

# Greenway Connection Study

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*Downtown Mocksville to  
Davie County Community Park*

May 2022



# Acknowledgments

Thank you to the town officials, local residents, partners, and advisors that participated in the development of this study through meetings, comment forms, field tours, and plan review.

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# Background & Existing Conditions

*S Salisbury St bridge over the railroad tracks.*



# Project Background

*This project, connecting Downtown Mocksville to Davie County Community Park, was the top priority in the Davie County Bicycle, Pedestrian, and Greenway Master Plan.*

The Piedmont Triad Regional Council (PTRC) applied for and received State Planning and Research funding from the North Carolina Department of Transportation (NCDOT) to assess options for improving bicycle and pedestrian connections between Davie County Community Park and nearby schools, employment centers, and residential areas.

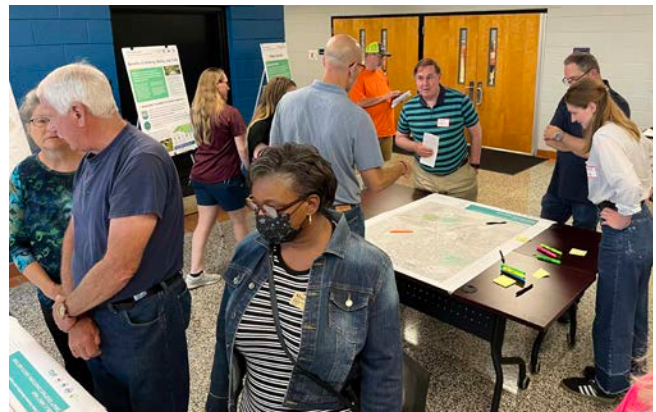
This feasibility study was recommended as a priority project in the Yadkin Valley Regional Bicycle Plan (2017) and the Davie County Bicycle, Pedestrian, and Greenway Master Plan (2021), developed with input from stakeholders and the public. Other local and regional plans, such as the Davie County Comprehensive Plan (2019), recommended greenway and trail development to connect key destinations in the county.

**This project, then, meets a top priority community need identified in multiple local and regional plans by providing a safe walking and biking connection between Downtown Mocksville, South Davie Middle School, and Davie County Community Park. The project will reduce the likelihood of crashes involving bicyclists and pedestrians,**

**improve opportunities for outdoor recreation in Davie County, and provide greater transportation choice for local residents, while enhancing local tourism, economic development, and quality of life. The main alternatives for potential bicycle and pedestrian facilities include the following:**

- 1.** A sidewalk along S Salisbury Street;
- 2.** A greenway trail west of S Salisbury Street from South Davie Middle School to Davie County Community Park; and
- 3.** A greenway trail east of S Salisbury Street from Depot Street to Davie County Community Park.

This study outlines these alternative recommendations and provides additional supporting information about the benefits of these projects, the current conditions, implementation steps, design resources, funding resources, and a summary of the planning process.



*Alternatives being reviewed and discussed at a public open house workshop in 2022.*

# Why Should Mocksville and Davie County Create a Walking and Bicycling Trail?

Increased rates of bicycling and walking will help to improve people's health and fitness, improve livability of our communities, enhance environmental conditions, decrease traffic congestion, and contribute to a greater sense of community.

Scores of studies from the fields of public health, urban planning, urban ecology, real estate, tourism, and transportation have demonstrated the value of supporting bicycling and walking. Communities across the United States and throughout the world are investing in improvements for bicycling, walking, and trails. They do this because of their obligations to promote health, safety and welfare, and also because of the growing awareness of the many benefits outlined in the studies listed below.



*WalkBikeNC is a blueprint for improving walking and biking in NC communities.*

## WalkBikeNC

▶ <https://www.ncdot.gov/bikeped/walkbikenc>

WalkBikeNC (North Carolina's Statewide Bicycle and Pedestrian Plan) is a blueprint for improving walking and bicycling for North Carolina communities. The website includes information on the benefits of walking and bicycling and the five "pillars"—health, safety, economy, mobility, and the environment.

## Trails Research and Benefits Library

▶ <https://headwaterseconomics.org/economic-development/trails-pathways/trails-research/>

Headwaters Economics compiled 120 studies on the impacts of trails into a searchable library. Findings include:

- ▶ Trails can generate business impacts and create new jobs by attracting visitors, especially overnight visitors.
- ▶ Local trails are a valuable part of residents' quality of life.
- ▶ Trails are often associated with higher property value, especially when a trail is designed to provide neighborhood access and maintain residents' privacy.
- ▶ Trails are associated with increased physical activity and improved public health, especially in rural places without other safe places to exercise.

## Bikes in Beds: How to Maximize Bicycle Tourism

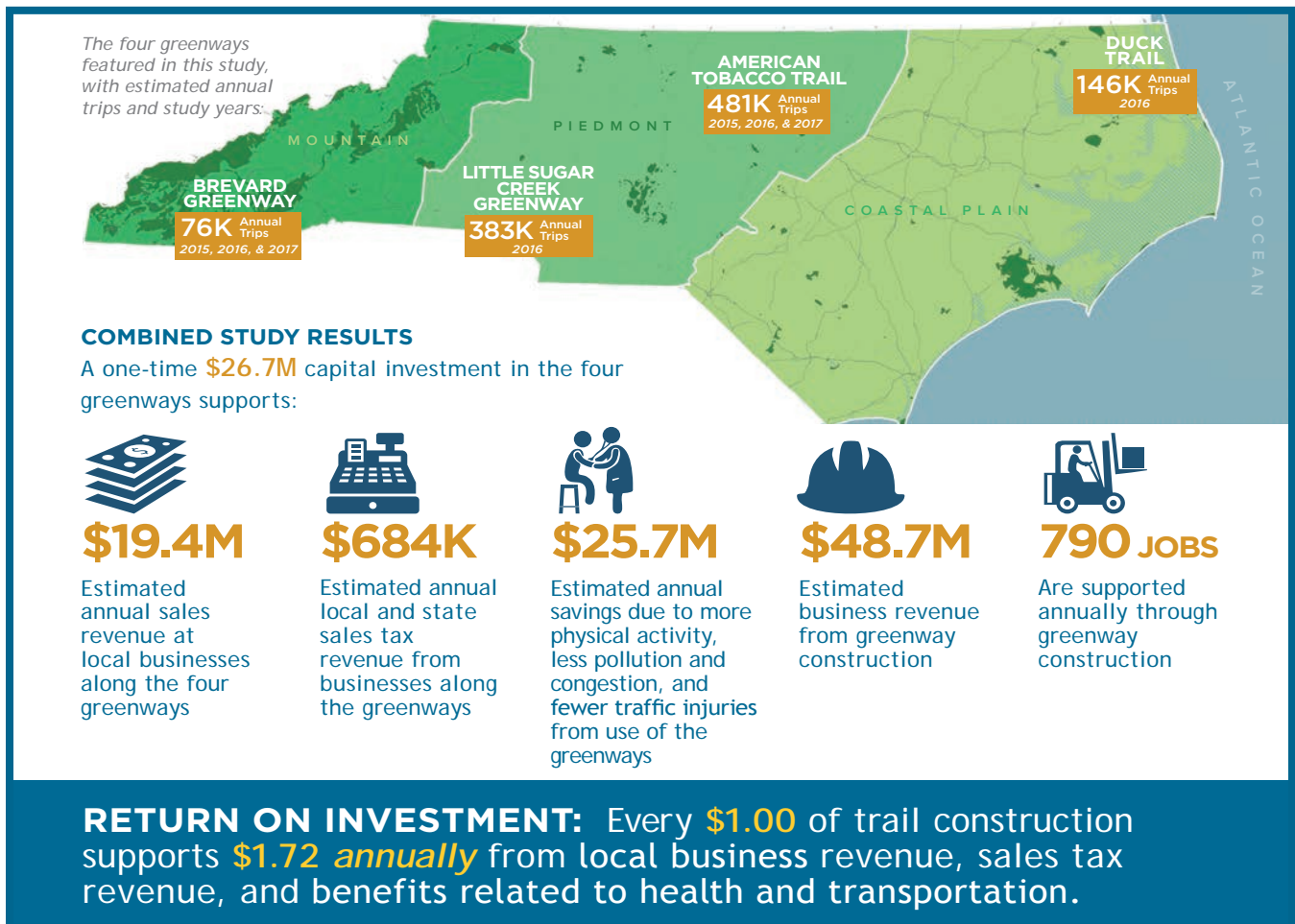
👉 [https://www.adventurecycling.org/sites/default/assets/File/Travel\\_Initiatives/Bicycle%20Tourism%20Webpages/2015\\_Bikes-in-Beds\\_WNCBikeTourism-FINAL-LowResolution.pdf](https://www.adventurecycling.org/sites/default/assets/File/Travel_Initiatives/Bicycle%20Tourism%20Webpages/2015_Bikes-in-Beds_WNCBikeTourism-FINAL-LowResolution.pdf)

This 2015 report from Haywood County, NC, details the economic impact of bicycle tourists. While focusing on Haywood County, this study also provides an overview of bicycle tourism opportunities for other NC communities.

## Evaluating the Economic Contribution of Shared Use Paths

👉 <https://itre.ncsu.edu/focus/bike-ped/sup-economic-impacts/>

Shared use paths, or greenways, provide a shared space for bicycle and pedestrian travel outside the roadway. The objective was to design and test an approach for measuring the economic contributions of greenways in NC. The study found that, on average, every \$1.00 of trail construction in NC supports \$1.72 annually from local business revenue, sales tax revenue, and benefits related to health and transportation.



Excerpt from the Executive Summary for "Evaluating the Economic Contribution of Shared Use Paths in NC."

## Walking the Walk: How Walkability Raises Home Values in U.S. Cities

👉 [https://nacto.org/docs/usdg/walking\\_the\\_walk\\_cortright.pdf](https://nacto.org/docs/usdg/walking_the_walk_cortright.pdf)

This report by CEOs for Cities looked at 94,000 real estate transactions in 15 markets and found that in 13 of those markets, higher levels of “walkability” were directly linked to higher home values.

## Active Transportation Transforms America

👉 <https://www.railstotrails.org/resource-library/resources/active-transportation-transforms-america/>

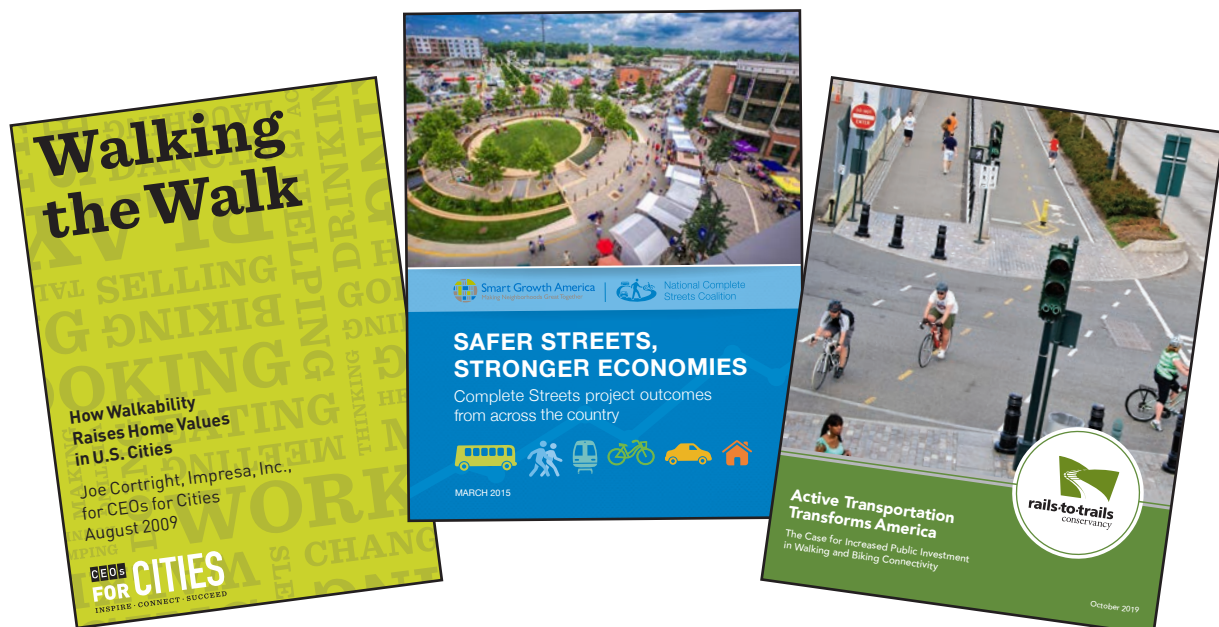
This report quantifies the potential benefits of connected multimodal networks by examining

scenarios and factors that shift trips from vehicles to active transportation modes. The benefits include reduced traffic congestion, job creation, better environmental quality, increased health, and economic investment.

## Safer Streets, Stronger Economies

👉 <https://smartgrowthamerica.org/wp-content/uploads/2016/08/safer-streets-stronger-economies.pdf>

This report by Smart Growth America studied the outcomes of 37 Complete Streets projects. The report found that, on average, Complete Streets projects improved safety, encouraged multimodal travel, and cost less than conventional transportation projects.





# Existing Conditions

The following numbered notes highlight opportunities and constraints in the study area. This list corresponds to the map on page 11.

- 1 At-grade RR crossing with signal arms.
- 2 Limited sight lines due to RR crossing structure.
- 3 RR crosses above grade; roadway space underneath is narrow/constrained.



- 4 At-grade RR crossing only serves the transformer building.
- 5 Sidewalk plan recommended sidewalks on Main St, but steep topography is a challenge.
- 6 Private driveway.
- 7 Land for a planned but not constructed street is being used as de facto backyard space.

- 8 Trucks are discouraged from entering Avgol Dr via Duke St; street has less truck traffic as a result.
- 9 Restricted access.
- 10 Utility easement on property owned by Avgol Industries.
- 11 S Salisbury St bridge is scheduled for replacement in 10 years; current bridge has narrow, uneven sidewalks on both sides.



- 12 Utility easement on Eaton Dr slopes steeply down from street level.
- 13 N side of Eaton Rd has more right-of-way (ROW) space than S side.
- 14 Utility poles and drainage grates along S Salisbury St located close to roadway on E and W sides.

- 15 Frequent driveways, heavy traffic (including many large trucks), and traffic noise along S Salisbury St negatively affect the experience for pedestrians and bicyclists.



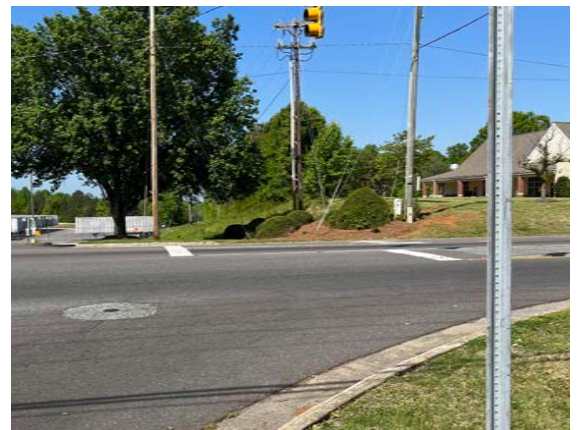
- 16 At-grade RR crossing with signal arms.

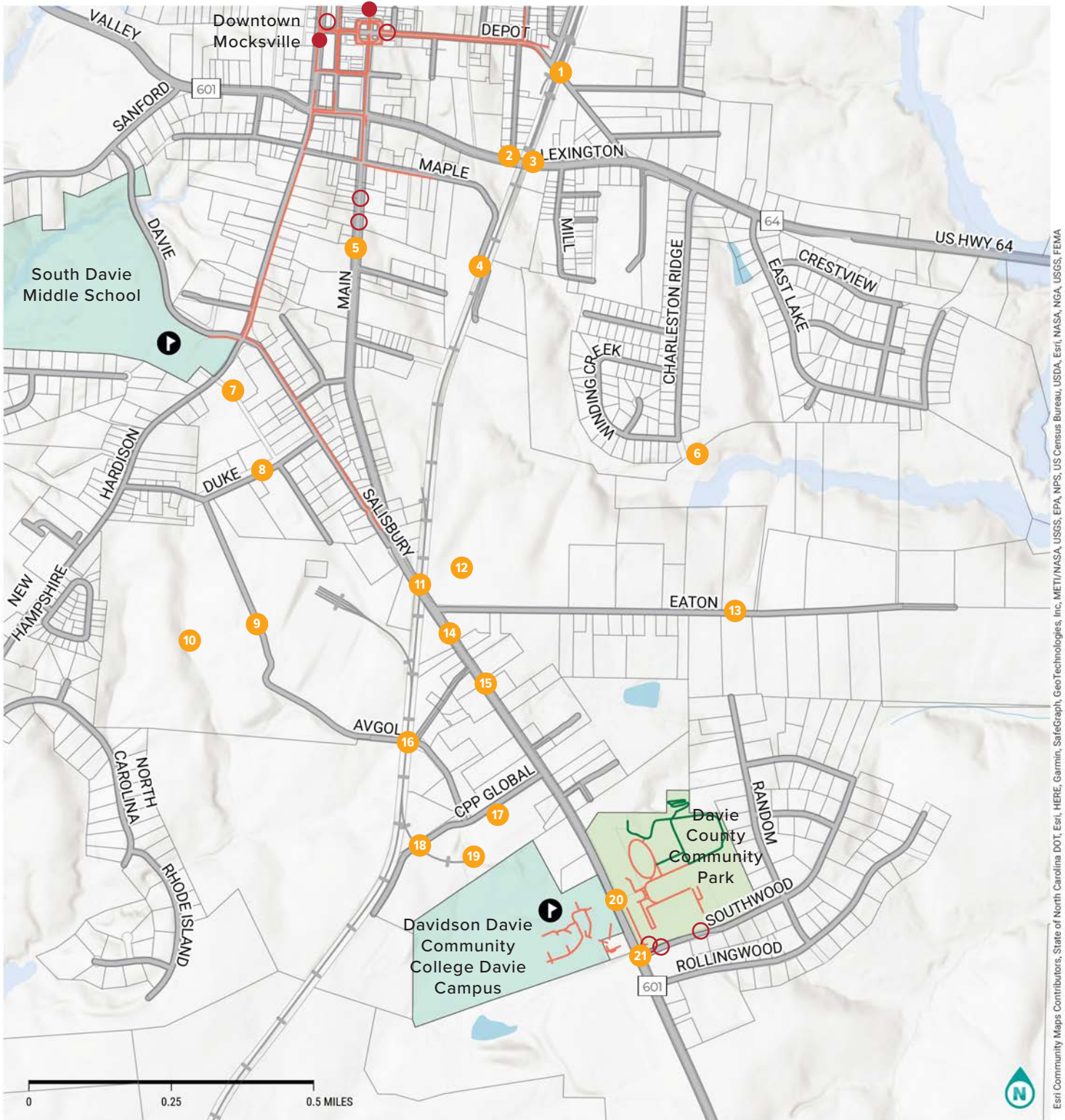


- 17 Open drainage ditch along S side of CPP Global/Kaydon Dr.
- 18 At-grade RR crossing with signal arms.
- 19 Active rail spur used by CPP Global.
- 20 Only existing marked crosswalk on S Salisbury St in the study corridor; no curb cuts.



- 21 No existing pedestrian crossing signals, marked crosswalks, or curb cuts at intersection; steep slope at NW corner continuing up W side of S Salisbury St to Dollar General.





# Existing Conditions

## EXISTING FEATURES

- Sidewalks
- Trails
- P Davie County Schools
- 100-Year Floodplain
- Parcels

## BIKE/PED CRASHES 2007-2020

- Possible Injury
- Suspected Serious Injury or Fatal Injury

Esri Community Maps Contributors, State of North Carolina DOT, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Esri, NASA, NGA, USGS, FEMA

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# Recommendations

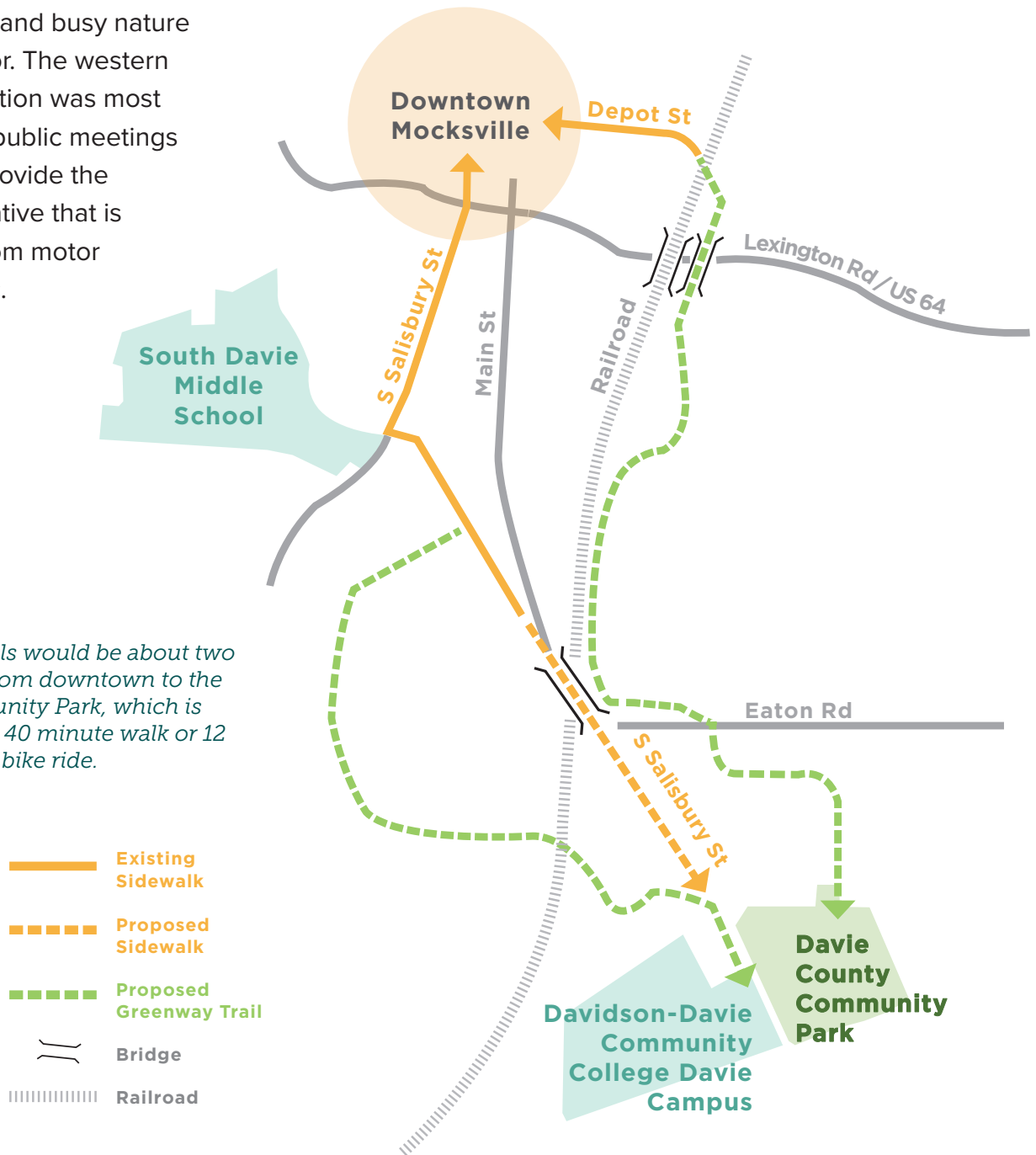
*Proposed S Salisbury St crossing improvements.*

# Recommendations Overview

## Overall Concept

The overall concept provides several options for linking Downtown Mocksville to Davie County Community Park, including two greenway options and one sidewalk option. The eastern greenway option requires a bridge over US 64 (high cost), and does not connect to South Davie Middle School. The sidewalk option along S Salisbury Street would be a huge improvement on existing conditions, but is not what is desired by most public participants in the planning process due to the number of driveways and busy nature of the corridor. The western greenway option was most preferred at public meetings and would provide the safest alternative that is separated from motor vehicle traffic.

*The trails would be about two miles from downtown to the Community Park, which is about a 40 minute walk or 12 minute bike ride.*



## Key Inputs for Trails Study Recommendations

Staff from the Town of Mocksville, Davie County and PTRC, as well as project consultants, drew upon the key inputs shown at right to inform the recommendations of this trails study. The pages that follow outline the main recommendations, with opportunities and constraints noted across the trail system.

