



Sumter

Walk + Bike

Master Plan

2023

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DISCLAIMER

Information contained in this document is for planning purposes and should not be used for final design of any project. All results, recommendations, concept drawings, cost opinions, and commentary contained herein are based on limited data and information and on existing conditions that are subject to change. Further analysis and engineering design are necessary prior to implementing any of the recommendations contained herein. Geographic and mapping information presented in this document is for informational purposes only, and is not suitable for legal, engineering, or surveying purposes. Mapping products presented herein are based on information collected at the time of preparation. Toole Design Group, LLC makes no warranties, expressed or implied, concerning the accuracy, completeness, or suitability of the underlying source data used in this analysis, or recommendations and conclusions derived therefrom.





E

**EXECUTIVE
SUMMARY**

EXECUTIVE SUMMARY

Planning for Walkability & Bikability

Prioritizing planning, funding, and implementation of pedestrian and bicycle infrastructure is a paramount step for the Sumter Metro area towards becoming a safer walkable and bikeable community. While pedestrian and bicycle crashes make up less than 1 percent of the total crashes reported for the Sumter area between 2016 and 2020, pedestrian and bicycle crashes make up close to 14 percent of those crashes that are considered serious or fatal injuries. This accounts for 33 out of 238 crashes that resulted in a fatality or incapacitating injury involving a pedestrian or bicyclist, making it important to place an emphasis on improving the areas pedestrian and bicycle network.

The Sumter Walk + Bike Master Plan is a document that guides the Sumter area in a process that provides a framework that generates excitement for a vision and goals to meet a realistic outcome; it engages the community with equitable representation; it inspires policies and programs that will promote advocacy; and it is implementable with feasible recommendations as funding becomes available and opportunities arise.

Public Outreach

A steering committee was established to guide the overall project development and included public and private sector, and residential stakeholders. The steering committee assisted in development of goals, objectives, performance measures, and the overall pedestrian and bicycle network. They also participated in the review of the draft plan.

The goals and objectives developed for this plan are focused, measurable outcomes to reflect priorities that will result in a more walkable, bikeable community. The goals established are Connectivity, Education, Equity, Health, and Safety.



A public outreach effort was crafted to include and inform the public on the planning process for the purpose, need, and benefits of pedestrian and bicycle infrastructure. Outreach efforts included:

- Press release
- Fact sheet
- Informational video
- Online survey
- Interactive map
- Social Media
- Pop-up events

The feedback from the outreach platforms guided the prioritization of facility selections. The top three priorities included:

1. Safety
2. Accessibility for all users
3. Ability for short trips

Walk + Bike Layers of Analysis

The Walk + Bike Network was developed using five overlapping layers of analyses:

- Barriers: Islands of limited connectivity
- Safety: Pedestrian and bicycle crash hot spots
- Destinations: Concentrations of community destinations
- Trip Potential: High activity between origins and destinations
- Public Input: Community requests and concerns

Facility Selection Priorities

1st

SAFETY



2nd

ACCESSIBLE FOR ALL USERS



3rd

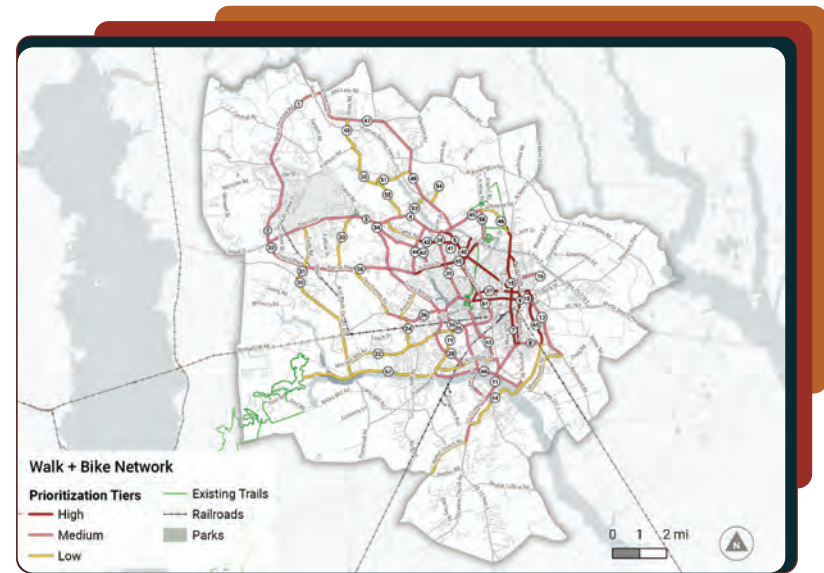
ABILITY FOR SHORT TRIPS



Walking and bicycling facilities
(Source: Toole Design Group)

This analysis resulted in a network of 67 specific corridors of off-street trails and on-street connections where investment can be made that will have the greatest impact for safe and comfortable facilities for walking and biking. Chapter 3 outlines the analysis that identifies these corridors and defines the differences between the off-street trails and on-street connections. Chapter 3 also outlines the next step in the process of defining the facility type of each corridor. A facility selection process was developed to provide for a wide range of flexibility in the planning, funding, and design of each of the 67 corridors. The Context-Typology-Facility Matrix, found in Table 8 on page 57, serves as a guide to determine where options such as sidewalks, sidepaths, separated bike lanes, and traffic calming should be located within the recommended network.

The plan includes a bikeshare analysis with mobility options that allow access to a network of bicycles that can be checked out and returned on demand. The analysis results in two scenarios that the Sumter area can consider. While the two options are not mutually exclusive, pursuing either option will make the other less feasible due to competition in the limited Sumter market. More detailed information on each option is provided in Table 9 on page 74.



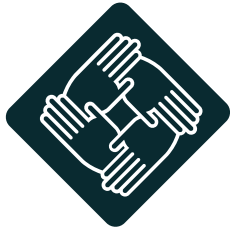
Walk + Bike Network Map

Walk + Bike Implementation

Utilizing the feedback from the outreach efforts, in combination with the goals and objectives defined by the steering committee, criteria listed in Table 10 on page 79 was developed to rank and prioritize the 67 corridors resulting in a top 10 corridors list.

Prioritization Criteria

EQUITY



PUBLIC INPUT



TRANSIT



PARKS & SCHOOLS



SAFETY



Early Action Projects

Six projects are identified as early action projects to kick off the implementation of the plan. These six projects are low-cost spot treatments that will have large impacts on safety, accessibility, and connectivity. Performance measures, a funding source matrix, a maintenance plan, and design guidance are presented as resources and guidance to complement the Walk + Bike network corridors and early action projects.

Table of Early Action Projects

Project ID	Type	Name	Estimated Cost
1	Bike	Broad Street & Alice Drive	\$52,200
2	Bike	McCrays Mill Road & South Guignard Drive	\$18,900
3	Walk + Bike	Wall Street Connector	\$664,400
4	Walk	Broad Street & Willow Drive	\$34,000
5	Walk	Manning Avenue Midblock Crossing	\$20,400
6	Walk	Patriot Parkway & Loring Mills Road	\$22,600



WELCOME
TO
Summer →

WELCOME
TO
Summer →

1

INTRODUCTION

- What is Walk + Bike?
- Why Walk + Bike?
- Goals & Objectives

WHAT IS WALK + BIKE?

What is the Walk + Bike Master Plan?

The Sumter Walk + Bike Master Plan (the Plan) is a document that will guide the Sumter Metro area toward a more walkable and bikeable future by prioritizing pedestrian elements while placing emphasis on the importance of developing a bicycle network. The Plan is context-sensitive, providing data-driven solutions built on public feedback and analyses that reflect the unique perspectives of walking and bicycling in the Sumter Metro Area. It envisions Sumter as a more dynamic and equitable community; one in which mobility options are expanded through a connected network of walking and bicycling facilities that increase comfort and reduce risk for all users. This network will be maintained and supported through robust programs and policies.

WHAT IS ACTIVE TRANSPORTATION?

Active transportation is walking, wheeling, bicycling, or any other non-motorized, human-powered travel between destinations.





WHY WALK + BIKE?



Why a Walk + Bike Plan?

Creating a community-specific pedestrian and bicycle master plan is important for the City of Sumter and the Sumter Metro Area for a variety of reasons.

1. The Plan provides a framework for implementation that will move the vision and goals toward reality.
2. The Plan has been developed from detailed analyses and community engagement, resulting in recommendations for Sumter that are realistic and meaningful.
3. The plan outlines policies and programs that support walking and bicycling through changes to the built environment and development standards that encourage non-motorized connectivity throughout the City and County.
4. Infrastructure recommendations in the Plan identify certain roadways and corridors for bicycling and walking facilities as funding is available or opportunities arise.

WHAT DOES WALK + BIKE PLAN SUCCESS LOOK LIKE?

- Generates excitement
- Equitable representation
- Inspires civic advocacy
- Feasible and implementable

GOALS & OBJECTIVES

Goals and objectives for this effort are focused on measurable outcomes that result in a more walkable, bikeable community.

Goals

The goals reflect community priorities based on responses to the online and paper surveys, steering committee input, and staff feedback.



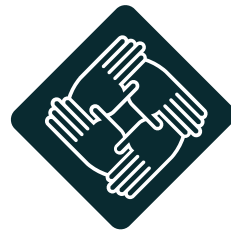
CONNECTIVITY

Design a connected network of low-stress pedestrian and bicycle facilities



EDUCATION

Inform residents and businesses about benefits and laws for people to walk and bike safely



EQUITY

Improve access to opportunities for all Sumter Metro area residents



HEALTH

Encourage walking and bicycling as an environmentally healthy activity and lifestyle



SAFETY

Provide safer and more accessible pedestrian and bicycle facilities

OBJECTIVES

CONNECTIVITY OBJECTIVES



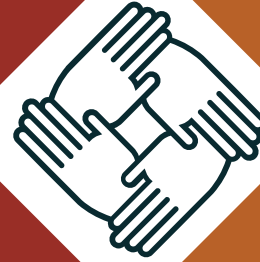
- Fill gaps in the sidewalk network
- Fund and build pedestrian and bicycle connected infrastructure and amenities
- Provide active transportation linkages to important destinations

EDUCATION OBJECTIVES



- Conduct city/county wide education campaigns for pedestrians, bicyclists, and motorists
- Create walking and biking safety demonstrations and activities for K-12 aged child
- Partner with local and state agencies to educate and promote safe walking and bicycling

EQUITY OBJECTIVES



- Provide pedestrian and bicycle infrastructure equitably throughout the Sumter Metro area
- Provide pedestrian and bicycle connectivity to communities that have been historically underserved
- Empower residents to be part of the process for safe walking and bicycling decision-making

HEALTH OBJECTIVES



- Encourage healthy lifestyles through greater walking and bicycling
- Reduce congestion by increasing walking and bicycling trips
- Promote walking and bicycling to neighborhood schools through campaigns

SAFETY OBJECTIVES



- Create safer sidewalk and bicycle networks for all users of all ages and abilities
- Reduce the number of pedestrian and bicycle crashes by providing safer pedestrian and bicycle facilities
- Add safer crossings across major arterials, bridges, and railroads linkages to important destinations



2

STATE OF SUMTER WALK + BIKE

- Existing Conditions
- Needs, Gaps, & Barriers
- Public Outreach
- Review of Existing Plans & Studies

EXISTING CONDITIONS

Study Area

The Sumter Area Transportation Study (SUATS) “study area” includes a 200 square mile portion of Sumter County, South Carolina. The study area ends north of Peach Orchard Road in the north; SC-261 to the west; Starks Ferry and Pearson Roads to the south; and US-15 North and Brewington Road to the east.

SUATS’ transportation network is shaped by the rural character of the surrounding area and urban growth in recent decades. Downtown Sumter has a street grid with state designated corridors such as US 521, US 378, and US 76. Most of these are high-speed roadways with 4-lanes and a center turn lane that serve as barriers between neighborhoods. The large concentration of destinations in and around Downtown Sumter offers opportunities for residents and visitors to reach these locations with relatively short trips that may not require a car. The lack of existing connections to areas outside of the City of Sumter means that rural/suburban residents lack multimodal access to those destinations.

Active transportation and transit go hand-in-hand and it is important that safe and comfortable last mile connections are made to improve transit viability.



Figure 1. Shot Pouch Greenway at N. Guignard Dr.

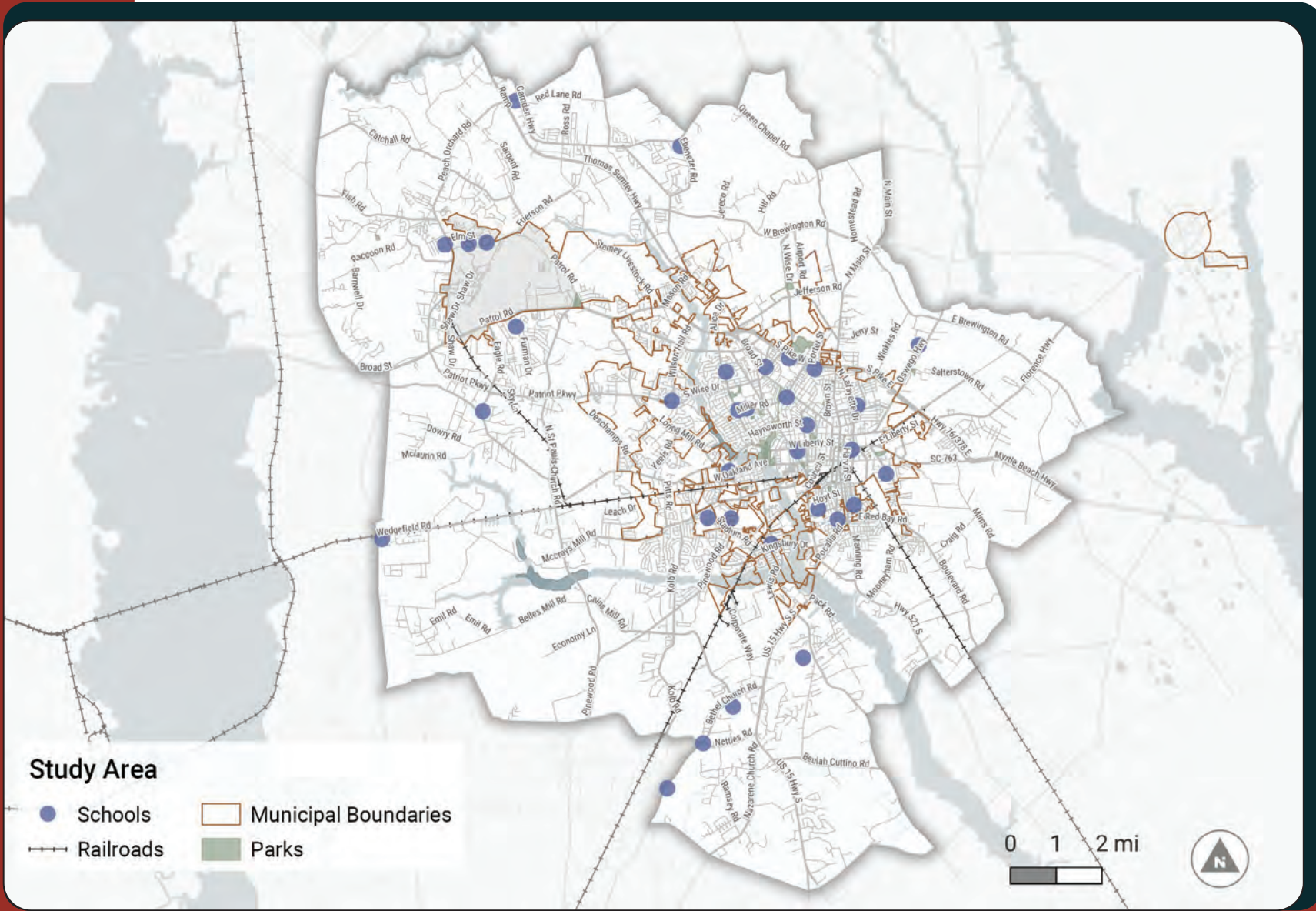


Figure 2. Sumter Bike + Walk Study Area Map

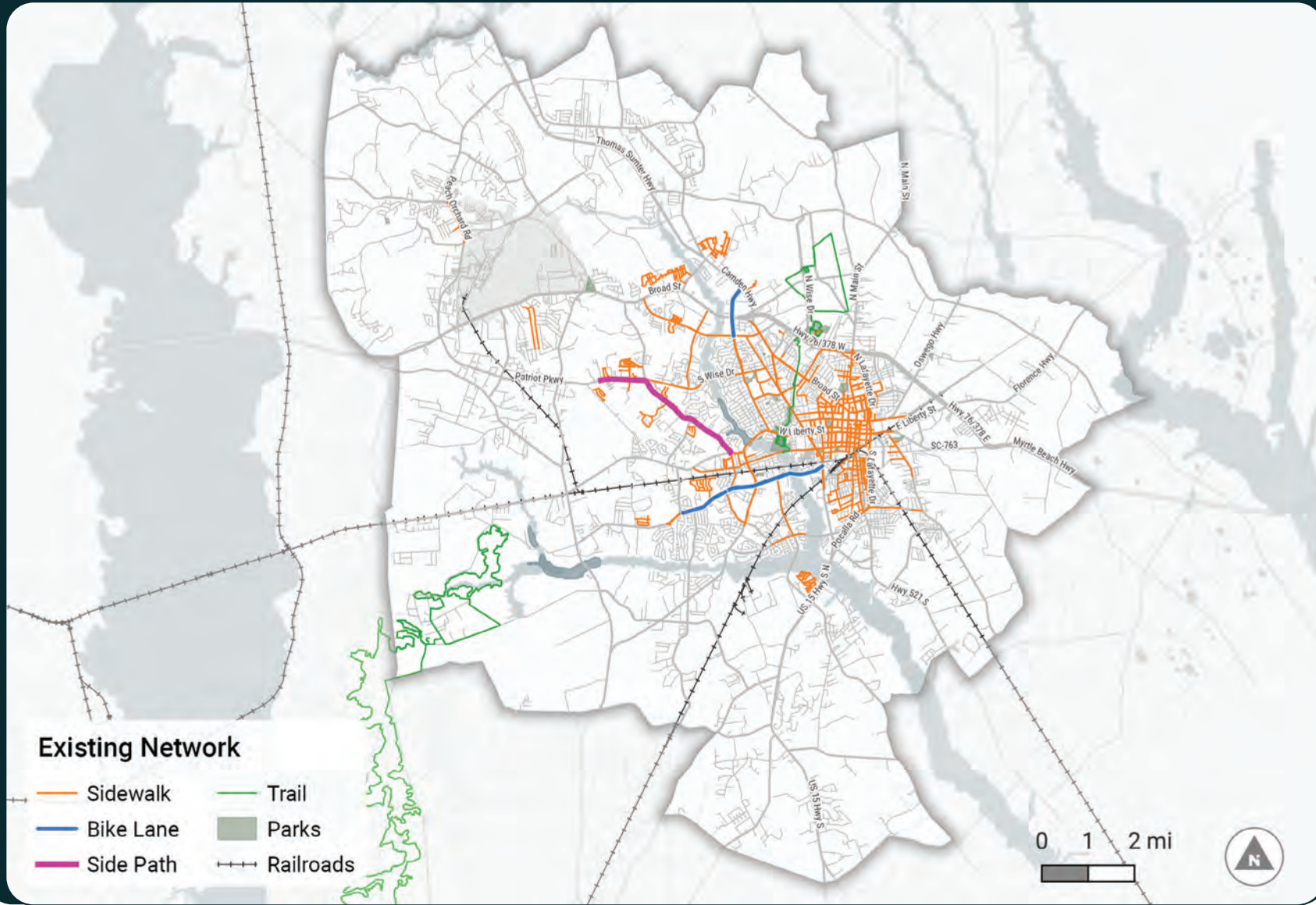


Figure 3. Existing Active Transportation Network Map

Existing Bicycle and Pedestrian Infrastructure

Currently, there are 157 miles of existing sidewalk, based on the last data collection in 2022, most of which is within the City of Sumter boundaries, specifically in the downtown area. Most streets that have sidewalk have it on both sides of the street, which affords pedestrians greater access and fewer potential conflicts with cars when reaching a destination that is on a specific side of the street. The lack of sidewalk outside of the downtown core limits pedestrian access across the study area and induces more motor vehicle trips even for trips to nearby destinations.

Connected bicycle networks have emerged as one of the most important ways to encourage, support, and expand bicycling for people of all ages and abilities. For people to choose to ride a bicycle, they must feel comfortable at each step of their trip. Currently there are four existing on-street bicycle facilities within the study area, bike lanes on McCrays Mill Road and Alice Drive and a side path on Loring Mill Road/Patriot Parkway.

Short block lengths (generally less than 200 feet), buffered wide sidewalks, and other dedicated areas for pedestrians to travel help users feel safe and comfortable. Greenways support those who



Figure 4. Downtown Sumter Existing Active Transportation Network Map

are already walking and encourage others to walk for trips, exercise, and recreation.

Several greenways and trails have been built, such as the Cypress Trail, Shot Pouch Greenway, and Swan Lake Trail, as well as a large portion of the Enduro Trail in the Manchester State Forest/Poinsett State Park.



Liberty St

SUMTER

Main St

ONLY

INTERNATIONAL CENTENNIAL PLAZA



NEEDS, GAPS, & BARRIERS



Overview

The Sumter Metro area multimodal transportation network was analyzed to identify gaps, barriers, and needs that should be addressed to make walking and bicycling more safe, convenient, and comfortable. The process began with a review of current and previous planning efforts in the City of Sumter, Sumter County, and the SUATS study area which are summarized in the Existing Plans & Studies Review section of Chapter 2. Building on that work, this document highlights the results from geospatial analysis and in-person site visits to identify gaps, barriers and needs for people walking and biking in the City of Sumter and Sumter County .

Walking & Biking in Sumter County Today

Table 1 and Figure 6 highlight key destinations in Sumter. These represent places for education, employment, and healthcare along with places for gathering, such as parks and recreational locations including Palmetto Park and Swan Lake Iris Gardens, which represent key trip generators for pedestrians and bicyclists. The large concentration of destinations in and around Downtown Sumter offers opportunities for residents and visitors to reach these locations with relatively short trips that may not require a car.



Figure 5. Swan Lake Iris Gardens Path

Table 1. Destinations

1	South Sumter Resource Center	11	Sumter County Library-Wesmark Branch	21	Sumter Municipal Airport
2	Sumter County Library-Main Branch	12	Sumter County Civic Center	22	Sumter Convention & Visitors Bureau
3	Sumter Little Theatre	13	Sumter County Museum	23	Dillon Park
4	Catchall-Shaw Community Center	14	North HOPE Center	24	Birnie HOPE Center
5	Sumter Military Museum	15	Patriot Hall	25	Memorial Park
6	Salterstown Community Center	16	University of South Carolina-Sumter	26	Veterans Park
7	Cherryvale Community Center	17	South HOPE Center	27	Sumter Mall
8	Sumter Opera House	18	Sumter County Library-South Sumter Branch	28	Black River Industrial Park
9	Ebenezer Community Center	19	Live Oak Industrial Park		
10	Sumter County Gallery of Art	20	DeLaine Community Center		

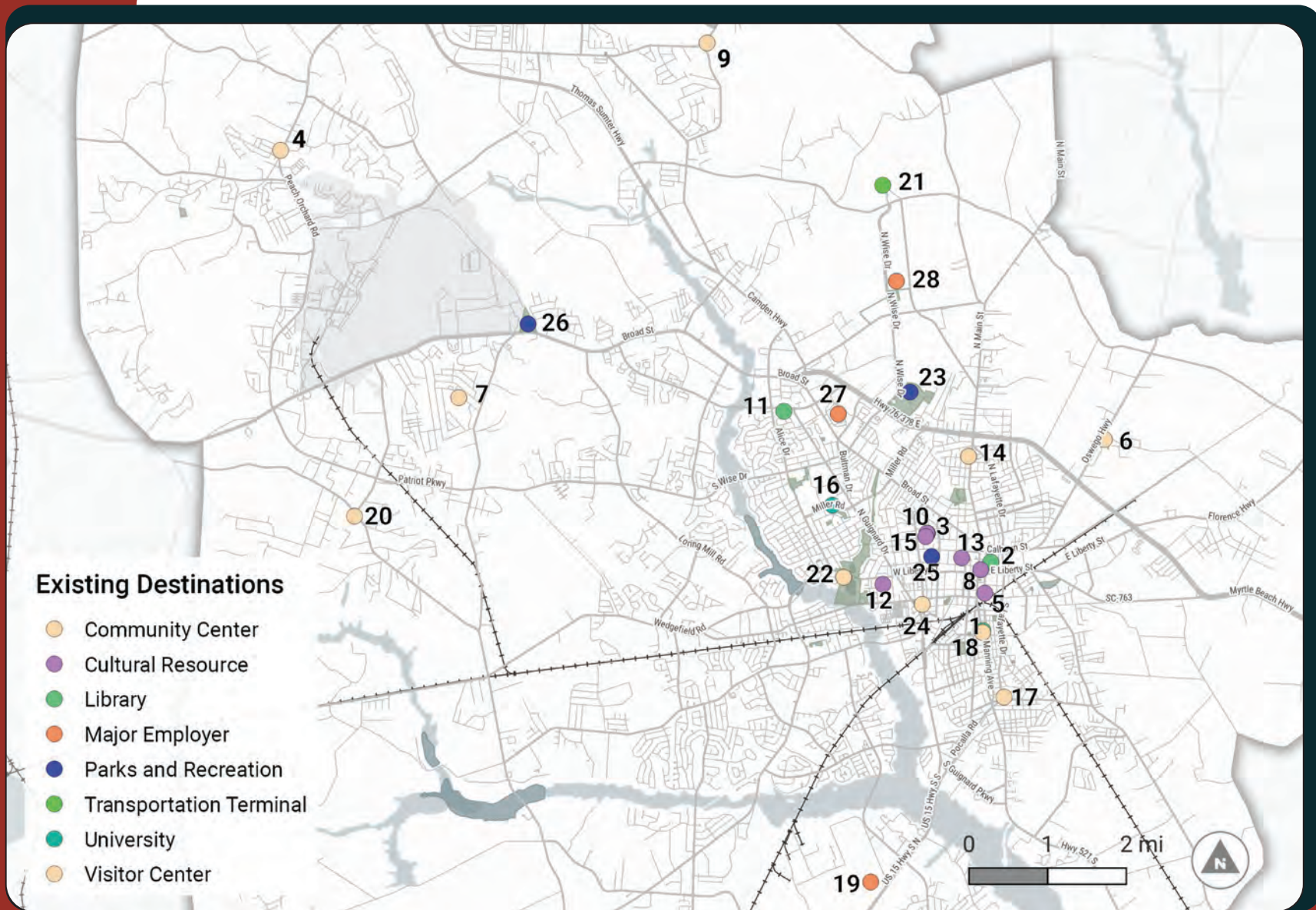


Figure 6. Existing Destinations Map

Bicycle & Pedestrian Infrastructure

A large proposed bicycle network made up of paved shoulders and signed routes is identified in the [SUATS Long Range Transportation Plan \(LRTP\)](#) adopted in 2018. While these facility types are not separated from motor vehicles, when completed, they can lay the groundwork for a comfortable connected bicycle network.

There are 59 miles of proposed or funded sidewalks as of 2019. The funded sidewalks are part of the 2014 Penny 4 Progress 1% Sales Tax Initiative and are nearly all constructed.



Figure 7. Shot Pouch Greenway Boardwalk

THE SHOT POUCH LOOP

A key recommendation from the SUATS LRTP was paving the Cypress Trail to connect to the Shot Pouch Greenway and create a continuous loop of paved shared use path. While dirt trails offer a unique natural experience, paved paths provide accessible routes for people of all ages and abilities.



Figure 8. Trail Paving

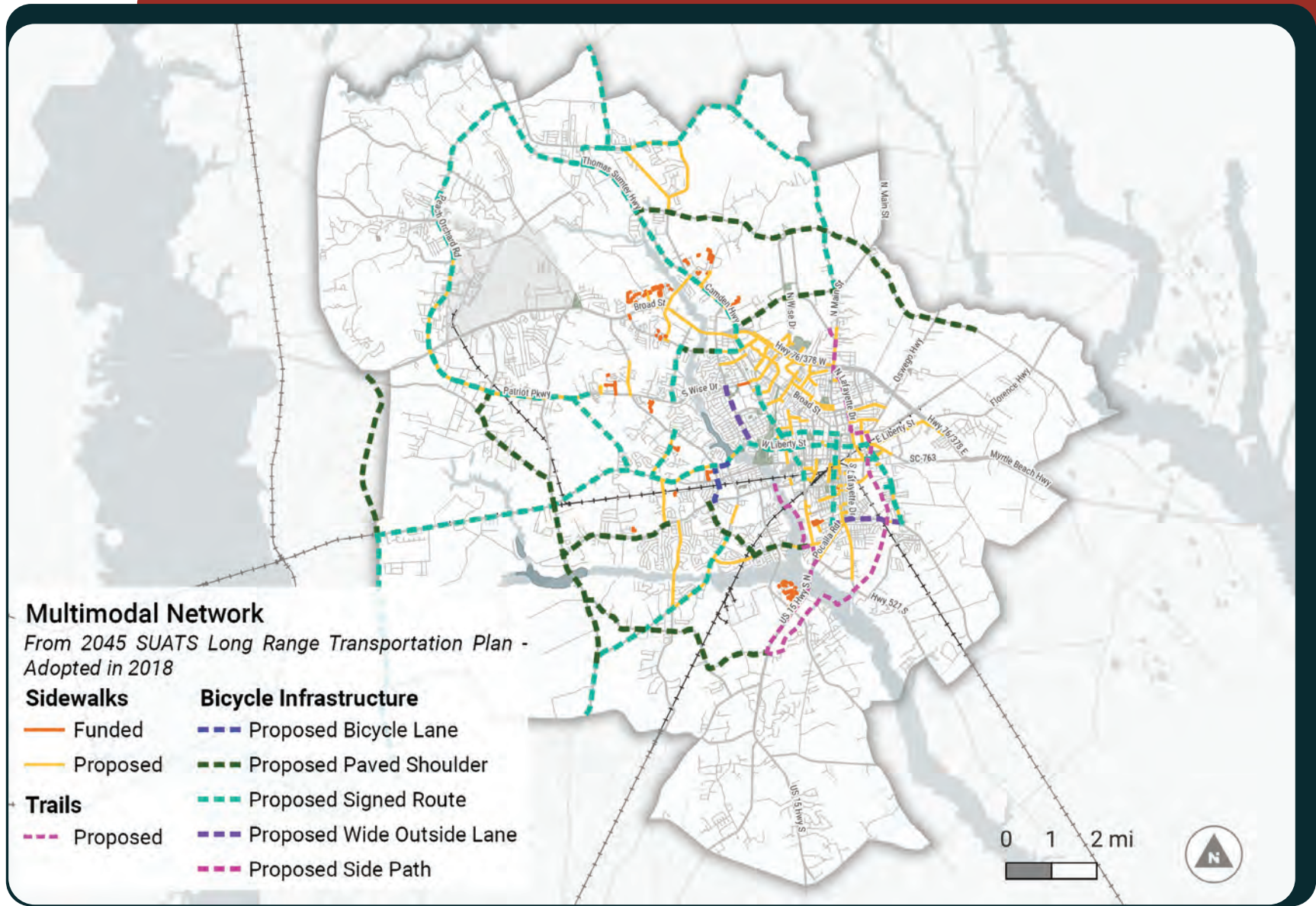


Figure 9. Active Transportation Infrastructure Map

Connections to Transit

The Santee Wateree Regional Transportation Authority (SWRTA) provides public bus service in Clarendon, Kershaw, Lee and Sumter counties. There are currently 4 active routes in Sumter: Sumter SmartRide and Mid-Day Express - Columbia, Route 40 - North Main, Route 70 - Shaw Shuttle, and Route 90 - Broad St. These four routes serve the study area with a focus on Shaw Air Force Base, Sumter Mall, Prisma Cancer Center, Prisma Health Tuomey Hospital, several Walmart locations, grocery stores, pharmacies, and retail areas. There is also a demand response reservation only route, Route 120 - Direct Express, which operates throughout the core of the City. Additionally, there is a commuter route that goes from Downtown Sumter to Downtown Columbia.

All the stops in downtown Sumter and along Broad Street and Westmark Boulevard are connected to the sidewalk network but as routes move further away from downtown, active transportation connections do not exist.



