
HOW OFTEN DO YOU BIKE?



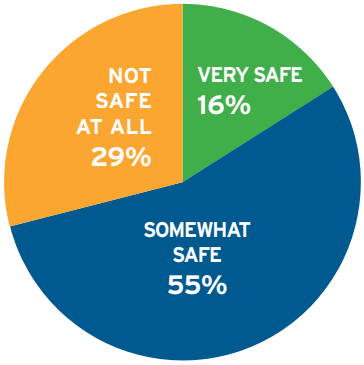
WHERE DO YOU MOST OFTEN BIKE?



HOW WOULD YOU RATE THE BIKING CONDITIONS IN BREVARD?



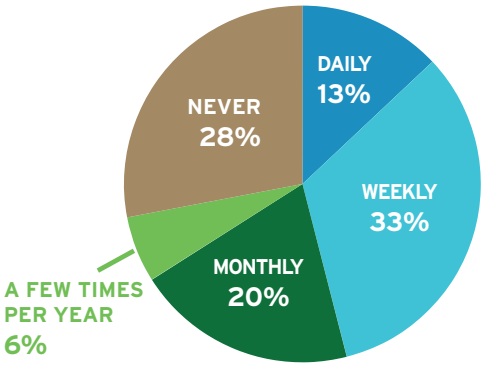
HOW SAFE DO YOU FEEL BIKING?



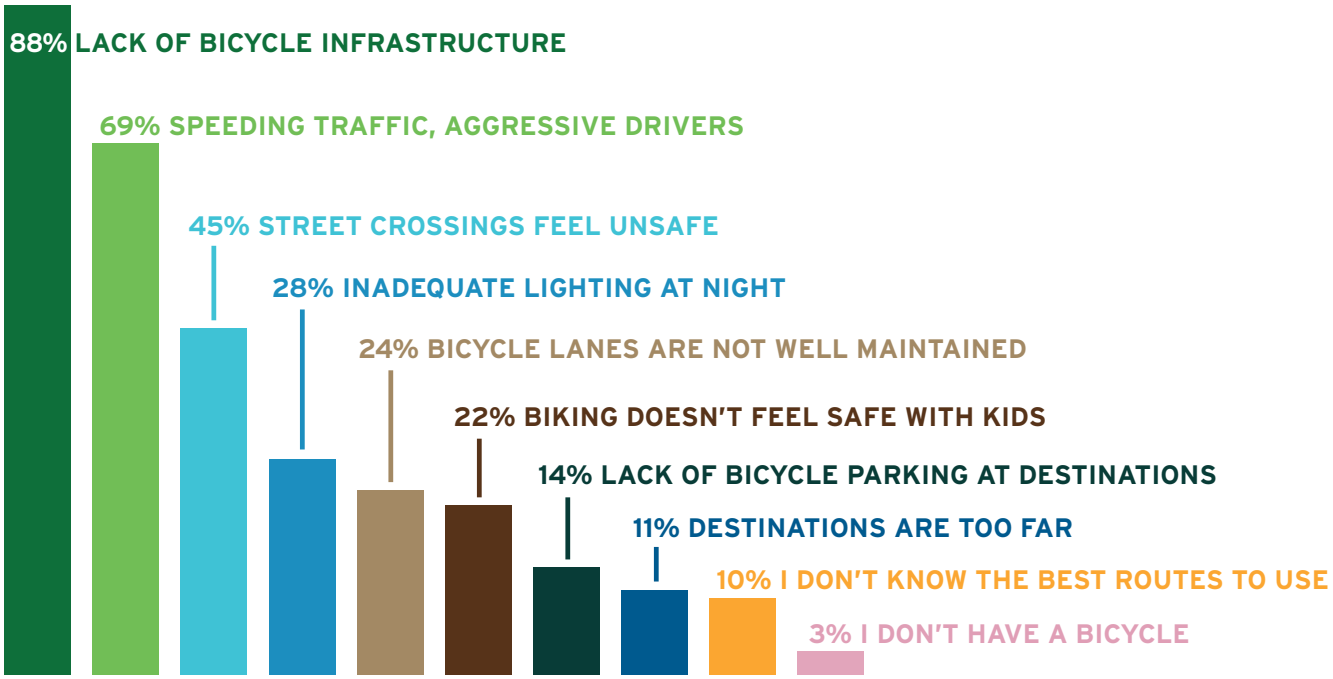
Biking Habits & Conditions, continued

WHY DO YOU TYPICALLY RIDE YOUR BICYCLE?

HOW OFTEN DO YOU BIKE ALONG THE BREVARD GREENWAY?

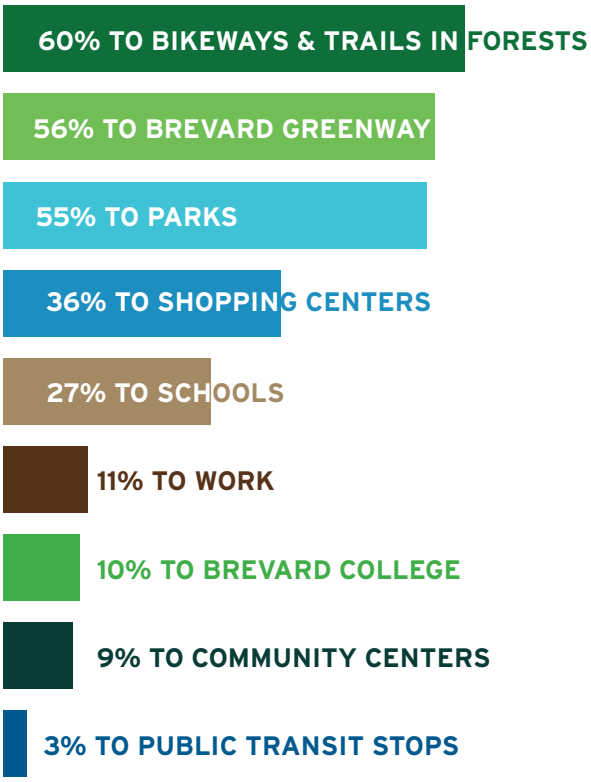


WHAT PREVENTS YOU FROM BIKING MORE OFTEN?

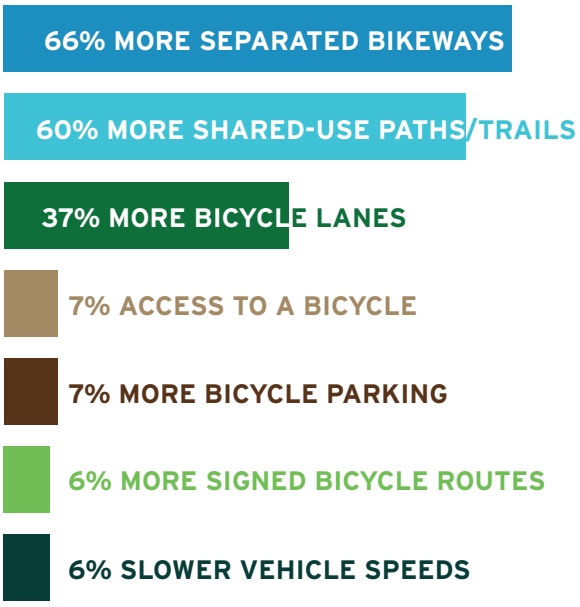


Biking & Walking Needs

WHERE ARE BETTER BICYCLE & PEDESTRIAN CONNECTIONS NEEDED?



WHAT WOULD ENCOURAGE YOU TO BIKE MORE OFTEN?



WHAT WOULD ENCOURAGE YOU TO WALK MORE OFTEN?

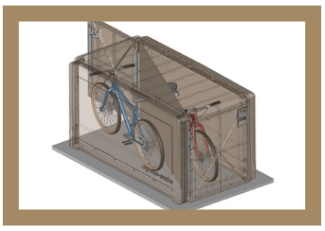
Biking & Walking Needs, continued

WHAT WALKING AND BIKING IMPROVEMENTS NEED TO BE PRIORITIZED?

- 82% NEW SIDEWALKS, CROSSWALKS, + BIKEWAYS
- 67% PEDESTRIAN + BIKING PATHS TO KEY DESTINATIONS
- 17% UPGRADES TO EXISTING SIDEWALK, RAMPS, + BIKEWAYS
- 16% IMPROVED ENFORCEMENT OF TRAFFIC LAWS
- 10% PROMOTION OF THE IMPORTANCE OF WALKING + BIKING
- 2% EDUCATIONAL PROGRAMS FOR WALKERS, BICYCLISTS, AND DRIVERS

WHAT TYPE OF BICYCLE PARKING WOULD YOU PREFER TO SEE MORE OF?

- 62% BICYCLE RACK
- 30% BICYCLE STATION
- 7% BICYCLE LID
- 6% BICYCLE LOCKER
- 37% NO PREFERENCE



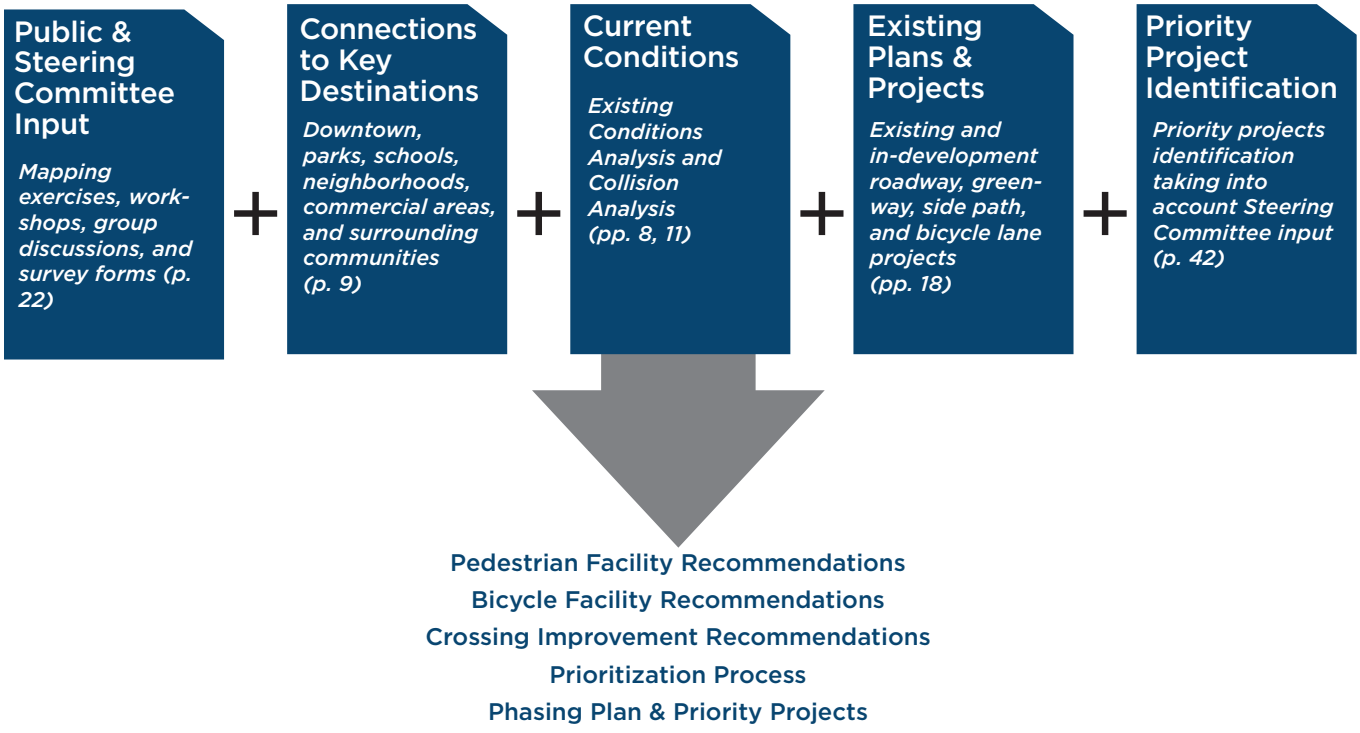
03 PEDESTRIAN + BICYCLE NETWORK RECOMMENDATIONS

PEDESTRIAN & BICYCLE FACILITY TYPES

The following pages detail recommended primary pedestrian and bicycle facilities. The recommended facility type for any given road was selected based on roadway characteristics (traffic volumes, speed limit, available right-of-way); review of previous plans and recommendations; review of planned projects; input from the public and steering committee on popular walking and bicycling corridors; opportunity for separation of pedestrian and bicycle travel from vehicular traffic, and connectivity to destinations.

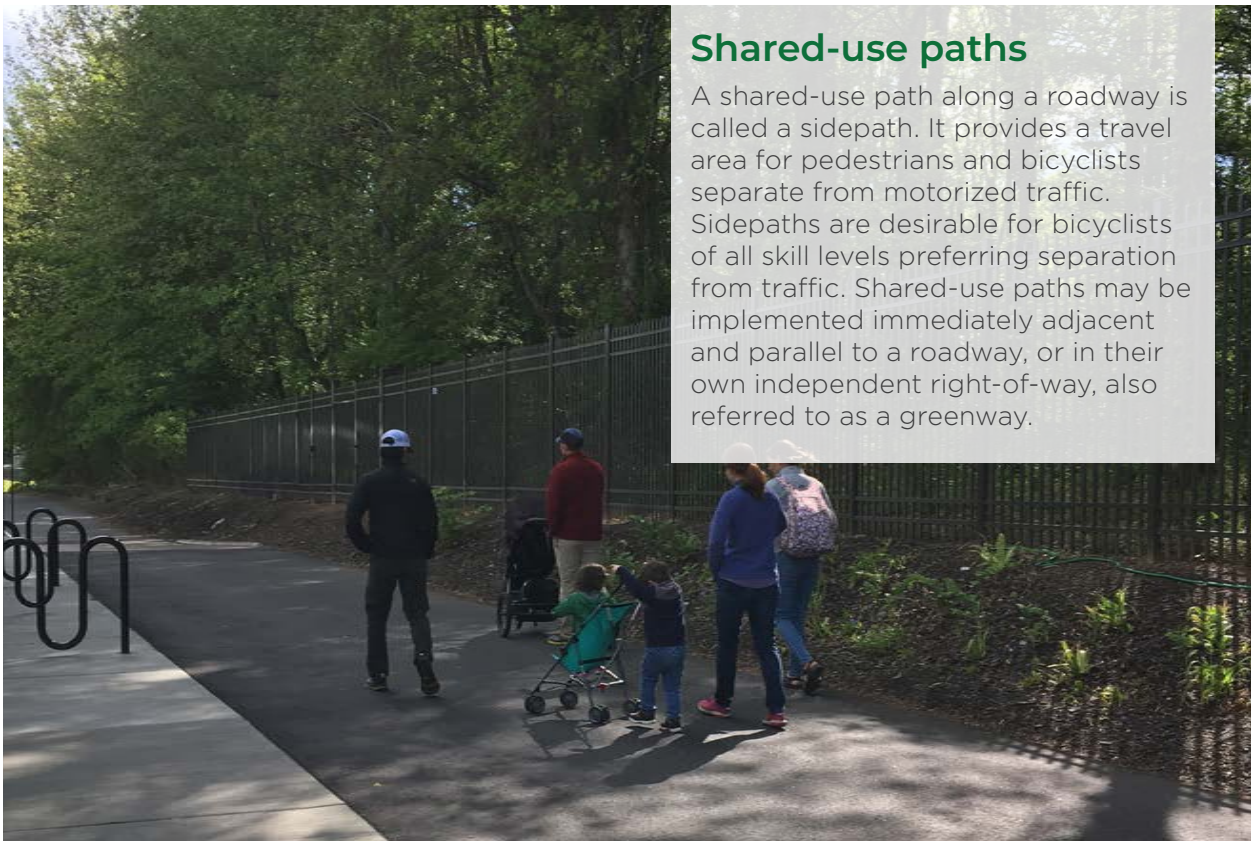
In all cases, the recommended facility type was selected based on meeting the needs of pedestrians and bicyclists of all ages and abilities. All experience levels and abilities were considered in order to make walking and bicycling safer and convenient for a broader audience, as this was a main concern of the Steering Committee.

BASIS OF RECOMMENDATIONS



Sidewalks

Sidewalks provide dedicated space intended for use by pedestrians that is safe, comfortable, and accessible to all. Sidewalks are physically separated from the roadway by a curb or unpaved buffer space. Sidewalks are appropriate on all types of roadways where pedestrian activity is likely.



Shared-use paths

A shared-use path along a roadway is called a sidepath. It provides a travel area for pedestrians and bicyclists separate from motorized traffic. Sidepaths are desirable for bicyclists of all skill levels preferring separation from traffic. Shared-use paths may be implemented immediately adjacent and parallel to a roadway, or in their own independent right-of-way, also referred to as a greenway.

Separated bicycle lanes

Separated Bicycle Lanes, sometimes called “Cycle Tracks,” or “Protected Bicycle Lanes” are dedicated bikeways that use a vertical element to provide separation from motor vehicle traffic. The vertical separation discourages drivers from parking or idling in the bikeway.

Standard bicycle lanes

Standard bicycle lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. Bicycle lanes make bicycling a more visible and comfortable option for people who usually would drive or walk.

Bicycle boulevard

A bicycle boulevard is a low-stress shared roadway that is designed to offer priority for bicyclists operating within a roadway shared with motor vehicle traffic. Bicycle boulevards may include traffic calming elements such as speed humps, chicanes, and traffic circles as well as lower speed limits, wayfinding signage and pavement markings.

Shared lane markings

Shared lane markings (SLMs) are roadway markings that are used to designate a shared lane environment for bicycles and automobiles, and also indicate proper bicyclist positioning. Shared lanes are typically only comfortable for confident bicyclists.

Crossing improvements

Roadway crossings represent a key safety challenge in Brevard for bicyclists and pedestrians, especially at non-signalized intersections, greenway crossings, or across streets lacking bicycle and pedestrian infrastructure. A combination of actuated signals and traffic controls can increase driver awareness of bicycle crossings. Crossing treatments are based on trail and roadway characteristics. Key roadway factors influencing the selected treatment include the posted speed limit, traffic volume, line of sight, street width, roadway and greenway geometry, and intersection configuration.

Natural surface trails

Natural surface trails can come in a variety of types and serve different types of users, including shared-use trails, hiking trails, mountain biking trails, and equestrian trails.

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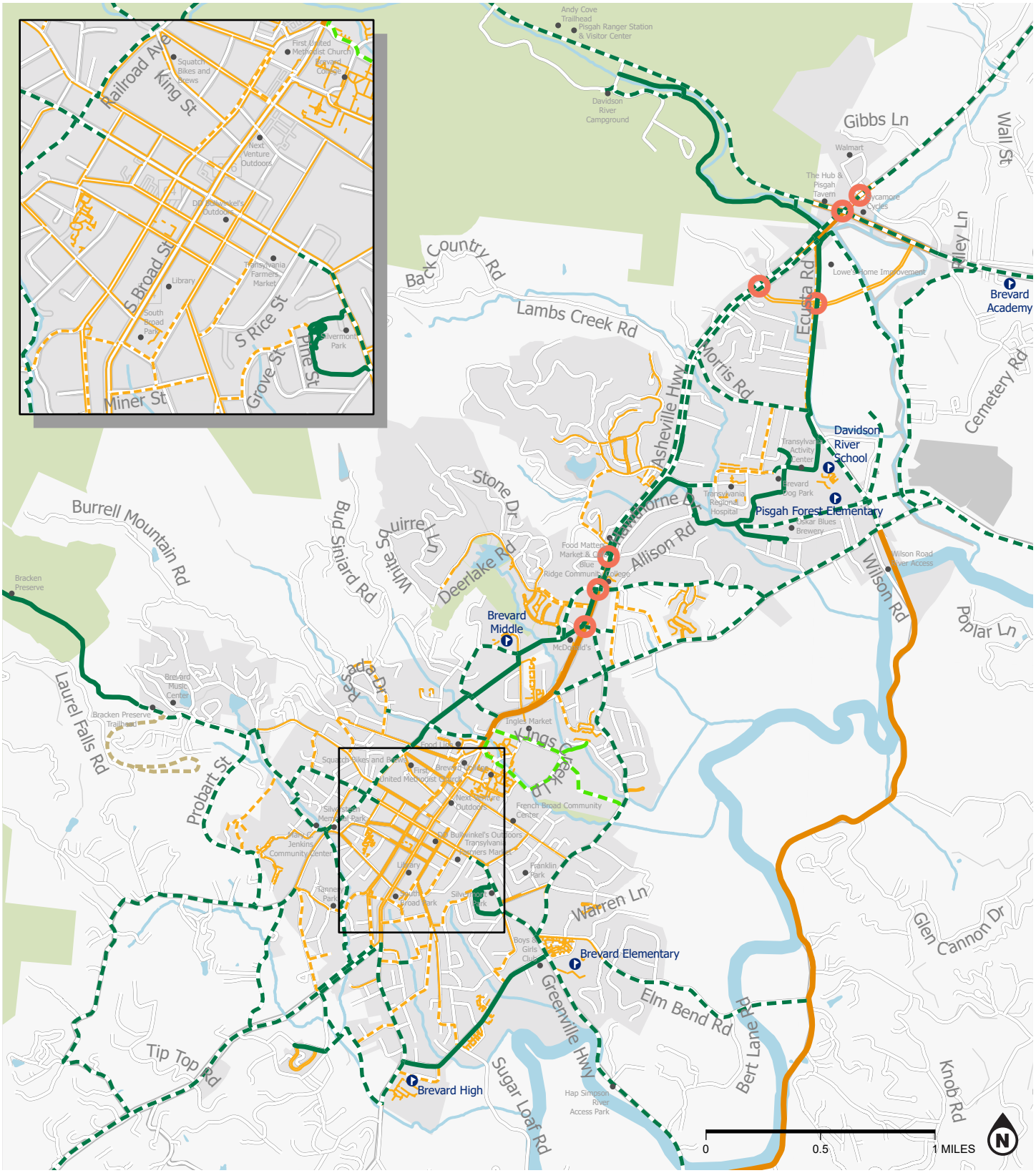
RECOMMENDED NETWORKS

The pedestrian network recommendations are depicted on the facing page, and the projects are outlined in Table 3.1, below. The bicycle network and crossing improvement recommendations are mapped and outlined on the following pages.

TABLE 3.1 *Project List of Recommended New Pedestrian Facilities*

Project Number	Corridor (from/to)	Proposed Facility Type	Length (ft)
1	Azalea Avenue	Sidewalk	1593.8
2	Broad Street- westside	Sidewalk	385.6
3	Caldwell Street	Sidewalk	1123.9
4	Caldwell Street- eastside	Sidewalk	286.8
5	Caldwell Street- westside	Sidewalk	460.3
6	Caldwell Street- westside	Sidewalk	412.7
7	Caldwell Street- westside	Sidewalk	429.0
8	Caldwell Street- westside	Sidewalk	381.8
9	Carolina Avenue	Sidewalk	2543.1
10	Deerlake Road- eastside	Sidewalk	567.0
11	Deerlake Road- northside	Sidewalk	1147.8
12	Deerlake Road- southside	Sidewalk	608.7
13	Deerlake Road- southside	Sidewalk	526.7
14	Ecusta Road	Sidewalk	3826.4
15	French Broad Street- northside	Sidewalk	252.1
16	French Broad Street- southside	Sidewalk	128.0
17	Grove Lane/Grove Street	Sidewalk	1556.0
18	Hays St/Laurel Ln/Aspen Pl	Sidewalk	428.0
19	Hays St/Laurel Ln/Aspen Pl	Sidewalk	728.9
20	High School Road	Sidewalk	1283.4
21	Johnson Street	Sidewalk	1027.1
22	Kings Creek Road	Sidewalk	525.6
23	Kings Mill Road	Sidewalk	909.3
24	Main Street	Sidewalk	720.9
25	Maple Street/Jordan Road	Sidewalk	1,347.2
26	Medical Park Circle	Sidewalk	307.0
27	Medical Park Dr/Temple Church Road	Sidewalk	2,821.3
28	Miner Street	Sidewalk	504.8
29	Miner Street	Sidewalk	566.9
30	Oakdale Road	Sidewalk	1,759.2
31	Owen Street	Sidewalk	970.1
32	Rosenwald Lane	Sidewalk	895.8
33	Silversteen Drive	Sidewalk	1,078.5
34	Southview Drive	Sidewalk	1,002.2
35	Straus Parkway	Sidewalk	1,977.5
36	Thrift store parking lot	Sidewalk	357.6
37	Tinsley Road	Sidewalk	1,705.7
38	Turnpike Road	Sidewalk	2,376.4
39	Varsity St/Gaston St	Sidewalk	1,059.3



PEDESTRIAN FACILITY RECOMMENDATIONS

CITY OF BREVARD
PEDESTRIAN & BICYCLE PLAN

alta

PEDESTRIAN FACILITIES

- Sidewalks- Existing
- Sidewalks- Proposed
- Shared-Use Path- Existing
- Shared-Use Path- Proposed
- Natural Surface Trail- Existing
- Natural Surface Trail- Proposed
- Shared Use Path- private, existing
- Shared Use Path- private, proposed
- Planned Roundabout
- Funded Roadway Projects

DESTINATIONS + BOUNDARIES

- Public Schools
- Railroad
- Streets
- Transylvania County
- Parks
- Brevard City Limits

TABLE 3.1 *Project List of Recommended Pedestrian Facilities, continued*

Project Number	Corridor (from/to)	Proposed Facility Type	Length (ft)
40	Varsity Street	Sidewalk	265.9
41	Verdery Avenue	Sidewalk	531.7
42	Wilson Drive	Sidewalk	355.3
43	Asheville Highway (Hudlin Gap Road/Deavor Road)	Shared-Use Path	6,491.6
44	Asheville Highway (Transylvania County line/Hudlin Gap Road)	Shared-Use Path	19,966.6
45	Asheville Highway- east side (Ecusta Road/existing sidepath south of Whitt Lane)	Shared-Use Path	5752.1
46	Asheville Highway- eastside (Tractor Supply driveway/Hospital Drive)	Shared-Use Path	598.1
47	Asheville Highway- westside (Straus Parkway/Osborne Road/existing Estatoe Trail)	Shared-Use Path	1,001.8
48	Asheville Highway- westside (Ecusta Road/Tanglewood Heights)	Shared-Use Path	3,833.5
49	Asheville Highway- westside (Tanglewood Heights/Straus Parkway)	Shared-Use Path	5,052.0
50	Asheville Highway- westside (Hendersonville Highway/existing Estatoe Trail)	Shared-Use Path	627.0
51	Brevard College Greenway - private property (Broad Street/Neely Road)	Shared-Use Path	3,808.2
52	Campus Drive/Kings Creek Loop - private property (Broad Street/backside of Kings Creek Loop)	Shared-Use Path	2,790.6
53	Cashiers Valley Road (Carolina Avenue/Rosman Highway)	Shared-Use Path	10,763.8
54	Chestnut Street (Asheville Highway/XX)	Shared-Use Path	1,214.1
55	Chestnut-Oakdale connector (Chestnut Street/Oakdale Road)	Shared-Use Path	522.4
56	Davidson River (Asheville Highway/Davidson River Road)	Shared-Use Path	3,661.2
57	Davidson River Bridge (Pisgah Highway/Estatoe Trail)	Shared-Use Path	256.5
58	Davidson River Campground trail spur (Estatoe Trail/Davidson River Campground)	Shared-Use Path	2,085.4
59	Davidson River Rd (Hendersonville Hwy/Old Hendersonville Hwy)	Shared-Use Path	6,985.1
60	Ecusta Road (existing greenway/Old Hendersonville Highway)	Shared-Use Path	2,568.2
61	Ecusta Trail (Davidson River Road/Estatoe Trail/Oskar Blues)	Shared-Use Path	3,950.4
62	Ecusta Trail (Everett Road/Davidson River Road)	Shared-Use Path	4,877.8
63	Ecusta Trail (Transylvania County Line/Valley Green Drive)	Shared-Use Path	14,402.9
64	Ecusta Trail (Valley Green Drive/Everett Road)	Shared-Use Path	18,646.8
65	Ecusta Trail spur (Ecusta Road/Carr Lumber Company Road)	Shared-Use Path	2,343.0
66	Elm Bend Road (Eagle Point Drive/Wilson Road)	Shared-Use Path	5,193.1
67	Estatoe Trail- Phase 1 (Whitmire Street/Main Street)	Shared-Use Path	1,173.7
68	Estatoe Trail- Phase 2 (Main Street/Mills Avenue)	Shared-Use Path	1,239.2
69	Estatoe Trail - Phase 3 (Mills Avenue/Rosman Highway)	Shared-Use Path	3,506.0
70	Estatoe Trail - Phase 4 (Rosman Highway/N. Country Club Road)	Shared-Use Path	3,483.8
71	Estatoe Trail- alternative route (Osborne Road/existing Estatoe Trail behind McDonald's)	Shared-Use Path	1,620.9
72	Estatoe Trail connector (Cambridge Drive/Estatoe Trail - Poplar Street/Ashville Highway)	Shared-Use Path	332.8
73	Estatoe Trail spur (Nicholson Creek/Forest Hill Road)	Shared-Use Path	462.7
74	Greenville Highway (Elm Bend Road/Barclay Road)	Shared-Use Path	12,367.6
75	Hays-Laurel connector (Hays Street/Laurel Lane)	Shared-Use Path	349.1
76	Hendersonville Highway (Asheville Highway/Deavor Road)	Shared-Use Path	2,415.6

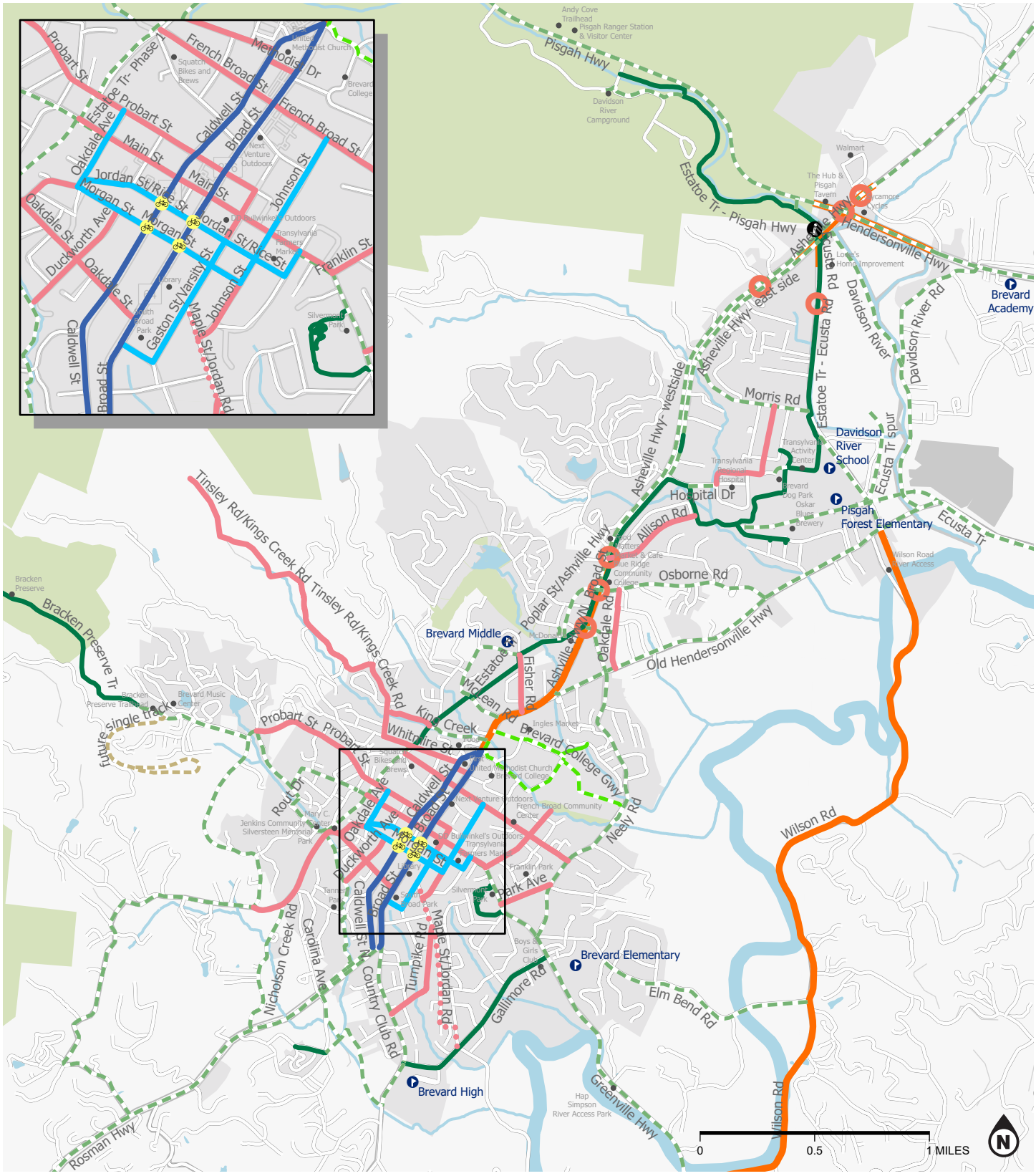
TABLE 3.1 *Project List of Recommended Pedestrian Facilities, continued*

Project Number	Corridor (from/to)	Proposed Facility Type	Length (ft)
77	Hendersonville Highway (Deavor Road/Lyday Loop)	Shared-Use Path	13,393.5
78	Hillview Street (Rout Drive/Hillview Circle)	Shared-Use Path	1,062.4
79	Holcombe Road + connector (Probart Street/Rout Drive)	Shared-Use Path	1,853.0
80	Hospital Drive (Cedar Hill Apartments entrance/Doctor Lane/Medical Park Dr)	Shared-Use Path	651.2
81	King Creek (Railroad Avenue/Broad Street)	Shared-Use Path	1,384.8
82	Main Street (Rice Street/Franklin Street)	Shared-Use Path	403.6
83	Main Street (Mills Avenue/Oaklawn Avenue)	Shared-Use Path	621.1
84	Main Street (Rosenwald Lane/Galloway Street)	Shared-Use Path	1,149.4
85	Main Street/Greenville Highway (Franklin Street/Parkview Drive)	Shared-Use Path	2,051.0
86	Main-Holcombe connector (Main Street/Holcombe Rd connector)	Shared-Use Path	726.1
87	McLean Road (Railroad Avenue/Broad Street)	Shared Use Path	767.3
88	McLean Road/Fisher Road (Poplar Street/Railroad Avenue)	Shared-Use Path	2,216.8
89	Medical Park-Dog Park connector (Medical Park Circle/Estatoe Trail- Dog Park)	Shared-Use Path	341.9
90	Morris Road (Asheville Highway/Ecusta Road)	Shared-Use Path	3,170.5
91	N. Country Club Road (Gallimore Road/Nicholson Creek Greenway)	Shared-Use Path	1,126.5
92	N. Country Club Road (Rosman Highway/Gallimore Road)	Shared-Use Path	2,851.6
93	Neely Rd (Old Hendersonville Highway/French Broad Street)	Shared-Use Path	5,200.8
94	Nicholson Creek Road (Cashiers Valley Road/Highway)	Shared-Use Path	3,110.6
95	Old Hendersonville Highway (Ecusta Trail/Osborne Road)	Shared-Use Path	4,587.1
96	Old Hendersonville Highway (Asheville Highway/Broad Street/Osborne Road)	Shared-Use Path	5,420.6
97	Old Hendersonville Highway (Grove Bridge Road//Lyday Loop)	Shared-Use Path	15,388.5
98	Osborne Road (Asheville Highway/Old Hendersonville Highway)	Shared-Use Path	3,965.0
99	Park Avenue (French Broad Street/Greenville Highway)	Shared-Use Path	1,933.6
100	Pinnacle Road/Music Camp Road (western terminus of Pinnacle/Probart Street)	Shared-Use Path	2,750.4
102	Pisgah Highway (Asheville Highway/Fish Hatchery Road)	Shared-Use Path	27,746.9
103	Probart Street (Holcombe Road/Cashiers Valley Road)	Shared-Use Path	5,366.9
104	future single track (Pinnacle Road/south of Club House Court)	Natural Surface Trail	5,808.8
105	Rosman Highway (Sky View Terrace/Red Sky Knoll)	Shared-Use Path	4,252.8
106	Rosman Highway (Forest Hill Road/Sky View Terrace)	Shared-Use Path	3,750.8
107	Rosman Highway- eastside (N. Country Club Road/Forest Hill Road)	Shared-Use Path	1,727.9
108	Rosman Highway- eastside (Red Sky Knoll/Clement Road)	Shared-Use Path	7,411.9
109	Rosman Highway- westside (Estatoe Trail- Norton Creek/Carolina Avenue)	Shared-Use Path	828.6
110	Rosman Highway- westside (Caldwell Street/Estatoe Trail- Norton Creek)	Shared-Use Path	772.8
111	Rosman Highway- westside (Pole Miller Road/Clement Road)	Shared-Use Path	4,100.9
112	Rosman Highway- westside (Selica Road/Pole Miller Road)	Shared-Use Path	2,328.6
113	Rosman Highway- westside (Red Sky Knoll/Selica Road)	Shared-Use Path	968.4
114	Rout Drive (northern terminus/Hillview Street)	Shared-Use Path	256.1
115	Tinsley-Commerce connector (Tinsley Road/Commerce Street)	Shared-Use Path	106.5

TABLE 3.2 *Project List of Recommended Bicycle Facilities**

Project Number	Corridor (from/to)	Proposed Facility Type	Implementation Method	Length (ft)
116	Allison Road (Ashville Highway/Estatoe Trail)	Shared Lane Markings (SLM)	Paint SLM Symbols	2,284.1
117	Ashville Highway/N. Broad Street (Caldwell Street/Straus Parkway)	Bicycle Lanes-planned R5800	Roadway Project	5,892.7
118	Broad Street (Caldwell Street/Main Street)	SLM (near-) Separated Bicycle Lane (long-term)	Paint SLM Symbols/ Restriping Project	2,213.2
118	Broad Street (Main Street/Rosman Highway)	SLM (near-) Separated Bicycle Lane (long-term)	Paint SLM Symbols/ Restriping Project	2,983.7
118	Caldwell Street (N. Broad Street/Rosman Highway)	SLM (near-) Separated Bicycle Lane (long-term)	Paint SLM Symbols/ Restriping Project	5,529.0
119	Carolina Avenue (Cashiers Valley Road/Rosman Highway)	Shared Lane Markings	Paint SLM Symbols	2,513.9
120	Carver Street (Oakdale Street/Oaklawn Avenue)	Shared Lane Markings	Paint SLM Symbols	705.0
121	Cashiers Valley Road (Oakdale Street/Probart Street)	Shared Lane Markings	Paint SLM Symbols	2,958.5
122	Commerce Street (Railroad Avenue/western terminus of Commerce Street)	Shared Lane Markings	Paint SLM Symbols	964.5
123	Davidson River Village (DRV) Connector (Asheville Highway/ Ecusta Road)	Bicycle Lanes-planned R5800	Roadway Project	1,335.6
124	Davidson River Village (DRV) Connector (Ecusta Road/ Hendersonville Highway)	Bicycle Lanes-planned R5800	Roadway Project	2,722.8
125	Duckworth Avenue (Morgan Street/southern terminus)	Shared Lane Markings	Paint SLM Symbols	1,347.8
127	Fisher Road (Poplar Street/Broad Street)	Shared Lane Markings	Paint SLM Symbols	1,320.4
128	Franklin Street (Main Street/northern terminus/King Creek)	Shared Lane Markings	Paint SLM Symbols	2,012.0
129	E French Broad Street, W French Broad Street (Railroad Avenue/Park Avenue)	Shared Lane Markings	Paint SLM Symbols	4,488.7
130	Gaston Street (Probart Street/Jordan Street)	Shared Lane Markings	Paint SLM Symbols	637.2
131	Gaston Street/Varsity Street (Jordan Street/Broad Street)	Bicycle Boulevard	Paint SLM Symbols + Traffic Calming	1,916.6
132	Johnson Street (French Broad Street/Morgan Street)	Bicycle Boulevard	Paint SLM Symbols + Traffic Calming	1,814.1
133	Johnson Street (Morgan Street/Maple Street)	Shared Lane Markings	Paint SLM Symbols	763.3
134	Jordan Street/Rice Street (Oaklawn Avenue/Main Street)	Bicycle Boulevard	Traffic Calming	2,768.4
135	Main Street (future greenway/Franklin Street)	Shared Lane Markings	Paint SLM Symbols	3,202.5
136	Methodist Drive (Caldwell Street/Broad Street)	Shared Lane Markings	Paint SLM Symbols	322.0
137	Morgan Street (Oaklawn Avenue/Johnson Street)	Bicycle Boulevard	Paint SLM Symbols + Traffic Calming	2,035.2
138	Oakdale Avenue (Probart Street/Carver Street)	Bicycle Boulevard	Paint SLM Symbols + Traffic Calming	958.4
139	Oakdale Road (Osborne Road/Old Hendersonville Highway)	Shared Lane Markings	Paint SLM Symbols	1,835.6
140	Oakdale Street (Carver Street/Broad Street)	Shared Lane Markings	Paint SLM Symbols	1,782.7
141	Park Avenue (Main Street/Parkview Drive)	Shared Lane Markings	Paint SLM Symbols	1,222.8
142	Probart Street (Holcombe Road/Gaston Street)	Shared Lane Markings	Paint SLM Symbols	5,319.1
142	Temple Church Road/Medical Park Drive (Morris Road/Hospital Drive)	Shared Lane Markings	Paint SLM Symbols	2,852.6
144	Tinsley Road/Kings Creek Road (northwestern terminus of Kings Creek Rd/Palmer Street)	Shared Lane Markings	Paint SLM Symbols	8,653.2
145	Turnpike Road (Maple Street/N. Country Club Road)	Shared Lane Markings	Paint SLM Symbols	2,424.9
146	Whitmire Street (Tinsley Road/Caldwell Street)	Shared Lane Markings		1,829.1
147	Wilson Road (Old Hendersonville Highway/Greenville Highway)	paved shoulders-planned R-5763	Roadway Project	19,424.4

*Note: Shared-use paths are depicted in the map, as they are shared-use facilities that accommodate pedestrian and bicycle travel, but they are not listed in the Bicycle Facility Recommendations Table since they are already listed in the Pedestrian Facility Recommendations Table on pages 30-33.