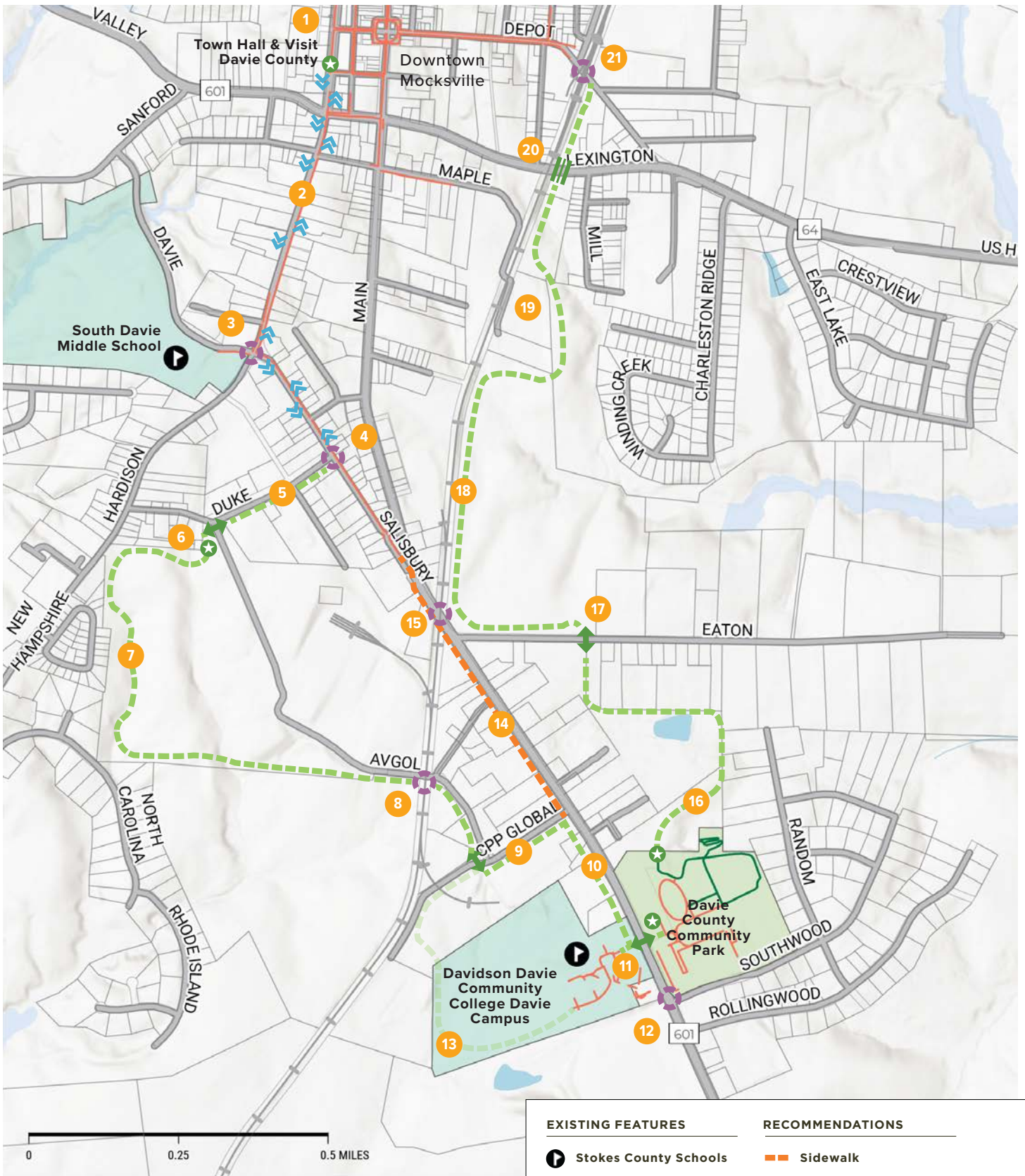


## Overall Recommendations Notes

The numbered notes that follow highlight recommendations in the study area and correspond to the map on page 15.

- 1 The route from downtown would begin at Town Hall and Visit Davie County. It would use existing sidewalks with the addition of shared lane markings (or "sharrows"). See the "Neighborhood Bikeway" examples and descriptions on page 50.
- 2 The above recommendation should be accompanied by a speed limit reduction on this section of S Salisbury St from 35 MPH to 25 MPH.
- 3 The intersection of S Salisbury St and S Davie Dr should be enhanced for pedestrian safety by the addition of a pedestrian refuge island, curb radius reduction (see page 56), high-visibility raised crosswalk (see page 54), and bike/ped crossing signage approaching the intersection.
- 4 A high-visibility raised crosswalk (see page 54) is recommended across S Salisbury St at Duke St to connect the proposed path on Duke St to the existing sidewalk on the east side of S Salisbury St.
- 5 A shared-use path along the roadway corridor (see page 46) is recommended on the south side of Duke St. The north

*[continued on page 16]*



# Recommendations Map

# = See notes on pages 14-17

EXISTING FEATURES	RECOMMENDATIONS
Stokes County Schools	Sidewalk
Parcels	Greenway Trail
100 Year Floodplain	Trailhead
Park	Trail Crossing (Street Level)
Sidewalk	Trail Crossing (Bridge)
Greenway Trail	Shared Lane Markings (Reduce to 25 MPH)
	Spot Improvement (see notes)

side may seem like a good route for the trail given the space under the transmission lines; however, the required 25-foot offset for trails from transmission tower structures would not allow for trail alignment (see page 31).

- 6 The shared use path would cross Avgol Dr then continue on an alignment to be determined through close coordination and negotiation with Avgol Industries as the property owner. Initial input from Avgol indicates that it may be possible to route the trail along the perimeter of the property, rather than the utility corridor that bisects the property (see page 18).
- 7 The alignment shown on the map is for discussion purposes only and is to be approved by Avgol Industries in the next phase of this project. A key concern of many property owners is liability; see page 35 for information on NC's Recreational Use Statute and landowner liability for trail users.
- 8 The proposed concept for the shared use path crossing of the railroad near Avgol Dr is illustrated on pages 20–21.
- 9 The shared-use path would continue along the roadway corridor (see page 46) for the sections of Avgol Dr, CPP Global Dr, and S Salisbury St. These sections will require careful design due to existing roadside drainage swales, CPP Global truck circulation, and CPP Global loading docks.
- 10 Driveway crossings along S Salisbury St should be designed to provide visibility to trail users as they cross (see pages 52–53).
- 11 The shared use path would cross S Salisbury St with a HAWK signal at the entrance to the Davie County Community College and Davie County Community Park (see pages 19 and 55). The leg of the intersection across the community college entrance should be modified to create a median refuge island.
- 12 The intersection of S Salisbury St and Southwood Dr should be enhanced for pedestrian safety to include high-visibility crosswalks, pedestrian signals, curb ramps, and sidewalks connecting to the college and park sidewalk networks.
- 13 An alternate connection (shown in faded, dashed green) could be explored from the Davie County Community College Campus to CPP Global Dr. This would require close coordination and negotiation with CPP Global representatives to determine feasibility of a) trail access on their property, and b) trail crossing of the railroad spur that connects to their facilities.
- 14 A sidewalk is recommended on the west side of S Salisbury St from the Davie County Community College and Davie County Community Park entrance to the existing sidewalks on the west side of S Salisbury St to the north. This section was already submitted for funding to NCDOT. Contact NCDOT Division 9 for details.



- 15 The existing S Salisbury St bridge over the railroad tracks should be redesigned to more safely accommodate people walking and bicycling (see page 22 for an example bridge in Greensboro, NC).
- 16 A longer-term shared use path connection on the east side of the study area could serve to create a loop back to downtown, starting north of Davie County Community Park, connecting to Eaton Rd. The proposed route is along multiple private properties where trail easements would need to be negotiated from willing landowners.
- 17 The proposed shared use path would cross Eaton Rd with a high-visibility crosswalk or HAWK signal (see page 55).
- 18 The proposed route in this section is also along multiple private properties. Trail easements would need to be negotiated from willing landowners, or could potentially be required for dedication through the development process (this would require that land development ordinances require trail easement dedication for trails on adopted plans such as this one). See the *Yadkin Valley Regional Bike Plan* (available through PTRC) for detailed policy recommendations and examples from other NC communities focused on this topic. Also see page 30 for information on working with developers to create trails.

- 19 The path would need to be aligned around the electrical substation with fencing, and ideally (from a trail user perspective) with heavy vegetative screening. An example trail that aligns in close proximity to an electrical substation is the South Ellerbee Creek Trail section of the East Coast Greenway in Durham, NC, which runs within 70 feet of the substation.



*Trail example in Durham, NC, near Duke St and Trinity Ave.*

- 20 The path would cross US 64 with a bicycle and pedestrian bridge, parallel but separate from the existing railroad bridge over US 64. This is an expensive option, but similar in cost to routing the trail westward to the intersection of US 64 and Depot St, which would be a less safe crossing.
- 21 The eastern "loop" route would then cross the existing at-grade railroad crossing at Depot St and connect to the existing sidewalk network in Downtown Mocksville, completing the loop. This railroad crossing could be enhanced with bike/ped crossing signage and pavement markings

## Project Rendering: *Typical Shared-Use Path / Greenway Trail Section*

*Existing conditions near Avgol Dr and Duke St (right), and of the same location with an illustrated trail (below). The trail surface example shown below is concrete, but actual trail surfaces could vary (see trail surface information in Appendix A, Design Resources).*

*Note: This rendering is for illustration purposes only. Initial input from Avgol indicates that this particular utility corridor is not viable for trail use.*

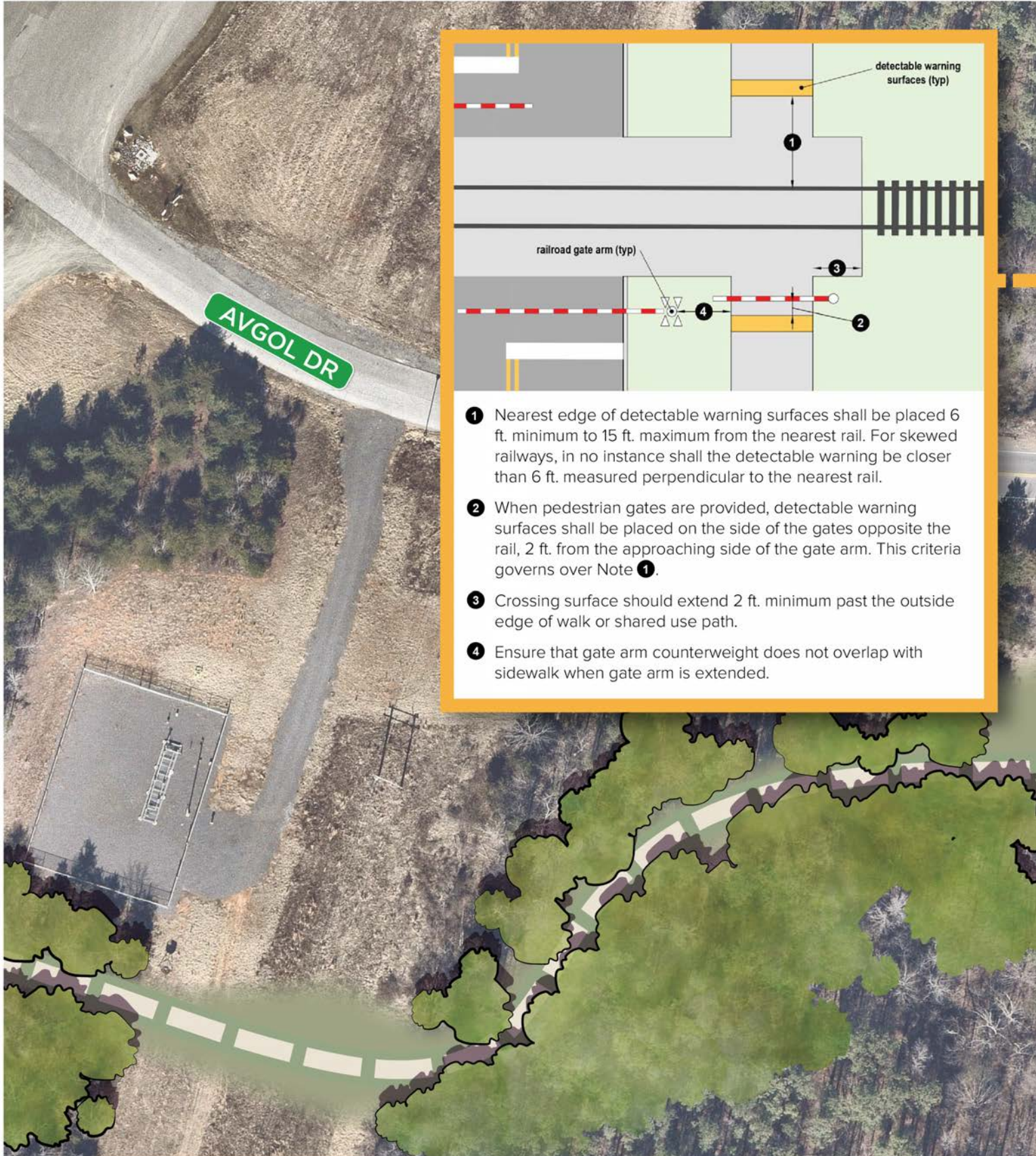


# Project Rendering: *Trail Crossing of S Salisbury Street at Davie County Community Park and Davie County Community College*

*Proposed S Salisbury Street crossing improvements at Davie County Community Park & Davie Community College entrance.*



## Conceptual Railroad Crossing Improvements at Avgol Drive



- 1 Nearest edge of detectable warning surfaces shall be placed 6 ft. minimum to 15 ft. maximum from the nearest rail. For skewed railways, in no instance shall the detectable warning be closer than 6 ft. measured perpendicular to the nearest rail.
- 2 When pedestrian gates are provided, detectable warning surfaces shall be placed on the side of the gates opposite the rail, 2 ft. from the approaching side of the gate arm. This criteria governs over Note 1.
- 3 Crossing surface should extend 2 ft. minimum past the outside edge of walk or shared use path.
- 4 Ensure that gate arm counterweight does not overlap with sidewalk when gate arm is extended.

*Inset Diagram Source: <https://www.transportation.ohio.gov/working/engineering/roadway/manuals-standards/multimodal/multimodal-pdf>*



Conceptual trail routing shown. Actual routing would depend on participation and interest of willing landowners.

## Project Example: *Proposed Design for Future S Salisbury Street Bridge Replacement*

*Example of a bridge in Greensboro, NC (below), that accommodates a sidewalk and a shared-use path. The existing bridge on S Salisbury Street (right) is insufficient for bicycles and pedestrians.*



*Images: Google Street View*

## Estimated Cost Range for Connection from South Davie Middle School to Davie County Community Park

DRAFT PLAN PLACEHOLDER

### How to Use Estimated Costs Ranges

Please take into account the following important notes and caveats:

- The cost estimates represent a planning-level of analysis and therefore are listed in ranges.
- Costs will likely change as more information becomes available in the design phase.
- Costs are listed in the base year of 2022, and should be escalated at a rate of 5% each year thereafter.
- Cost estimates do not include land acquisition/ROW needs, utility relocations, alterations to drainage structures, engineering, or construction inspection.
- Design costs are not listed but they can range between 10 and 20% of construction costs, depending on the size and complexity of the project. Ranges will be higher on projects using federal funds that require a high level of regulatory compliance and on projects that impact Federal Emergency Management Agency (FEMA)-regulated floodways that require detailed flood modeling and permitting. Small projects will also see higher percentages for design cost.

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# Implementation



*Example walking and bicycling trail in North Carolina.*





# Implementation Action Steps

The action steps draw from the opportunities shown in this document. These should be guiding steps for the Town of Mocksville and the Piedmont Triad Regional Council to initiate plan implementation and to begin top projects.

TASK	DETAILS	PHASE
Adopt this plan.	Through adoption, the plan becomes an official planning document of the Town of Mocksville and the PTRC. Adoption does not commit Mocksville/PTRC to dedication of funding, but rather shows intention to support plan implementation over time. It also signals to outside funding groups that Mocksville has undergone a successful, supported planning process, which is key to securing outside funding.	Short-term (2022)
Seek multiple funding sources and facility development options.	Project recommendations contain cost estimates, and potential funding opportunities are listed at the end of this report. Key funding partners could include NCDOT, PTRC, NC State Parks' NC Trails program (Recreational Trails Program Grant), and the Great Trails State Coalition.	Short-term/Ongoing (2022)
Involve major stakeholders and landowners in trail alignment decision process.	Coordination and approval for lease and use of property from Avgol Industries is required for several trail recommendations in this plan, as outlined in project cut sheets. CPP Global should be similarly consulted, depending on how much right-of-way is available along CPP Global Dr. Segments of the proposed trails pass near Duke Energy transmission easements, possibly necessitating a Trail Encroachment Agreement (contact: Jimmy Flythe, Government & Community Relations for NC West Region). Conversations with private landowners of potentially affected parcels should also be ongoing.	Short-term/Ongoing (2022–)
Complete priority projects.	Aim to complete the priority project segments in the next 2–5 years, from Downtown Mocksville to Avgol, and from Avgol to Davie County Community Park.	Ongoing (2022–2027)
Develop a long-term funding strategy.	To allow continued development of the project recommendations, capital funds for bicycle and pedestrian facility construction should be set aside every year. Aim for a minimum of 20% of the base costs for the priority project(s) in order to at least have a match for outside resources. Funding for an ongoing maintenance program should also be included in operating budgets.	Short-term/Ongoing (2022–)

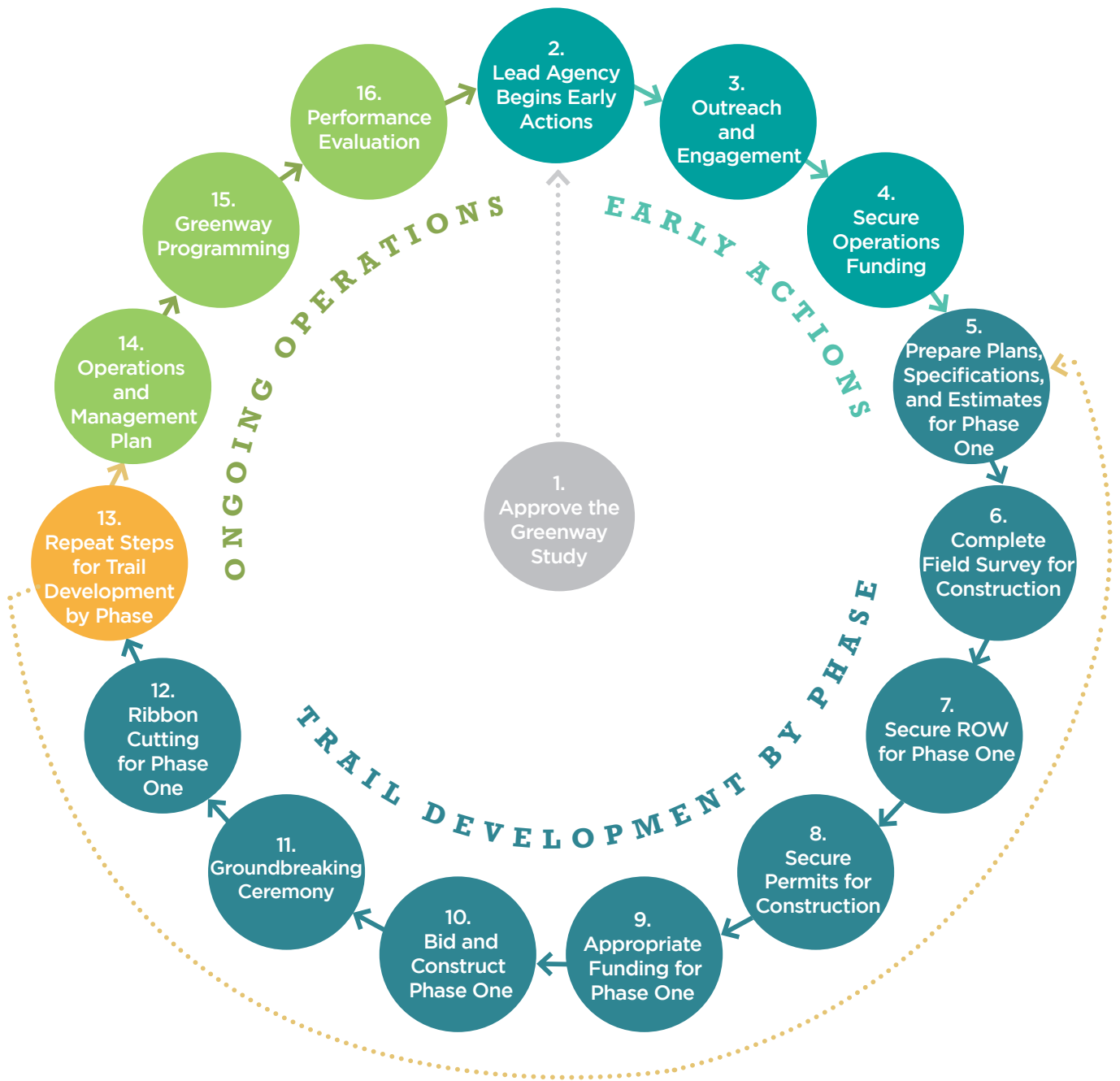
Coordinate project implementation with NCDOT road resurfacing and bridge replacement schedule.	Resurfacing is a very important part of implementing bike facilities and comes at very little cost. If possible, coordinate installation of new pavement markings (such as crosswalk and shared lane marking recommendations) with the resurfacing schedule to save on costs. Another important step is the inclusion of pedestrian and bike facilities in the design of the S Salisbury St/US 601 bridge that is to be replaced in the next decade.	Short-term/Ongoing (2022–)
Update Unified Development Ordinance.	Consider requiring developers to set aside trail easements where they are proposed on existing plans, such as this one. See the <i>Yadkin Valley Regional Bike Plan</i> (available through PTRC) for detailed policy recommendations and examples from other NC communities focused on this topic.	Short-term/Ongoing (2022–)
Launch new programs.	New programs should be launched to complement infrastructure improvements, as described in this document.	Ongoing (2023–)
Seek designation as a Bicycle-Friendly Community & Walk-Friendly Community.	The development and implementation of this plan is an essential first step toward becoming a designated Bicycle-Friendly and Walk-Friendly Community. With progress on these recommendations, Mocksville should be in a position to apply for and receive recognition by 2026. See the League of American Bicyclists website ( <a href="https://www.bikeleague.org/community">https://www.bikeleague.org/community</a> ) and the Walk Friendly Community program website ( <a href="http://walkfriendly.org/">http://walkfriendly.org/</a> ) for further information.	Mid- to Long-term (2026–)
Update this plan.	This plan should be updated by 2030 (about eight years from adoption). If many of the recommendations have been completed by then, a new set of priorities should be established. If not, a new implementation strategy should be established.	Long-term (2030)



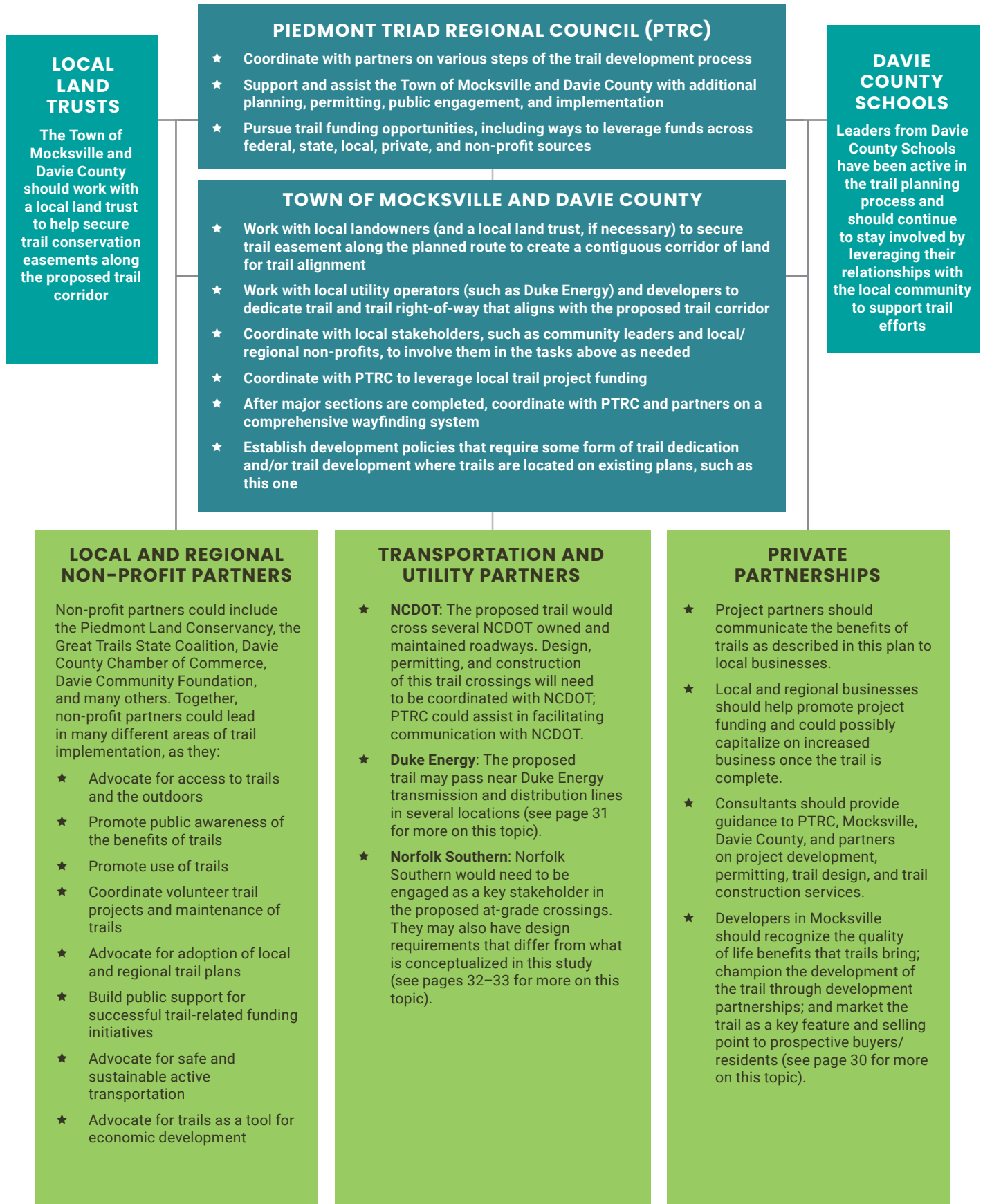
*Davie County Community Park walking path (existing).*

# Typical Trail Development Process

The following diagram outlines the typical steps that are required after plan approval and into trail development and operations. In reality, some actions may occur simultaneously or in a slightly different order.