Figure 10. Santee Wateree RTA Bus in Sumter, SC
(Source: [Sumter County Website](#))

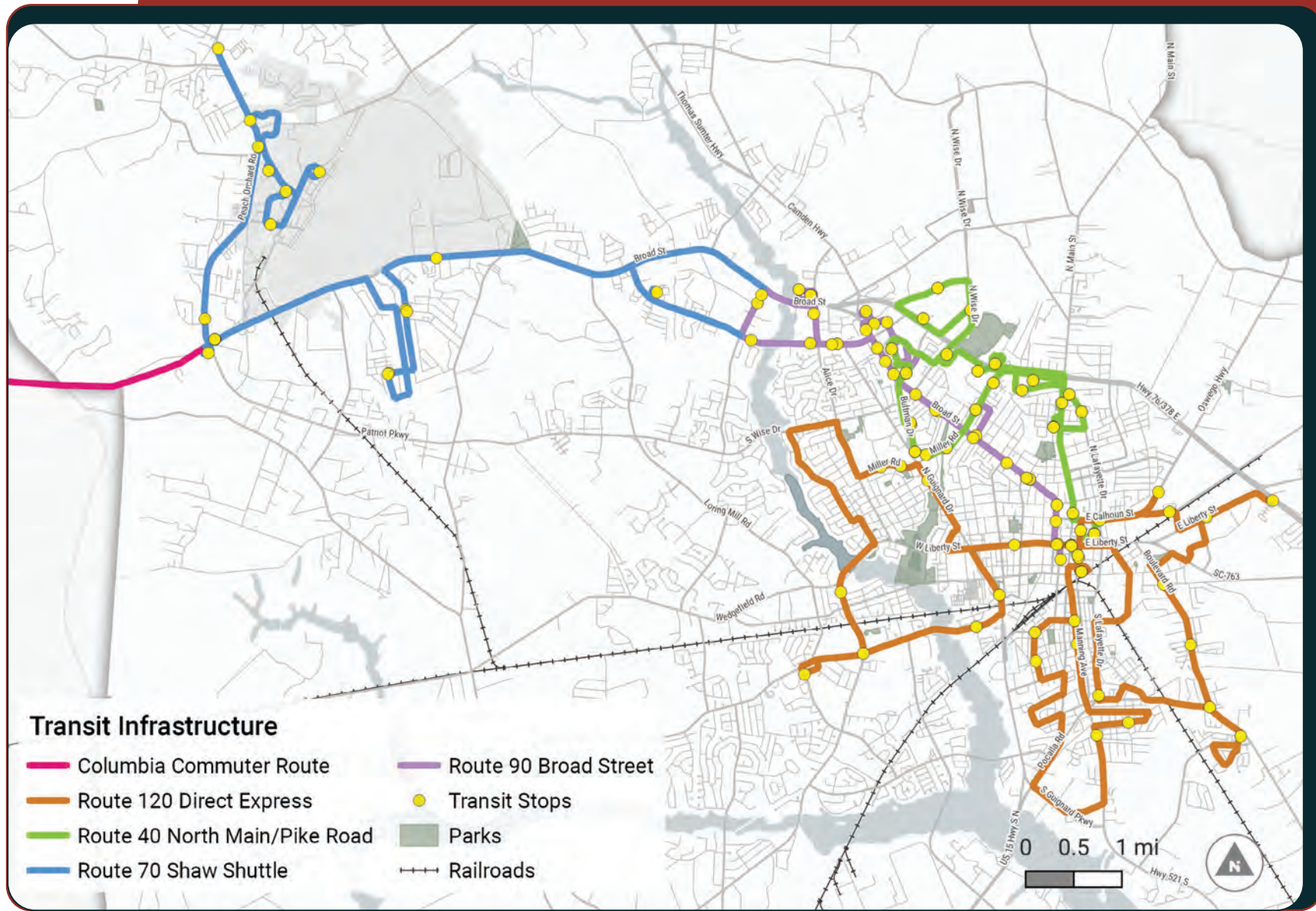


Figure 11. Transit Infrastructure Map

Equitable Access to the Bicycle & Pedestrian Network

Everyone deserves to move throughout their community with ease and dignity. Census block groups within the study area with a higher percentage of zero car households; lower median incomes; higher proportions of Black, Indigenous and people of color (BIPOC); higher proportions of households with people under 18; and higher proportions of households with people 65 and older were all given higher priority in the network selection process. Based on demographic data and existing and proposed bicycle and pedestrian facilities, equitable access to the network was assessed in terms of the following metrics.

Table 2. Equity Priority Criteria & Scoring

	Description
People who don't own cars or do not drive	A safe and accessible bike network can connect people without access to a vehicle with employment and education opportunities, as well as key community destinations.
People with lower incomes	The high cost of maintaining a personal vehicle places a disproportionate burden on households with low incomes. More affordable transportation options can foster self-sustainability, promote independence, and allow for spending on other household essentials.
Black Indigenous and People of Color (BIPOC)	Communities of color have historically experienced less investment and transportation resources than predominantly white communities. This means residents of these communities often have less options to get where they need to go. For the purpose of this analysis, people of color are defined as people who identify as non-white, one or more race, and/or Hispanic/Latine.
Children	A safe and accessible bicycle network provides children with alternative routes to school or other destinations in Sumter County. In addition, riding a bicycle benefits youth by providing opportunities for physical activity and to better connect with their surrounding community. ¹
Older adults	The presence of alternative, affordable transportation options reduce isolation and economic hardship and increase quality of life for older adults. ² Nationwide, older adults comprise the fastest growing group of bicyclists. ³

1. Santa Barbara Bike Coalition, (2017), "Research Shows Benefits of Biking," <http://www.sbbike.org/bikebenefitsresearch>
2. Transportation for America, (2011), Aging in Place, Stuck without Options: Fixing the Mobility Crisis Threatening the Baby Boom Generation, <https://t4america.org/docs/SeniorsMobilityCrisis.pdf>
3. AARP, (2015), "Bicycles Aren't Just for Kids," <https://www.aarp.org/livable-communities/getting-around/info-2015/bicycles-bike-riding-older-adults>.

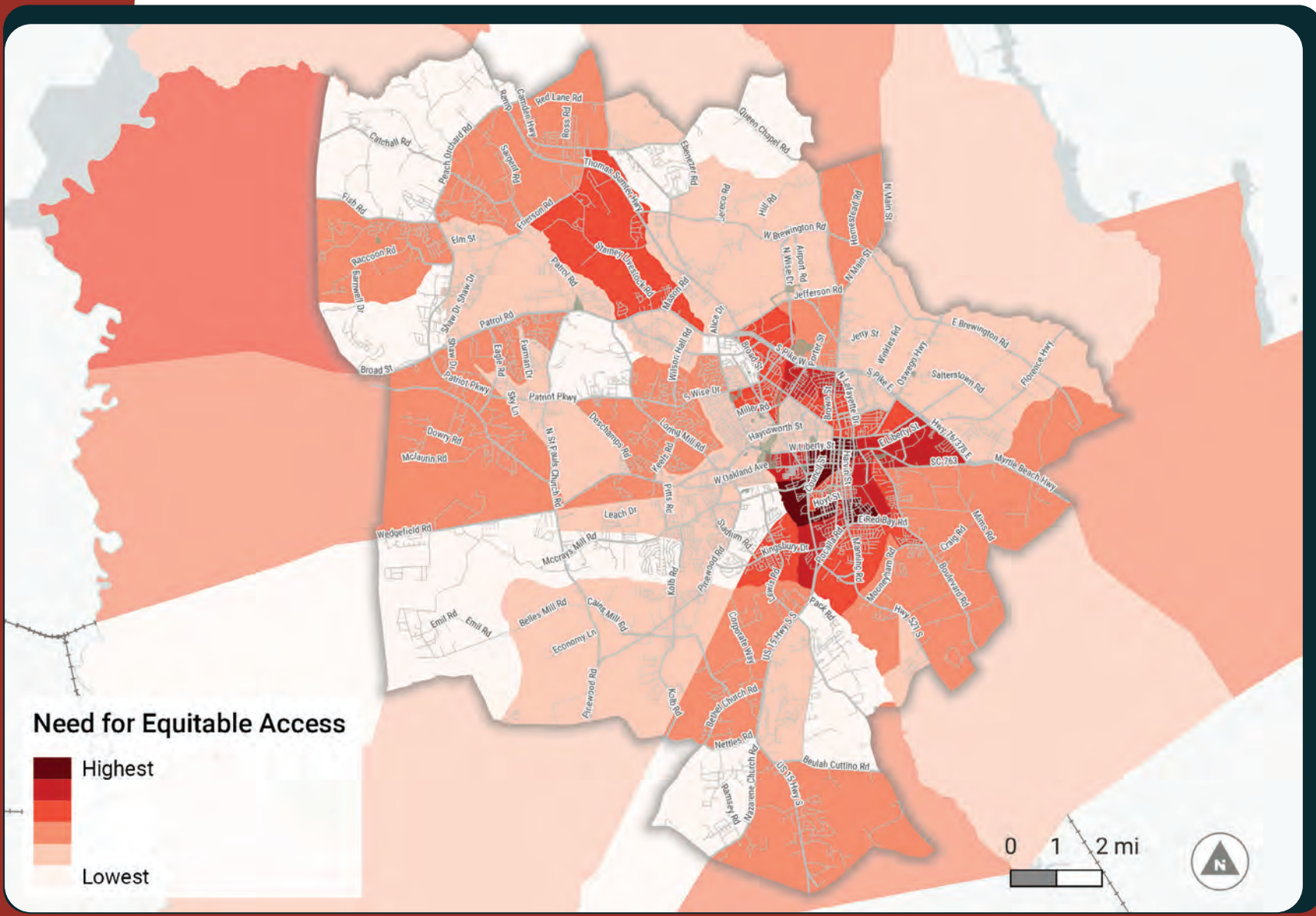


Figure 12. Equity Priority in Sumter Map

Crash Analysis

Bicycle and pedestrian crashes represent 13.8% of serious crashes but 1% of total crashes. Pedestrian, bicycle, and vehicle crash data was reviewed from 2016 to 2020. There were 11,191 crashes during that timeframe, 116 of which involved bicycles or pedestrians. These crashes make up a small portion of the overall crashes but make up a disproportionate amount of serious injury and fatal crashes, with 33 out of 238 crashes that resulted in a fatality or incapacitating injury involving bicycles or pedestrians.



Figure 13. Cars Navigating Downtown Sumter

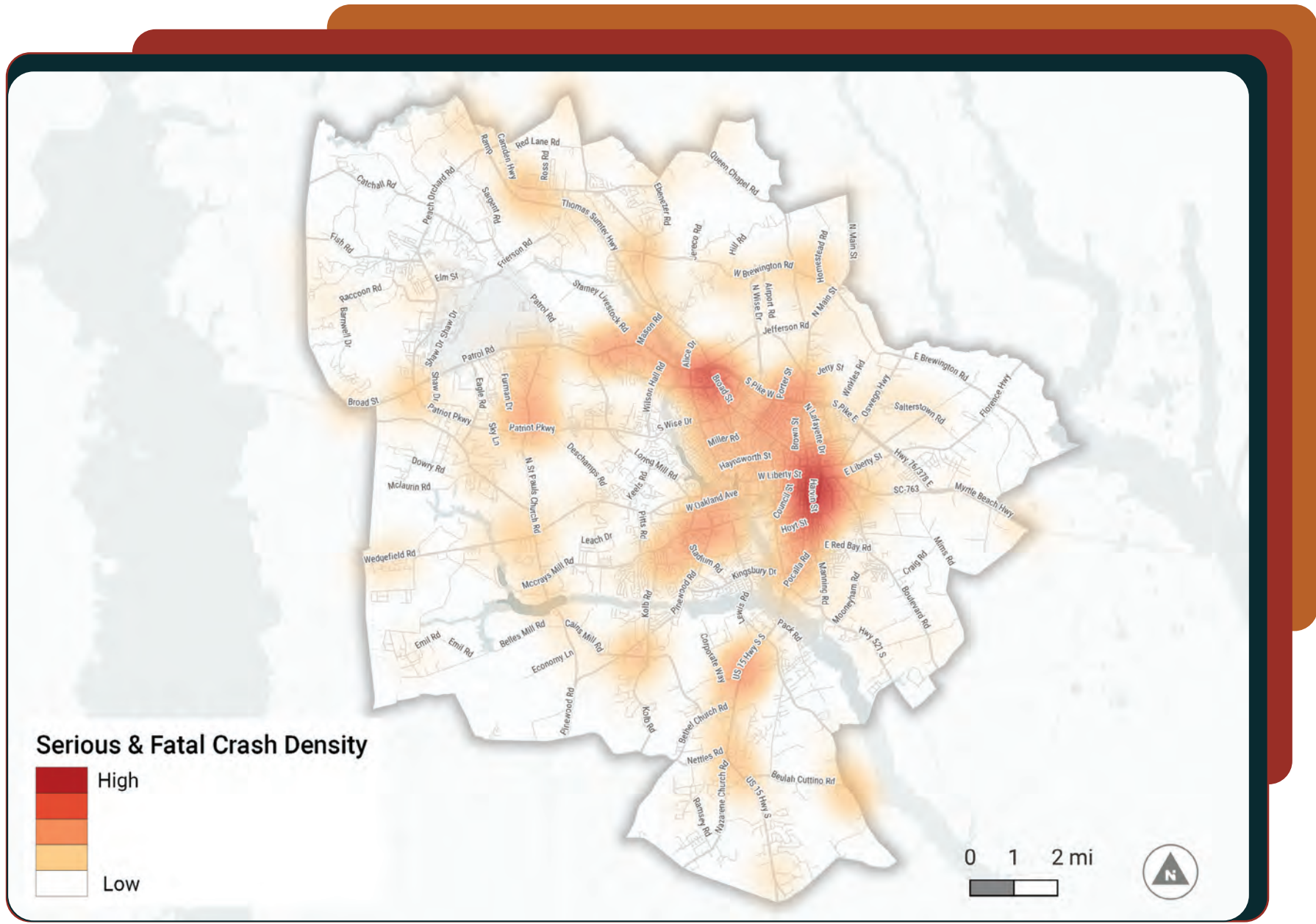


Figure 14. Bicycle and Pedestrian Involved Crashes Map

Barriers Related to Rail

Four railroad lines cross the study area and create divides between downtown, parks, neighborhoods, and employment centers. Three are owned by the CSX and one by the United States Air Force. Railroads present a major barrier to establishing a comfortable multimodal network as railroads pose unique challenges for bicyclists and people who use other wheeled devices.

While none of the existing bicycle facilities currently cross a railroad, an envisioned Turkey Creek Greenway alignment crosses the railroad twice and the proposed bicycle network laid out in the LRTP would include a significant number of rail crossings.



Figure 15. Rail Crossing at E. Red Bay Road near Brent Street

Barriers Related to High Speed Roads

The ability of pedestrians and bicyclists to travel between their origin and destination can be constrained by high-speed roads (over 35 mph) just as much as by rail lines. Crossing these roads or riding along them is a highly hazardous prospect as increased speed also increases the chance that a crash will result in a fatal or serious injury crash. The National Highway Traffic Safety Administration (NHTSA) states that a crash involving a vehicle going 30mph has a 50% likelihood of resulting in a serious or fatal injury for a pedestrian, with that likelihood increasing dramatically as the speed increases.⁴

Pedestrians and bicyclists are intuitively aware of this speed concern and are unlikely to walk or bike somewhere if they need to cross/use a high-speed road, so these roads serve as barriers to active transportation.

4. National Highway Traffic Safety Administration (2018) TRAFFIC SAFETY FACTS: Pedestrian and Bicyclist Data Analysis. Washington, DC: NHTSA Office of Behavioral Safety Research.

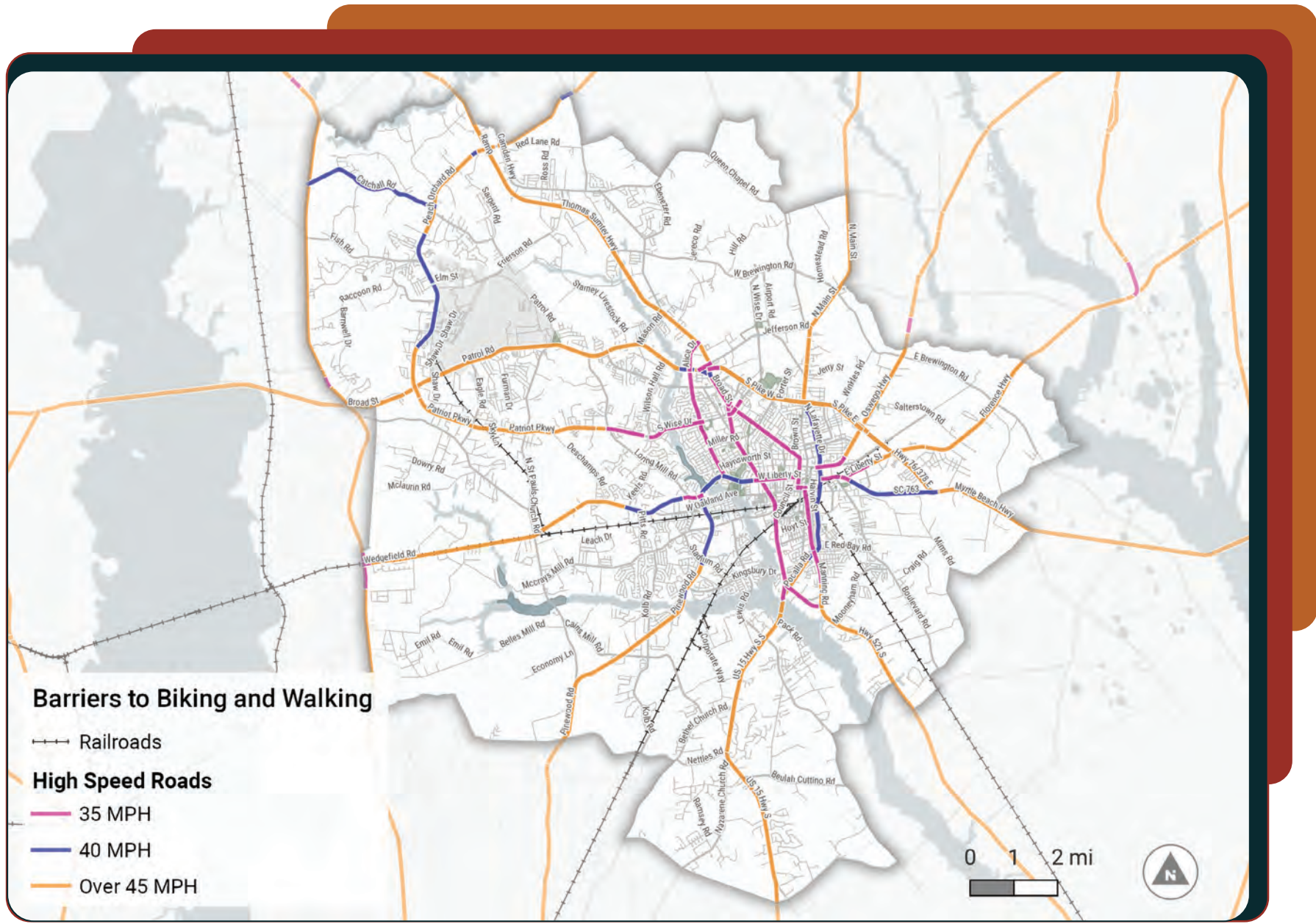


Figure 16. Potential Barriers to Active Transportation Map

PUBLIC OUTREACH

Community Driven Approach

Outreach activities were guided by the SUATS Public Participation Plan, which is committed to mobility improvements that are inclusive of all modes of transportation including bike and pedestrian.

The purpose of SUATS public involvement was to improve mobility and travel safety, promote and provide meaningful opportunities for the public to help shape the priorities, and engage communities for public support.

Many opportunities were available to the public to provide input and to stay informed throughout the process. Close to 1,900 public interactions were achieved between all the outreach activities during the 12-month study period. Strong support for future bike and pedestrian facilities was expressed throughout the study and informed the identification of future concepts.



Figure 17. Art in the Park Pop-up Event



602

Interactive Map
Visitors

299

Web Survey
Respondents

220

Pop Up Event
Visitors

97

Paper Survey
Respondents

250

Project Cards
Distributed

350

Fact Sheets
Distributed

9

Open House
Comment
Forms

30

Open House
Attendees

37

Project Video
Views

Project Participation Plan

The outreach strategies were crafted to inform the public of the planning process, educate on the purpose, need, and benefits of bicycle and pedestrian infrastructure, and gather feedback for the plan. A primary engagement effort was to gather input and data on connections and barriers to bicycling and walking as well as perceptions about current conditions and future needs. Engaging specific user groups, such as

those who currently walk or use existing systems, underserved populations and those who do not traditionally engage in planning processes were also targeted for their input.

To bring awareness to the plan, several activities were initiated early in the process. The mix of strategies ensured an opportunity to reach a broad range of the population to begin receiving feedback.



STEERING COMMITTEE

Established to guide the overall project development and included public and private sector, and residential stakeholders



PRESS RELEASE

Prepared to introduce the project's purpose and highlight outreach activities



FACT SHEET

Content with a project overview and distributed at public events and to public places such as libraries, parks, community centers, schools and places of worship



INFORMATIONAL VIDEO

Produced to describe the purpose of the project using visuals and inspire people to get involved with the process



SURVEY AND INTERACTIVE MAP

Created to better understand how the public currently uses bike and pedestrian facilities and to obtain ideas for future amenities



SOCIAL MEDIA

Posts provided opportunities to reach the community and included Facebook, Instagram, and Twitter

In Person Outreach

In person interaction was very important for this process which provided opportunities to discuss the plan process, learn about specific bike and pedestrian issues and identify preferences for bike and pedestrian facilities. SUATS staff and consultant team members participated in local events around the Sumter Metro area to conduct in-person outreach. During these events, the project fact sheet and project cards were distributed containing information on how to get involved. Participants also provided specific locational comments on a study area map identifying problem areas, spaces where bike and pedestrian facilities are desirable, and areas of traffic concerns related to speeding, debris and lighting. This feedback is contained in Appendix 1.

Participants at these events also participated in a dot exercise to label preferences for biking and walking facilities. The following tables illustrate the results.



Figure 18. Community Outreach Events in Sumter

Table 3. Community Preferences for Walking Projects

What Walking Projects Do You Prefer?					
	Iris Festival	Global Conference	Art in the Park	Festival on the Avenue	Total
Unbuffered Sidewalk	4	0	1	10	15
Shared Used Path along road	42	7	17	11	77
Sidewalk with narrow buffer	8	1	6	0	15
Sidewalk with wide buffer	38	6	25	19	88
Crosswalk	17	3	25	10	55

Table 4. Community Preferences for On-Road Cycling Projects

What On-Road Cycling Projects Do You Prefer?					
	Iris Festival	Global Conference	Art in the Park	Festival on the Avenue	Total
Shared Lane & Neighborhood	0	0	3	1	4
Bike Lane	7	6	10	7	30
Buffered Bike Lane	8	1	19	2	30
Sidewalk with Wide Buffer	28	11	29	32	100
Crosswalk	9	1	10	5	25

The dot exercise also included the opportunity to rank priorities of how projects could be considered. Table 5 highlights the results of that exercise.

Table 5. Community Project Priorities

Rank Your Top 5 Priorities					
	Iris Festival	Global Conference	Art in the Park	Festival on the Avenue	Total
Recreational Opportunities	1	5	7	3	16
Accessibility	9	3	7	2	21
Equity	17	0	5	10	32
Safety	10	4	13	8	35
Better Connections	2	1	6	0	9
Access to Parks and Greenspace	9	1	10	5	25
Short Trips via Walking	3	1	9	2	15
Amenities	4	1	8	0	13



Figure 19. Iris Festival Interactive Boards



Figure 20. Art in the Park Interactive Boards

Participation in other local events included a Friday Night Concert downtown that provided the opportunity to distribute the survey in hard copy form which resulted in 35 surveys completed.

Open House

A public open house was conducted to introduce the draft Master Plan recommendations and receive input. Attendees interacted with several displays including:

Base Maps/Existing Conditions

- Study Area Map
- Existing Walk and Bike Facilities Map

Public Input received

- Ped Survey Response Map
- Bike Survey Response Map
- Metro Quest Public Input Dot Map

Draft Network Recommendations

- Layers of Analysis Graphics and Maps board
- Draft Network Recommendations Map
- There were also tables with large scale Network Recommendation maps laid out

Bike Share Analysis

- Bike Share Analysis Board

In addition to providing verbal comments and questions to staff and consultant team members, attendees were provided written comment forms to provide feedback in writing. There was general support for the recommendations with concerns expressed about safety, maintenance, aesthetics and landscaping.



Figure 21. Conversations during Public Outreach



Online Survey

The web survey and interactive map were active from May 10th to September 5th and saw 602 visitors and 299 participants which resulted in 8,424 survey points. The feedback from these outreach platforms is contained in Appendix 1.

Themes

- Safety was the top priority in the online web survey with this factor getting 155 first place votes which is 127 more votes than the next highest factor. This resulted in this factor seeing an average ranking of 1.85 out of 5. Safety comes in many forms in the eyes of the respondents with some focusing on crosswalk signage and additional walking paths, while others focused on safety in the form of a higher police presence and better lighting. That same result was seen in the 97 paper surveys that were received with safety getting an average rating of 1.33.
- The second-place ranking was accessibility for both versions with an average rating of 2.95 for the online survey and 2.48 for the paper survey.
- The demographics makeup of the respondents to the online survey did not match that of Sumter for race or age which requires the results to be viewed with caveats. The respondents were whiter (67%) than the region (45%) while the Black population was correspondingly under-represented with 15% survey respondents compared to 45% of the community as a whole. When it came to age, the community is fairly equally spread out in age groups with most groups, such as 25-34 or 45-54, being around 10-14% of the population. The survey saw a bunching up of ages:
 - » 25 to 34 (21.5%)
 - » 35 to 44 (26.9%)
 - » 45 to 54 (24.6%)
 - » 55 to 64 (17.4%)
- Some bunching was expected as roughly 27% of the population (under 19 years of age) was unlikely to respond to the survey. The hope is that the parents of those children would respond to the survey with their needs in mind.



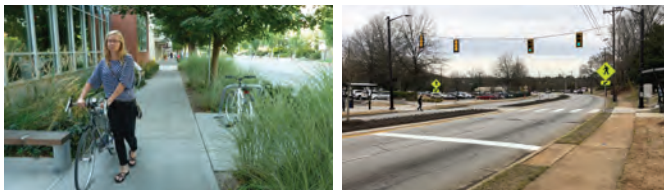
GREENWAYS & TRAILS RANKING:

- Greenways: 96% approval
- Rail Trail: 93% approval
- Unpaved Trail: 65% approval



PEDESTRIAN FACILITIES RANKING:

- Sidewalk with Wide Buffer: 91% approval
- Shared Use Path: 89% approval
- Sidewalk with narrow buffer: 63% approval
- Unbuffered Sidewalk: 36% approval



BICYCLE FACILITIES RANKING:

- Separated Bike Lane: 84% approval
- Buffered Bike Lane: 83% approval
- Standard Bike Lane: 79% approval
- Signed Bicycle Route: 44% approval
- Shared Lane/Neighborhood Bikeway: 32% approval



Walking and bicycling facilities (Source: Toole Design Group)

Facility Selection Priorities

1st

SAFETY



2nd

ACCESSIBLE FOR ALL USERS



3rd

ABILITY FOR SHORT TRIPS



REVIEW OF EXISTING PLANS & STUDIES

Existing plans and studies were thoroughly reviewed with a focus on identifying recommendations for infrastructure, programs, and policies that may influence walking and bicycling within the community. Local regulations related to the design and construction of streets, pedestrian and bicycle facilities, and new development were also reviewed and analyzed with an eye for identifying conflicts that may potentially impede future projects or impact the safety of people on foot or bicycle. A matrix was developed to display which plans contained references to pedestrian and or bicycle planning elements. See Table 6. The SUATS 2045 LRTP (2018) and the Sumter Connectivity & Greenways Master Plan for Shot Pouch Creek (2014) contained more than half of the 9 references listed in the matrix and are summarized in the following sections. Specifics on funding information for pedestrian and bicycle projects can also be found in the SUATS FY2021-2027 Transportation Improvement Program (TIP) report. Summaries for each of the plans and studies reviewed can be found in Appendix 2.

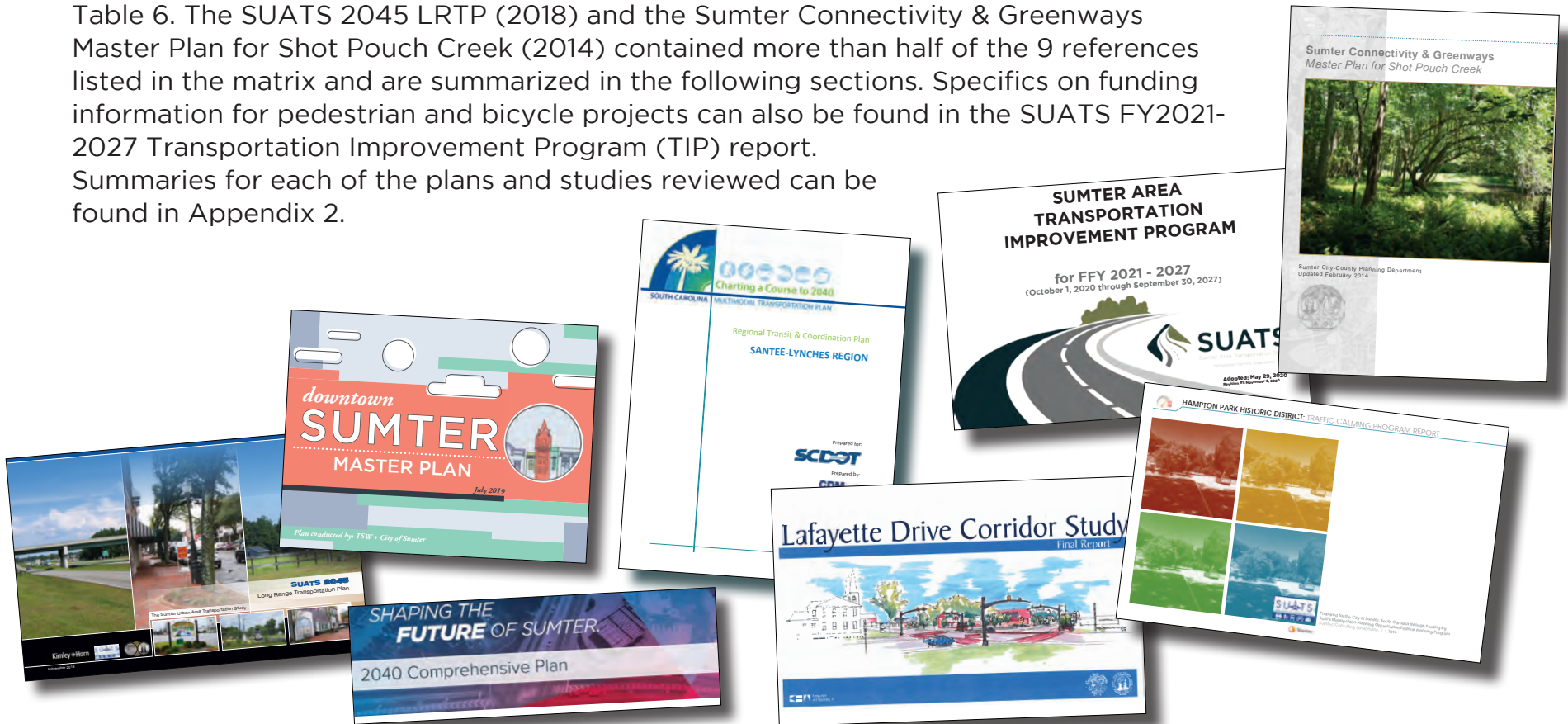


Table 6. Plan Reviews

	Annual budget for bike/ ped. infrastructure	Bicycle friendly policies	Bikeway to street coverage ratio	Direct bikeway connections along arterials	Filling sidewalk gaps	Priority corridors with bikeways and sidewalks	Reducing bicycle and pedestrian crash rate	Reducing vehicle speeds/ traffic calming	Short trip mode share
Turkey Creek Greenway Feasibility Study (2022)				✓	✓	✓	✓		
SUATS FY2021-2027 TIP	✓						✓	✓	
Sumter 2040 Comprehensive Plan (2019)					✓		✓		
Sumter Downtown Master Plan (2019)						✓	✓	✓	
SUATS 2045 LRTP (2018)	✓	✓	✓	✓	✓	✓	✓	✓	
Hampton Park Historic District: Traffic Calming Program Report (2016)						✓		✓	
Santee-Lynches Regional Transit Plan (2018)		✓				✓	✓		✓
Sumter Connectivity & Greenways Master Plan for Shot Pouch Creek (2014)				✓	✓	✓	✓	✓	
Lafayette Drive Corridor Study (2007)				✓	✓		✓	✓	

SUATS 2045 Long Range Transportation Plan (LRTP) (2018)

In order to enhance the transportation system in the City of Sumter and Sumter County, the SUATS LRTP looked to identify areas in need of improvement. The LRTP outlines proposed projects and policies as well as implementation strategies.

Recommended improvements to the roadways include paving and resurfacing, expanding the existing sidewalk network, road widening, intersection enhancements, greenway connections, and traffic calming measures (pages 5-1 – 5-2). The “Complete Street” concept, which considers the street’s setting, pedestrian area, intersections, and vehicular travel way (page 5-17 – 5-20), is suggested for new roads and roadway enhancement projects as it safely accommodates all roadway users. Of the listed roadway projects, all but three recommend some form of pedestrian/ bicycle improvements (pages 5-21 – 5-44).