BICYCLE FACILITY RECOMMENDATIONS

CITY OF BREVARD PEDESTRIAN & BICYCLE PLAN

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BICYCLE FACILITIES

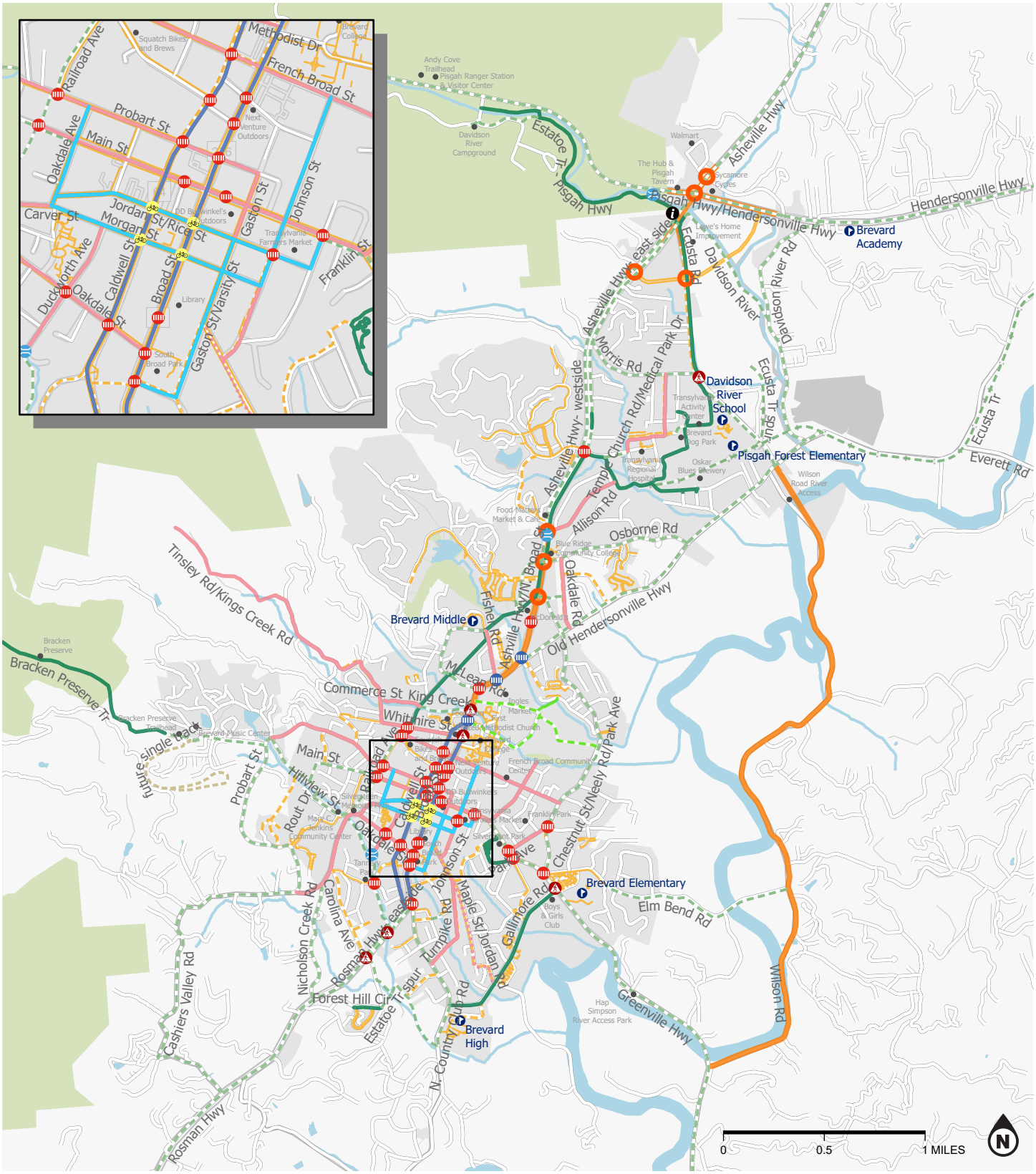
- Bike Crossing Signal
- Separated Bike Lane (SBL)- Proposed (long-term)
- Bike Boulevard- Proposed
- Shared Lane Markings (SLM)- Existing
- SLM- Proposed
- Shared-Use Path- Existing
- Shared-Use Path- Proposed
- Natural Surface Trail- Existing
- Natural Surface Trail- Proposed
- Shared Use Path- private, existing
- Shared Use Path- private, proposed
- Information Kiosk/Map- proposed
- Planned Roundabout
- Funded Roadway Projects

DESTINATIONS + BOUNDARIES

- Public Schools
- Railroad
- Streets
- Transylvania County
- Parks
- Brevard City Limits

TABLE 3.3 *Project List of Recommended Crossing Improvements*

Project Number	Corridor 1	Corridor 2	Proposed Treatment
148	Asheville Highway	new signal at Aldi's	Crossing Improvement
149	Asheville Highway	Hospital Drive	Crossing Improvement
150	Asheville Highway	Old Hendersonville Highway	Crossing Improvement- Planned (R-5800)
151	Asheville Highway	Brian Berg Lane	Pedestrian+Bicycle Tunnel
152	Asheville Highway	Osborne Road	Planned Roundabout
153	Asheville Highway	Pisgah Highway/Hendersonville Highway	Planned Roundabout
154	Asheville Highway	Forest Gate Drive/ Deavor Road	Planned Roundabout
155	Asheville Highway	Chestnut Street/Jackson Court	Planned Roundabout
156	Asheville Highway	Allison Road/Fortune Cove Road	Planned Roundabout
157	Asheville Highway	Davidson River Village (DRV) Connector	Planned Roundabout
158	Broad Street	Morgan Street	Bicycle Crossing Signal
159	Broad Street	Jordan Street	Bicycle Crossing Signal
160	Broad Street	McLean Road	Crossing Improvement
161	Broad Street	Varsity Street	Crossing Improvement
162	Broad Street	Oakdale Street	Crossing Improvement
163	Broad Street	Library entrance	Crossing Improvement
164	Broad Street	Probart Street	Crossing Improvement
165	Broad Street	Plaza Way	Crossing Improvement
166	Broad Street	Kelly's Way/Appletree Street	Crossing Improvement
167	Broad Street	Caldwell Street	Crossing Improvement- Planned (R-5800)
168	Broad Street	Fisher Road	Crossing Improvement- Planned (R-5800)
169	Broad Street	Kings Creek	Pedestrian Hybrid Beacon (PHB)
170	Broad Street	First Methodist Church/Brevard College	RRFB/PHB
171	Broad Street/ Rosman Highway	N. Country Club Road	Crossing Improvement
172	Caldwell Street	Morgan Street	Bicycle Crossing Signal
173	Caldwell Street	Jordan Street	Bicycle Crossing Signal
174	Caldwell Street	Probart Street	Crossing Improvement
175	Caldwell Street	King Street	Crossing Improvement
176	Caldwell Street	French Broad Street	Crossing Improvement
177	Caldwell Street	Oakdale Street	Crossing Improvement
178	Davidson River	Pisgah Highway	Pedestrian & Bicycle Bridge
179	Duckworth Avenue	Oakdale Street	Crossing Improvement
180	Duckworth Avenue	southern terminus of Duckworth	Pedestrian & Bicycle Bridge
181	Ecusta Road	south of Morris Road	Pedestrian Hybrid Beacon (PHB)
182	Ecusta Road	Davidson River Village (DRV) Connector	Planned Roundabout
183	Estatoe Trail	north of Ecusta Road	Crossing Improvement
184	Greenville Highway	Parkview Drive/Elm Bend Road	Crossing Improvement
185	Greenville Highway	Gallimore Road/Trowbridge Lane	RRFB/PHB
186	Jordan Street	Johnson Street	Crossing Improvement
187	Main Street	east of Galloway Street	Crossing Improvement
188	Main Street	Greenville Highway/Wilson Drive	Crossing Improvement
189	Main Street	Rice Street	Crossing Improvement
190	Main Street	midblock alley between Broad & Gaston	Crossing Improvement
191	Main Street	Times Arcade Alley	Crossing Improvement



CROSSING IMPROVEMENT RECOMMENDATIONS

CITY OF BREVARD
PEDESTRIAN & BICYCLE PLAN

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CROSSING IMPROVEMENT

- High Visibility Crosswalk
- RRFB/Ped Hybrid Beacon (PHB)
- Ped+Bike Bridge/Tunnel- planned
- Planned Crosswalks (R-5800)
- Bike Crossing Signal

Proposed Amenities

- Information Kiosk/Map- proposed

- Sidewalks- Existing
- Sidewalks- Proposed
- Shared-Use Path- Existing
- Shared-Use Path- Proposed
- Natural Surface Trail- Existing
- Natural Surface Trail- Proposed
- Shared Use Path- private, existing
- Shared Use Path- private, proposed
- Planned Roundabout
- Funded Roadway Projects

DESTINATIONS + BOUNDARIES

- Public Schools
- Key Destinations
- Railroad
- Streets
- Transylvania County
- Parks
- Brevard City Limits

TABLE 3.3 *Project List of Recommended Crossing Improvements, continued*

Project Number	Corridor 1	Corridor 2	Proposed Treatment
192	Main Street	Park Avenue	Crossing Improvement
193	Parkview Drive	Park Avenue	Crossing Improvement
194	Probart Street	Railroad Avenue	Crossing Improvement
195	Railroad Avenue	King Street	Crossing Improvement
196	Rosman Highway	Carolina Avenue/Forest Hill Road	Pedestrian Hybrid Beacon (PHB)
197	Rosman Highway	Norton Creek/future greenway	Pedestrian Hybrid Beacon (PHB)
198	Silversteen Drive	Norton Creek/future greenway	Crossing Improvement
199	Whitmire Street	Railroad Avenue	Crossing Improvement

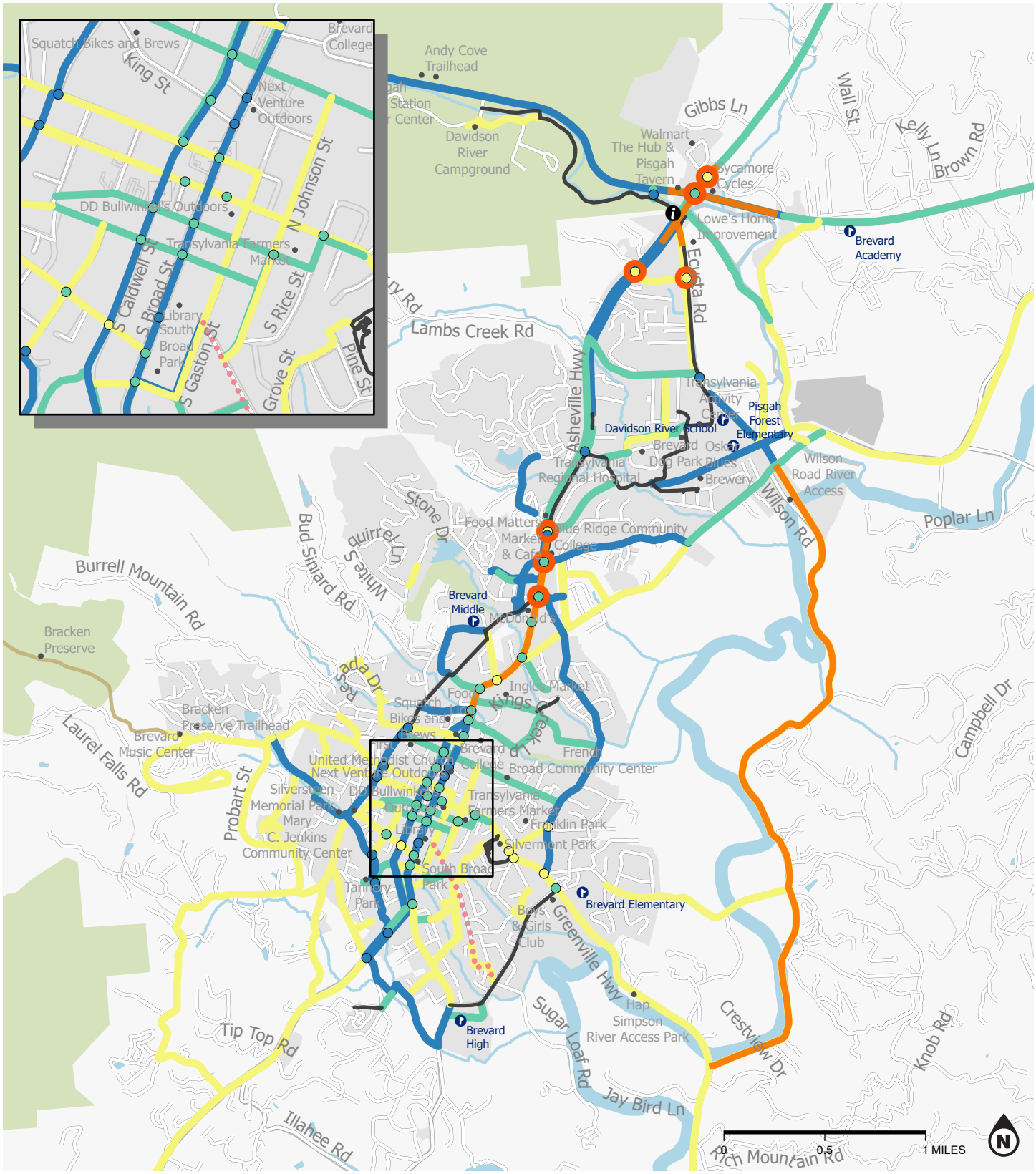
PRIORITIZATION PROCESS + PHASING PLAN

In 2018, Brevard's Pedestrian Comprehensive Plan was updated, and priority shared-use path and sidewalk projects were identified. Those priorities, especially the shared-use paths, remain the priorities or near-term implementation for the City of Brevard. In some cases, sidewalk recommendations were updated and upgraded to be shared-use path recommendations as the recommendations from the Transylvania County Bicycle Plan were integrated with those of the Pedestrian Plan. These shared-use path recommendations, as well as the other on-street bicycle facility recommendations developed through this planning effort have been prioritized using criteria developed to reflect the priorities expressed by the Steering Committee.

The project list with prioritization scores is provided on the following pages. The scores form the basis for a phased approach to funding and implementing the projects, with the higher ranking projects (scores of 5 or more) being designated as near-term priorities for implementation. Lower scoring projects are designated for later phases of implementation.

PRIORITIZATION CRITERIA:

- **Estatoe Trail:** the project connects to or extends the Estatoe Trail
- **Safety:** the project creates a separated facility in an area that has previously experienced a bicycle- and/or pedestrian-involved collision
- **Connectivity:** the project fills a gap in the current sidewalk or bicycle network or improves an important crossing in the network
- **Public Support:** the project reflects previously identified priority projects or was identified as a priority corridor/crossing during this planning effort. Priority corridors/crossings included:
  - » Probart Street
  - » Broad Street/Asheville Highway (especially between downtown and Chestnut Street)
  - » Neely Road
  - » Whitmire Street
  - » Allison Road
  - » Osborne Road
  - » Rosman Hwy (near future Estatoe Greenway crossing),
  - » future Ecusta Trailhead area



PRIORITY PROJECT PHASING

CITY OF BREVARD
PEDESTRIAN & BICYCLE PLAN

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PRIORITIZED PROJECT RECOMMENDATIONS

Priority Project Phases
- Near-term Priority Crossing
- Mid-term Priority Crossing
- Near-term Priority Crossing
- Near-term Priority
- Mid-term Priority
- Long-term Priority

Existing + Funded Projects
- Planned Roundabout
- Funded Roadway Projects
- Shared Lane Markings (SLM)- Existing
- Shared-Use Path- Existing
- Natural Surface Trail- Existing

DESTINATIONS + BOUNDARIES
- Public Schools
- Railroad
- Streets
- Transylvania County
- Parks
- Brevard City Limits

TABLE 3.4 *Near-Term Priority Project List with Prioritization Scores*

Project Number	Corridor	Proposed Facility/ Treatment	Prioritization Criteria				Total Priority Score
			Estatoe Trail	Safety	Connec-tivity	Public Support	
68	*Estatoe Trail (Phase 2)*	*Shared Use Path*	*2*	*2*	*2*	*2*	*8*
69	*Estatoe Trail (Phase 3)*	*Shared Use Path*	*2*	*2*	*2*	*2*	*8*
70	*Estatoe Trail (Phase 4)*	*Shared Use Path*	*2*	*2*	*2*	*2*	*8*
71	Estatoe Trail- alternative route	Shared Use Path	2	2	2	2	8
72	Estatoe Trail connector	Shared Use Path	2	2	2	2	8
98	**Osborne Road**	**Shared Use Path**	**2**	**2**	**2**	**1**	**7**
60	Ecusta Road	Shared Use Path	2	2	2	1	7
67	*Estatoe Trail (Phase 1)*	*Shared Use Path*	*2*	*1*	*2*	*2*	*7*
47	Asheville Highway- westside	Shared Use Path	2	2	2	0	6
54	Chestnut Street	Shared Use Path	2	2	1	1	6
78	Hillview Street	Shared Use Path	2	2	1	1	6
91	N. Country Club Road	Shared Use Path	2	2	1	1	6
93	**Neely Road**	**Shared Use Path**	**2**	**2**	**1**	**1**	**6**
99	Park Avenue/Parkview Drive	Shared Use Path	2	2	1	1	6
107	Rosman Highway- eastside	Shared Use Path	2	2	0	2	6
198	Silversteen Drive/Norton Creek/ Future Greenway	Crossing Improvement	2	1	2	1	6
149	Asheville Highway/Hospital Drive	Crossing Improvement	2	1	1	1	5
151	Asheville Highway/Brian Berg Lane	Pedestrian+Bicycle Tunnel	2	1	1	1	5
45	Asheville Highway- east side	Shared Use Path	2	2	1	0	5
48	Asheville Highway- westside	Shared Use Path	2	2	1	0	5
118	**Broad Street & Caldwell Street**	**Sharrows (near) Separated Bicycle Lanes (longterm)**	**0**	**2**	**2**	**1**	**5**
163	Broad Street/Library entrance	Crossing Improvement	0	2	2	1	5
165	Broad Street/Plaza Way	Crossing Improvement	0	2	2	1	5
166	Broad Street/Kelly's Way/ Appletree Street	Crossing Improvement	0	2	2	1	5
55	Chestnut-Oakdale connector	Shared Use Path	2	2	1	0	5
178	Davidson River/Pisgah Highway	Pedestrian+Bicycle Bridge	2	1	1	1	5
11	Deerlake Road- northside	Sidewalk	2	2	1	0	5
12	Deerlake Road- southside	Sidewalk	2	2	1	0	5
180	Duckworth Avenue/southern terminus of Duckworth	Pedestrian+Bicycle Bridge	2	2	1	0	5
181	Ecusta Road/south of Morris Road	Pedestrian Hybrid Beacon (PHB)	2	1	1	1	5
61	Ecusta Trail	Shared Use Path	2	1	1	1	5
76	Hendersonville Highway	Shared Use Path	2	2	1	0	5
79	Holcombe Road + connector	Shared Use Path	2	1	1	1	5
81	King Creek	Shared Use Path	2	2	1	0	5
187	Main Street/east of Galloway Street	Crossing Improvement	2	1	1	1	5
87	McLean Road	Shared Use Path	2	2	0	1	5
88	McLean Road/Fisher Road	Shared Use Path	2	2	1	0	5
90	Morris Road	Shared Use Path	2	2	0	1	5
101	Pisgah Highway	Shared Use Path	2	2	1	0	5
194	Probart Street/Railroad Avenue	Crossing Improvement	2	1	1	1	5

Bolded *rows denote projects for which a detailed cutsheet and cost estimate have been developed (see pages 46-55).* Italicized *rows denote the Estatoe Trail segments that have been approved for construction in the next three years.*

TABLE 3.4 *Near-Term Priority Project List with Prioritization Scores, continued*

Project Number	Corridor	Proposed Facility/ Treatment	Prioritization Criteria				Total Priority Score
			Estatoe Trail	Safety	Connec-tivity	Public Support	
103	Probart-Main connector	Shared Use Path	2	1	1	1	5
195	Railroad Avenue/King Street	Crossing Improvement	2	1	1	1	5
196	Rosman Highway/Carolina Avenue/Forest Hill Road	Pedestrian Hybrid Beacon (PHB)	2	1	1	1	5
197	Rosman Highway/Norton Creek/ Future Greenway	Pedestrian Hybrid Beacon (PHB)	2	1	1	1	5
109	Rosman Highway- westside	Shared Use Path	2	1	0	2	5
35	Straus Parkway	Sidewalk	2	1	2	0	5
39	Varsity Street/Gaston Street	Sidewalk	0	2	2	1	5
199	Whitmire Street/Railroad Avenue	Crossing Improvement	2	1	1	1	5

TABLE 3.5 *Mid-Term Priority Project List with Prioritization Scores*

Project Number	Corridor	Proposed Facility/ Treatment	Prioritization Criteria				Total Priority Score
			Estatoe Trail	Safety	Connec-tivity	Public Support	
137	**Morgan Street**	**Bicycle Boulevard**	**0**	**1**	**2**	**1**	**4**
134	**Jordan Street/Rice Street**	**Bicycle Boulevard**	**0**	**1**	**2**	**1**	**4**
116	Allison Road	Shared Lane Markings	2	0	1	1	4
43	Asheville Highway	Shared Use Path	2	2	0	0	4
152	Asheville Highway/Osborne Road	planned roundabout	0	2	2	0	4
46	Asheville Highway- eastside	Shared Use Path	2	1	1	0	4
49	Asheville Highway- westside	Shared Use Path	2	1	1	0	4
50	Asheville Highway- westside	Shared Use Path	2	2	0	0	4
51	Brevard College Greenway	Shared Use Path (private property)	0	2	2	0	4
158	Broad Street/Morgan Street	Bicycle Crossing Signal	0	2	1	1	4
159	Broad Street/Jordan Street	Bicycle Crossing Signal	0	2	1	1	4
161	Broad Street/Varsity Street	Crossing Improvement	0	1	2	1	4
162	Broad Street/Oakdale Street	Crossing Improvement	0	1	2	1	4
164	Broad Street/Probart Street	Crossing Improvement	0	2	1	1	4
167	Broad Street/Caldwell Street	Crossing Improvement-Planned (R-5800)	0	2	1	1	4
169	Broad Street/Kings Creek	Pedestrian Hybrid Beacon (PHB)	0	2	1	1	4
170	Broad Street/First Methodist Church/Brevard College	RRFB/PHB	0	1	2	1	4
171	Broad Street/Rosman Highway/N. Country Club Road	Crossing Improvement	0	2	1	1	4
4	Caldwell Street- eastside	Sidewalk	0	2	2	0	4
5	Caldwell Street- westside	Sidewalk	0	2	2	0	4
56	Davidson River	Shared Use Path	2	2	0	0	4
13	Deerlake Road- southside	Sidewalk	2	1	1	0	4
185	Greenville Highway/Gallimore Road/Trowbridge Lane	RRFB/PHB	2	1	1	0	4
20	High School Road	Sidewalk	0	2	2	0	4
80	Hospital Drive	Shared Use Path	2	1	1	0	4
21	Johnson Street	Sidewalk	0	2	2	0	4
186	Jordan Street/Johnson Street	Crossing Improvement	0	2	2	0	4

Bolded *rows denote projects for which a detailed cutsheet and cost estimate have been developed (see pages 46-55).*

TABLE 3.5 *Mid-Term Priority Project List with Prioritization Scores, continued*

Project Number	Corridor	Proposed Facility/ Treatment	Prioritization Criteria				Total Priority Score
			Estatoe Trail	Safety	Connec-tivity	Public Support	
189	Main Street/Rice Street	Crossing Improvement	0	2	2	0	4
190	Main Street/midblock alley between Broad & Gaston	Crossing Improvement	0	2	2	0	4
89	Medical Park-Dog Park connector	Shared Use Path	2	1	1	0	4
29	Miner Street	Sidewalk	0	1	2	1	4
114	Rout Drive	Shared Use Path	2	1	0	1	4
40	Varsity Street	Sidewalk	0	1	2	1	4
129	**E French Broad Street, W French Broad Street**	**Shared Lane Markings**	**0**	**1**	**2**	**0**	**3**
148	Asheville Highway/new signal at Aldi's	Crossing Improvement	0	2	1	0	3
150	Asheville Highway/Old Hendersonville Highway	Crossing Improvement-Planned (R-5800)	0	2	1	0	3
153	Asheville Highway/Pisgah Highway/Hendersonville Highway	Planned Roundabout	0	2	1	0	3
155	Asheville Highway/Chestnut Street/Jackson Court	Planned Roundabout	0	2	1	0	3
160	Broad Street/McLean Road	Crossing Improvement	0	1	1	1	3
2	Broad Street- westside	Sidewalk	0	2	1	0	3
3	Caldwell Street	Sidewalk	0	2	1	0	3
172	Caldwell Street/Morgan Street	Bicycle Crossing Signal	0	2	1	0	3
173	Caldwell Street/Jordan Street	Bicycle Crossing Signal	0	2	1	0	3
174	Caldwell Street/Probart Street	Crossing Improvement	0	2	1	0	3
175	Caldwell Street/King Street	Crossing Improvement	0	2	1	0	3
176	Caldwell Street/French Broad Street	Crossing Improvement	0	2	1	0	3
6	Caldwell Street- westside	Sidewalk	0	2	1	0	3
7	Caldwell Street- westside	Sidewalk	0	2	1	0	3
8	Caldwell Street- westside	Sidewalk	0	2	1	0	3
52	Campus Drive/Kings Creek Loop	Shared Use Path (private property)	0	2	1	0	3
57	Davidson River Bridge	Shared Use Path	2	1	0	0	3
179	Duckworth Avenue/Oakdale St	Crossing Improvement	0	2	1	0	3
183	Estatoe Trail/north of Ecusta Rd	Crossing Improvement	0	2	1	0	3
73	Estatoe Trail spur	Shared Use Path	2	1	0	0	3
15	French Broad Street- northside	Sidewalk	0	2	1	0	3
16	French Broad Street- southside	Sidewalk	0	2	1	0	3
18	Hays St/Laurel Ln/Aspen Pl	Sidewalk	0	2	1	0	3
77	Hendersonville Highway	Shared Use Path	0	2	1	0	3
82	Main Street	Shared Use Path	0	2	1	0	3
191	Main Street/Times Arcade Alley	Crossing Improvement	0	2	1	0	3
26	Medical Park Circle	Sidewalk	0	1	2	0	3
27	Medical Park Dr/Temple Church Road	Sidewalk	0	2	1	0	3
95	Old Hendersonville Highway	Shared Use Path	0	2	0	1	3
31	Owen Street	Sidewalk	0	2	1	0	3
110	Rosman Highway- westside	Shared Use Path	0	2	0	1	3
33	Silversteen Drive	Sidewalk	0	1	2	0	3

Bolded *rows denote projects for which a detailed cutsheet and cost estimate have been developed (see pages 46-55).*

TABLE 3.6 *Long-Term Priority Project List with Prioritization Scores*

Project Number	Corridor	Proposed Facility/ Treatment	Prioritization Criteria				Total Priority Score
			Estatoe Trail	Safety	Connec-tivity	Public Support	
1	Azalea Avenue	Sidewalk	0	2	0	0	2
14	Ecusta Road	Sidewalk	0	2	0	0	2
17	Grove Lane/Grove Street	Sidewalk	0	1	1	0	2
19	Hays St/Laurel Ln/Aspen Pl	Sidewalk	0	2	0	0	2
23	Kings Mill Road	Sidewalk	0	2	0	0	2
24	Main Street	Sidewalk	0	1	1	0	2
25	Maple Street/Jordan Road	Sidewalk	0	1	1	0	2
28	Miner Street	Sidewalk	0	1	1	0	2
30	Oakdale Road	Sidewalk	0	2	0	0	2
36	Thrift store parking lot	Sidewalk	0	1	1	0	2
38	Turnpike Road	Sidewalk	0	1	1	0	2
42	Wilson Drive	Sidewalk	0	1	1	0	2
58	Davidson River Campground trail spur	Shared Use Path	0	1	1	0	2
59	Davidson River Road	Shared Use Path	0	1	0	1	2
62	Ecusta Trail	Shared Use Path	0	1	0	1	2
65	Ecusta Trail spur	Shared Use Path	0	1	0	1	2
66	Elm Bend Road	Shared Use Path	0	2	0	0	2
74	Greenville Highway	Shared Use Path	0	1	1	0	2
75	Hays-Laurel connector	Shared Use Path	0	2	0	0	2
83	Main Street	Shared Use Path	0	1	1	0	2
85	Main Street/Greenville Highway	Shared Use Path	0	1	1	0	2
92	N. Country Club Road	Shared Use Path	0	2	0	0	2
94	Nicholson Creek Road	Shared Use Path	0	2	0	0	2
96	Old Hendersonville Highway	Shared Use Path	0	2	0	0	2
97	Old Hendersonville Highway	Shared Use Path	0	2	0	0	2
100	Pinnacle Road/Music Camp Road	Shared Use Path	0	1	1	0	2
102	Probart Street	Shared Use Path	0	1	0	1	2
104	Future Single Track	Natural Surface Trail	0	1	1	0	2
105	Rosman Highway	Shared Use Path	0	2	0	0	2
108	Rosman Highway- eastside	Shared Use Path	0	2	0	0	2
111	Rosman Highway- westside	Shared Use Path	0	2	0	0	2
117	Ashville Highway/N. Broad Street/Caldwell Street	Bicycle Lanes-planned R5800	0	1	1	0	2
120	Carver Street	Shared Lane Markings	0	1	1	0	2
121	Cashiers Valley Road	Shared Lane Markings	0	1	1	0	2
130	Gaston Street	Shared Lane Markings	0	1	1	0	2
131	Gaston Street/Varsity Street	Bicycle Boulevard	0	1	1	0	2
132	Johnson Street	Bicycle Boulevard	0	1	1	0	2
135	Main Street	Shared Lane Markings	0	1	1	0	2
136	Methodist Drive	Shared Lane Markings	0	1	1	0	2
140	Oakdale Street	Shared Lane Markings	0	1	1	0	2
142	Probart Street	Shared Lane Markings	0	1	1	0	2
146	Whitmire Street	Shared Lane Markings	0	0	1	1	2
147	Wilson Road/Old Hendersonville Highway/Greenville Highway	Paved Shoulders-Planned R-5763	0	1	1	0	2

See Appendix E on page 134 for the remainder of the Long-term projects and prioritization scores.

PRIORITY PROJECTS

This section outlines preliminary concept-level design for five specific projects as examples of the variety of facility types recommended in the Plan. They show realistic examples of what implementation of each type of project might look like, including the coordination of intersection improvements to connect new and existing facilities. These project locations include:

1. **Osborne Road - Shared Use Path**
2. **Neely Road - Shared Use Path**
3. **Broad Street + Caldwell Street - Paired Separated Bicycle Lanes**
4. **Morgan Street + Jordan Street - Paired Bicycle Boulevards**
5. **French Broad Street - Shared Lane Markings**

For each project, the following details are provided:

- Project description and locator map
- Project challenges
- Concept design[1]
- Roadway Characteristics
- Project Detail
- Construction cost opinion

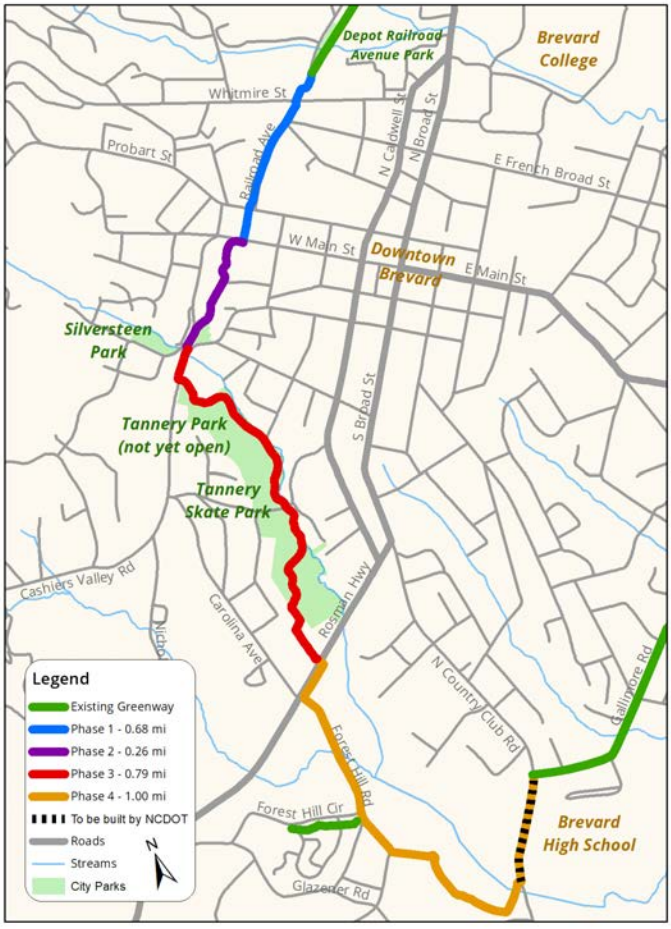
1 The facility types and concept designs provided on the following pages were developed and reviewed by engineers, but they are only examples of what can be implemented and are not intended as required design features.

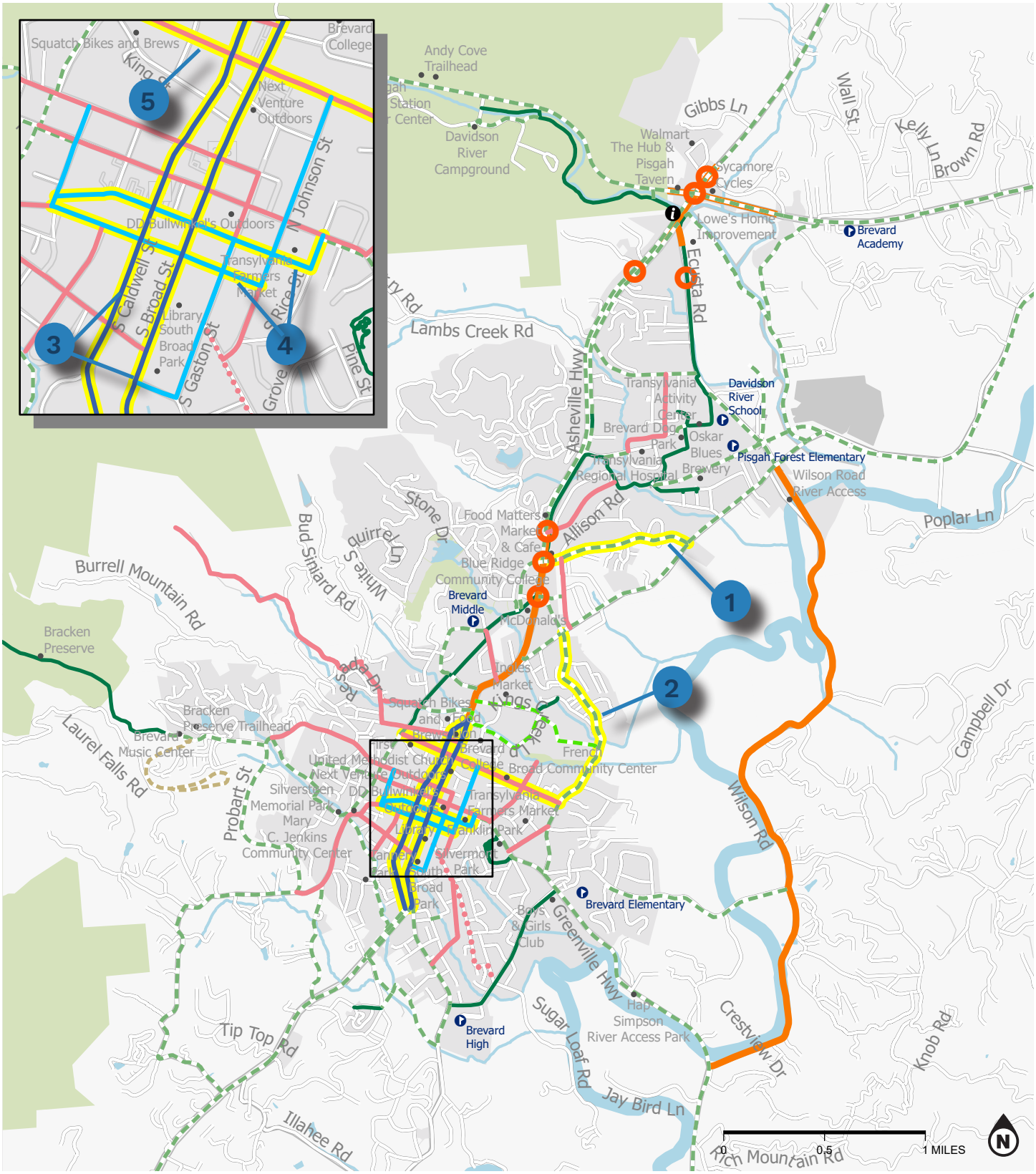
Estatoe Trail is Top Priority

Completing the Estatoe Trail was a recurring priority for the public who participated in this planning process. As this plan was being developed, the City of Brevard passed a resolution to extend the Estatoe Trail to Brevard High School in three years. At right is a map of the phased planned to complete the construction of the Estatoe Trail that was provided with the announcement of the City's resolution in September 2021. The goal of completing the Estatoe Trail remains the top priority of Brevard's constituents.