# Framework for Implementation



## Working with Developers to Create Trails

Every new development presents an opportunity to consider potential bicycle and pedestrian connections. **Planned development projects in Mocksville could be opportunities to expand the current walking and biking network.**

Proactive coordination between the town and developers will foster the growth of connected networks of trails that benefit all parties involved; prospective residents desiring access to trails and open space will be attracted to Mocksville, and developers can market the trails as an amenity that adds value. **The Town should consider adopting a trail-friendly ordinance for all new developments.** There are many options, but common ordinances require new development to dedicate space for future trails or pay a fee-in-lieu that the town can use to build and maintain other trails.

### CASE STUDY: Briar Chapel Development, Chapel Hill, NC

Newland Communities is an example of a developer with nationwide presence that markets trails and greenways as key amenities to its prospective buyers. In the case of the 1,700-acre Briar Chapel development, a rezoning process (which had to be completed before the development could be built) resulted in an agreement between Newland and Chapel Hill that preserved nearly half the acreage as open space. **Far from "wasted space," the preserved land became a major selling point for Newland and an amenity for Briar Chapel residents,** who have access to 20 parks and playgrounds, 20+ miles of trails, and nearly 900 acres of open space.



*Photo: Newland Communities*

*A local biking group, Triangle Off Road Cyclists, holds an annual race event on Briar Chapel's trails.*

Source: <https://www.newlandco.com/about/case-studies/briar-chapel/>

# Shared-Use Paths within Utility ROW Easements

Utility right-of-way (ROW) corridors are typically owned by a landowner who provides an easement to the utility company. These long corridors, clear of many obstacles, can make ideal routes for shared-use paths. In Mocksville, Duke Energy transmission corridors could be a possible greenway route. Duke Energy is usually amenable to trails within their corridors as long as the proposed trail meets certain requirements, detailed below.

## Design Requirements

- ▶ **Maximum trail width** is 12ft.
- ▶ **Trail must be at least 25ft away** from any Duke Energy structures.
- ▶ **Bollards** must be installed at trailheads that connect to/cross streets to prevent vehicular traffic from entering the trail.
- ▶ **Reinforced trail area for heavy equipment** may be required at some access points.
- ▶ **Culverts** (min. 20ft wide) must be installed where trails cross creeks, ditches, etc.
- ▶ **No structures** such as lights, signs, benches, etc. are allowed within the easement.
- ▶ **Vegetation/plantings** must adhere to Duke Energy guidelines (varies by location).
- ▶ **Parking areas are allowed** within the easement, subject to restrictions.

Sources:

<https://www.carolinathreadtrail.org/wp-content/uploads/2018/12/Working-with-Duke-Energy.pdf>  
[https://desitecoreprod-cd.azureedge.net/\\_/media/pdfs/community/shared-use-paths-trails-guidelines.pdf?la=en&rev=c081c87714c842f4855cff8c426e2635](https://desitecoreprod-cd.azureedge.net/_/media/pdfs/community/shared-use-paths-trails-guidelines.pdf?la=en&rev=c081c87714c842f4855cff8c426e2635)



Photo: Stuart MacDonald, americantrails.org

*Example of a shared-use path in a transmission line corridor.*

## Process Requirements

- ▶ Execute a **Trail Encroachment Agreement** with Duke Energy.
- ▶ Provide Duke Energy with deed information of all property owners affected by the trail.
- ▶ Provide proof that property owners have signed easement agreement with trail owner.
- ▶ Obtain engineering drawing approval from a **Duke Energy Asset Protection Specialist**.

## Other Considerations

- ▶ Trail owner is responsible for safety and liability of trail construction and use.
- ▶ Duke Energy reserves the right to close the trail at any time without notice for construction/maintenance.
- ▶ When a utility corridor ROW is granted as an easement, the deed might not allow uses beyond electrical transmission/maintenance.

# Working with Norfolk Southern

## General Process

This guide is intended to be a high-level overview of the process of working with Norfolk Southern on any projects initiated by an outside party that may affect or be near the NS right-of-way. Communities should refer directly to Norfolk Southern's Public Improvement Projects Manual for detailed information on each of the steps below, as well as sample approval process and construction schedules and required forms. The Manual is located at: <http://www.nscorp.com/content/nscorp/en/transportation-terms/other-requirements/public-project-guidelines.html>

Additionally, Norfolk Southern requires payment for the costs associated with the project review and approval process. All expenses incurred by the party seeking review for attending meetings, reviewing plans, preparing correspondence, and travel expenses must be paid by that party. During construction, costs would also likely be incurred for the required flagman (railroad protective services).

### PRELIMINARY ENGINEERING

The first step should be contacting NS's assigned Public Improvements Engineer for the state of North Carolina, George (Brian) Taylor, to provide initial project information. Next, a standard PE agreement should be completed. The outside party is required to submit initial plans to NS and make revisions as required before the submission of final plans. The submission process include a Concept, 30%, 60%, 90%, and 100% packages. Sponsors should reference the Special Provisions and Design Criteria contained in



Appendices E, H, & I of the Manual to ensure compliance. NS will then complete a final review, execute a standard project agreement, and provide a Force Account Estimate (FAE) detailing anticipated construction costs.

Additionally, any outside parties such as surveyors who must enter NS ROW as part of the process must complete a "Right of Entry" application and satisfy insurance requirements.

### CONSTRUCTION

Force Account Work typically includes construction engineering, accounting, railroad protective services, communications changes, signal and electrical changes, track work, and T-cubed (changes to NS fiber optic communications facilities). All construction work



must be performed in accordance with the Norfolk Southern Special Provisions for Protection of Railway Interests (Appendix E of the Manual). The full construction process steps are detailed in the NS Construction Checklist, which can be found in Appendix J of the Manual. No work may be performed on, under, over, or adjacent to NS property until NS insurance is approved and the contractor receives written authorization from the Railroad Engineer. In addition, NS or its contracted engineering personnel will perform routine monitoring of the construction site and its activities.

In the event that NS anticipates expenses exceeding the original FAE, it will provide a revised FAE for the sponsor's approval.

## Pedestrian & Bicycle Projects

General NS policy is to not allow pathways that would permit pedestrian, bicycle, and other recreational traffic to move parallel to trains on NS right-of-way or to cross at grade. However, NS is committed to cooperating in the establishment of recreational paths, provided all of the general requirements described above are met, and with certain specific bike and pedestrian infrastructure requirements. These are as follows:

- ▶ Where a path and a NS rail line parallel each other, safety measures such as signage and fencing will be required. Installation and maintenance costs of these measures are the responsibility of the trail sponsor or agency.
- ▶ Trails may pass over or under railroad tracks, as long as appropriate measures are undertaken to ensure safety and the previously described preliminary engineering and construction monitoring process is followed. A license requirement will be required, which will assign

ownership and maintenance responsibility of the trail to the sponsor.

- ▶ Over-/underpass structures may be required to be removed at the sponsor's expense if they are found to interfere with railroad operations or maintenance.
- ▶ Multi-use paths that utilize existing or proposed railroad drainage structures will not be permitted.
- ▶ If a trail crossing occurs at an established at-grade highway-rail crossing, it will be considered as long as it is within the highway easement and appropriately signed and protected. The crossing must be at a 90-degree angle and must meet the requirements of the MUTCD.
- ▶ At the preliminary engineering level, the concept, 30%, 60%, ROW, 90%, and 100% plan packages should be provided to NS for review and approval.
- ▶ Proposed structures that pass over NS must meet the requirements set forth in the NS Special Provisions and Overhead Bridge (OHB) Design Criteria.
- ▶ Sponsor-developed plans must consider the constructability of the proposed OHB, including site access, equipment requirements, girder splice locations, support tower requirements, overhead and undergrade utilities, as well as the NS facility type, number of tracks, and frequency of trains.
- ▶ Bicycle and pedestrian trails that run parallel to NS routes must be located off NS property and will require independent structures located off NS property where necessary to cross over any features such as creeks that require an elevated structure. Use of NS Underpass Structures is not permitted.
- ▶ Protective fencing and signage may be required at the discretion of NS.

# Programs to Build Support for Trails

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.

## Media Campaign to Educate Motorists, Bicyclists, and Pedestrians

Watch for Me NC is a comprehensive campaign aimed at reducing the number of bicyclists and pedestrians hit and injured in crashes with vehicles. The campaign consists of educational messages on traffic laws and safety, and an enforcement effort by area police.

This ongoing statewide grant program is administered by the NCDOT Integrated Mobility Division (NCDOT IMD). The Town should contact the NCDOT IMD to request materials and guidance. As a part of this program, the Town could:

- ▶ Distribute the educational materials made available by NCDOT at local festivals and other events and at local businesses.
- ▶ Work with police officers to hand out bicycle lights along with bicycle and pedestrian safety cards.
- ▶ Enforce motorist rates of yielding to pedestrians.

The Town may participate by visiting [WatchForMeNC.org](https://www.watchformenc.org) and downloading

materials and information that may be used right away. The Town should also apply when the Call for Participants is issued, typically in February of each year. See the website for contact information and notice of the annual program opening:

<https://www.watchformenc.org/>

## Hike & Bike Map

One of the most effective ways of encouraging people to walk more often or to ride a bicycle is through the use of maps and guides to show where you can walk and bike, and to guide people to enjoyable routes and destinations. The Lilies Project website has a "work-in progress" self-guided walking tour of downtown Walnut Cove. A complete map of all recommended walking and biking routes in Walnut Cove, including sidewalks, trails (such as the paths at Fowler Park, Lions Park, and East Walnut Cove Community Park), and the Mountains to Sea Trail connection, would be an excellent resource for visitors and longtime residents alike.

These maps can be designed so that a portion of the map is devoted to bicycle and pedestrian safety education, such as informational graphics that demonstrate bicycle hand signals and how to share the road and the trail safely. The map should be made available online and printed as needed to be actively distributed to residents and visitors.

## North Carolina's Year of the Trail: 2023

On August 18, 2021, the NC Legislature declared 2023 North Carolina's Year of the Trail, highlighting an opportunity to showcase, promote, and celebrate our state's extensive trail systems. The event organizer, the Great Trails State Coalition, envisions a future where each of NC's 100 counties enjoys the proven benefits of trails, including benefits to transportation, the environment, the health and safety of our citizens, and tourism and economic development.

This statewide campaign will reach all communities and potential visitors with the message of how and where to experience the trails across the state. The Town of Walnut Cove and Stokes County should seek out opportunities to be involved in the Year of the Trail in 2023. Planning efforts are already underway as of early 2022. Walnut Cove and Stokes County could host an event to build support for trails proposed in this plan, and highlighting the Mountains to Sea Trail alignment through the town's new roundabout.

Visit the Great Trails State Coalition website (<https://greattrailsnc.org/year-of-the-trail/>) to learn more about key aspects of the Year of the Trail, such as:

- ▶ Public Engagement
- ▶ Media Attention
- ▶ Educational Tracks
- ▶ Legislative Connections



## NC's Recreational Use Statute & Landowner Liability for Trail Users

Liability is a common concern for landowners who are considering allowing a trail on their property. **North Carolina's Recreational Use Statute limits landowners' liability for trail users.**

The North Carolina General Assembly enacted the Recreational Use Statute (N.C. Gen. Stat. § 38A-4) to encourage landowners to make their land and water freely open to the public for educational and recreational uses. When a landowner opens their land to the public for these purposes and does not charge an entry fee (e.g., a trail or greenway), lawful visitors are "*owed no greater duty of care than trespassers for purposes of premises liability.*" (The duty of care owed to trespassers is to "*refrain from the willful or wanton infliction of injury.*")

Landowners do maintain some liability. For example, the doctrine of attractive nuisance still applies. Additionally, the landowner "*shall inform direct invitees of any known artificial or unusual hazards.*"

For more detailed information about the statute and other considerations for landowners, see:

<https://www.carolinathreadtrail.org/wp-content/uploads/2018/08/CLE-Manus-LO.pdf>



*Example walking and bicycling trail in North Carolina*



# Appendices

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# Design Resources

*Example walking and bicycling trail in North Carolina*



# Overview

This toolbox presents guidance for local agency staff, elected officials and community advocates to create a more walkable and bicycle-friendly community for people of all ages and abilities. Planners and project designers should refer to these guidelines in developing the infrastructure projects recommended by this plan, but they should not be used as the sole reference for any detailed engineering design.

As a starting point, the following list of resources are from the NCDOT website for “Bicycle & Pedestrian Project Development & Design Guidance”, located here (resources listed are linked through this page; Last retrieved in December 2021): <https://connect.ncdot.gov/projects/BikePed/Pages/Guidance.aspx>

## North Carolina Guidelines

### NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT)

- ▶ WalkBikeNC: Statewide Pedestrian & Bicycle Plan
- ▶ Glossary of North Carolina Terminology for Active Transportation
- ▶ NCDOT Complete Streets: This policy directs the department to consider and incorporate several modes of transportation when building new projects or making improvements to existing infrastructure. The link below is a landing page with resources such as the Complete Streets policy, the Implementation Guide, Evaluation Methodology, Flowchart, FAQs, and more. <https://connect.ncdot.gov/projects/BikePed/Pages/Complete-Streets.aspx>
- ▶ Evaluating Temporary Accommodations for Pedestrians
- ▶ NC Local Programs Handbook
- ▶ Traditional Neighborhood Development Guidelines

### GREENWAY CONSTRUCTION STANDARDS

- ▶ Greenway Standards Summary Memo
- ▶ Design Issues Summary
- ▶ Greenway Design Guidelines Value Engineering Report
- ▶ Summary of Recommendations
- ▶ Minimum Pavement Design Recommendations for Greenways
- ▶ Steps to Construct a Greenway or Shared-Use Trail

# National Guidelines

## RAILS-TO-TRAILS CONSERVANCY

- ▶ General Design Guidance: <https://www.railstotrails.org/build-trails/trail-building-toolbox/>
- ▶ Rails-with-Trails: <https://www.railstotrails.org/resource-library/resources/americas-rails-with-trails/>

## AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

- ▶ Guide for the Development of Bicycle Facilities
- ▶ Guide for the Planning, Design, and Operation of Pedestrian Facilities

## THE FEDERAL HIGHWAY ADMINISTRATION (FHWA)

- ▶ Accessibility Guidance
- ▶ Design Guidance
- ▶ Facility Design
- ▶ Facility Operations

## MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

- ▶ Part 4E: Pedestrian Control Features
- ▶ Part 7: Traffic Controls for School Areas
- ▶ Part 9: Traffic Controls for Bicycle Facilities





## NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS (NACTO)

- ▶ Urban Bikeway Design Guide
- ▶ Urban Street Design Guide

## SAFE ROUTES TO SCHOOL (SRTS) NON-INFRASTRUCTURE

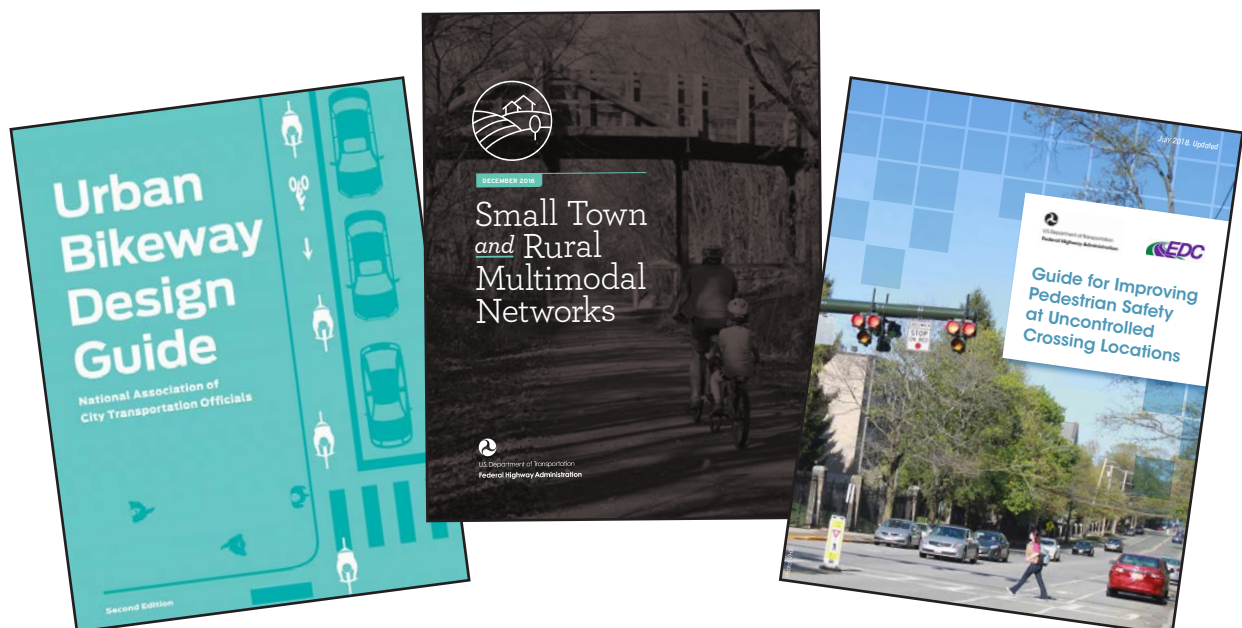
- ▶ National Center for Safe Routes to School
- ▶ National Partnership for Safe Routes to School

## US ACCESS BOARD

- ▶ ABA Accessibility Standards
- ▶ ADA Accessibility Guidelines
- ▶ ADA Accessibility Standards
- ▶ Public Rights-of-Way, Streets & Sidewalks, and Shared Use Paths

## ADDITIONAL FHWA RESOURCES

- ▶ Achieving Multimodal Networks (2016): [https://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/publications/multimodal\\_networks/](https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_networks/)
- ▶ Small Town and Rural Multimodal Networks Design Guide (2017): <https://ruraldesignguide.com/>
- ▶ Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2018): [https://safety.fhwa.dot.gov/ped\\_bike/step/docs/STEP\\_Guide\\_for\\_Improving\\_Ped\\_Safety\\_at\\_Unsig\\_Loc\\_3-2018\\_07\\_17-508compliant.pdf](https://safety.fhwa.dot.gov/ped_bike/step/docs/STEP_Guide_for_Improving_Ped_Safety_at_Unsig_Loc_3-2018_07_17-508compliant.pdf)



# Trail Surface Considerations

Trail surfaces vary widely in installation cost, user preference, maintenance requirements, aesthetics, and life cycle. These are some considerations for common trail surface types.



## ASPHALT

**LIFE CYCLE:** 10-20 years  
**REPLACE COST:** \$1.5M/mile

- Smooth surface can accommodate many types of uses
- May buckle from tree roots
- Can include a soft-surface shoulder to provide more options for trail users



## CONCRETE

**LIFE CYCLE:** 25-35 years  
**REPLACE COST:** \$2M/mile

- Higher initial cost than asphalt
- Durable and resilient to flooding
- Hard surface is not preferred by some users, including runners



## CRUSHED STONE

**LIFE CYCLE:** 5-10 years  
**REPLACE COST:** \$500K/mile

- Natural appearance
- Can be made from almost any type of stone
- Accessible for most user types if properly compacted

### Sources:

Surface characteristics: Rails to Trails Conservancy. "Surfaces."

[www.railstotrails.org/build-trails/trail-building-toolbox/design/surfaces/](http://www.railstotrails.org/build-trails/trail-building-toolbox/design/surfaces/)

Life cycle and cost info: Greenways Incorporated (2022) (except natural earth)

Photos: Crushed Stone: Rocky Branch Trail (Carolina Thread Trail)

Boardwalk: Rich Park Greenway, Piedmont Legacy Trails



**LIFE CYCLE:** Constructed greenway facilities have a limited life cycle, or useful life. The life cycle varies based on environmental impact, use, and maintenance. The estimates provided are for the typical life cycle of each trail type.



## BOARDWALK

**LIFE CYCLE:** 7-10 years  
**REPLACE COST:** \$2M/mile

- Often used for parts of trails that cross wetlands
- Expensive to install and maintain
- Can be slippery when wet
- Allows drainage and reduces negative impacts on wetlands



## NATURAL EARTH

**LIFE CYCLE:** 5-7 years  
**REPLACE COST:** \$50K/mile

- Inexpensive to build and maintain (can often be maintained by volunteers)
- May have drainage issues
- Typically not accessible for wheelchairs, strollers, roller skates/scooters/skateboards, and some bikes

## OTHER SURFACES

### SOIL-CEMENT

- Uses soil combined with cement and water to stabilize the surface
- Must manage drainage to avoid trail erosion
- Less expensive than asphalt

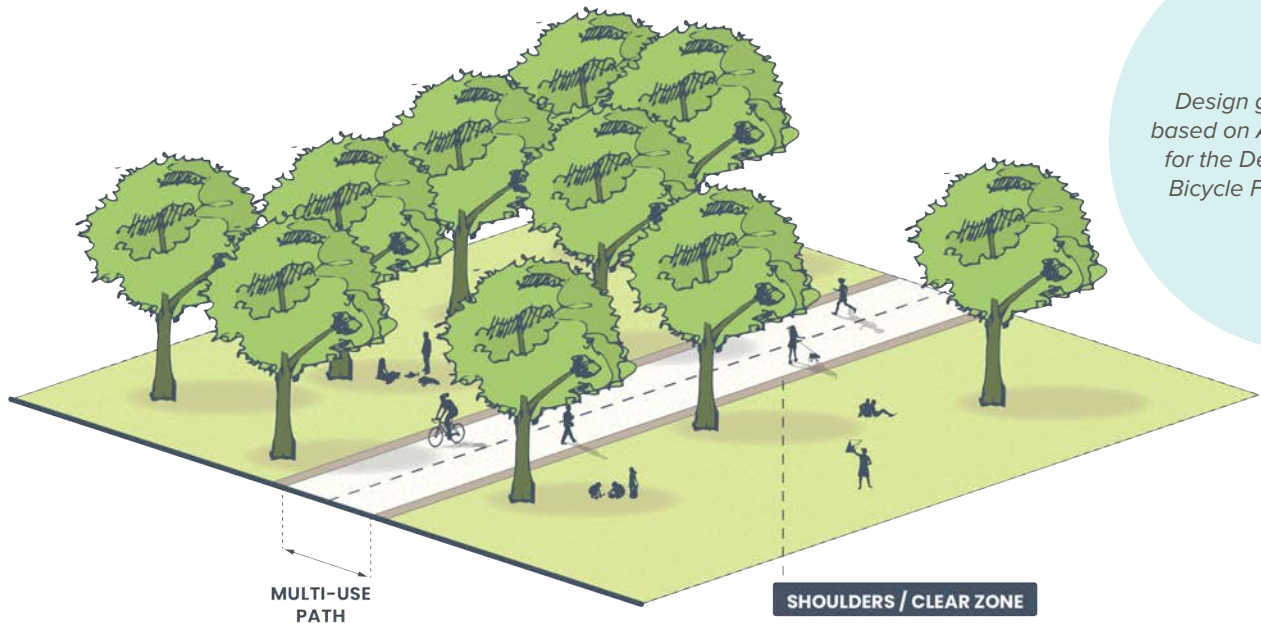
### RESIN-BASED STABILIZED MATERIAL

- Uses resin to bind soil or aggregate together
- Natural appearance
- Less environmental impact than asphalt
- Less expensive than asphalt

### RECYCLED MATERIALS

- Uses discarded materials such as old tires mixed into concrete
- Not extensively studied; maintenance needs and costs are not well-documented

# Shared Use Path



*Design guidelines are based on AASHTO, Guide for the Development of Bicycle Facilities (2012)*

A shared use path (SUP), labeled in the graphic above as a multi-use path, provides a travel area separate from motorized traffic for cyclists, pedestrians, skaters, wheelchair users, joggers, and other users. SUPs are desirable for cyclists of all skill levels preferring separation from traffic. These off-road travelways generally provide routes and connections not provided by existing roadways. Most SUPs are designed for two-way travel of multiple user types. Designs vary depending on factors such as the grade of the land, size and amount of vegetation present, and proximity to waterways, structures, and other elements.