Residents of Sumter have expressed a need for improved pedestrian and bicycle access and facilities throughout the transportation network. Specifics of the “Bicycle and Pedestrian Element” can be found in Chapter 6 of the LRTP. Through consideration of the existing state of sidewalks,

bicycle lanes, and trails, and the general needs of pedestrians and bicyclists, the 2045 LRTP recommends new sidewalks, bike lanes, and multi-use paths and improvements to those already existing in the SUATS study area (pages 6-11 – 6-16).

Additional proposed measures to increase user safety include traffic calming strategies, signage, designated bicycle parking, and general maintenance (pages 6-17 – 6-19). Education, encouragement, and enforcement programs and policies are recommended to promote cycling and familiarize citizens with the activity while instilling safety measures (pages 6-21 – 6-23).

Survey results reveal the most common form of commuting to work is by car while walking is the second most common and biking the third (page 7-3). Funding information for bicycle and pedestrian projects can be found on page 9-2.

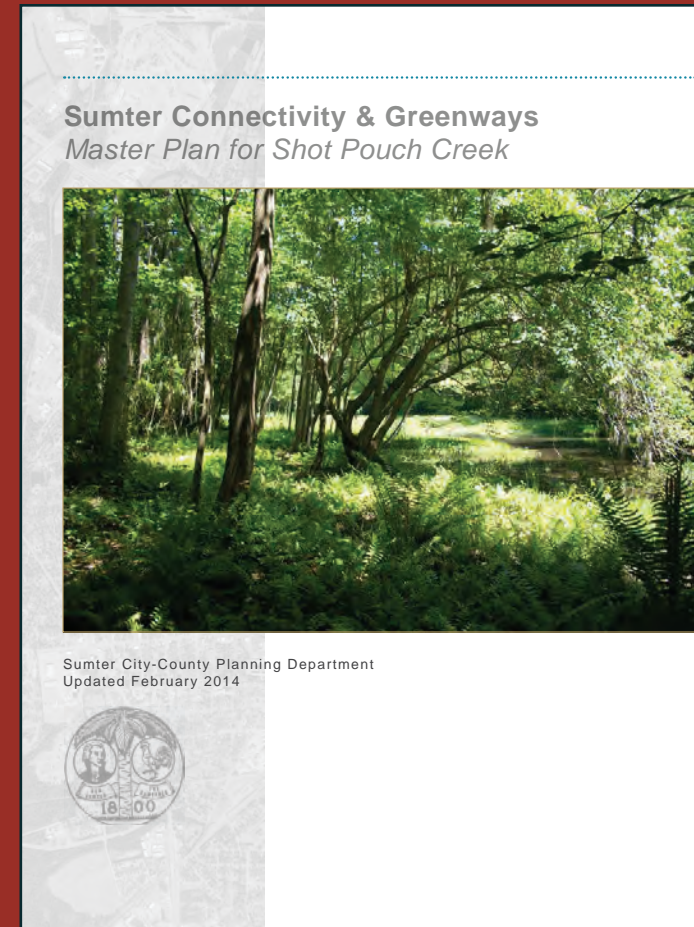
Chapter 10 “Implementation Plan” presents the LRTP implementation strategies with specifics on bicycle and pedestrian implementation on page 10-3.

Sumter Connectivity & Greenways Master Plan for Shot Pouch Creek (2014)

The Shot Pouch Creek Master Plan provides proposed greenway paths and improvement ideas for the existing greenway that ensure safe and more pedestrian and bicycle-friendly connections to Sumter neighborhoods, parks, and other areas of interest. This master plan proposes new pathways, crosswalks, medians, signage, fencing, security cameras, landscaping, and trail connections to improve user experience on the greenway.

Focus areas of the master plan to include these proposed amenities are Dillon Park to Broad Street (pages 17-27), the Broad Street Node (pages 28-29), Broad Street to Guignard Drive (pages 31-33), the Guignard Drive Node (pages 34-36), Guignard Drive to Swan Lake (page 37), Haynsworth Street (page 38), Liberty Street Node at Swan Lake (pages 43-44), Swan Lake to Birnie Hope Center (page 47), Oakland Avenue (page 48), and Second Mill Pond (pages 49-51).

Proposed along Liberty Street and Guignard Drive are corridor enhancements such as signalization, crosswalk markings, greenway connections (pages 67-68), and traffic calming measures (page 69).





3

FUTURE OF SUMTER WALK + BIKE

- Network Development
- Facility Selection
- Policies & Programs
- Education, Equity, Health, & Safety
- Bike Share Feasibility Analysis

NETWORK DEVELOPMENT

Approach

Bicycle and pedestrian facilities provide safe, comfortable spaces for people to walk, roll, and ride. Each facility is only as valuable as the connection it makes to a destination or another facility. Without a connected network, new projects will miss the opportunity to create real transportation options for people walking and biking.

To make the most of future investments, this plan recommends a connected, continuous network of walking and biking facilities which together will be more powerful than the sum of its parts. **The Walk + Bike Network represents streets and trails where investment in safe, comfortable facilities for walking and biking will have the greatest impact.** The plan builds on existing infrastructure and previously planned projects and adds new connections to destinations across the growing Sumter region. It is important to note that the Walk + Bike Network intentionally does not include every street. When implemented together though, these streets and trails have the potential to make a transformative impact on how people move for recreation, commuting, and everyday trips.

Layers of Analysis

The Walk + Bike Network was developed using five overlapping layers of analyses:

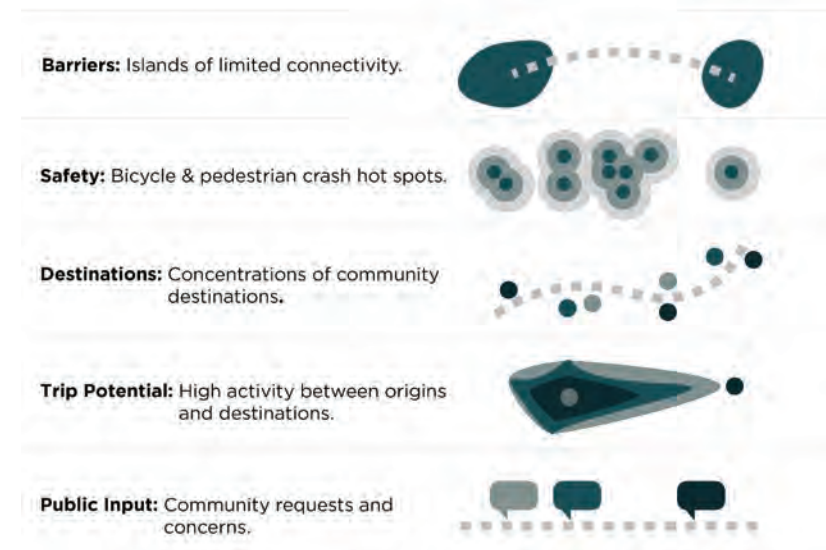


Figure 22. Layers of Analysis

Network recommendations also incorporate findings from Chapter 2 including equity priority areas and connections to existing and previously planned infrastructure. This data-driven approach ensures that the network will most effectively serve the people in Sumter, and especially those who will most benefit from it.

Barriers

The Barriers Analysis highlights islands of limited connectivity within Sumter. The barriers are identified by “breaking up” the Sumter Metro area everywhere there is an existing potential connection. These included existing trails and local, service, and collector streets. Areas with lots of road connections were broken into many small pieces. The larger areas left over (shown in Figure 23) indicate islands where future network connections are most needed.

Safety

Crash hot spots identify areas where people have been struck by a vehicle while walking or biking. Because of the dispersed population in this area though, historical crash data shown in Figure 24 only tells one part of the roadway safety story. Crash data does not capture near misses or places where there may be limited bicycle and pedestrian activity because people already perceive the area as unsafe.

Destinations

At its core, a good network connects people to places. The destinations map in Figure 25 highlights key community points of interest by including:

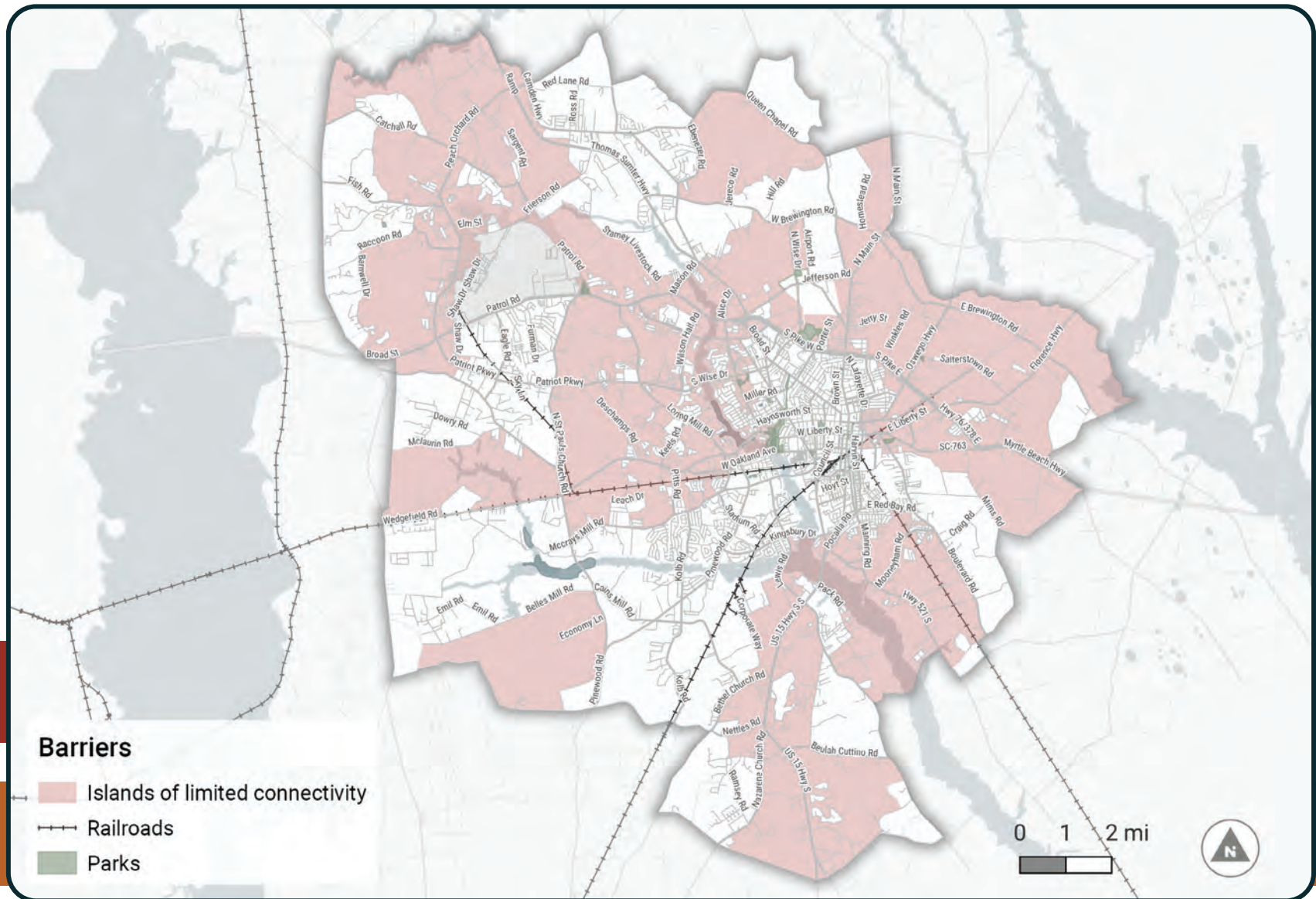
- Commercial areas,
- Healthcare facilities,
- Multi-family housing developments,
- Mobile home parks,
- Parks, and
- Schools.

Trip Potential

The Trip Potential Analysis measures factors that are likely to lead to higher levels of walking and bicycling activity between two areas. It begins by identifying origin and destination points, including schools, parks, retail, employment centers and census blocks for population. Next, straight lines are drawn between all possible origin and destination pairs. Figure 26 shows a heat map of these lines with darker areas representing higher bicycle trip potential.

Public Input

The public voice was a key layer in shaping the Walk + Bike Network. Figure 27 shows the over 600 MetroQuest responses where residents identified places they feel unsafe and where they would like to see bicycle or pedestrian improvements in the future. Paper surveys from in-person engagement events were also used to identify important community connections.



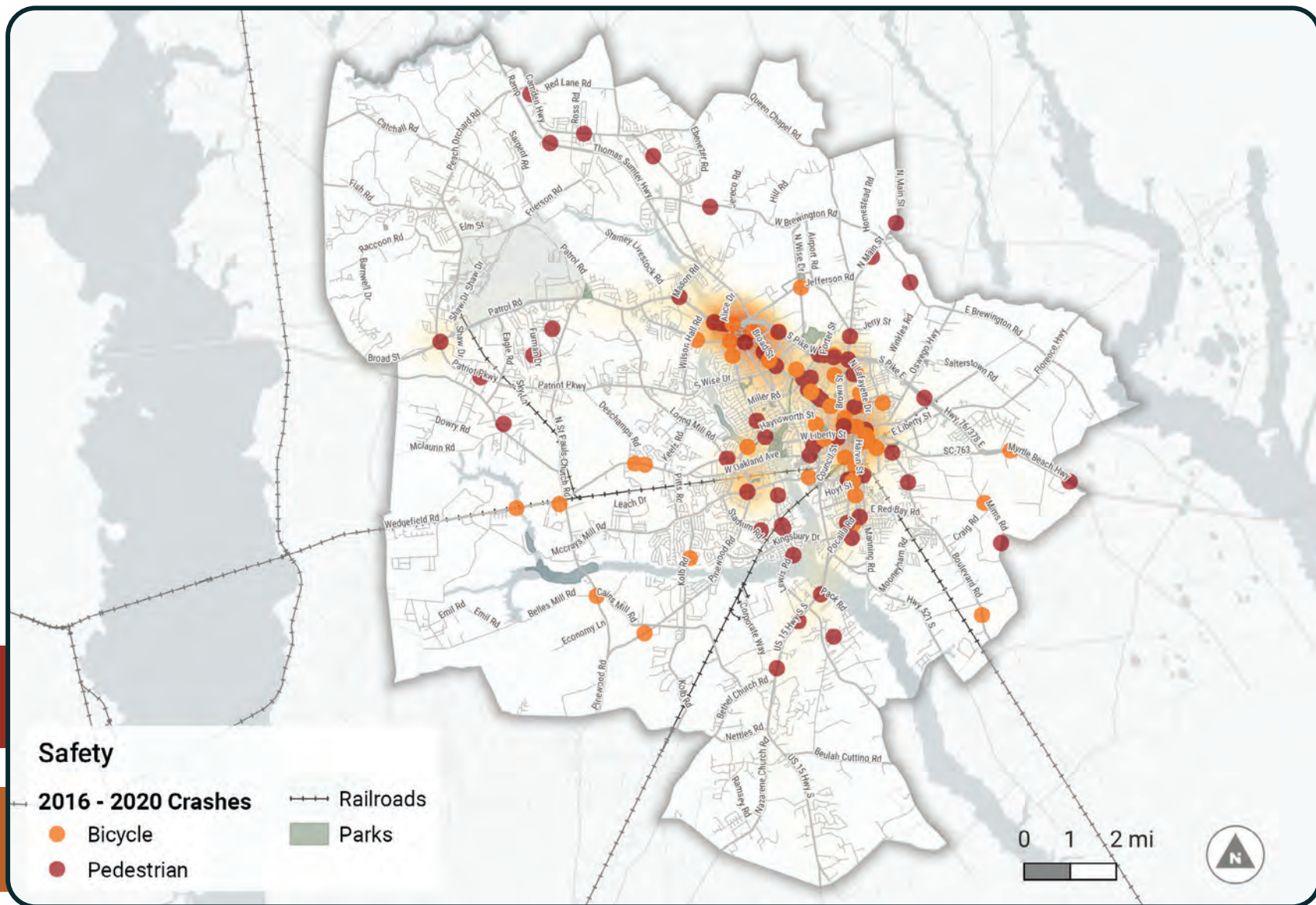


Figure 24. Safety Map

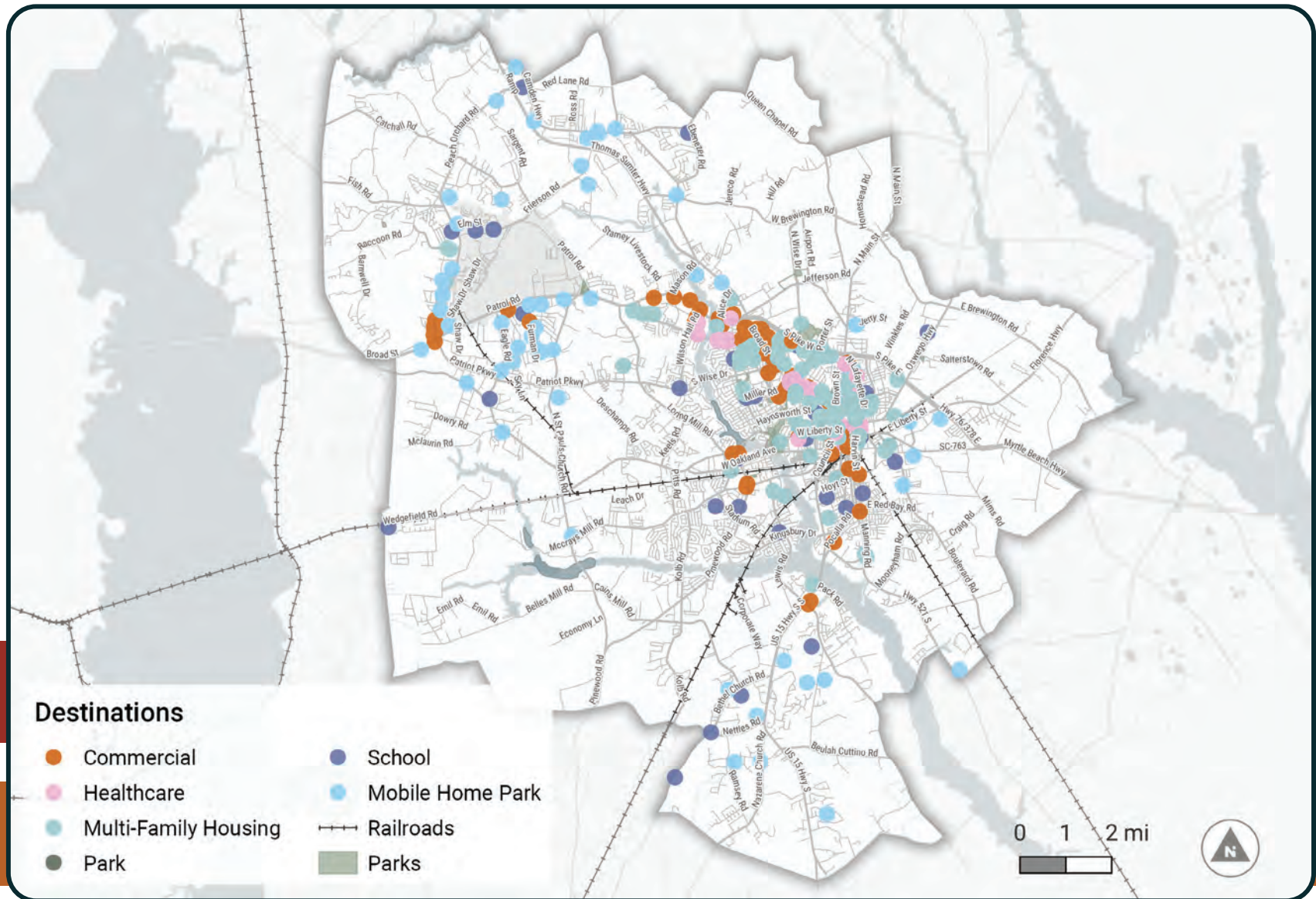


Figure 25. Destinations Map

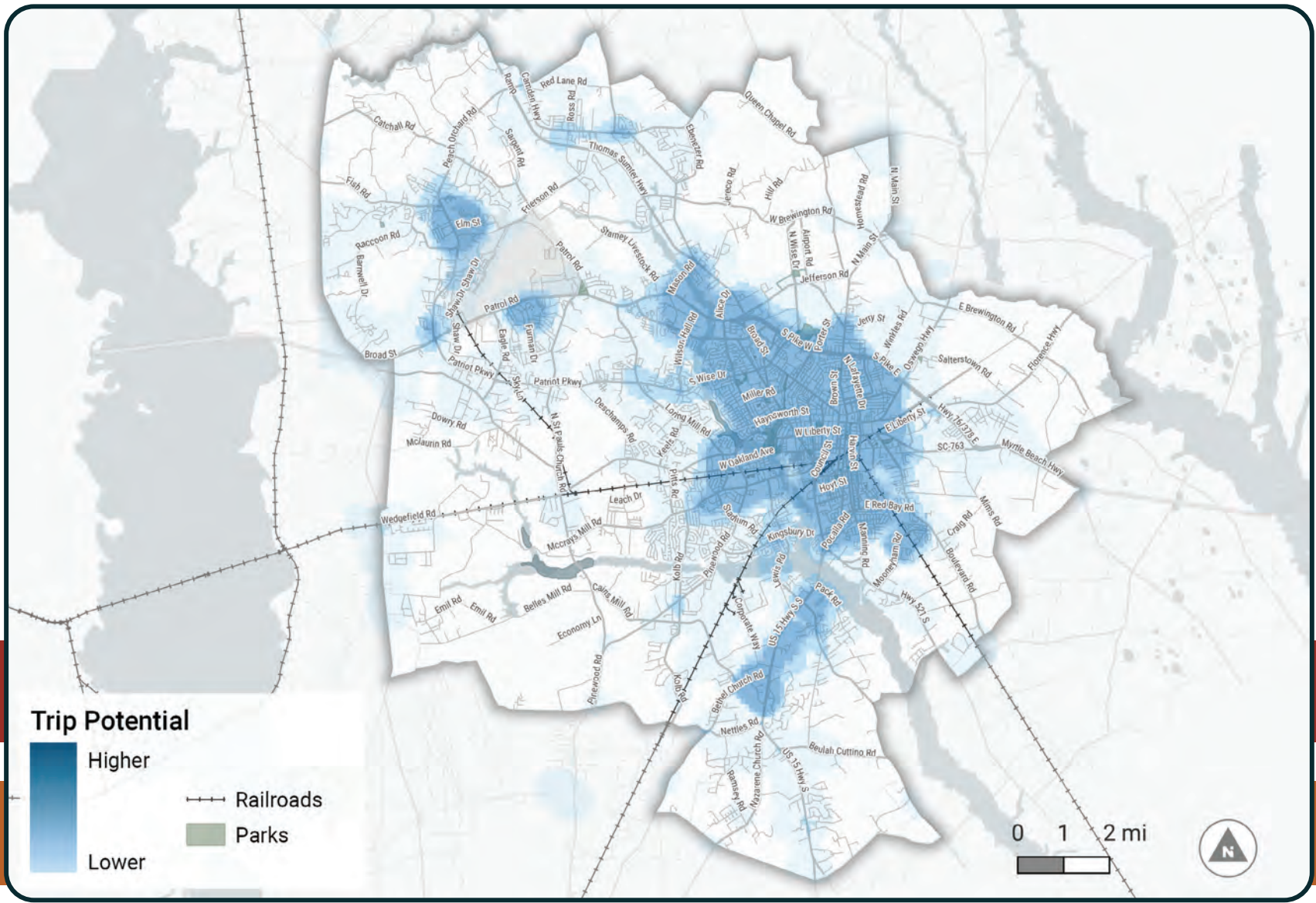


Figure 26. Trip Potential Map

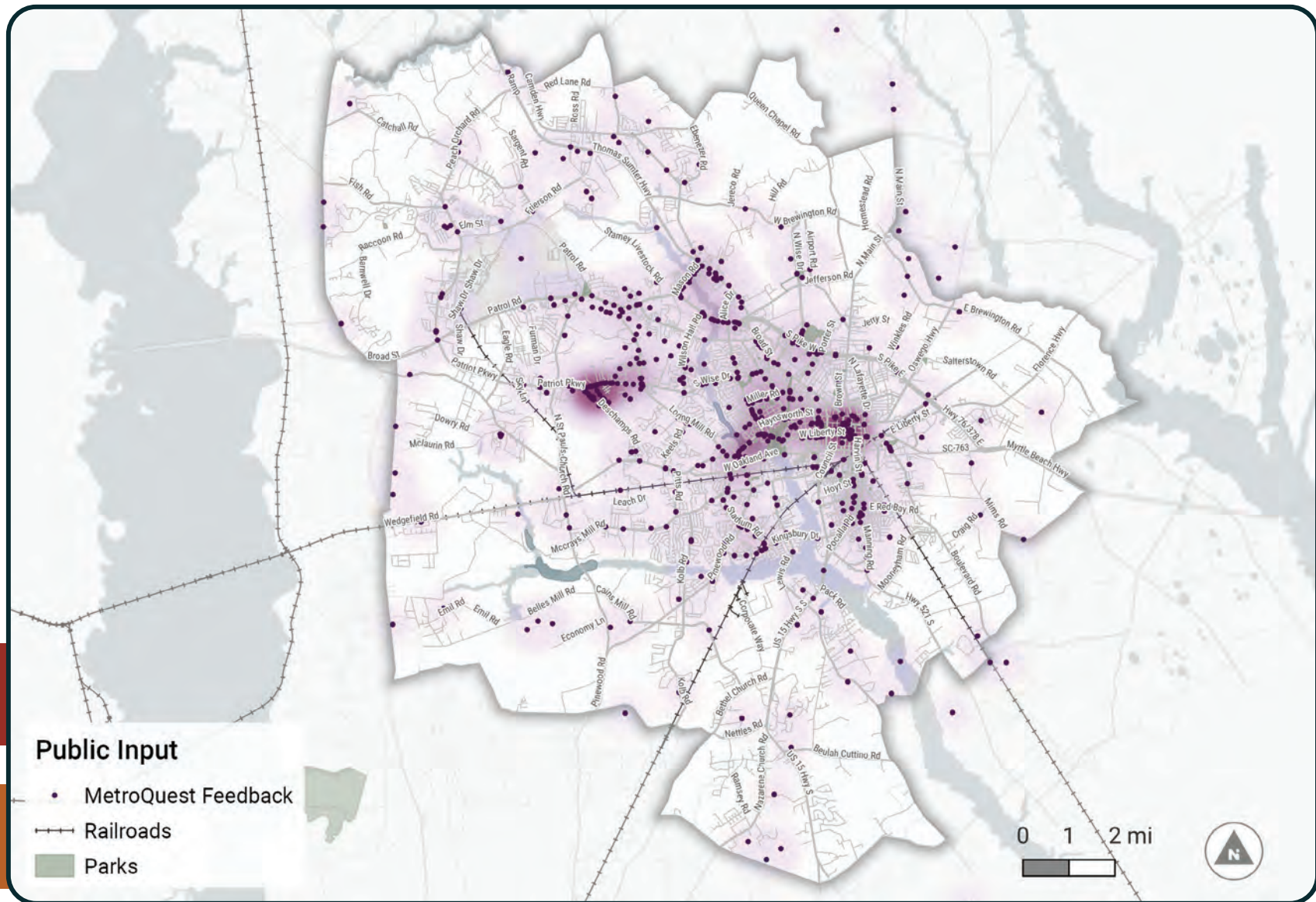


Figure 27. Public Input Map

Network Recommendations

Figure 28 shows the proposed Walk + Bike Network. The lines on the map represent streets and trails where investment in safe, comfortable facilities for walking and biking will have the greatest positive impact. This map does not specifically identify any one type of pedestrian or bicycle facility to be implemented. Instead, the network is categorized more generally into:

- Off-street trails: These lines represent existing and proposed greenways and shared use paths that provide shared space for walking and biking. Off-street trails typically follow natural corridors and easements along waterways, old rail lines, or utility rights-of-ways.
- On-street connections: These lines represent roadway corridors that should provide safe, comfortable infrastructure for people walking and biking. The specific pedestrian and bicycle facilities for each corridor will vary based on the roadway functional class and surrounding land use context. Selecting the correct facility based on land use and functional class is discussed in detail in the next section.

OFF-STREET TRAILS



ON-STREET CONNECTIONS

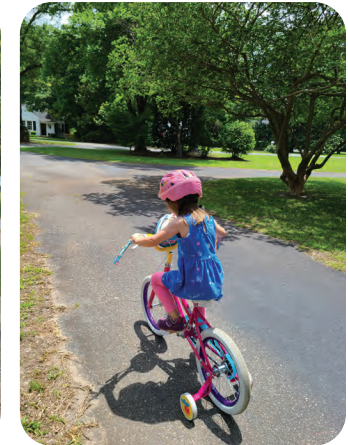


Table 7. Walk + Bike Network Corridors

1	Peach Orchard Rd	23	Lynam Rd	45	Jefferson Rd
2	Peach Orchard Rd	24	Pitts Rd	46	Airport Rd
3	Broad St	25	N St Pauls Church Rd	47	Camden Hwy
4	Broad St	26	26 Wedgefield Rd	48	Camden Hwy
5	Broad St	27	Deschamps Rd	49	Charles Jackson St & Pecan Acres Rd
6	Broad St & Warren St	28	Keels Rd	50	Stamey Livestock Rd
7	Manning Ave & N-S Main St	29	Loring Mill Rd	51	Four Bridges Rd
8	Pocalla Rd & E Red Bay Rd	30	Cane Savannah Rd	52	Stamey Livestock Rd
9	N-S Lafayette Dr	31	Eagle Rd	53	Mason Rd
10	E-W Liberty St	32	Patriot Pkwy	54	Beckwood Rd
11	US 15 Hwy S S	33	N St Pauls Church Rd	55	Camden Hwy
12	Bethel Church Rd	34	Loring Mill Rd	56	S Wise Dr & Patriot Pkwy
13	Boulevard Rd	35	Mccrays Mill Rd	57	S Wise Dr
14	Mooneyham Rd	36	Pinewood Rd & W Liberty St	58	N Wise Dr
15	N Main St	37	Calhoun Dr & W Calhoun St	59	Wise Dr
16	E Charlotte Ave	38	Alice Dr	60	N Guignard Dr
17	Lewis Rd	39	Alice Dr	61	S Guignard Dr
18	Kingsbury Dr	40	N Bultman Dr	62	Off-Street Trail
19	Pinewood Rd	41	Gion St	63	Off-Street Trail
20	Stadium Rd	42	Carter Rd	64	Off-Street Trail
21	Mccrays Mill Rd	43	W Wesmark Blvd	65	Off-Street Trail
22	Mccrays Mill Rd	44	Wilson Hall Rd		

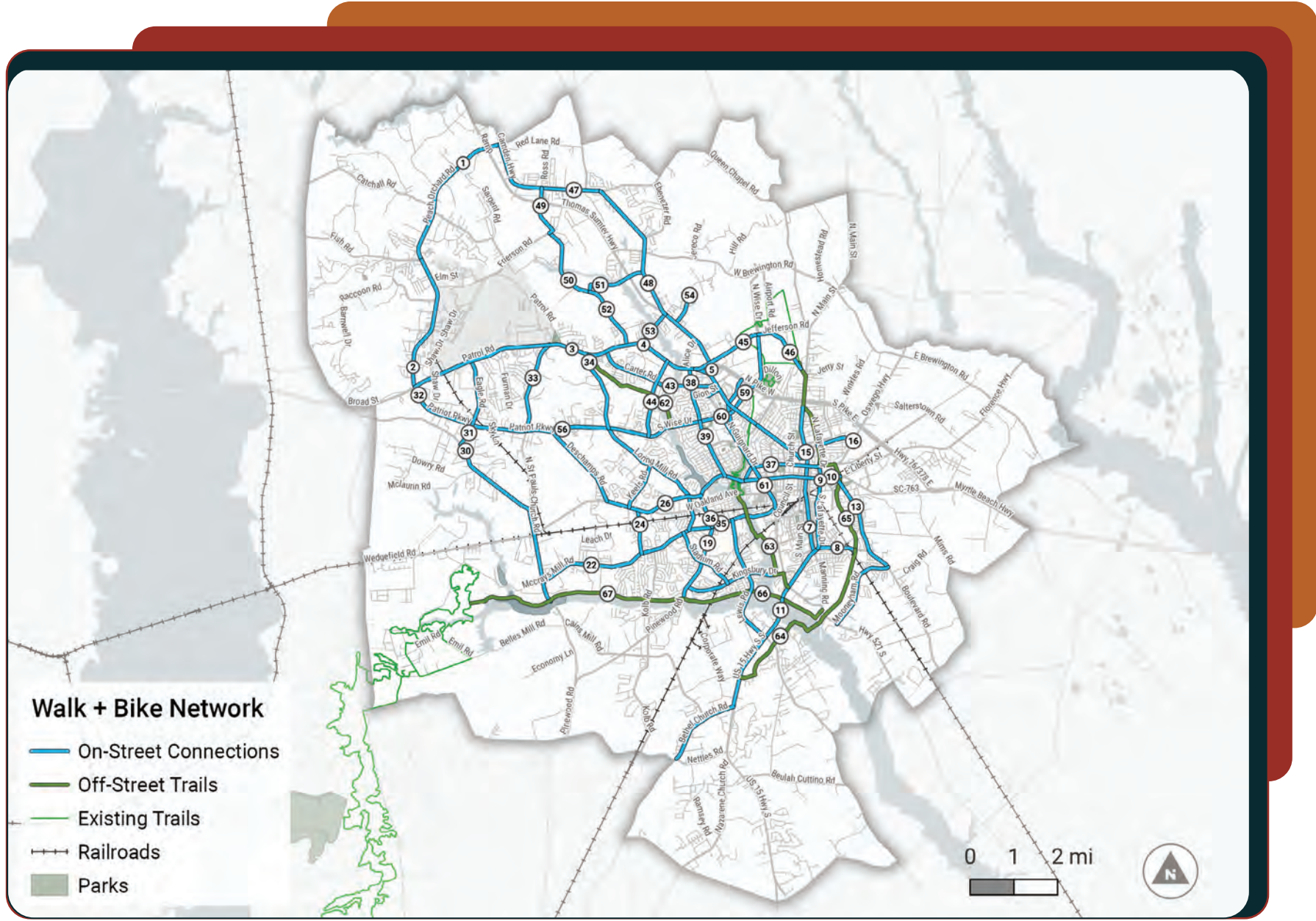


Figure 28. Walk + Bike Network Map



FACILITY SELECTION



As SUATS, the City of Sumter, and Sumter County begin implementing the recommendations of this Plan, they will need to select appropriate facilities for each project. Facility selection depends on a number of factors including existing right-of-way, lane widths, budgetary constraints etc. all of which will vary over time as the community continues to grow.