Ecusta Trail is Top Priority

The City of Brevard has long supported the Ecusta Trail as an asset to our community with cultural, economic, and transportation benefits. The first formal act was a resolution of support adopted in March of 2015. In June of 2021, the Brevard City Council adopted Resolution 2021-21, officially declaring its intent to be the lead governmental agency working towards securing funding, overseeing construction, and managing public use of the Ecusta Trail within Transylvania County. The City has already taken several steps in pursuit of this goal, including applying for a $15 million Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant for trail construction, and entering into a long-term lease agreement with Conserving Carolina, the land trust that owns the rail corridor. In May of 2022, the City was awarded a $1 million grant from the Federal Lands Access Program (FLAP) to begin final engineering and design work of the trail. The Ecusta Trail is—and will remain – a key priority for the City through construction and beyond.





REPRESENTATIVE PRIORITY PROJECTS

CITY OF BREVARD
PEDESTRIAN & BICYCLE PLAN

alta

PRIORITIZED PROJECT RECOMMENDATIONS

- Representative Priority Project

Proposed Bike + Ped Facilities

- Separated Bike Lane (SBL)
- Bike Boulevard
- Shared Lane Markings (SLM)
- Shared-Use Path
- Natural Surface Trail
- Shared Use Path- private

Existing Bike + Ped Facilities

- Shared Lane Markings (SLM)
- Shared-Use Path
- Natural Surface Trail
- Funded Roadway Projects
- Planned Roundabout

DESTINATIONS + BOUNDARIES

- Public Schools
- Railroad
- Streets
- Transylvania County
- Parks
- Brevard City Limits

Project 1:
Shared-Use Path along Osborne Road, from Asheville Highway to Old Hendersonville Highway

Osborne Road is an important east-west connector between Asheville Highway and Old Hendersonville Highway. Although it typically does not have a high volume of traffic on it, the roadway is curvy and hilly, which warrants a recommendation for a more separated bicycle facility. Also, given that there are no sidewalks on Osborne, a shared use path is recommended in order to safely support both walking and biking along this corridor.

The right of way is approximately 60-feet along the entire length of the corridor so there is room for a shared use path; however, buildings near the property lines, topographic changes, and heavy tree cover along the roadways all present significant challenges to installing a shared use path. Still, the connections to key destinations like Blue Ridge Community College and the Asheville Highway corridor make this an invaluable connection.

Roadway Characteristics (Existing):

- Average Annual Daily Traffic (AADT) = 750 – 1,900
- Speed Limit = 35 mph
- Curb + Gutter presence: both
- Pavement Width: ~22 feet
- Number of Lanes: 2.

Project Details:

- 10-foot Sidepath
- 5-foot planted buffer
- Length: 0.75 miles

Construction Cost Opinion:

- $2,035,000*

**Detailed cost estimates are provided in the Appendix and are based on NCDOT's P6.0 Bicycle-Pedestrian Cost Estimation Tool.*

PRIORITIZED PROJECT RECOMMENDATIONS

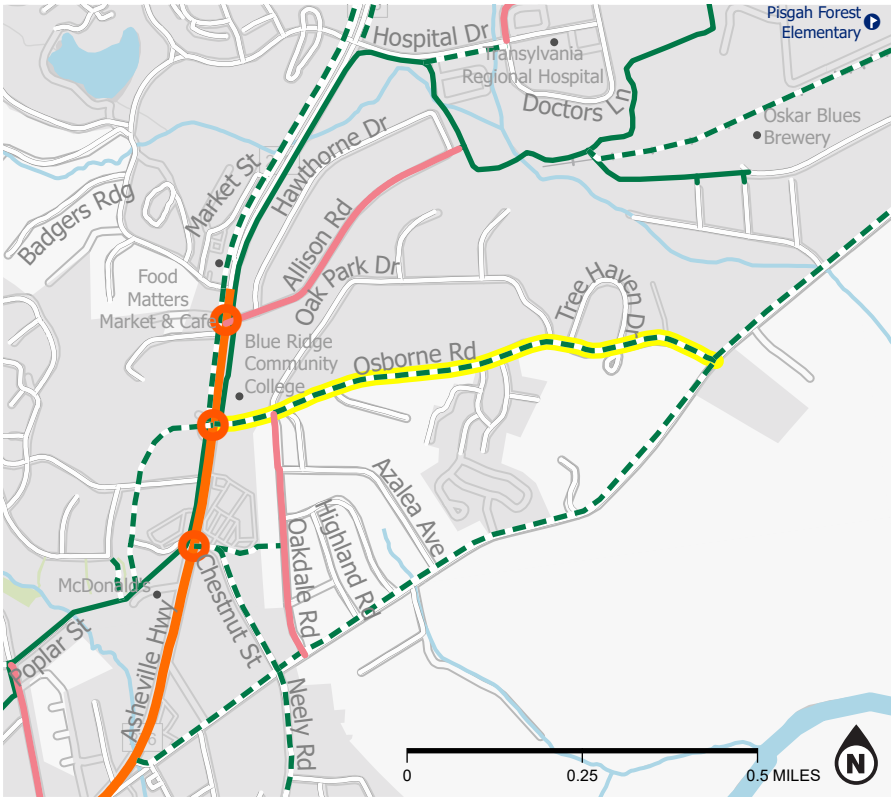
- Representative Priority Project

Proposed Bike + Ped Facilities

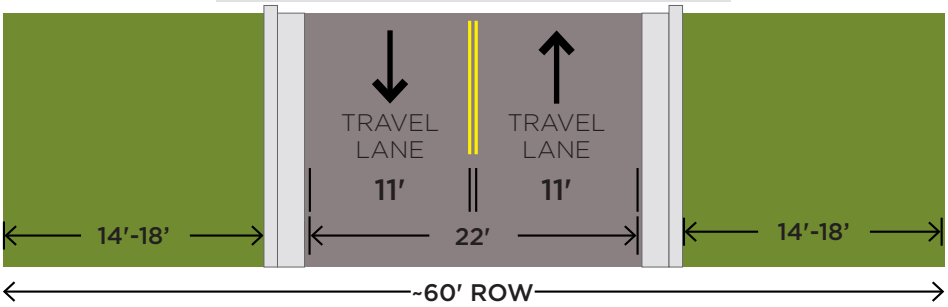
- Shared Lane Markings (SLM)
- Shared-Use Path

Existing + Funded Facilities

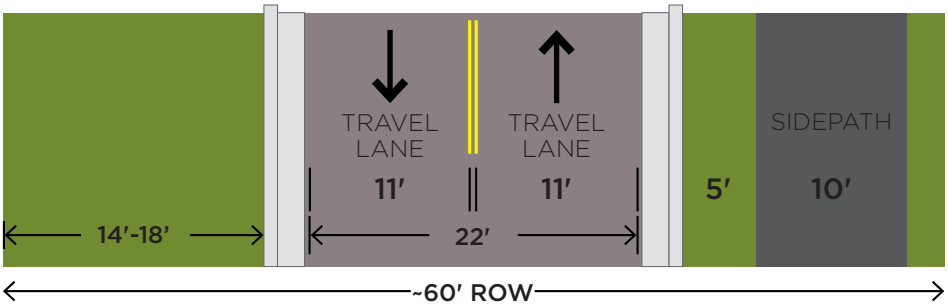
- Shared-Use Path
- Funded Roadway Projects
- Planned Roundabout



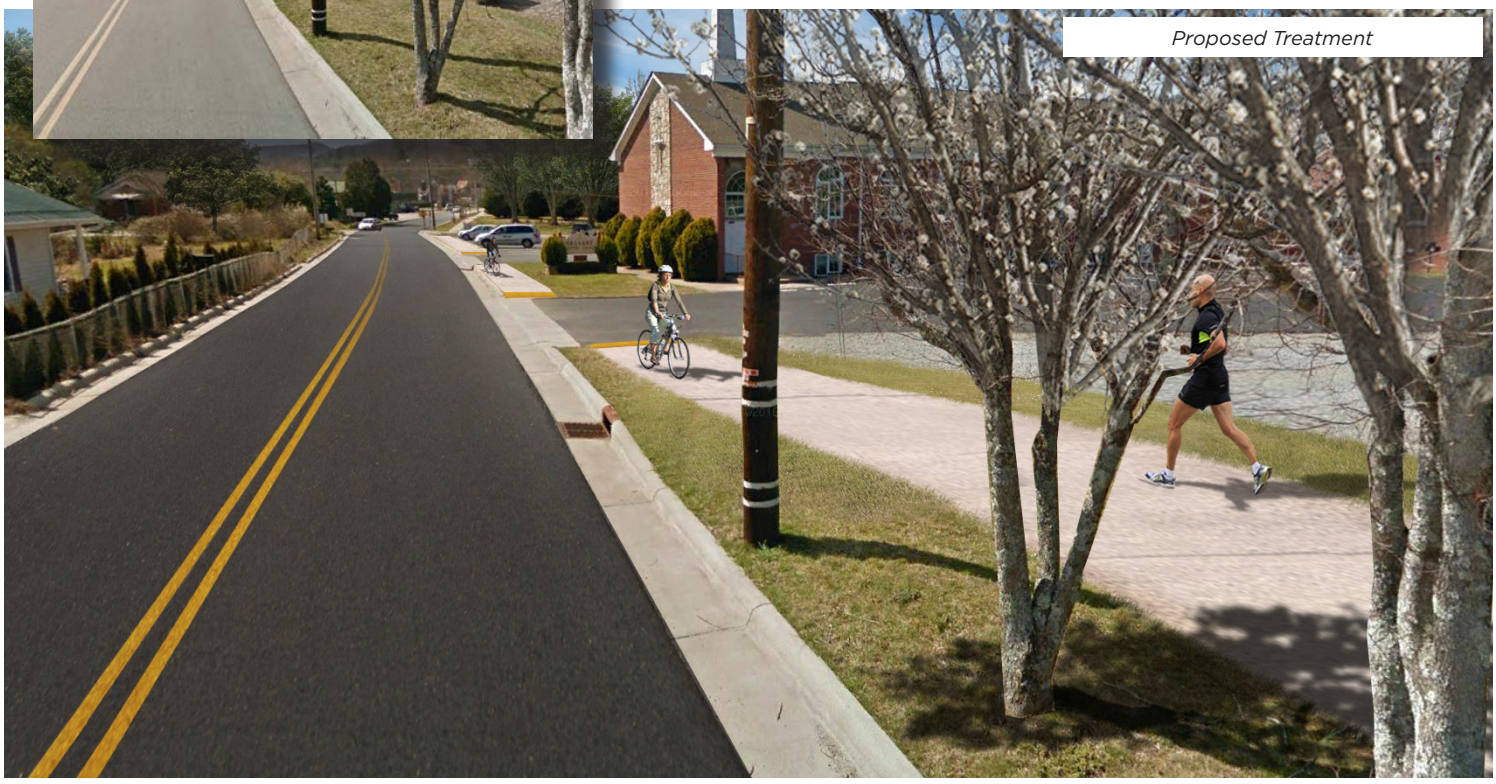
Existing Cross-Section



Proposed Cross-Section: Sidepath



Existing Conditions



PROJECT 2:
Shared-Use Path along Neely Road, from Old Hendersonville Highway to French Broad Street

Neely Road is an important north-south connection on the east side of town and is a long-standing top priority corridor from the Pedestrian Plan update of 2018, where the recommended facility was a sidewalk. Given the narrow right-of-way and more rural nature of the roadway, the sidewalk recommendation was updated and upgraded to a shared-use path in order to accommodate both pedestrian and bicycle traffic along this important corridor. This facility type offers the benefit of all active travel modes on one facility, rather than sidewalks and bicycle lanes, which would require significantly more right-of-way and cost more to widen the road.

Roadway Characteristics (Existing):

- Average Annual Daily Traffic (AADT) = 5,300
- Speed Limit = variable 25/35 mph
- Curb + Gutter presence: none
- Presence of Shoulders: none
- Pavement Width: ~22 feet
- Number of Lanes: 2

Project Details:

- 10-foot Sidepath
- 5-foot planted buffer
- Length: 0.98 miles

Construction Cost Opinion:

- $3,165,000*

**Detailed cost estimates are provided in the Appendix and are based on NCDOT's P6.0 Bicycle-Pedestrian Cost Estimation Tool.*

PRIORITIZED PROJECT RECOMMENDATIONS

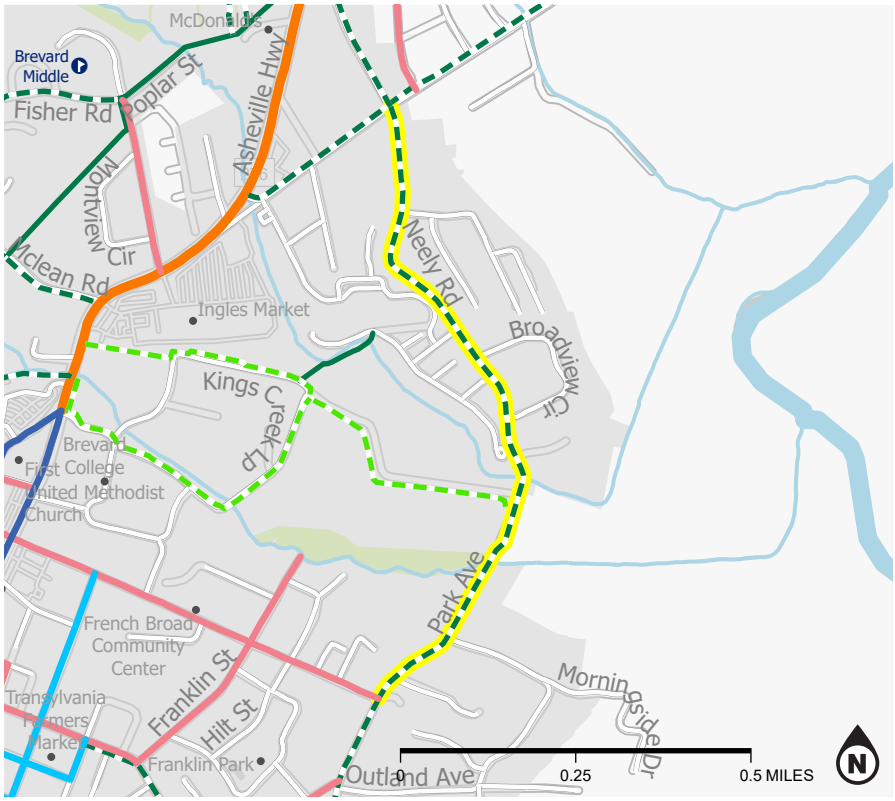
- Representative Priority Project

Proposed Bike + Ped Facilities

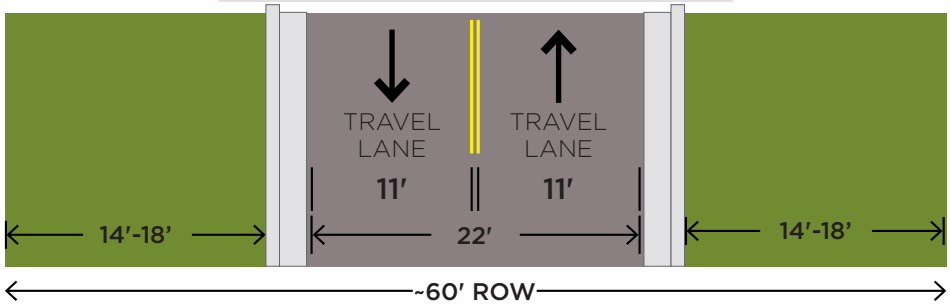
- Separated Bike Lane (SBL)
- Bike Boulevard
- Shared Lane Markings (SLM)
- Shared-Use Path
- Shared Use Path- private

Existing + Funded Facilities

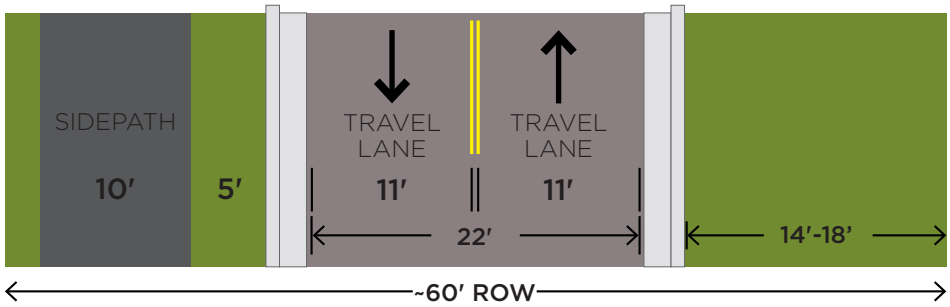
- Shared-Use Path
- Funded Roadway Projects
- Planned Roundabout



Existing Cross-Section



Proposed Cross-Section: Sidepath



Existing Conditions

Proposed Treatment

Project 3:
Separated Bicycle Lanes on Broad Street and Caldwell Street, for the full length of the Caldwell/Broad pair

Broad Street and Caldwell Street each have two travel lanes in one direction and one lane in the other, forming an uneven pair of roadways that, combined, have three lanes of north-bound travel and three lanes of southbound. The traffic volumes on these two roadways are at or below the threshold where two lanes in each direction could accommodate the traffic. The excess travel lane on each roadway could be converted into a separated bicycle lane, creating a pair of separated bicycle lanes. This pair of separated bicycle lanes would create an important bicycle connection through downtown Brevard that would be safe for all ages and abilities, and increase bicycle access to downtown and its many restaurants and businesses.

A full traffic analysis is recommended to evaluate how this roadway design would affect traffic on these two roadways. This analysis could also evaluate converting Broad and Caldwell into a true one-way pair, with two lanes of travel in each direction, which would offer simplified intersections and remove high crash-potential left turns across opposing traffic.

Roadway Characteristics (Existing):

- Average Annual Daily Traffic (AADT) = 9,900 - 14,500 (Broad Street) and (8,100 - 13,000)
- Speed Limit = variable 20/35 mph on Broad Street, 25 mph on Caldwell Street
- Curb + Gutter presence: curb is present throughout, gutter is present throughout except for downtown blocks of Broad Street
- Pavement Width: 50 feet (Broad Street) 33 - 36 ft (Caldwell Street)
- Number of Lanes: 6 total (3 north, 3 south)

Project Details:

- Restripe Broad Street and Caldwell Street to convert outside lane to be Separated Bicycle Lanes
- Length: 0.98 miles (Broad Street) 1.04 miles (Caldwell Street)

Construction Cost Opinion:

- $5,345,000*

**Detailed cost estimates are provided in the Appendix and are based on NCDOT's P6.0 Bicycle-Pedestrian Cost Estimation Tool.*

PRIORITIZED PROJECT RECOMMENDATIONS

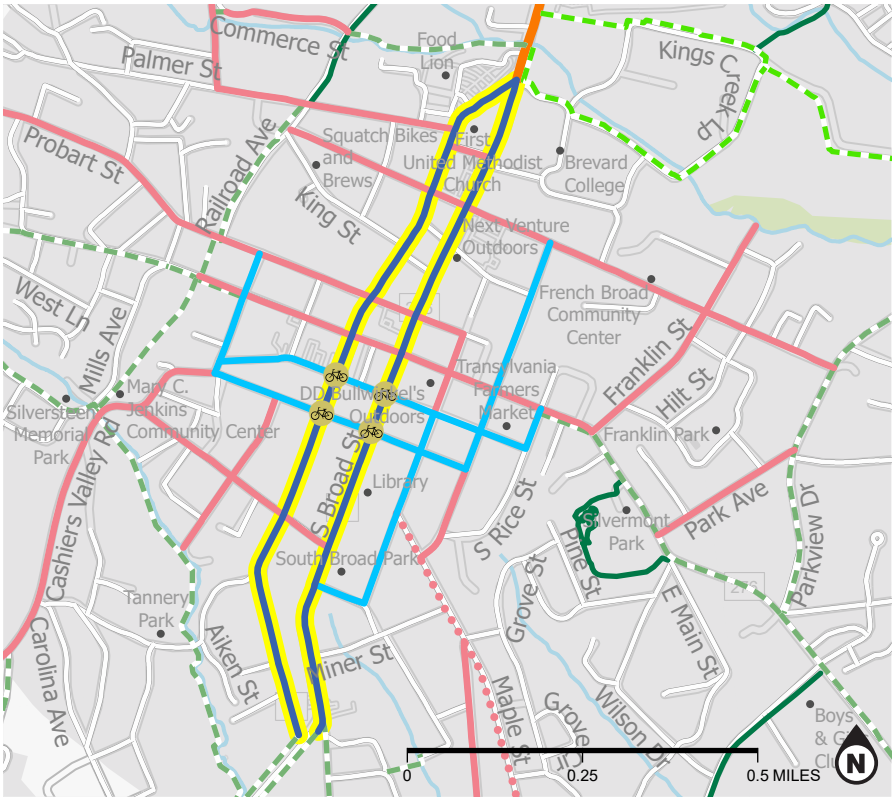
- Representative Priority Project

Proposed Bike + Ped Facilities

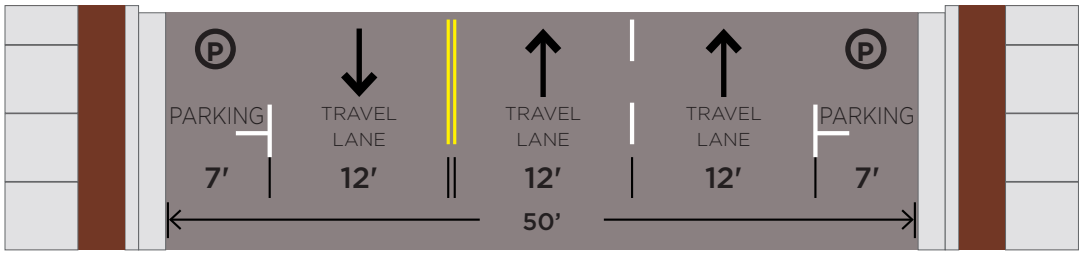
- Separated Bike Lane (SBL)
- Bike Boulevard
- Shared Lane Markings (SLM)
- Shared-Use Path
- Shared Use Path- private
- Bike Traffic Signal

Existing + Funded Facilities

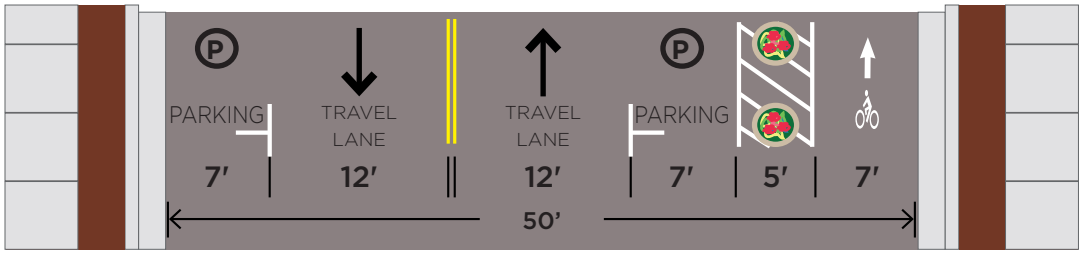
- Shared-Use Path
- Shared Lane Markings (SLM)
- Funded Roadway Projects



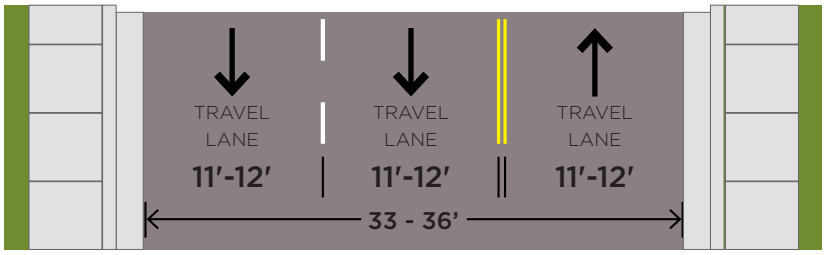
Existing Cross-Section (Broad St)



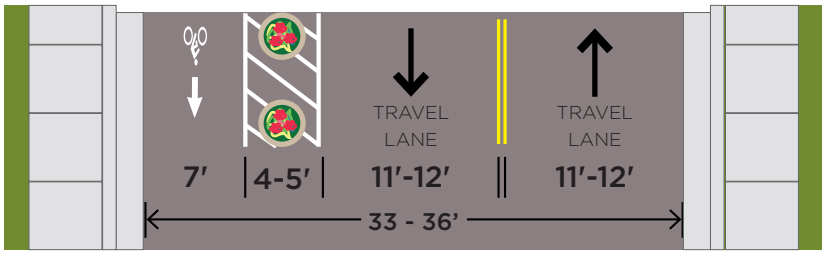
Proposed Cross-Section: Separated Bicycle Lanes

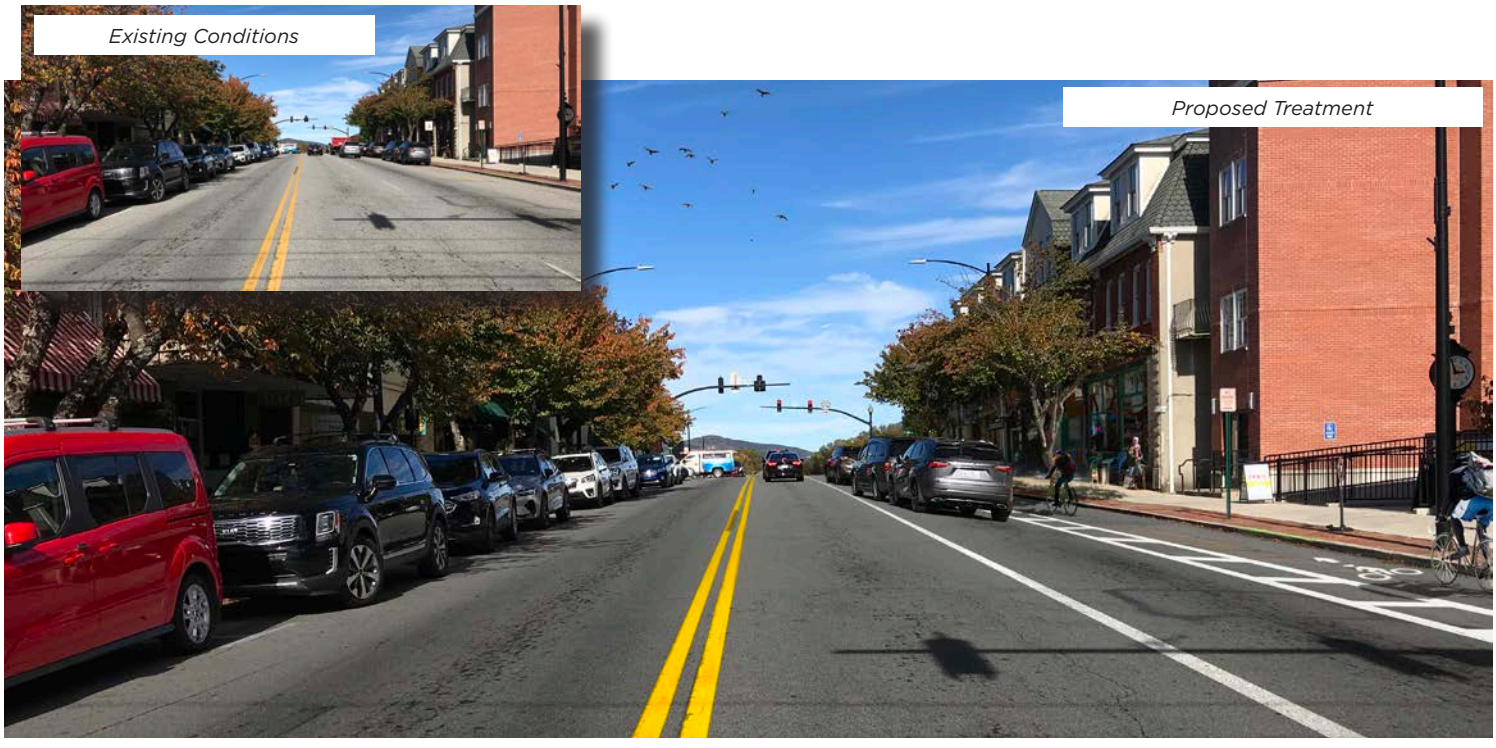


Existing Cross-Section (Caldwell St)



Proposed Cross-Section: Paired Separated Bicycle Lanes





Project 4:
Bicycle Boulevards on Morgan Street and Jordan Street, from Oaklawn Avenue to Johnson Street

Morgan Street and Jordan Street are an important pair of one-way roads in downtown Brevard, offering cross-town access for traffic of all kinds. One-way streets already offer ideal routes for bicyclists to travel without encountering high-speed motor vehicles. Adding additional features to prioritize bicyclists enhances the safety and comfort for people of all ages and abilities.

This project modifies the recommendations of the Downtown Master Plan and Streetscape, which also recommends bicycle boulevards on Morgan and Jordan Streets. This plan recommends buffered bicycle lanes to help provide separation between motor vehicle traffic and bicycle traffic. These buffered bicycle lanes can also be configured as contraflow bicycle lanes where the bicycle traffic is in the opposite direction of the one-way motor vehicle traffic (see photo-simulation on facing page).

This plan also recommends bicycle traffic signals be installed at the intersections of Morgan Street and Broad Street, Morgan and Caldwell Street, Jordan and Broad, and Jordan and Caldwell.

Roadway Characteristics (Existing):

- Average Annual Daily Traffic (AADT) = unknown
- Speed Limit = 25 mph
- Curb + Gutter presence: curb, no gutter pan
- Pavement Width: 24 feet
- Number of Lanes: one travel lane, 1 parking lane on each road

Project Details:

- Green-backed buffered bicycle lane
- Wayfinding Signage
- Length: 0.52 miles (Jordan Street) 0.39 miles (Morgan Street)

Construction Cost Opinion:

- $1,870,000*

**Detailed cost estimates are provided in the Appendix and are based on NCDOT's P6.0 Bicycle-Pedestrian Cost Estimation Tool.*

PRIORITIZED PROJECT RECOMMENDATIONS

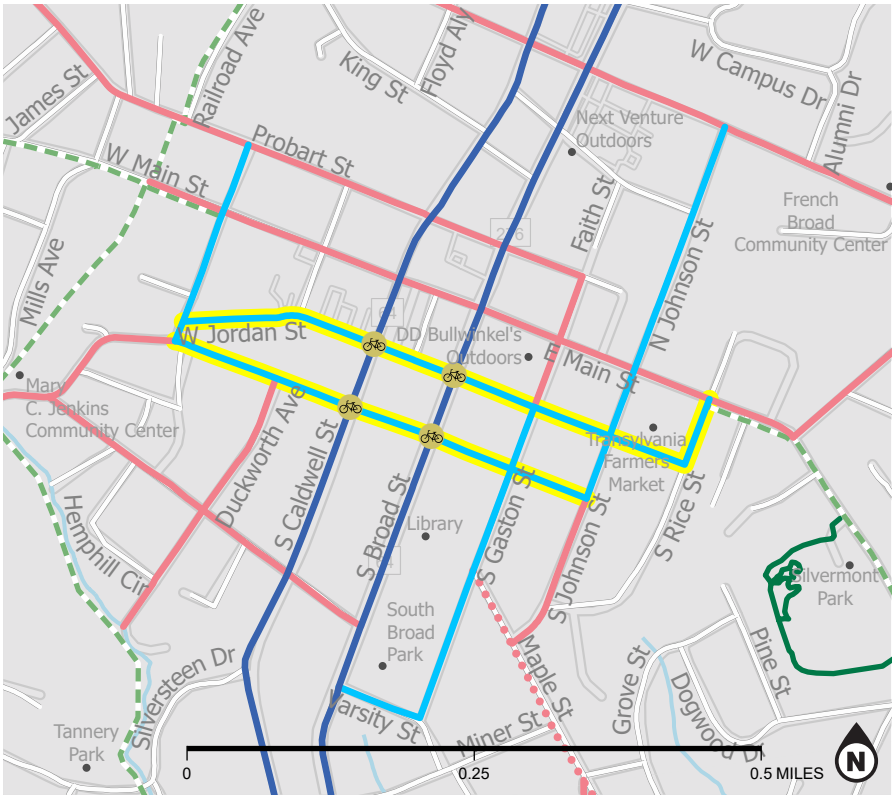
Representative Priority Project

Proposed Bike + Ped Facilities

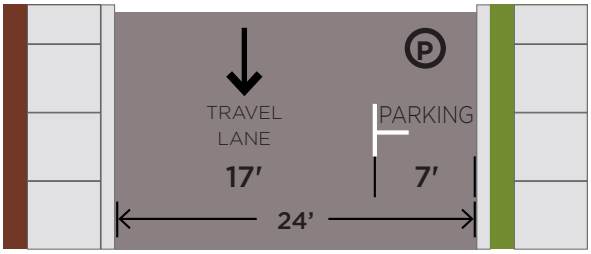
- Separated Bike Lane (SBL)
- Bike Boulevard
- Shared Lane Markings (SLM)
- Shared-Use Path
- Bike Traffic Signal

Existing Bike + Ped Facilities

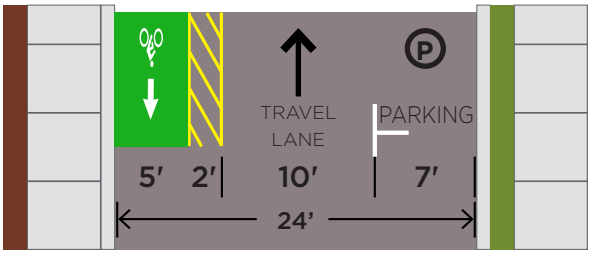
- Shared-Use Path
- Shared Lane Markings (SLM)



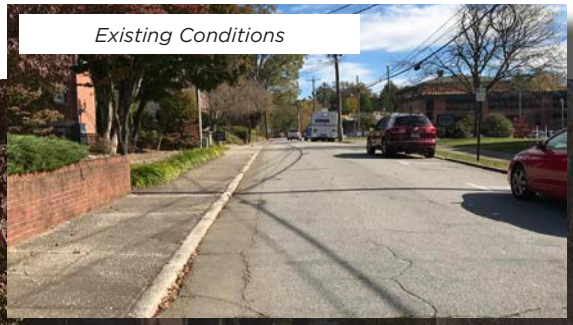
Existing Cross-Section



Proposed Cross-Section:
Bicycle Boulevard



Existing Conditions



Proposed Treatment

Project 5:
Shared Street on French Broad Street, from Railroad Avenue to Park Avenue

French Broad Street is another important east-west connector that provides direct access between Park Avenue and Railroad Avenue. A sidewalk already exists on the north side of the road, and there is enough right-of-way on the south side (10 feet) that a sidewalk could be also provided there as well. The full right-of-way is only 40 feet, and the paved roadway is only 22-feet wide, which limits the options for on-street facilities.

This plan recommends shared lane markings and traffic calming, including speed humps/tables and reducing the speed limit to 25 miles per hour.

A long-term option to study further might be reconstructing East French Broad Street to shift the roadway south and create more space on the north side for a shared-use path.