## Typical Application

SUPs are typically located in independent rights-of-way, separate from roadways.

Refer to guidance on sidepaths for information on shared use paths adjacent to roadways.

## REAL WORLD EXAMPLES



**American Tobacco Trail**  
Durham, NC

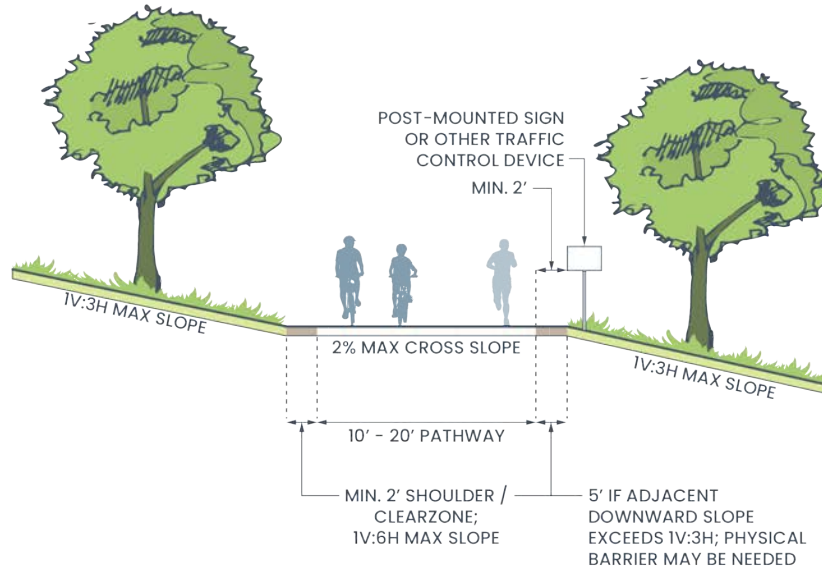


**Art to Heart Trail**  
Raleigh, NC



**Salisbury Greenway**  
Salisbury, NC

Source: Carolina Thread Trail



## Design Guidelines

### WIDTH

A demand analysis, combined with the use of FHWA's SUPLOS Calculator, should be conducted to determine appropriate widths. 10-12' is a typical default SUP width, and 8' width is acceptable only in constrained conditions and for short distances (AASHTO Bike Guide Section 5.2.1).

### SHOULDER / CLEAR ZONE

Minimum 2' graded area (maximum 1V:6H slope) should be provided for clearance from landscaping or other vertical elements such as fences, light poles, sign posts, etc.; recommend aggregate or turf grass to prevent weeds from spilling onto trail.

### VERTICAL CLEARANCE

8' minimum, 10' typical.

### SLOPE

Trail slopes should be designed at 5% (greater slope is permitted, but should be limited, see AASHTO); SUP cross slope should not exceed 2%.

### PHYSICAL BARRIER

If the land beyond the shoulder/clear zone has a slope exceeding 3:1, a physical barrier may need to be added.

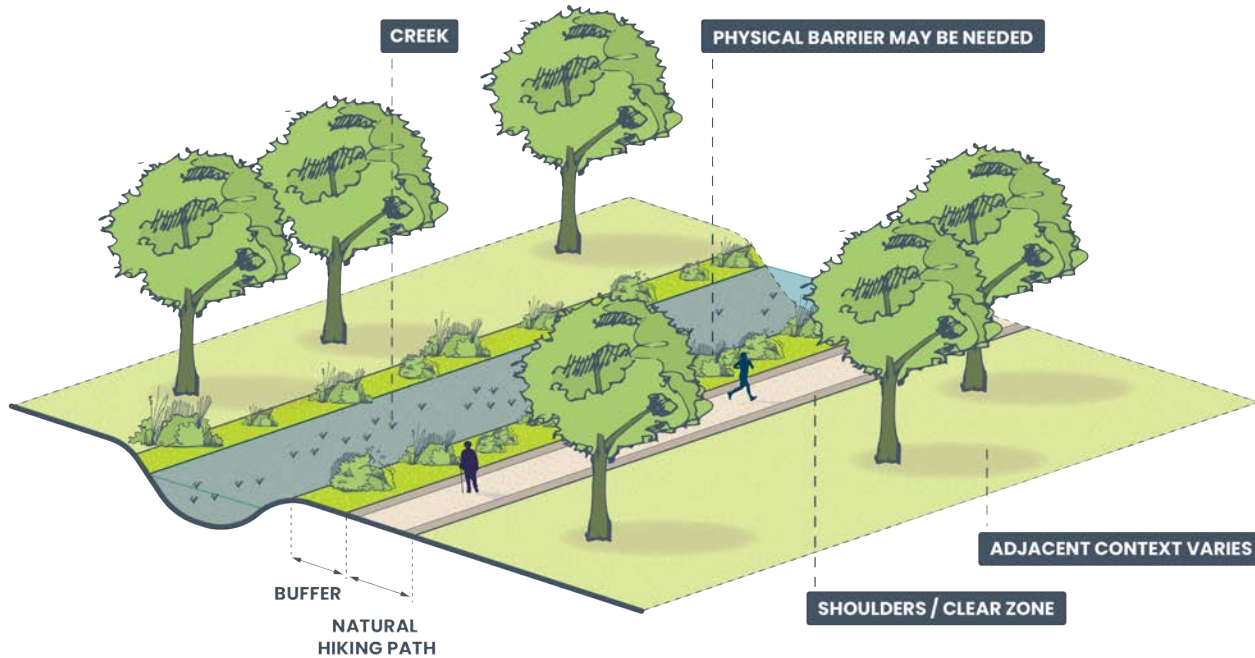
### OTHER DESIGN CRITERIA

With the great variety of users on open space trails, amenities such as benches, trash and recycling receptacles, bike racks, and appropriate lighting should be included along trails.

Trail design should comply with all AASHTO requirements for shared use paths related to design speed, sight distances, stopping distances, and grades.

# Natural Surface Trail

## Riparian Corridor in Environmentally Sensitive Areas



Sometimes referred to as footpaths or hiking trails, the natural surface trail is used along corridors that are environmentally-sensitive but can support bare earth, wood chip, or boardwalk trails. Soft surface trails may be used as spur trails, or as parallel trails to primary paved routes.

### Typical Application

Natural surface trails are a low-impact solution and found in areas with limited development or where a more primitive experience is desired. These are not intended to be ADA compliant or accommodate all non-motorized uses.

### REAL WORLD EXAMPLES



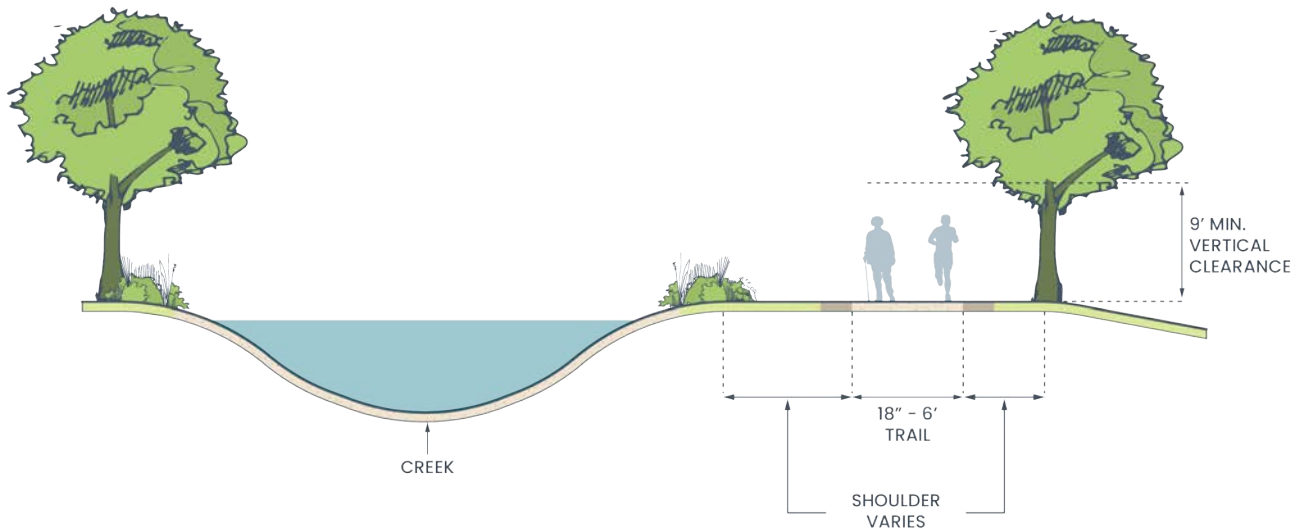
**Peavine Trail**  
Marion, NC

Source: Rails to Trails Conservancy



*Left: Smooth crusher fines can be a good surface material for natural surface trails for all user types. Right: Trail surface material can be further stabilized with a variety of products.*

Source: National Trails Training Partnership



## Design Guidelines

### WIDTH

Trails can vary in width from 18 inches to 6 feet or greater.

### VERTICAL CLEARANCE

Maintained at nine-feet above grade.

### ENVIRONMENTAL CONSIDERATIONS

Trail surface can be made of dirt, rock, soil, forest litter, or other native materials. Some trails use crushed stone (crusher run) that contains about 4% fines by weight, and compacts with use.

Provide positive drainage for trail tread without extensive removal of existing vegetation; maximum slope is 5 percent (typical).

### OTHER DESIGN CRITERIA

Base preparation varies from machine-worked surfaces to those worn only by usage.

Trail erosion control measures include edging along the low side of the trail, steps and terraces to contain surface material, and water bars to direct surface water off the trail; use bedrock surface where possible to

reduce erosion. Refer to the US Forest Service 2007 Trail Construction and Maintenance Notebook for detailed guidance on erosion control methods.

Consider implications for accessibility when weighing options for width and surface treatments. Refer to guidance on Accessible Shared Use Paths for more information on design for accessibility and shared use.

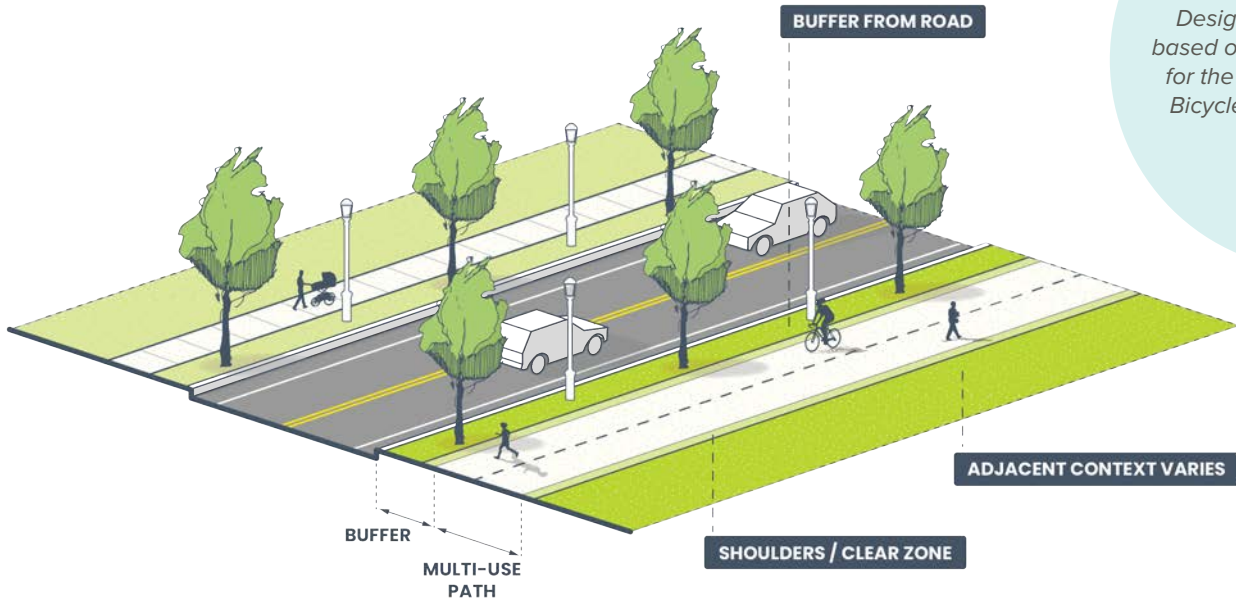
### OTHER RESOURCES

The International Mountain Biking Association's (IMBA) online resources offer free, easy-to-access information for the benefit of mountain bikers in the U.S. and around the globe. Search the collection of PDFs, videos, books, and graphics to further your local mountain bike access and advocacy efforts.

Source: <https://www.imba.com/explore-imba/resource-hub>

# Shared Use Path

## Roadway Corridor



*Design guidelines are based on AASHTO, Guide for the Development of Bicycle Facilities (2012)*

Shared use paths which are located alongside roadway corridors, also known as sidepaths, serve as both recreational and utilitarian routes. While this placement poses unique SUP challenges, such as driveway crossings and close proximity to moving vehicles, these trails create direct and important routes through the community.

## Typical Application

When SUPs run alongside a roadway corridor, standard shared use path characteristics should be maintained in order to reinforce the continuity of the SUP and create a distinction between sidewalks and other nearby facilities. Buffer space of at least 5' between the roadway and SUP can include smaller vegetation, light and utility poles, and other physical barriers. A buffer must be at least 8' wide to accommodate trees.

## REAL WORLD EXAMPLES



**High Point Greenway**  
High Point, NC

Source: City of High Point



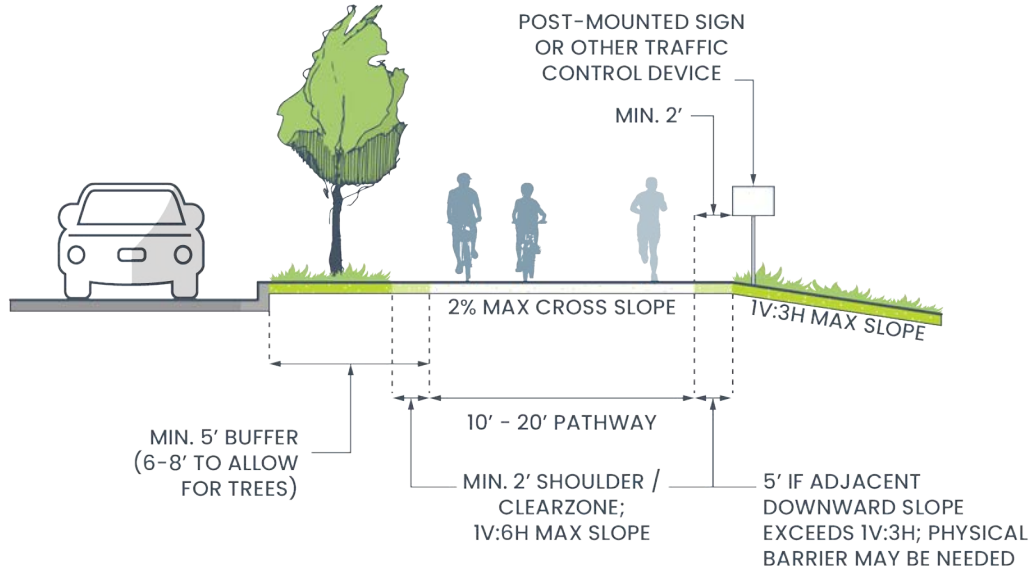
**Research Triangle Park Trails**  
Cary and Raleigh, NC



**Wilma Dykeman Greenway**  
Asheville, NC

Source: Connect Buncombe





## Design Guidelines

### WIDTH

A demand analysis, combined with the use of FHWA's SUPLOS Calculator, should be conducted to determine appropriate widths. 10-12' is a typical default SUP width, and 8' width is acceptable only in constrained conditions and for short distances (AASHTO Bike Guide Section 5.2.1).

### BUFFER

A wide separation should be provided between the trail and adjacent roadway. The buffer is measured from the face of curb (if present) or the edge of the paved roadway, and should not be less than 8'. Paved shoulders do not count towards the overall buffer width. Greater separation is desirable along high-speed roadways. In either case, if proper separation is not achievable, a physical barrier or railing should be provided.

### SHOULDER / CLEAR ZONE

Minimum 2' graded area (maximum 1V:6H slope) should be provided for clearance from landscaping or other vertical elements such as streetscape amenities, light poles, sign posts, etc.; recommend aggregate or turf grass to prevent weeds from spilling onto trail.

### VERTICAL CLEARANCE

8' minimum, 10' typical.

### SLOPE

SUP slopes should be designed at 5% (greater slope is permitted, but should be limited, see AASHTO); SUP cross slope should not exceed 2%.

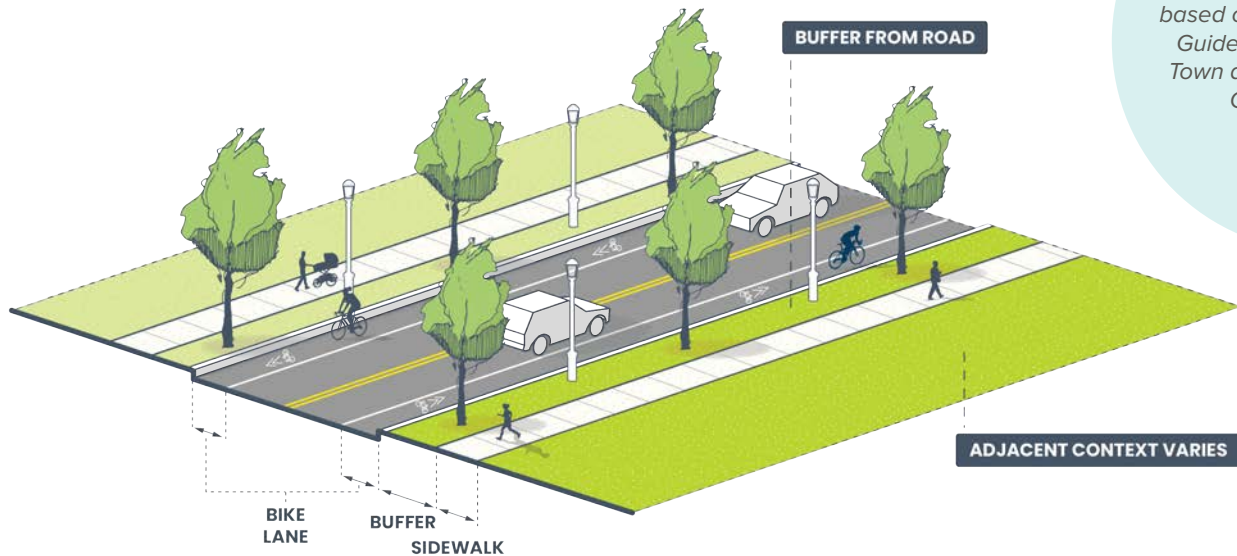
### OTHER DESIGN CRITERIA

Trail design should comply with all AASHTO requirements for shared use paths related to design speed, sight distances, stopping distances, and grades. See AASHTO p. 5-8 for roadway corridor conflict considerations.

### SIGNAGE

Wayfinding or other informational signage, if located within buffer between roadway and trail, should be mounted at 7' from trail to bottom of sign and 2' from the side of the SUP (see MUTCD).

# Sidewalks



*Design guidelines are based on NACTO Design Guides and the Small Town and Rural Design Guide (2016)*

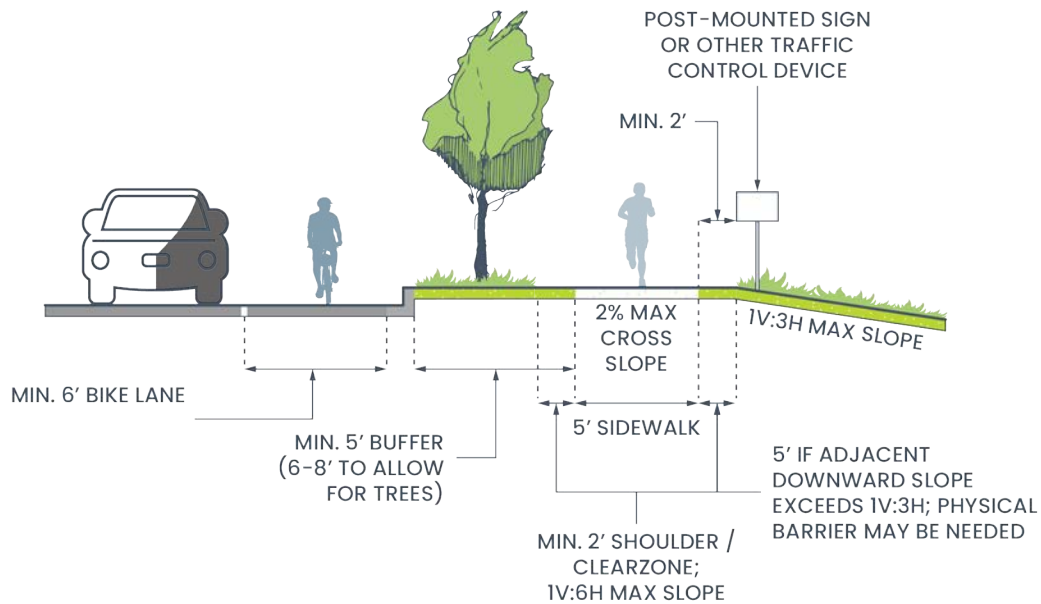
Sidewalks are the most fundamental element of the walking network, as they provide an area for pedestrian travel separated from vehicle traffic. Providing adequate and accessible facilities can lead to increased numbers of people walking, improved safety, and the creation of social space.

## Typical Applications

Sidewalks should be provided on both sides of urban commercial streets, and should be required in areas of moderate residential density. (1-4 dwelling units per acre).

When retrofitting gaps in the sidewalk network, locations near transit stops, schools, parks, public buildings, and other areas with high concentrations of pedestrians should be the highest priority.

In rural areas, no curb and gutter is necessary to establish a sidewalk. Instead, the sidewalk should feature a wide furnishing zone, which may be configured as an open ditch for stormwater catchment and infiltration. Ditches can be retrofitted into bioswales or rain-gardens for filtration and water purification.



## Design Guidelines

### WIDTH

It is important to provide adequate width along a sidewalk corridor. A pedestrian through zone width of 6' enables two pedestrians (including wheelchair users) to walk side-by-side, or to pass each other comfortably.

In areas of high demand, sidewalks should contain adequate width to accommodate the high volumes and different walking speeds of pedestrians.

### BUFFER

Appropriate placement of street trees in the furnishing zone (minimum width 4') helps buffer pedestrians from the travel lane and increases facility comfort.

### OTHER DESIGN CRITERIA

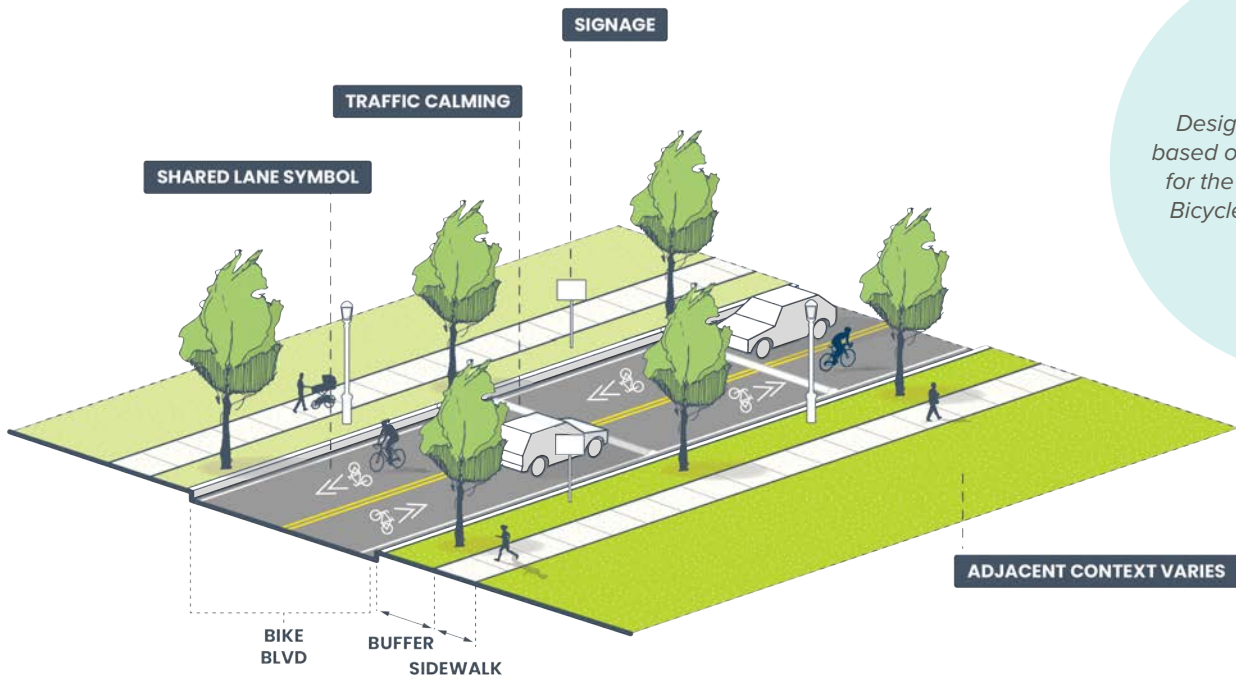
At a minimum, the Americans with Disabilities Act requires a 3' clear width in the pedestrian zone plus 5' passing areas every 200'.