Rather than prescribe a specific facility to each corridor in the Network, this Plan provides strategies for design decisions through a facility selection menu that is based on street typology, land use context, and generalized design guidelines for common facility types. This approach allows for flexibility while ensuring consistent, appropriate designs across the region.

This section provides guidance for local staff to select the appropriate facilities, using the following tools:

- **Street Typologies:** Classifying roadways based on their features and traffic
- **Land Use Context:** Characterizing land use and development patterns

Street Typologies

Street typologies are based on the functional classes SUATS has defined for their roadways:

- **Highways** move the largest numbers of vehicles and have limited access
- **Arterials** include major and minor arterials that move large volumes of vehicles for longer distance travel across the SUATS region.
- **Collectors** have lower speeds and volumes with more frequent access to adjacent land uses. They serve shorter distance travel between local streets and arterials
- **Local Streets** are the most abundant roadway type and provide the greatest access to adjacent land uses

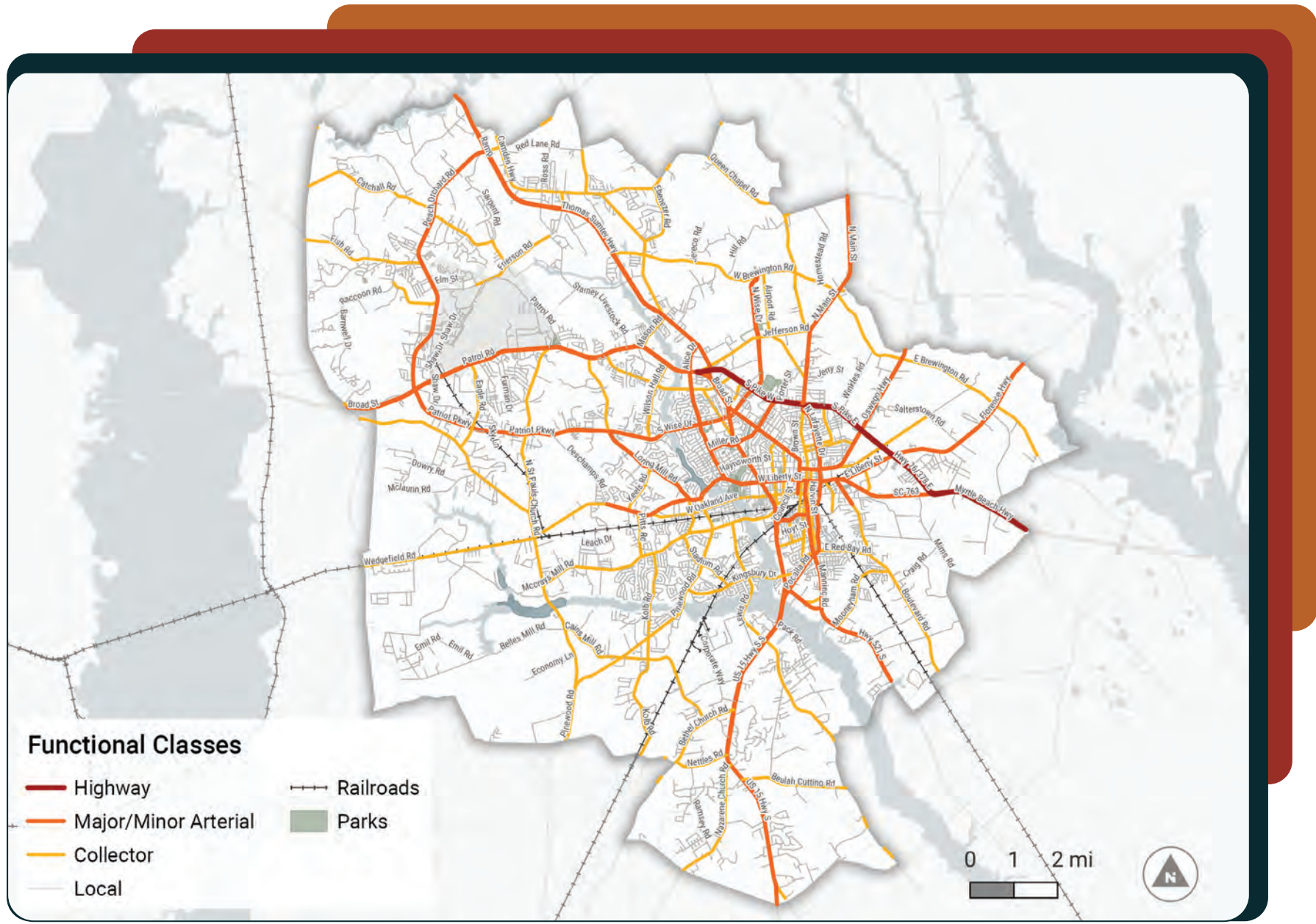


Figure 29. Functional Classes Map

Land Use Contexts

This section describes the landscape, building form and placement, and roadway network design of our built environment. It is intended to provide for more flexible and diverse facility options by allowing surrounding land use types and densities to inform street design. The boundaries for the following five context categories were developed by local staff, however there is rarely a hard “line” where one context ends, and another begins.

- **Downtown Core:** This area includes the blocks immediately within Downtown Sumter and the Central Business District. The area is characterized by short, gridded blocks and higher density commercial, civic, and medical land use.
- **Urban:** This covers the Downtown Planning Area which represents the historic core of the Sumter Metro area. It is characterized by moderate density and a mix of commercial, industrial, civic, and residential land uses.
- **Suburban:** These areas surround the historic downtown and are characterized by separated land uses, residential enclaves, and auto-oriented commercial corridors.
- **Rural:** These areas support low-density residential development and selected non-residential and agricultural uses in a relaxed regulatory climate.

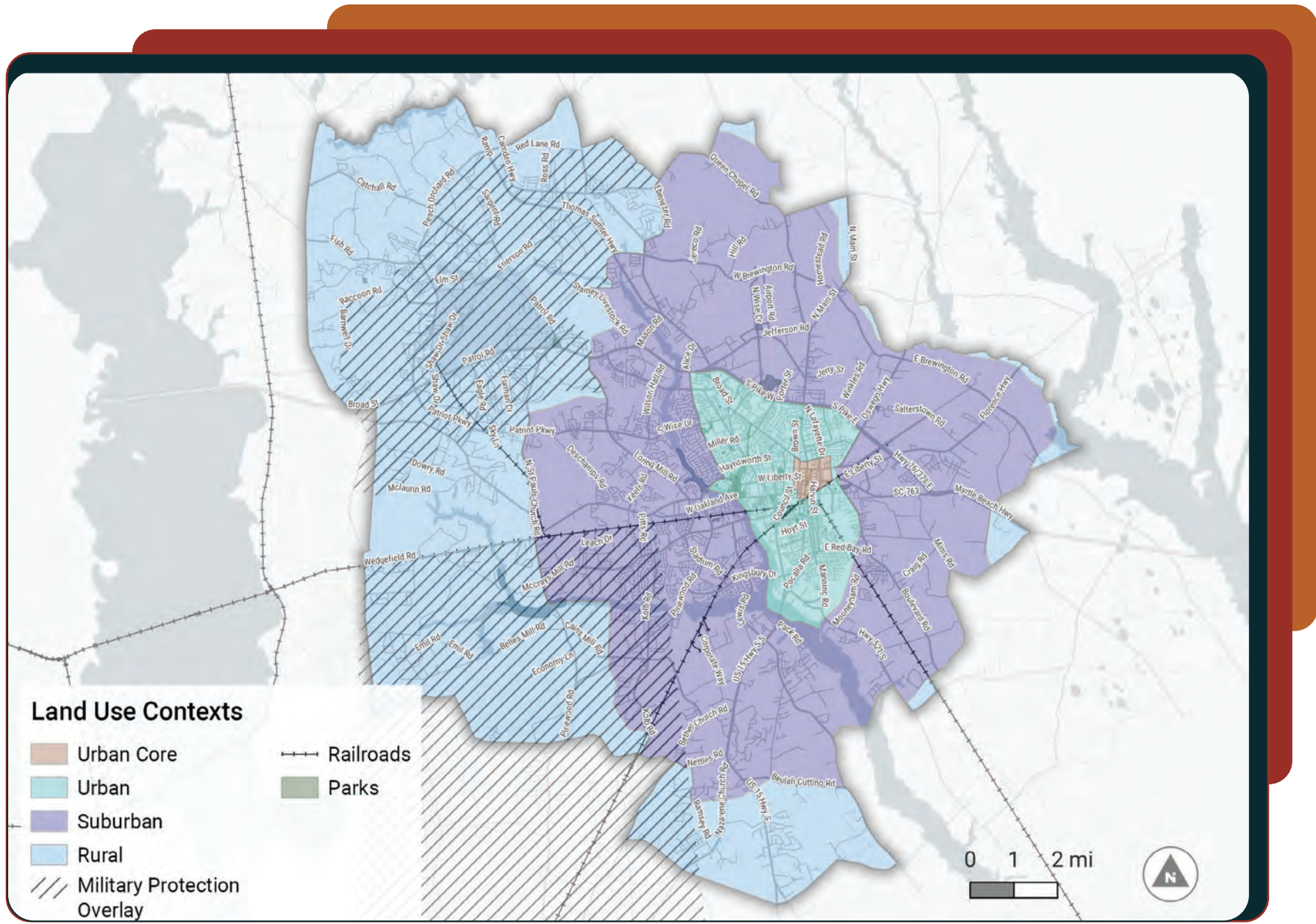


Figure 30. Land Use Contexts Map

Selection Menu

Table 8 illustrates the options for walking and biking facilities according to a street's typology and context. Facility types include sidewalks, sidepaths, traffic calming, and separated bike lanes. It is important to recognize that even streets that fall within the same typology may vary greatly in character, capacity, and context. By providing a menu of options, the Walk + Bike Plan provides flexibility to encourage implementation.

PEDESTRIAN FACILITIES



SHARED-USE FACILITIES














BICYCLE FACILITIES



Facility Types (Source: Toole Design Group)

Table 8. Context-Typology-Facility Matrix

		 Arterial	 Collector	 Local Street
Downtown Core		wide sidewalk (8' min) with buffer (both sides of EVERY street)	wide sidewalk (8' min) with buffer (both sides of EVERY street)	sidewalk (both sides of EVERY street)
		separated bike lanes	separated bike lanes	traffic calming/shared lane
Urban		wide sidewalk (8' min) with buffer (both sides of the street)	wide sidewalk (8' min) with buffer (both sides of the street)	sidewalk (both sides of the street)
		separated bike lanes	separated bike lanes	traffic calming/shared lane
Suburban		wide sidewalk (8' min) with buffer (both sides near transit, parks, and schools)	wide sidewalk (8' min) with buffer (both sides near transit, parks, and schools)	traffic calming/sidewalk
		separated bike lanes or sidepath	separated bike lanes or sidepath	traffic calming/shared lane
Rural		sidepath	sidepath	traffic calming
				traffic calming/shared lane



POLICIES & PROGRAMS



Policies and Programs

Implementing a pedestrian and bicycle friendly community will require local and regional strategies and collaboration, aimed at creating programming and introducing policy that builds upon the momentum of the Plan. A vibrant and cohesive network will thrive with the right tools in place for the public, as well as the development of the community.

The following are a variety of policy and program opportunities that when established and adopted, will support the Sumter Walk + Bike Master Plan. While policies alone do not require large capital expenditures, they will be more effective when used in coordination with the Implementation and Capital Improvement Plan, and guided by established performance measures. They will also require varying degrees of collaboration and cooperation among city and county departments and personnel. At the same time, some programs may require operational expenditures and should be considered as part of the City and County's annual budgets.

Policies

Sidewalk Improvements

A Sidewalk Improvement Policy can play a role in improving the sidewalk network within the SUATS region. This policy would identify and provide dedicated funding for projects to repair damaged sidewalks, fill sidewalk gaps, and upgrade sidewalks and intersections to meet current ADA standards. There is no SC benchmark established for percentage of funding to allocate for sidewalk improvements. However, a rule of thumb is that the average cost for sidewalk ranges between \$65-\$85 per linear foot, which would total between \$343K-\$449K per mile of sidewalk. Funding for this type of policy could be established with an annual budget. The policy would also create a reoccurring sidewalk inventory to help establish priorities for funding sidewalk improvements.

Marked Crosswalks

The purpose of a Marked Crosswalk Policy is to provide for the consistent application of treatment systems at signalized and non-signalized intersections and at mid-block crosswalks to

ensure that marked crosswalks are of a consistent quality on all local, collector, and arterial roadways. If applied in a consistent manner, drivers can respond to crosswalks correctly and without delay, adding to the comfortability of pedestrian users.

Bike Parking

This policy can be established to provide accommodations for bicyclists at the beginning and end of trips. A strong Bicycle Parking Policy would help to identify opportunities for coordinating bicycle parking near key locations such as multifamily housing, parks and recreation, retail and office developments, and civic land uses. Sumter can also work with developers by relaxing vehicle parking requirements in exchange for adequate bicycle accommodations located at newly developed facilities.

Developer-Built Sidewalk

Sidewalk implementation can often be inaccessible without adjoining adequate sidewalk segments. This policy would provide the option for developers to either construct sidewalk along the right-of-way as part of their development or to pay a fee to the City for future construction of sidewalk segments. The City may use sidewalk fee-in-lieu payments to construct sidewalk that spans greater distances and across multiple properties to connect into the greater pedestrian network. Fee-in-lieu rates should be escalated to future year dollars (e.g., 10 years out) and evaluated annually to ensure that adequate fees are available for



Figure 31. Bike Parking on the Shot Pouch Greenway

The adoption and implementation of policies and programs that support walking and bicycling encourages the development of a safe, comfortable, integrated transportation network for all users, regardless of age, ability, income, or ethnicity.

sidewalk construction. Fee-in-lieu requirements are generally listed as a dollars to construct per linear foot of sidewalk.

Examples of jurisdictions in South Carolina that offer fee-in-lieu arrangements include Greenville County and the Town of Chapin.

- Greenville County allows developers to provide a fee-in-lieu of sidewalk construction. In addition, the developer must dedicate an easement for the future development of the sidewalk (i.e., if outside the right-of-way). Fee-in-lieu payment is required at the time of the final plat. The County must spend the fees collected on sidewalks or other pedestrian improvements, but they can be used anywhere in the county.
- The Town of Chapin allows for a fee-in-lieu payment when it is not possible to construct a sidewalk as part of a development project. Fees collected are held in a fund that is used for future sidewalk and trail construction anywhere in the town.

When requiring developers to build sidewalks, it is important to include some level of guidance for their preferred design and construction. It is recommended that such guidance be included in a standalone “design guidance” document that is referenced in the ordinance but independent thereof. This allows for more regular updating of the design guidance without the full procedural hurdles of amending an ordinance. It is recommended that the design guidance included in the appendix of this document (i.e., in its entirety or selected sections) be utilized.

SCDOT recognizes that strategic planning for walking, bicycling, and transit accommodations is critical to ensuring a comprehensive and fiscally sound approach to implement a complete streets policy.

Developer-Built Bicycle Facilities

This is a policy that requires new development to dedicate land or construct planned bikeway projects (on-street dedicated bikeways or greenway trails) that could facilitate the expansion of the regional bicycle network. In addition, this policy expands options for funding and developing bikeway infrastructure. The City may choose to provide a fee-in-lieu option for developers for bikeways like the previously mentioned developer-built sidewalk policy.

Examples of jurisdictions in South Carolina that require the construction of bicycle facilities as part of development include Charleston County, Horry County, Town of James Island, and the Cities of Charleston and Folly Beach.

- As part of a jointly adopted corridor overlay district for Folly Road, Charleston County,

the Town of James Island, and the Cities of Charleston and Folly Beach require the construction of a 12 foot-wide multi-use path along both sides of Folly Road. All four jurisdictions utilize the same design guidance document, which is provided to developers to ensure a uniform and continuous pathway.

- Horry County requires the dedication of open space as part of development projects, with a sliding scale for the required amount of open space based on the type of development. Greenways, bicycle paths, footpaths, and sidewalks are all listed as acceptable open space in the ordinance. Additionally, Horry County does allow a fee-in-lieu to be paid instead of providing the open space, and the Planning Commission can invoke the fee-in-lieu if it deems that provided open space would not benefit the public.

Similar to what was mentioned for sidewalks previously, it is recommended that some level of guidance for the preferred design and construction of bicycle facilities be provided to developers. It is further recommended that the design guidance included in the appendix of this document (i.e., in its entirety or selected sections) be utilized.

Programming

Pedestrian and Bicycle Coordinator

The creation of a full-time Pedestrian and Bicycle Coordinator position is critical to the success of the implementation of the Walk + Bike Plan.

This position is essential to push forward the recommendations made in this Plan; regularly review and update the recommendations based on changing circumstances; keep track of funding opportunities, performance achievements, goals, and objectives; and identify opportunities for the advancement of active transportation in general. Having someone that can exclusively give attention to active transportation, and related programs and policies, will not only increase the effectiveness of pedestrian and bicycle projects and initiatives, but will also allow other staff to focus on their primary areas of responsibility.

Pedestrian and Bicycle Advisory Committee

A Pedestrian and Bicycle Advisory Committee would create an opportunity for engaged residents to provide ongoing feedback on policies, programs, and projects related to walking and bicycling. The committee would work closely with the planning department, transportation staff, and the Pedestrian and Bicycle Coordinator to provide input and suggest continued enhancements to the network. This committee should include and represent a diverse portion of regional civic leaders, residents, and business owners.

Data Collection

For many of the Plan's education, safety, and encouragement recommendations to be

effective, and for the measures of success to be benchmarked over time, it is important to have data that can support these efforts. To know and understand what facilities are attracting new users and varied user types, data collection must include the counting of pedestrians and bicyclists on these facilities. Finally, all data must be accessible, easy to understand and interpret, and able to be readily passed between databases and GIS platforms.

Restriping and Reconfigure Coordination

In 2021, the South Carolina Department of Transportation (SCDOT) issued a Complete Streets Directive,⁵ establishing guidelines for inclusion of multimodal accommodations in projects undertaken on the state-owned highway system. Ultimately, the state recognizes walking and bicycling as modes of travel and the importance of transit accommodations within the highway network. For the purposes of this directive, SCDOT shall collaborate with Planning Organizations such as SUATS to ensure that the local needs and modal visions for the region are executed in a cohesive manner. Coordination opportunities may include restriping of the

proposed network for an on-road bicycle facility with a resurfacing project or reconfigured a corridor to include pedestrian and/or bicycle facilities with a widening project. This collaboration is imperative to ensure a comprehensive and fiscally responsible approach to managing time, resources, and funding for these types of projects. The Walk + Bike Plan will help in communicating to SCDOT Sumter's desired future network and facilitate the coordination in executing on restriping and reconfiguring opportunities.

Educational Programs and Events

There are several programs that Sumter can use to promote walking and bicycling in the community. Some of these programs includes Safe Routes to School, county and state health programming, National Bike Month, and Walk to School Day/ Bike to School Day. Sumter can provide support for these programs by promoting them on social media and other outlets, passing resolutions to officially recognize events, involve elected officials in events, waiving event permits, and coordinating and providing police escorts when possible.

5. <https://info2.scdot.org/SCDOTPress/PublishingImages/DD%2028%20Complete%20Streets.pdf>

Partnerships

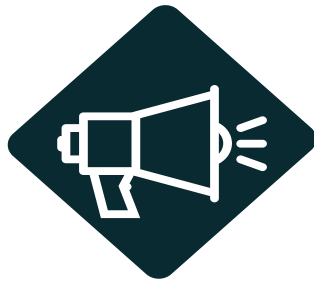
The City of Sumter can partner with local civic groups, non-profit agencies, and private businesses to sponsor healthy and active lifestyle initiatives and programming that can promote the use of the pedestrian and bicycle network. This programming will also be significant in helping to maintain and garner public support for future planning, funding, construction, and improvements to the overall network.



Figure 32. Bicycle and Pedestrian Bridge along the Shot Pouch Greenway

EDUCATION, EQUITY, HEALTH, & SAFETY

The goals reflected from the plan's public engagement process resulted in an emphasis on connectivity, education, equity, health, and safety. Each of these goals were defined within the context of transportation and for the Walk + Bike Plan by a team of stakeholders. The need and solutions for connectivity are addressed throughout the plan in the Existing Conditions and Network Development chapters. The focus for this section is to elaborate on the integration of education, equity, health, and safety into Sumter's culture of walking and bicycling.



Education

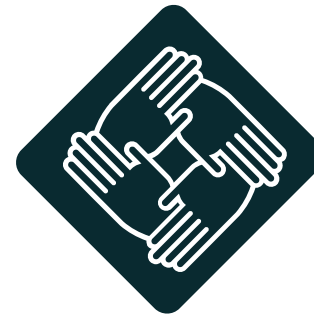
Definition: Inform residents and businesses about benefits and laws for people to safely walk and bike.

All users of a public roadway must understand how to safely travel and interact with the various transportation modes. The regulations that govern all users can be taught through various educational programs, training classes, and marketing and awareness campaigns.

To be effective, pedestrian and bicycle education campaigns for the Sumter Metro area should be paired with encouragement and equity. The transportation profession traditionally organized traffic safety programs around the 3 E's of engineering, education, and enforcement. The Walk + Bike plan promotes the new 3 E's of education, equity, and encouragement. The importance of equity is paired with education throughout the plan in the goals, objectives, and performance measures. Also, as part of the objectives and performance measures, education is paired with encouragement through the provision of recognition and incentive programs or basic services to make it easier to walk and bike to destinations. These Walk + Bike Plan programs and policies can help to encourage active transportation to be viewed as a more convenient option.

GENERAL TIPS WHEN CONSIDERING EDUCATION:

- Education should be equitable to acknowledge the specific needs of a diverse population with considerations of translations, messaging locations, and media materials.
- Age-specific messages are important – who is the target audience you’re trying to reach?
- Empathy can be an important message of education campaigns: helping drivers understand what it is like to be on bike, and vice versa.



Equity

Definition: Improve access to opportunity for all citizens of the Sumter Metro area

Tied to accessibility and economics, the need to provide equitable transportation solutions cannot be overlooked. The City also has a desire and commitment to tackle issues of race and social justice, and the design and implementation of pedestrian and bicycle projects is one opportunity where this can be addressed. The Walk + Bike Plan will provide for the needs of the City and County by making it a priority to improve the walking and bicycling environment for their diverse populations. Equity is included in the criteria for prioritizing network projects.



Health

Definition: Encourage walking and bicycling as an environmentally healthy activity and lifestyle

The U.S. Surgeon General recommends that adults should get at least 30 minutes of moderate physical activity every day of the week. Yet, more than 60 percent of American adults do not do this.⁶ Furthermore, nearly half of adolescents are not vigorously active on a daily basis. National levels of obesity and the related problems of heart disease, diabetes, and other chronic conditions continue to rise, in part due to increasingly sedentary lifestyles and a reliance on automobiles for travel for even short distances. Having a viable and comfortable active transportation network can encourage individuals to take advantage of the health benefits provided through walking and bicycling.

6. Center for Disease Control, https://www.cdc.gov/healthyplaces/health_planning_tools.htm



Safety

Definition: Provide safer and more accessible pedestrian and bicycle facilities

Improving the safety and comfort for walking and bicycling activity is a key component to making this a successful plan. Historically, U.S. cities have constructed roadways specifically for accommodating automobiles. With the resurgence of active transportation, creating safe, clear, and consistent accommodations for walkers and bicyclists is essential to enhancing safety for all road users. This can be accomplished by reducing speeding, delineating roadway space, and encouraging safe interactions between all modes. Between 2016 and 2020, Sumter's total crashes were approximately 1.63 percent of the total for the state of South Carolina, including 116 pedestrian and bicycle crashes. Constructing sidewalks, crosswalks, sidepaths, and protected bicycle facilities would raise the comfort level of pedestrians and bicyclists and decrease risks of conflict with motor vehicles. Safety is also included in the criteria for prioritizing network projects.

Participatory events are often successful in changing people’s perceptions about the effectiveness of a plan; therefore, performance measures of achievable activities, listed in Table 14 on page 105, have been established for each of these goals. The City’s implementation of these goals and objectives, utilizing the defined performance measures, along with the implementation of the policies and programs laid out in this plan, will help to change Sumter’s culture and behavior toward walking and bicycling. Residents will take notice of what is being implemented throughout the city, realize the new options being offered, and begin to celebrate and champion more change for active transportation within their communities.



Figure 33. Swan Lake Playground

BIKE SHARE FEASIBILITY ANALYSIS

What is bikeshare and micromobility?

Bikeshare is a mobility option that allows users to access a network of bicycles that can be checked out and returned on-demand. Riders pay for use of the bikes on a per-trip basis or with a monthly or annual membership, often at accessible prices that are comparable to or lower than other public transit. Most bikeshare systems have pricing tiers that encourage short one-way trips rather than long trips, which differentiates the service from bicycle rental. Common trip types include connecting to transit, commuting, social/entertainment trips, and exercise/recreation.

The most well-known bikeshare systems in the US are often located in larger cities, such as Citibike in New York City, Capital Bikeshare in Washington D.C., and Blue Bikes SC in Columbia. These systems have prominent stations or “docks” where bicycles are checked out and returned, and they have proven to be stable, long-lasting systems that still make up approximately 58% of bikeshare systems in North America.⁷ However, the high cost of the bicycles and docks poses a significant barrier to entry especially for smaller municipalities.

Since 2017, entrants to the market have introduced new and popular fleet types into the industry – such as dockless electric bikes (“e-bikes”) and electric scooters (“e-scooters”) – as well as new business models that

MICROMOBILITY

Micromobility is the catch-all industry term used for e-bikes, scooters, mopeds, and other low-speed, lightweight vehicles that are driven by a single user.

7. North American Bikeshare & Scootershare Association (NABSA). (2022). 3rd Annual Shared Micromobility State of the Industry Report. UC Berkeley: Transportation Sustainability Research Center. <http://dx.doi.org/10.7922/G2HD7TOP> Retrieved from <https://escholarship.org/uc/item/3pg7g10q>

have lowered the barrier to entry for many cities to have their own shared micromobility system. Companies such as Bird, Lime, Spin, and others can set up shared e-bike or e-scooter systems quickly and at much less cost to the municipality, which has seen them proliferate in cities of all sizes across the country. However, it is up to the municipalities to establish rules and policies to effectively manage these companies and the public right-of-way to reduce potential negative externalities, such as inappropriately parked vehicles.



Figure 35. Bird Dockless Electric Scooters
(Source: Thomas Cizauskas)



Figure 34. Blue Bike SC Docked Bikeshare System in
Columbia, SC
(Source: Blue Bike SC)



Figure 36. Lime Dockless Electric Bicycles
(Source: Tom Page)

What's the case for micromobility in Sumter?

The project team conducted meetings and interviews with City staff, stakeholders, and steering committee members; analyzed Census data; and distributed micromobility-related questions to the general public in a survey to determine local interest and preferences in a shared micromobility system. Stakeholders believed that students and young professionals, people without cars, tourists and visitors, and people seeking recreational opportunities were the most likely audiences. An analysis of these market segments was performed based on these conversations and Census data, which showed low to moderate local demand for a shared micromobility system in the Sumter Metro area. Day visitors seeking recreational activities and college students moving around town were the likeliest users of bikeshare or shared scooters.

Census data was used for GIS analysis to map out where college-aged persons, persons without access to a motor vehicle, and regional recreational destinations are located in the Sumter Metro area. Through this, the downtown area of Sumter was identified as an area that has a higher proportion of all three factors compared to other areas, such as Shaw Air Force Base. Figure 37 shows the Sumter Metro area and Census County Division with percentage of people ages 20-29 and no vehicle households by census tract, visitor points of interest, and existing and proposed bicycle infrastructure. The Sumter Census County Division (CCD) – which encompasses 12 census tracts that make up downtown Sumter and immediately surrounding neighborhoods – was analyzed to identify potential market size for a shared micromobility system.

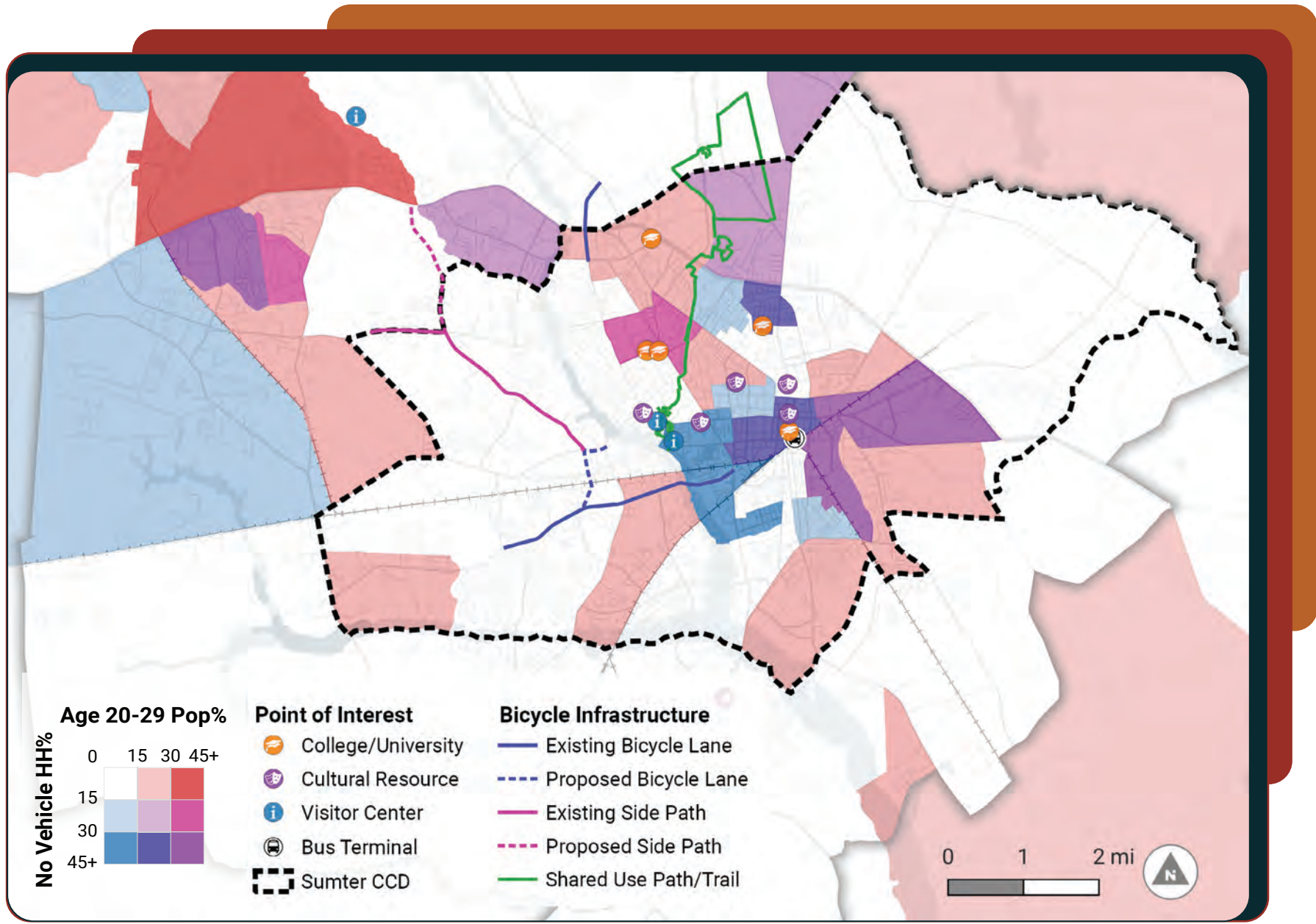


Figure 37. Bike Share Feasibility Map

What options are available to Sumter?