Roadway Characteristics (Existing):

- Average Annual Daily Traffic (AADT) = 600 - 1,500
- Speed Limit = 35 mph
- Curb + Gutter presence: curb, no gutter pan
- Pavement Width: 22 feet
- Number of Lanes: 2

Project Details:

- Shared Lane Markings
- Traffic Calming
- Reduce Speed Limit to 25 mph
- Wayfinding Signage
- Length: 0.85 miles

Construction Cost Opinion:

- $20,000*

**Detailed cost estimates are provided in the Appendix and are based on NCDOT's P6.0 Bicycle-Pedestrian Cost Estimation Tool.*

PRIORITIZED PROJECT RECOMMENDATIONS

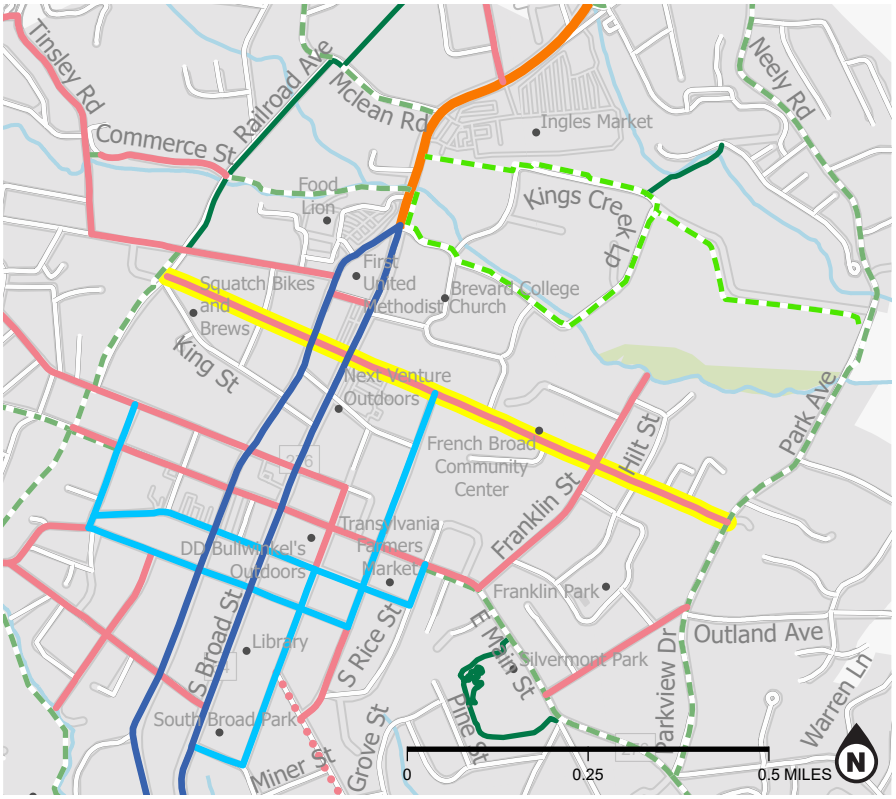
- Representative Priority Project

Proposed Bike + Ped Facilities

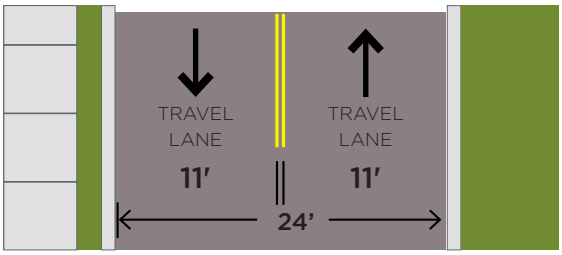
- Separated Bike Lane (SBL)
- Bike Boulevard
- Shared Lane Markings (SLM)
- Shared-Use Path
- Shared Use Path- private

Existing + Funded Facilities

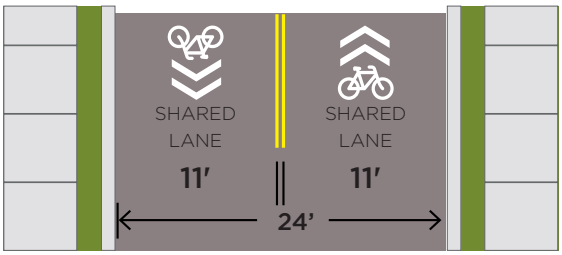
- Shared-Use Path
- Shared Lane Markings (SLM)
- Funded Roadway Projects



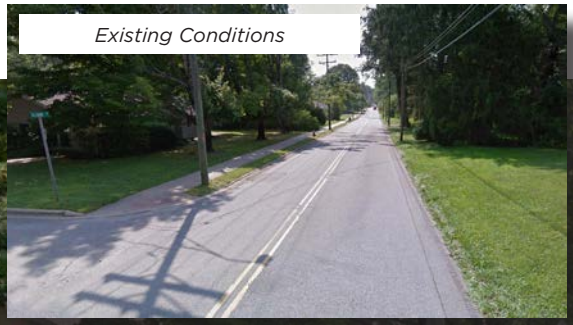
Existing Cross-Section



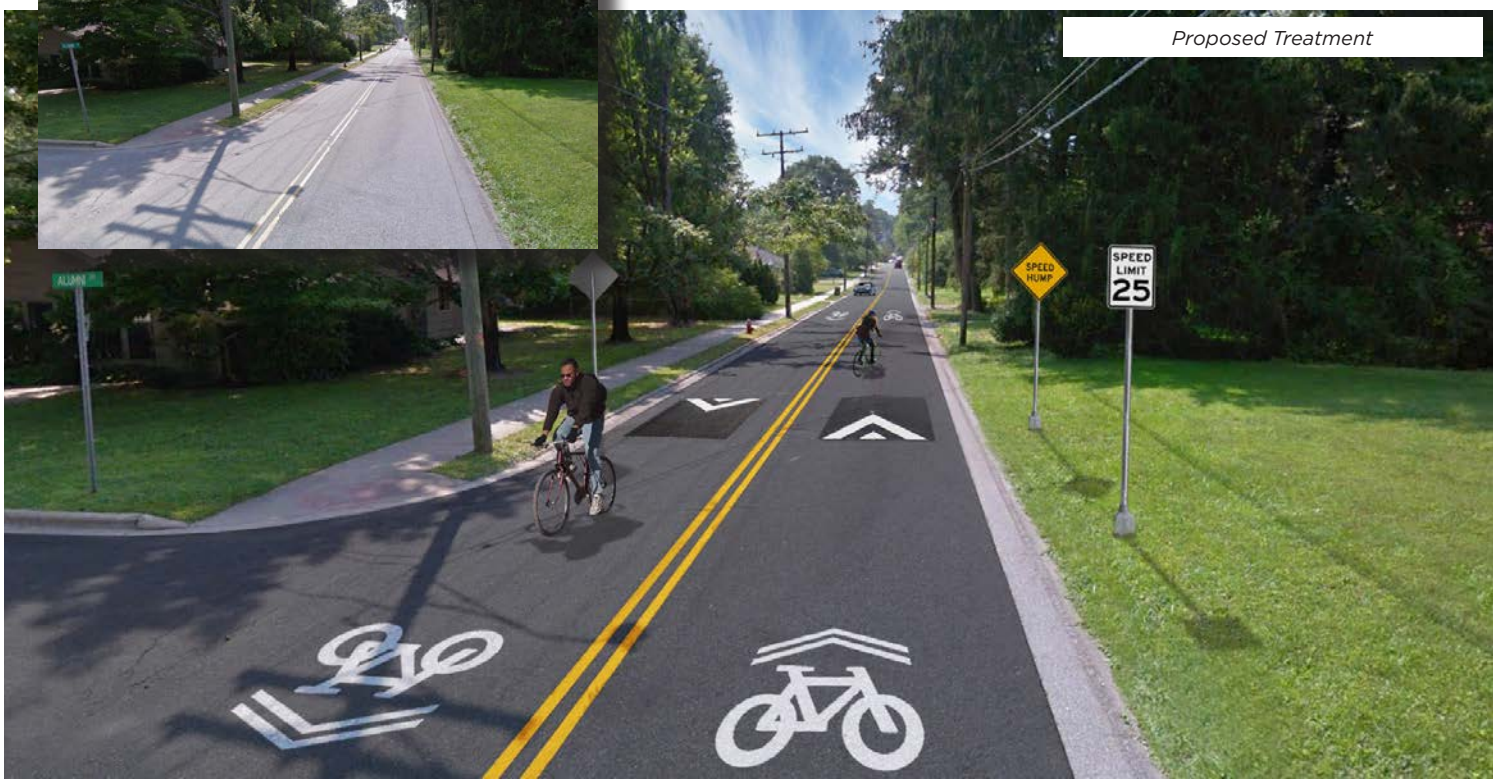
Proposed Cross-Section: Shared Street



Existing Conditions



Proposed Treatment



04 PROGRAM + POLICY RECOMMENDATIONS

PROGRAM RECOMMENDATIONS

Education, encouragement, enforcement, and promotional programs will help improve safety and accessibility for residents, as they learn how to safely travel along sidewalks, trails, and bikeways.

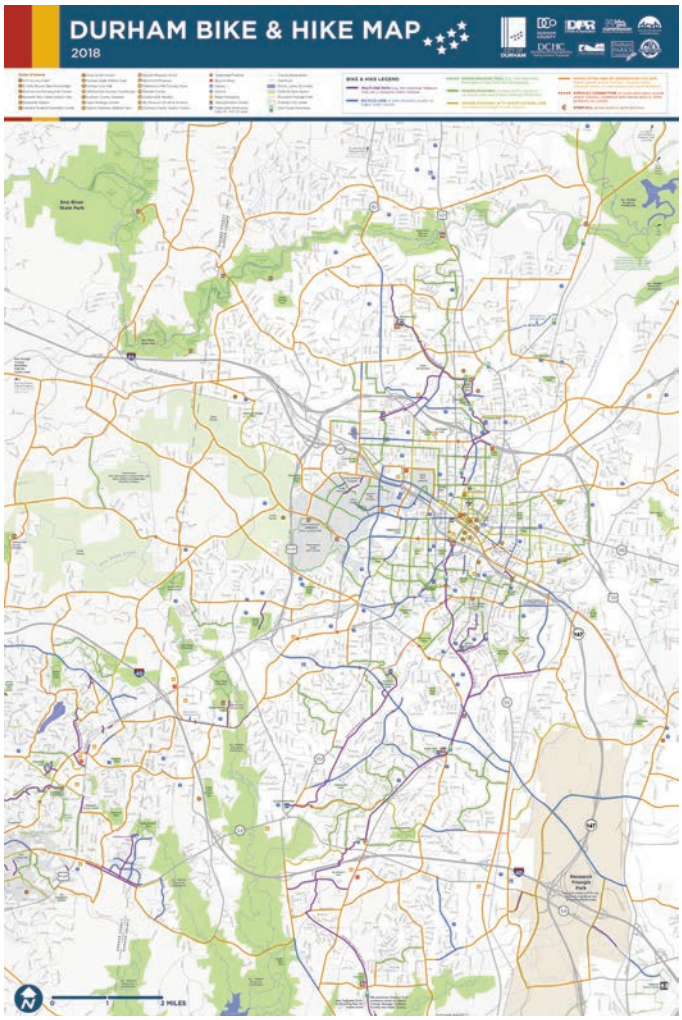
Wayfinding Signage Program

Wayfinding signage enhances resident and visitor orientation by directing pedestrians, bicyclists, and motorists to popular destinations around town. Brevard should develop a customized wayfinding program that provides effective orientation and direction to key destinations (see example at right). A wayfinding program can include directional signage, on-road markings, and kiosks with city maps. Signs can be customized for bicycling.

Above: Example wayfinding signage from Cornelius. A customized wayfinding signage design could be developed for Brevard to include Brevard logos; destinations; walking and bicycling-oriented travel times; and sponsorship branding.

Citywide Bicycle Map (Paper + Digital

One of the most effective ways of encouraging people to ride a bicycle is through the use of maps and guides to show where you can bike, and to guide people to enjoyable routes and destinations. These maps can also be designed so that a portion of the map is devoted to bicycle safety education, such as informational graphics that demonstrate bicycle hand signals and how to share the road and the trail safely. The map can be made available online and printed as needed to be actively distributed to residents and visitors. A City Bicycle Map could be created following completion of this plan.



Open Streets Events/Ciclovias

Car-free, open street events have many names-Sunday Parkways, Ciclovias, Summer Streets, and Sunday Streets-and involve periodic street "openings" that create a temporary park that is open to the public for walking, bicycling, dancing, and other physical activity. The purpose of the event is to encourage physical activity by providing a fun, welcoming environment for activity. Car-free street events have been very successful internationally and are rapidly becoming popular in the US. Local businesses open doors and set up tables along sidewalks to support the event and generate foot and bicycle traffic for their businesses. See http://openstreetsproject.org/ for more information.

Examples of Open Street events in Durham and Boone, NC

Bike/Walk to School Day & Bike to Work Day Events

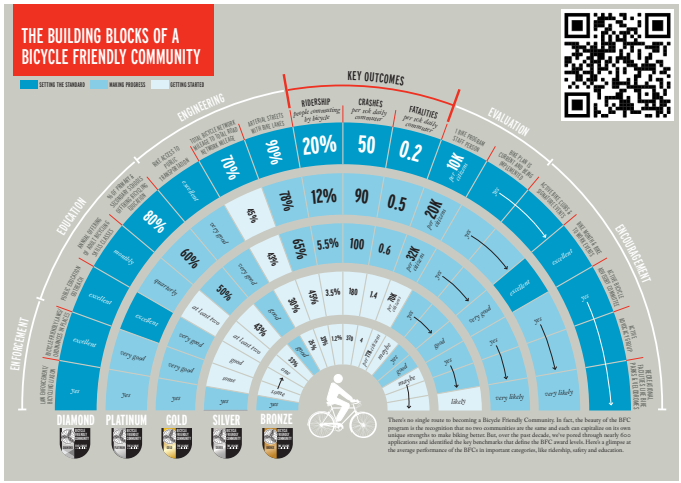
Bike and Walk to School Day events often include walking and biking competitions, outreach to parents, and pop-up infrastructure on routes to schools. These activities help parents figure out how to safely transport children by foot and bicycle and help children learn safe walking and bicycling skills. Activities may include a walking school bus, bicycle safety checks, a group ride or parade, "freedom from training wheels" clinics, and opportunities to try out different ways to transport children (e.g., walking, scooters, bicycle trailers, cargo bicycles, kid seats, etc.).

Bike to Work Day is a nationwide event that promotes bicycling to work and is typically the third Thursday in May. Organized events, such as group rides with elected officials and team-based bicycle challenges, can create opportunity for bicyclists to ride the streets of Brevard for utilitarian purposes and encourage new riders to bike to work.

Bike- and Walk Friendly Community Status

The Bike Friendly Community (BFC) program (administered by the League of American Bicyclists) is a national recognition program developed to encourage towns and cities across the US to create more bikeable environments. By reapplying for the BFC program, the City of Brevard could work towards a higher designation than its previous "Honorable Mention", and would receive valuable feedback from the League of American Bicyclists on how to further improve conditions for bicycling as compared to peer communities in NC and nationwide.

The Walk-Friendly Community program is a national program that recognizes towns and cities across the US that have created more walkable environments through comprehensive programs, plans, and policies. The City of Brevard can use the recommended guidelines and criteria for recognition to help improve conditions for walking as compared to peer communities in NC and nationwide. Visit http://walkfriendly.org for more information.



BFC Infographic. Download the full version here: http://bikeleague.org/sites/default/files/BFC%20infographic.pdf

Vision Zero Planning

Vision Zero (VZ) is a strategy to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. First implemented in Sweden in the 1990s, VZ has proved successful across Europe—and now it's gaining momentum in major American cities.

Adopting a VZ Policy is a community's commitment to creating a more balanced transportation system by prioritizing the safety of all roadway users—pedestrians and bicyclists; not just vehicle drivers and passengers—in the design and construction of its streets. A VZ Policy sets goals and objectives for eliminating traffic fatalities and injuries, and can be a city's first step towards establishing a VZ Plan.

A VZ Plan is a specific plan intended to reduce conflicts between cars and other roadways users—drivers, bicyclists, pedestrians, and others. By reducing conflicts between cars and other roadway users, VZ will prioritize safety as it encourages all modes of transportation with the primary goal of reducing bicycle and pedestrian conflicts, recognizing that when people feel safe and comfortable, they are more likely to walk and ride.

A VZ Plan is used to identify and address the causes of roadway-related injury and deaths through a data-driven process. With a VZ Plan in place, existing streets and any future street reconstruction projects would be reviewed for their compatibility with the goals and objectives of its Vision Zero Policy. Vision Zero focuses on human behavior; it emphasizes design solutions that account for human error and awareness to improve human behavior. More information on Vision Zero can be found at: ncvisionzero.org/ .

Law Enforcement Training

As Brevard develops new laws to improve the safety of vulnerable roadway users, partnering with the Brevard Police Department to improve the police department's curriculum on bicyclist safety laws will be important. When police officers are knowledgeable about bicycle laws and safety, they are more able and willing to enforce the laws that keep bicyclists safe.

A curriculum on existing laws around sharing the road can be oriented towards enforcement of bicyclists and drivers. This may include updating course material to include laws around new forms of micromobility, such as e-bikes.

The Brevard Police Department can work with local bicycle advocates to review any existing training materials and to develop course material. They can create a brief presentation that can be incorporated in a training, with a presentation that lasts no more than 20 minutes. Pamphlets on applicable laws (with the enforcement codes listed) can be made so police officers can quickly reference and pass out when enforcing bicycle safety laws. The Town should consider including additional information on reporting bicycle crashes that is based on best practices.

An example of a law enforcement training and education program on bicycle (and pedestrian) safety is available through the BikeCleveland advocacy group's website here: www.bikecleveland.org/enforcement/

Speed Enforcement

Speed feedback signs show "Your Speed and the "Speed Limit" to alert drivers to their actual speed and the posted speed limit (speed trailers serve a similar function, but are portable). They work best if they flash or provide a SLOW DOWN message if drivers exceed a preset speed threshold. Other effective features can include flashing a bright white light that mimics a photo speed camera or a blue and red light that mimics a police car when drivers are moving too fast. Some speed trailers have the capability to collect traffic count data and speed data throughout the day, which can be used to identify the most dangerous traffic times when more enforcement is needed.

Additional guidance from SafeRoutesInfo.org:

- Speed feedback signs still need to be used with other standard speed limit signs placed in advance of or next to it
- Typically, officers do not issue tickets based on the speed on the display unit. Instead, they use certified radar equipment if they are monitoring speed at the location
- Speed trailers need to be placed in locations where they do not block pedestrians, bicyclists, motor vehicle traffic or other vital traffic control signs
- Speed trailers are not substitutes for permanent actions, such as traffic-calming treatments to address neighborhood speeding issues.

POLICY RECOMMENDATIONS

One of the most cost-effective implementation strategies for the City of Brevard to improve pedestrian and bicycle facilities is to establish land development regulations and street design standards within their Unified Development Ordinance (UDO) that promote walkable and bikeable new development and capital projects. As part of a comprehensive approach to developing recommendations for a more walkable and bikeable community, Brevard's development ordinances, standards and policies were reviewed to identify general issues and opportunities impacting the pedestrian and bicycling environment. Regulatory standards and policies were analyzed through the lens of the project vision and goals, and to be consistent with the vision for this plan:

"Brevard is a premier destination for biking and walking, with a safe and expansive network of bicycle and pedestrian facilities connecting the city to the surrounding outdoor recreation and cultural destinations."

Model regulatory and policy language from around North Carolina and the US was identified for elements including land use/transportation integration, connectivity, Complete Streets, and bicycle parking, enabling the City to maximize sidewalk, on-road bicycle, and multi-use trail improvements in conjunction with new development, redevelopment, and corridor improvement projects.

Based on the policy and ordinance review, the following priority policy recommendations are identified:

Priority Policy and Regulatory Recommendations:

- Update the Unified Development Ordinance (UDO) to reflect **bicycle facility design** standards for the facility types recommended in this plan, including traffic calming elements of a bicycle boulevard.
- Update the UDO to specify short- and long-term **bicycle parking standards**.

By updating the design standards for pedestrian and bicycle facilities, and bicycle parking, the City of Brevard will be more prepared to have these facilities built as roadways are repaved and widened, and as new developments are built. These approaches to infrastructure improvements will complement other specific capital projects, and education, enforcement, and evaluation recommendations provided elsewhere in this planning document. The full policy and regulatory review is in the Appendix.

Bicycle Facility Design

The City should review and update all relevant policy and design guidance regarding bikeway design, materials, and supporting amenities to be consistent with best practices and regional guidance in order to ensure consistency and continuity across jurisdiction lines. The City should clearly define opportunities for relevant departments to coordinate on design, implementation, and maintenance of the network so that it can best serve the needs of all users.

Design Guidance Resources for the development of bicycle facilities by roadway type are provided in Chapter 5, Implementation Plan.

Bicycle Parking Standards

Bicycle parking is an important component of the bicycle network. Secure end-of-trip accommodations encourage people to travel by bicycle. The following policies seek to enhance current efforts to provide functional, secure and convenient bicycle parking.

Bicycle Corrals

Develop appropriate policies and standards to allow and promote the implementation of bicycle corrals. Bicycle corrals offer more short-term bicycle parking (that would normally be placed on the sidewalk) in a consolidated space on the street, occupying a traditional motor vehicle parking space. Bicycle corrals are commonly installed at locations that attract bicyclists and where parking bicycles at traditional short-term racks may crowd or clutter available sidewalk space.

Before installing bicycle corrals, a maintenance plan should be developed defining responsibilities, schedule, and methods for improving their longevity, maintaining their utility, and how corrals will fit into snow removal and street sweeping programs.

The bicycle corral parking area can be delineated or protected using poured concrete curbs, bollards, or planter boxes. Regardless of delineation type, corrals should be designed with the user in mind, maintaining ingress and egress and the same aisle and spacing standards desired for the short-term bicycle parking.

The benefits of bicycle corrals are not limited to the users themselves. Corrals can also provide, on average, a ratio of eight to twelve customers to one parking space, thus fostering more commercial opportunities for nearby businesses.

Long-Term Bicycle Parking

Consider developing requirements for long-term bicycle parking where land uses might encourage high demand for more secure, weather-proof bicycle parking. These could include places like schools, universities, or places that offer end of trip facilities such as changing rooms and lockers.

These facilities may include:

- *Lockers*. Fully enclosed and secure bicycle parking space accessible only to the owner or operator of the bicycle.
- *Restricted Access Parking*. A location that provides short-term-style bicycle racks within a locked room or locked enclosure accessible only to the owners of bicycles parked within.
- *Personal Storage*. Storage within view of the bicycle owner either in his or her office or another secure location within the building.

Request-A-Rack

Implementing a Request-A-Rack program will allow and encourage requests for bicycle racks that meet the standards set forth in this section. The City should maintain a supply of standard bicycle racks that can be installed upon request by business and property owners, managers and other bicycle parking requesters to provide increased bicycle parking in Brevard and mitigate bicycles locked to posts, signs, and trees. The rack request form can be hosted on the city's website. Each request should be sent to the appropriate staff as well.

Additional Policy Recommendations

In addition to the policy updates identified in development ordinance review, the following policy areas are recommendations to address the long-term vision and goals of this plan.

Maintenance

Routine maintenance can prolong the life of surface materials, increase the utility of the system, and encourage greater use. This includes maintaining bicycle lanes, protected facilities, and shared use paths by keeping them clear of debris, surfaces free from obstructions, and crossings well-marked. For shared use paths and trails, maintaining access points, trail surface, and crossings are important components to a well-functioning and effective system that supports trips of all types.

It is recommended that the City develop a routine maintenance schedule and track maintenance over time. These activities should include all components of the bicycle, shared use path, and trail networks.

In addition to routine maintenance, the City should track more significant maintenance needs and integrate these improvements into annual budgeting. This information should be tracked in a manner consistent with the system inventory recommended as part of this plan.

Develop a Dedicated Pedestrian & Bicycle Funding Stream

Communities that are successful in expanding their pedestrian and bicycling network leverage funds from a variety of sources and consistently make investments in capital and maintenance projects. A dedicated funding source is one mechanism to ensure sustainability and consistent expansion of bikeways.

Local governments can create a dedicated funding source by setting aside portions of general transportation revenue, public school bonds, county health department funding, parking fees, and traffic violation revenue for upgrades to biking facilities.

Brevard should consider partnering with other area governmental agencies, such as the Land of Sky RPO and Transylvania County to identify potential funding mechanisms. As an example, the City of Columbia, SC, implements bikeways through Richland County, which created a 1% sales tax for transportation, one-third of which goes to funding greenways and trails.

The Bracken Preserve is a popular destination for mountain bikers and walkers—both Brevard residents and visitors, alike.

05 IMPLEMENTATION PLAN

This chapter defines a structure for managing the implementation of this Plan. Implementing its recommendations will require leadership and dedication to pedestrian and bicycle facility development on the part of a variety of agencies. Equally critical, will be meeting the need for a recurring source of revenue. Even small amounts of local funding are essential for matching and leveraging outside sources. Most importantly, the City need not accomplish the recommendations of this plan by acting alone; success will be realized through collaboration with regional and state agencies, the private sector, and non-profit organizations.

Other important actions can be taken in advance of major investments, including formalizing a Bicycle and Pedestrian Advisory Committee (BPAC), initiating education and safety programs, and incorporating recommendations from this Plan into other City documents, policies, and procedures. Getting a project "shovel-ready" can be a huge step towards implementation, as many outside funding sources look more favorably upon projects that are already in public right-of-way, planned, and designed. Following through on these priorities will allow the key stakeholders to prepare for the development of larger bicycle and trail projects over time, while taking advantage of strategic opportunities as they arise.

IMPLEMENTATION FRAMEWORK

Key Partners & ROLES in Implementation

Brevard City Council

Recognize the value of bikeways, greenways, sidewalks by adopting this plan, thereby supporting quality of life in Brevard.

NCDOT-IMD*

Guidance on pedestrian + bicycle policy & project funding; Support in coordinating with local division & district offices

NCDOT Division 14

- Become familiar with the recommendations in this plan
- Communicate with Land of Sky RPO on potential projects that could incorporate pedestrian and bicycle facilities, especially where recommendations cross or align with NCDOT maintained ROW
- Coordinate with Land of Sky RPO on the STI process for pedestrian and bicycle projects

Land of Sky RPO

Coordinate with Brevard on leveraging funding opportunities through the STI processes; Incorporate this Plan's projects into long-range transportation plans

Brevard Interdepartmental Partners and/or BPAC

- Lead on funding, as part of CIP and public-private partnerships
- Coordinate implementation of this Plan's Action Steps
- Coordinate with Land of Sky Rural Planning Organization to leverage local funding on specific projects
- Coordinate with NCDOT Division for pedestrian and bicycle facilities as incidental projects during roadway reconstruction and resurfacing
- Continue to enforce development regulations to support bicycle facility and greenway development
- Coordinate with NCDOT, Land of Sky RPO and other project partners through the pedestrian and bikeway development process

Regional Partners

Continued coordination and partnerships with:

- Transylvania County Planning and Community Development
- Transylvania County Schools
- Neighboring cities and counties
- Conserving Carolina and Friends of the Ecusta Trail
- Private Developers

Private Sector

Potential partners in developing pedestrian + bicycle facilities and potential program sponsorship

Local Residents, Business Owners, and Civic Organizations

- Help build public support for pedestrian + bicycle projects and programs
- Reach out to elected officials and other decision-makers to express support for greenways, bikeways, + sidewalks

Consultants

Assist Brevard by providing guidance on project development, and by providing design and construction services

Acronym Legend:

BPAC: Bicycle & Pedestrian Advisory Committee
NCDOT: North Carolina Department of Transportation
IMD: Integrated Mobility Division
RPO: Regional Planning Organization
STI: Strategic Transportation Investments

ACTION STEPS

Table 5.1 Implementation Action Steps

#	TASK	LEAD	SUPPORT	DETAILS	PHASE
	ADMINISTRATIVE A ADMINISTRATIVE ACTION STEPS ACTION STEPS				
1	Adopt the *Brevard Pedestrian + Bicycle Plan*.	City Council	City Staff, Project Consultants, Steering Committee	Through adoption, the Plan becomes an official planning document of the City. Adoption does not commit the city to dedication of funding, but rather shows intention to support plan implementation over time. It also signals to outside funding groups that Brevard has undergone a successful, supported planning process, which is key to securing outside funding.	2022
2	Designate staff to lead implementation of *Brevard Pedestrian + Bicycle Plan*, including a "Pedestrian + Bicycle Plan Coordinator".	City Council & City Manager	Multiple departmental directors	The City Manager; City directors of Planning & Zoning, and Public Works; and the Public Safety Committee should each identify their respective departmental staff leads for implementing this pedestrian & bicycle plan. A staff organizational chart for plan implementation should be shared among departments, so there is a known point person for each. A single point person among the designated staff should be designated as the "Pedestrian + Bicycle Plan Coordinator".	2022
3	Designate a Bicycle and Pedestrian Advisory Committee (BPAC) for plan implementation.	City Council	City Manager and designated staff from step above	The City of Brevard should form a Bicycle and Pedestrian Advisory Committee (BPAC) out of the plan's steering committee to assist in the implementation of this plan. The BPAC should have representation from active pedestrians and commuting and recreational bicyclists and should champion the recommendations of this plan. The formation of this group would be a significant step in becoming designated as a Walk and Bicycle Friendly Community. The committee would provide a communications link between the residents of the community and local government. They should also continue to meet periodically, and be tasked with assisting City staff in community outreach, marketing, and educational activities recommended by this plan. See Chapter 4 for program recommendations.	2022
4	Communicate this plan's priority projects to potential implementation partners.	[future] Pedestrian + Bicycle Plan Coordinator	BPAC & NCDOT-Integrated Mobility Division (IMD)	The purpose of this step is to network with potential project partners, and to build support for implementing the top projects. Possible groups to receive a presentation/coordination meeting include: Land of Sky RPO, NCDOT Division 14, Transylvania County Parks & Recreation, neighboring jurisdictions. Consider a presentation at an annual Brevard Pedestrian & Bicycle Workshop.	2022

Table 5.1 Implementation Action Steps, continued

#	TASK	LEAD	SUPPORT	DETAILS	PHASE
	ADMINISTRATIVE ACTION STEPS (CONTINUED)				
5	Begin Annual Brevard Pedestrian + Bicycle meeting.	[future] Pedestrian + Bicycle Plan Coordinator	Departmental leads, stakeholders, NCDOT Division 14 highway staff and planning engineer	Coordination between key project partners will provide a level of accountability, and ensure that recommendations are implemented. Key project partners (see task 4 above & organizational chart) should meet on an annual basis to discuss and evaluate the implementation of this Plan. A brief progress benchmark memo should be a product of these meetings, and participants should reconfirm the plan's goals each year. The meetings could also occasionally feature special training sessions, or include on-site tours of recently completed projects and upcoming priority project corridors.	Ongoing (Beginning Summer 2022)
6	Update Brevard Pedestrian + Bicycle Plan	City Council & [future] Pedestrian + Bicycle Plan Coordinator	BPAC	This plan should be updated by 2027 (about five years from adoption). If many projects and programs have been completed by then, a new set of priorities should be established. If not, a new implementation strategy should be established, potentially reassigning project priorities.	2027
	INFRASTRUCTURE, POLICY, AND FUNDING ACTION STEPS				
7	Ensure that Brevard Pedestrian + Bicycle Plan recommendations are implemented as part of new development.	[future] Pedestrian + Bicycle Plan Coordinator	Designated staff from Planning & Zoning, Public Works departments	Other City documents and maps should be updated with recommendations from Brevard Pedestrian + Bicycle Plan, to ensure pedestrian and bicycle facilities are implemented with new development. Consider updates to the development standards to better support pedestrian bicycling infrastructure and bicycle parking standards.	2022 onward
8	Ensure that projects are incorporated in NCDOT's prioritization process and in the future planning of the NCDOT Planning Branch	[future] Pedestrian + Bicycle Plan Coordinator	Land of Sky RPO, NCDOT Division 14, and NCDOT Planning Branch, Transylvania County Transportation Advisory Council (TCTAC)	The City of Brevard, Land of Sky RPO, and NCDOT Division 14 should coordinate to fund recommendations from this plan over time. Use the plan cut-sheets and recommendation maps to communicate project details and to submit projects for funding. The City will need to be prepared to match at least 20% of their submitted project totals. Projects that have secured public right-of-way and design completed (or at least underway) will be more competitive.	2022 onward
9	Seek multiple funding sources and facility development options.	[future] Pedestrian + Bicycle Plan Coordinator	BPAC (for potential grant writing assistance, funding research, letters of support, etc.)	It will be necessary to consider many different sources of funding that together will support plan implementation. Funding sources can be used for a variety of activities, including: programs, planning, design, implementation, and maintenance. The appendix outlines the most likely sources of funding from the federal, state, and local government levels as well as from the private and non-profit sectors.	2022 onward

Table 5.1 Implementation Action Steps, continued

#	TASK	LEAD	SUPPORT	DETAILS	PHASE
10	Adopt guidelines for greenway trail accessibility	City Council	Brevard Planning & Zoning	Adopt the Outdoor Area Guidelines from the US Access Board. The guidelines are available for download and review here: https://www.access-board.gov/webinars/2021/08/05/accessible-pedestrian-trails-and-shared-use-paths/	2022
	INFRASTRUCTURE, POLICY, AND FUNDING ACTION STEPS (CONTINUED)				
11	Develop a long-term funding strategy.	[future] Pedestrian + Bicycle Plan Coordinator & Departmental leads, including Finance	City Council	To allow continued development of the project recommendations, capital funds for pedestrian and bicycle facility construction should be set aside every year. Funding for an ongoing maintenance program should also be included in the City's operating budget. Consider incorporating the *Brevard Pedestrian & Bicycle Plan*'s recommendations into a multi-year bond package for the City of Brevard, along with other initiatives, such as with projects related to parks, recreation, and transportation improvements.	2022 onward
12	Begin Priority Projects	[future] Pedestrian + Bicycle Plan Coordinator	City Council, departmental leads, private contractors	Dedicate funding, seek proposals, and hire a contractor for a site survey, construction documents, and permitting. Confirm that the project can be designed completely within existing public right-of-way, and secure easements if needed. When design is complete, select a phase of the project to be constructed first, based on costs and funding available at that stage. Send the project out to bid, select a contractor, and begin work. See typical project development cycle later in this chapter.	2022 onward
13	Invest in staff training opportunities related to pedestrian and bicycle infrastructure.	City Council	[future] Pedestrian + Bicycle Plan Coordinator & departmental leads	Consider trainings from the National Association of City Transportation Officials (NACTO) on the Urban Bikeway Design Guide. These trainings can be customized for Brevard staff, helping to ensure that as new facilities are designed and constructed, they are up to world-class standards for safety and functionality. If Brevard hosts the workshop, they could strategically invite NCDOT division staff, Land of Sky RPO staff, and others who would be partners in implementation. Cost sharing for the training could come from participation of staff from neighboring municipalities. More info: https://nacto.org/training-and-workshops/	Training would be most beneficial before design phase of major projects

Table 5.1 Implementation Action Steps, continued

#	TASK	LEAD	SUPPORT	DETAILS	PHASE
14	Maintain pedestrian and bicycle facilities.	Designated staff from Public Works	BPAC & General Public (for reporting maintenance needs); NCDOT	Brevard should define a maintenance plan, budget, and schedule for existing and future pedestrian and bicycle facilities, pavement markings, and sidewalks, working with NCDOT where necessary. See maintenance program recommendations in Chapter 3 for more on this topic.	2022 onward
INFRASTRUCTURE, POLICY, AND FUNDING ACTION STEPS (CONTINUED)					
15	Continue participating in NCDOT and ITRE's Non-Motorized Traffic Monitoring Program (Pedestrian & Bicycle Counts)	Public Works & Transportation and Parks, Recreation, and Cultural Resources	NCDOT & ITRE https://www.ncdot.gov/divisions/bike-ped/Pages/research-data.aspx	Since late 2014, NCDOT and local governments have installed equipment that uses electromagnetic bicycle detectors and infrared technology to count bicycle and pedestrian traffic. Over time, Brevard can expand this program as more bicycle facilities are constructed, and use this data to justify investment, prioritize projects, and understand preferred bicycling routes and behavior.	2022 onward
16	Coordinate with NCDOT Division 14 on their 3-year road resurfacing schedule (and any short term changes to it) to accomplish projects that require pavement markings.	[future] Pedestrian + Bicycle Plan Coordinator & Designated staff from Public Works & Transportation	NCDOT Division 14	Resurfacing is a very important opportunity for implementing bicycle facilities, especially ones that are primarily pavement markings. It is essential for implementation that the City stay in close touch with NCDOT Division 14 Operations and Maintenance staff to stay on top of the resurfacing schedule and keep closely abreast of any updates or changes to the schedule. Checking in with the Division at least once every quarter is not too often. Additionally, a BPAC representative could be assigned to reviewing the three-year resurfacing/restriping schedule from Division 14 on a regular basis to ensure there are no missed opportunities.	2022 onward
PROGRAM ACTION STEPS					
17	Initiate efforts to provide safe routes to school	City of Brevard	Transylvania County Schools, NCDOT Bike/Pedestrian Division	This effort will complement the objectives and priorities of the *Brevard Pedestrian & Bicycle Plan*. Additionally, NCDOT is looking for ways to continue some Safe Routes to School (SRTS) funding; coordinate with NCDOT-IMD regarding future opportunities for SRTS funding.	2022 onward
18	Launch new programs.	[future] Pedestrian + Bicycle Plan Coordinator & BPAC	NCDOT IMD, Brevard Police Dept., Transylvania County Schools & Transylvania County Public Health, public health advocates	These groups should coordinate new programs, as described in Chapter 4, such as launching a safety campaign, developing a map or mobile app with bicycle routes, hosting an "open streets" event, and pursuing some form of greenways signage and wayfinding program. The *Brevard Pedestrian & Bicycle Plan* steering committee members could also be called upon for program involvement.	Most feasible to begin programs after a BPAC is formed

Table 5.1 Implementation Action Steps, continued

#	TASK	LEAD	SUPPORT	DETAILS	PHASE
PROGRAM ACTION STEPS (CONTINUED)					
19	Distribute bicycle and pedestrian safety information.	BPAC	NCDOT IMD, Police Department, Heart of Brevard, Chamber of Commerce, Transylvania County Tourism Development Authority, Transylvania Times, bicycle shops and advocacy groups	NCDOT has print material with safety tips for motorists, bicyclists and pedestrians available for download at https://www.watchformenc.org/program-materials/. Other methods of distribution could include web sites, social media, and 'on-the-ground' in park kiosks. The Watch for Me NC program is another resource for this task (with more information at https://www.watchformenc.org/).	2022 onward
20	Conduct communication & outreach campaigns related to walking and bicycling.	BPAC	Local newspapers, City website & social media managers	BPAC should publicly announce their successes as progress is made. This could be achieved through social media and by establishing a page on the City website dedicated to bicycle/pedestrian education and project updates. Also, BPAC should provide regular (annual) reports to the City Council on implementation progress.	2022 onward
21	Seek designation as a Bicycle-Friendly Community and Walk Friendly Community	[future] Pedestrian + Bicycle Plan Coordinator	BPAC (members could be assigned tasks to complete individual portions of the application process)	The development and implementation of this plan is an essential first step toward becoming a designated Bicycle-Friendly Community and Walk Friendly Community. With progress on program, policy, and infrastructure recommendations, the City should be in a position to apply for and receive recognition by 2023. See https://bikeleague.org/community for more information on the application process.	2022

Facility Development Methods

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 new way to fund and prioritize transportation projects. See the appendix for more information.

RESIDENTIAL AND COMMERCIAL DEVELOPMENT

The construction of sidewalks, bicycle facilities, trails, greenways, and safe crosswalks should be required during 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 pedestrian and bicyclist access into, within, and through large parking lots. This ensures the future growth of the pedestrian and bicycle networks and the development of safe communities.

ROADWAY CONSTRUCTION

Pedestrians and bicyclists should be accommodated any time a new road is constructed or an existing road is reconstructed. In the longer-term, all new roads with moderate to heavy motor vehicle traffic should have sidewalks, bicycle facilities, and safe intersections. Also, case law surrounding the Americans with Disabilities Act (ADA) has found that roadway resurfacing constitutes an alteration, which requires the addition of curb ramps at intersections where they do not yet exist.