The clear width may be reduced to a minimum of 32 inches for short, constrained segments of up to 24 inches long, provided that constrained segments are separated by regular clear width segments that are a minimum of 48 inches long and 36 inches wide.

Providing a 6' clear width across the full corridor for all new sidewalks (and 12' or greater in downtown and pedestrian-priority areas) meets requirements for passing and maneuverability.

Existing deficient-width sidewalks are to be retrofitted to meet citywide standards.

# Neighborhood Bikeway



*Design guidelines are based on AASHTO, Guide for the Development of Bicycle Facilities (2012)*

A bike boulevard is a low-speed, low-volume roadway that is designed to enhance comfort and convenience for people cycling. It provides better conditions for cycling while improving the neighborhood character and maintaining emergency vehicle access. Bike boulevards are intended to serve as a low-stress bikeway network, providing direct and convenient routes.

Key elements of bike boulevards are unique signage and pavement markings, traffic calming and diversion features to maintain low vehicle volumes, and convenient major street crossings.

## REAL WORLD EXAMPLES



**Burlington-to-Elon Bike Boulevard**  
Burlington, NC

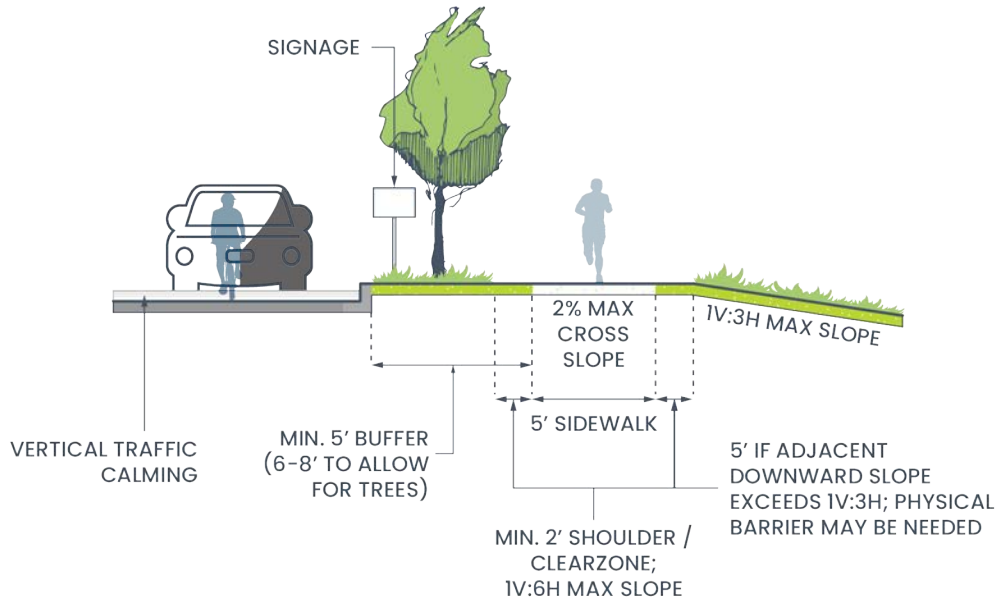


**Neighborhood Bike Boulevard**  
Durham, NC



**Neighborhood Bike Boulevard**  
Sisters, OR

Source: Western Transportation Institute



## Design Guidelines

### GENERAL DESIGN CRITERIA

Signs and pavement markings are the minimum treatments necessary to designate a street as a bike boulevard.

Implement volume control treatments based on the context of the bike boulevard, using engineering judgment.

Intersection crossings should be designed to enhance comfort and minimize delay for cyclists of diverse skills and abilities

### TYPICAL USE

Parallel with, and in close proximity to major thoroughfares (1/4 mile or less) on low-volume, low-speed streets.

Follow a desire line for bicycle travel that is ideally long and relatively continuous (2-5 miles).

Avoid alignments with excessive zigzag or circuitous routing. The bikeway should have less than 10% out of direction travel compared to shortest path of primary corridor.

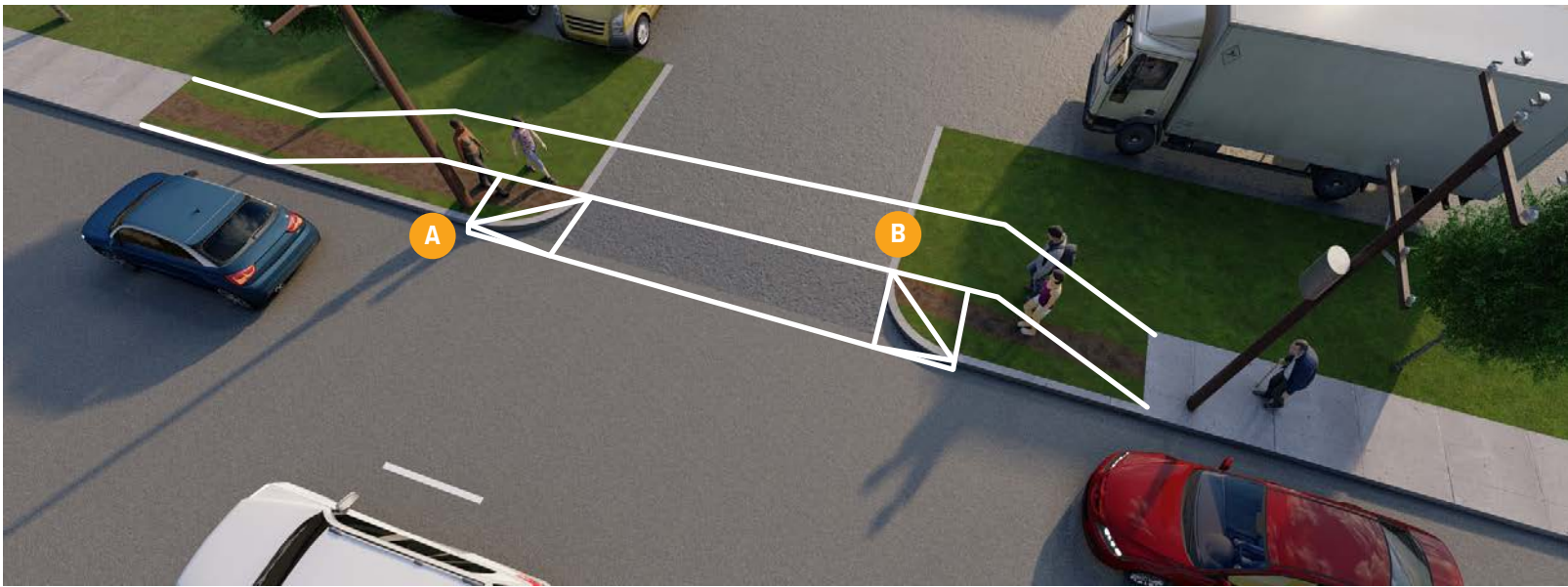
Local streets with traffic volumes of fewer than 2,500 vehicles per day and posted speed limits of 25 miles per hour. Utilize traffic calming to maintain or establish low volumes and discourage vehicle cut through / speeding.

### FURTHER CONSIDERATIONS

Bike boulevards are established on streets that improve connectivity to key destinations and provide a direct, low-stress route for cyclists, with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority over other modes.

Bike boulevard retrofits to local streets are typically located on streets without existing signalized accommodation at crossings of collector and arterial roadways. Without treatments for cyclists, these intersections can become major barriers along the bike boulevard.

Traffic calming can deter motorists from driving on a street. Anticipate and monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.



## Sidewalk Infill and Improvements

Due to historic development patterns, sidewalks may be missing or underbuilt for limited segments along an otherwise continuous corridor, or may be provided on only one side of the street where demand exists for access on both sides. Sidewalk infill and improvement strategies should identify and prioritize gaps in order to provide complete, accessible facilities.

Providing a sidewalk along a roadway can reduce pedestrian crashes by 88%<sup>1</sup>.

### Typical Application

- ▶ Missing segments in an otherwise complete corridor
- ▶ Missing on one side of a corridor
- ▶ Where sidewalks are completely absent from the roadway
- ▶ The AASHTO Guide for the Development of Pedestrian Facilities states “Wherever there is developed frontage along a road or street, there will be people walking for exercise, visiting neighbors, accessing bus stops, or walking for pure enjoyment. Sidewalk or pathways are needed to safely accommodate these activities.” (2004, p.25)

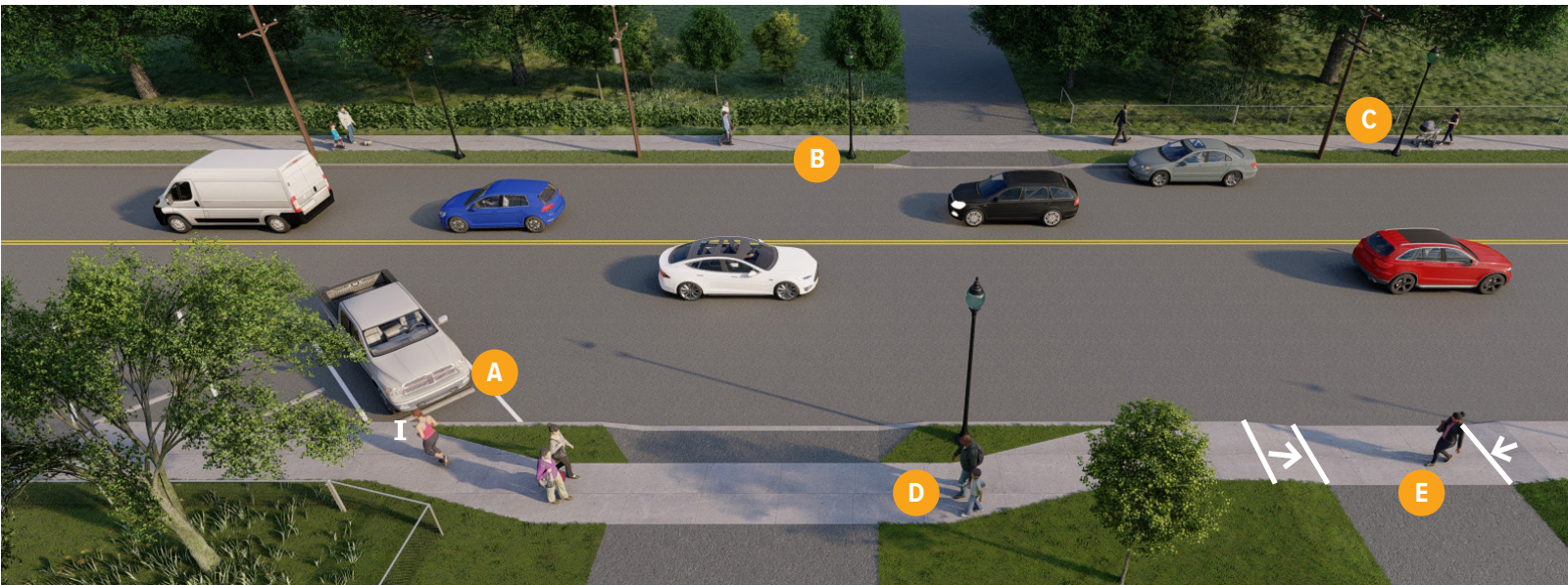
### Design Features

- ▶ Sidewalk width will vary depending on the available public right-of-way between the curb line and private property line.
- ▶ Generally, sidewalk infill projects do not change the configuration of the roadway travel area.
- ▶ When filling gaps in a corridor, sidewalk segments should provide adequate width and landscaped buffer. A buffer zone of four to six feet is desirable to separate pedestrians from the street.
- A** Infill sidewalks may need to transition at the ends of the segments to connect to existing sidewalk alignment and design.
- B** New and reconstructed sidewalks must meet accessibility guidelines. This includes the design of curb ramps and driveway curb cuts.

### Planning-Level Cost Estimate

- ▶ Varies significantly dependent on project specifications

<sup>1</sup> <http://www.cmfclearinghouse.org/index.cfm>



## Sidewalk Obstructions and Driveways

Obstructions to pedestrian travel in the sidewalk corridor typically include driveway ramps, curb ramps, sign posts, utility and signal cabinets, pull boxes and poles, mailboxes, fire hydrants and street furniture. Driveways and entrances to parking structures can also be particularly challenging due to the restricted visibility of exiting motorists.

### Typical Application

- ▶ Limiting the number and width of access points reduces the need for special provisions.
- ▶ Obstructions such as utility boxes, pull boxes and traffic signal cabinetry should be placed in the furnishing or utility zone between the sidewalk and the roadway, or behind the sidewalk. They should be set back from driveway entrances to increase visibility of pedestrians.

### Design Features

- A** When sidewalks abut angled on-street parking, increase the width of the sidewalk by 3' to account for vehicle overhang.
- B** Planter strips allow sidewalks to remain level, with the driveway grade change occurring within the planter strip. The furnishing or utility zone also serves as the extended area where driveway grade changes should occur. This ensures a continuous elevation along the pedestrian through zone.
- C** When sidewalks abut hedges, fences, or buildings, an additional two feet of lateral clearance should be added to provide appropriate shy distance.

**D** Where constraints preclude a planter strip, or where the planter strip is narrow, wrapping the sidewalk around the driveway allows the sidewalk to still remain level.

**E** Driveways are a common sidewalk obstruction, especially for wheelchair and other mobility assisted device users. When constraints only allow curb-tight sidewalks, lowering the entire sidewalk at the driveway approach keeps the cross-slope at a constant grade. However, this may be uncomfortable for pedestrians and could create drainage problems behind the sidewalk. Frequent driveways in this configuration create a “roller coaster” effect forcing pedestrians to constantly be climbing or descending.

### Further Considerations

Pedestrians easements may allow for the installation of sidewalks outside of the available right-of-way.

### Planning-Level Cost Estimate

- ▶ Varies significantly dependent on project specifications



## Raised Crosswalks

Typically limited to 2 and 3-lane roadways (30mph max), raised crosswalks slow vehicles and have a studied crash reduction factor of 45%<sup>1</sup>.

Raised crosswalks create a special emphasis on crossing pedestrians and should be used on a limited basis. Schools and Neighborhood Greenways are good candidate locations. Some raised crossings can eliminate the need for grade changes over the pedestrian path of travel and improve comfort for users.

### Typical Application

- ▶ Use detectable warnings at the curb edges to alert vision-impaired pedestrians that they are entering the roadway.
- ▶ Approaches to the raised crosswalk may be designed to be similar to speed humps.
- ▶ Drainage improvements may be required depending on the grade of the roadway.

### Design Features

- A** A tactile warning device should be used at the curb edge.
- B** No grade change with sidewalk level is preferred.

### Further Considerations

Like a speed hump, raised crosswalks have a traffic slowing effect which may be unsuitable on high-speed streets, designated transit or freight routes, and in locations that would reduce access for emergency responders. The noise of vehicles traveling over raised crosswalks may be of concern to nearby residents and businesses.

### Planning-Level Cost Estimate

- ▶ \$300-400 per linear foot of crossing width utilizing concrete construction. Does not include bulbouts as depicted in graphic.

<sup>1</sup> <http://www.cmfclearinghouse.org/index.cfm>





## Pedestrian Hybrid Beacon

Hybrid beacons or High-Intensity Activated Crosswalks (HAWK) are used to improve non-motorized crossings of major streets. A hybrid beacon consists of a signal head with two red lenses over a single yellow lens on the major street, and a pedestrian signal head for the crosswalk. Hybrid beacons are only used at marked mid-block crossings or unsignalized intersections. They are activated with a pedestrian pushbutton at each end. If a median refuge island is used at the crossing, another pedestrian pushbutton can be located on the island to create a two-stage crossing.

### Typical Application

- ▶ Suitable for arterial streets where posted speeds are 30-45 mph and multiple travel lanes. In some cases, PHBs are also being implemented along 2-lane roadways.
- ▶ Where off-street bicycle facilities intersect major streets without signalized intersections.
- ▶ At intersections or midblock crossings where there are high pedestrian volumes.

### Design Features

- ▶ Hybrid beacons may be installed without meeting traffic signal control warrants based on engineering judgment if roadway speed and volumes are excessive for comfortable pedestrian crossings.
- ▶ If installed within a signal system, signal engineers should evaluate the need for the hybrid beacon to be coordinated with other signals. To maximize pedestrian compliance, the PHBs should activate on demand.
- ▶ Parking and other sight obstructions should be prohibited for at least 100 feet in advance of and at least 20 feet beyond the marked crosswalk to provide adequate sight distance.

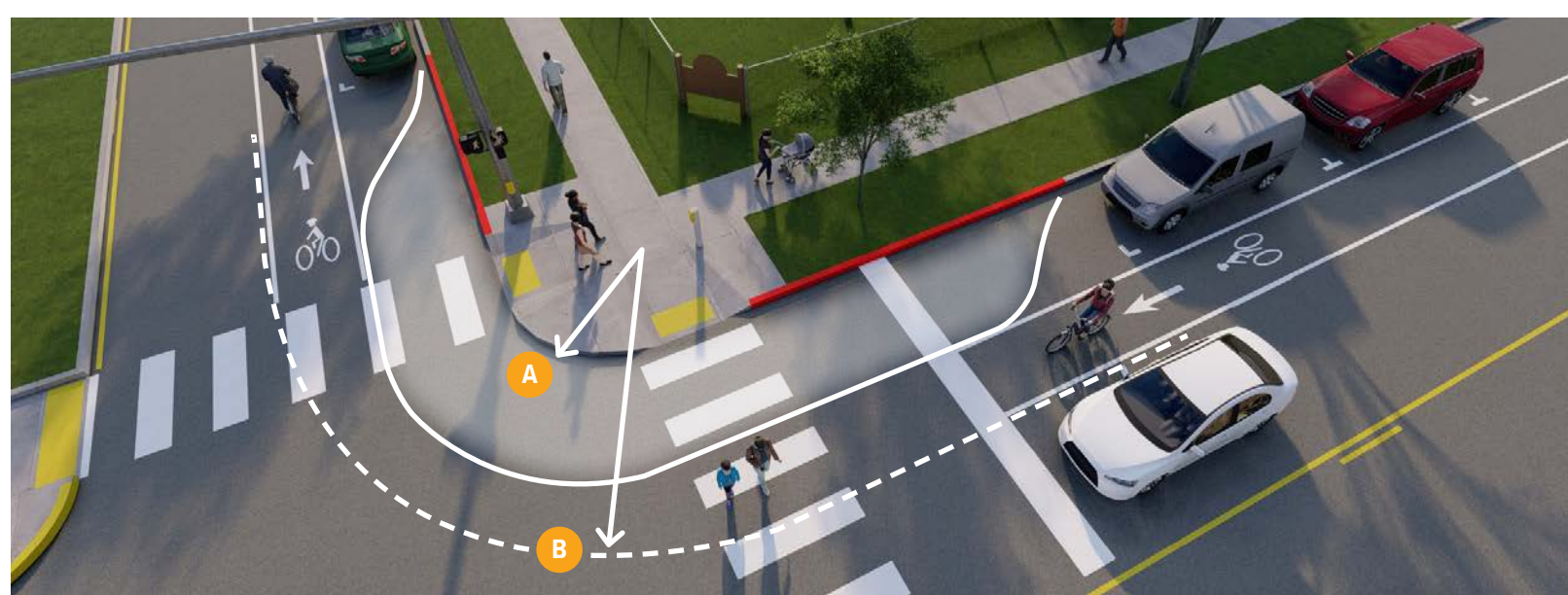
- ▶ Crossings with a median refuge and no more than two lanes in each direction may utilize side mounted beacons for reduced cost and complexity.

### Further Considerations

- ▶ Hybrid beacons are normally activated by push buttons, but may also be triggered by infrared, microwave, or video detectors. If not on-demand, the maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street, but a much shorter delay is strongly preferred.
- ▶ Each crossing, regardless of traffic speed or volume, requires review to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity, and safety.
- ▶ The installation of hybrid beacons should also include public education and enforcement campaigns to ensure proper use and compliance.

### Planning-Level Cost Estimate

- ▶ \$30,000-\$150,000 depending on complexity and overhead vs side mounted configuration.



## Corner Radii

The size of a curb's radius can have a significant impact on pedestrian comfort and safety. A smaller curb radius provides more pedestrian area at the corner, allows more flexibility in the placement of curb ramps, results in a shorter crossing distance and requires vehicles to slow more on the intersection approach. During the design phase, the chosen radius should be the smallest possible for the circumstances and consider the effective radius in any design vehicle turning calculations.

### Typical Application

The curb radius may be as small as 3 ft where there are no turning movements, or 5 ft where there are turning movements and adequate street width. On-street parking and bike lanes create a larger effective turning radius and can therefore allow a smaller physical curb radius.

### Design Features

Corners have two critical dimensions which must be considered together.

- A** The physical radius controls the pedestrian experience.
- B** The effective radius is the widest turning arc that a vehicle can take through the corner and is larger than the physical radius. The effective radius should be considered when studying design vehicle accommodation.

### Further Considerations

Several factors govern the choice of curb radius in any given location. These include the desired pedestrian area of the corner, traffic turning movements, street classifications, design vehicle turning radius, intersection geometry, and whether there is on-street parking or a bike lane (or both) between the travel lane and the curb. This is a complex topic and many strategies can be employed to balance the trade-offs between accommodating large vehicles and maximizing pedestrian safety. Truck aprons, mountable corners, and wider turning into multiple receiving lanes can help keep turning speeds low for the vast majority of vehicles.

For more information on corner design, including policy support, recommendations, case studies and more, see [Corner Design for All Users: A review of geometric design practices to improve safety for pedestrians and bicyclists at intersection corners](#).

# Pedestrians at Signalized Intersections

## Typical Application

### PEDESTRIAN SIGNAL HEADS

Pedestrian signal heads indicate to pedestrians when to cross at a signalized crosswalk. Pedestrian signal indications are recommended at all traffic signals except where pedestrian crossing is prohibited by signage.

Countdown pedestrian signals should be retrofitted at existing signals with older style pedestrian signals and on any new installation. Countdown signals have a crash reduction factor of between 25 and 52% in varied studies<sup>1</sup>.

### SIGNAL TIMING AND THE PEDESTRIAN PHASE

Adequate pedestrian crossing time is a critical element of the walking environment at signalized intersections. The length of a signal phase with parallel pedestrian movements should provide sufficient time for a pedestrian to safely cross the adjacent street. The MUTCD recommends a walking speed of 3.5 ft per second.

At crossings where older pedestrians or pedestrians with disabilities are expected, crossing speeds as low as 3 ft per second should be assumed. Special pedestrian phases can be used to provide greater visibility or more crossing time for pedestrians at certain intersections (See *Pedestrian Traffic Signal Enhancements*).

Large pedestrian crossing distances can be broken up with median refuge islands. A pedestrian pushbutton can be provided on the median to create a two-stage pedestrian crossing if the pedestrian phase is actuated. This ensures that pedestrians are not stranded on the median, and is especially applicable on large, multi-lane roadways with high vehicle volumes, where providing sufficient pedestrian crossing time for a single stage crossing may be an issue.



- A** Consider the use of a Leading Pedestrian Interval (LPI) to provide additional traffic-protected crossing time to pedestrians. See *Pedestrian Traffic Signal Enhancements* for additional detail.
- B** Accessible Pedestrian Signals (APS) provide crossing assistance to pedestrians with vision impairment at signalized intersections

## Further Considerations

Pushbuttons should be located so that someone in a wheelchair can reach the button from a level area of the sidewalk without deviating significantly from the natural line of travel into the crosswalk. Pushbuttons should be marked (for example, with arrows) so that it is clear which signal is affected.

In areas with very heavy pedestrian traffic, consider an all-pedestrian signal phase to give pedestrians free passage in the intersection when all motor vehicle traffic movements are stopped. This may provide operational benefits as turning movements are then unimpeded.

<sup>1</sup> <http://www.cmfclearinghouse.org/index.cfm>

\ B \

# Funding Resources

*Example walking and bicycling trail in North Carolina*



## Overview

When considering possible funding sources for bicycle, pedestrian, and trail 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 use 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 appendix outlines the most likely sources of funding from the federal, state, and local government levels as well as from the private and nonprofit 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

Federal funding is typically directed through state agencies to local governments either in the form of formula funds or discretionary grants. Federal funding typically requires a local match of five percent to 50 percent, but there are sometimes exceptions. The following is a list of possible Federal funding sources that could be used to support the construction of trail facilities.

### **Transportation Alternatives Program (TAP) Bike/Ped Scoping Guide**

In January 2020, NCDOT released the Transportation Alternatives Program (TAP) Bike/Ped Scoping Guide. This document provides detail and guidance on the Project Delivery Process and important elements to consider in bike/ped project development.