During the community outreach phase of the Sumter Walk + Bike Master Plan, survey respondents had a clear preference for docked bikeshare (61% liked or strongly liked) while interest in dockless bikes or scooters was more mixed and about the same between them (see Figure 38). However, the higher costs of buying docked bikeshare equipment – while still having to make it an affordable mobility option – means that docked bikeshare systems are generally not profitable and require public subsidy or alternative revenue streams (e.g., advertising and sponsorships) to cover their costs.⁸ This is similar to other forms of public transit. Docked bikeshare systems have tended to be most feasible in large cities with more resources and larger advertising and sponsorship markets, or in limited rollouts in small communities often focused around connecting a few key destinations or points along a greenway/trail or campus area. Local municipalities and stakeholders are often heavily involved in these systems in both time and expense, such as the case of Blue Bike SC in Columbia, SC.

Smaller cities with fewer resources have tended to establish permits or contracted with private

companies for bikeshare and scootershare services. Although the upfront cost and effort to establish these programs is much lower for cities under these models, they should be aware and have the capacity to manage the relationship with the private companies providing service, ensure that the program is operated in compliance with the terms of the permit or contract, and be ready to respond to public comments and feedback on the program. Concerns about sidewalk clutter, safety of use, and potential theft for dockless fleet types were expressed during community outreach and can be addressed with proper policies and

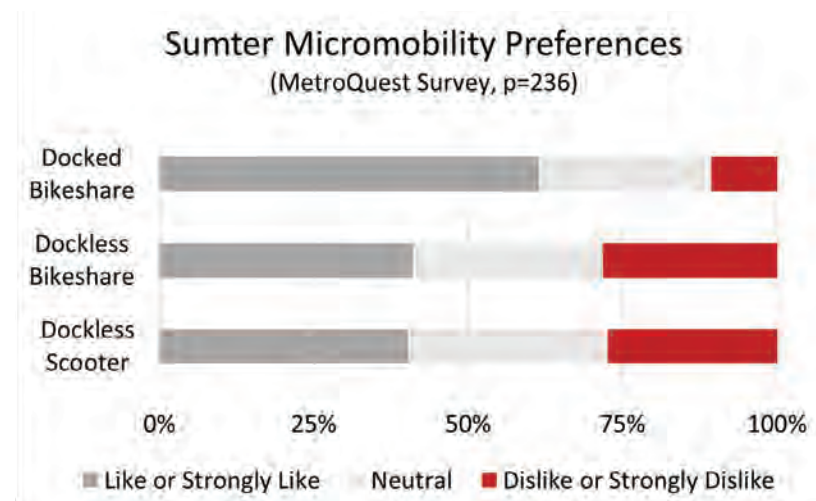


Figure 38. MetroQuest Survey Results showing Micromobility Fleet Type Preferences

8. Docked bikeshare system farebox recoveries typically range from 20% to 40% for programs in small- to medium-sized communities.

oversight of the system. This is the path that Anderson, SC took when the city signed an agreement with Bird to provide shared e-scooters. While developing this plan, a review was conducted of micromobility fleet types, business models, case studies from South Carolina, and policy recommendations.

What's Feasible?

Based on the moderate potential for ridership in Sumter and the available options based on the state of the micromobility industry at the time of writing, two options for micromobility systems are possible in the Sumter Metro area:

1. A small (up to 30 bike and 5 station) locally owned and operated docked bikeshare system focused on the trail system and primarily recreational riders, or
2. A larger (starting with a 100-device fleet) privately-owned dockless e-scooter or e-bike system.

Option 1 offers docked bikes or e-bikes, which are the community's preferred vehicle type and provide the most organized parking option. However, it would be a smaller system with less coverage and likely require greater public involvement in the management and oversight of the program and a higher capital outlay and fundraising effort to subsidize operations.

Option 2 offers more coverage to the community and almost all of the financial risk borne by the private operator. However, it relies on a private operator being interested in providing service in the Sumter market and what mix of vehicle types they feel is needed to make the system sustainable. These systems are typically dockless and will require some management and oversight to ensure that they are operated effectively and address parking and other operational service issues. More detailed information on each option is provided in Table 9.

To move forward with micromobility in Sumter, a local stakeholder should reach out to potential operators under Option 2 to understand the full range of options available to Sumter in this fully private model. Consider whether the fleet types, size, fares, service areas, and other characteristics proposed by different vendors meets Sumter's transportation and mobility needs. If not, then Option 1 is the remaining option for Sumter and effort should be directed to find fundraising partners and a bikeshare system vendor. While the two options are not necessarily mutually exclusive, pursuing either option will make the other less feasible due to competition in the limited Sumter market. More detailed information on each option is provided in Table 9.

Table 9. Micromobility System Options for Sumter Metro Area by Feasibility Criteria

	Option 1 - Docked Bikeshare System	Option 2 - Dockless E-Scooter or E-Bike System Pilot
Possible Ridership	4,380 to 8,800 trips annually (based on 0.4 to 0.8 trips/bike/day) ⁹	22,000 to 36,500 trips annually (based on 0.6 to 1.0 trips/vehicle/day)
Size and Coverage	Up to 5 stations and 30 pedal bikes or e-bikes Possible locations could include 2 downtown stations and 3 stations along the Shot Pouch Greenway (e.g., at Swan Lake, YMCA, Dillon Park) = ~1.75 square miles of system coverage	Pilot 100 e-bikes and/or e-scooters with performance measures to increase the fleet over time City of Sumter boundary = 32.8 square miles of system coverage
Operating Model	City, County, another public agency, or non-profit owns and manages the program Operations provided by system owner or contracted to a third-party operator	Service provided by one private sector vendor City or County provides regulation and oversight of the program

9. Higher end of range based on average trips/vehicle/day for bikes and scooters in small cities (population less than 200,000) in North America in 2021 from NABSA report. Lower end of range based on average trips/bike/day for active docked bikeshare system in South Carolina, with difference between high and low in Option 1 applied to Option 2.

Table 9. Micromobility System Options for Sumter Metro Area by Feasibility Criteria, continued

	Option 1 - Docked Bikeshare System	Option 2 - Dockless E-Scooter or E-Bike System Pilot
Cost	<p>Capital: approximately \$320,000</p> <p>Operations: approximately \$90,000 annually</p>	<p>Private sector bears cost of capital and operations</p> <p>Local government staff costs include staff time and resources to oversee the program</p>
Funding Options	<p>Capital: state and federal grants with local match and/or private sector contributions</p> <p>Operations: ridership revenue, sponsorship/advertising, and/or public subsidy</p>	<p>Some public funding is required to cover local government staffing costs</p> <p>Revenues generated by the City charging fees for operations in the right-of-way are available</p>
Effort for Local Entity	<p>Could range from staff time for oversight and management to significant resources and full responsibility for the program</p>	<p>Staff time to establish, oversee, and evaluate the pilot program</p>



4

IMPLEMENTATION

- **Prioritization**
- **Top 10 Corridors**
- **Early Action Projects**
- **Performance Measures**
- **Funding**
- **Maintenance Plan**



PRIORITIZATION



Building Out the Network

The Walk + Bike Network identifies the trails and roadway corridors where investment will have the greatest impact on encouraging walking and biking and making SUATS a safe and comfortable place for people of all ages and abilities. While the Plan emphasizes the value of a network-based approach, implementation begins with realistically scaled individual projects. This section provides a roadmap for prioritizing corridors within the Network and the tools needed to select and install appropriate pedestrian or bicycle facilities.

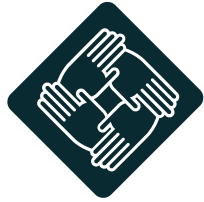
Prioritization

Figure 28 in Chapter 3 shows the Network broken into 68 corridors, each of which have opportunities for multiple projects of varying scales. While every corridor is a valuable piece of the Network, prioritizing the most important places is crucial to starting the implementation process and ultimately making the vision of the Plan a reality.

Table 10 lists the prioritization criteria which were selected based on input from local leaders and community members. Figure 39 shows the prioritization of corridors along the network.

While every corridor may not have received a high score, each corridor on the proposed Network aligns with this prioritization criteria and is a critical piece of increasing connectivity and safety for pedestrians and bicyclists in SUATS. Corridors that score lower but fill essential gaps in the network may still end up being considered for implementation sooner or in conjunction with adjacent projects. Additionally, while scores have been established, these are for planning purposes only. It is understood that there will be “projects of opportunity,” and projects should be implemented when opportunities arise or when funding is available.

EQUITY



PUBLIC INPUT



TRANSIT



PARKS & SCHOOLS



SAFETY



Table 10. Prioritization Criteria

Factor	Rationale	Corridor Scoring
<p>Equity</p>	<p>Often, groups within a community that are already economically or systemically disadvantaged are more severely impacted by limited or inadequate walking and bicycling networks. The Plan’s Equity Analysis in Chapter 2 identified areas in the community where people may more often rely on walking and bicycling for trips. The analysis’ areas of high concern represent US census blocks with the highest concentrations of people who identified as a minority, were over 65 or under 18, as well as those who were living below the poverty line or living in a zero-car household.</p>	<p>Within an area of high concern - 10 pts Within an area of medium concern - 5pts</p>
<p>Public Input</p>	<p>Throughout the planning process, people have shared their experiences walking and bicycling. Public feedback from MetroQuest, surveys, and public open houses was incorporated into the prioritization process to ensure the community’s voice was reflected in final recommendations.</p>	<p>High density of comments - 10 pts Low-to-moderate density of comments - 5 pts</p>

Table 10. Prioritization Criteria, continued

Factor	Rationale	Corridor Scoring
Transit	Public transit provides links to employment and education opportunities, as well as other key community resources. Those who commute by public transit also require active transportation infrastructure for first- and last-mile connectivity.	Within a 1/4 mile of a transit stop - 10 pts Within 1/2 mile of a transit stop - 5 pts
Parks & Schools	Parks are destinations for recreation within a community where residents desire to walk or bike. Educational facilities were included to capture a population that may have less access to a personal vehicle and could benefit from other forms of transportation.	Within 1/4 mile of a school - 10 pts Within 1/4 mile of a park - 10 pts Within 1/2 mile of a school - 5 pts Within 1/2 mile of a park - 5 pts
Safety	While reviewing crash data was an important step in developing the Network, a systemic approach to safety requires looking at the factors that lead to crashes and the circumstances that are likely to cause death or serious injury. Nationally, vehicle speed is the number one factor influencing the number of crashes and crash severity. ¹⁰ Corridors with high-speed intersections, where unsafe conflicts are most likely to occur, were given higher scores.	Corridor has multiple high-speed intersections - 10 pts Corridor has at least one high-speed intersection - 5pts
	Total Points	60 pts

A complete list of prioritized corridors is included in Appendix 3.

10. National Transportation Safety Board (2017) "Reducing Speeding-Related Crashes Involving Passenger Vehicles."

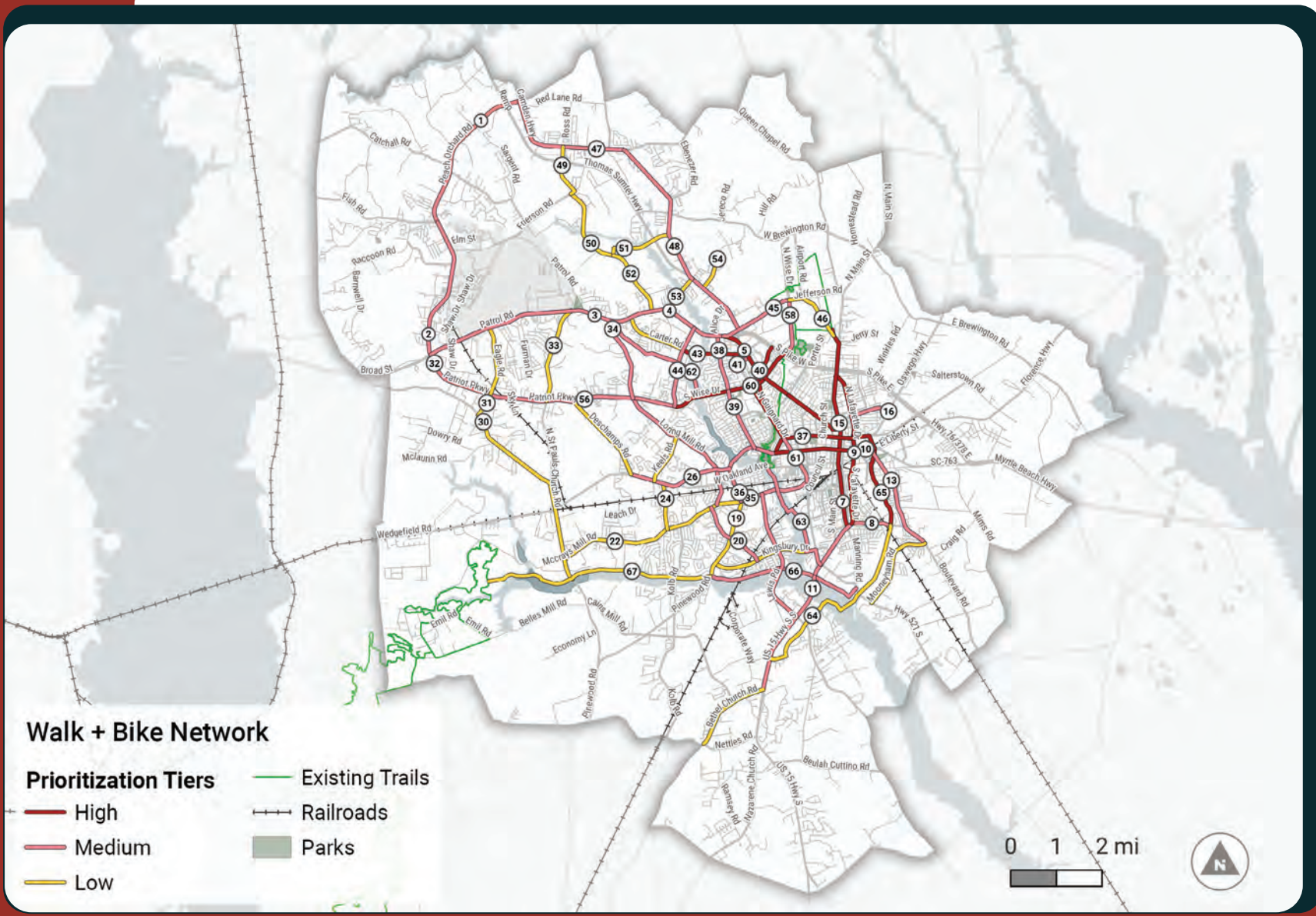


Figure 39. Map of Scored Corridors along the Network



TOP 10 CORRIDORS



Overview

The following section includes cutsheets for the top 10 highest scoring corridors. These corridors represent sites where the public has voiced the strongest desire for change and where investments for people walking and biking will have the greatest impact on safety, equity, and access to community destinations. The top 10 corridors were selected from the highest scoring corridors within a mix of land use contexts.

Table 11. Top 10 Corridors

ID	Name	Status
9	Lafayette Drive	<ul style="list-style-type: none"> In Feasibility Study phase for operational design improvements along the corridor, from the US-378 bypass to US-521 2007 Corridor Study
37	Calhoun Dr & West Calhoun St	<ul style="list-style-type: none"> Corridor studied as part of the 2016 Hampton Park Traffic Calming Study
7	Manning Ave	<ul style="list-style-type: none"> In engineering design phase for a 5 ft. sidewalk on one side and a 7 ft. sidewalk sidepath on the other side of the road from the Manning Ave Bridge to US-15 Construction expected to begin in the first quarter of 2024
15	N Main St	<ul style="list-style-type: none"> In engineering design phase for a 5 ft. sidewalk on one side and a 7 ft. sidewalk sidepath on the other side of the road from Loring Dr to US-15 Construction is expected to begin by the end of 2023
6	Broad St - Warren St	<ul style="list-style-type: none"> No specific current planning efforts
40	Bultman Dr	<ul style="list-style-type: none"> No specific current planning efforts
55	Camden Highway	<ul style="list-style-type: none"> No specific current planning efforts
4	Broad St	<ul style="list-style-type: none"> No specific current planning efforts
3	Broad St	<ul style="list-style-type: none"> No specific current planning efforts
32	Patriot Pkway	<ul style="list-style-type: none"> No specific current planning efforts

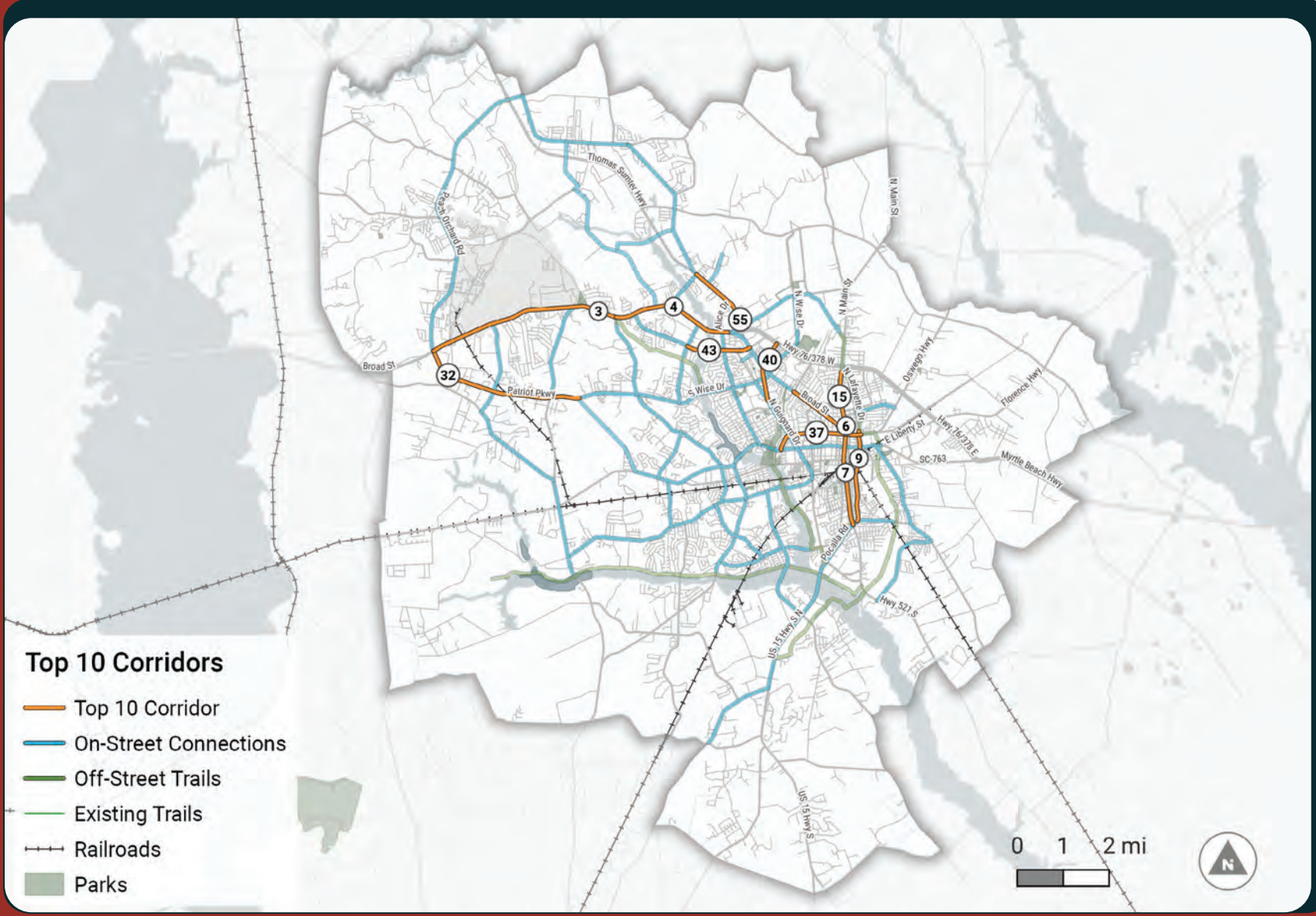













Figure 40. Map of Top 10 Corridors

Moving from Priority Corridors to Projects

Prioritization helps identify corridors where investment will have the greatest impact towards a connected, safe, pedestrian and bicycle network. Once a corridor is selected, the next step is to define the specific project (or projects) needed along the corridor. Moving from corridors to project definition can be broadly broken into three-steps which are tied to the Facility Selection Menu on page 57 and shown below.

Table 12. Context-Typology-Facility Matrix

		 Arterial	 Collector	 Local Street
Downtown Core		wide sidewalk (8' min) with buffer (both sides of EVERY street)	wide sidewalk (8' min) with buffer (both sides of EVERY street)	sidewalk (both sides of EVERY street)
		separated bike lanes	separated bike lanes	traffic calming/shared lane
Urban		wide sidewalk (8' min) with buffer (both sides of the street)	wide sidewalk (8' min) with buffer (both sides of the street)	sidewalk (both sides of the street)
		separated bike lanes	separated bike lanes	traffic calming/shared lane
Suburban		wide sidewalk (8' min) with buffer (both sides near transit, parks, and schools)	wide sidewalk (8' min) with buffer (both sides near transit, parks, and schools)	traffic calming/sidewalk
		separated bike lanes or sidepath	separated bike lanes or sidepath	traffic calming/shared lane
Rural		sidepath	sidepath	traffic calming
				traffic calming/shared lane

STEP 1. Define the Purpose

The Priority Corridor cutsheets on the following pages list the Street Typology for each corridor and the predominate Land Use around it. Is this corridor a heavily trafficked commuter route through downtown? A suburban neighborhood connection?

KEY QUESTIONS:

- What is this corridor's Land Use Context & Street
- Typology?

STEP 2: Assess the Need

Using the Selection Menu, the land use and street typology highlight the appropriate pedestrian and bicycle facilities needed for the corridor.

The needs of the corridor are then identified by comparing the recommended facility from the Selection Menu to the current conditions along the corridor. For the Priority Corridors this is listed in the pedestrian and bicycle completeness sections of each cutsheet.

KEY QUESTIONS:

- What are the recommended facilities based on the Selection Menu?
- What are the current conditions on the corridor?

STEP 3: Identify What's Missing

The gaps between the recommended facilities and the current completeness of each corridor reveal the specific projects needed. It is important to note that “projects” may not always require building something new. A rural corridor with existing sidewalks may only require widening the sidewalk on one side to create a side path for bicyclists.

Repurposing existing travel lanes or right-of-way, can also be a valuable way to leverage space for a new facility rather than constructing something new beyond the existing edge of pavement.

KEY QUESTIONS:

- Where do new facilities need to be built?
- Where can we repurpose existing right-of-way?
- Where should we continue to maintain existing
- facilities?

PRIORITY CORRIDOR

LAFAYETTE DRIVE



Pedestrian Completeness

- 5 foot sidewalk on both sides
- Little to no buffer
- Needs maintenance



Bicycle Completeness

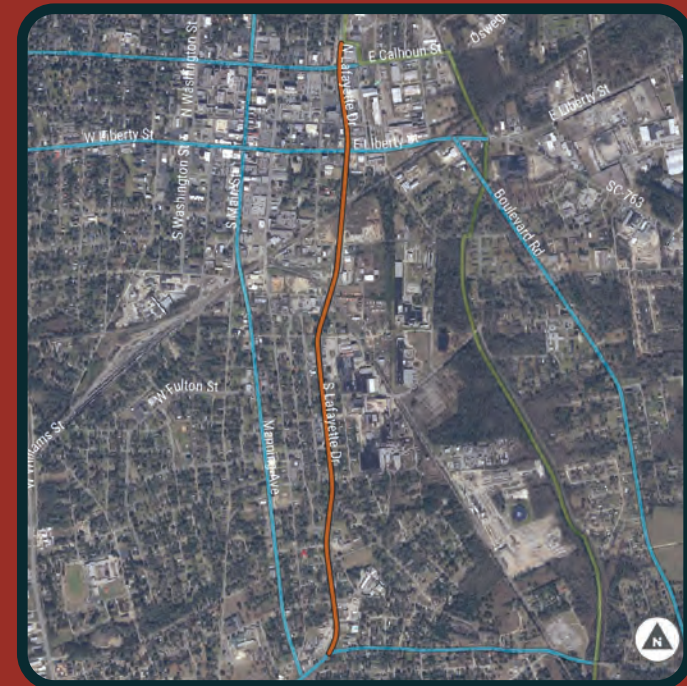
- No bicycle facilities



Context: Urban Core



Typology: Major Arterial



Existing Conditions

Length: 0.6 miles

Number of Lanes: Five to six lanes

Speed: 40 mph

PRIORITY CORRIDOR

CALHOUN DRIVE & WEST CALHOUN STREET



Pedestrian Completeness

- Sidewalk on both sides of the street through Winn St
- Sidewalk on one side from Winn St to N. Guignard Dr
- No sidewalks from N. Guignard Dr to Liberty St



Bicycle Completeness

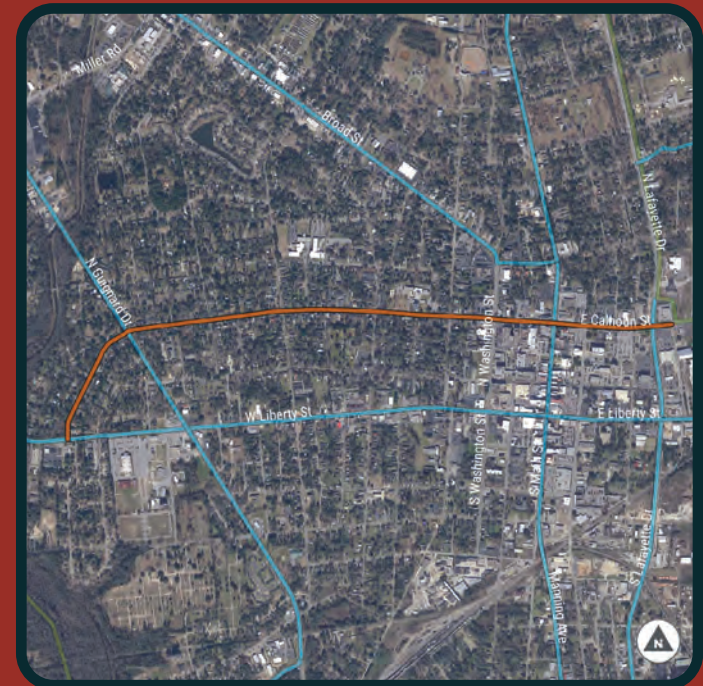
- No bicycle facilities



Context: Urban Core



Typology: Local Street



Existing Conditions

Length: 0.6 miles

Number of Lanes: Two lanes - Widens to four lanes at N. Washington St

Speed: 30-35 mph

PRIORITY CORRIDOR

MANNING AVENUE



Pedestrian Completeness

- Overgrown 5 foot sidewalks on both sides of the street
- Sidewalk gaps begin south of Orange Street



Bicycle Completeness

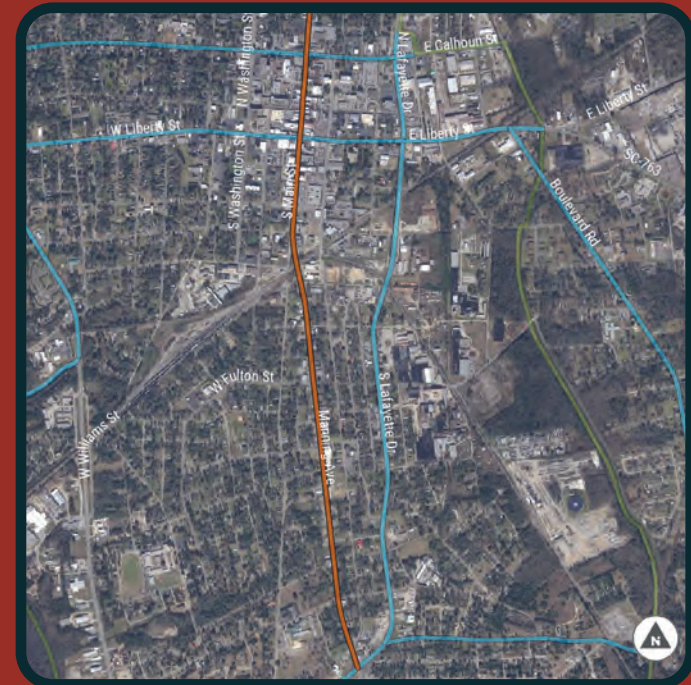
- No bicycle facilities



Context: Urban Core



Typology: Minor Arterial



Existing Conditions

Length: 0.7 miles

Number of Lanes: Three lanes

Speed: 35 mph

PRIORITY CORRIDOR

NORTH MAIN STREET



Pedestrian Completeness

- Sidewalk on both sides of the street through FC James Ct
- Sidewalk on one side north of E. College St
- Sidewalk is narrow with no buffer



Bicycle Completeness

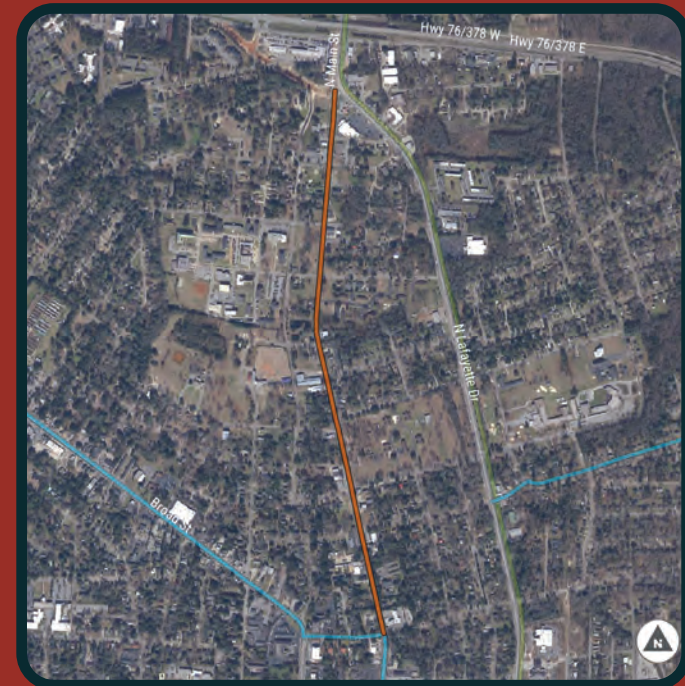
- No bicycle facilities
- Northern connection to Turkey Creek Greenway Alignment



Context: Urban



Typology: Collector



Existing Conditions

Length: 0.4 miles

Number of Lanes: Three lanes

Speed: 30-35 mph

PRIORITY CORRIDOR

BROAD STREET - WARREN STREET



Pedestrian Completeness

- 5 foot sidewalk on both sides with no buffer
- Multiple driveway cuts
- No midblock crossings and limited crossing facilities at intersections



Bicycle Completeness

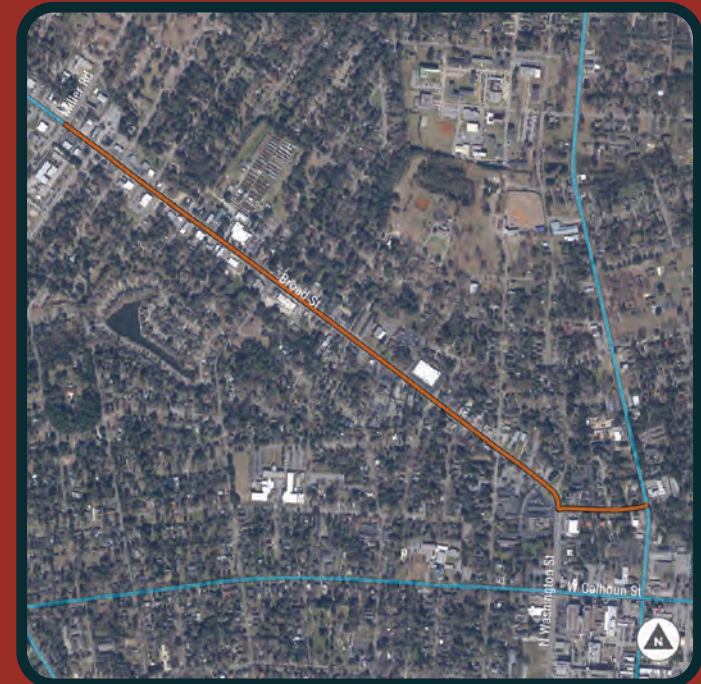
- No bicycle facilities



Context: Urban



Typology: Major Arterial



Existing Conditions

Length: 0.4 miles

Number of Lanes: Three - five lanes

Speed: 35 mph

PRIORITY CORRIDOR

BULTMAN DRIVE



Pedestrian Completeness

- 5 foot sidewalk on both sides with no buffer up to Broad Street
- No sidewalks north of Broad Street
- Multiple driveway cuts
- No midblock crossings and limited crossing facilities at intersections