Repaving

Repaving projects provide a clean slate for revising pavement markings. When a road is repaved, the roadway should be restriped to provide space for bicycle 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, though this will likely require a local contribution. 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

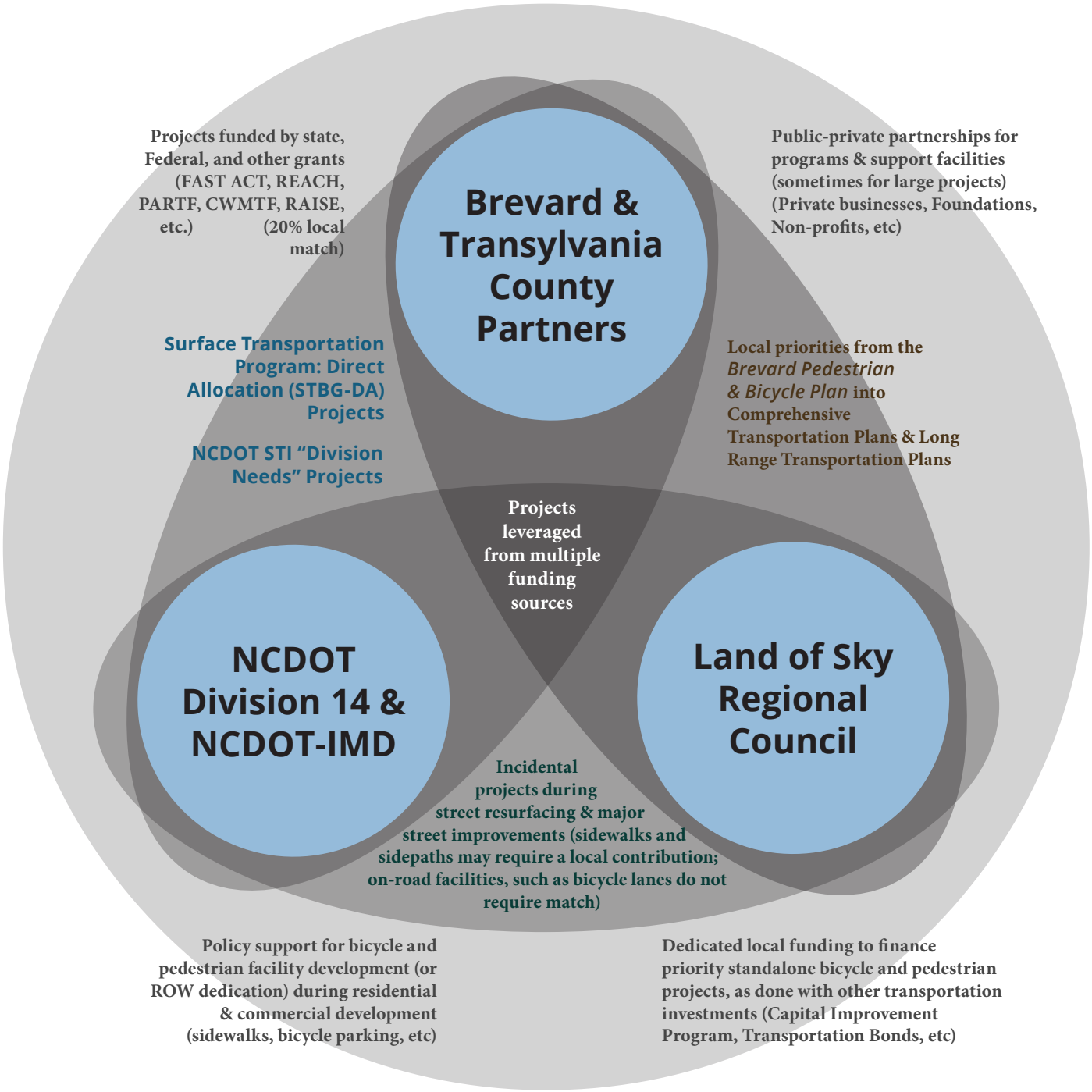
Provisions should always be made to include walking and bicycling facilities as a part of vehicular bridges. See NCDOT's "List of Bridges and Current Status": https://www.ncdot.gov/initiatives-policies/Transportation/bridges/Pages/default.aspx. Even though bridge construction and replacement does not occur regularly, it is important to consider these policies for long-term bicycle planning.

City Easements

Brevard should continue to revise existing utility easements to accommodate public access greenway trail facilities. Adopting policy language to allow for public access for trail users, as a matter of right, on all new sewer and utility easements would greatly enhance the development of greenways. 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 City's resources.

FUNDING OPPORTUNITIES

Typical Project FUNDING PARTNERS AND METHODS



Typical Project Development Process

These are the steps typically involved in pedestrian and bicycle facility development, when the project is being built independent of other major development or roadway projects. Certain funding sources may have additional requirements, and some steps may occur simultaneously or in a different order.

THE INFRASTRUCTURE INVESTMENT AND JOBS ACT (IIJA) (ALSO KNOWN AS THE BIPARTISAN INFRASTRUCTURE BILL)

The following is a preliminary summary of how IIJA may affect funding sources related to bicycle, pedestrian, and trail infrastructure based on what is known at the time this plan was written (late 2021).

FORMULA FUNDS (STATE DOTs ADMINISTER TO LOCALS)

TRANSPORTATION ALTERNATIVES PROGRAM (TAP)

TAP funding will increase from $850 million to $1.44 billion per year. This is the largest dedicated source of funds for walking and biking projects in the US, and it just got 70% bigger. The North Carolina Department of Transportation (NCDOT) administers this funding for rural areas of the state that do not have a metropolitan planning organization.

Land of Sky Regional Planning Organization administers Transportation Alternatives Program funding on a competitive basis to local jurisdiction in Brevard and Transylvania County.

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

States where more than 15% of all fatalities involve bicyclists or pedestrians (Vulnerable Road Users or VRU), will be required to spend 15% of their Highway Safety Improvement Program (HSIP) funding on bicycle/pedestrian projects. The percentage of VRU fatalities in North Carolina has been over 15% for the last five years (15.9%-17.1%).[1] Projects are evaluated, prioritized, and selected at the NCDOT district level based on three years of crash data (targeted funds) or systemic approved projects as outlined in the HSIP guidance.

Every state and MPO will be required to use at least 2.5% of its apportioned funding to develop planning documents that can include but are not limited to, Complete Streets standards, a Complete Streets prioritization plan, multimodal corridor studies, or active transportation plans (among other uses).

FOR MORE INFORMATION on these programs, check with Land of Sky RPO staff.

1 NC Vision Zero. Visualization: Safety Dashboard. Accessed at https://ncvisionzero.org/visualizations/safety-dashboard/

DISCRETIONARY GRANTS (US DOT ADMINISTERS TO LOCALS)

REBUILDING AMERICAN INFRASTRUCTURE WITH SUSTAINABILITY AND EQUITY (RAISE)

In the first RAISE grant cycle, nearly one in five funded grant applications involved trail development. In addition, the selection committee awarded another 21% of funding to projects focused on making roads safer for vulnerable road users like bicyclists and pedestrians. The Ecusta Trail and/or Estatoe Trail projects might compete well for the RAISE program with a focus on connecting people to local and regional destinations.

Under the Infrastructure Investment and Jobs Act (IIJA), the RAISE grant program will have $7.5 billion available over the next five years. Competitive applications to this program have the following in common:

1. The project can demonstrate broad community support and is a recognized local or regional priority.
2. The project explicitly considers how it will address climate change and racial equity.
3. The project documents direct and significantly favorable local or regional impact relative to the scoring criteria:
   - Safety
   - Environmental Sustainability
   - Quality of Life
   - Economic Competitiveness
   - State of Good Repair
   - Innovation
   - Partnership
4. The project has a high benefit to cost ratio.
5. The project demonstrates readiness by providing a detailed scope of work and budget, a realistic project delivery schedule, an understanding of the environmental risks, permit requirements, and mitigation measures, and is within the public right-of-way.
6. A United States Senator or Congress member actively champions the project.

For more information on RAISE program guidelines and upcoming Notice of Funding Opportunities, see:

www.transportation.gov/RAISEgrants

HEALTHY STREETS PROGRAM

This new program is a $500 million federal grant program to fund projects that address urban heat island effect, to include porous pavement changes and improvements to the tree canopy, especially along pedestrian walkways and public transit stops.

ACTIVE TRANSPORTATION INFRASTRUCTURE INVESTMENT PROGRAM

This is another new program through which local, regional, state, and tribal governments can apply to receive funding for active transportation projects and planning grants that build upon a local/regional/state network or network spine. The projects and planning efforts have to account for safety and facilitate more people walking and biking.

SAFE STREETS AND ROADS FOR ALL

With $6 billion, this new federal grant program will fund Vision Zero plans, infrastructure, and programs.

US DOT is developing grant program guidelines and will publish Notices of Funding Opportunities (NOFO) as they become available for each of the programs above.

When considering possible funding sources for bicycle and pedestrian projects, it is important to remember that not all construction activities or programs will be accomplished with a single funding source. It will be necessary to consider several sources of funding that together will support full project completion. Funding sources can be used for a variety of activities, including: programs, planning, design, implementation, and maintenance. This section outlines the most likely sources of funding from the federal, state, and local government levels as well as from the private and non-profit sectors.

Note that this reflects the funding available at the time of writing. Funding amounts, cycles, and the programs themselves may change over time.

Federal Funding Sources

AMERICAN RESCUE PLAN ACT (ARPA)

Funding Agency: Various Federal agencies including USDA; Consumer Product Safety Fund; Elementary and Secondary School Emergency Relief Fund; EPA; CDC; FEMA; PPP; Veterans Health Administration

Match: 0%

Description: The Coronavirus State and Local Fiscal Recovery Funds provide substantial flexibility for each government to meet local needs—including support for households, small businesses, impacted industries, essential workers, and the communities hardest hit by the crisis. These funds can also be used to make necessary investments in water, sewer, and broadband infrastructure.

Source: https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/state-and-local-fiscal-recovery-funds

GREAT AMERICA OUTDOORS ACT (GAOA)

Funding Agency: National Park Service; US Fish and Wildlife Service; Bureau of Land Management; Bureau of Indian Education; US Forest Service

Match: 0%

Description: This legislation will use revenues from energy development to provide needed maintenance for critical facilities and infrastructure in our national parks, forests, wildlife refuges, recreation areas, and American Indian schools. It will also use royalties from offshore oil and natural gas to permanently fund the Land and Water Conservation Fund to invest in conservation and recreation opportunities across the country.

Source: https://www.nps.gov/subjects/legal/great-american-outdoors-act.htm

INFRASTRUCTURE INVESTMENT AND JOBS ACT (PENDING CONGRESS)

Funding Agency: Various government agencies

Match: 0%

Description: The fund will rebuild the nation's deteriorating roads and bridges and fund new climate resilience and broadband initiatives such as modernizing the nation's power grid, repairing and replacing aging public works projects, moving communities vulnerable to climate change, reconnect communities divided by highway construction, improve access to running water in tribal and Alaska Native communities, restore lakes across the country, provide funding for Amtrak, provide more funding for programs intended to provide safe commutes for pedestrians, reduce collisions between vehicles and wildlife, clean up drinking water by removing lead-contaminated pipes, and reserve at least $25 million per year for "small and disadvantaged communities."

Source: https://www.congress.gov/bill/117th-congress/house-bill/3684

BUILDING RESILIENT INFRASTRUCTURE AND COMMUNITIES

Funding Agency: Federal Emergency Management Agency (FEMA)

Match: Contextually dependent

Description: Building Resilient Infrastructure and Communities (BRIC) will support states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards.

The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.

Source: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

ENVIRONMENTAL PROTECTION AGENCY FLOOD MITIGATION ASSISTANCE PROGRAM (FMA)

Funding Agency: Federal Emergency Management Agency (FEMA)

Match: 0%

Description: FMA is a competitive grant program that provides funding to states, local communities, federally recognized tribes, and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. FEMA requires state, local, tribal, and territorial governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation assistance projects.

Source: https://www.ncdps.gov/our-organization/emergency-management/disaster-recovery/hazard-mitigation/non-disaster-grants

UNITED STATES DEPARTMENT OF AGRICULTURE HEALTHY FORESTS RESERVE PROGRAM (HFRP)

Funding Agency: USDA Natural Resources Conservation Service

Match: 0%

Description: HFRP helps landowners restore, enhance and protect forestland resources on private lands through easements and financial assistance. HRFP aids the recovery of endangered and threatened species under the Endangered Species Act, improves plant and animal biodiversity and enhances carbon sequestration. Land enrolled in HFRP easements must be privately owned or owned by Indian tribes and restore, enhance or measurably increase the recovery of threatened or endangered species, improve biological diversity, or increase carbon storage.

Source: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/forests/

UNITED STATE DEPARTMENT OF AGRICULTURAL CONSERVATION EASEMENT PROGRAM (ACEP)

Funding Agency: USDA Natural Resources Conservation Service

Match: 17%

Description: ACEP helps landowners, land trusts, and other entities protect, restore, and enhance wetlands, grasslands, and working farms and ranches through conservation easements. Land protected by agricultural land easements protect the long-term viability of the nation's food supply by preventing conversion of productive working lands to non-agricultural uses, and provides additional public benefits, including environmental quality, historic preservation, wildlife habitat and protection of open space.

Source: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/nc/programs/easements/acep/?cid=stelprdb1249510

REBUILDING AMERICAN INFRASTRUCTURE WITH SUSTAINABILITY AND EQUITY (RAISE)

Funding Agency: US Department of Transportation (USDOT)

Match: 20%

Description: RAISE provides an opportunity for DOTs to invest in road, rail, transit and port projects that promise to achieve national objectives. RAISE grants are for capital investments in surface transportation infrastructure and are to be awarded on a competitive basis for projects that will have a significant local or regional impact.

Source: https://www.transportation.gov/RAISEgrants

INFRASTRUCTURE FOR REBUILDING AMERICA

Funding Agency: US Department of Transportation (USDOT)

Match: 20%

Description: These grants advance the priorities of rebuilding America's infrastructure and creating jobs by funding highway and rail projects of regional and national economic significance. NFRA grants are selected based on several criteria: how they would improve local economies, create jobs, and meet all statutory requirements, and how they would address climate change, environmental justice, and racial equity.

Source: https://www.transportation.gov/buildamerica/financing/infra-grants/infrastructure-rebuilding-america

COMMUNITY DEVELOPMENT BLOCK GRANTS (CDBG)

Funding Agency: US Department of Housing and Urban Development

Match: 0%

Description: CDBG provides annual grants on a formula basis to states, cities, and counties to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low- and moderate-income persons.

Source: https://www.hudexchange.info/programs/cdbg/

FEDERAL LANDS ACCESS PROGRAM (FLAP)

Funding Agency: US Federal Highway Administration (FHWA)

Match: 20%

Description: FLAP was established to improve transportation facilities that provide access to, are adjacent to, or are located within Federal lands. FLAP supplements State and local resources for public roads, transit systems, and other transportation facilities, with an emphasis on high-use recreation sites and economic generators.

Source: https://highways.dot.gov/federal-lands/programs-access

TRANSPORTATION ALTERNATIVES SET-ASIDE (TA)

Funding Agency: US Federal Highway Administration (FHWA)

Match: 20%

Description: TA provides funding for projects and activities defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation, trails that serve a transportation purpose, and safe routes to school projects.

Source: https://www.fhwa.dot.gov/fastact/factsheets/transportationalternativesfs.cfm

SURFACE TRANSPORTATION BLOCK GRANT (STBG)

Funding Agency: US Federal Highway Administration (FHWA)

Match: 5%

Description: STBG provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.

Source: https://www.fhwa.dot.gov/specialfunding/stp/

HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

Funding Agency: US Federal Highway Administration (FHWA)

Match: 0%

Description: The HSIP is a core Federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned roads and roads on tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance.

Source: https://safety.fhwa.dot.gov/hsip/

NATIONAL HIGHWAY PERFORMANCE PROGRAM (NHPP)

Funding Agency: US Federal Highway Administration (FHWA)

Match: 20%

Description: The NHPP provides support for the condition and performance of the National Highway System (NHS), for the construction of new facilities on the NHS, and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS.

Source: https://www.fhwa.dot.gov/fastact/factsheets/nhppfs.cfm

SAFE ROUTES TO SCHOOL (SRTS) PROGRAM

Funding Agency: US Department of Transportation (USDOT)

Match: 0%

SRTS enables and encourages children to walk and bike to school. The program helps make walking and bicycling to school a safe and more appealing method of transportation for children. SRTS facilitates the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools. Most of the types of eligible SRTS projects include sidewalks or shared use paths. However, intersection improvements (i.e. signalization, marking/upgrading crosswalks, etc.), on-street bicycle facilities (bicycle lanes, wide paved shoulders, etc.) or off-street shared use paths are also eligible for SRTS funds.

Source: https://www.transportation.gov/mission/health/Safe-Routes-to-School-Programs

FEDERAL LAND AND WATER CONSERVATION FUND

Funding Agency: State and Local Assistance Programs Division (SLAD)

Match: 50%

Description: The Land and Water Conservation Fund (LWCF) has historically been a primary funding source of the US Department of the Interior for outdoor recreation development and land acquisition by local governments and state agencies. Over its first 49 years (1965 - 2014), LWCF has provided more than $16.7 billion to acquire new Federal recreation lands as grants to State and local governments.

Over 40,000 grants to states and localities have been approved under the LWCF grants program for acquisition, development and planning of outdoor recreation opportunities in the United States. Grants have supported purchase and protection of 3 million acres of recreation lands and over 29,000 projects to develop basic recreation facilities in every State and territory of the nation.

As of August 2020, the LWCF is now permanently funded by the federal government for $900 million every year. This is hundreds of millions more per year than the fund typically receives.

Source: https://www.nps.gov/subjects/lwcf/stateside.htm

ENVIRONMENTAL CONTAMINATION CLEANUP FUNDING SOURCES

Funding Agency: US Environmental Protection Agency (EPA)

EPA's Brownfields Program provides direct funding for brownfields assessment, cleanup, revolving loans, and environmental job training. EPA's Brownfields Program collaborates with other EPA programs, other federal partners, and state agencies to identify and leverage more resources for brownfields activities. The EPA provides assessment grants to recipients to characterize, assess, and conduct community involvement related to brownfields sites. They also provide Area-wide planning grants (AWP) which provides communities with funds to research, plan, and develop implementation strategies for areas affected by one or more brownfields.

Source: https://www.epa.gov/brownfields

COOPERATIVE ENDANGERED SPECIES CONSERVATION FUND GRANTS

Funding Agency: US Fish and Wildlife Service (USFWS)

Match: 25%

Description: Section 6 of the ESA authorizes the Service to provide federal financial assistance through the Cooperative Endangered Species Conservation Fund (CESCF) to states and territories (states) to support the development and implementation of conservation programs for the benefit of resident listed, candidate, and at-risk species on non-federal lands. This financial assistance, provided in the form of competitive grants and made available through four CESCF grant programs, contributes approximately $51.8 million toward species and habitat conservation annually.

Source: https://www.fws.gov/endangered/grants/

State Funding Sources

There are multiple sources for state funding of bicycle and pedestrian transportation projects. However, beginning July 1, 2015, state transportation funds cannot be used to match federally-funded transportation projects, according to a law passed by the North Carolina Legislature.

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

Passed in 2013, the Strategic Transportation Investments law (STI) allows NCDOT to use its funding more efficiently and effectively to enhance the state's infrastructure, while supporting economic growth, job creation and a higher quality of life. This process encourages thinking from a statewide and regional perspective while also providing flexibility to address local needs.

STI also establishes the Strategic Mobility Formula, a new way of allocating available revenues based on data-driven scoring and local input. It was used for the first time to develop NCDOT's current construction schedule, the 2016-2025 State Transportation Improvement Program (STIP).

The STIP, which identifies the transportation projects that will receive funding during a 10-year period, is a state and federal requirement. Federal law requires it to be updated at least every four years. NCDOT, however, updates it every two years. Work is currently underway to update the STIP for 2023-2032.

The new Strategic Mobility Formula funds projects in three categories: Division Needs, Regional Impact, and Statewide Mobility. All independent bicycle and pedestrian 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, with a breakdown as follows:

Safety 15%

- Definition: Projects or improvements where bicycle or pedestrian accommodations are non-existent or inadequate for safety of users
- How it's measured: Crash history, posted speed limits, and estimated safety benefit
- Calculation:

STI Revenue Distribution (Source: www.ncdot.gov/strategic-transportationinvestments)

  - » Bicycle/pedestrian crashes along the corridor within last five years: 40% weight
  - » Posted speed limits, with higher points for higher limits: 40% weight
  - » Project safety benefit, measured by each specific improvement: 20% weight

Access 10%

- Definition: Destinations that draw or generate high volumes of bicyclists/pedestrians
- How it's measured: Type of and distance to destination

Demand 10%

- Definition: Projects serving large resident or employee user groups
- How its measured: # of households and employees per square mile within 1 ½ mile bicycle or ½ mile pedestrian facility + factor for unoccupied housing units (second homes)

Connectivity 10%

- Definition: Measure impact of project on reliability and quality of network
- How it's measured: Creates score per each Strategic Transportation Investments based on degree of bicycle/pedestrian separation from roadway and connectivity to similar or better project type

Cost Effectiveness 5%

- Definition: Ratio of calculated user benefit divided by NCDOT project cost
- How it's measured: Safety + Demand + Access + Connectivity)/Estimated Project Cost to NCDOT

Local Input 50%

- Definition: Input from MPO/RPOs and NCDOT Divisions, which comes in the form points assigned to projects.
- How it is measured: Base points + points for population size. A given project is more likely to get funded if it is assigned base points from both the MPO/RPO and the Division, making the need for communicating the importance of projects to these groups critical. Further, projects that have a local match will score higher.

ADDITIONAL BICYCLE AND PEDESTRIAN PROJECT REQUIREMENTS:

Federal funding typically requires a 20% non-federal match

State law prohibits state match for bicycle and pedestrian projects (except for Powell Bill). Since state law prohibits state monies from being the match for bicycle and pedestrian projects, the Town will need to supply the 20% match from other sources, such as the Town's own funds, matching grants, etc.

- Limited number of project submittals per MPO/RPO/Division
- Minimum project cost requirement is $100,000
- Bicycle/Pedestrian projects typically include: bicycle lanes, side path/greenway, paved shoulders, sidewalks, pedestrian signals, SRTS infrastructure projects, and other streetscape/multi-site improvements (such as median refuge, signage, etc.)

These rankings largely determine which projects will be included in NCDOT's State Transportation Improvement Program (STIP). The STIP is a federally mandated transportation planning document that details transportation planning improvements prioritized by the stakeholders for inclusion in NCDOT's Work Program over the next 10 years. "More than 900 non-highway construction projects were prioritized for years 2015-2020, totaling an estimated $9 billion. NCDOT will only have an estimated $1.5 billion to spend during this time period." The STIP is updated every 2 years. The STIP contains funding information for various transportation divisions of NCDOT, including, highways, rail, bicycle and pedestrian, public transportation and aviation.

For more information on STIP: www.ncdot.gov/initiatives-policies/Transportation/stip/Pages/default.aspx

To access the STIP: connect.ncdot.gov/projects/planning/Pages/State-Transportation-Improvement-Program.aspx

For more about the STI process: www.ncdot.gov/initiatives-policies/Transportation/stip/Pages/strategic-transportation-investments.aspx

INCIDENTAL PROJECTS

Bicycle accommodations, such as bicycle lanes, wide paved shoulders, , intersection improvements, bicycle safe bridge design, etc., are frequently included as "incidental" features of larger highway/roadway projects. This is increasingly common with the adoption of NCDOT's "Complete Streets" Policy.

In addition, bicycle safe drainage grates and handicapped accessible sidewalk ramps are now a standard feature of all NCDOT highway construction. Most pedestrian safety accommodations built by NCDOT are included as part of scheduled highway improvement projects funded with a combination of federal and state roadway construction funds, and usually with a local match. On-road bicycle accommodations, if warranted, typically do not require a local match.

"Incidental Projects" are often constructed as part of a larger transportation project, when they are justified by local plans that show these improvements as part of a larger, multi-modal transportation system. Having a local bicycle or pedestrian plan is important, because it allows NCDOT to identify where bicycle and pedestrian improvements are needed, and can be included as part of highway or street improvement project. It also helps local government identify what their priorities are and how they might be able to pay for these projects. Under "Complete Streets" local governments may be responsible for a portion of the costs for bicycle and pedestrian projects.

DUKE ENERGY WATER RESOURCES FUND

Duke Energy is investing $10 million in a fund for projects that benefit waterways in the Carolinas. The fund supports science-based, research-supported projects and programs that provide direct benefit to at least one of the following focus areas:

- Improve water quality, quantity and conservation;
- Enhance fish and wildlife habitats;
- Expand public use and access to waterways; and
- Increase citizens' awareness about their roles in protecting these resources.

Brevard could consider this resource for its proposed greenway network. For more information: www.nccommunityfoundation.org/apply/grants/corporate-grantmaking-programs/duke-energy-water-resources-fund

CLEAN WATER MANAGEMENT TRUST FUND

The Clean Water Management Trust Fund is available to any state agency, local government, or non-profit whose primary purpose is the conservation, preservation, and restoration of North Carolina's environmental and natural resources. Grant assistance is provided to conservation projects that:

- enhance or restore degraded waters;
- protect unpolluted waters, and/or
- contribute toward a network of riparian buffers and greenways for environmental, educational, and recreational benefits;
- provide buffers around military bases to protect the military mission;
- acquire land that represents the ecological diversity of North Carolina; and
- acquire land that contributes to the development of a balanced State program of historic properties.

The application deadline is typically in February. For more information: nclwf.nc.gov/grants

SPOT SAFETY PROGRAM

The Spot Safety Program is a state funded public safety investment and improvement program that provides highly effective low cost safety improvements for intersections, and sections of North Carolina's 79,000 miles of state maintained roads in all 100 counties of North Carolina. The Spot Safety Program is used to develop smaller improvement projects to address safety, potential safety, and operational issues. The program is funded with state funds and currently receives approximately $9 million per state fiscal year. Other monetary sources (such as Small Construction or Contingency funds) can assist in funding Spot Safety projects, however, the maximum allowable contribution of Spot Safety funds per project is $250,000.

The Spot Safety Program targets hazardous locations for expedited low cost safety improvements such as traffic signals, turn lanes, improved shoulders, intersection upgrades, positive guidance enhancements (rumble strips, improved channelization, raised pavement markers, long life highly visible pavement markings), improved warning and regulatory signing, roadside safety improvements, school safety improvements, and safety appurtenances (like guardrail and crash attenuators).

A Safety Oversight Committee (SOC) reviews and recommends Spot Safety projects to the Board of Transportation (BOT) for approval and funding. Criteria used by the SOC to select projects for recommendation to the BOT include, but are not limited to, the frequency of correctable crashes, severity of crashes, delay, congestion, number of signal warrants met, effect on pedestrians and schools, division and region priorities, and public interest. For more information: connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx

POWELL BILL FUNDS

Annually, State street-aid allocations (Powell Bill Funds) are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. Powell Bill funds shall be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways. Beginning July 1, 2015 under the Strategic Transportation Investments initiative,

Powell Bill funds may no longer be used to provide a match for federal transportation funds such as Transportation Alternatives. Certified Statement, street listing, add/delete sheet and certified map from all municipalities are due between July 1st and July 21st of each year. Additional documentation is due shortly after. More information: connect.ncdot.gov/municipalities/State-Street-Aid/Pages/default.aspx

HIGHWAY HAZARD ELIMINATION PROGRAM

The Hazard Elimination Program is used to develop larger improvement projects to address safety and potential safety issues. The program is funded with 90 percent federal funds and 10 percent state funds. The cost of Hazard Elimination Program projects typically ranges between $400,000 and $1 million. A Safety Oversight Committee (SOC) reviews and recommends Hazard Elimination projects to the Board of Transportation (BOT) for approval and funding. These projects are prioritized for funding according to a safety benefit to cost (B/C) ratio, with the safety benefit being based on crash reduction. Once approved and funded by the BOT, these projects become part of the department's State Transportation Improvement Program (STIP). For more information: connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx

GOVERNOR'S HIGHWAY SAFETY PROGRAM

The Governor's Highway Safety Program (GHSP)

funds safety improvement projects on state highways throughout North Carolina. All funding is performance-based. Substantial progress in reducing crashes, injuries, and fatalities is required as a condition of continued funding. This funding source is considered to be "seed money" to get programs started. The grantee is expected to provide a portion of the project costs and is expected to continue the program after GHSP funding ends. State Highway Applicants must use the web-based grant system to submit applications. For more information: www.ncdot.gov/initiatives-policies/safety/ghsp/Pages/default.aspx

THE NORTH CAROLINA DIVISION OF PARKS AND RECREATION – RECREATIONAL TRAILS AND ADOPT-A-TRAIL GRANTS

The North Carolina Division of Parks and Recreation and the State Trails Program offer funds to help citizens, organizations and agencies plan, develop and manage all types of trails ranging from greenways and trails for hiking, biking, and horseback riding to river trails and off-highway vehicle trails. "The Adopt-a-Trail Grant Program (AAT) awards $108,000 annually to government agencies, nonprofit organizations and private trail groups for trail projects. The Recreational Trails Program (RTP) is a $1.3 million grant program funded by Congress with money from the federal gas taxes paid on fuel used by off-highway vehicles. Grant applicants must be able to contribute 20% of the project cost or in-kind contributions. Both grant applications are typically due in January or February. For more information: trails.nc.gov/trail-grants

NC PARKS AND RECREATION TRUST FUND (PARTF)

The Parks and Recreation Trust Fund (PARTF) provide dollar-for-dollar matching grants to local governments for parks and recreational projects to serve the general public. Counties, incorporated municipalities, and public authorities, as defined by G.S. 159-7, are eligible applicants. A local government can request a maximum of $500,000 with each application. An applicant must match the grant dollar-for-dollar, 50 percent of the total cost of the project, and may contribute more than 50 percent. The appraised value of land to be donated to the applicant can be used as part of the match. The value of in-kind services, such as volunteer work, cannot be used as part of the match. Grant applications are typically due in February. For more information: www.ncparks.gov/more-about-us/parks-recreation-trust-fund/parks-and-recreation-trust-fund

COMMUNITY DEVELOPMENT BLOCK GRANT FUNDS

Community Development Block Grant (CDBG) funds are available to local municipal or county governments that qualify for projects to enhance the viability of communities by providing decent housing and suitable living environments and by expanding economic opportunities, principally for persons of low and moderate income. State CDBG funds are provided by the US Department of Housing and Urban Development (HUD) to the state of North Carolina. All North Carolina small cities are eligible to apply for funds except for 23 entitlement cities that receive funds directly from the US Department of Housing and Urban Development (HUD) (Brevard does not receive direct funds, so it is eligible to apply). Each year, CDBG provides funding to local governments for hundreds of critically-needed community improvement projects throughout the state. More information: www.nccommerce.com/grants-incentives

CLEAN WATER MANAGEMENT TRUST FUND (CWMTF)

This fund was established in 1996 and has become one of the largest sources of money in North Carolina for land and water protection, eligible for application by a state agency, local government, or non-profit. At the end of each year, a minimum of $30 million is placed in the CWMTF. The revenue of this fund is allocated as grants to local governments, state agencies, and conservation non-profits to help finance projects that specifically address water pollution problems. Funds may be used for planning and land acquisition to establish a network of riparian buffers and greenways for environmental, educational, and recreational benefits. Deadlines are typically in February. For more information: nclwf.nc.gov/

SAFE ROUTES TO SCHOOL (SRTS)

SRTS is managed by NCDOT, but is federally funded; See Federal Funding Sources above for more information.

URBAN AND COMMUNITY FORESTRY GRANT

The North Carolina Division of Forest Resources Urban and Community Forestry grant can provide funding for a variety of projects that will help toward planning and establishing street trees as well as trees for urban open space. The goal is to improve public understanding of the benefits of preserving existing tree cover in communities and assist local governments with projects which will lead to a more effective and efficient management of urban and community forests. Grant requests should range between $1,000 and $15,000 and must be matched equally with non-federal funds. Grant funds may be awarded to any unit of local or state government, public educational institutions, approved non-profit 501(c)(3) organizations, and other tax-exempt organizations. First

time municipal applicant and municipalities seeking Tree City USA status are given priority for funding. Grant applications are due by March 31 at 5:00 pm and recipients are notified by mid-July each year.

For more about Tree City USA status, including application instructions, visit: www.ncforestservice.gov/Urban/urban_grant_program.htm

Local Government Funding Sources

Municipalities often plan for the funding of pedestrian and bicycle facilities or improvements through development of Capital Improvement Program (CIP) or occasionally, through their annual Operating Budgets. In Raleigh, for example, the greenways system has been developed over many years through a dedicated source of annual funding that has ranged from $100,000 to $500,000, administered through the Recreation and Parks Department. CIPs should include all types of capital improvements (water, sewer, buildings, streets, etc.) versus programs for single purposes. This allows municipal decision-makers to balance all capital needs. Typical capital funding mechanisms include the capital reserve fund, capital protection ordinances, municipal service district, tax increment financing, taxes, fees, and bonds. Each category is described below. A variety of possible funding options available to North Carolina jurisdictions for implementing pedestrian and bicycle projects are also described below. However, many will require specific local action as a means of establishing a program, if not already in place.

CAPITAL RESERVE FUND

Municipalities have statutory authority to create capital reserve funds for any capital purpose, including pedestrian facilities. The reserve fund must be created through ordinance or resolution that states the purpose of the fund, the duration of the fund, the approximate amount of the fund, and the source of revenue for the fund. Sources of revenue can include general fund allocations, fund balance allocations, grants, and donations for the specified use.

CAPITAL PROJECT ORDINANCES

Municipalities can pass Capital Project Ordinances that are project specific. The ordinance identifies and makes appropriations for the project.

LOCAL IMPROVEMENT DISTRICT (LID)

Local Improvement Districts (LIDs) are most often used by cities to construct localized projects such as streets, sidewalks, or bikeways. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as traffic trip generation.

MUNICIPAL SERVICE DISTRICT

Municipalities have statutory authority to establish municipal service districts, to levy a property tax in the district additional to the town-wide property tax, and to use the proceeds to provide services in the district. Downtown revitalization projects are one of the eligible uses of service districts, and can include projects such as street, sidewalk, or bikeway improvements within the downtown taxing district.

TAX INCREMENT FINANCING

Project Development Financing bonds, also known as Tax Increment Financing (TIF) is a relatively new tool in North Carolina, allowing localities to use future gains in taxes to finance the current improvements that will create those gains. When a public project (e.g., sidewalk improvements) is constructed, surrounding property values generally increase and encourage surrounding development or redevelopment. The increased tax

revenues are then dedicated to finance the debt created by the original public improvement project. Streets, streetscapes, and sidewalk improvements are specifically authorized for TIF funding in North Carolina. Tax Increment Financing typically occurs within designated development financing districts that meet certain economic criteria that are approved by a local governing body. TIF funds are generally spent inside the boundaries of the TIF district, but they can also be spent outside the district if necessary to encourage development within it. Although larger cities use this type of financing more often, Woodfin, NC is an example of another small town that has used this type of financing.

OTHER LOCAL FUNDING OPTIONS

- Bonds/Loans
- Taxes
- Impact fees
- Exactions
- Installment purchase financing
- In-lieu fees
- Partnerships

Private and Non-Profit Funding Sources

Many communities have solicited funding assistance from private foundations and other conservation-minded benefactors. Below are several examples of private funding opportunities available.

LAND FOR TOMORROW CAMPAIGN

Land for Tomorrow is a diverse partnership of businesses, conservationists, farmers, environmental groups, health professionals, and community groups committed to securing support from the public and General Assembly for protecting land, water, and historic places. The campaign was successful in 2013 in asking the North Carolina General Assembly to continue to support conservation efforts in the state. The state budget bill includes about $50 million in funds for key conservation efforts in North Carolina. Land for Tomorrow works to enable North Carolina to reach a goal of ensuring that working farms and forests, sanctuaries for wildlife, land bordering streams, parks, and greenways, land that helps strengthen communities and promotes job growth, and historic downtowns and neighborhoods will be there to enhance the quality of life for generations to come. For more information: www.land4tomorrow.org/

THE ROBERT WOOD JOHNSON FOUNDATION

The Robert Wood Johnson Foundation was established as a national philanthropy in 1972 and today it is the largest US foundation devoted to improving the health and health care of all Americans.

Grant making is concentrated in four areas:

- To ensure that all Americans have access to basic health care at a reasonable cost
- To improve care and support for people with chronic health conditions
- To promote healthy communities and lifestyles
- To reduce the personal, social and economic harm caused by substance abuse: tobacco, alcohol, and illicit drugs

Projects considered for funding typically are innovative and aim to create meaningful, transformative change. Project examples include: service demonstrations; gathering and monitoring of health-related statistics; public education; training and fellowship programs; policy analysis; health services research; technical assistance; communications activities; and evaluations. For more specific information about what types of projects are funded and how to apply, visit: www.rwjf.org/en/how-we-work/grants-and-grant-programs.html

NORTH CAROLINA COMMUNITY FOUNDATION

The North Carolina Community Foundation, established in 1988, is a statewide foundation seeking gifts from individuals, corporations, and other foundations to build endowments and ensure financial security for non-profit organizations and institutions throughout the state. Based in Raleigh, the foundation also manages a number of community affiliates throughout North Carolina, that make grants in the areas of human services, education, health, arts, religion, civic affairs, and the conservation and preservation of historical, cultural, and environmental resources. The foundation also manages various scholarship programs statewide. For more information: https://www.nccommunityfoundation.org/

RITE AID FOUNDATION GRANTS

The Rite Aid Foundation is a foundation that supports projects that promote health and wellness in the communities that Rite Aid serves. Award amounts vary and grants are awarded on a one year basis to communities in which Rite Aid operates. The Rite Aid Foundation focuses on three core areas for charitable giving: children's health and well-being; special community health and wellness needs; and Ride Aid's own community of associates during times of special need. Online resource: foundation.riteaid.com/

Z. SMITH REYNOLDS FOUNDATION

This Winston-Salem-based Foundation has been assisting the environmental projects of local governments and non-profits in North Carolina for many years. The Foundation focuses its grant making on five focus areas: Community Economic Development; Environment; Public Education; Social Justice and Equity; and Strengthening Democracy. Deadline to apply is typically in August. For more information: www.zsr.org/grants-programs

BANK OF AMERICA CHARITABLE FOUNDATION, INC.

The Bank of America Charitable Foundation is one of the largest in the nation. There are numerous different initiatives and grant programs, yet the ones most relevant to increased recreational opportunities and trails are the Revitalizing Neighborhoods and Environment Programs. Starting in 2013, a new

10-year, $50 billion goal to be a catalyst for climate change was launched. This initiative aims to spark the "innovation economy and advance a transition to a low-carbon future." For more information: https://about.bankofamerica.com/en/making-an-impact/find-resources

DUKE ENERGY FOUNDATION

Funded by Duke Energy shareholders, this non-profit organization makes charitable grants to selected non-profits or governmental subdivisions. Each annual grant must have:

- An internal Duke Energy business "sponsor"
- A clear business reason for making the contribution

The grant program has several investment priorities: Education; Environment; Economic and Workforce Development; and Community Impact and Cultural Enrichment. Related to this project, the Foundation would support programs that support conservation, training, and research around environmental and energy efficiency initiatives. For more information: www.duke-energy.com/community/duke-energy-foundation

NATIONAL TRAILS FUND

American Hiking Society created the National Trails Fund in 1998, the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting and maintaining foot trails in America. 73 million people enjoy foot trails annually, yet many of our favorite trails need major repairs due to a $200 million backlog of badly needed maintenance. National Trails Fund grants help give local organizations the resources they need to secure access, volunteers, tools and materials to protect America's cherished public trails. To date, American Hiking has granted more than $588,000 to 192 different trail projects across the US for land acquisition, constituency building campaigns, and traditional trail work projects. Awards range from $500 to $10,000 per project.