For more information: <https://connect.ncdot.gov/projects/BikePed/Documents/BikePed%20Project%20Scoping%20Guidance%20for%20Local%20Governments.pdf>

### **STBGP-DA & TASA-DA Funds**

The Surface Transportation Block Grant Program Direct Attributable (STBGP-DA) and Transportation Alternative Set Aside Direct Attributable (TASA-DA) are federal funding sources distributed by metropolitan planning organizations (MPOs). Member jurisdictions of MPOs are eligible to apply for these funds through a competitive funding process that prioritizes locally administered projects. These projects are funded using the federal funding sources directly attributed to the region with a minimum 20% local match.

For more information: <https://www.ptrc.org/services/regional-planning/transportation/northwest-piedmont-rpo>

## The Infrastructure Investment and Jobs Act (IIJA)

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 (Q2 2022).

### FORMULA FUNDS (STATE DOTs ADMINISTER TO LOCALS)

#### ***Transportation Alternatives Program (TAP)***

TAP 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.

#### ***Congestion Mitigation and Air Quality Improvement Program (CMAQ)***

CMAQ will increase by 10% to \$13.2B. This program funds interchange improvements, local transit operations, and bike and pedestrian infrastructure to help meet the National Ambient Air Quality Standard in non-attainment areas. Each project is evaluated to quantify its air quality improvement benefits. Funds cannot be used to add capacity for single-occupancy vehicles. Funding is distributed to non-attainment areas by population and weighted by air quality severity.

#### ***Highway Safety Improvement Program (HSIP)***

States where more than 15% of all fatalities involve cyclists or pedestrians (Vulnerable Road Users or VRU), will be required to spend 15% of their HSIP funding on bicycle/pedestrian projects. This includes North Carolina, where about 15% of all fatalities involve VRUs. 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).

### 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 cyclists and pedestrians. Many trail and greenway projects have a chance to compete well for the RAISE program when they 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](https://www.transportation.gov/RAISEgrants)

### ***Healthy Streets Program (NEW)***

\$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 (NEW)***

Local, regional, state, and tribal governments can apply to the program 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 (NEW)***

\$6 billion federal grant program to 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.

## Other Federal Funding Sources

### Safe Routes to School (SRTS) Program

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 (bike lanes, wide paved shoulders, etc.) or off-street shared use paths are also eligible for SRTS funds.

The North Carolina Department of Transportation's Safe Routes to School (SRTS) Program was established in 2005 through SAFETEA-LU as a federally funded program to provide an opportunity for communities to improve conditions for bicycling and walking to school. It is currently supported with Transportation Alternatives federal funding through the Surface Transportation Block Grant program established under the FAST Act. The SRTS Program has set aside \$1,500,000 per year of Transportation Alternative Program (TAP) funds for non-infrastructure programs and activities over a three-year period. Funding requests may range from a yearly amount of \$50,000 to \$100,000 per project. Projects can be one to three years in length. Funding may be requested to support activities for community-

wide, regional or statewide programs. Check the link below for information on the current funding cycle.

For more information: <https://connect.ncdot.gov/projects/BikePed/Pages/Non-Infrastructure-Alternatives-Program.aspx>

### Federal Transit Administration Enhanced Mobility of Seniors and Individuals with Disabilities

This program can be used for capital expenses that support transportation to meet the special needs of older adults and persons with disabilities, including providing access to an eligible public transportation facility when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs.

For more information: <https://www.transit.dot.gov/funding/grants/enhanced-mobility-seniors-individuals-disabilities-section-5310>

### Federal Lands Transportation Program (FLTP)

The FLTP funds projects that improve transportation infrastructure owned and maintained by the following Federal Lands Management Agencies: National Park Service (NPS), U.S. Fish and Wildlife Service (FWS), USDA Forest Service, Bureau of Land Management (BLM), U.S. Army Corps of Engineers, Bureau of Reclamation, and independent Federal agencies with land and natural resource management responsibilities. FLTP funds are available for program



administration, transportation planning, research, engineering, rehabilitation, construction, and restoration of Federal Lands Transportation Facilities. Transportation projects that are on the public network that provide access to, adjacent to, or through Federal lands are also eligible for funding. Under the IIJA, \$2.2 billion has been allocated to the program for FY 2022-2026.

For more information: <https://flh.fhwa.dot.gov/programs/fltp/documents/FAST%20FLTP%20fact%20sheet.pdf>

### **Federal Land and Water Conservation Fund**

The Land and Water Conservation Fund (LWCF) has historically been a primary funding source of the U.S. Department of the Interior for outdoor recreation development and land acquisition by local governments and state agencies. In North Carolina, the program is administered by the Department of Environment and Natural Resources.

Since 1965, the LWCF program has built a park legacy for present and future generations. In North Carolina alone, the LWCF program has provided more than \$75 million in matching grants to protect land and support more than 875 state and local park projects. More than 38,500 acres have been acquired with LWCF assistance to establish a park legacy in our state. 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.

For more information: <https://www.ncparks.gov/more-about-us/grants/lwcf-grants>

### **Rivers, Trails, and Conservation Assistance Program**

The Rivers, Trails, and Conservation Assistance Program (RTCA) is a National Parks Service (NPS) program that provides technical assistance via direct NPS staff involvement to establish and restore greenways, rivers, trails, watersheds and open space. The RTCA program only provides planning assistance; there are no implementation funds available. Projects are prioritized for assistance based on criteria, including conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments. Project applicants may be state and local agencies, tribes, nonprofit organizations, or citizen groups. National parks and other federal agencies may apply in partnership with other local organizations. This program may benefit trail development in North Carolina indirectly through technical assistance, particularly for community organizations, but is not a capital funding source.

For more information: <https://www.nps.gov/orgs/rtca/index.htm>

### **Environmental Contamination Cleanup Funding Sources**

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.

For more information: <https://www.epa.gov/brownfields/types-brownfields-grant-funding>

#### **National Fish and Wildlife Foundation: Five Star & Urban Waters Restoration Grant Program**

The Five Star & Urban Waters Restoration Grant Program seeks to develop community capacity to sustain local natural resources

for future generations by providing modest financial assistance to diverse local partnerships for wetland, riparian, forest and coastal habitat restoration, urban wildlife conservation, stormwater management as well as outreach, education and stewardship. Projects should focus on water quality, watersheds and the habitats they support. The program focuses on five priorities: on-the-ground restoration, community partnerships, environmental outreach, education and training, measurable results, and sustainability. Eligible applicants include nonprofit organizations, state government agencies, local governments, municipal governments, tribes, and educational institutions. Projects are required to meet or exceed a 1:1 match to be competitive.

For more information: <http://www.nfwf.org/fivestar/Pages/home.aspx>

## **State and State-Administered Funding Sources**

There are multiple sources for state funding of bicycle and pedestrian transportation projects. However, 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 a way of allocating available revenues based on data-driven scoring and local input. It is used for the State Transportation Improvement Program (STIP), which identifies the transportation projects that will receive funding during a 10-year period. STIP is a state and federal requirement, which NCDOT updates it every two years.

#### *STI's Quantitative Scoring Process*

All independent bicycle and pedestrian projects are ranked based on a quantitative scoring process, with the following main steps:

- ▶ Initial Project Review (NCDOT Strategic Prioritization Office (SPOT))
- ▶ Review Projects and Data (NCDOT Integrated Mobility Division (IMD))
- ▶ Review Data (MPOs, RPOs, Divisions)
- ▶ Review Updates and Calculate Measures (NCDOT IMD)
- ▶ Score Projects (NCDOT SPOT)

#### *Bicycle and Pedestrian Project Eligibility Requirements*

- ▶ Minimum total project cost = \$100,000.
- ▶ Eligible costs include right-of-way, preliminary engineering, and construction.
- ▶ Bicycle and pedestrian and public transportation facilities that appear in a state, regional or locally adopted transportation plan will be included as part of the proposed roadway project. NCDOT will fully fund the cost of designing,

acquiring right of way, and constructing the identified facilities.

#### *Specific Improvement Types*

- ▶ Grade-Separated Bicycle Facility (Bicycle)
- ▶ Off-Road/Separated Linear Bicycle Facility (Bicycle)
- ▶ On-Road; Designated Bicycle Facility (Bicycle)
- ▶ On-Road Bicycle Facility (Bicycle)
- ▶ Multi-Site Bicycle Facility (Bicycle)
- ▶ Grade-Separated Pedestrian Facility (Pedestrian)
- ▶ Protected Linear Pedestrian Facility (Pedestrian)
- ▶ Multi-Site Pedestrian Facility (Pedestrian)
- ▶ Improved Pedestrian Facility (Pedestrian)

#### *Bundling Projects*

- ▶ Allowed across geographies and across varying project types.
- ▶ Bundling will be limited by project management requirements rather than geographic limitations.
- ▶ Any bundled project must be expected to be under one project manager/administrative unit (must be a TAP-eligible entity).
- ▶ Makes projects more attractive for LIPs and easier to manage/let.

#### *More Information on Prioritization 6.0*

NCDOT's Prioritization Data page has training slides that explain the prioritization process: <https://connect.ncdot.gov/projects/planning/Prioritization%20Data/Forms/AllItems.aspx>

See the “Prioritization Training” folder and the following session information within:

- ▶ Session 3: Detailed information on overall scoring components, including local input points.
- ▶ Session 4: Features relevant project funding information.
- ▶ Session 7: Detailed slides explaining the bicycle and pedestrian project scoring.

#### *High Impact/Low Cost Funds*

Established by NCDOT in 2017 to provide funds to complete low-cost projects with high impacts to the transportation system including intersection improvement projects, minor widening projects, and operational improvement projects. Funds are allocated equally to each Division.

#### *Project Selection Criteria*

Each Division is responsible for selecting their own scoring criteria for determining projects funded in this program. At a minimum, Divisions must consider all of the following in developing scoring formulas:

- ▶ The average daily traffic volume of a roadway and whether the proposed project will generate additional traffic.
- ▶ Any restrictions on a roadway.
- ▶ Any safety issues with a roadway.
- ▶ The condition of the lanes, shoulders, and pavement on a roadway.
- ▶ The site distance and radius of any intersection on a roadway.
- ▶ \$1.5M max per project unless otherwise approved by the Secretary of Transportation.

- ▶ Projects are expected to be under contract within 12 months of funding approval by BOT.

#### *NCDOT Technical Review & Approval*

- ▶ Division Engineer completes project scoring and determines eligibility.
- ▶ Division Engineer determines projects to be funded and requests approval of funding from the Chief Engineer. Division Engineer shall supply all necessary project information including funding request forms, project designs and cost estimates.
- ▶ The Project Review Committee will make a recommendation for further investigation or to include on the Board Agenda for action by the Secretary, NCDOT.

#### **Incidental Projects**

Bicycle and Pedestrian accommodations such as; bike lanes, wide paved shoulders, sidewalks, intersection improvements, bicycle and pedestrian safe bridge design, etc. are frequently included as “incidental” features of larger highway/roadway projects.

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.

“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 bike and pedestrian improvements are needed, and can be included as part of highway or street improvement projects. It also helps local government identify what their priorities are and how they might be able to pay for these projects. Under the updated NCDOT Complete Streets Policy, NCDOT pays the full cost for incidental projects if the project is proposed in a locally adopted plan (see link to updated NCDOT Complete Streets Policy below).

For more information: <https://connect.ncdot.gov/projects/BikePed/Documents/Complete%20Streets%20Implementation%20Guide.pdf>

### **NC Highway Safety Improvement Program**

The purpose of the North Carolina Highway Safety Improvement Program (HSIP) is to provide a continuous and systematic process that identifies reviews and addresses specific traffic safety concerns throughout the state. The program is structured in several distinct phases:

- ▶ A system of safety warrants is developed to identify locations that are possibly deficient.
- ▶ Locations that meet warrant criteria are categorized as potentially hazardous (PH) locations.
- ▶ Detailed crash analyses are performed on the PH locations with the more severe and correctable crash patterns.

- ▶ The Regional Traffic Engineering staff performs engineering field investigations.
- ▶ The Regional Traffic Engineering staff utilizes Benefit: Cost studies and other tools to develop safety recommendations.

Depending on the cost and nature of the countermeasures, the investigations may result in requesting Division maintenance forces to make adjustments or repairs, developing Spot Safety projects, developing Hazard Elimination projects, making adjustments to current TIP project plans or utilizing other funding sources to initiate countermeasures. Selected projects are evaluated to determine the effectiveness of countermeasures.

The ultimate goal of the HSIP is to reduce the number of traffic crashes, injuries and fatalities by reducing the potential for and the severity of these incidents on public roadways.

For more information: <https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-program-and-Projects.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).

### **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. Permitted safety projects include checking station equipment, traffic safety equipment, and BikeSafe NC equipment. However, funding is not allowed for speed display signs. 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. Applications must include county level crash data. Local governments, including county governments and municipal governments, are eligible to apply.

For more information: <https://www.ncdot.gov/initiatives-policies/safety/ghsp/Pages/default.aspx>

### **The North Carolina Division of Parks and Recreation - Recreational Trails Program Grant**

Funding from the federal Recreational Trails Program (RTP), which is used for renovating or constructing trails and greenways, is allocated to states. The North Carolina Division of Parks and Recreation and the State Trails Program manages these funds with a goal of helping 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. Grants are available to governmental agencies and nonprofit organizations. The maximum grant amount is \$250,000 and requires a 25% match of RTP funds received. Permissible uses include:

- ▶ New trail or greenway construction
- ▶ Trail or greenway renovation
- ▶ Approved trail or greenway facilities
- ▶ Trail head/ trail markers
- ▶ Purchase of tools to construct and/or renovate trails/greenways
- ▶ Land acquisition for trail purposes
- ▶ Planning, legal, environmental, and permitting costs - up to 10% of grant amount
- ▶ Combination of the above

For more information: <http://www.ncparks.gov/more-about-us/grants/trail-grants/recreational-trails-program>

### **NC Parks and Recreation Trust Fund (PARTF)**

The Parks and Recreation Trust Fund (PARTF) provides 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. Property acquired with PARTF funds must be dedicated for public recreational use.

For more information: <https://www.ncparks.gov/more-about-us/parks-recreation-trust-fund/parks-and-recreation-trust-fund>

### **Clean Water Management Trust Fund**

The Clean Water Management Trust Fund (CWMTF) is available to any state agency, local government, or non-profit organization 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.

For more information: <http://www.cwmtf.net/#appmain.htm>

### **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 plan and establish 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 more effective and efficient management of urban and community forests.

For more information: [https://www.ncforestservice.gov/Urban/urban\\_grant\\_program.htm](https://www.ncforestservice.gov/Urban/urban_grant_program.htm)

## Local Funding Sources

Local governments often plan for the funding of bicycle and pedestrian infrastructure or improvements through development of Capital Improvement Projects (CIP) or occasionally, through their annual Operating Budgets. CIPs should include all types of capital improvements (water, sewer, buildings, streets, etc.) versus programs for single purposes. This allows decision-

makers to balance all capital needs. Typical capital funding mechanisms include the capital reserve fund, taxes, fees, and bonds. However, many will require specific local action as a means of establishing a program if it is not already in place.

## Private and Nonprofit Funding Sources

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

### **Rails-To-Trails Conservancy**

Under the Doppelt Family Trail Development Fund, RTC will award approximately \$85,000 per year, distributed among several qualifying projects, through a competitive process. Eligible applicants include nonprofit organizations and state, regional, and local government agencies. Two types of grants are available - community support grants and project transformation grants. Around three to four community support grants are awarded each year, ranging from \$5,000-\$10,000 each. Community Support Grants support nonprofit organizations or “Friends of the Trail” groups that need funding to get trail development or trail improvement efforts off the ground. Each year, 1-2 Project Transformation Grants are awarded that range from \$15,000-\$50,000. The intention

of these grants is to enable an organization to complete a significant trail development or improvement project. For both types of grants, applications for projects on rail-trails and rails-with-trails are given preference, but rail-trail designation is not a requirement. The trail must serve multiple user types, such as bicycling, walking, and hiking, and must be considered a trail, greenway, or shared use path.

For more information: <http://www.railstotrails.org/our-work/doppelt-family-trail-development-fund/>

### **National Fish and Wildlife Foundation (NFWF)**

The National Fish and Wildlife Foundation (NFWF) is a private, nonprofit, 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. One of the most relevant programs for bicycle and pedestrian projects is Acres for America. Funding priorities include conservation of bird, fish, plants and wildlife habitats, providing access for people to enjoy outdoors, and connecting existing protected lands. Federal, state, and local government agencies, educational institutions, Native American tribes, and non-profit organizations may apply twice annually for matching grants. Due to the competitive nature of grant funding for Acres for America, all awarded grants require a minimum 1:1 match.

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 intend 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>

### **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. 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: <http://www.land4tomorrow.org/>

### **The Conservation Alliance**

The Conservation Alliance is a nonprofit 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. Funding criteria states that:

- ▶ The project should seek to secure lasting and quantifiable protection of a specific wild land or waterway. We prioritize landscape-scale projects that have a clear benefit for habitat.
- ▶ The campaign should engage grassroots citizen action in support of the conservation effort. We do not fund general education, restoration, stewardship, or scientific research projects.

- ▶ All projects must have a clear recreational benefit.

For more information: <http://www.conservationalliance.com/grants/?yearly=2020>

### **Blue Cross Blue Shield (BCBS) of North Carolina Foundation**

BCBS does not have a traditional grant cycle and announces grant opportunities on a periodic basis. Grants can range from small-dollar equipment grants to large, multi-year partnerships.

For more information: <http://www.bcbsncfoundation.org/grants-programs/grantmaking-overview/>

### **Duke Energy Foundation**

Funded by Duke Energy shareholders, this foundation makes charitable grants to nonprofit organizations and government agencies. Grant applicants must serve communities that are also served by Duke Energy. The grant program has several investment priorities that could potentially fund bicycle and pedestrian projects. The Duke Energy Foundation is committed to making strategic investments to build powerful communities where nature and wildlife thrive, students can excel and a talented workforce drives economic prosperity for all.

For more information: <https://www.duke-energy.com/community/duke-energy-foundation>

### **Z. Smith Reynolds Foundation**

This Winston-Salem-based Foundation is committed to improving the quality of life for all North Carolinians. The Z. Smith Reynolds Foundation is a statewide, private, family foundation that has been a catalyst for positive change in North Carolina for more than 80 years. A variety of grant programs are available.

For more information: <http://www.zsr.org/grants-programs>

### **Bank of America Charitable Foundation**

The Bank of America Charitable Foundation supports a wide range of activities, including a focus on community greening efforts that create healthy neighborhoods and environmental sustainability through the preservation, creation or restoration of open space, parks and community gardens.

For more information: <https://about.bankofamerica.com/en-us/global-impact/charitable-foundation-funding.html>

### **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. Local governments typically create funds to facilitate and simplify a transaction from a corporation's donation to the given locality. 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. Local governments typically create funds to facilitate and simplify a transaction from an individual's donation to the given locality. 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 from church groups, civic groups, scout troops and environmental groups to work on greenway development on special community workdays. Volunteers can also be used for fundraising, maintenance, and programming needs.

| C |

# Planning Process & Public Engagement

Public open house meeting for this study in April 2022

## Charrette Summary

This project used NCDOT's charrette approach for public participation, which focuses on problem-solving and participation by stakeholders and the public. The charrette spanned two days and was held at Davie County Community Park in Mocksville.

## Charrette Preparation

The project team worked with Mocksville and Davie County leaders to set meeting dates and notify the steering committee. Leading up to the charrette, the project team created a flyer to advertise the public open house meetings. Mocksville and Davie County leadership distributed the flyer, public survey, and information about the project to their networks through multiple channels, including:

### Digital

- ▶ Press release in Davie County Enterprise Record (ran for ~2 weeks in April)
- ▶ Article in Davie County Enterprise Record
- ▶ DCRP Facebook and Instagram posts leading up to meetings
- ▶ Links to flyer and survey on DCRP and Mocksville websites
- ▶ Email to DCRP ActiveNet account holders
- ▶ Article on Davie County Blog

### Physical

- ▶ Announcement made at DCRP Easter Event in April
- ▶ Flyers posted at DCCP
- ▶ Flyers sent out to Town of Mocksville Water and Sewer customers
- ▶ Outreach to Davie Middle School administrators



**Public Open House**  
COMMUNITY PARK GREENWAY CONNECTION STUDY

**April 26, 2022, 5:30-7:00 PM**  
Meeting Focus: Existing Conditions

**April 27, 2022, 5:30-7:00 PM**  
Meeting Focus: Draft Recommendations

**Davie County Community Park**  
151 Southwood Drive,  
Mocksville, NC 27028

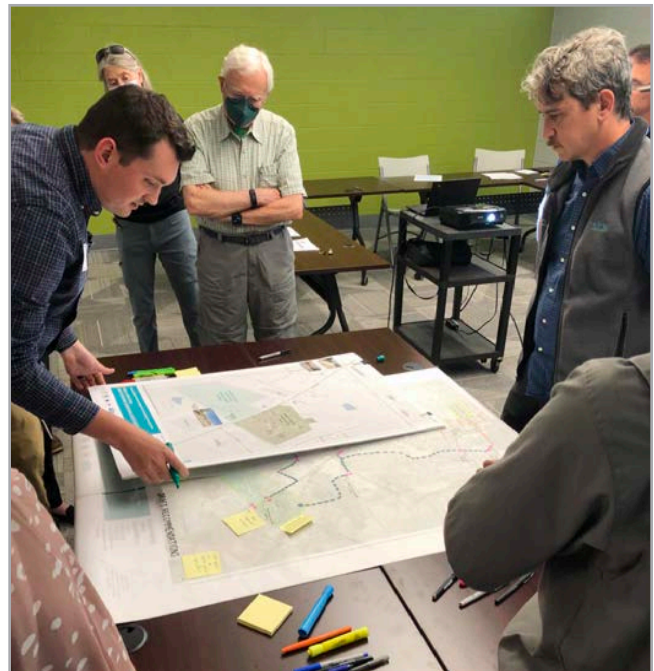
**WE WANT TO HEAR FROM YOU!**  
Share your ideas for a new walking and biking connection from South Davie Middle School to Davie County Community Park.

**GET INFORMATION**  
For more information, please contact:  
Carter Spradling, Piedmont Triad Regional Council  
336.904.0300 | cspradling@ptrc.org

**PROVIDE FEEDBACK**  
Take the online survey at:  
<https://www.surveymonkey.com/ MocksvilleGreenwayStudy>  
or scan the QR code.

Paul A. Moore, Davie County Recreation and Parks  
336.753.8326 | pmoore@daviecountync.gov

*Flyer advertising the project and public open house meetings.*



*Participants providing input at Public Open House #2.*

Additionally, the project team reached out to representatives from Avgol Non-Woven, which owns property along the corridor, to inform them about the project, invite them to meet, and notify them about the upcoming public open house meetings. A response was received in May 2022, and local leaders from the Town of Mocksville met with Avgol representatives in May to discuss the project.

## Charrette Day 1: April 26, 2022

### TOUR OF STUDY AREA

Members of the project team met with Town and County leadership to conduct a site visit of the study area on foot and by car. The project team documented existing conditions through photos and field notes.

### PUBLIC OPEN HOUSE #1

The project team hosted an open house event from 5:30 to 7:00pm at Davie County Community Park. Members of the public were invited to learn about the project, take the project survey, ask questions, provide input on existing conditions, and share their recommendations. Approximately 30 people attended the meeting. The project team documented input received by asking participants to draw on and label maps of the study area with their comments. The team provided hard copies of the project survey and open comment cards, along with information about the project and the benefits of investment in walking and bicycling infrastructure and programs.

## Charrette Day 2: April 27, 2022

### DRAFT RECOMMENDATIONS

Based on information learned from the study area tour and feedback from public meeting participants, the project team drafted recommendations for a walking and bicycling connection between downtown Mocksville and Davie County Community Park. The project team prepared a map that overlaid the recommendations on the existing conditions, and created visualizations of what the recommendations could look like in several key areas, including a HAWK signal crossing, a railroad crossing, and a greenway trail.

### STEERING COMMITTEE PRESENTATION

The project team presented the findings from the previous day and the draft recommendations to the steering committee for initial review and discussion.

### PUBLIC OPEN HOUSE #2

The project team hosted an open house event from 5:30 to 7:00pm at Davie County Community Park. Members of the public were invited to review and comment on the draft recommendations. Approximately 15 people attended the meeting. The project team documented input by asking participants to draw on and label maps of the study area with their comments. Hard copies of the project survey and open comment cards were also provided along with information about the project and the benefits of investment in walking and bicycling infrastructure and programs.

# Summary of Public Open House Feedback

## LOCATION-SPECIFIC COMMENTS

LOCATION	COMMENTS
Intersection of S Salisbury St and Jericho Hardin St	Drivers speed at this intersection and on the nearby sections of S Salisbury St. Participants noted that children often walk near this intersection due to its proximity to South Davie Middle School, so safety was a high priority. One person commented about possibly making the intersection into a roundabout.
Duke St	People noted the lower traffic volumes on this street are due to trucks being discouraged or prohibited from entering Avgol via this route.
Avgol Dr	While several people reported running or biking on this semi-restricted street without issues, others said they had been asked to leave by Avgol security personnel.
S Salisbury St Bridge	People noted the bridge was unpleasant to cross on foot or by bicycle. The uneven and narrow sidewalks do not connect beyond the bridge and are difficult to navigate for some people. One person described seeing people on bikes travel down the steep embankment and cross the railroad tracks at grade under the bridge rather than ride over the bridge.
Avgol utility easement	Many participants saw the easement on Avgol Non-Woven's undeveloped property as a good potential route for a greenway.
Main St from S Salisbury St bridge to Maple Ave	The sidewalk plan called for sidewalks on Main St but they have not been implemented because topography has posed a challenge.