Bicycle Completeness

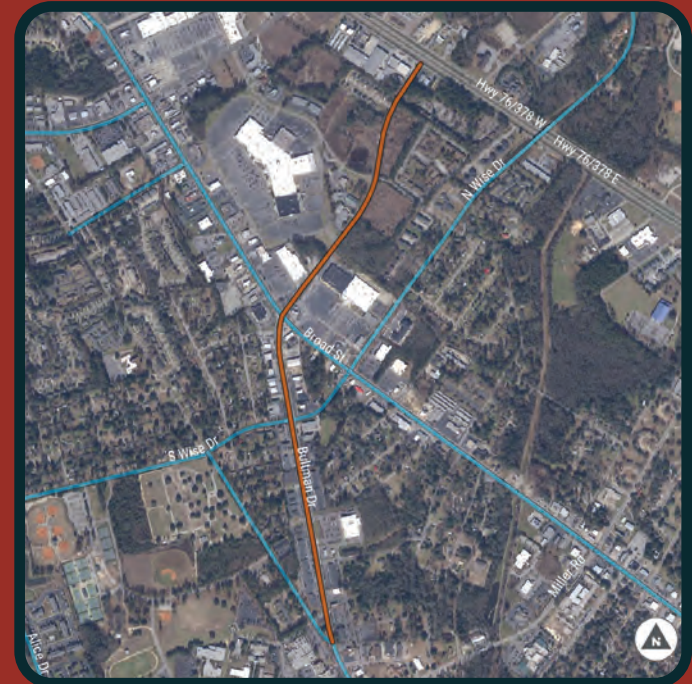
- No bicycle facilities



Context: Urban



Typology: Major Arterial



Existing Conditions

Length: 0.4 miles

Number of Lanes: Five lanes

Speed: 35 mph

PRIORITY CORRIDOR

CAMDEN HIGHWAY



Pedestrian Completeness

- No sidewalks



Bicycle Completeness

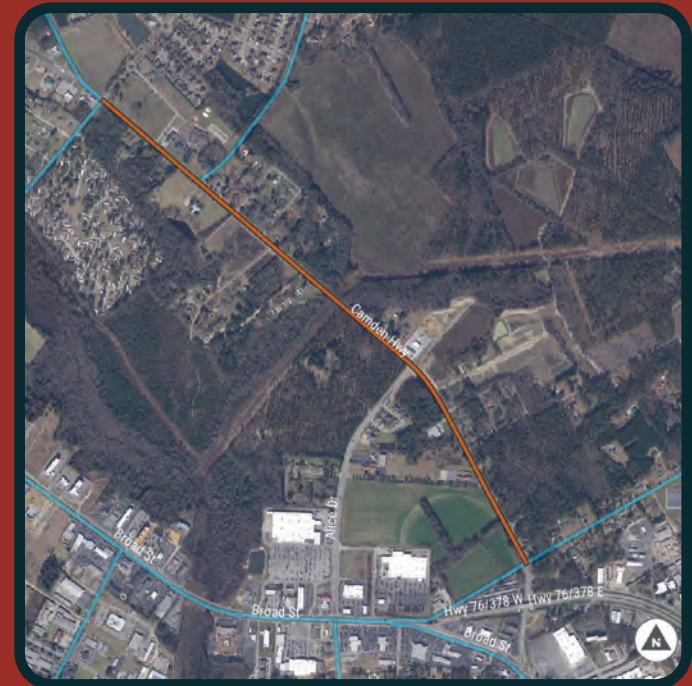
- No bicycle facilities



Context: Suburban



Typology: Major Arterial



Existing Conditions

Length: 0.5 miles

Number of Lanes: Five lanes

Speed: 40 mph

PRIORITY CORRIDOR

BROAD STREET (EAST)



Pedestrian Completeness

- No sidewalks



Bicycle Completeness

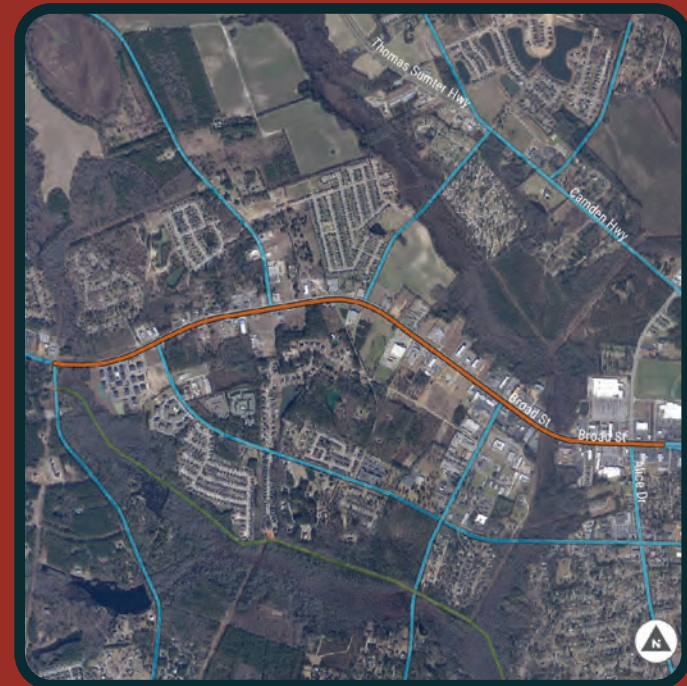
- No bicycle facilities



Context: Suburban



Typology: Major Arterial



Existing Conditions

Length: 0.8 miles

Number of Lanes: Four lane divided highway

Speed: 45 mph

PRIORITY CORRIDOR

BROAD STREET (WEST)



Pedestrian Completeness

- No sidewalks



Bicycle Completeness

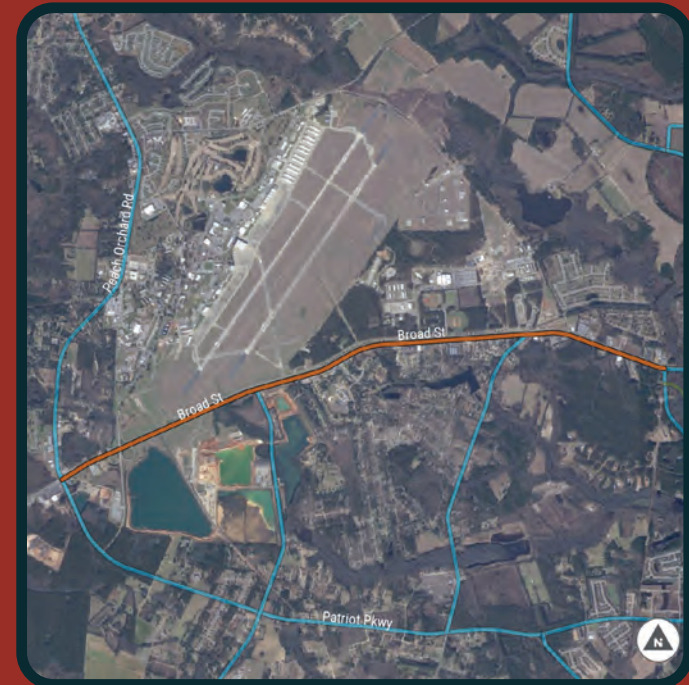
- No bicycle facilities



Context: Rural



Typology: Major Arterial



Existing Conditions

Length: 1.3 miles

Number of Lanes: Four lane divided highway

Speed: 55 mph

PRIORITY CORRIDOR

PATRIOT PARKWAY



Pedestrian Completeness

- No sidewalks



Bicycle Completeness

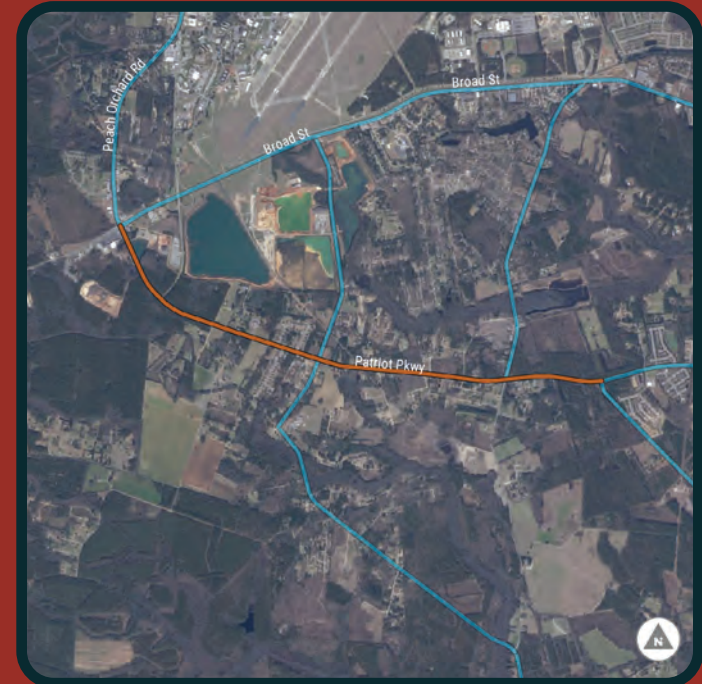
- No bicycle facilities



Context: Rural



Typology: Minor Arterial



Existing Conditions

Length: 1.1 miles

Number of Lanes: Two lane road

Speed: 45 mph

EARLY ACTION PROJECTS

Overview

The Top 10 corridors highlighted in the previous chapters represent connections across the SUATS region that will have the greatest system-wide impact walking and biking. Early Action Projects shown on the following pages represent spot treatments that are intentionally small in cost and effort but provide big improvements for safety, accessibility, and connectivity across the network. Working on these projects in the immediate future will jump-start the Walk + Bike Network and provide a vision for what larger active transportation investments can look like in the future. Early Action Projects should be considered along with pre-existing project concepts and plans that improve walking and biking conditions in the region, such as road diet projects from the Downtown Master Plan, the US-378 Bypass, and the Shot Pouch Greenway Connections.

Approach

Early Action projects were identified in areas with significant safety concerns for people walking and biking and where opportunities existed to fill critical network gaps. To keep costs low, these projects are also in locations where additional striping, milling, or changes to the curb line would not be needed.

Table 13. Early Action Projects

Project ID	Type	Name	Estimated Cost
1	Bike	Broad Street & Alice Drive	\$52,200
2	Bike	McCrays Mill Road & South Guignard Drive	\$18,900
3	Walk + Bike	Wall Street Connector	\$664,400
4	Walk	Broad Street & Willow Drive	\$34,000
5	Walk	Manning Avenue Midblock Crossing	\$20,400
6	Walk	Patriot Parkway & Loring Mills Road	\$22,600

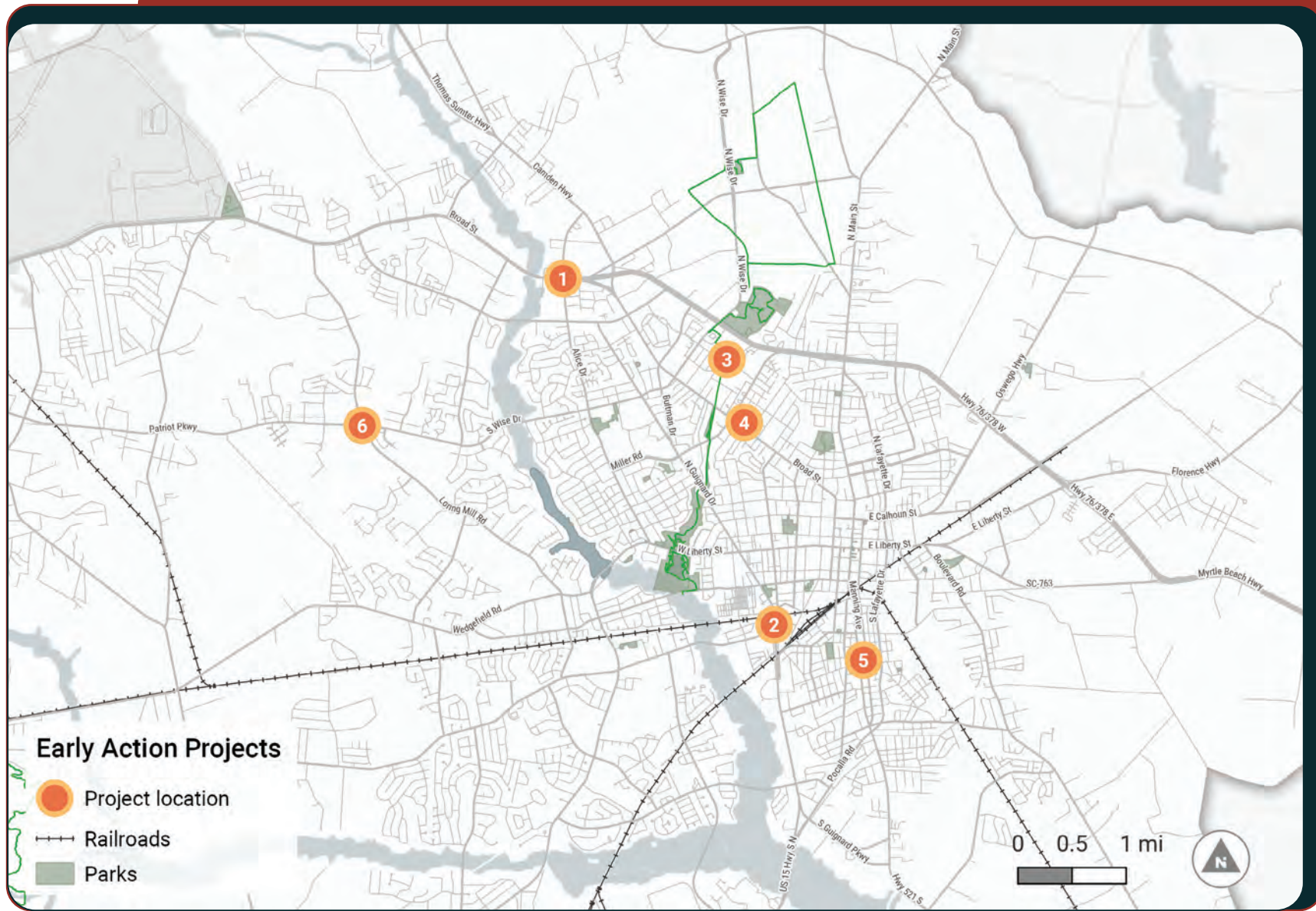


Figure 41. Map of Early Action Projects

BROAD STREET & ALICE DRIVE

LOCATION

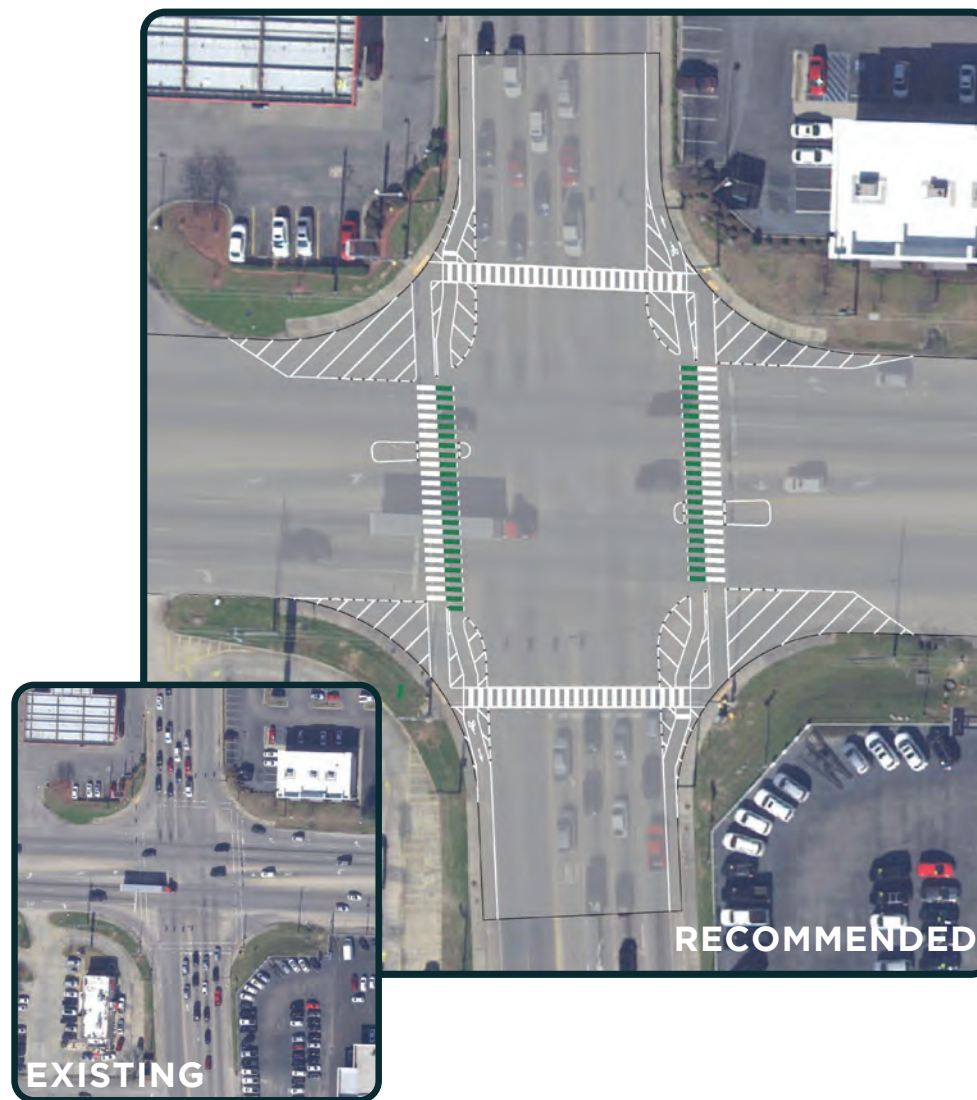
- Bicycle & pedestrian crashes near this intersection
- Unprotected bike lanes through the intersection
- Wide turning radius

RECOMMENDATIONS

- Add curb extensions at all approaches and protected corners for bicyclists
- Add high visibility crosswalks and green bicycle crossing markings

ESTIMATED COSTS

Thermoplastic Pavement Marking	\$23,500
Flexible Delineator	\$10,400
Mobilization & Demobilization (5%)	\$1,700
Maintenance of Traffic (5%)	\$1,700
Contingencies	\$14,900
TOTAL	\$52,200



MCCRAYS MILL ROAD & S. GUIGNARD DRIVE

LOCATION

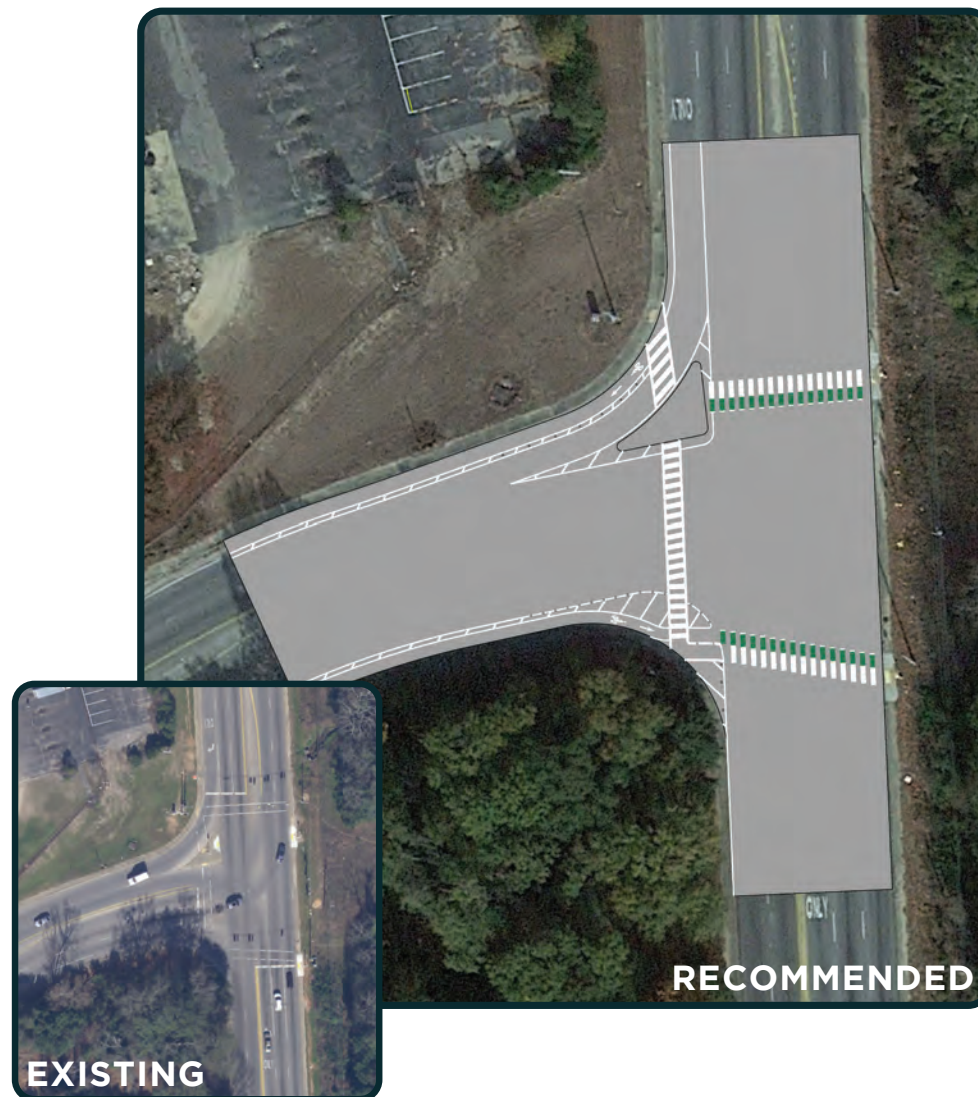
- Painted bike lane on McCray Mill Rd ends at S. Guignard Dr
- One of only two bike lanes
- Right turn slip lanes allow for high-speed turns

RECOMMENDATIONS

- Add flexposts to separate bike lane leading into intersection
- Add protected corner
- Add bicycle crossing markings
- Explore opportunities to fully remove slip lanes in the future

ESTIMATED COSTS

Thermoplastic Pavement Marking	\$9,300
Flexible Delineator	\$3,000
Mobilization & Demobilization (5%)	\$600
Maintenance of Traffic (5%)	\$600
Contingencies	\$5,400
TOTAL	\$18,900



SHOT POUCH GREENWAY

WALL STREET CONNECTOR

LOCATION

- 750 ft easment between Wall St and the Shot Pouch Greenway
- Opportunities for future trailside development

RECOMMENDATIONS

- Construct 10' shared use path connecting
- Add bridge over Shot Pouch Branch

ESTIMATED COSTS

10' Paved Shared Use Path (\$512/linear ft x 724 ft)	\$414,400
Shared Use Bridge (City of Sumter estimate)	\$250,000
TOTAL	\$664,400



RECOMMENDED



EXISTING

BROAD STREET & WILLOW DRIVE

LOCATION

- Five lane skewed crosswalk
- School crossing to Willow Drive Elementary School
- Multiple open driveways

RECOMMENDATIONS

- Re-align crosswalk on Broad Street
- Add Median refuge island/nose
- Add ADA ramp on north side
- Adjust placement of School Crossing Sign

ESTIMATED COSTS

Sidewalk, Curb & Gutter	\$9,300
Curb Ramps	\$10,600
Thermoplastic Pavement Markings	\$2,200
Signage & Flexible Delineators	\$2,300
Mobilization & Demobilization (5%)	\$1,200
Maintenance of Traffic (5%)	\$1,200
Contingencies	\$10,600
TOTAL	\$37,400



MANNING AVENUE MIDBLOCK CROSSING

LOCATION

- Three lane midblock crossing to Jehovah Missionary Baptist Church
- Multiple public comments and nearby pedestrian crashes

RECOMMENDATIONS

- Add Median refuge island
- Add ADA ramps
- Add Advance signage

ESTIMATED COSTS

Sidewalk, Curb & Gutter	\$1,700
Curb Ramps	\$7,800
Thermoplastic	\$1,500
Signage	\$1,500
Flexible Delineator	\$700
Mobilization & Demobilization (5%)	\$700
Maintenance of Traffic (5%)	\$700
Contingencies	\$5,800
TOTAL	\$20,400



PATRIOT PARKWAY & LORING MILLS ROAD

LOCATION

- Sidepath/sidewalk on north side of skewed intersection
- No crosswalk on east intersection approach (S. Wise Dr)
- Multiple public comments

RECOMMENDATIONS

- Median refuge island and high visibility crosswalk on north leg
- Add splitter island on southeast
- Add high visibility crosswalk on east leg across slip lane
- Explore opportunities to fully remove slip lanes in the future

ESTIMATED COSTS

Asphalt	\$3,400
Thermoplastic Pavement Marking	\$6,600
Flexible Delineator	\$4,700
Mobilization & Demobilization (5%)	\$700
Maintenance of Traffic (5%)	\$700
Contingencies	\$6,500
TOTAL	\$22,600










◆ PERFORMANCE MEASURES ◆

Performance measures will be helpful in evaluating the progress being made toward achieving the goals and objectives for the SUATS Walk + Bike Master Plan. Active transportation performance measures enable evaluations of walking and biking projects and programs based on quantitative data. Performance measures are essential to the planning and design for pedestrians and bicyclists. The measures help to prioritize projects, evaluate the appropriate facility types, and track progress over time.

Meaningful and context-sensitive performance measures dedicated to bicycling and walking are valuable for many reasons, including:

- To demonstrate project value to citizens and elected officials
- To aide in funding and programing
- To comply with federal, state, and local funding, design, and construction requirements
- To produces a better, safer built environment
- To engage stakeholder participation in project selection and programing
- To capture datasets and data collection that supports the projects and programs

Table 14. Performance Measures

 Connectivity	 Education	 Equity	 Health	 Safety
By 2024, sidewalk and bike facility improvements to be included in the City and County Capital Improvement Plan, as well as SUATS's TIP	Quarterly promote bike rodeos/events for kids	By 2024, prioritize high density minority, low-income, and zero vehicle household areas for pedestrian and bicycle facilities in the LRTP and the City-County Comprehensive Plan	By 2024 coordinate a walking step count program	By 2028 install high visibility crosswalks at high-priority stop controlled intersections
By 2025 Install bicycle amenities (racks, fix it stations, etc.) at all public facilities	By end of 2023, establish a Bike and Pedestrian Committee	By 2024, prioritize pedestrian and bike facility access to jobs in high transportation disadvantaged population areas in the LRTP and the City-County Comprehensive Plan	By 2025 Install sidewalk within 1/4 mile radius of all schools	Annually allocate funding for protected bike lane feasibility, design, and construction
By 2026 install at least one new bicycle facility in each Land Use Context Area	Annually host Bike to Work event in May	By 2030 ensure ALL existing sidewalks are upgraded to meet minimum required standards	By 2030 install a walk/bike facility within 0.25 miles of each residential area	Annually promote Safe Routes to School* programs
By 2028 install sidewalk or a ped/bike facility within a 1/4 mile radius of all schools	Annually coordinate with public and private schools to promote bike education	Annually promote events to get bikes to the underserved		
Annually, 5% of identified sidewalk gaps have been addressed	Annually promote a pedestrian and bike education campaign	Annually construct new sidewalk in a Land Use Context Area on a rotating schedule		
Annually allocate funding for trail and side path feasibility, design, and construction				
Annually allocate funding for sidewalk feasibility, design, and construction				
<p>*Safe Routes to School (SRTS) is an approach that promotes walking and bicycling to school through infrastructure improvements, enforcement, tools, safety education, and incentives to encourage walking and bicycling to school.</p>				

FUNDING

Dedicated local funding is the most consistent and reliable funding source to implement pedestrian and bicycle projects. It is an indication of a community’s commitment to growing its active transportation infrastructure and strengthens potential for the application of federal and state funding. Local funds are often used to leverage additional state and federal funds. However, state and federal funds are typically more competitive and require more oversight and documentation which sometimes extend past the construction of the project.

Table 15. Funding

Funding	Level	Description	Notes
Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	Federal	The United States Department of Transportation is investing in roads, rail, transit and port projects, under what was previously known as the BUILD or TIGER grants. RAISE can provide funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, or MPOs for multi-modal and multi-jurisdictional projects.	Competitive process.
Safe Streets and Roads for All SS4A	Federal	Establishes the new Safe Streets and Roads for All (SS4A) discretionary grant program, which supports local initiatives to prevent death and serious injury on roads and streets, commonly referred to as "Vision Zero" or "Toward Zero Deaths" initiatives.	A Safety Action Plan must be developed before a project can be funded.
Surface Transportation Block Grant Program (STBG)	Federal	Provides funding that may be used by states and localities for a wide range of projects to preserve and improve the conditions and performance of surface transportation, including highway, transit, intercity bus, pedestrian, and bicycle projects.	NA

Table 15. Funding, continued

Funding	Level	Description	Notes
Formula Grants for Rural Areas	Federal	The Formula Grants for Rural Areas program provides capital, planning, and operating assistance to states to support public transportation in rural areas with populations of less than 50,000, where many residents often rely on public transit to reach their destinations.	NA
Transportation Alternatives (TA)	Federal	Encompasses a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity.	NA
Highway Safety Improvement Program (HSIP)	Federal	These funds can be used for sidewalks, intersections between a trail and a road, bike lanes, traffic calming, crosswalks, and other safety improvements. Increasing safety and access to your parks.	NA
Congestion Mitigation and Air Quality Improvement (CMAQ)	Federal	Implemented to support surface transportation projects and other related efforts that contribute air quality improvements and provide congestion relief.	NA
Infrastructure for Rebuilding America Discretionary Grant (INFRA)	Federal	INFRA awards competitive grants for multimodal freight and highway projects of national or regional significance to improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas.	Typically larger scale projects. For a large project, the INFRA grant must be at least \$25 million. For a small project, the grant must be at least \$5 million.
Recreational Trails Program (RTP)	Federal	Provides funds to the States to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses.	May be limited to certain sections of the plan.

Table 15. Funding, continued

Funding	Level	Description	Notes
Transportation Infrastructure Finance & Innovation Act (TIFIA)	Federal	Goal is to leverage Federal resources and stimulate capital market investment in transportation infrastructure by providing credit assistance in the form of direct loans, loan guarantees, and standby lines of credit (rather than grants) to projects of national or regional significance.	Loan Program - minimum \$10 million for Rural projects.
Reconnecting Communities Pilot (RCP) Program	Federal	The RCP Program funds projects that mitigate the impacts of highways, roads, rail lines, or other transportation facilities that create a barrier to community connectivity, including barriers to mobility, access, or economic development. Funds are available in the form of planning grants and capital construction grants.	NA
Railway-Highway Crossing Program (RHCP)	Federal	The RHCP provides funds for safety improvements to reduce the number of fatalities, injuries, and crashes at public railway-highway grade crossings.	NA
Parks and Recreation Trust Fund (PARTF)	State	Provides dollar-for-dollar matching grants to local governments for the acquisition and/or development of park and recreational projects to serve the general public.	Mostly for Parks but does mention greenways, trails, and access to parks.
Complete Streets	State	Policy that directs the department to consider and incorporate several modes of transportation when building new projects or making improvements to existing infrastructure.	NA
Planning Grant Initiative	State	Pedestrian and Bicycle Planning Grant Initiative - to encourage municipalities to develop comprehensive pedestrian plans and bicycle plans	NA

Table 15. Funding, continued

Funding	Level	Description	Notes
State Transportation Improvement Program (STIP)	State	The seven-year transportation improvement program effective from 2021-2027 is the funding program for all projects and program areas receiving federal, state, and local funding.	Many of the Federal Grants are under STIP.
SC State Budget Earmarks	State	House Ways and Means Committee annual allocation of surplus for non-reoccurring appropriations	To be determined annually at the beginning of each fiscal year.
General Obligation Bond (GO)	Local	Voters approve funding to improve mobility/transportation, greenways, and parks & recreation.	None at this time but added for consideration.
Limited Obligation Bond (LO)	Local	Issued by a municipality authorized to build, acquire, or improve a revenue-producing property.	None at this time but added for consideration.
Capital Improvements Program (CIP)	Local	A short-range plan, usually four to ten years, which identifies capital projects and equipment purchases, provides a planning schedule and identifies options for financing the plan.	None at this time but added for consideration.
Penny Sales Tax	Local	Voters approve funding to fund capital projects by raising the sales tax in the county and allocating to improve mobility/transportation initiatives.	The county plans to pursue a vote in the Fall of 2024.
PeopleForBikes	Private	Provides funding for important projects that build momentum for bicycling in communities across the U.S. These projects include bike paths and rail trails, as well as mountain bike trails, bike parks, BMX facilities, and large-scale bicycle advocacy initiatives.	NA



MAINTENANCE PLAN



Pedestrian & Bicycle Facility Maintenance Plan

This section provides guidance on year-round maintenance for pedestrian and bicycle facilities, including sidewalks, crosswalks, curb ramps, shared use paths, and bicycle lanes. Maintaining pedestrian and bicycle facilities year-round is critical to ensuring those facilities are accessible, safe, and functional. Well-maintained facilities ensure that residents will use and support increased activities along them.