Projects the American Hiking Society will consider include:

- Securing trail lands, including acquisition of trails and trail corridors, and the costs associated with acquiring conservation easements.
- Building and maintaining trails which will result in visible and substantial ease of access, improved hiker safety, and/or avoidance of environmental damage.
- Constituency building surrounding specific trail projects - including volunteer recruitment and support.

For more information: https://americanhiking.org/National-Trails-Fund/

THE CONSERVATION ALLIANCE

The Conservation Alliance is a non-profit organization of outdoor businesses whose collective annual membership dues support grassroots citizen-action groups and their efforts to protect wild and natural areas. Grants are typically about $35,000 each. Since its inception in 1989, The Conservation Alliance has contributed $4,775,059 to environmental groups across the nation, saving over 34 million acres of wild lands.

The Conservation Alliance Funding Criteria are as follows:

- The Project should be focused primarily on direct citizen action to protect and enhance our natural resources for recreation.
- The Alliance does not look for mainstream education or scientific research projects, but rather for active campaigns.
- All projects should be quantifiable, with specific goals, objectives, and action plans and should include a measure for evaluating success.
- The project should have a good chance for closure or significant measurable results over a fairly short term (within four years).

For more information: http://www.conservationalliance.com/grants

NATIONAL FISH AND WILDLIFE FOUNDATION (NFWF)

The National Fish and Wildlife Foundation (NFWF) is a private, non-profit, tax exempt organization chartered by Congress in 1984. The National Fish and Wildlife Foundation sustains, restores, and enhances the Nation's fish, wildlife, plants, and habitats. Through leadership conservation investments with public and private partners, the Foundation is dedicated to achieving maximum conservation impact by developing and applying best practices and innovative methods for measurable outcomes.

The Foundation provides grants through more than 70 diverse conservation grant programs. A few of the most relevant programs for bicycle and pedestrian projects include Acres for America, Conservation Partners Program, and Environmental Solutions for Communities. Funding priorities include bird, fish, marine/coastal, and wildlife and habitat conservation. Other projects that are considered include controlling invasive species, enhancing delivery of ecosystem services in agricultural systems, minimizing the impact on wildlife of emerging energy sources, and developing future conservation leaders and professionals.

For more information: http://www.nfwf.org/whatwedo/grants/Pages/home.aspx

THE TRUST FOR PUBLIC LAND

Land conservation is central to the mission of the Trust for Public Land (TPL). Founded in 1972, the TPL is the only national non-profit working exclusively to protect land for human enjoyment and well-being. TPL helps acquire land and transfer it to public agencies, land trusts, or other groups that have intentions to conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities.

For more information: http://www.tpl.org

BLUE CROSS BLUE SHIELD OF NORTH CAROLINA FOUNDATION (BCBS)

Blue Cross Blue Shield (BCBS) focuses on programs that use an outcome approach to improve the health and well-being of residents. Healthy Places grant concentrates on increased physical activity and active play through support of improved build environment such as sidewalks, and safe places to bike. Eligible grant applicants must be located in North Carolina, be able to provide recent tax forms and, depending on the size of the non-profit, provide an audit. For more information: http://www.bcbsncfoundation.org/

ALLIANCE FOR BIKING & WALKING: ADVOCACY ADVANCE GRANTS

Bicycle and pedestrian advocacy organizations play the most important role in improving and increasing biking and walking in local communities. Rapid Response Grants enable state and local bicycle and pedestrian advocacy organizations to develop, transform, and provide innovative strategies in their communities. Since 2011, Rapid Response grant recipients have won $100 million in public funding for biking and walking. The Advocacy Advance Partnership with the League of American Bicyclists also provides necessary technical assistance, coaching, and training to supplement the grants. For more information, visit www.peoplepoweredmovement.org

LOCAL TRAIL SPONSORS

A sponsorship program for trail amenities allows smaller donations to be received from both individuals and businesses. Cash donations could be placed into a trust fund to be accessed for certain construction or acquisition projects associated with the greenways and open space system. Some recognition of the donors is appropriate and can be accomplished through the placement of a plaque, the naming of a trail segment, and/or special recognition at an opening ceremony. Types of gifts other than cash could include donations of services, equipment, labor, or reduced costs for supplies.

CORPORATE DONATIONS

Corporate donations are often received in the form of liquid investments (i.e. cash, stock, bonds) and in the form of land. Municipalities typically create funds to facilitate and simplify a transaction from a corporation's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented.

PRIVATE INDIVIDUAL DONATIONS

Private individual donations can come in the form of liquid investments (i.e. cash, stock, bonds) or land. Municipalities typically create funds to facilitate and simplify a transaction from an individual's donation to

the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented.

FUNDRAISING/CAMPAIGN DRIVES

Organizations and individuals can participate in a fundraiser or a campaign drive. It is essential to market the purpose of a fundraiser to rally support and financial backing. Often times fundraising satisfies the need for public awareness, public education, and financial support.

VOLUNTEER WORK

It is expected that many citizens will be excited about the development of a greenway corridor. Individual volunteers from the community can be brought together with groups of volunteers form church groups, civic groups, scout troops and environmental groups to work on greenway development on special community workdays. Volunteers can also be used for fund-raising, maintenance, and programming needs.

INNOVATIVE FUNDING OPTIONS

Crowdsourcing "is the process of obtaining needed services, ideas, or content by soliciting contributions from a large group of people, and especially from an online community, rather than from traditional employees or suppliers." An example crowdsourcing tool used locally with some success is "ioby", which offers the ability to organize different forms of capital—cash, social networks, in-kind donations, volunteers, advocacy: https://ioby.org/about

PERFORMANCE MEASURES

The City of Brevard should establish performance measures to benchmark progress towards achieving the goals of this Plan. These performance measures should be stated in an official report within two years after the Plan is adopted. Baseline data should be collected as soon as the performance measures are established. Example performance measures to address aspects of this Plan's goals for pedestrian and bicycle transportation and recreation in Brevard are outlined below:

- **Safety**
  - » Measures of pedestrian and bicycle crashes and injuries;
  - » Measures of the number of people educated and/or number of people ticketed as a part of a pedestrian/bicycle safety campaign
- **Quality of life**
  - » Measures of accessibility of local destinations/ nodes via the pedestrian and bicycle network;
  - » Measures of how many people are meeting daily physical activity recommendations.
- **Transportation Choices**.
  - » Measures of how many pedestrian and bicycle facilities are available and the quality of these facilities;
  - » Measures of how many people are walking and biking on on-road and off-road facilities;
  - » Measures of commute mode share.
- **Economic Impact**
  - » Measures of household transportation cost savings;
  - » Measures of traffic congestion cost savings
- **Environment**.
  - » Measures of greenhouse gas emissions;
  - » Measures of vehicle miles traveled.

Project Goals

Create **safer conditions** for walking and biking

Increase **overall quality of life** and livability

Create more **choices for transportation,** recreation, and exercise through walking and biking

Generate a positive **economic impact** and increase tourism related to active living

Protect the **environment** and promote environmental stewardship

A bicyclist turning off of N. Broad Street onto McLean Road.

DESIGN GUIDANCE RESOURCES

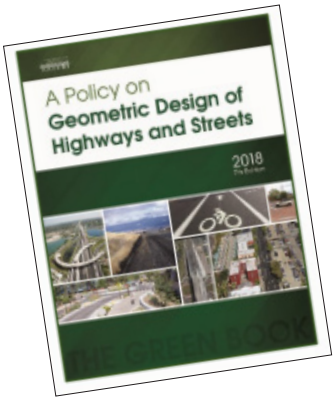
This Design Guidance section presents a toolbox of current design guidance and standards to implement bicycle improvements. It has been developed to complement the City's Pedestrian + Bicycle Plan and reflects other nationally recognized efforts to promote pedestrian and bicycle safety and comfort. The information assembled here is not, however, a substitute for a more thorough evaluation by a professional engineer prior to implementation of facility improvements with considerations to physical, right of way, and other constraints.

National Guidance

National Association of city Transportation Officials' (NACTO) Urban Street design Guide

https://nacto.org/publication/urban-street-design-guide/

The National Association of City Transportation Officials' *(NACTO) Urban Street Design Guide (2013)* is a collection of nationally recognized street design standards, and offers guidance on the current state of the practice designs. This guide provides best practice for streets to serve as not only efficient travel corridors but public spaces, and it includes a toolkit of street design elements with key dimensions and applications.

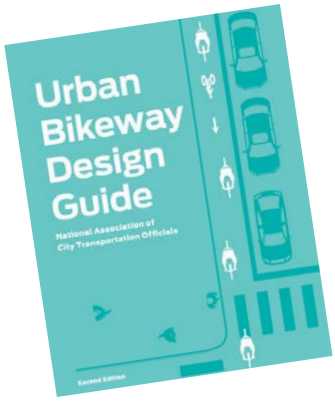


American Association of State Highway and Transportation Officials' (AASHTO) A Policy on Geometric Design of Highways and Streets

A Policy on Geometric Design of Highways and Streets (2018) provides national guidance on the design of highways and streets. The 7th edition of the "The Green Book" offers an updated framework for geometric design that is more flexible, multimodal, and performance based than in previous editions.

Federal Highway Administration's (FHWA) Separated Bike Lane Planning and Design Guide

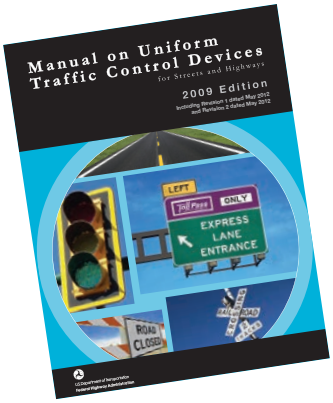
The *Separated Bike Lane Planning and Design Guide* (2015) is the latest national guidance on the planning and design of separated bicycle lane facilities released by the Federal Highway Administration (FHWA). The resource documents best practices as demonstrated around the US and offers ideas on future areas of research, evaluation and design flexibility.



NACTO Urban Bikeway Design Guide

https://nacto.org/publication/urban-bikeway-design-guide/

The NACTO *Urban Bikeway Design Guide* is a publication of nationally recognized bicycle way design and offers guidance on current state-of-the-practice designs. This guide is based on current practices in the best cycling cities in the world. The intent of the guide is to offer substantive guidance for cities seeking to improve bicycle transportation in places where competing demands for the use of the right of way present unique challenges. All of the NACTO *Urban Bikeway Design Guide* treatments are in use internationally and in many cities around the US.



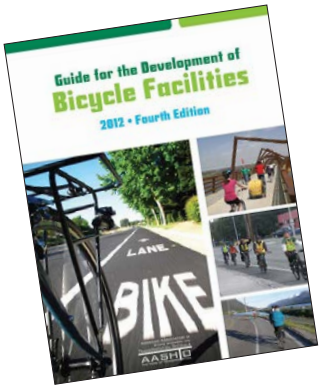
FHWA Manual on Uniform Traffic Control Devices (MUTCD)

https://mutcd.fhwa.dot.gov/

The *MUTCD* defines the standards used by road managers nationwide to install and maintain traffic control devices on public streets, highways, bikeways, and private roads open to public traffic. The *MUTCD* is the primary source for guidance on lane striping requirements, signal warrants, and recommended signage and pavement markings.

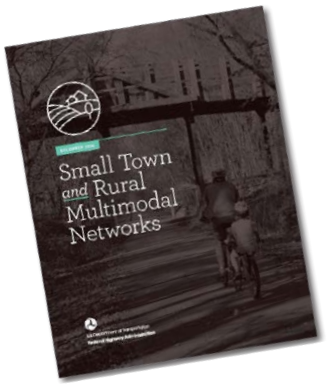
To further clarify the *MUTCD* standards, the FHWA created a table of contemporary bicycle facilities that lists various bicycle related signs, markings, signals, and other treatments and identifies their official status (e.g., can be implemented, currently experimental).

Bicycle way treatments not explicitly covered by the *MUTCD* are often subject to experiments, interpretations and official rulings by the FHWA. The *MUTCD* Official Rulings is a resource that allows website visitors to obtain information about these supplementary materials. Copies of various documents (such as incoming request letters, response letters from the FHWA, progress reports, and final reports) are available on this website.



AASHTO Guide for the Development of Bicycle Facilities

The AASHTO *Guide for the Development of Bicycle Facilities*, updated in June 2012, provides guidance on dimensions, use, and layout of specific bicycle facilities. The standards and guidelines presented by AASHTO provide basic design information, such as minimum shared use pathway widths, bicycle lane dimensions, geometric design, detailed striping requirements and recommended signage and pavement markings.



US Department of Transportation (USDOT) Small Town and Rural Multimodal Networks Guide

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/

The *Small Town and Rural Multimodal Networks Guide* translates existing street design guidance and facility types for bicycle and pedestrian safety and comfort for the smaller scale places not addressed in guides such as the NACTO *Street Design Guide* and ITE *Walkable Urban Thoroughfares* report. The guide provides clear examples of how to interpret and apply design flexibility to improve bicycling and walking conditions. This guide pertains in particular to the Municipality of Anchorage as it is comprised of a small urbanized area and large rural area.

The stated goals of the guide include "to provide a bridge between existing guidance on bicycle and pedestrian design and rural practice, encouraging innovation in the development of safe and appealing networks for bicycling and walking in small towns and rural areas, and to provide examples of peer communities and project implementation that is appropriate for rural communities."

State Guidance

North Carolina Department of Transportation (NCDOT):

- WalkBikeNC: The Statewide Pedestrian and Bicycle Plan: https://www.ncdot.gov/bikeped/walkbikenc/default.aspx
- North Carolina Terminology for Active Transportation: https://connect.ncdot.gov/projects/BikePed/Documents/NC%20Terminology%20for%20Active%20Travel.pdf
- NC Local Programs Handbook: https://connect.ncdot.gov/municipalities/Funding/Pages/LPM%20Handbook.aspx
- Traditional Neighborhood Development Guidelines: https://rosap.ntl.bts.gov/view/dot/34002/dot_34002_DS1.pdf?

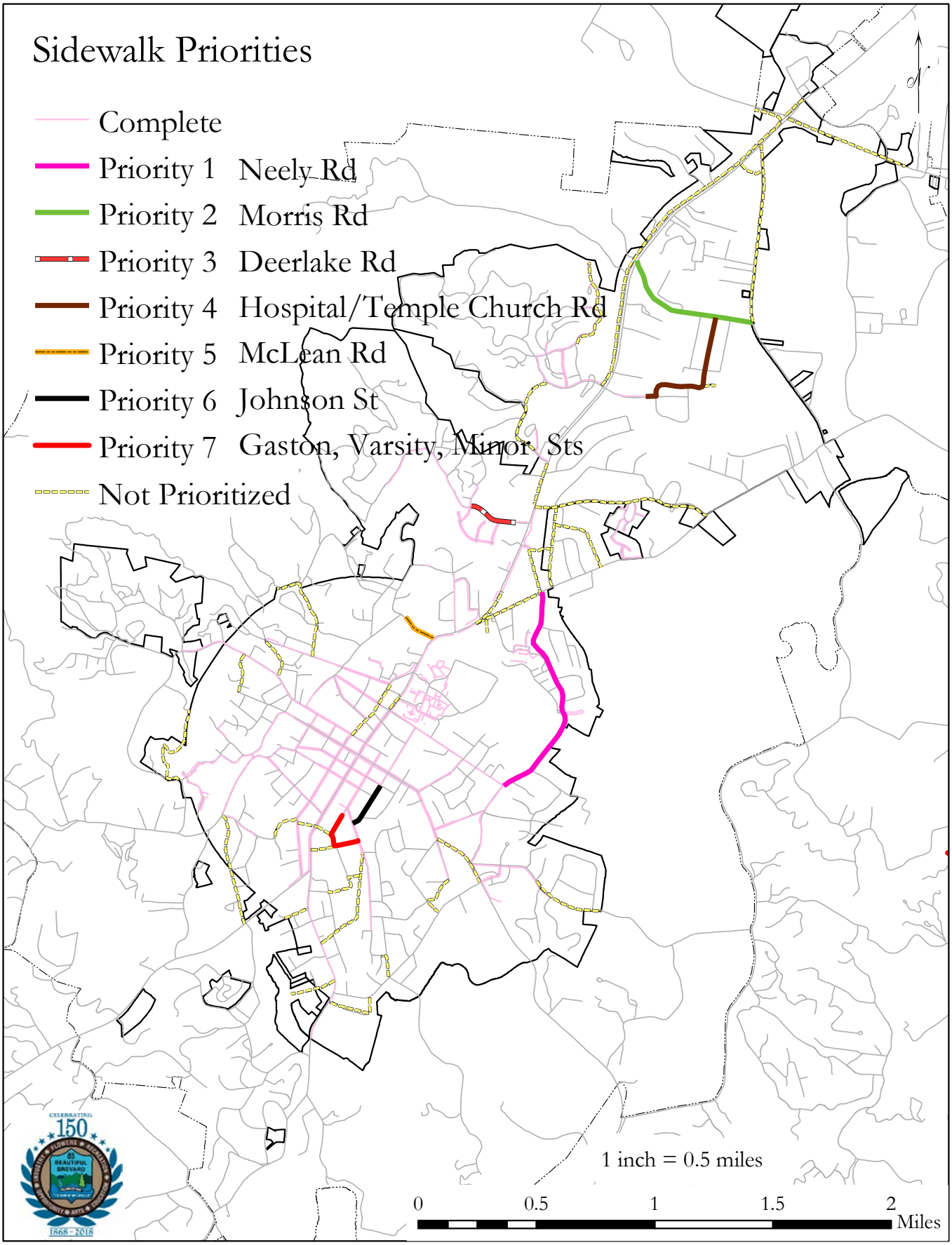
Greenway Construction Standards:

- Greenway Standards Summary Memo: https://connect.ncdot.gov/projects/BikePed/Documents/Greenway%20Standards%20Summary%20Memo.pdf
- Design Issues Summary: https://connect.ncdot.gov/projects/BikePed/Documents/Design%20Issues%20Summary.pdf
- Greenway Design Guidelines Value Engineering Report: https://connect.ncdot.gov/projects/BikePed/Documents/Greenway%20Design%20Guidelines%20Value%20Engineering%20Report.pdf
- Summary of NCDOT Responses to Greenway Design Standards Value Engineering Study: https://connect.ncdot.gov/projects/BikePed/Documents/Summary%20of%20Recommendations.pdf
- Minimum Pavement Design Recommendations for Greenways: https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Minimum%20Pavement%20Design%20Recommendations%20for%20Greenways.pdf

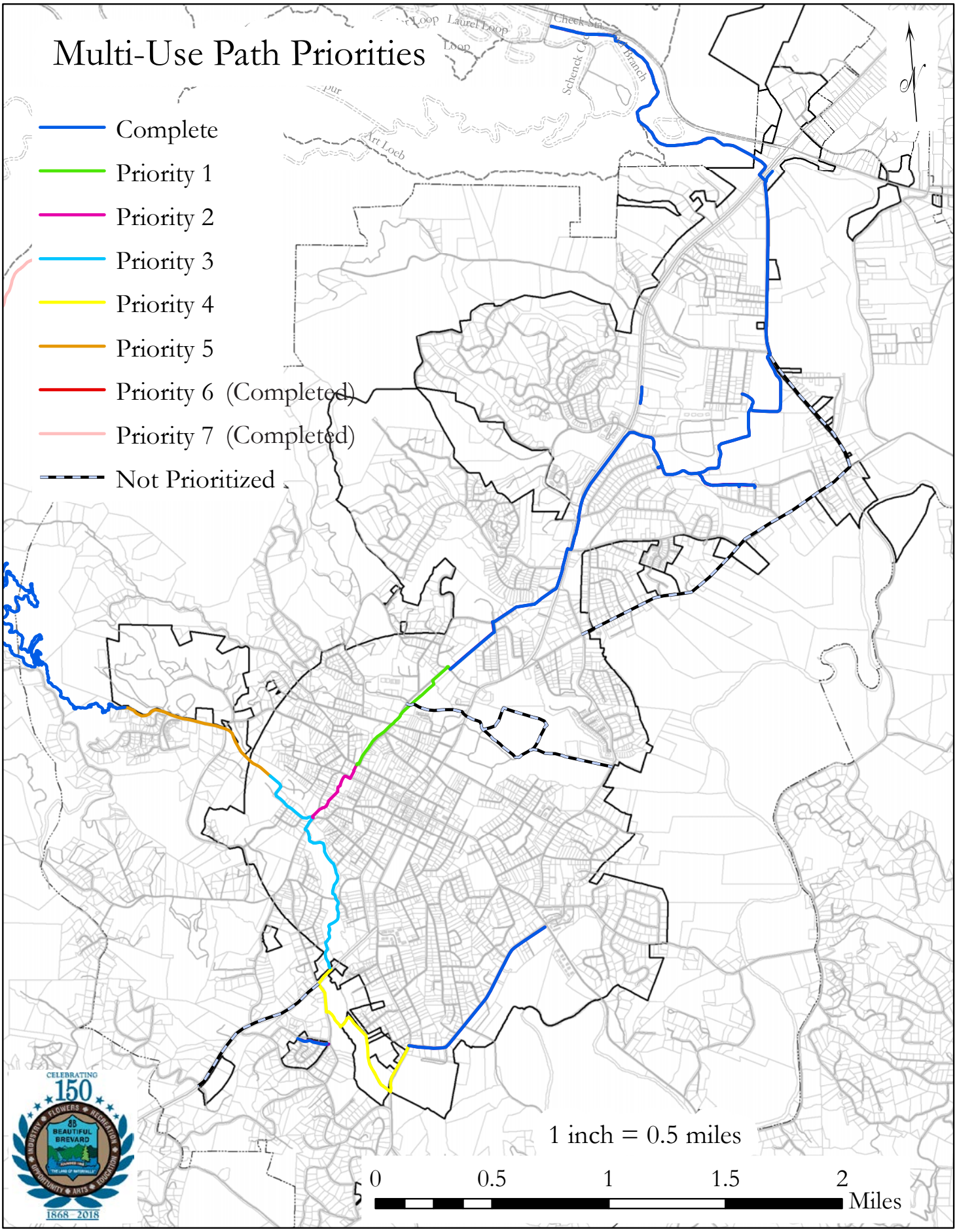
A APPENDICES

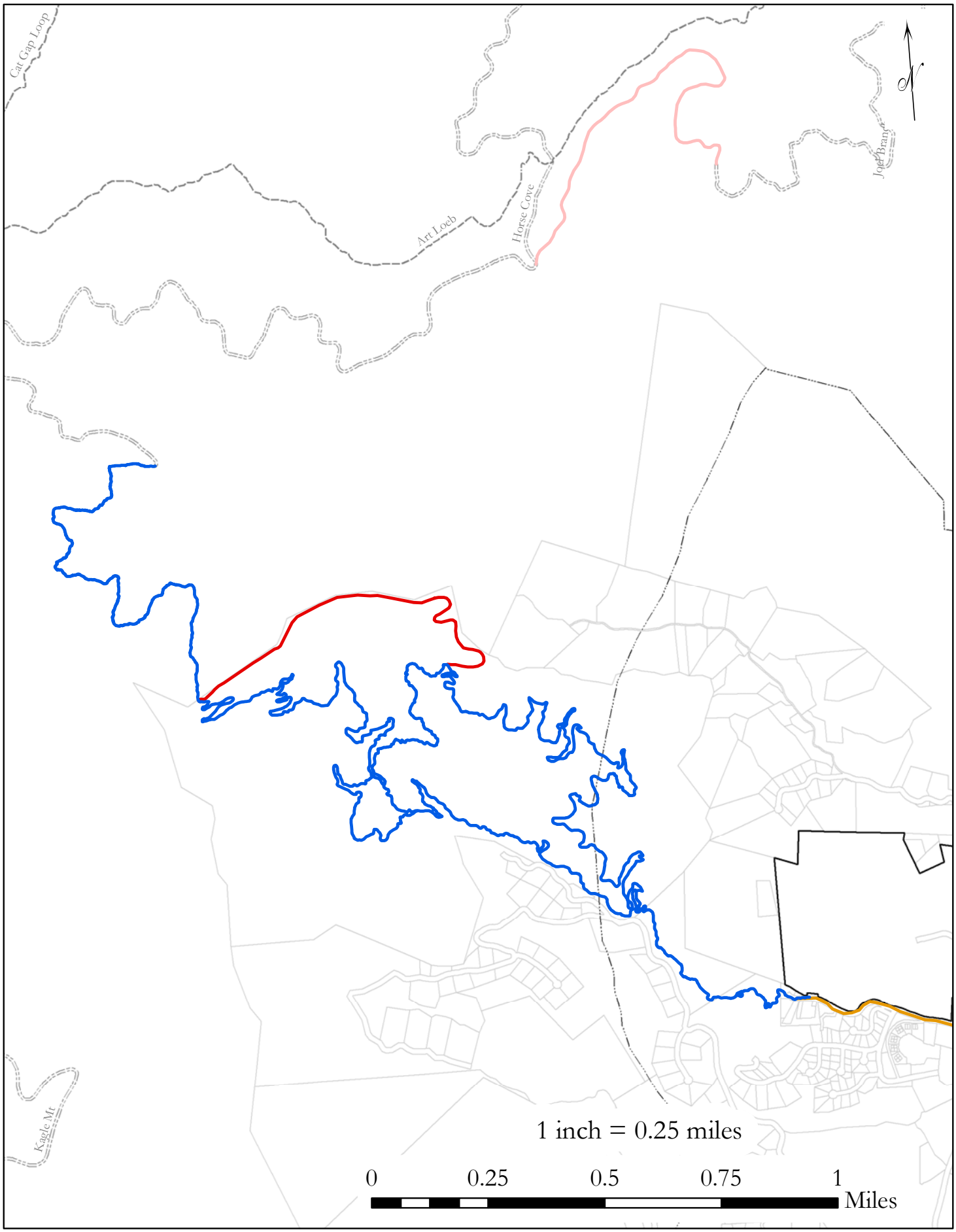
CONTENTS:

Appendix A - Priority Sidewalk and Multi-Use Path Maps from the 2018 update to the Brevard Comprehensive Pedestrian Plan

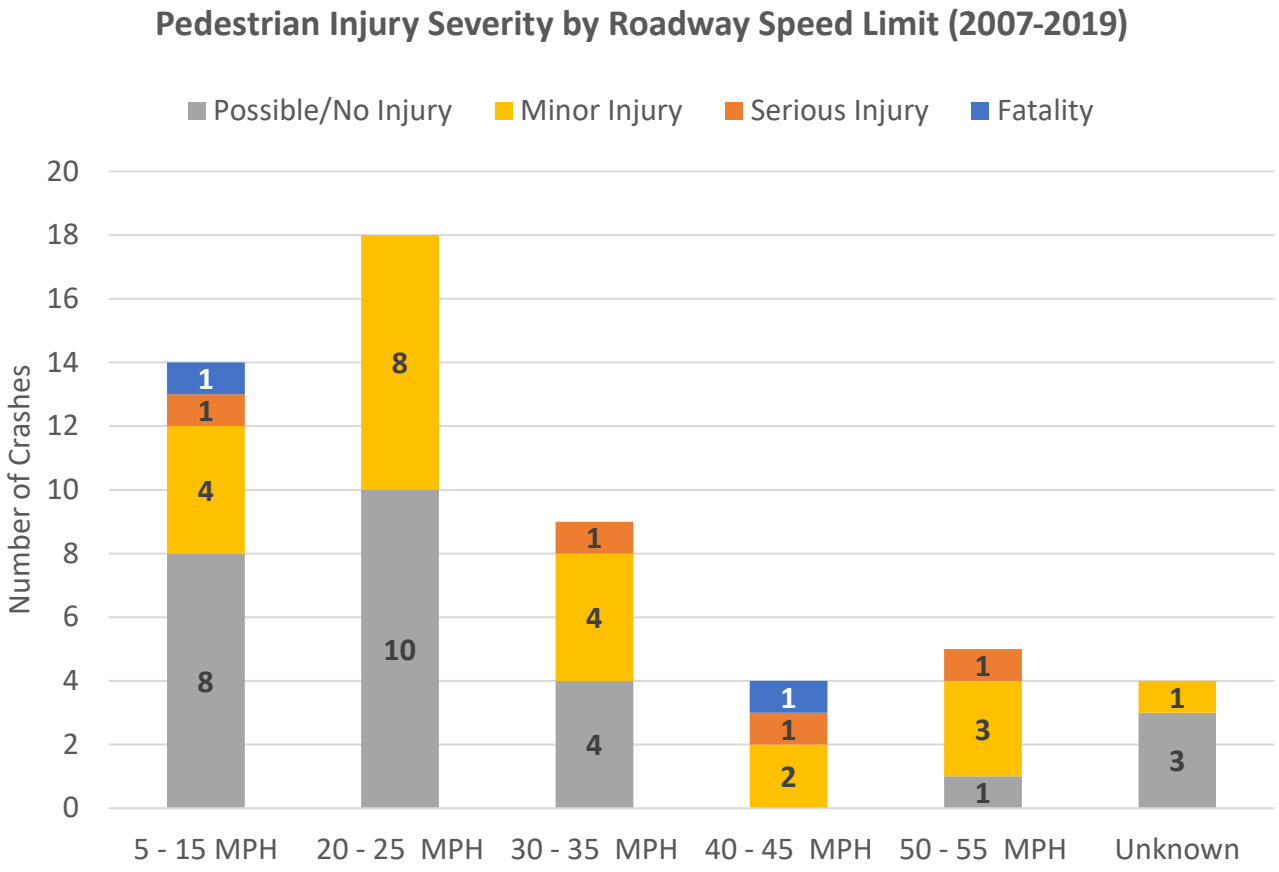


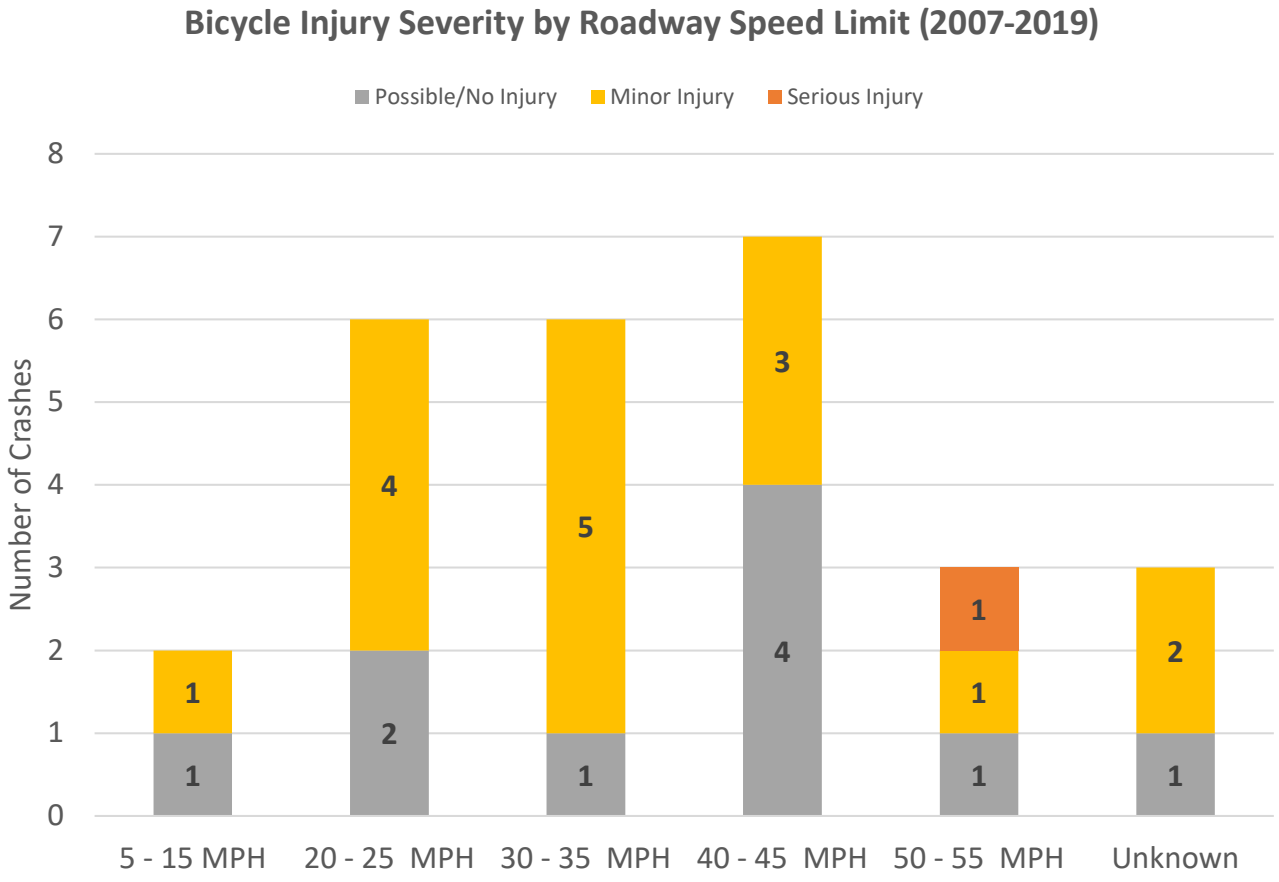
2018 Sidewalk Priorities

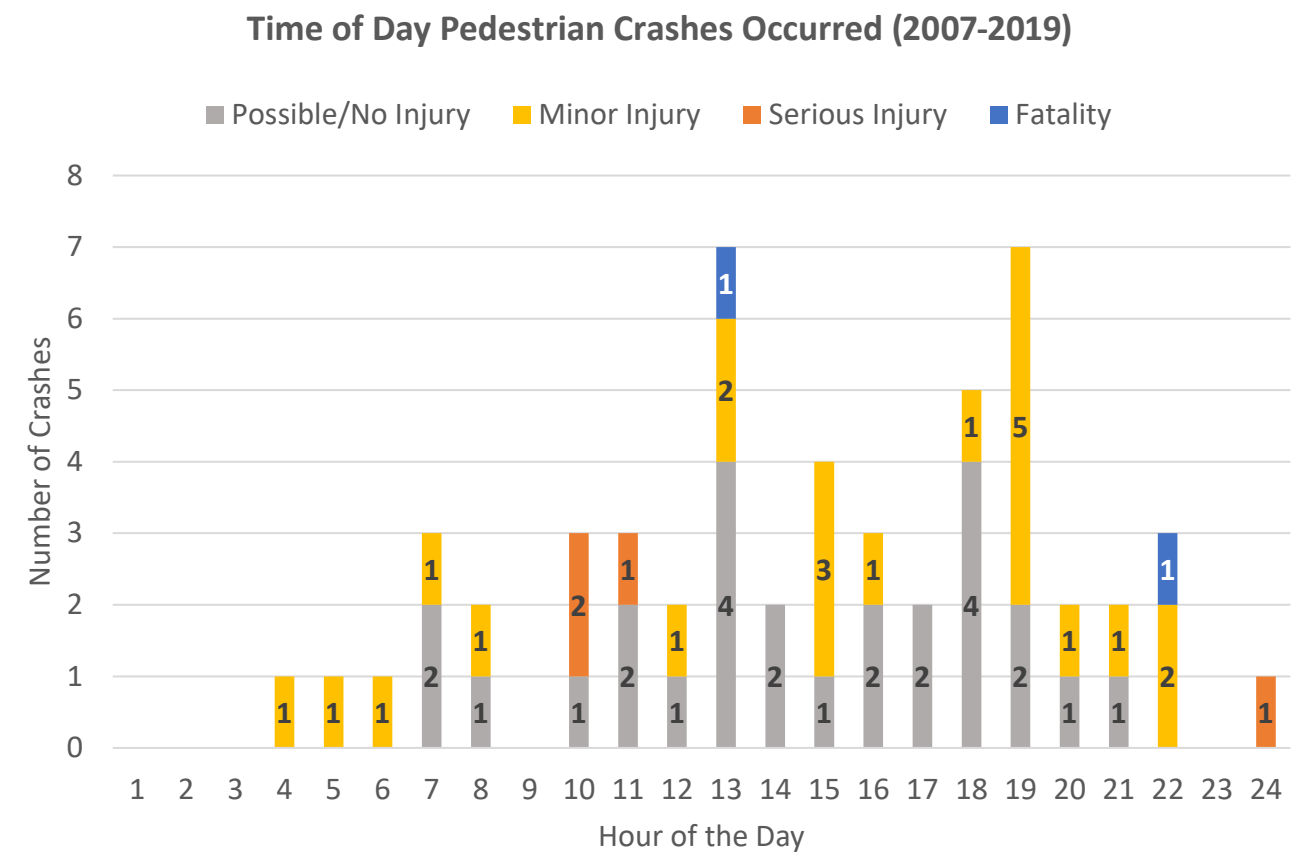

Multi-Use Path Priorities
Complete
Priority 1
Priority 2
Priority 3
Priority 4
Priority 5
Priority 6 (Completed)
Priority 7 (Completed)
Not Prioritized
1 inch = 0.5 miles
0
0.5
1
1.5
2
Miles