## GENERAL COMMENTS

- ▶ **Walking and biking on S Salisbury St currently:** Many people felt that the current corridor is very unsafe and unpleasant for walking and biking. People noted that they do not see many people riding bicycles on the corridor and that the southern section (near the college and DCCP) was the most dangerous for biking. People described running on quieter side streets and having to cross S Salisbury St wherever they felt

they had an opportunity (because there are few designated crossings).

- ▶ **On-road versus off-road:** Participants almost unilaterally preferred an off-road option, and many preferred a route that deviated east or west of S Salisbury Street rather than parallel to it. Reasons given included a desire to be in nature and the unpleasant/unsafe feeling environment on S Salisbury St.



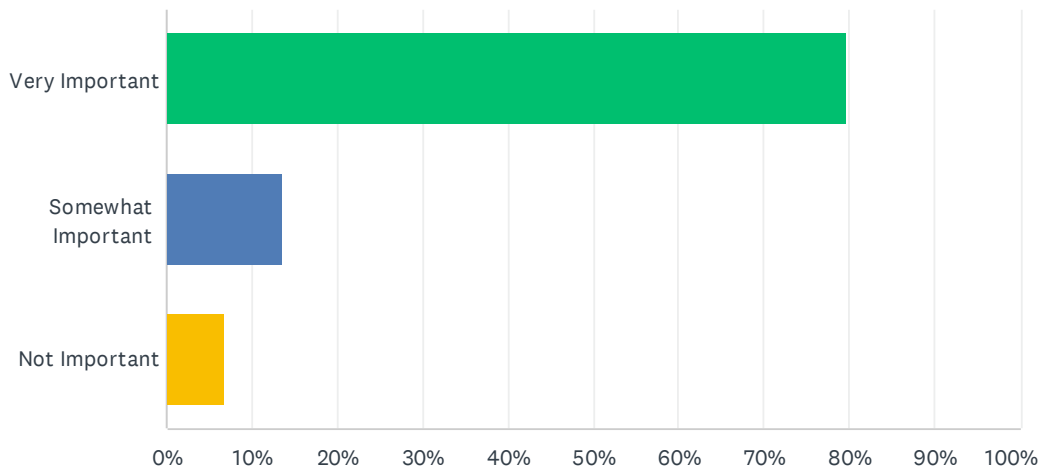


# Public Survey Responses

The project team gathered public feedback through an online survey. Hard copies of surveys were available at the public open house meetings. A total of 181 survey responses were recorded from March 28th to May 15th, 2022.

## Q1 How important to you is the goal of creating more opportunities for walking, bicycling, and trails in Mocksville? Select one.

Answered: 177 Skipped: 1



### Tell us why you feel this way (optional)

I have three kids (2, 10,12) and we love biking and walking and having somewhere else to do this would be awesome!!

We need it.

I think I am most interested in recreation trails personally. As a community leader I can see great potential for creating and expanding access to all our citizens when key destinations (grocery, healthcare, food) are included in those plans.

There are many people who Cycle and many walkers I'm the area. It would be safer and provide more choices.

Unused to live in a city that had lots of walking and biking trails all over the town.

I've enjoyed riding greenways and Rails to Trails ex (New River Trail, Galax VA) for the past 30 years. I use hotels, Restaurants and shop the local areas. This idea not only produces local revenue but also promotes a good, healthy lifestyle for families . It is also a selling point for new industries and home buyers. I highly recommend Davie County funding this project along with state and federal monies which are available for this type of recreational activity.

It promotes an active community and provides clean transportation options for people of all income levels.

We need a good safe place to walk. The park is nice, but not a fan of walking through the woods.

My family of 4 all ride bikes. Because there are no dedicated bike lanes, having trails would make it so much safer for us to bike.

Connectivity, residential and commercial economic impacts, tourism, and fits the overall county brand tag "you belong here" and town brand tag "time we'll spent"

For health and mental wellness.

The more open spaces we have for residents and non-residents to enjoy, the more people will come here to enjoy. The more people come here to enjoy, the more Mocksville and Davie County become a destination for both new residents and visitors.

I've moved here about 10 years ago and absolutely do NOT want to be someone who tries to change my new location to something they think it should be, I just know how much enjoyment my kids/family & I had with walking & cycling paths. Not just enjoyment, but of course it promotes a healthy lifestyle, and really does what our society needs nowadays, getting people back out in front of each other.

We need more safe ways to walk and ride in Davie County. If the opportunities are available, more people might use them and become healthier.

There aren't many local places to go walking except for public sidewalks and a few short places at the park. We have to go out of county to be able to go for walks or bike riding.

Safe option for bike riding

As a Mocksville couple with retirement right on the horizon, fitness is very important to us. We take advantage of the sidewalks in town and the wonderful trails in Rich Park quite often. We have bicycles but haven't ridden them as often as we'd like due to the fact that we don't feel comfortable riding them on the sidewalks and would have to load them up to take them to Rich Park. We haven't tried the Davie Community Park. We live very close to South Davie Middle and would be able to ride right over there and bike away!

There are limited options for people in the coolemee and south mocksville area to walk and bike without traveling

There are only a few places to walk or bike... downtown/uptown and it's a little scary if you have kids with you. The greenway at Rich Park is very hilly with ups and downs so not good for a bike or those with knee and joint issues. The Rec center is nice but little shade and very hot at times...and can be a farther drive for some...

Being able to walk around this area is nice. I live right by there and we already have a walk way in front of my house.

Trails would help make this community healthier

Great for exercise and connection! Would love to see a greenway between North Ridge community and Rich Park too!!!

Don't live in Mocksville but love to visit.

I walk in the Davie County parks and am very concerned that we maintain and increase green spaces because they are essential to our health and to the beauty of our county.

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I have seen the success of nearby walking trails at tanglewood, and believe Mocksville could benefit from this same concept. The trail at rich park is nice, but the change in grade is excessive making it slightly less attractive than the tanglewood option.

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I am on the cross country team at Davie High School. Davie county is a terrible place to run there are barely any trails. When we run at Davie High we often have to run on the sides of roads in the grass with cars speeding past us. A large greenway trail system would be a great improvement to the infrastructure of Davie county and lead to many new economic opportunities. This project must happen!

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I am very involved already with the YMCA, cycling, and promoting the Tour of Farmington Bike event each year

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Increase in traffic on the streets is becoming difficult for walking.

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It adds to the quality of life which is vital to keeping our community healthy and connected.

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there are very few sidewalks available through Mocksville / Davie County to allow safe walking routes for travel or excersize. There are often employees walking to work at fast food or retail along routes 158 / 64 in early morning and late evenings at risk with traffic.

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Safety, property values

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Right now I have to drive 15 or so minutes to get to a safe place to run. While the community park is a great place it's not as easy for everyone to access due to the distance and "rush hour" traffic

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It would allow the community to be more connected and allow people more opportunities to get outside and exercise.

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Walking and biking are excellent exercises for all ages and fitness levels, having a place to walk or bike safely would help bring people in our community together, would help us all be more healthy, and would be a great selling point for people looking to move into our community.

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Free healthy activity!!

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Many residents currently go outside of Mocksville to take advantage of walking and biking trails in neighboring communities. It would be wonderful to have trails in Mocksville to promote healthy, active lifestyles right her in our community.

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More places for outdoors activity, and exercise is so important

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I think this plan is a GREAT idea!!!

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A healthy community is more productive and the trail will draw tourism and re-location to the area.

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I would love somewhere safe to ride bikes with my children that is not in the roads.

---

I have started walking more and more on my lunch break and really enjoy being outdoors.

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A healthy lifestyle is important and this includes places to provide opportunities to pursue a healthier life

---

Mocksville is, at present, decidedly NOT pedestrian friendly or bike friendly. There are too many areas (eg: along Yadkinville Rd) that lack sidewalks for pedestrians, making walking rather unsafe. There is essentially no cycling infrastructure (eg: bike racks) near almost any of the businesses in town. It's hard to promote increased walking and biking when everything about the town is decidedly auto-centric.

---

I run two to three days consistently each week. Most of my runs take place either on main street but the sidewalks are not always level and wide enough for my jogging stroller. Most days I have to go to Clemmons at Morgan Elementary or Tanglewood to get wide enough paths to run on.

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In general people are too sedentary. We need more opportunity to be active in a safe way. I am fearful when I see people biking on our public roads.

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I've lived in two other towns with paved greenways and consider it a major advantage to a towns environment.

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Creating biking/walking paths that connect communities protects more green space into the future. The current housing boom is showing the need for better land planning in Davie County. The need to protect open space goes hand in hand with walking/biking paths.

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There are none of any length where people can get out and exercise, especially since more and more people have less or no outdoor space at their homes.

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Love greenways in other towns and counties! We need one!

---

It will improve the health of our community and make David county a wonderful place to reside and attract others who are also interested in health and activity.

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The more places to walk and bike the more diversity and space for people to enjoy. The more likely people will get outside to enjoy nature.

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For Safety

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Safe options for walking for exercise

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More opportunities to exercise

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Having opportunities for walking trails promotes healthy living and exercise for more residents in Mocksville. Having this connection from South Davie would allow my family to walk from our house to the Community Park.

---

We like to bicycle We live by Davie middle school, we would love a safe place to bike and walk

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we need a safe place to ride bikes, currently have none.

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I walk several times a week and would welcome new, safe routes to walk.

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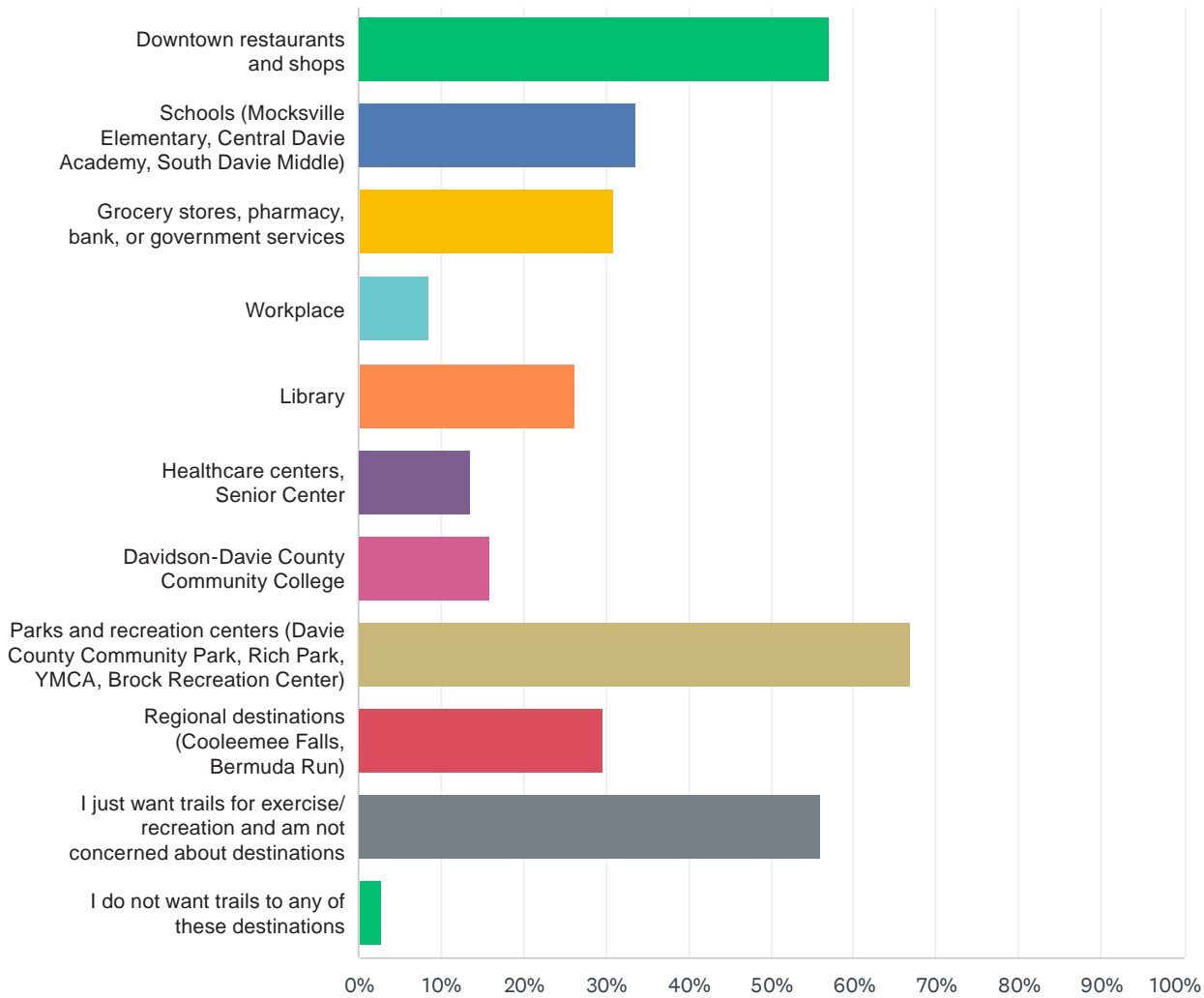
Since moving here approx. 3 yrs. ago, we have always felt that if provided, this area would flourish with a trail system. The town is beautiful but not runner/walker friendly unless you stick to sidewalks. Once the sidewalks run out, all bets are off lol.

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More opportunities for outdoor recreation is a major attribute to communities.

## Q2 What destinations would you most like to get to by walking, bicycling, and greenway trails? Select all that apply.

Answered: 175 Skipped: 3



**OTHER (PLEASE SPECIFY)**

Existing sidewalks are fine.

Camping, fishing, restaurants, parks, picnic,

I live at the Comet Bermuda Run Complex. I would LOVE something/a path to travel around with

Historical markers

I'd like more trails for exercise/ recreations without destination being important.

I would love to have a greenway between the North Ridge development and Rich Park as it is only a few hundred yards through the woods

Farmington Community Center

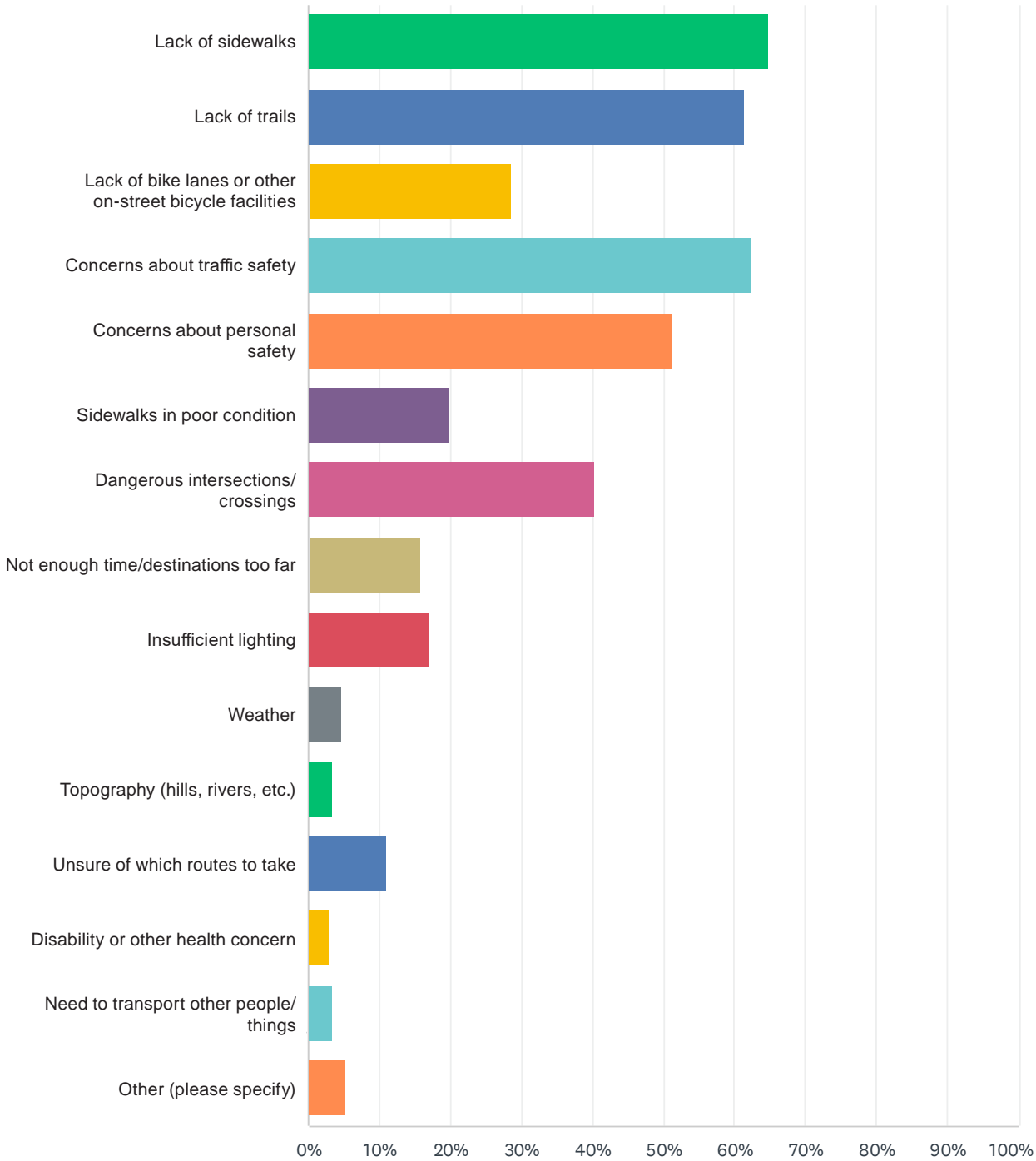
Combine utility (i.e. walk to the grocery store) with beauty (i.e a peaceful relaxing walk by a creek)

We need more sidewalks around town!!!!

The more trails the better!

### Q3 What prevents you from walking and/or biking more often? (check all that apply)

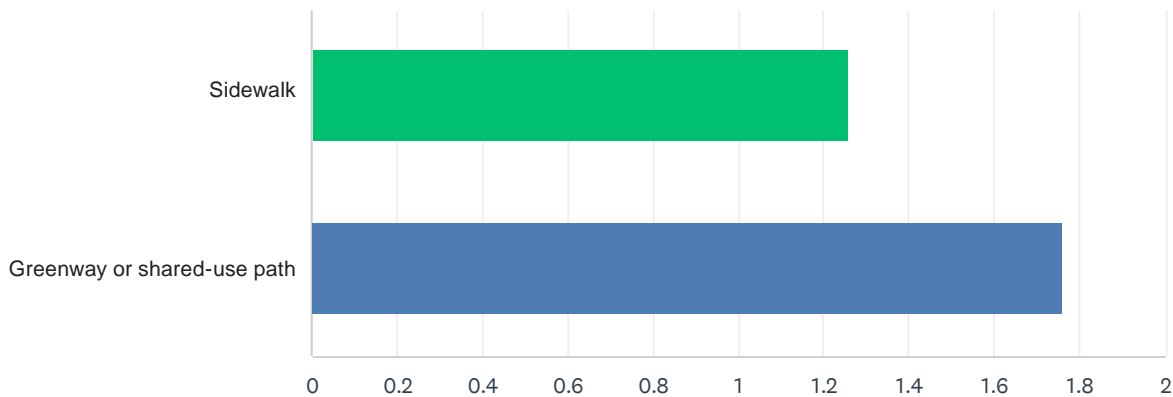
Answered: 171 Skipped: 7



OTHER (PLEASE SPECIFY)
No good place with lights at daylight savings time
im not being prevented from walking or biking
I'm autistic and need opportunities to sit down in shade every so often
Nothing is currently preventing me from walking and biking as much as I please
Signage is extremely helpful on trails because gps isn't always available in rural areas
I leave the county to go take advantage of the greenways in Forsyth and would love to be able to stay closer to home.
Would love sidewalks on US 64 W!
The roads are just big enough for vehicles. Walking on the sides of roads with no shoulder and no sidewalks is very dangerous with the speeds of vehicles.
Bathrooms for my toddler

### Q4 Please rank your preferred type of pedestrian facility.

Answered: 159 Skipped: 19

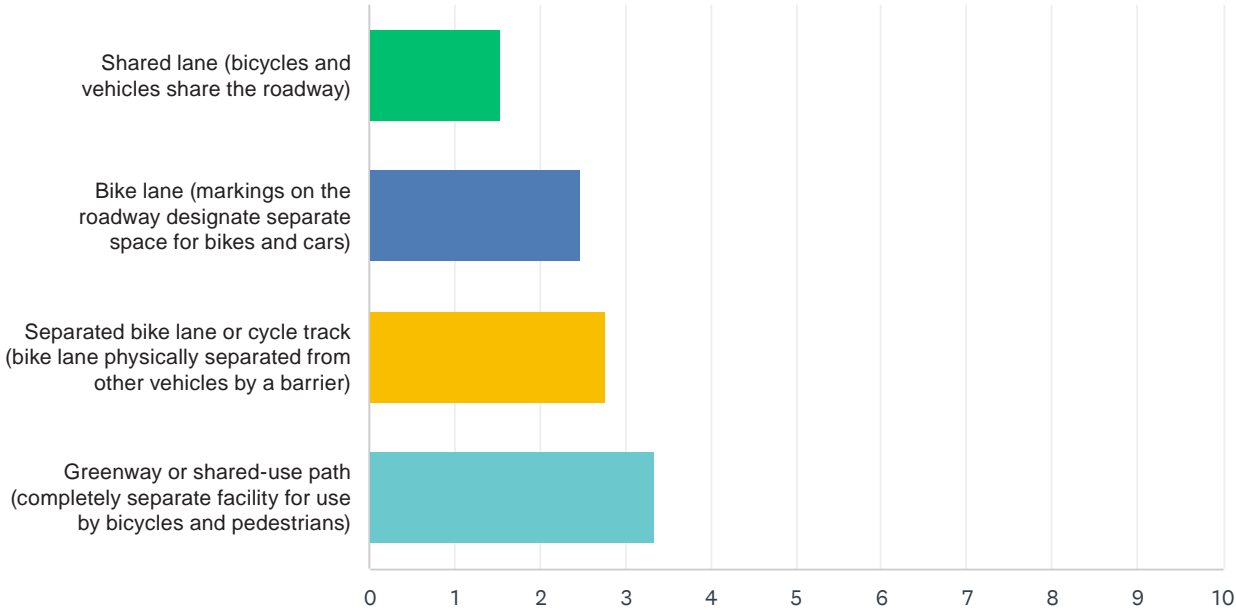


	1	2	N/A	TOTAL	SCORE
Sidewalk	25.00% 38	71.71% 109	3.29% 5	152	1.26
Greenway or shared-use path (completely separate facility for use by bicycles and pedestrians)	74.52% 117	22.93% 36	2.55% 4	157	1.76



### Q5 Please rank your preferred type of bicycle facility.

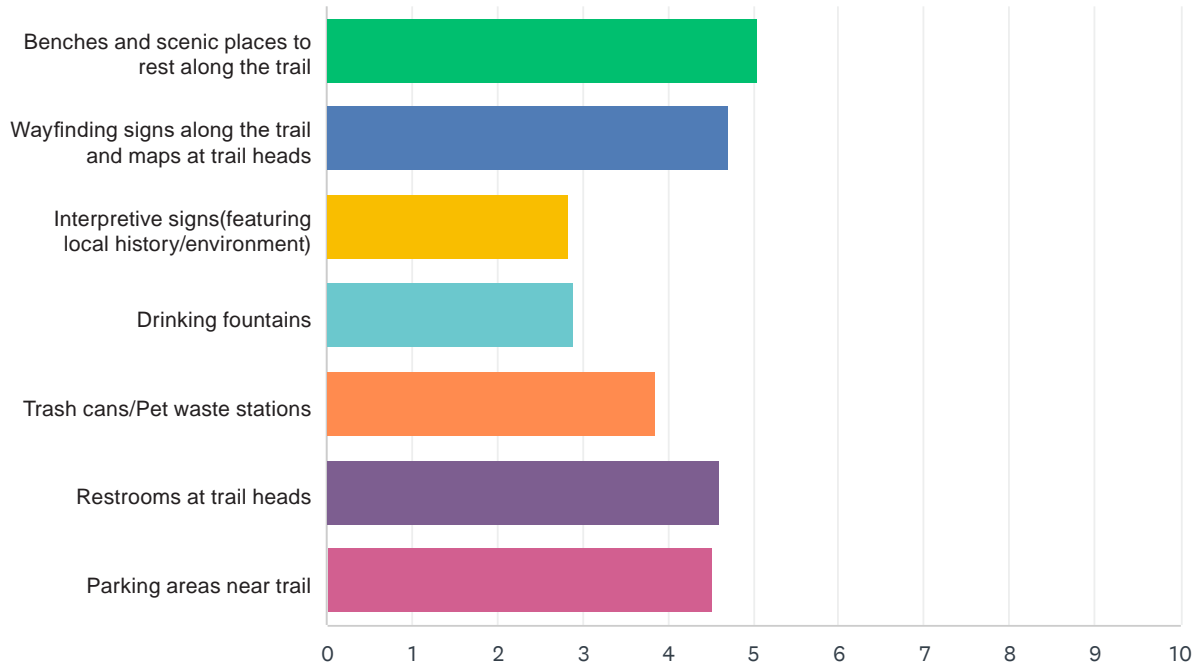
Answered: 158 Skipped: 20



	1	2	3	4	N/A	TOTAL	SCORE
Shared lane (bicycles and vehicles share the roadway)	5.96% 9	6.62% 10	14.57% 22	56.95% 86	15.89% 24	151	1.54
Bike lane (markings on the roadway designate separate space for bikes and cars)	14.57% 22	17.22% 26	50.99% 77	5.30% 8	11.92% 18	151	2.47
Separated bike lane or cycle track (bike lane physically separated from other vehicles by a barrier)	18.42% 28	45.39% 69	14.47% 22	11.84% 18	9.87% 15	152	2.78
Greenway or shared-use path (completely separate facility for use by bicycles and pedestrians)	55.19% 85	20.78% 32	6.49% 10	8.44% 13	9.09% 14	154	3.35