Currently, most maintenance is addressed on an as-need basis in response to resident complaints or municipal staff observations. It is recommended that systems for reporting and responding to observations of damages, vandalism, and repairs are put into place by both the city and county.

All-season maintenance covers topics such as general maintenance, pavement preservation and repair, and pavement markings, bicycle racks, and signage. With the City of Sumter being located in the southeastern portion of the state, it generally does not experience extreme winter conditions; however, some winter maintenance best practices are outlined, including snow and ice removal, pre-

and post-winter storm treatments, and winter maintenance programs.

All-Season Maintenance

GENERAL MAINTENANCE

General maintenance includes on-going upkeep such as sweeping, vegetation management, and signage and bike rack repair. The City currently owns one street sweeper and operates when necessary. Sweeping of pedestrian and bicycle facilities should be done on a regular basis, at least once in the spring and once in the fall, to clear bikeways and walkways of sand, leaves, or other debris. As the use of facilities increase, so should the frequency of sweeping. Special sweeping equipment can be purchased, such as broom attachments that attach to utility vehicles.

Vegetation management includes the maintenance of grass, trees, shrubs, bushes, and other organic material. Vegetation management is typically performed on an ongoing, as-needed basis. Sometimes these tasks are based on complaints from the public, and sometimes municipal staff will do semi-regular inspection to identify problem areas. Lastly, signs along pedestrian and bike facilities also require maintenance, as they can

become accidentally damaged, vandalized, or worn through natural aging. To mitigate graffiti vandalism, signs can be treated with an anti-graffiti coating that makes it easier to remove common forms of graffiti such as spray paint and marker pens. Signs that are replaced due to aging or accidental damage should be replaced on an as-needed basis, which varies based on sign type and level of damage.

Bicycle racks may be damaged over time or from maintenance equipment bumping into them. Depending on the severity of the damage, damaged bicycle racks may be able to be repaired relatively easily. Racks that are seriously damaged may require removal and replacement with a new rack. Sumter should consider additional funding for annual maintenance and replacement of damaged racks.

PAVEMENT PRESERVATION AND REPAIR

All types of bikeways and walkways will become damaged, worn, lifted, or cracked over time, and pavement preservation methods and repairs can help increase the lifespan of those facilities and delay the need for resurfacing or reconstruction. Just as importantly, many repairs will have an immediate impact on the safety of pedestrians and bicyclists by reducing current hazards.

Sidewalks are usually the most common pedestrian facility in a community needing on-going maintenance attention. Ignoring repairs will

There are two ways that the City, County and SCDOT can improve its responsiveness to pedestrian facility maintenance:

1. Address pedestrian maintenance needs, especially sidewalk and curb ramp replacement, when streets are resurfaced, and not wait until there is a reconstruction project.
2. Create a revolving sidewalk and curb ramp repair program. The City still needs to be responsive to complaints and concerns about daily safety problems related to sidewalks and curb ramps, but in addition, a more proactive approach would be to have the City initiate an inspection and repair program for pedestrian facilities. To administer a manageable program and address equity, this could be done by focusing on a percentage of locations per Land Use Context Area. While sidewalks are inspected, curb ramps should be as well.

often result in tripping hazards for pedestrians as well.

Often, replacing sidewalk sections are the best fix and offers a longer-term solution. According to the Federal Highway Administration (FHWA) Guide for Maintaining Pedestrian Facilities for Enhanced Safety replacing a sidewalk section is considered corrective maintenance since the underlying problem for the failure is normally addressed. Replacing just a small concrete sidewalk segment or panel (commonly 5' by 5') is not always practical since an alignment problem often occurs at the joint of a sidewalk involving two or three sidewalk segments (10 to 15'). The City, County, and SCDOT will replace longer stretches of sidewalks as part of street reconstruction projects. This is becoming somewhat more common for maintaining shared-use paths and off-street trails.

Some agencies use pavement condition indexes and rating systems to better understand the condition of walkways, trails, and bikeways. These systems guide various types of pavement preservation and indicate when repair work is needed. Generally, agencies contract with private companies to initially evaluate the entire walkway, trail or roadway network.

PAVEMENT MARKINGS

Pavement markings include striping, hatching, and other markings that delineate pedestrian and bicycle facilities from other uses and provide wayfinding at key locations. Different types of pavement markings include paint, recessed inlay markings, and durable thermoplastic marking tape. Inlay markings are slightly recessed into the pavement, so they do not get scraped off or worn down by snowplows, a common problem for surface markings. However, the downside to inlay markings is that they are less visible when it is raining at night because the retro-reflective beads that are used in the markings are diffused by the water, therefore lights do not reflect off them as well.

Thermoplastic marking tape is generally more durable than paint but can cost up to 5-8 times the price per foot as paint. Paint is the cheapest form of pavement marking, but it gets worn off easily and therefore requires more frequent reapplication. Bike lane surface markings near intersections generally wear out faster than in the middle of a block because vehicles are turning over the markings more often, or they stop on the markings and then accelerate and spin their tires on the marking. Recessed inlay markings are less prone to that problem because they have less surface exposure to car tires.

MAINTENANCE OF VERTICAL ELEMENTS (SEPARATED BIKE LANES)

Separated Bike Lanes are being successfully installed throughout the U.S. They often use simple pavement markings to create a wider separation between a bike lane and moving vehicles/door zone of parked cars supplemented with a vertical barrier. See Appendix 4 for an example of a Separated Bike lane. Stripping can be implemented during routine roadway repaving projects at almost no cost and maintenance follows the procedures highlighted above. The vertical barrier can include parked cars placed between the bike lane and moving vehicular traffic. Additional barriers include flex-posts and boxes filled with flowering plants which can be maintained by adjacent businesses and residents. Sweeping can be easily accommodated if the facility is designed to accommodate the width of Sumter’s street-sweeping vehicles or if barriers are used seasonally. Additional barrier types, their cost and durability are listed in Table 16.

Table 16. Barrier Types, Costs, & Durability

Flex-Posts	Removable Inexpensive Low durability; may require frequent replacement
Parking Stops/ Raised Oblong Bumps	Removable Durable Low visibility (due to lack of vertical element)
Planter Boxes	Removable Inflexible vertical element may be problematic on high-speed roadways Requires significant maintenance (of plantings)
Rigid Bollards	Usually permanent Relatively expensive Inflexible vertical element may be problematic on high-speed roadways



APPENDICES

APPENDIX 1 A3

Community Engagement Summaries

APPENDIX 2 A19

Review of Existing Plans & Studies

APPENDIX 3 A25

Complete List of Prioritized Corridors

APPENDIX 4 A33

Design guidance





A

APPENDIX 1

COMMUNITY
ENGAGEMENT
SUMMARIES

COMMUNITY ENGAGEMENT SUMMARIES

Public Comments from Destinations and Barriers Boards

Art in the Park - April 23rd, 2022

Iris Festival - May 28th-29th, 2022

General Comments

- Sponsor more walk/bike events to bring awareness
- Connect downtown
- Policing of aggressive drivers
- Litter is an issue along many roads

Pedestrian

- Bethel area needs
- Carolina Ave.
- 521 - Alice Dr. to Beckwood (Beach Forest)
- Pohouse to Wilson Hill Rd. (sidewalks are cracked)
- Better maintenance of facilities/some are hazardous from overgrown vegetation and trees onto sidewalks
- Need facilities in Mulberry
- Lighting is important and needs improving - use LED
- Hwy 378 at apartments needs crossing facilities - maybe a bridge
- Better signage for crosswalk at hospital
- Concerned about crossings at Guignard and Broad
- There are no crosswalks on Broad
- Facility with no dogs
- Facilities for dogs
- West Calhoun - separate
- Sidewalks from Sumter High School to downtown
- Sidewalks at Furman Middle School to US 15 near Pocalla Mineral Springs

Biking

- Bethel (add bike lanes)
- Remove debris from bike lanes
- South of Wise needs bike lanes
- Concerned about crossing at Guignard from Alice Drive Middle School
- Need facilities in Mulberry
- Wilson Hall needs bike lanes
- Swan Lake needs bike lanes
- Alice Drive between Wise and Broad – lanes are full of debris and need to be swept
- Better lighting – use LED
- Greenway next to Black River
- Bike lane to Shaw AFB
- West Calhoun to hospital
- Lakewood area – parallel
- Bike lanes from Sumter High School to downtown
- Stadium Road needs lights – hard to see at night

Other Comments

- Crosswell area needs speed bumps
- More grocery stores on the southside
- Williams St/Foxhearth/Highland needs repairing
- Bethel Church Road community wants neighborhood association
- Feel safe at Dillon Park because people are around, and police patrol the area

Open House Summary – November 16, 2022

Attendees were greeted upon arrival with a sign in process that included a description of the flow of the open house and provided comment forms for written feedback. SUATS staff and consultant team members were available to interact with attendees at the following displays:

Base Maps/Existing Conditions

- Study Area Map
- Existing Walk and Bike Facilities Map

Public Input received

- Ped Survey Response Map
- Bike Survey Response Map
- Metro Quest Public Input Dot Map

Draft Network Recommendations

- Layers of Analysis Graphics and Maps board
- Draft Network Recommendations Map
- There were also tables with large scale Network Recommendation maps laid out

Bike Share Analysis

- Bike Share Analysis Board

In addition, large maps were spread out on tables for attendees to identify specific locations of interest for bike and ped facilities. This was facilitated by SUATS staff and consultant team members.

The following comment forms were submitted by attendees:

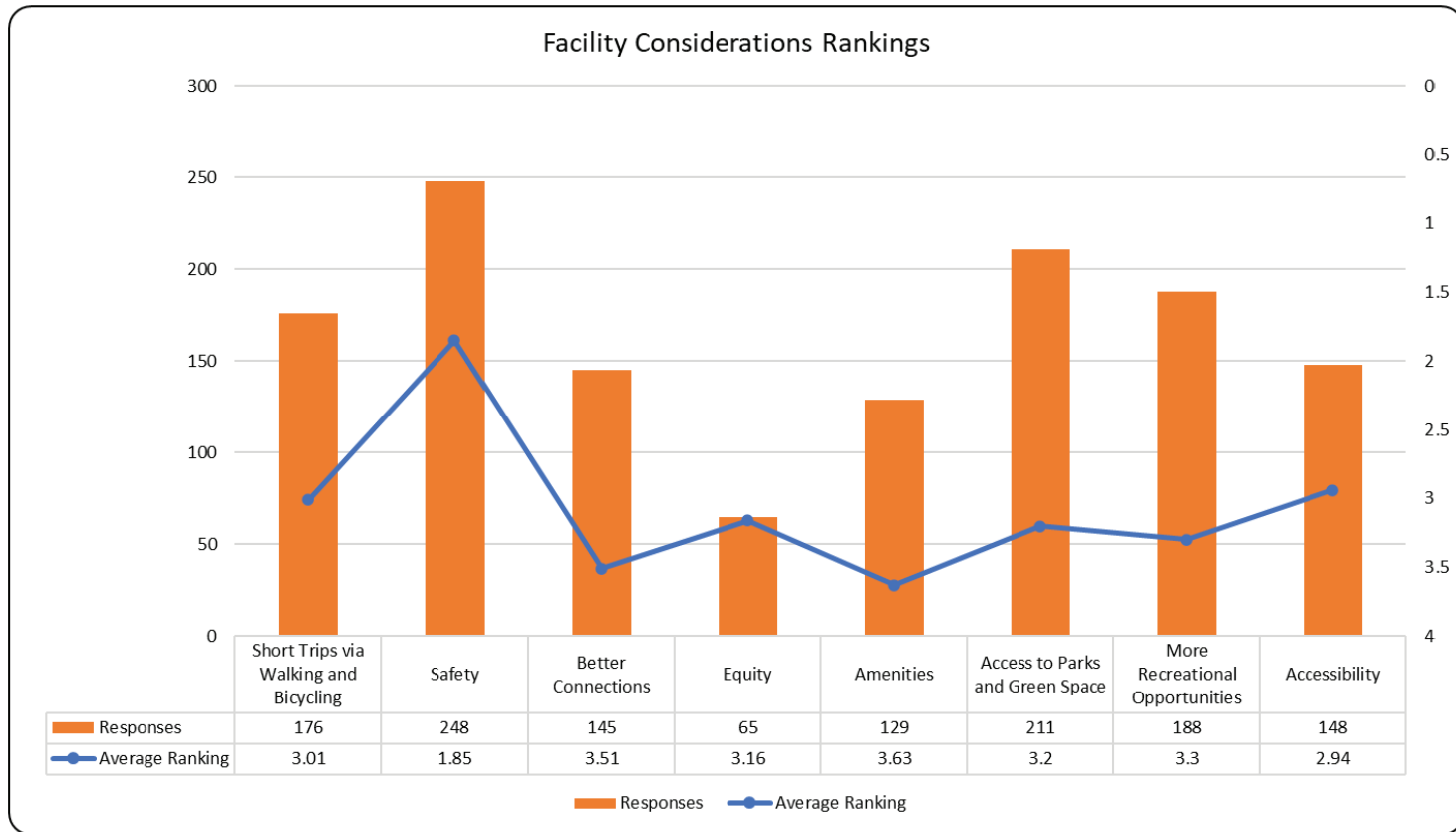
1. Please plant trees, shrubs, and wildflowers along paths. Plowden Pond loop is desolate and barren. In my opinion, cutting down trees and construction of paths without vegetation does not benefit anyone.
2. Fundraising through Sumter companies that could sponsor the entire Bike + Walk Master Plan by adopting a bicycle lane for example.
 - » Benefits for employee's health
 - » Incentives for employees who walk or bike
3. Sidewalks and bicycle lanes could also be used for going to school safely ("walking" bus supervised by adults like in Europe) instead of going there by car
4. Promotion of bicycle events (bicycle night with music and supervised by police) no cars allowed
5. I like it, great ideas and make it safe
6. Great displays and interactive activity; welcoming and personable staff
7. How will these be maintained? We have one trash officer. Plowden Pond loop is unattractive
8. Turkey Creek private landowners – it's a no go. Re-route map. We do not want anyone walking or riding bike on property that they do not have reason to do.
9. Turkey Creek area is a no go for private landowners who do not want to give up their

land. Also we hunt, fish, farm, and do not need anyone walking down the path during these times. There will be no access for emergency vehicles. The crime rate in the area is high and we are allowing out for the safety of the public.

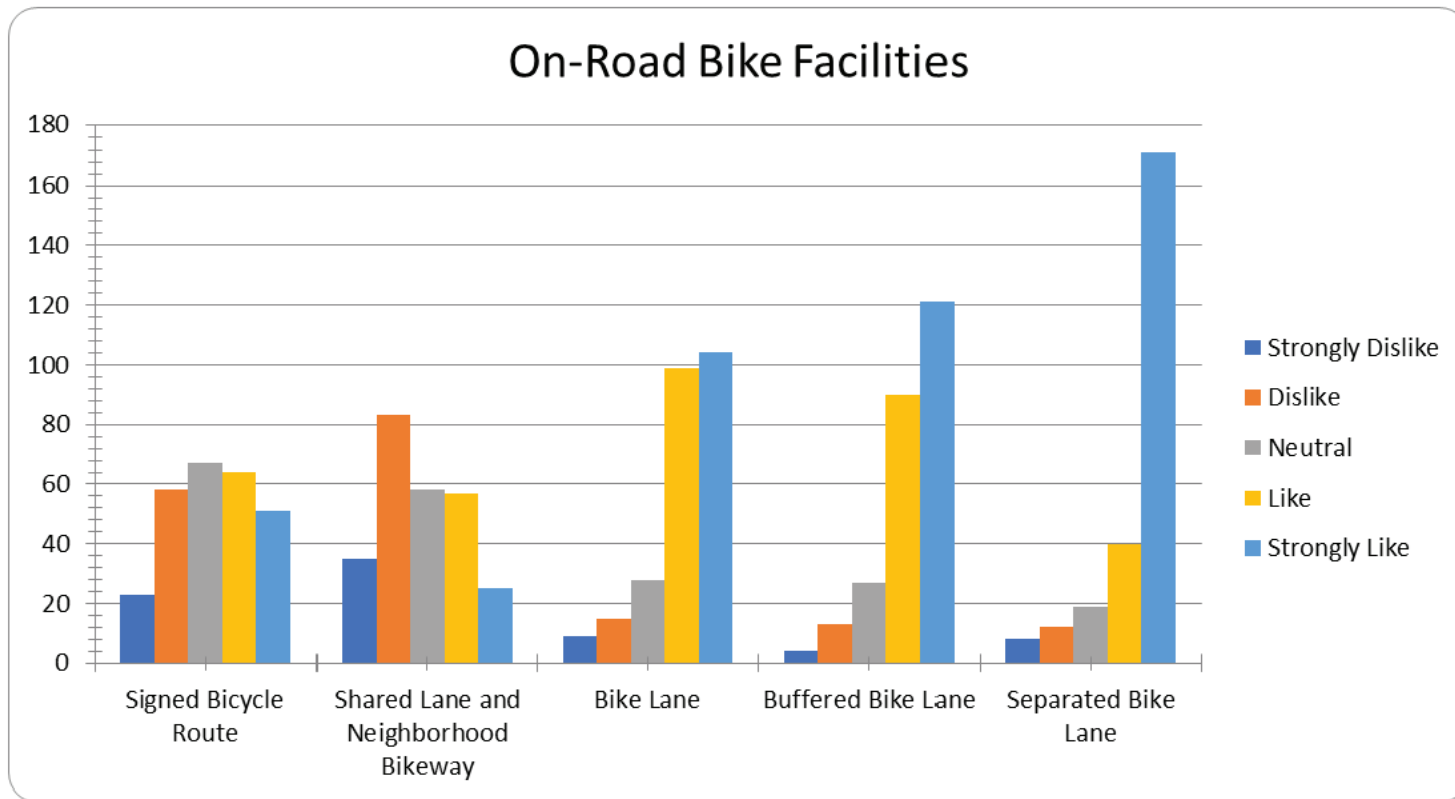
10. Mooneyham Road (Turkey Creek Walkway) in my opinion would be a mistake as it could lead to further drug use and abuse not to mention trespassing on to landowners' property surrounding the creek. Though the "walkway" may have grants to pay for building, it would be up to taxpayers to keep up the walkway. I would rather my money be spent more wisely.
11. I think that the path along Turkey Creek is a total waste. In the summer biting insects would make the trail impossible to use and increase trash and crime.

Metroquest Survey Results

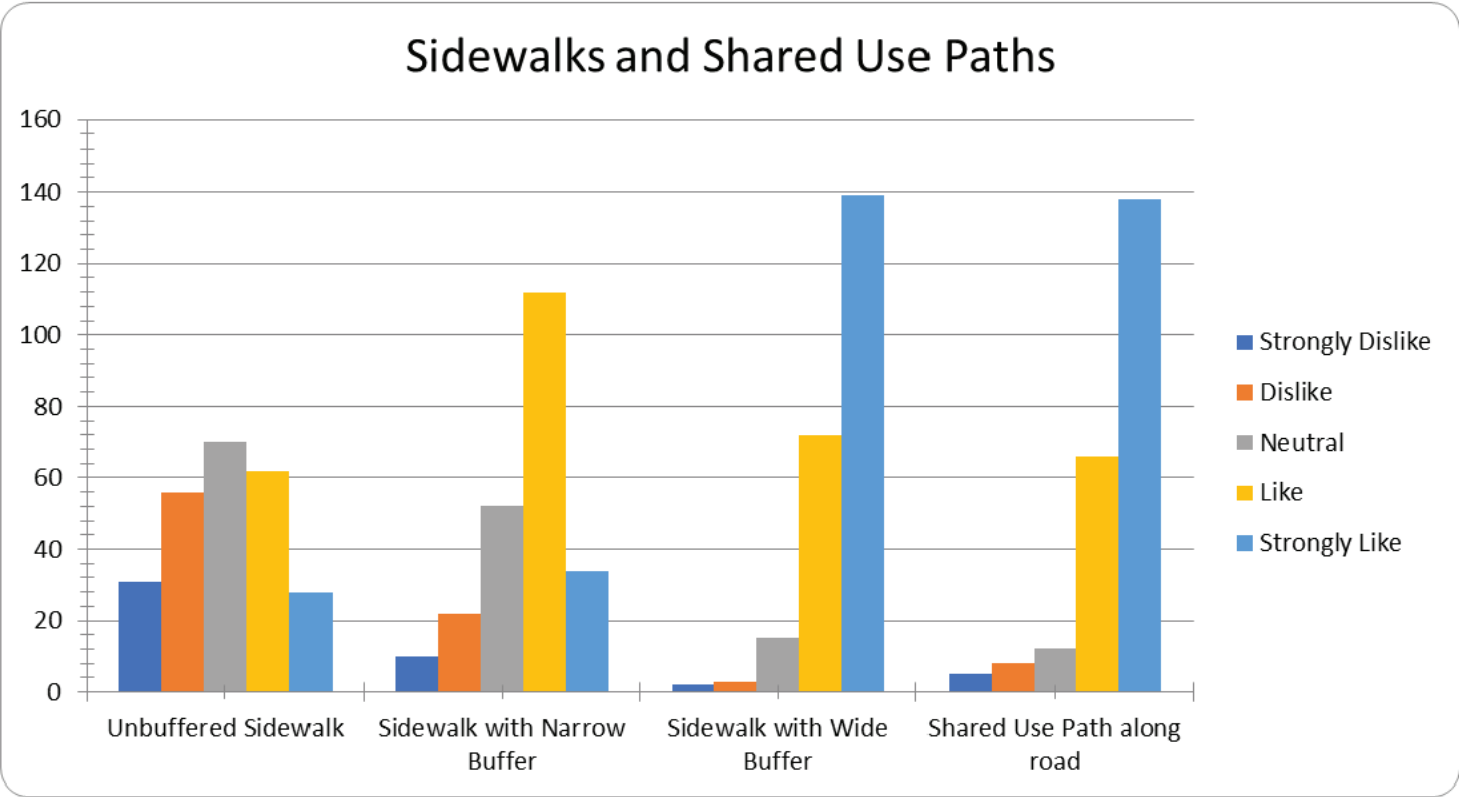
Respondents' top 5 priorities when Sumter builds new walk and bike facilities.



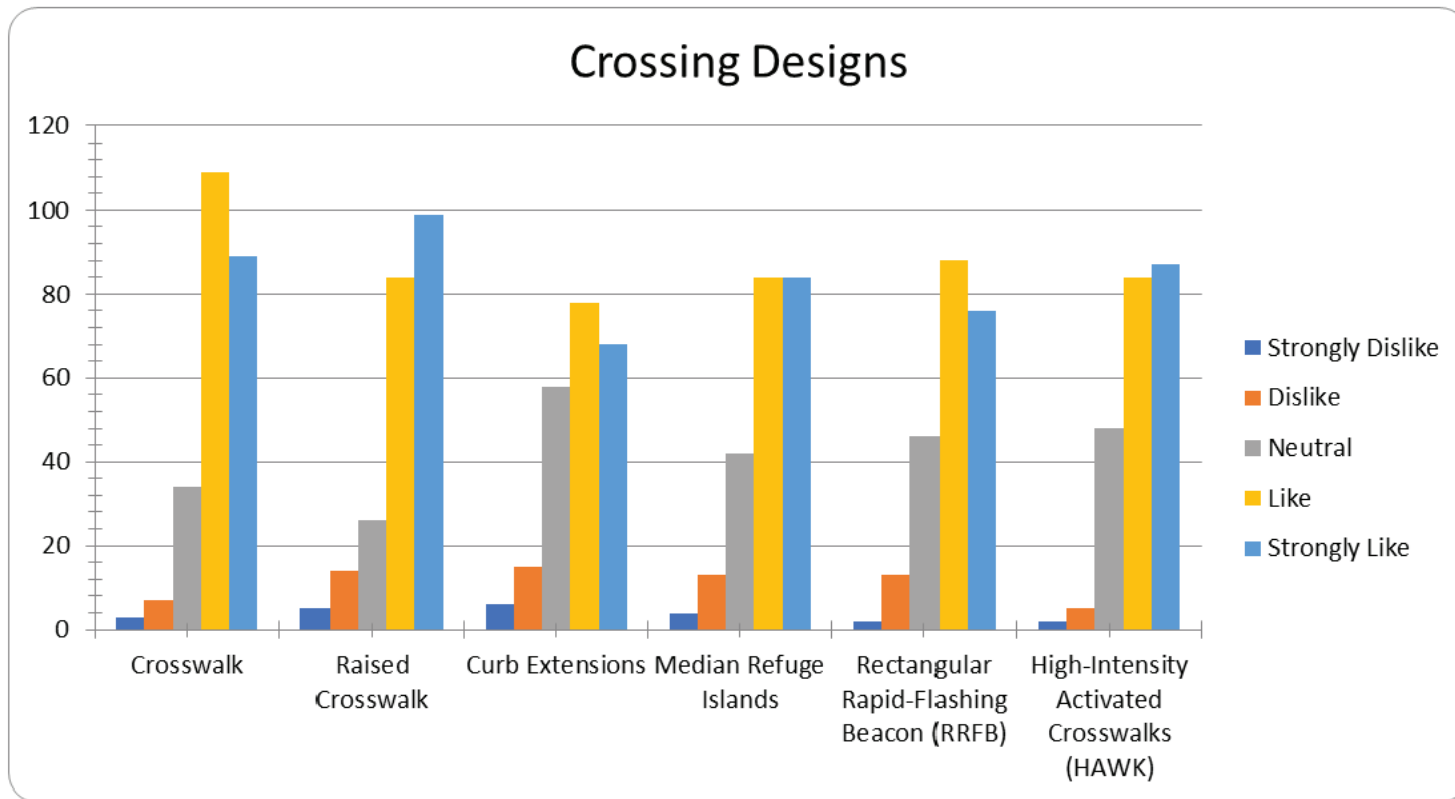
Respondent's Feelings on Different Facility Types



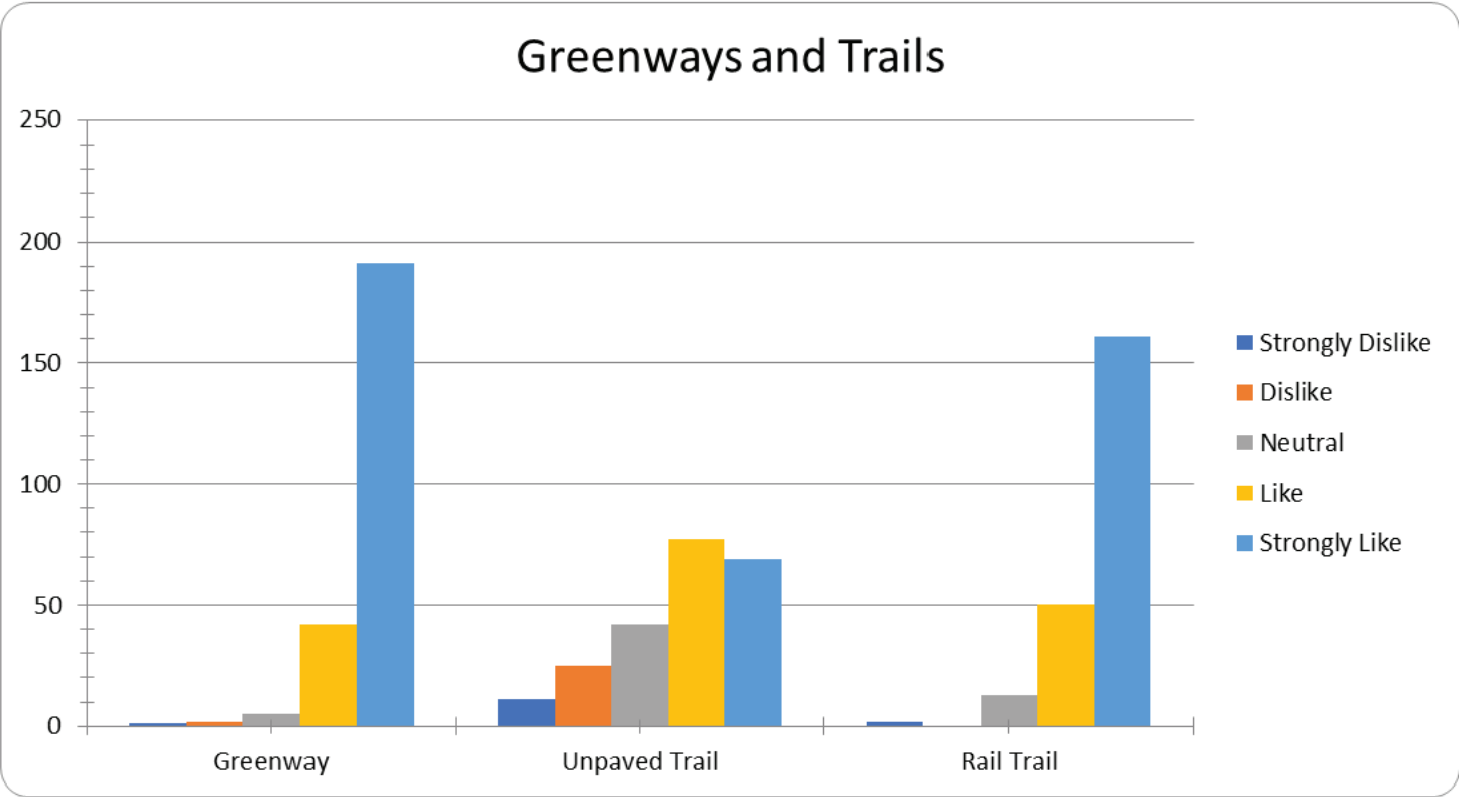
Respondent's Feelings on Different Facility Types



Respondent's Feelings on Different Facility Types



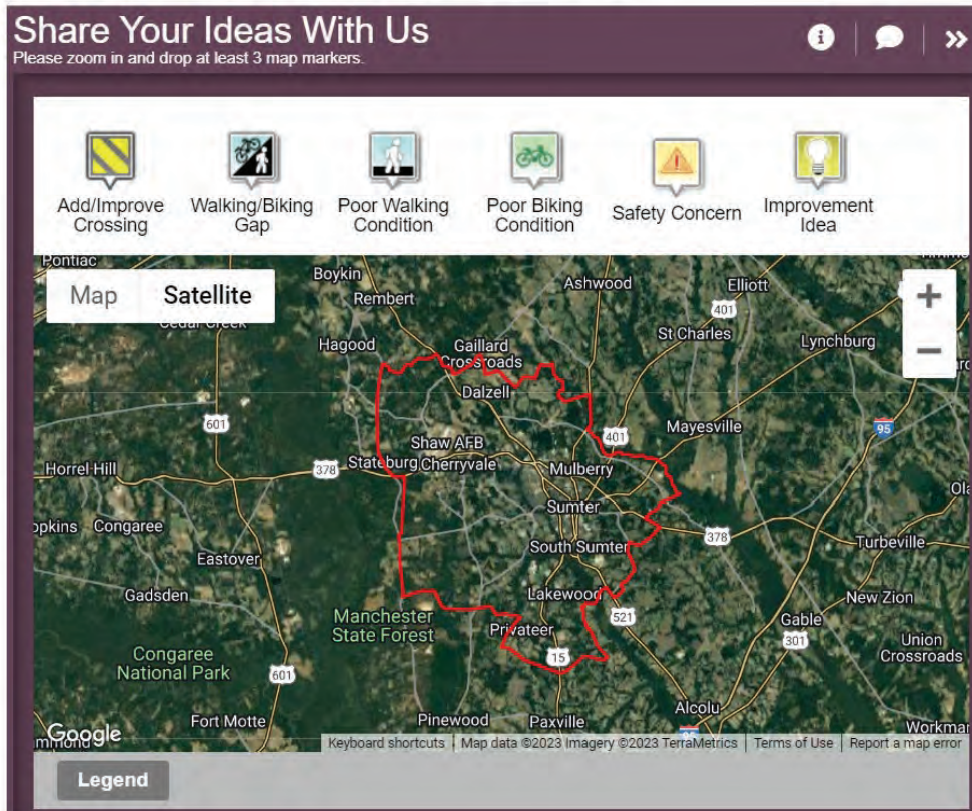
Respondent's Feelings on Different Facility Types