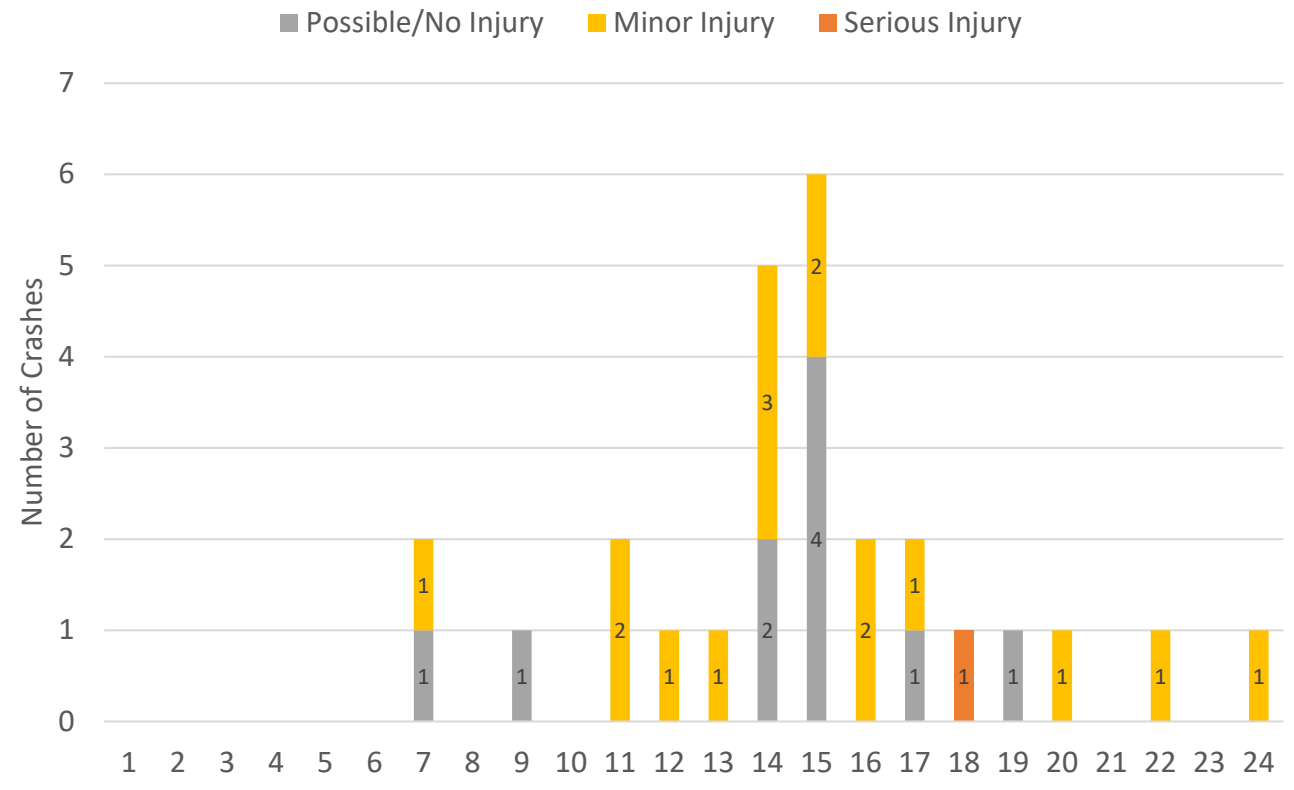

Cat Gap Loop
Art Loeb
Horse Cove
Joe Brany
Kagle Mt
1 inch = 0.25 miles
0
0.25
0.5
0.75
1
Miles

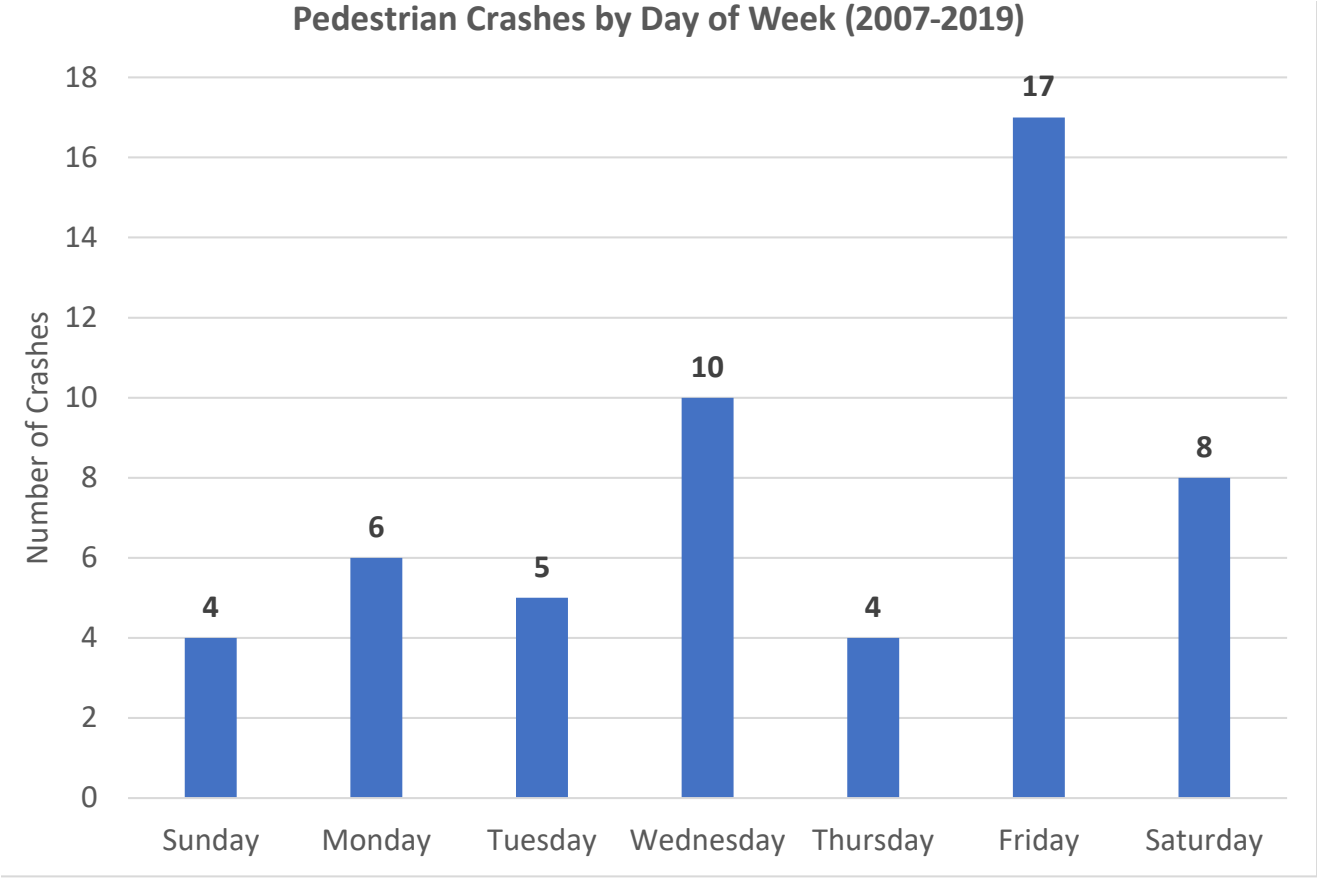
Appendix B - Collision Analysis (Continued)

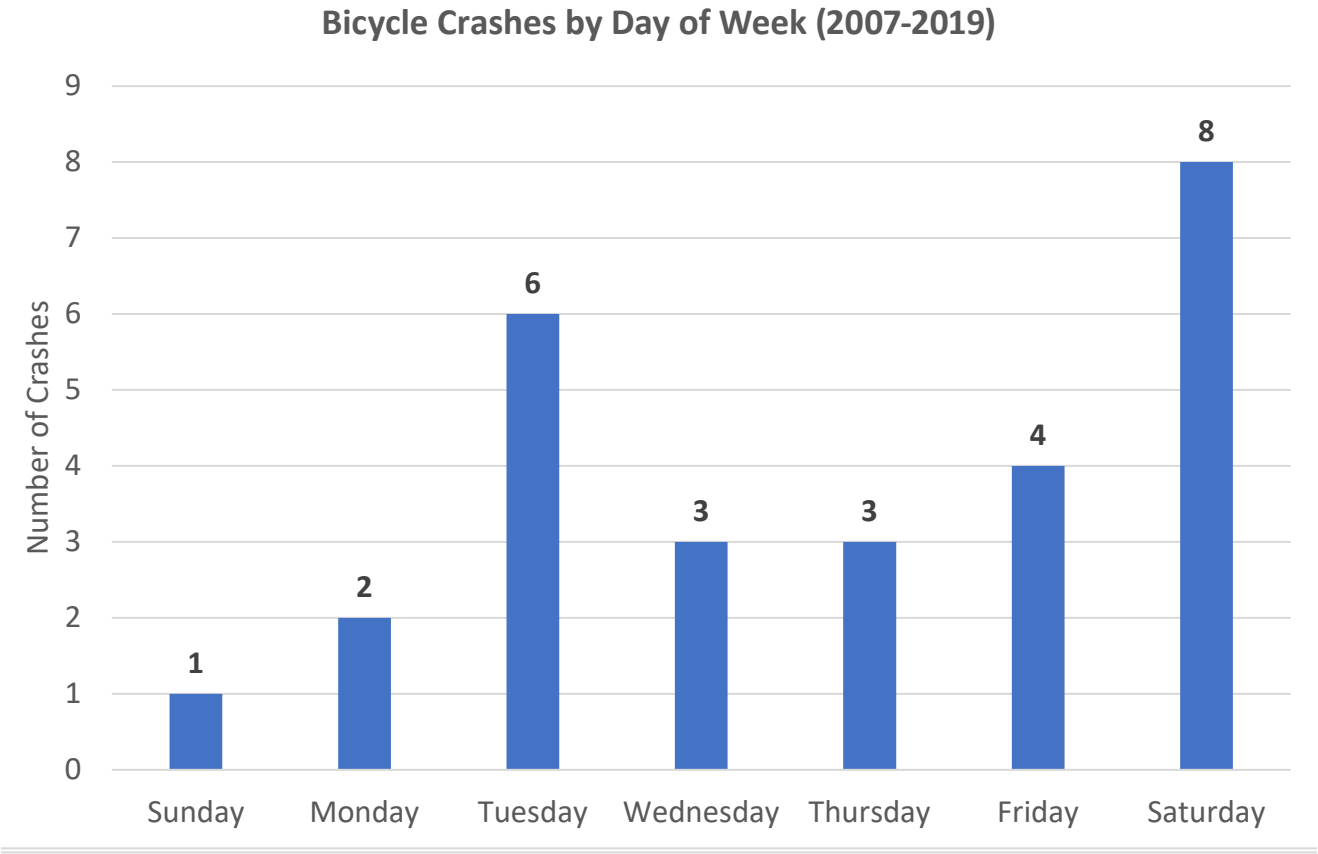


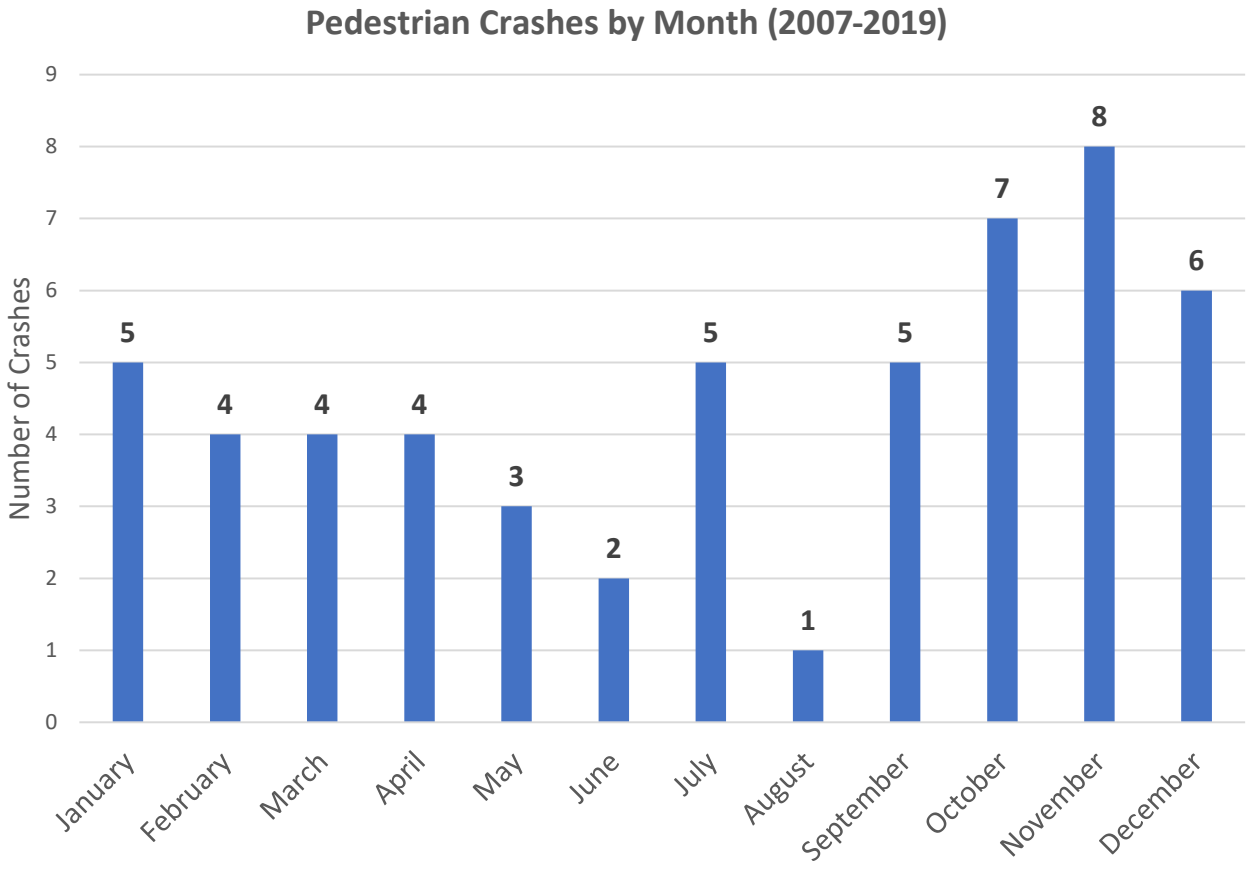


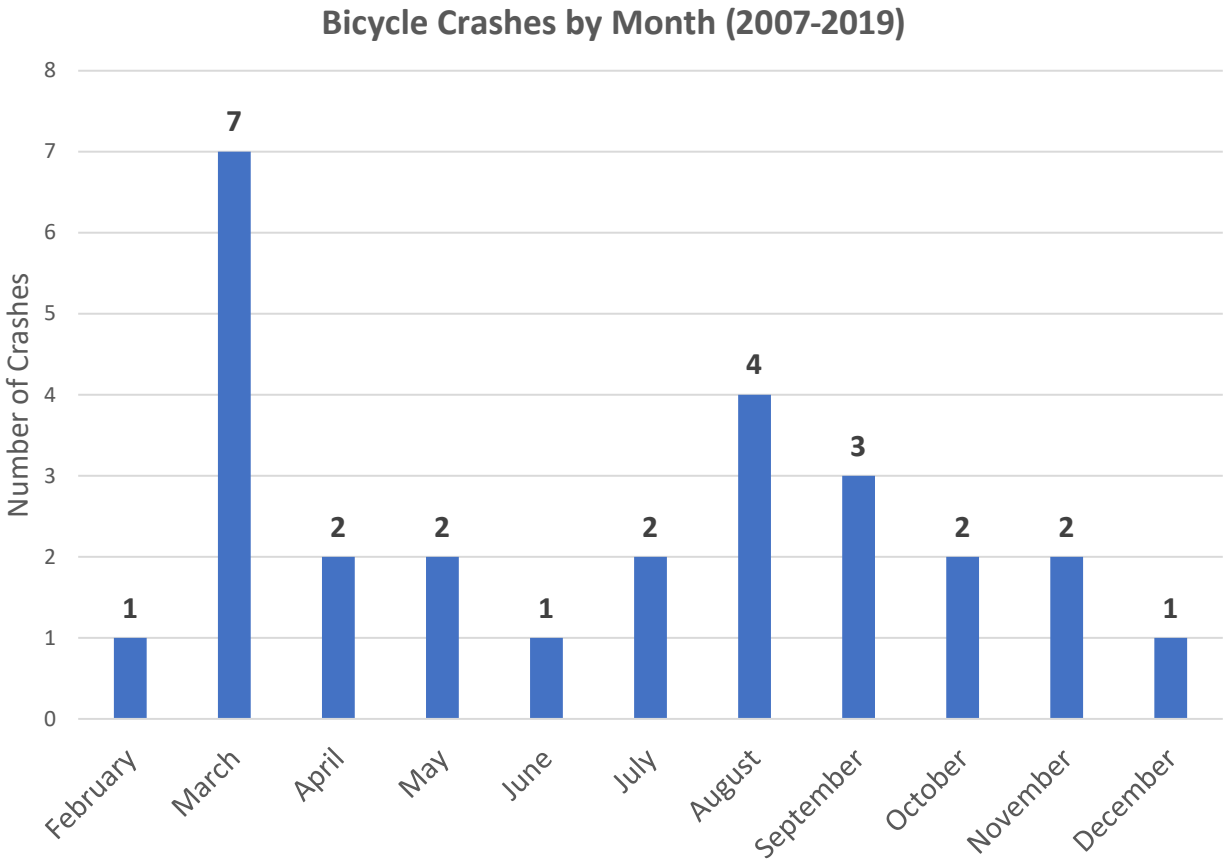

Time of Day Pedestrian Crashes Occurred (2007-2019)
Possible/No Injury
Minor Injury
Serious Injury
Fatality
Number of Crashes
Hour of the Day
0 1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

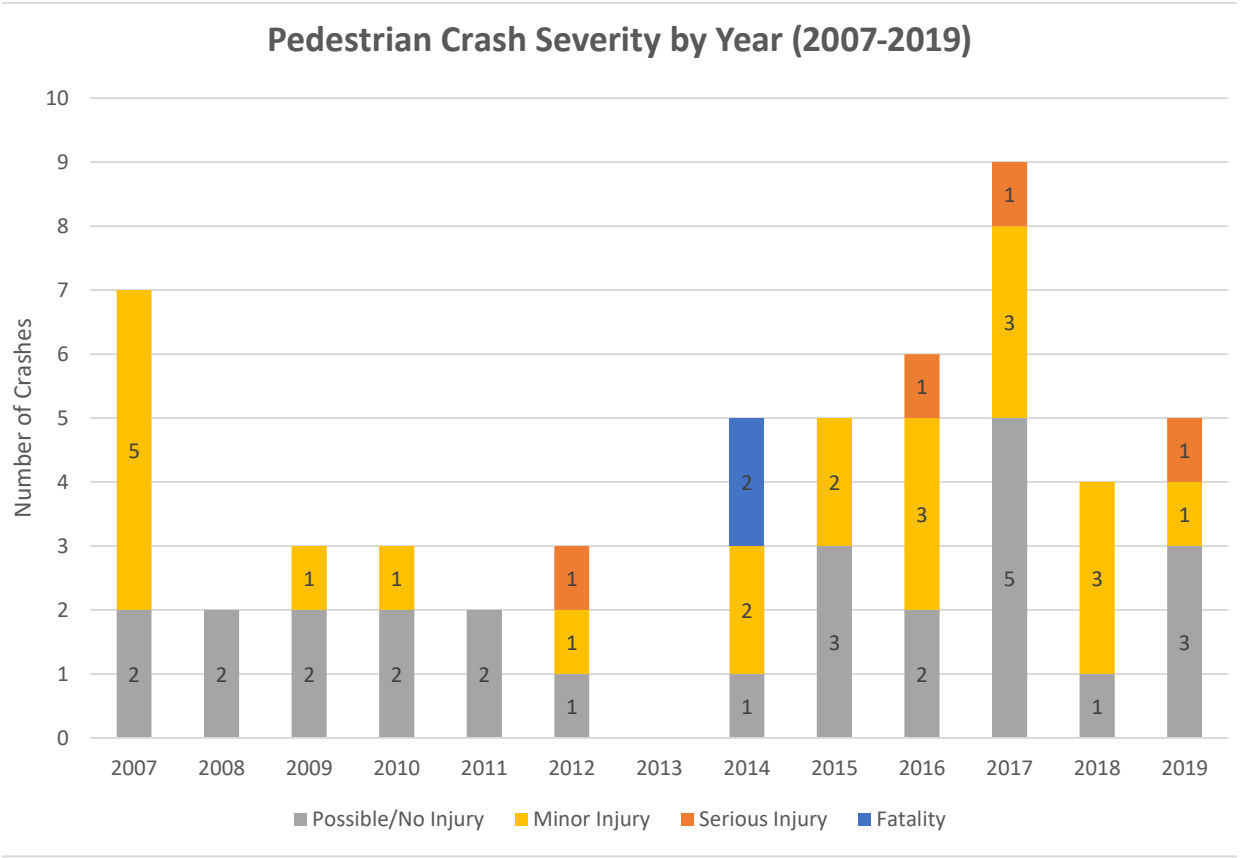

Time of Day Bicycle Crashes Occurred (2007-2019)
Possible/No Injury
Minor Injury
Serious Injury
Number of Crashes
0 1 2 3 4 5 6 7
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

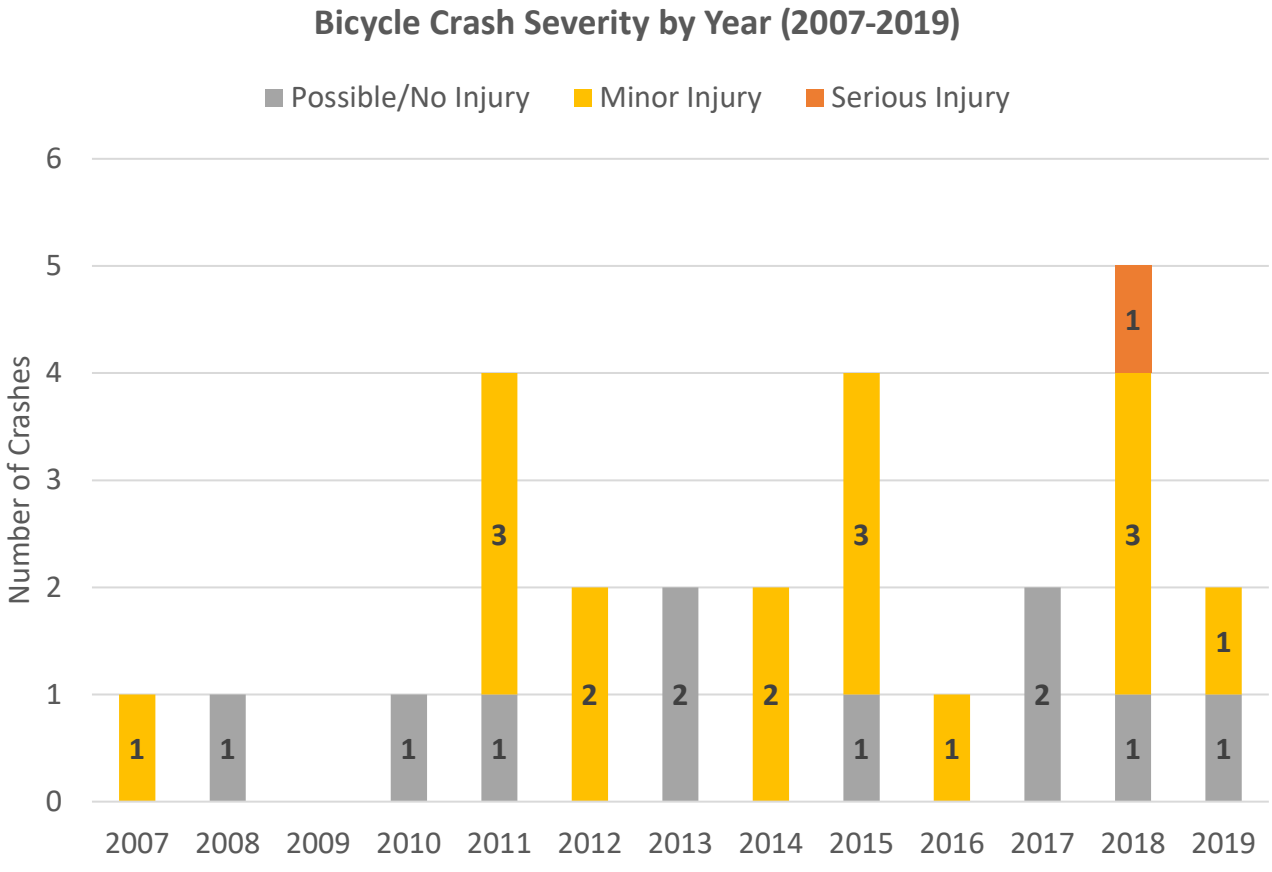

Pedestrian Crashes by Day of Week (2007-2019)
Number of Crashes
18
16
14
12
10
8
6
4
2
0
4
6
5
10
4
17
8
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

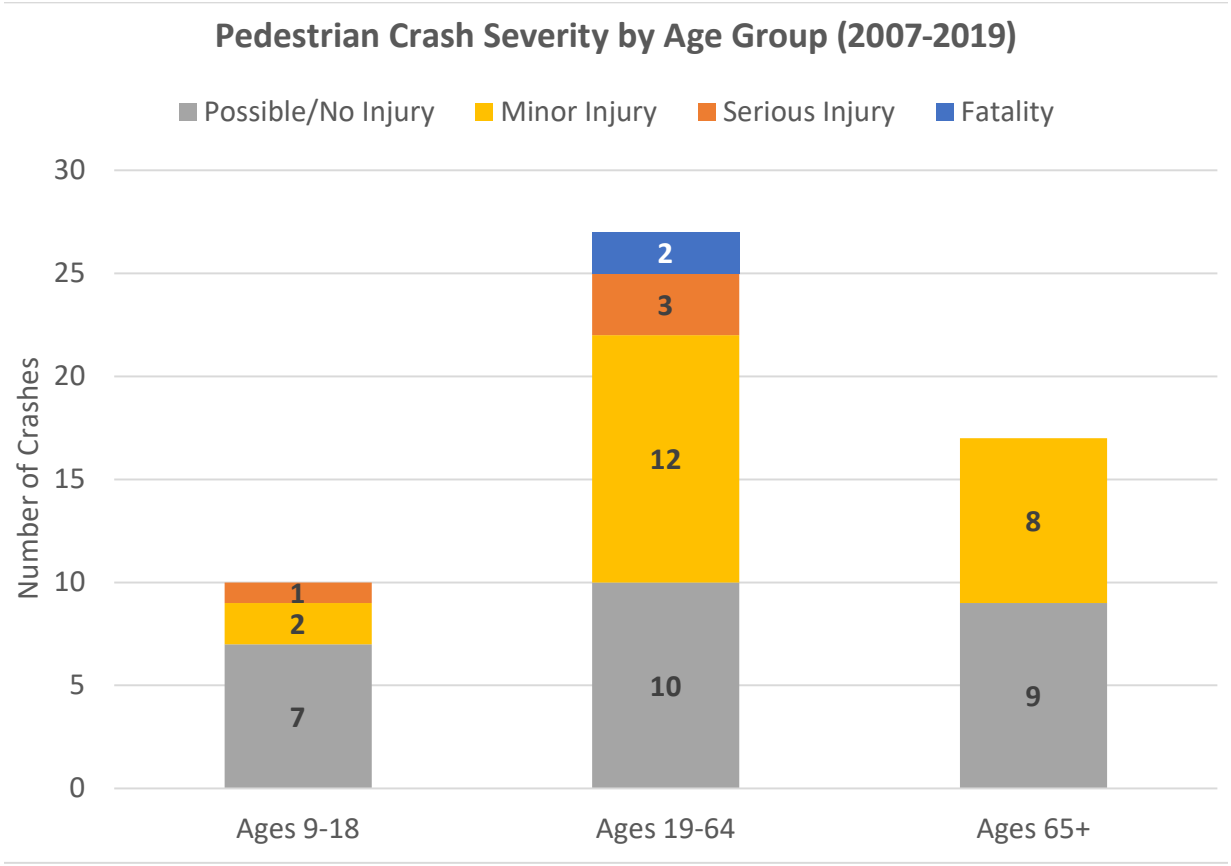

Bicycle Crashes by Day of Week (2007-2019)
Number of Crashes
9
8
7
6
5
4
3
2
1
0
1
2
6
3
3
4
8
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

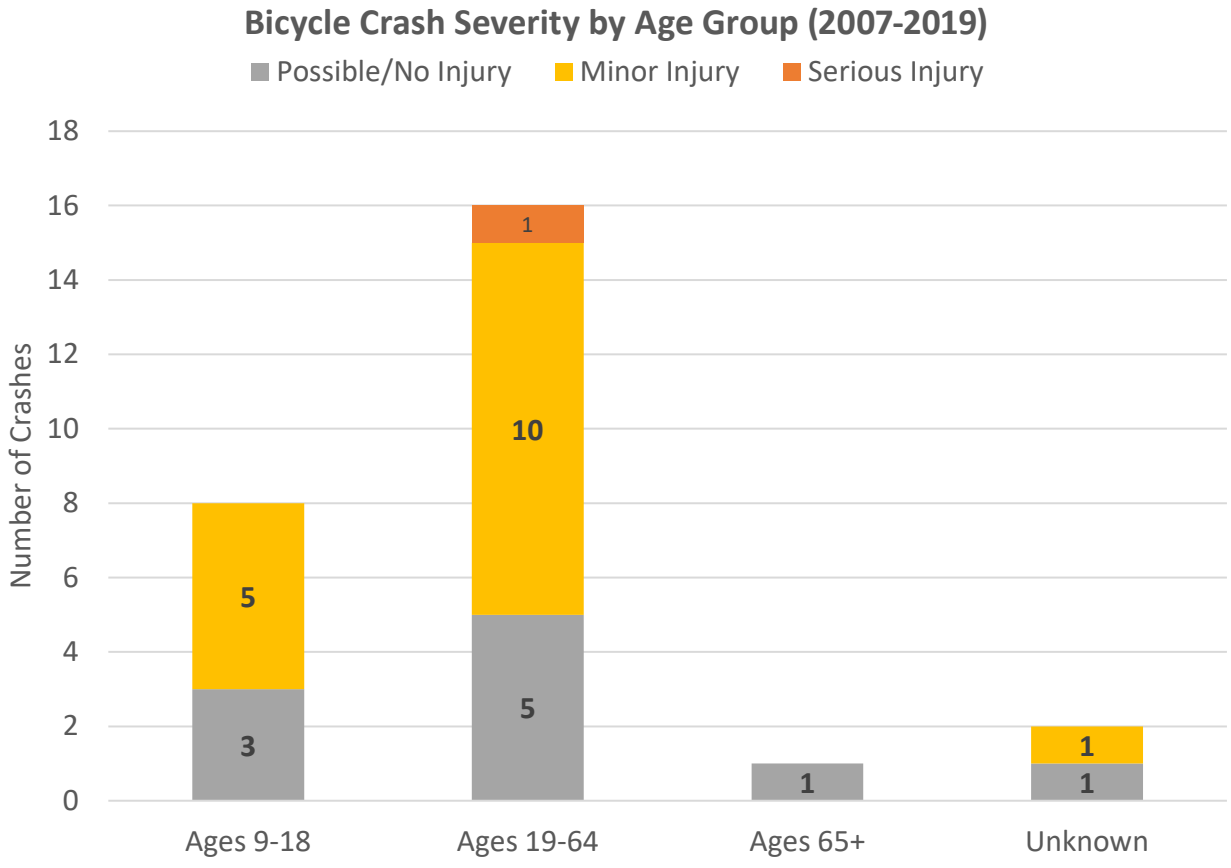

Pedestrian Crashes by Month (2007-2019)
Number of Crashes
0
1
2
3
4
5
6
7
8
9
5
4
4
4
3
2
5
1
5
7
8
6
January
February
March
April
May
June
July
August
September
October
November
December


Bicycle Crashes by Month (2007-2019)
Number of Crashes
0
1
2
3
4
5
6
7
8
1
7
2
2
1
2
4
3
2
2
1
February
March
April
May
June
July
August
September
October
November
December


Pedestrian Crash Severity by Year (2007-2019)
Number of Crashes
10
9
8
7
6
5
4
3
2
1
0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Possible/No Injury
Minor Injury
Serious Injury
Fatality


Bicycle Crash Severity by Year (2007-2019)
Possible/No Injury
Minor Injury
Serious Injury
Number of Crashes
6
5
4
3
2
1
0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019


Pedestrian Crash Severity by Age Group (2007-2019)
Possible/No Injury
Minor Injury
Serious Injury
Fatality
Number of Crashes
30
25
20
15
10
5
0
1
2
7
2
3
12
10
8
9
Ages 9-18
Ages 19-64
Ages 65+


Bicycle Crash Severity by Age Group (2007-2019)
Possible/No Injury
Minor Injury
Serious Injury
Number of Crashes
18
16
14
12
10
8
6
4
2
0
5
3
1
10
5
1
1
1
Ages 9-18
Ages 19-64
Ages 65+
Unknown

Appendix C - Policy & Regulatory Review

Brevard's regulatory standards and policies were analyzed and compared to model regulatory and policy language from around North Carolina and the US to identify and improve the regulatory language. This will enable the City to maximize sidewalks, on-road bicycle facilities, and multi-use trail improvements as new development, redevelopment, and corridor improvement projects are considered. The complete policy review is summarized on the following pages. The priority policy changes and recommendations that were identified through this review are presented in Chapter 4.

<table>
<tr><th>Topics/Strategies</th><th>Policies/Recommendations</th></tr>
<tr><td colspan="2">1. Complete Streets and Greenways</td></tr>
<tr><td>1.1. Implement Complete Streets Policy

A complete streets policy allows cities and towns to work towards creating a street network that encourages pedestrian and bicycle travel and provides safe and comfortable roadways for all users.

NCDOT's Complete Streets Planning and Design Guidelines will apply to all NCDOT-maintained streets in the City. The NCDOT guidelines also provide excellent guidance for locally maintained streets and street networks and complete streets planning and design processes, which can be applied in Brevard.</td><td>UDO, Adopted Plans, or Engineering/Design Standards

EXCELLENT. Complete Streets Statement.

From Resolution N. 2018-06:

The City of Brevard strongly endorses a Complete Streets approach to enhance transportation options for all and to improve quality of life for the residents of Brevard as follows:

1. The City of Brevard shall, to the maximum extent practical, plan, design, construct, operate, and maintain all City streets to provide a comprehensive and integrated street network for people of all ages and abilities traveling by foot, bicycle, automobile, and commercial vehicle.

2. The City of Brevard shall, to the maximum extent practical, advocate for State -maintained roads in the City to provide a comprehensive and integrated street network for people of all ages and abilities traveling by foot, bicycle, automobile, and commercial vehicle when coordinating on such projects with NCDOT officials.

General Recommendations

Consider adding as acceptable references for street design:

- NCDOT Complete Street Implementation Guide
- NCDOT Complete Streets Policy Guidance memo
- NCDOT Roadway Design Manual
- NCDOT Complete Streets Planning and Design Guidelines
- NCDOT Traditional Neighborhood Street Design Guidelines
- FHWA Bikeway Selection Guide
- FHWA Separated Bike Lane Guide
- AASHTO Guide for the Design of Bicycle Facilities (latest edition; in the process of being updated at time of plan adoption.)
- NACTO Urban Street Design Guide
- NACTO Urban Bikeway Design Guide
- Other State and national guidance, as relevant

In addition to the very thorough NCDOT's Complete Streets Policy documents and Complete Streets Planning and Design Guidelines*, Smart Growth America provides great resources for designing streets that cater to all users, including a best practices guide co-authored with the National Complete Streets Coalition.

(*NCDOT's Planning & Design Guidelines were developed to provide planners, designers and decision makers with a framework for evaluating and incorporating various design elements into transportation projects and processes.

For NCDOT's policy on implementation and funding of Complete Streets, see NCDOT's 2019 Complete Streets Policy Guidance memo and the NCDOT Complete Street Implementation Guide and NCDOT Roadway Design Manual.)</td></tr>
</table>

Topics/Strategies	Policies/Recommendations
1.2 Develop Complete Street Design Guidelines for a variety of contexts and all street/roadway user groups The subsections below include recommendations for pedestrian- and bicycle-related elements of Complete Streets and complete pedestrian and greenway networks. Sidewalks, greenways, and streetscape amenities such as street trees and lighting are some most fundamental elements of Complete Streets for pedestrians and greenway users. Access management, multi-modal level of service assessments, and traffic calming are also critical for developing complete street networks for walking through the development review and capital project implementation process..	**UDO, Adopted Plans, or Engineering/Design Standards** **Good,** but there are areas for improvement noted in the sections to follow. **General Recommendations** The NCDOT *Complete Street Planning and Design Guidelines* and the design guidelines that accompany this plan include recommendations on complete street design elements for pedestrians and greenway users. Brevard could adopt and endorse the NCDOT guidelines and other national guidelines, including the NACTO *Urban Street Design Guide*. The design guidance should be integrated into Brevard's Unified Development Ordinance. See examples from the *Raleigh Street Design Manual* and the *Charlotte Urban Street Design Guidelines*. Consider adopting by reference for street design one or more of the following and including in the new UDO: - NCDOT Complete Streets Planning and Design Guidelines - NCDOT Traditional Neighborhood Street Design Guidelines - The design guidelines included in this plan
1.3. Require pedestrian accommodations, including by roadway type Pedestrian facilities should be determined based on street types and land uses of a given roadway corridor.	**UDO, Adopted Plans, or Engineering/Design Standards** **Excellent.** Section 13.5.N.10, *Pedestrian and bicycle infrastructure*, requires pedestrian and bicycle improvements based on Zoning District and by street type—whether it is a City Street or an NCDOT Street. **General Recommendations** Consider adopting by reference for street design one or more of the following and including in the new UDO: - NCDOT Complete Streets Planning and Design Guidelines - NCDOT Traditional Neighborhood Street Design Guidelines - The design guidelines included in this plan

Topics/Strategies	Policies/Recommendations
1.4. Require designated bikeways (bicycle lanes, shoulders, greenways, etc) during new development or redevelopment or capital roadway projects	**UDO, Adopted Plans, or Engineering/Design Standards** **Excellent.** *Section 13.5.N. Pedestrian and bicycle infrastructure:* *Sidewalks, multi-use paths, or other pedestrian/bicycle infrastructure shall be constructed in accordance with the following requirements:* 1. *In determining the type of pedestrian/bicycle infrastructure that shall be required the Administrator shall refer to any adopted plan or policy of the city for guidance. Such plans or policies include but are not limited to:* City of Brevard Comprehensive Transportation Plan, City of Brevard Comprehensive Pedestrian Plan, City of Brevard Street Schedule, City of Brevard Comprehensive Land Use Plan, City of Brevard Recreation Plan*, other master plans and small area plans, and other plans and policies.* 2. *Sidewalks, multi-use paths, and other pedestrian and bicycle improvements shall be installed by the developer and dedicated to the city prior to the approval of any final subdivision plat, or issuance of final zoning approval or certificate of occupancy for any development plan. Pedestrian and/or bicycle infrastructure shall be constructed within the street right-of-way. The approving authority shall require the dedication of additional street right-of-way or a pedestrian easement when sufficient right-of-way does not exist to comply with this requirement. The approving authority may accept the dedication of additional right-of-way or a pedestrian easement in order to accommodate alternative routes and designs that do not follow streets.* See also, *Subsections 3-8* for further detail. See also, *Subsection 9.d:* *Multi-use paths and other infrastructure:* *d. On-street bicycle lanes shall be required when called for upon an adopted plan or policy of the city.* **General Recommendations** None
1.5. Require dedication, reservation or development of greenways	**UDO, Adopted Plans, or Engineering/Design Standards** **Excellent.** See Section 13.5.N, detailed above. See also, *Subsection 9:* *Multi-use paths and other infrastructure:* *a. Multi-use paths, and other pedestrian and bicycle infrastructure shall be provided instead of or in addition to sidewalks wherever called for on an adopted plan or policy of the city. Such plans or policies include but are not limited to:* City of Brevard Comprehensive Transportation Plan, City of Brevard Comprehensive Pedestrian Plan, City of Brevard Street Schedule, City of Brevard Comprehensive Land Use Plan, City of Brevard Recreation Plan*, other master plans and small area plans, and other plans and policies.* *b. When a multi-use path is required in an area not adjacent to a public or private street, then such facility shall be credited towards the satisfaction of the open space requirements as set forth in Chapter 7 of this ordinance.* *c. All required multi-use paths shall be dedicated to the City of Brevard by means of right-of-way or pedestrian easement.* **General Recommendations** None
1.6. Require new sidewalks, greenways, etc., to connect to existing facilities	**UDO, Adopted Plans, or Engineering/Design Standards** **Needs improvement.** None **General Recommendations** Connectivity of facilities is critical for walking and biking conditions. New development should be required to connect to or extend existing facilities bicycle and pedestrian facilities. See the following for other examples: Chapter 6 of Wake Forest, NC UDO for recommendations for bikeways and greenways, especially sections 6.5.3, 6.8.2, 6.9, 6.10. Chapter 7 of the Wilson, NC UDO regarding greenways. New Hanover County, NC's EDZD Zoning District provides points for new developments that connect to the existing bike-way network and key destinations and provides a good definition of the bikeway network. (Section 54.1-14 and following.)