## Q6 Please rank the importance of the following features for greenway trails.

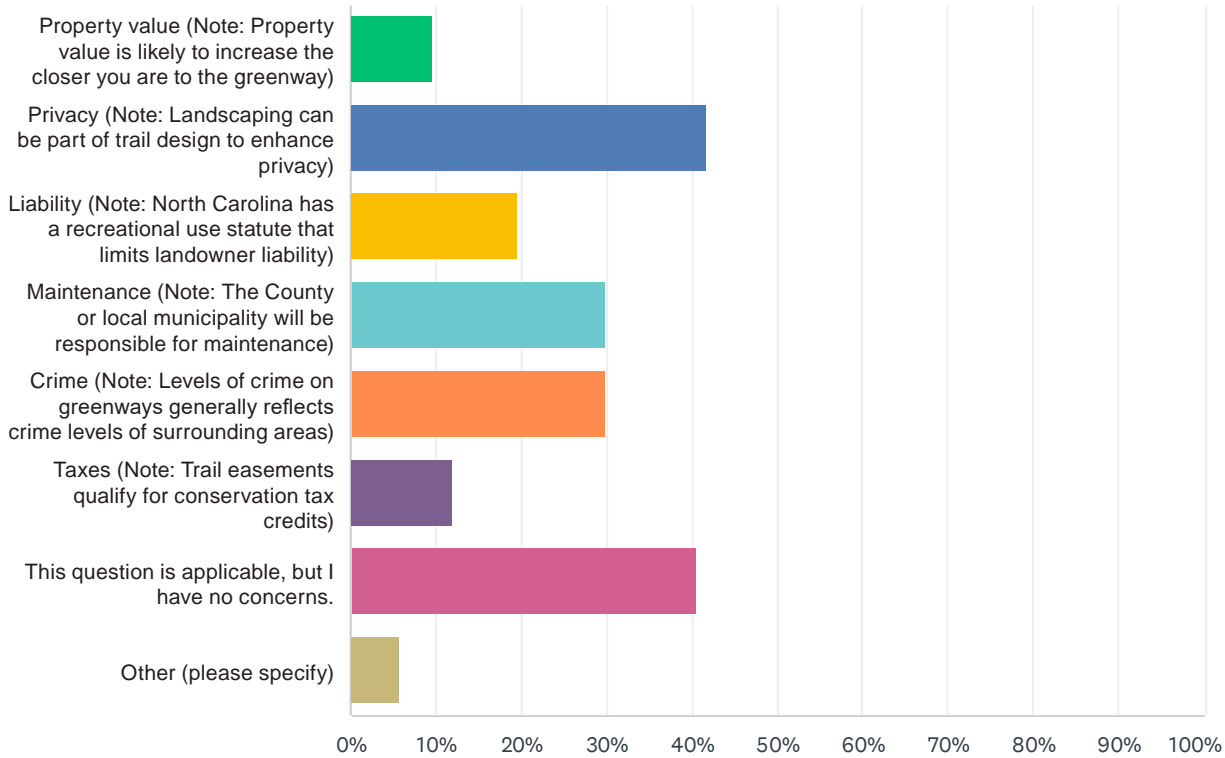
Answered: 156 Skipped: 22



	1	2	3	4	5	6	7	N/A	TOTAL	SCORE
Benches and scenic places to rest along the trail	26.71% 39	20.55% 30	15.07% 22	12.33% 18	12.33% 18	4.79% 7	4.11% 6	4.11% 6	146	5.06
Wayfinding signs along the trail and maps at trail heads	17.88% 27	19.87% 30	13.91% 21	18.54% 28	12.58% 19	10.60% 16	1.99% 3	4.64% 7	151	4.71
Interpretive signs (featuring local history/environment)	2.05% 3	4.11% 6	13.01% 19	14.38% 21	10.96% 16	21.23% 31	27.40% 40	6.85% 10	146	2.84
Drinking fountains	2.03% 3	7.43% 11	10.14% 15	13.51% 20	14.86% 22	18.24% 27	28.38% 42	5.41% 8	148	2.89
Trash cans/Pet waste stations	8.11% 12	6.76% 10	20.27% 30	15.54% 23	24.32% 36	14.19% 21	6.76% 10	4.05% 6	148	3.85
Restrooms at trail heads	13.42% 20	27.52% 41	14.77% 22	13.42% 20	9.40% 14	15.44% 23	3.36% 5	2.68% 4	149	4.61
Parking areas near trail	30.92% 47	11.84% 18	9.87% 15	8.55% 13	8.55% 13	7.89% 12	17.76% 27	4.61% 7	152	4.51

## Q7 What would be your main concerns about greenways if you lived or owned land near a trail?

Answered: 158 Skipped: 20



### OTHER (PLEASE SPECIFY)

the land has to be taken from someone for this bullshit

Having too many people

People walking through my property of parking around my home.

Enforcement of the 4 way stop intersection at S Davie/Salisbury St. We see vehicle run/glide thru those stop signs often during our walks.

Just making sure they actually get used and enjoyed

Cutting down my trees in my front yard

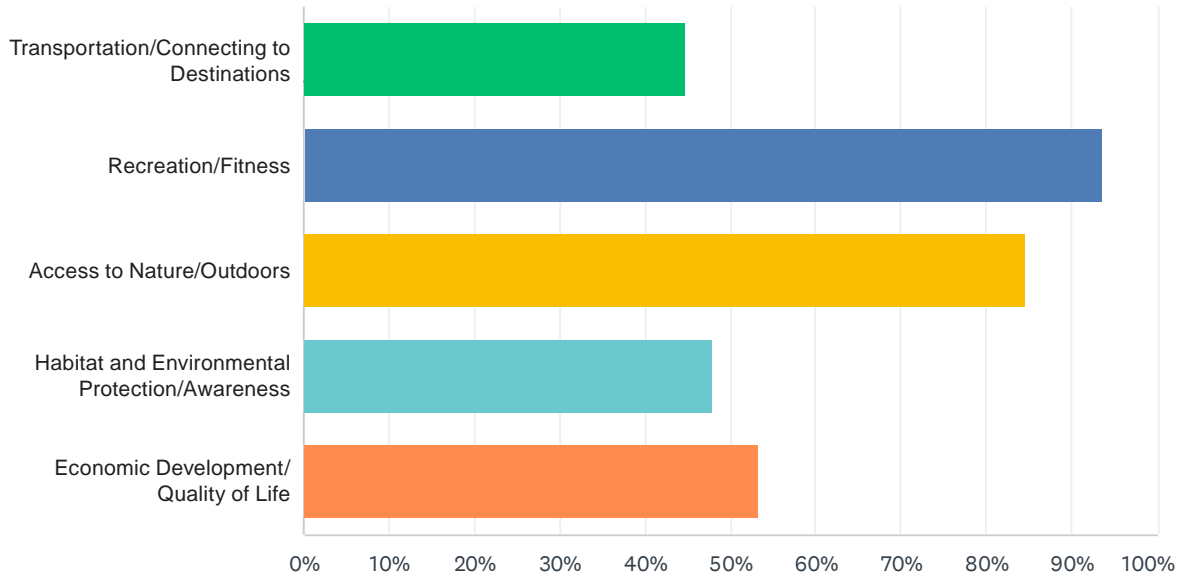
I do not want a trail/greenway near my house as I do not want strangers being close to my home/property- being loud, leaving trash, etc

Police presence occasionally but routinely on trails to deter bad people.

safety so biking and walking are both safe, room for both

## Q8 What are the most important benefits and uses of greenway trails? Select all that apply.

Answered: 156 Skipped: 22



**OTHER (PLEASE SPECIFY)**

burning thru money

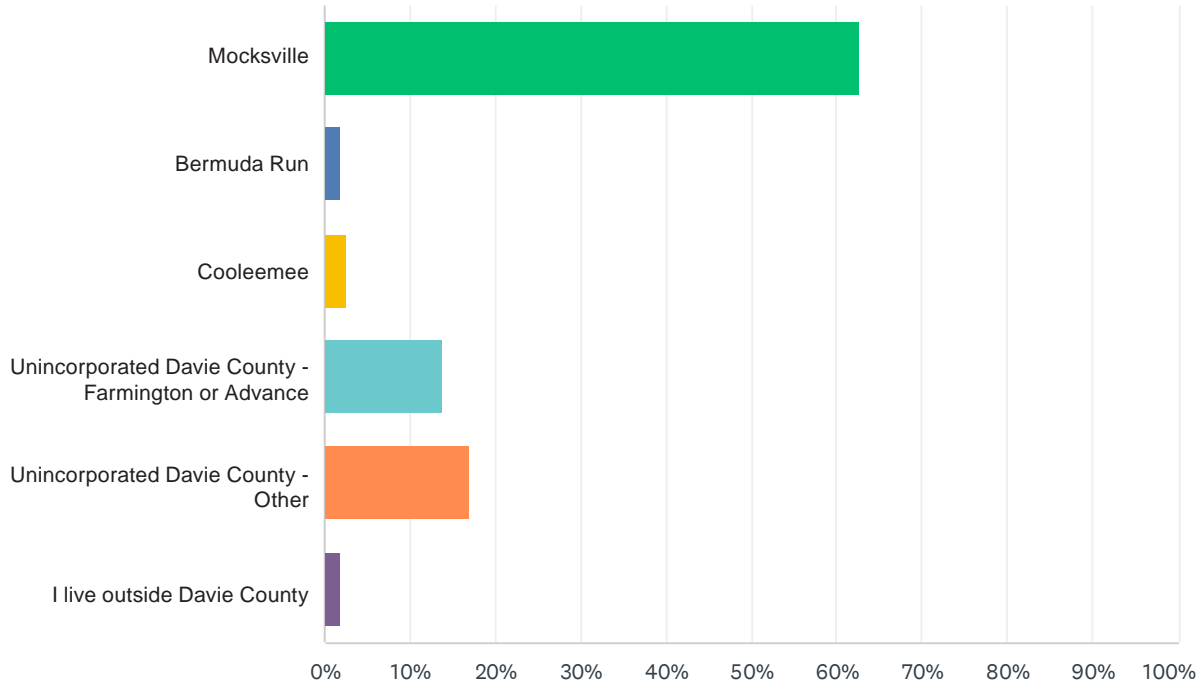
Unnecessary way of spending a lot of mony

Extra points for Quality of Life

I think this is a FANTASTIC way to improve the health of our community as well as contribute to making Davie County a desirable place to move to for work which is greatly needed by local employers.

# Q9 Where do you live?

Answered: 158 Skipped: 20



**OTHER (PLEASE SPECIFY)**

Clarksville

William R Davie fire district area

Tiny home in Mocksville at lake Myers also

Smith Grove Davie County

Howardtown Circle

Will be building a new house in mocksville

Will be moving to Mocksville in a few months

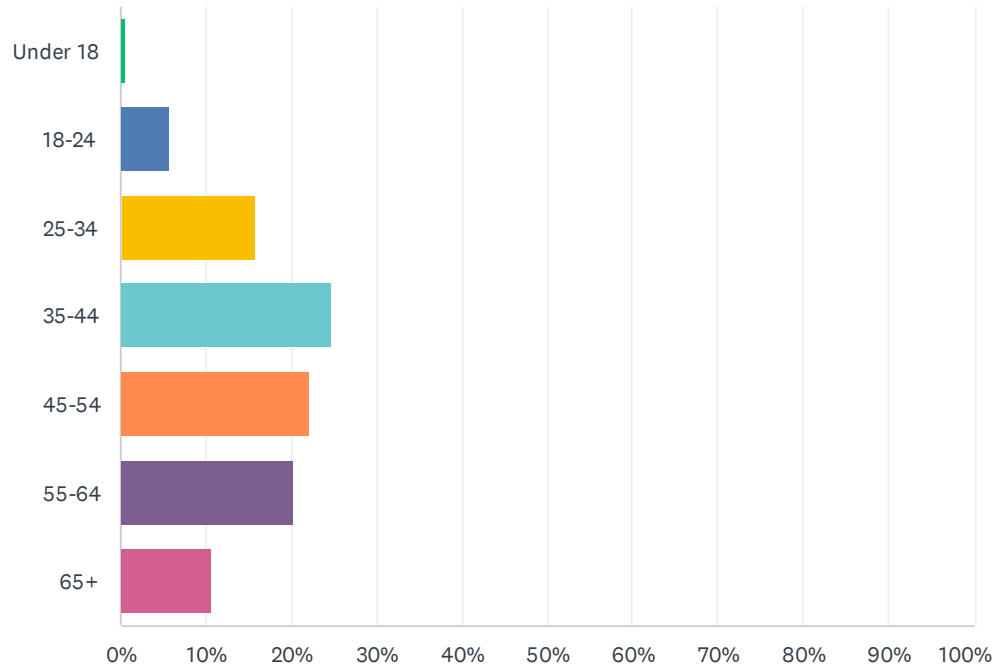
Sheffield Callahan area

Hickory Hill

behind community park

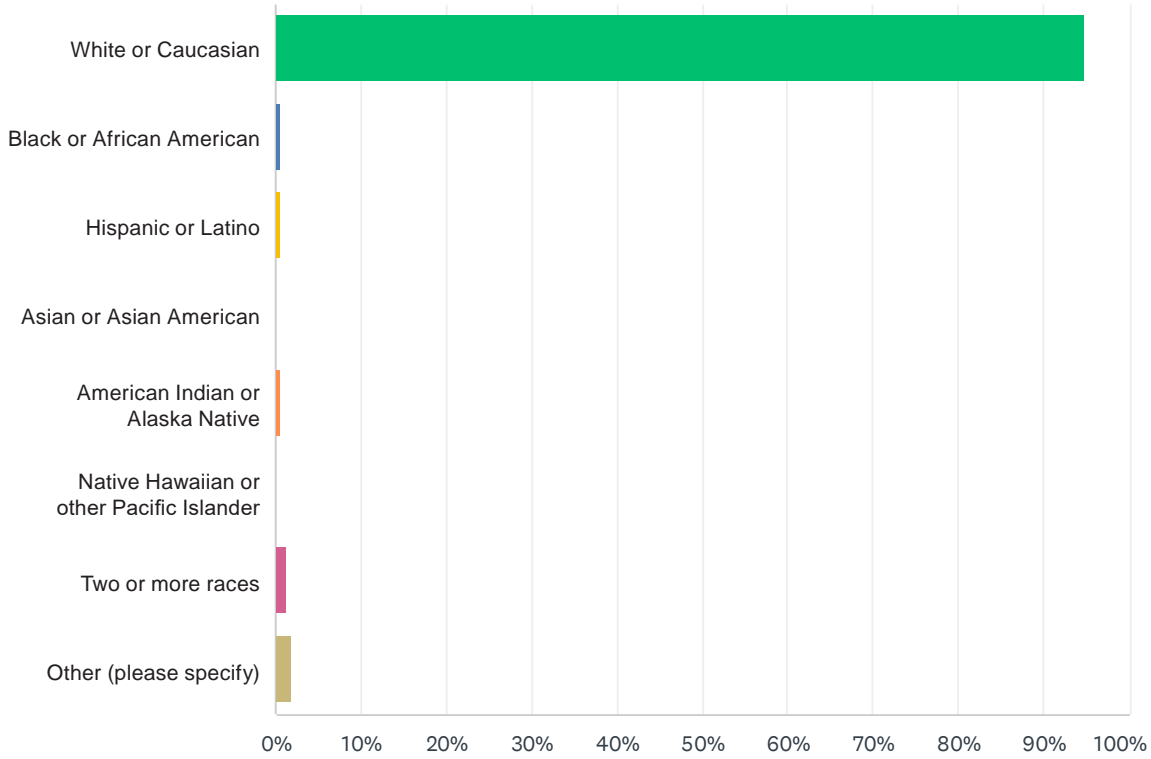
### Q10 What is your age group?

Answered: 158 Skipped: 20



# Q11 What race or ethnicity most describes how you identify yourself?

Answered: 155 Skipped: 23



**OTHER (PLEASE SPECIFY)**

Why is my race important for this survey?

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secret

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It should not matter

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## Q12 What is your gender?

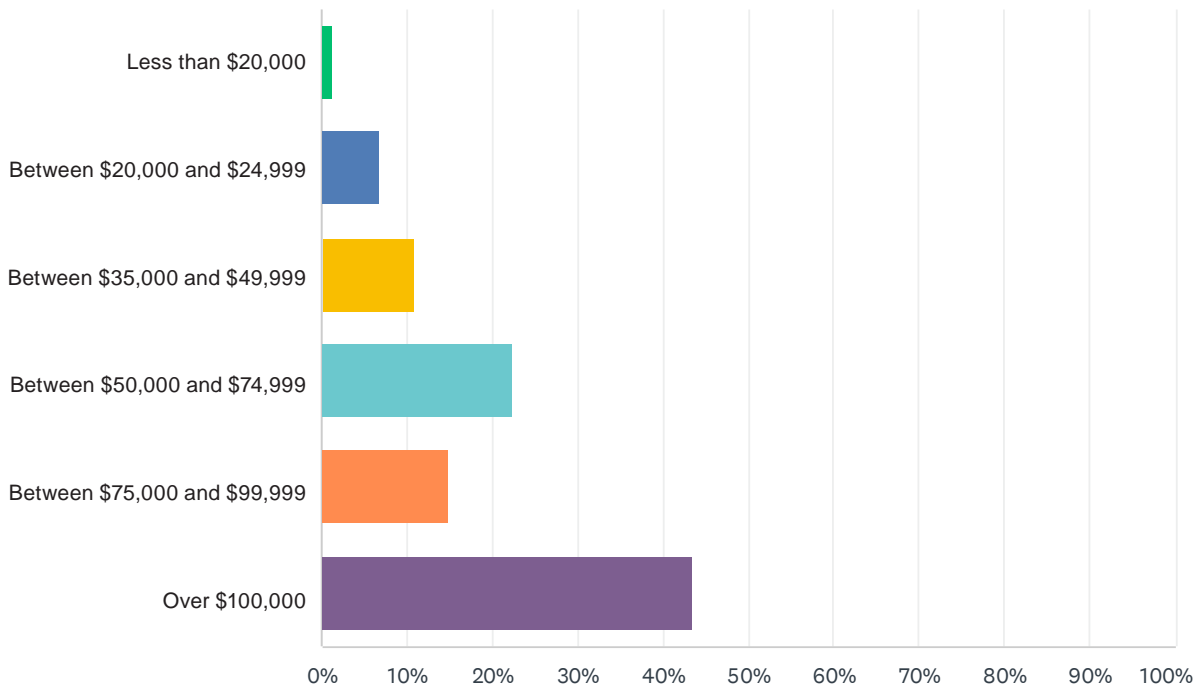
Answered: 152 Skipped: 26

RESPONSES	Number	Percent
Female	108	71.1%
Male	39	25.7%
Other Response (see below)	5	3.3%

OTHER RESPONSES
My gender doesn't affect my survey answers
secret
We are a married couple
male, wife interested also female
47

## Q13 What is your household income?

Answered: 147 Skipped: 31





## Q14 Are there other comments you would like to share about walking, biking, and trails in Mocksville?

Answered: 53 Skipped: 125

### RESPONSES

I love the Mocksville greenway. It would be nice for it to be longer.

na

Would like to see more sidewalks apart from the downtown area

Shaded benches please

This needs to happen.

Please consider the restrooms being baby friendly with a changing table. I'm sure the majority of the people using this will have kids/a stroller with them.

I think it's a great idea to add as most towns already have sidewalks and bike lanes to keep pedestrians safe while walking.

Would be very nice to have and concern for safety staying off roads

I think that Mocksville would benefit greatly from more trails and parks in town. It's interesting to walk by different plants that have a sign next to them letting you know what they are. As well as signs telling you about the history of different places.

Shared use trails are widely used. A good example is a small trail like Salem Park in Winston Salem. Surface material is also a big consideration for bike riders and pedestrians. Trail maintenance is critical. Rules and regulations are very important. Directional signs are very useful.

Love Rich Park and the trails. Would like more sidewalks getting there, specifically extend North on Main St

I wish we would have a sidewalk from Walgreens area, down yadkinville to connect to wilkesboro. So many people walk from the apartments and it would be great to be able to bike from there to downtown for events with my family.

Continuing to meet the needs of the community by offering new, accessible things like a Greenway, keeps the community moving forward. Things like this help attract families and people looking for enrichment within their community.

Great internal park trail systems. We are decades behind in systemwide greenway trail development

It would be very convenient to have a trail/sidewalk that runs down south main street to connect the downtown area with the new Rec facility. Traffic on this stretch or road is very heavy, and it's almost impossible to walk along this area now; due to lack of shoulder on the road and uneven terrain.

This would be an excellent addition to Davie County.

Mocksville just needs more things to do... An eventual Greenway from the high-school to the new davie county recreation center. Connecting to the library and downtown would be a plus as well.

The Greenway Construction should be an ongoing attempt to connect various areas of the county. Start with connecting through all of Mocksville, then to Advance & Bermuda Run.

PLEASE do something different than what is already in place. This county desperately needs to upgrade its walking/biking trails.

We would love to see improvements such as these to Mocksville. It would be nice to feel comfortable/safe taking our grandchildren on biking trails in Mocksville.

Would be a great asset to our county

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Safety is my number 1 concern

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Looking forward to a place to bike and walk with my family/young kid.

---

Please design a trail that goes by Cedar Trace apartments for the disabled

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Please make this happen

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Would love access to Rich Park from the North Ridge community

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It's essential that we provide these assets. Let's not just talk about improving health and preserving the natural beauty. We've made a great start and should continue progressing.

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Very grateful Mocksville is considering enhanced greenway trails addressing safety and accessibility!

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In the follow up projects there is mention of on road lanes along hwy 158 and 801, which seems dangerous to me given the traffic volume. I would encourage physical buffers or separate greenway for bikes and pedestrians if at all possible

---

na

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Incredible benefits and much needed.

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I think this is fantastic and so grateful to live in a community that is forward thinking enough to make this a priority.

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Please keep pet friendly

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I'm glad there could be plans for a greenway in Mocksville!

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Please move forward this project is important for so many reasons!

---

I love walking to the park my kids grown up mocksville I love all they do now o hope all this help to make more changes

---

I think this is a great idea and am excited that we might get a greenway to use. I use the Davie Community park to walk at currently and would LOVE to have new trails or some trails that are closer to my house because I live in town. I would LOVE to be able to ride my bike into the downtown area with out have to ride with the car traffic because I worry about being hit. It would be so much better for my health and the environment and cheaper than using my car especially with the gas prices continuing to rise. Thank you!

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Please consider running a sidewalk past South Davie to the apartment complex and New Hampshire Court or Colonial Estates neighborhoods. There are often folks that walk to school or to town - the road is narrow and there isn't a good shoulder for either cars or people.

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Mocksville is a great place to live and the addition of greenway trails would make it even better.

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I hope this plan goes through!

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With the growing needs of our town I think it's vital to have more options for walking biking and trails in Mocksville

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Just please make it off the highway and safe for kids

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This would be a huge advantage for Davie County, I'm so excited it's being considered!

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PLEASE BUILD THEM!

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Rich Park is great, but the trails need to be longer for those who like to bike, walk or run for longer distances.

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I think this would be a great addition to Davie county. We really could use more walking trails

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Would love a 5-6 mile greenway!!! This is exciting!

Have plenty of shade. Wide enough path for pedestrians with pets and bicycles if they share the path. Prefer no skateboards as some of those people are not careful and may run over people!!

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More sidewalks along streets and roadways.

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Would consider property tax increase for project

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Sidewalk access will boost local business along Hwy 601 more than a secluded greenway or trail.

---

new park nice but we need safe place to ride bikes on trails, big benefit to town and county

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I live near South Davie so I am excited about the possibility of a trail to the new park.

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I am excited to see how this project will take off! As a family of runners/walkers, we love new places to go and would love to support a local trail!

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A greenway with a pedestrian bridge that includes DDCC is pref.



**alta**