Topics/Strategies	Policies/Recommendations
1.7. Consider pedestrian concerns and Level of Service (LOS) in Traffic Impact Analyses and other engineering studies	**UDO, Adopted Plans, or Engineering/Design Standards** **Needs improvement.** No specific guidelines for pedestrian LOS analysis or mitigation are included in the UDO. **General Recommendations** Brevard should consider adopting multi-modal of service standards where active transportation and transit use are expected to be high. Consideration of bicycle and pedestrian levels of service assure adequate facilities for bicyclists and pedestrians in new development and capital improvements. This also helps promote walking and bicycling as a legitimate means of transportation. The NCDOT Complete Streets Planning and Design Guidelines provides factors of "Quality of Service " and LOS for bicycle, pedestrian, and transit modes (See Chapter 3, page 39 and Chapter 5). The City of Raleigh's Street Design Manual uses multimodal level of service approach in determining road improvements and traffic mitigation. Charlotte, NC uses Pedestrian LOS and Bicycle LOS Methodologies for intersection improvements in their Urban Street Design Guidelines.
1.8. Adopt traffic calming programs, policies, and standards Traffic calming on local streets increases safety and comfort for all roadway users, including pedestrians and bicyclists. It also increases neighborhood livability.	**UDO, Adopted Plans, or Engineering/Design Standards** **Needs improvement.** A policy exists, but no specific measures or design standards are specified. *Section 13.5.G. Traffic calming devices:* *The use of approved traffic calming measures is encouraged as alternatives to conventional traffic control measures on Neighborhood Streets and within circulation areas of commercial and mixed-use developments.* **General Recommendations** FHWA has developed a comprehensive Traffic Calming ePrimer. See also the NACTO Urban Bikeway Design Guide section on Bicycle Boulevards, which includes traffic calming measures. The Town of Huntersville has an excellent example of neighborhood traffic calming policy that is a great model for other communities. Such traffic calming measures, if adopted by Brevard, could be used to enhance bicycle boulevard treatments in the community.
1.9. Develop an access management program or policy Limiting turning movements on major roadways and requiring cross-access between adjacent parcels of land, including commercial developments, is a great tool for reducing the amount of traffic and turning movements on major roads while increasing safety and connectivity for pedestrians, bicycles, and cars.	**UDO, Adopted Plans, or Engineering/Design Standards** **Good.** *Section 9.3. Access Management* specifies the terms of the Access Management standards and also states that, *"Where the NCDOT Driveway Manual or Median Crossover Guide conflicts with these standards, the stricter of the two standards should prevail."* **General Recommendations** The NCDOT Complete Streets Planning and Design Guidelines provides recommended "Access Density" guidelines (See Chapter 4, page 61 and 62 and following).

Topics/Strategies	Policies/Recommendations
2. Pedestrian & Bicycle Urban Design Elements	
2.1 Require Planting Strips and Street Trees When planted in a planting strip between the sidewalk and the curb, street trees provide a buffer between the pedestrian zone and the street. In addition to their value for improving the air quality, water quality, and beauty of a community, street trees can also help slow traffic and improve comfort for pedestrians. Trees add visual interest to streets and narrow the street's visual corridor, which may cause drivers to slow down.	**UDO, Adopted Plans, or Engineering/Design Standards** **Excellent.** *Section 13.5. Landscaping:* *1.Streets shall be landscaped with street trees. Commercial streets shall have trees which complement the face of the buildings and which shade the sidewalk. Residential streets shall provide for an appropriate canopy, which shades both the street and sidewalk, and serves as a visual buffer between the street and the home.* *2. All street trees shall be installed in accordance with Chapter 8 of this ordinance. Large canopy trees shall be planted in a planting strip at a minimum average distance of 40 feet on-center.* *3. The minimum width of all planting strips shall be six feet. For large canopy trees such as Willow Oaks and Red Maples, a minimum of eight foot planting strip is suggested.* **General Recommendations** None
2.2 Require Pedestrian-Scale Street Lighting	**UDO, Adopted Plans, or Engineering/Design Standards** **Excellent.** Section 11.2.- Outdoor lighting standards and Section 11.5.- Street lighting detail lighting requirements for the safety of cars and pedestrians, and Subsection 11.5.C specifies that: *"Pedestrian lighting should be prioritized over automobile lighting. Lighting should be placed in a manner to limit the casting of shadows on sidewalks."* **General Recommendations** None
2.3. Adopt bicycle parking requirements	**UDO, Adopted Plans, or Engineering/Design Standards** **Needs improvement.** Section 10.3.C. Bicycle parking: Group developments, planned developments, multi-family developments containing more than three dwelling units, conditional zoning districts, and special use permit developments, and any other development requiring ten or more parking spaces shall provide secure bicycle storage capable of serving building users. One bicycle space shall be provided for every 20 required automobile parking spaces as determined by Section 10.3.A, with a minimum of one 4-bicycle rack. Bicycle racks are encouraged to be placed in convenient locations near building entrances. The administrator may adjust bicycle parking requirements to account for shared parking, buildings located in close proximity to one another, or the presence of public bicycle racks in close proximity. **General Recommendations** The design standards do not specify the type of bicycle racks that should be used. This plan suggests that inverted U-racks be used and that wave racks not be allowed as they do not provide adequate security, capacity, or balance for bicycles. Also, the standards do not differentiate between short-term and long-term bicycle parking in terms of the amount of bicycle parking to be provided. Different standards of bicycle parking are needed for short-term visitors and customers and for longer term users like employees, residents, and students. See City of Wilson UDO, Chapter 9: Parking & Driveways, Section 9.4 and 9.6. Good standards for bicycle parking design can be found through the Association of Pedestrian and Bicycle Professionals' Bicycle Parking Guidelines. (www.apbp.org) The City of Charlotte has excellent standards for long-term and short-term bicycle parking it its Zoning Ordinance. Bicycle Parking Model Ordinance, Change Lab Solutions.

Topics/Strategies	Policies/Recommendations
3. Connectivity Requirements	
3.1. Block size requirements *"[A]* ***Good [street] network provides more direct (shorter) routes for bicyclists and pedestrians to gain access to the thoroughfares and to the land uses along them (or allows them to avoid the thoroughfare altogether).*** *Likewise, good connections can also allow short-range, local [motor] vehicular traffic more direct routes and access, resulting in less traffic and congestion on the thoroughfares. This can, in turn, help make the thoroughfare itself function as a better, more complete street. For all of these reasons,* ***a complete local street network should generally provide for multiple points of access, short block lengths, and as many connections as possible."*** (NCDOT Complete Streets Planning and Design Guidelines, p 59)	**UDO, Adopted Plans, or Engineering/Design Standards** **Excellent.** *Section 13.5.K. Blocks:* *1. The lengths, widths, and shapes of blocks shall be determined with due regard to:* *a. The provision of adequate building sites suitable to the special needs of the type of use contemplated, and adequate public open spaces accessible and visible to residents.* *b. District requirements and design criteria.* *c. Needs of non-vehicular and vehicular traffic circulation and traffic control and safety.* *d. Opportunities and constraints of topography, with convenient access to important physical and topographical features such as lakes and rivers, significant areas of trees and other natural features, and areas of high ground offering scenic views.* *2. Blocks shall not be less than 200 feet nor more than 660 feet (⅛-mile), as measured from edge of right-of-way, unless site and topography or other special circumstances are present as determined by the administrator. Where deemed necessary by the administrator, a pedestrian crosswalk of at least ten feet in width may be required.* *3. Blocks shall have sufficient width to allow two tiers of lots of minimum depth except where single tier lots are required to separate residential development from another type of use, or when abutting a perennial stream or lake.* **General Recommendations** See the example table on page 59 of the NCDOT Complete Streets Planning and Design Guidelines for a context-based approach to block size. See City of Charlotte Subdivision Ordinance, Section 20-23 for good example of context-based connectivity requirements and block standards.

Topics/Strategies	Policies/Recommendations
3.2. Require connectivity/ cross-access between adjacent land parcels *"[A]* ***Good [street] network provides more direct (shorter) routes for bicyclists and pedestrians to gain access to the thoroughfares and to the land uses along them (or allows them to avoid the thoroughfare altogether).*** *Likewise, good connections can also allow short-range, local [motor] vehicular traffic more direct routes and access, resulting in less traffic and congestion on the thoroughfares. This can, in turn, help make the thoroughfare itself function as a better, more complete street. For all of these reasons,* ***a complete local street network should generally provide for multiple points of access, short block lengths, and as many connections as possible."*** (NCDOT Complete Streets Planning and Design Guidelines, p 59)	**UDO, Adopted Plans, or Engineering/Design Standards** **Excellent.** Brevard has language regarding connectivity, as quoted below. Its UDO also specifies using a connectivity index in order to ensure a high degree of connectivity (Section 9.2.- Connectivity index). *Section 13.5. - Street design.* *B.Streets to connect: Streets shall interconnect within a development and with adjoining development in accordance with Chapter 8 and 10 of this ordinance. Culs-de-sac are permitted only where topographic conditions and/or exterior lot line configurations offer no practical alternatives for connection or through traffic. Street stubs shall be provided with development adjacent to open land to provide for future connections at the discretion of the administrator. Streets shall be planned with due regard to the designated corridors shown on adopted plans and policies of the city or Transylvania County.* **General Recommendations** Requiring connectivity or cross-access between adjacent developments is a great tool for reducing the amount of traffic on major roads while increasing connectivity for pedestrians, bicycles, service vehicles, and neighborhood access. For good model language, see City of Wilson, NC UDO, Section 6.4: Connectivity Or City of Catawba Forest, NC UDO, Section 6.5, Connectivity. Both codes above also provide requirements for when bicycle/pedestrian connections between parcels, public open space, and between cul-de-sacs is required.

Topics/Strategies	Policies/Recommendations
3.3. Limit dead end streets or cul-de-sacs Dead end streets or Cul-de-sacs, while good at limiting motor vehicular traffic in an area, are a severe hindrance pedestrian and bicycle connectivity and over all neighborhood/community accessibility, including for emergency access and other services.	**UDO, Adopted Plans, or Engineering/Design Standards** **Excellent.** See Section 13.5.B, above, regarding connectivity and street design, where cul-de-sac are also discussed. *Section 13.5.O. Culs-de-sac and closes. Where practical, a close (see graphic, below) shall be used in place of a cul-de-sac. Culs-de-sac and closes shall be designed to facilitate the turning radius of emergency vehicles.* **General Recommendations** None
4. Resources	
The following documents were referenced for this policy and regulatory review. Other references for best practices are listed in the columns on far the right.	**UDO, Adopted Plans, or Engineering/Design Standards** City of Brevard's Unified Development Code **General Recommendations** REFERENCED DOCUMENTS AND OTHER RESOURCES: 1. NCDOT Complete Streets Planning and Design Guidelines (July 2012) 2. NCDOT Traditional Neighborhood Development (TND) Guidelines. 3. City of Wilson, NC UDO. 4. City of Wendell, NC UDO. 5. City of Wake Forest, NC UDO. 6. New Hanover County Zoning Ordinance 7. FHWA Traffic Calming ePrimer 8. Town of Huntersville neighborhood traffic calming policy 9. City of Charlotte Subdivision Ordinance 10. Association of Pedestrian and Bicycle Professionals' Bicycle Parking Guidelines, www.apbp.org. 11. Bicycle Parking Model Ordinance, Change Lab Solutions. And other documents noted in this column in the rows above.

Appendix D - Detailed Cost Estimates

Priority Project #1 - Osborne Road Shared Use Path

SIT 2: Off-Road/Separated Linear Bicycle Facilty

Start Over

Project Name: Osborne Rd sidepath

SPOT ID:

Project Type: Shared-Use Path, Multi-Use Path, Rail-Trail, or Sidepath

1	Total Project Length	3,965 feet
2	Proposed Facility Width (Default is 10 feet)	10 feet
3	Project Located on Both Sides of the Road	☐ YES ☑ NO
4	County	Transylvania
5	City	Brevard
6	Surrounding Development Type	Suburban
7	Registered Historic District	☐ YES ☑ NO
8	Existing Curb & Gutter within Project Area	☑ YES ☐ NO
9	Number of Stream Crossings	0
10	Percentage of ROW Area Needed	None (0-15%)
11	Impact to Active Railroad Track or Railroad ROW	☐ YES ☑ NO

12 Roadways Intersected

Interstate	0
Freeway	0
Major Arterial	0
Arterial	0
Major Collector	0
Collector	0
Local Road	4
Total	4

13 Signalized Intersections Crossed
(Number within Total Roadways Intersected)

0

14 Number of Existing Bridges

Interstate	0
Freeway	0
Major Arterial	0
Arterial	0
Major Collector	0
Collector	0
Local Road	0
Small Stream	0
Medium Stream	0
Large Stream	0
Railroad	0
Total	0

15 Submitted by: HMALONEY *Date:* 4/30/2022

Generate Cost | Clear

Cost Estimate Summary

Go to Calculation Tab

Print PDF

Total	**$**	**2,035,000**
Design	$	295,000
ROW	$	5,000
Utilities	$	70,000
Construction	$	1,665,000

Enter Any Desired Notes in the Box Below

Disclaimers

All costs are based on 2019 prices and cost components are rounded to the nearest $5,000, with a minimum of $5,000 per component. This tool assumes that 10% of the utilities located within the project area would need to be relocated.

This tool assumes established ecoregion typologies, construction market regions, and average land values specific to North Carolina. They are determined within the tool based on user inputs for project location. This location-based information is used in ROW, construction, and environmental mitigation calculations.

This tool assumes a project impact area for ROW and environmental mitigation calculations based on chosen SIT, project type, project length, and project facility width.

This tool is limited in accuracy by user inputs and the complexity of questions presented for each project. If the inputs are incorrect, the tool's accuracy will be diminished.

This tool does not estimate costs associated with the purchase or taking of buildings within its ROW estimate calculations. It is assumed that projects would require land acquisition only.

Estimates for the construction of new and/or the modification of existing structures (bridges or tunnels) have been simplified to estimate an assumed width of each structure based on the type of feature crossed and other factors. The construction of new and/or modification of existing structures can be exponentially complex based on project specifications. A separate feasibility study is highly recommended to address the high variability associated with structure costs.

Priority Project #2 - Neely Road Shared Use Path

SIT 2: Off-Road/Separated Linear Bicycle Facilty

Start Over

Project Name: Neely Road Sidepath

SPOT ID:

Project Type: Shared-Use Path, Multi-Use Path, Rail-Trail, or Sidepath

1	Total Project Length	5,201 feet
2	Proposed Facility Width (Default is 10 feet)	10 feet
3	Project Located on Both Sides of the Road	☐ YES ☑ NO
4	County	Transylvania
5	City	Brevard
6	Surrounding Development Type	Suburban
7	Registered Historic District	☐ YES ☑ NO
8	Existing Curb & Gutter within Project Area	☐ YES ☑ NO
9	Number of Stream Crossings	2
10	Percentage of ROW Area Needed	None (0-15%)
11	Impact to Active Railroad Track or Railroad ROW	☐ YES ☑ NO

12 Roadways Intersected

Interstate	0
Freeway	0
Major Arterial	0
Arterial	0
Major Collector	0
Collector	0
Local Road	8
Total	8

13 Signalized Intersections Crossed
(Number within Total Roadways Intersected)

0

14 Number of Existing Bridges

Interstate	0
Freeway	0
Major Arterial	0
Arterial	0
Major Collector	0
Collector	0
Local Road	0
Small Stream	2
Medium Stream	0
Large Stream	0
Railroad	0
Total	2

15 Submitted by: HMALONEY

Date: *4/30/2022*

Generate Cost

Clear

Cost Estimate Summary

Go to Calculation Tab

Print PDF

Total	**$**	**3,165,000**
Design	$	520,000
ROW	$	10,000
Utilities	$	90,000
Construction	$	2,545,000

Enter Any Desired Notes in the Box Below

Disclaimers

All costs are based on 2019 prices and cost components are rounded to the nearest $5,000, with a minimum of $5,000 per component. This tool assumes that 10% of the utilities located within the project area would need to be relocated.

This tool assumes established ecoregion typologies, construction market regions, and average land values specific to North Carolina. They are determined within the tool based on user inputs for project location. This location-based information is used in ROW, construction, and environmental mitigation calculations.

This tool assumes a project impact area for ROW and environmental mitigation calculations based on chosen SIT, project type, project length, and project facility width.

This tool is limited in accuracy by user inputs and the complexity of questions presented for each project. If the inputs are incorrect, the tool's accuracy will be diminished.

This tool does not estimate costs associated with the purchase or taking of buildings within its ROW estimate calculations. It is assumed that projects would require land acquisition only.

Estimates for the construction of new and/or the modification of existing structures (bridges or tunnels) have been simplified to estimate an assumed width of each structure based on the type of feature crossed and other factors. The construction of new and/or modification of existing structures can be exponentially complex based on project specifications. A separate feasibility study is highly recommended to address the high variability associated with structure costs.

Priority Project #3 - Broad Street + Caldwell Street Paired Separated Bicycle Lanes

SIT 2: Off-Road/Separated Linear Bicycle Facilty

Start Over

Project Name: Broad Street Separated Bike Lane

SPOT ID:

Project Type: Contra-Flow Bicycle Lane or Separated Bicycle Lane

1	Total Project Length	5,197 feet
2	Proposed Facility Width (Default is 10 feet)	12 feet
3	Project Located on Both Sides of the Road	☐ YES ☑ NO
4	County	Transylvania
5	City	Brevard
6	Surrounding Development Type	Downtown
7	Registered Historic District	☑ YES ☐ NO
8	Existing Curb & Gutter within Project Area	☑ YES ☐ NO
9	Number of Stream Crossings	0
10	Percentage of ROW Area Needed	None (0-15%)
11	Impact to Active Railroad Track or Railroad ROW	☐ YES ☑ NO

12 Roadways Intersected

Interstate	0
Freeway	0
Major Arterial	1
Arterial	0
Major Collector	2
Collector	0
Local Road	8
Total	11

13 Signalized Intersections Crossed
(Number within Total Roadways Intersected): 6

14 Number of Existing Bridges

Interstate	0
Freeway	0
Major Arterial	0
Arterial	0
Major Collector	0
Collector	0
Local Road	0
Small Stream	0
Medium Stream	0
Large Stream	0
Railroad	0
Total	0

15 Submitted by: HMALONEY *Date:* *5/3/2022*

Generate Cost | Clear

Cost Estimate Summary

Go to Calculation Tab

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Total	**$**	**2,750,000**
Design	$	475,000
ROW	$	15,000
Utilities	$	90,000
Construction	$	2,170,000

Enter Any Desired Notes in the Box Below

Disclaimers

All costs are based on 2019 prices and cost components are rounded to the nearest $5,000, with a minimum of $5,000 per component. This tool assumes that 10% of the utilities located within the project area would need to be relocated.

This tool assumes established ecoregion typologies, construction market regions, and average land values specific to North Carolina. They are determined within the tool based on user inputs for project location. This location-based information is used in ROW, construction, and environmental mitigation calculations.

This tool assumes a project impact area for ROW and environmental mitigation calculations based on chosen SIT, project type, project length, and project facility width.

This tool is limited in accuracy by user inputs and the complexity of questions presented for each project. If the inputs are incorrect, the tool's accuracy will be diminished.

This tool does not estimate costs associated with the purchase or taking of buildings within its ROW estimate calculations. It is assumed that projects would require land acquisition only.

Estimates for the construction of new and/or the modification of existing structures (bridges or tunnels) have been simplified to estimate an assumed width of each structure based on the type of feature crossed and other factors. The construction of new and/or modification of existing structures can be exponentially complex based on project specifications. A separate feasibility study is highly recommended to address the high variability associated with structure costs.

Priority Project #3 - Broad Street + Caldwell Street Paired Separated Bicycle Lanes, continued

SIT 2: Off-Road/Separated Linear Bicycle Facilty

Start Over

Project Name: Caldwell Street Separated Bike Lane

SPOT ID:

Project Type: Contra-Flow Bicycle Lane or Separated Bicycle Lane

1	Total Project Length	5,529 feet
2	Proposed Facility Width (Default is 10 feet)	12 feet
3	Project Located on Both Sides of the Road	☐ YES ☑ NO
4	County	Transylvania
5	City	Brevard
6	Surrounding Development Type	Downtown
7	Registered Historic District	☑ YES ☐ NO
8	Existing Curb & Gutter within Project Area	☑ YES ☐ NO
9	Number of Stream Crossings	0
10	Percentage of ROW Area Needed	None (0-15%)
11	Impact to Active Railroad Track or Railroad ROW	☐ YES ☑ NO

12 Roadways Intersected

Interstate	0
Freeway	0
Major Arterial	0
Arterial	0
Major Collector	2
Collector	0
Local Road	10
Total	12

13 Signalized Intersections Crossed
(Number within Total Roadways Intersected): 4

14 Number of Existing Bridges

Interstate	0
Freeway	0
Major Arterial	0
Arterial	0
Major Collector	0
Collector	0
Local Road	0
Small Stream	0
Medium Stream	0
Large Stream	0
Railroad	0
Total	0

15 Submitted by: HMALONEY *Date:* *5/3/2022*

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Total	**$**	**2,595,000**
Design	$	450,000
ROW	$	15,000
Utilities	$	95,000
Construction	$	2,035,000

Enter Any Desired Notes in the Box Below

Disclaimers

All costs are based on 2019 prices and cost components are rounded to the nearest $5,000, with a minimum of $5,000 per component. This tool assumes that 10% of the utilities located within the project area would need to be relocated.

This tool assumes established ecoregion typologies, construction market regions, and average land values specific to North Carolina. They are determined within the tool based on user inputs for project location. This location-based information is used in ROW, construction, and environmental mitigation calculations.

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This tool does not estimate costs associated with the purchase or taking of buildings within its ROW estimate calculations. It is assumed that projects would require land acquisition only.

Estimates for the construction of new and/or the modification of existing structures (bridges or tunnels) have been simplified to estimate an assumed width of each structure based on the type of feature crossed and other factors. The construction of new and/or modification of existing structures can be exponentially complex based on project specifications. A separate feasibility study is highly recommended to address the high variability associated with structure costs.

Priority Project #4 - Morgan Street + Jordan Street Paired Bicycle Boulevards

SIT 2: Off-Road/Separated Linear Bicycle Facilty

Start Over

Project Name: Jordan Street Contraflow Bike Lane

SPOT ID:

Project Type: Contra-Flow Bicycle Lane or Separated Bicycle Lane

1	Total Project Length	2,768 feet
2	Proposed Facility Width (Default is 10 feet)	7 feet
3	Project Located on Both Sides of the Road	☐ YES ☑ NO
4	County	Transylvania
5	City	Brevard
6	Surrounding Development Type	Downtown
7	Registered Historic District	☑ YES ☐ NO
8	Existing Curb & Gutter within Project Area	☑ YES ☐ NO
9	Number of Stream Crossings	0
10	Percentage of ROW Area Needed	None (0-15%)
11	Impact to Active Railroad Track or Railroad ROW	☐ YES ☑ NO

12 Roadways Intersected

Interstate	0
Freeway	0
Major Arterial	1
Arterial	1
Major Collector	0
Collector	0
Local Road	4
Total	6

13 Signalized Intersections Crossed
(Number within Total Roadways Intersected): 2

14 Number of Existing Bridges

Interstate	0
Freeway	0
Major Arterial	0
Arterial	0
Major Collector	0
Collector	0
Local Road	0
Small Stream	0
Medium Stream	0
Large Stream	0
Railroad	0
Total	0

15 Submitted by: HMALONEY *Date:* *5/20/2022*

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Total	**$**	**920,000**
Design	$	185,000
ROW	$	5,000
Utilities	$	50,000
Construction	$	680,000

Enter Any Desired Notes in the Box Below

This project is intended to be paired with a similar treatment on Morgan Street.

Disclaimers

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This tool does not estimate costs associated with the purchase or taking of buildings within its ROW estimate calculations. It is assumed that projects would require land acquisition only.

Estimates for the construction of new and/or the modification of existing structures (bridges or tunnels) have been simplified to estimate an assumed width of each structure based on the type of feature crossed and other factors. The construction of new and/or modification of existing structures can be exponentially complex based on project specifications. A separate feasibility study is highly recommended to address the high variability associated with structure costs.

Priority Project #4 - Morgan Street + Jordan Street Paired Bicycle Boulevards, continued

SIT 2: Off-Road/Separated Linear Bicycle Facilty

Start Over

Project Name: Morgan Street Contraflow Bike Lane

SPOT ID:

Project Type: Contra-Flow Bicycle Lane or Separated Bicycle Lane

1	Total Project Length	2,035 feet
2	Proposed Facility Width (Default is 10 feet)	7 feet
3	Project Located on Both Sides of the Road	☐ YES ☑ NO
4	County	Transylvania
5	City	Brevard
6	Surrounding Development Type	Downtown
7	Registered Historic District	☑ YES ☐ NO
8	Existing Curb & Gutter within Project Area	☑ YES ☐ NO
9	Number of Stream Crossings	0
10	Percentage of ROW Area Needed	None (0-15%)
11	Impact to Active Railroad Track or Railroad ROW	☐ YES ☑ NO

12 Roadways Intersected

Interstate	0
Freeway	0
Major Arterial	1
Arterial	1
Major Collector	0
Collector	0
Local Road	1
Total	3

13 Signalized Intersections Crossed
(Number within Total Roadways Intersected): 2

14 Number of Existing Bridges

Interstate	0
Freeway	0
Major Arterial	0
Arterial	0
Major Collector	0
Collector	0
Local Road	0
Small Stream	0
Medium Stream	0
Large Stream	0
Railroad	0
Total	0

15 Submitted by: HMALONEY *Date:* *5/20/2022*

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Total	**$**	**735,000**
Design	$	165,000
ROW	$	5,000
Utilities	$	35,000
Construction	$	530,000

Enter Any Desired Notes in the Box Below

This project is intended to be paired with a similar treatment on Jordan Street.

Disclaimers

All costs are based on 2019 prices and cost components are rounded to the nearest $5,000, with a minimum of $5,000 per component. This tool assumes that 10% of the utilities located within the project area would need to be relocated.

This tool assumes established ecoregion typologies, construction market regions, and average land values specific to North Carolina. They are determined within the tool based on user inputs for project location. This location-based information is used in ROW, construction, and environmental mitigation calculations.

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This tool is limited in accuracy by user inputs and the complexity of questions presented for each project. If the inputs are incorrect, the tool's accuracy will be diminished.

This tool does not estimate costs associated with the purchase or taking of buildings within its ROW estimate calculations. It is assumed that projects would require land acquisition only.

Estimates for the construction of new and/or the modification of existing structures (bridges or tunnels) have been simplified to estimate an assumed width of each structure based on the type of feature crossed and other factors. The construction of new and/or modification of existing structures can be exponentially complex based on project specifications. A separate feasibility study is highly recommended to address the high variability associated with structure costs.

Priority Project #4 - Morgan Street + Jordan Street Paired Bicycle Boulevards, continued

SIT 4: On-Road Bicycle Facility

Start Over

Project Name: Jordan Street Sharrows

SPOT ID:

Project Type: Shared Lane Marking (Sharrow)

1 Total Length of Roadway to be Improved by Sharrows: 2,768 feet

2 Submitted by: HMALONEY

Date: 5/20/2022

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Total	**$**	**20,000**
Design	$	5,000
ROW	$	5,000
Utilities	$	5,000
Construction	$	5,000

Enter Any Desired Notes in the Box Below

This project intended to be paired with a similar treatment on Morgan Street.

Disclaimers

All costs are based on 2019 prices and cost components are rounded to the nearest $5,000, with a minimum of $5,000 per component.

This tool assumes established ecoregion typologies, construction market regions, and average land values specific to North Carolina. They are determined within the tool based on user inputs for project location. This location-based information is used in ROW, construction, and environmental mitigation calculations.

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This tool does not estimate costs associated with the purchase or taking of buildings within its ROW estimate calculations. It is assumed that projects would require land acquisition only.

Estimates for the construction of new and/or the modification of existing structures (bridges or tunnels) have been simplified to estimate an assumed width of each structure based on the type of feature crossed and other factors. The construction of new and/or modification of existing structures can be exponentially complex based on project specifications. A separate feasibility study is highly recommended to address the high variability associated with structure costs.

Priority Project #4 - Morgan Street + Jordan Street Paired Bicycle Boulevards, continued

SIT 4: On-Road Bicycle Facility

Start Over

Project Name: Morgan Street Sharrows

SPOT ID:

Project Type: Shared Lane Marking (Sharrow)

1 Total Length of Roadway to be Improved by Sharrows: 2,035 feet

2 Submitted by: HMALONEY

Date: 5/20/2022

Generate Cost

Clear

Cost Estimate Summary

Go to Calculation Tab

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Total	**$**	**20,000**
Design	$	5,000
ROW	$	5,000
Utilities	$	5,000
Construction	$	5,000

Enter Any Desired Notes in the Box Below

This project intended to be paired with similar treatment on Jordan Street

Disclaimers

All costs are based on 2019 prices and cost components are rounded to the nearest $5,000, with a minimum of $5,000 per component.

This tool assumes established ecoregion typologies, construction market regions, and average land values specific to North Carolina. They are determined within the tool based on user inputs for project location. This location-based information is used in ROW, construction, and environmental mitigation calculations.

This tool assumes a project impact area for ROW and environmental mitigation calculations based on chosen SIT, project type, project length, and project facility width.

This tool is limited in accuracy by user inputs and the complexity of questions presented for each project. If the inputs are incorrect, the tool's accuracy will be diminished.

This tool does not estimate costs associated with the purchase or taking of buildings within its ROW estimate calculations. It is assumed that projects would require land acquisition only.

Estimates for the construction of new and/or the modification of existing structures (bridges or tunnels) have been simplified to estimate an assumed width of each structure based on the type of feature crossed and other factors. The construction of new and/or modification of existing structures can be exponentially complex based on project specifications. A separate feasibility study is highly recommended to address the high variability associated with structure costs.

Priority Project #4 - Morgan Street + Jordan Street Paired Bicycle Boulevards, continued

SIT 5: Multi-Site Bicycle Facility

Start Over

Project Name: Jordan/Morgan Bike Signals

SPOT ID:

Project Type: Multi-Site Bicycle Facility

1	Total Number of Bicycle Corrals	0
2	Total Amount of Bike Detection / Actuation Signals	4
3	Total Amount of Bicycle Parking	0
4	Total Number of Bicycle Share / Micro-Mobility Share Stations	0
5	Total Number of Bicycle Signals	4
6	Total Number of Bicycle Wheel Channels	0
7	Total Number of Curb Radii Revisions	0
8	Total Number of Hybrid Beacons	0
9	Total Number of Intersection Markings / Signage	0
10	Total Amount of Lighting	0
11	Total Number of Mid-Block Crossings	0
12	Total Amount of Wayfinding Stations	0

13 Submitted by: HMALONEY *Date:* *5/20/2022*

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Total	**$**	**175,000**
Design	$	25,000
ROW	$	5,000
Utilities	$	5,000
Construction	$	140,000

Enter Any Desired Notes in the Box Below

This project intended to be paired with contraflow bike lanes and sharrows on Jordan and Morgan Streets.

Disclaimers

All costs are based on 2019 prices and cost components are rounded to the nearest $5,000, with a minimum of $5,000 per component.

This tool assumes established ecoregion typologies, construction market regions, and average land values specific to North Carolina. They are determined within the tool based on user inputs for project location. This location-based information is used in ROW, construction, and environmental mitigation calculations.

This tool assumes a project impact area for ROW and environmental mitigation calculations based on chosen SIT, project type, project length, and project facility width.

This tool is limited in accuracy by user inputs and the complexity of questions presented for each project. If the inputs are incorrect, the tool's accuracy will be diminished.

This tool does not estimate costs associated with the purchase or taking of buildings within its ROW estimate calculations. It is assumed that projects would require land acquisition only.

Estimates for the construction of new and/or the modification of existing structures (bridges or tunnels) have been simplified to estimate an assumed width of each structure based on the type of feature crossed and other factors. The construction of new and/or modification of existing structures can be exponentially complex based on project specifications. A separate feasibility study is highly recommended to address the high variability associated with structure costs.

Priority Project #5 - French Broad Street Shared Lane Markings

SIT 4: On-Road Bicycle Facility

Start Over

Project Name: French Broad Street Sharrows

SPOT ID:

Project Type: Shared Lane Marking (Sharrow)

1 Total Length of Roadway to be Improved by Sharrows: 4,489 feet

2 Submitted by: HMALONEY

Date: *5/20/2022*

Generate Cost

Clear

Cost Estimate Summary

Go to Calculation Tab

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Total	**$**	**20,000**
Design	$	5,000
ROW	$	5,000
Utilities	$	5,000
Construction	$	5,000

Enter Any Desired Notes in the Box Below

This project intended to be paired with signage and traffic calming.

Disclaimers

All costs are based on 2019 prices and cost components are rounded to the nearest $5,000, with a minimum of $5,000 per component.

This tool assumes established ecoregion typologies, construction market regions, and average land values specific to North Carolina. They are determined within the tool based on user inputs for project location. This location-based information is used in ROW, construction, and environmental mitigation calculations.

This tool assumes a project impact area for ROW and environmental mitigation calculations based on chosen SIT, project type, project length, and project facility width.

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This tool does not estimate costs associated with the purchase or taking of buildings within its ROW estimate calculations. It is assumed that projects would require land acquisition only.

Estimates for the construction of new and/or the modification of existing structures (bridges or tunnels) have been simplified to estimate an assumed width of each structure based on the type of feature crossed and other factors. The construction of new and/or modification of existing structures can be exponentially complex based on project specifications. A separate feasibility study is highly recommended to address the high variability associated with structure costs.

Appendix E - Long-Term Project List with Prioritization Scores (continued)

TABLE 3.6 *Long-Term Priority Project List with Prioritization Scores, continued from page 47*

Project Number	Corridor	Proposed Facility/ Treatment	Prioritization Criteria				Total Priority Score
			Estatoe Trail	Safety	Connec-tivity	Public Support	
154	Asheville Highway/Forest Gate Drive/ Deavor Road	Planned Roundabout	0	1	1	0	2
156	Asheville Highway/Allison Road/ Fortune Cove Road	Planned Roundabout	0	1	1	0	2
157	Asheville Highway/Davidson River Village (DRV) Connector	Planned Roundabout	0	1	1	0	2
168	Broad Street/Fisher Road	Crossing Improvement- Planned (R-5800)	0	1	1	0	2
177	Caldwell Street/Oakdale Street	Crossing Improvement	0	1	1	0	2
182	Ecusta Road /Davidson River Village (DRV) Connector	Planned Roundabout	0	1	1	0	2
184	Greenville Highway/Parkview Drive/Elm Bend Road	Crossing Improvement	0	1	1	0	2
188	Main Street/Greenville Highway/ Wilson Drive	Crossing Improvement	0	1	1	0	2
192	Main Street/Park Avenue	Crossing Improvement	0	1	1	0	2
193	Parkview Drive/Park Avenue	Crossing Improvement	0	1	1	0	2
9	Carolina Avenue	Sidewalk	0	1	0	0	1
10	Deerlake Road- eastside	Sidewalk	0	1	0	0	1
22	Kings Creek Road	Sidewalk	0	1	0	0	1
32	Rosenwalkd Lane	Sidewalk	0	1	0	0	1
34	Southview Drive	Sidewalk	0	1	0	0	1
37	Tinsley Road	Sidewalk	0	1	0	0	1
41	Verdery Avenue	Sidewalk	0	1	0	0	1
44	Asheville Highway	Shared Use Path	0	1	0	0	1
53	Cashiers Valley Road	Shared Use Path	0	1	0	0	1
63	Ecusta Trail	Shared Use Path	0	1	0	0	1
64	Ecusta Trail	Shared Use Path	0	1	0	0	1
84	Main Street	Shared Use Path	0	1	0	0	1
86	Main-Holcombe connector	Shared Use Path	0	1	0	0	1
106	Rosman Highway	Shared Use Path	0	1	0	0	1
112	Rosman Highway- westside	Shared Use Path	0	1	0	0	1
113	Rosman Highway- westside	Shared Use Path	0	1	0	0	1
115	Tinsley-Commerce connector	Shared Use Path	0	1	0	0	1
123	Davidson River Village (DRV) Connector	Bicycle Lanes- Planned R5800	0	1	0	0	1
125	Duckworth Avenue	Shared Lane Markings	0	1	0	0	1
127	Fisher Road	Shared Lane Markings	0	0	1	0	1
133	Johnson Street	Shared Lane Markings	0	1	0	0	1
139	Oakdale Road	Shared Lane Markings	0	1	0	0	1
141	Park Avenue	Shared Lane Markings	0	0	1	0	1
142	Temple Church Road/Medical Park Drive	Shared Lane Markings	0	1	0	0	1
145	Turnpike Road	Shared Lane Markings	0	0	1	0	1
119	Carolina Avenue	Shared Lane Markings	0	0	0	0	0

Project Number	Corridor	Proposed Facility/ Treatment	Prioritization Criteria				Total Priority Score
			Estatoe Trail	Safety	Connec-tivity	Public Support	
122	Commerce Street	Shared Lane Markings	0	0	0	0	0
124	Davidson River Village (DRV) Connector	Bicycle Lanes-planned R5800	0	0	0	0	0
128	Franklin Street	Shared Lane Markings	0	0	0	0	0
138	Oakdale Avenue	Bicycle Boulevard	0	0	0	0	0
144	Tinsley Road/Kings Creek Road	Shared Lane Markings	0	0	0	0	0

BREVARD

PEDESTRIAN *and* BICYCLE PLAN

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N.C. DEPARTMENT OF TRANSPORTATION