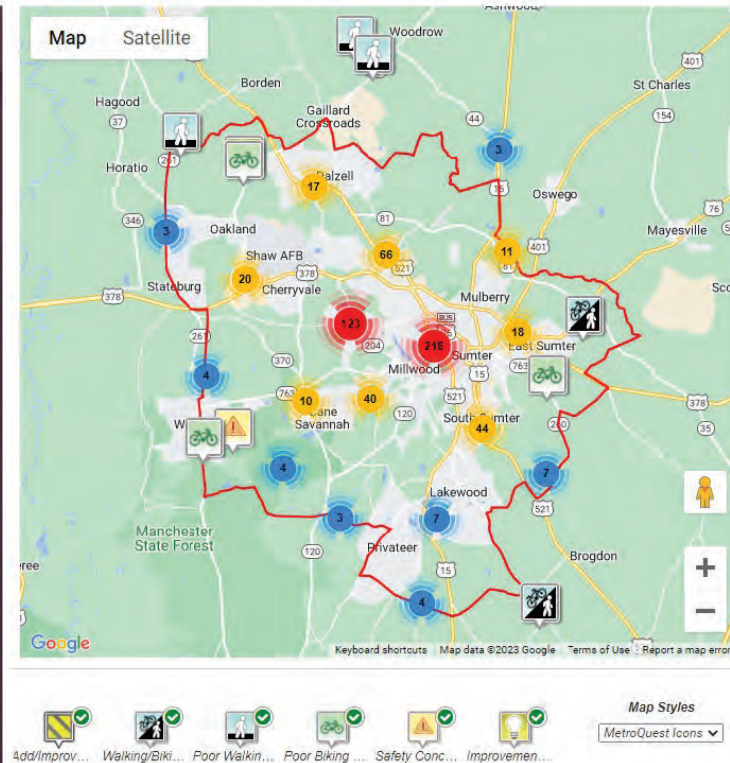
Respondent's Feelings on Different Facility Types



Mapping Exercise

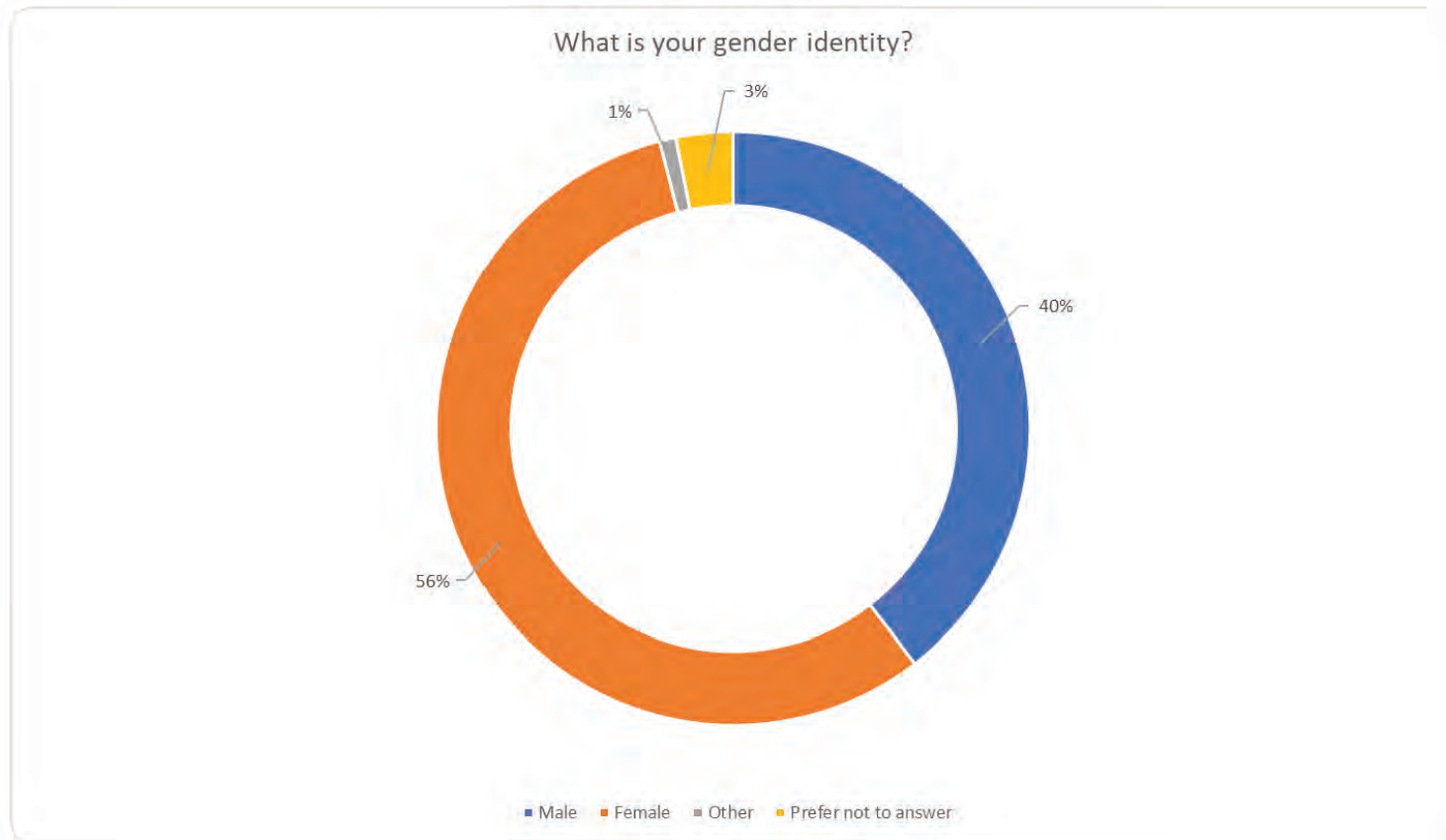


Mapping Exercise Results



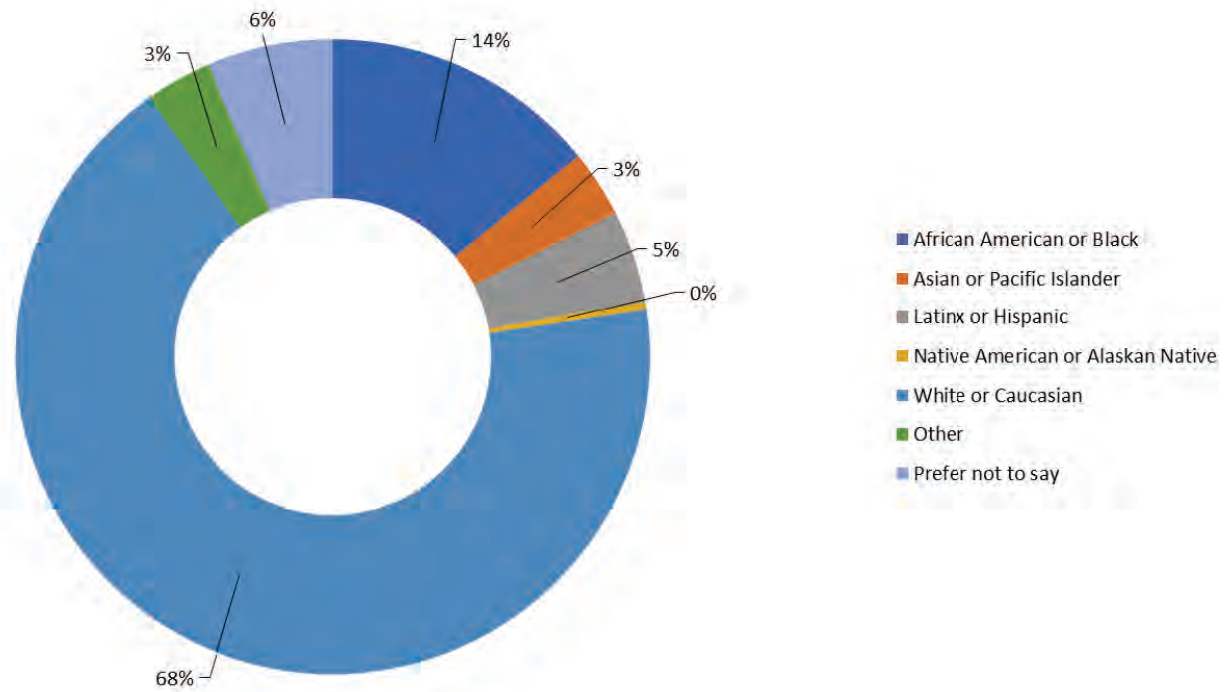
The responses received from the Mapping Exercise were spread across the whole study area as shown in the image on the right. The numbers in the colored bubbles represent how many responses were added in that general area. The comment density was highest in the Downtown area with roughly 216 points added in this area. This is followed by the Wise Drive/Patriot Parkway Corridor.

Demographic Data

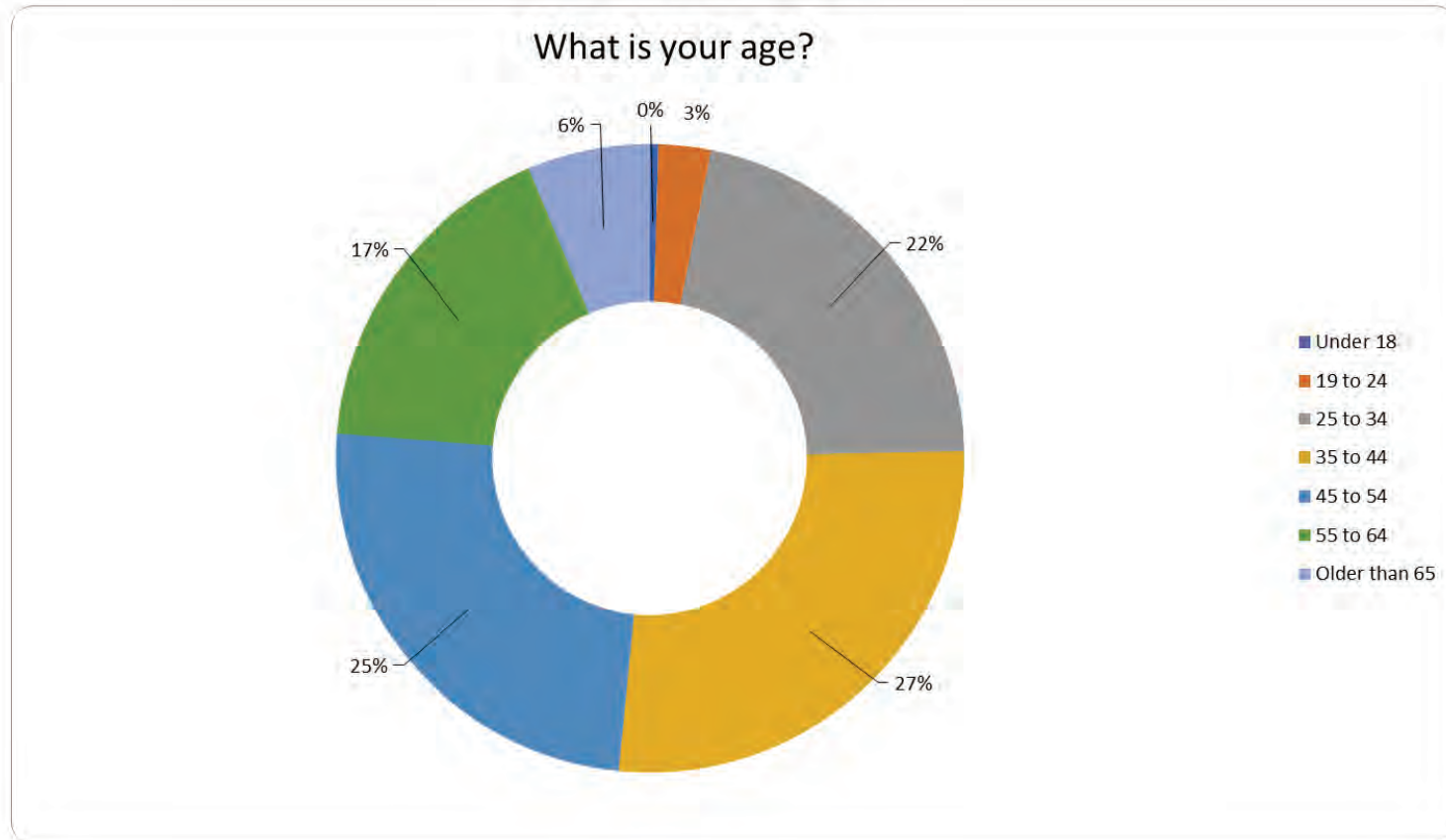


Demographic Data

What race or ethnicities do you identify with? Select all that apply



Demographic Data





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APPENDIX 2

REVIEW OF
EXISTING PLANS
& STUDIES

REVIEW OF EXISTING PLANS & STUDIES

SUATS TIP (2020)

The SUATS Transportation Improvement Program (TIP) outlines necessary transportation projects and their required funding. Typical TIP projects include intersection and signalization improvements, safety projects, transit alternatives, and pedestrian and bicycle infrastructure needs. The TIP uses the SUATS goals of reducing crash rates and improving the general safety of pedestrians and cyclists, creating interconnected streets, and creating a balanced transportation system as guidelines for determining which projects are essential and what funds to allocate toward the projects (page 13). A breakdown of funding is found on pages 20-27.

Sumter 2040 Comprehensive Plan (2019)

When considering future land use, the “Transportation Element” of the 2040 Comprehensive Plan looks at all aspects of Sumter’s transportation system, including sidewalks and bike paths. The T-4 map shows proposed bike and pedestrian project locations,

and the T-6 map shows proposed and existing bike paths (page T3). Through new and updated sidewalks, trails, signalizations, etc., the City and County expect improved safety and usability of the transportation system.

Sumter Downtown Master Plan (2019)

The Sumter Downtown Master Plan presents improvement ideas and implementation strategies for the city’s downtown. These proposed ideas look to create more commercial and residential opportunities in the downtown area by building upon the city’s history and recent improvements. Road diets, on-street parking, bicycle lanes, wider sidewalks, traffic calming measures, and ADA compliant intersection improvements are proposed along Liberty, Harvin, Washington, Sumter, and Bartlette Streets with the suggested improvements varying by street. The proposed bike lanes will create a “loop” in the downtown area and provide a connection to the Shot Pouch Trail (pages 17-29).

SUATS Long Range Transportation Plan (LRTP) 2045 (2018)

In order to enhance the transportation system in the City of Sumter and Sumter County, the SUATS LRTP looks to identify areas in need of improvement. The LRTP outlines proposed projects and policies as well as implementation strategies. Recommended improvements to the roadways include paving and resurfacing, expanding the existing sidewalk network, road widening, intersection enhancements, greenway connections, and traffic calming measures (pages 5-1 – 5-2). The “Complete Street” concept, which considers the street’s setting, pedestrian area, intersections, and vehicular travel way (page 5-17 – 5-20), is suggested for new roads and roadway enhancement projects as it safely accommodates all roadway users. Of the listed roadway projects, all but three recommend some form of pedestrian/bicycle improvements (pages 5-21 – 5-44). Residents of Sumter have expressed a need for improved pedestrian and bicycle access and facilities throughout the transportation network. Specifics of the “Bicycle and Pedestrian Element” can be found in Chapter 6 of the LRTP. Through consideration of the existing state of sidewalks, bicycle lanes, and trails, and the general needs

of pedestrians and bicyclists, the 2045 LRTP recommends new sidewalks, bike lanes, and multi-use paths and improvements to those already existing in the SUATS study area (pages 6-11 – 6-16). Additional proposed measures to increase user safety include traffic calming strategies, signage, designated bicycle parking, and general maintenance (pages 6-17 – 6-19). Education, encouragement, and enforcement programs and policies are recommended to promote cycling and familiarize citizens with the activity while instilling safety measures (pages 6-21 – 6-23). Survey results reveal the most common form of commuting to work is by car while walking is the second most common and biking the third (page 7-3). Funding information for pedestrian and bicycle projects can be found on page 9-2. Chapter 10 “Implementation Plan” presents the LRTP implementation strategies with specifics on bicycle and pedestrian implementation on page 10-3.

Hampton Park Historic District: Traffic Calming Program Report (2016)

This report focuses on the Hampton Park Historic District, primarily Calhoun Street, as there is a rising need for safety measures due to increased traffic counts in the area. Survey results found

walking and biking to be the second and third most common forms of transportation in the district and driving the first (page 4). Because speeding is not a significant occurrence along the western section of Calhoun Street, only pedestrian and bicycle-friendly improvements are suggested (page 8). The middle section of Calhoun Street does see an increase in speeding due to the existing layout of this particular section of road. Traffic calming measures and pedestrian and bicycle safety features, like pedestrian islands, curb extensions, and bicycle lanes, are proposed (page 9). There is an increased vehicular and pedestrian presence at the Eastern section of Calhoun Street near the commercial area; therefore, traffic calming measures, such as medians and highly visible crosswalks, are recommended. This area also contains the beginning of the westbound bike lane and the termination of the eastbound bike lane (page 10). Bike lanes and sharrow markings are proposed along Haynsworth Street and Hampton Avenue respectively (page 12).

Santee- Lynches Regional Transit Plan (2014)

The Santee- Lynches Regional Transit Plan examines the region's existing transportation network, areas of improvement within the network, and strategies for further developing and

enhancing the network. The SCDOT recognizes multimodal transportation as an important element in the improvement of the state's overall transportation system. Because safety remains one of the main goals of the Santee- Lynches Transit Plan, there is a focus on reducing crash rates of vehicles, pedestrians, and bicycles through roadway improvements and safe driving practices (page 33). Data based on information collected about citizens in the region relates to the need and demand for a variety of transit options (pages 49-58). Appendix A (pages 69-71) lists points made during the kickoff meeting, many of which pertain to pedestrian and bicycle facilities and policies in the region.

Shot Pouch Creek Master Plan (2014)

The Shot Pouch Creek Master Plan provides proposed greenway paths and improvement ideas for the existing greenway that ensure safe and more pedestrian and bicycle-friendly connections to Sumter neighborhoods, parks, and other areas of interest. This master plan proposes new pathways, crosswalks, medians, signage, fencing, security cameras, landscaping, and trail connections to improve user experience on the greenway. Focus areas of the master plan to include these proposed amenities are: Dillon Park

to Broad Street (pages 17-27), the Broad Street Node (pages 28-29), Broad Street to Guignard Drive (pages 31-33), the Guignard Drive Node (pages 34-36), Guignard Drive to Swan Lake (page 37), Haynsworth Street (page 38), Liberty Street Node at Swan Lake (pages 43-44), Swan Lake to Birnie Hope Center (page 47), Oakland Avenue (page 48), and Second Mill Pond (pages 49-51). Proposed along Liberty Street and Guignard Drive are corridor enhancements such as signalization, crosswalk markings, greenway connections (pages 67-68), and traffic calming measures (page 69).

Lafayette Drive Corridor Study (2007)

The Lafayette Drive Corridor study presents ideas for improving safety and usability along Lafayette Drive. Focus areas along the road include the North Gateway District, the Government District, and the South End District. Although each area necessitates different program specifics, the general recommendations for the whole of Lafayette Drive include planted medians, new and/or improved crosswalks, improved intersections and signalization, and multimodal transportation access where appropriate (pages 12, 20, 23, 31). These improvements will facilitate traffic calming and provide better access and safety for pedestrians and cyclists.

Additional Plans & Studies Reviewed

The following plans and studies made no reference to pedestrian nor bike facility planning:

- Sumter City-County Planning Department Year End Report (2020)
- Sumter Affordable Housing Study (2019)
- Sumter Shaw AFB- Joint Land Use Study (2016)
- City of Sumter Tree Canopy Estimate (2013)
- City of Sumter Historic Resources Survey (2010)





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APPENDIX 3

**COMPLETE
LIST OF
PRIORITIZED
CORRIDORS**

COMPLETE LIST OF PRIORITIZED CORRIDORS

Corridor ID	Name	Equity Score	Schools Score	Transit Score	Parks Score	Public Input Score	Safety Score	Total Score	Tier	Land Use	Functional Class	Length (mi)
7	N-S Main St & Manning Ave	10	10	10	10	10	10	60*	High	Urban Core	Minor Arterial	0.66
9	N-S Lafayette Dr	10	10	10	10	10	10	60*	High	Urban Core	Major Arterial	0.60
37	Calhoun Dr & W Calhoun St	10	10	10	10	10	10	60*	High	Urban Core	Local Street	0.59
65	Off-Street Trail	10	10	10	10	10	10	60	High	Urban		1.51
10	E-W Liberty St	10	10	10	10	10	10	60	High	Urban Core	Minor Arterial	0.66
6	Broad St & Warren St	10	10	10	10	10	10	60*	High	Urban	Major Arterial	0.43
15	N Main St	10	10	10	10	10	10	60*	High	Urban	Collector	0.36
40	N Bultman Dr	5	10	10	10	10	10	55*	High	Urban	Major Arterial	0.41
57	S Wise Dr	5	10	10	10	10	10	55	High	Urban	Minor Arterial	0.54
59	Wise Dr	5	10	10	10	10	10	55	High	Urban	Minor Arterial	0.32
43	W Wesmark Blvd	5	10	10	10	10	10	55*	High	Urban	Collector	0.42
5	Broad St	5	10	10	10	10	10	55	High	Urban	Major Arterial	0.61

* Corridor is recommended as a Top 10 Corridor

Corridor ID	Name	Equity Score	Schools Score	Transit Score	Parks Score	Public Input Score	Safety Score	Total Score	Tier	Land Use	Functional Class	Length (mi)
60	N Guignard Dr	5	10	10	10	10	10	55	High	Urban	Major Arterial	0.42
8	Pocalla Rd & E Red Bay Rd	10	10	0	10	10	10	50	Medium	Urban	Minor Arterial	0.70
55	Camden Hwy	5	10	10	5	10	10	50*	Medium	Suburban	Major Arterial	0.47
58	N Wise Dr	5	10	10	10	10	5	50	Medium	Suburban	Minor Arterial	0.38
38	Alice Dr	5	10	10	10	10	5	50	Medium	Urban	Minor Arterial	0.38
39	Alice Dr	5	10	5	10	10	10	50	Medium	Urban	Minor Arterial	0.42
2	Peach Orchard Rd	5	10	10	10	5	10	50	Medium	Rural	Major Arterial	0.96
4	Broad St	5	10	10	5	10	10	50*	Medium	Suburban	Major Arterial	0.81
45	Jefferson Rd	5	10	10	10	5	10	50	Medium	Suburban	Collector	0.51
16	E Charlotte Ave	10	10	10	10	0	10	50	Medium	Urban	Collector	0.26
61	S Guignard Dr	10	10	5	10	10	5	50	Medium	Urban	Major Arterial	0.33
41	Gion St	5	10	10	10	5	5	45	Medium	Urban	Local Street	0.09
32	Patriot Pkwy	5	10	10	5	10	5	45	Medium	Rural	Minor Arterial	1.09
34	Loring Mill Rd	5	5	10	5	10	10	45	Medium	Suburban	Collector	0.55
36	Pinewood Rd & W Liberty St	5	10	0	10	10	10	45	Medium	Urban	Minor Arterial	0.62
26	Wedgfield Rd	5	10	0	10	10	10	45	Medium	Suburban	Minor Arterial	0.71

* Corridor is recommended as a Top 10 Corridor

Corridor ID	Name	Equity Score	Schools Score	Transit Score	Parks Score	Public Input Score	Safety Score	Total Score	Tier	Land Use	Functional Class	Length (mi)
3	Broad St	5	0	10	10	10	10	45*	Medium	Rural	Major Arterial	1.28
44	Wilson Hall Rd	5	10	10	0	10	10	45	Medium	Suburban	Collector	0.55
13	Boulevard Rd	5	10	10	10	5	5	45	Medium	Suburban	Collector	0.76
62	Off-Street Trail	5	10	10	0	10	10	45	Medium	Suburban		0.81
63	Off-Street Trail	10	10	0	10	5	10	45	Medium	Urban		0.84
29	Loring Mill Rd	5	10	0	10	10	5	40	Medium	Suburban	Minor Arterial	0.75
56	S Wise Dr & Patriot Pkwy	5	10	0	10	10	5	40	Medium	Suburban	Minor Arterial	0.67
35	Mccrays Mill Rd	10	10	0	10	5	5	40	Medium	Urban	Collector	0.47
23	Lynam Rd	5	10	0	10	10	5	40	Medium	Suburban	Collector	0.25
20	Stadium Rd	5	10	0	10	10	5	40	Medium	Suburban	Collector	0.49
1	Peach Orchard Rd	5	10	10	0	5	10	40	Medium	Rural	Major Arterial	1.08
66	Off-Street Trail	5	10	0	5	10	10	40	Medium	Urban		1.06
11	US 15 Hwy S S	5	10	0	10	5	10	40	Medium	Urban	Minor Arterial	0.84
47	Camden Hwy	5	10	0	10	5	10	40	Medium	Rural	Collector	0.90
48	Camden Hwy	5	5	0	10	10	10	40	Medium	Suburban	Collector	1.02
17	Lewis Rd	10	10	0	10	5	5	40	Medium	Suburban	Collector	0.93

* Corridor is recommended as a Top 10 Corridor

Corridor ID	Name	Equity Score	Schools Score	Transit Score	Parks Score	Public Input Score	Safety Score	Total Score	Tier	Land Use	Functional Class	Length (mi)
42	Carter Rd	5	0	10	0	10	10	35	Low	Suburban	Collector	0.43
18	Kingsbury Dr	5	10	0	5	10	5	35	Low	Suburban	Collector	0.64
19	Pinewood Rd	0	10	0	10	10	5	35	Low	Suburban	Collector	0.53
21	Mccrays Mill Rd	0	10	0	10	10	5	35	Low	Suburban	Collector	0.54
46	Airport Rd	5	5	5	10	5	5	35	Low	Suburban	Collector	0.42
33	N St Pauls Church Rd	0	0	10	10	5	5	30	Low	Rural	Collector	0.65
31	Eagle Rd	5	10	10	0	0	5	30	Low	Rural	Collector	0.62
12	Bethel Church Rd	5	10	0	10	0	5	30	Low	Suburban	Collector	0.57
54	Beckwood Rd	5	0	0	0	10	10	25	Low	Suburban	Local Street	0.22
28	Keels Rd	5	5	0	0	5	10	25	Low	Suburban	Collector	0.34
53	Mason Rd	5	0	0	0	10	10	25	Low	Suburban	Collector	0.27
64	Off-Street Trail	5	10	0	0	5	5	25	Low	Suburban		1.40
24	Pitts Rd	0	5	0	0	5	10	20	Low	Suburban	Collector	0.31
27	Deschamps Rd	0	0	0	10	10	0	20	Low	Suburban	Local Street	0.62
52	Stamey Livestock Rd	5	0	10	0	5	0	20	Low	Suburban	Local Street	0.47
30	Cane Savannah Rd	5	10	0	0	0	5	20	Low	Rural	Collector	0.68

Corridor ID	Name	Equity Score	Schools Score	Transit Score	Parks Score	Public Input Score	Safety Score	Total Score	Tier	Land Use	Functional Class	Length (mi)
25	N St Pauls Church Rd	5	0	0	0	5	5	15	Low	Rural	Collector	0.66
14	Mooneyham Rd	5	0	0	0	0	10	15	Low	Suburban	Collector	0.60
49	Charles Jackson St & Pecan Acres Rd	5	0	0	0	5	5	15	Low	Rural	Local Street	0.36
50	Stamey Livestock Rd	5	0	0	0	5	0	10	Low	Rural	Local Street	0.56
51	Four Bridges Rd	5	0	0	0	5	0	10	Low	Suburban	Local Street	0.44
67	Off-Street Trail	0	0	0	0	5	5	10	Low	Suburban		1.54
22	Mccrays Mill Rd	0	0	0	0	5	0	5	Low	Suburban	Collector	0.76

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A photograph of a building exterior with a mural and a dark green diamond-shaped overlay containing text. The background shows a building with a mural of a dinosaur and a landscape, a door with a 'FAS' sign, and some landscaping. The overlay is a dark green diamond shape with a white letter 'A' at the top, 'APPENDIX 4' in the middle, and 'DESIGN GUIDANCE' at the bottom. There are also three diagonal stripes in red, orange, and dark green at the bottom right corner.

A

APPENDIX 4

DESIGN
GUIDANCE

DESIGN GUIDANCE

Summary

Recommendations that achieve a safe, connected, accessible, comfortable, and convenient pedestrian and bicycle network require design guidance that reflects best practices and can serve as a resource for the County moving forward. Design guidance provided in this appendix is drawn from a comprehensive review of existing state and federal pedestrian and bicycle policies. In accordance with the South Carolina Pedestrian and Bicycle Safety Action Plan, SCDOT Complete Streets Policy and Departmental Direction number 28, implementation of complete streets on state-owned highway systems will require policy change with numerous other sources of information within the Department of Transportation. Direction number 28 states that it will supersede all other Department guidance that conflict with it and has adopted publications from the following sources to draw principles from:

- Federal Highway Administration (FHWA)

- National Cooperative Highway Research program (NCHRP)
- Transportation Research Board (TRB)
- American Association of State and Highway Transportation Officials (AASHTO)
- National Association of City Transportation Officials (NACTO)
- National Highway Traffic Safety Administration (NHTSA)

Guidance from these organizations is referenced throughout the appendix and references to the publications can be found on the Facility Section Guidance section. This design guidance should be used by planners and engineers to better understand important considerations as they plan and design safe and comfortable infrastructure for SUATS. Pedestrian and Bicycle design features in this appendix may update existing standards while others may be new treatments to be adopted by the City or County for implementation.

Why design pedestrian facilities using this guidance?

Walking and wheeling (i.e., traveling via wheelchair or other mobility assisting device for people with disabilities) are the most basic and sustainable forms of transportation. Walking/wheeling is an affordable way to travel between destinations that is accessible to nearly the entire population.

To encourage walking in the County, infrastructure must be safe, comfortable, visible, and accessible. In most contexts, pedestrian traffic flow should be separated from motorized travel horizontally and/or vertically. Separation protects users from high-speed traffic and helps people walking feel more at ease. Also, well-designed pedestrian infrastructure makes people more visible to cars. All infrastructure should be compliant with guidelines from the Americans with Disabilities Act (ADA) to ensure that the network of routes is accessible to all, regardless of age or ability.

Why design bicycle facilities using this guidance?

Estimates show that most of the US population—upwards of 60-70%—would like to bicycle for some trips but are uncomfortable interacting with vehicular traffic. This group, commonly identified as the “Interested but Concerned” category, are most comfortable cycling separated from motorized vehicles. Conversely, roughly 1% of the US population indicate they are “Strong and Fearless” bicyclists, comfortable sharing the road with motorized vehicles. In the middle, approximately 7% are in the “Enthusied and Confident” category, and they may be comfortable cycling for short distances with motorized vehicles.

If SUATS wants to increase bicycling, particularly for a diverse array of trip types, it is essential to select and design facilities that will allow more people to feel comfortable bicycling for these trips. Less confident bicyclists prefer physical separation from vehicular traffic as traffic volumes and speeds increase.

Facility Selection Guidance

The selection of pedestrian and bicycle facilities requires a balance of community priorities of local land use context, analysis, engineering judgment, available funding, and physical constraints based on existing street characteristics. The facility selection process is iterative; as more data about the street and surrounding context is gathered, the type of facility that designers and planners deem most appropriate may change. It is important to consider all priorities previously listed to make the best selection for any given project. The Federal Highway Administration (FHWA) Bikeway Selection Guide is a valuable resource for bikeway specific selection and uses vehicle speed and traffic volumes to assist practitioners with planning and designing bikeways for all ages and abilities.

Comfort Typology of Bicyclists



Design User Profile	Non-Bicyclist	Interested but Concerned	Somewhat Confident	Highly Confident
Bicycling Preferences	Uncomfortable bicycling in any condition, have no interest in bicycling, or are physically unable to bicycle.	Often not comfortable with bike lanes, may bike on sidewalks even if bike lanes are provided; prefer off-street or separate bicycle facilities or quiet or traffic-calmed residential roads. May not bike at all if bicycle facilities do not meet needs for perceived comfort.	Generally prefer more separated facilities, but are comfortable riding in bicycle lanes or on paved shoulders if need be.	Comfortable riding with traffic, will use roads without bike lanes.
Percent of General Public	31-37%	51-56%	5-9%	4-7%

Other Resources

The publications listed here are excellent resources for planning and design guidance in implementing safe, comfortable accommodations for pedestrians and bicyclists in a variety of environments. Many of these resources are available online at no cost. Additional sources for standards and guidance are referenced throughout this Guide. These should be used in conjunction with this Guide to assist in making decisions as appropriate.

ADA: Americans with Disabilities Act:

- United States Access Board's proposed Public Rights-of-Way Accessibility Guidelines (PROWAG), 2011
- 2010 ADA Standards for Accessible Design

American Association of State Highway and Transportation Officials (AASHTO)

- Guide for the Development of Bicycle Facilities, 2012
- Guide for Geometric Design of Transit Facilities on Highways and Streets, 2014
- Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2004

Federal Highway Administration (FHWA)

- Federal Highway Administration (FHWA) Bikeway Selection Guide, 2019
- The Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD)
- Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts, 2016

- Federal Highway Administration (FHWA) Traffic Calming e-Primer 3.7
- Separated Bike Lane Planning and Design Guide, 2015
- Incorporating On-Road Bicycle Networks into Resurfacing Projects, 2016
- FHWA's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations, 2018

The National Association of City Transportation Officials (NACTO)

- NACTO Transit Street Design Guide, 2016
- NACTO Urban Bikeway Design Guide, 2012
- NACTO Urban Street Design Guide, 2013

Local Standards

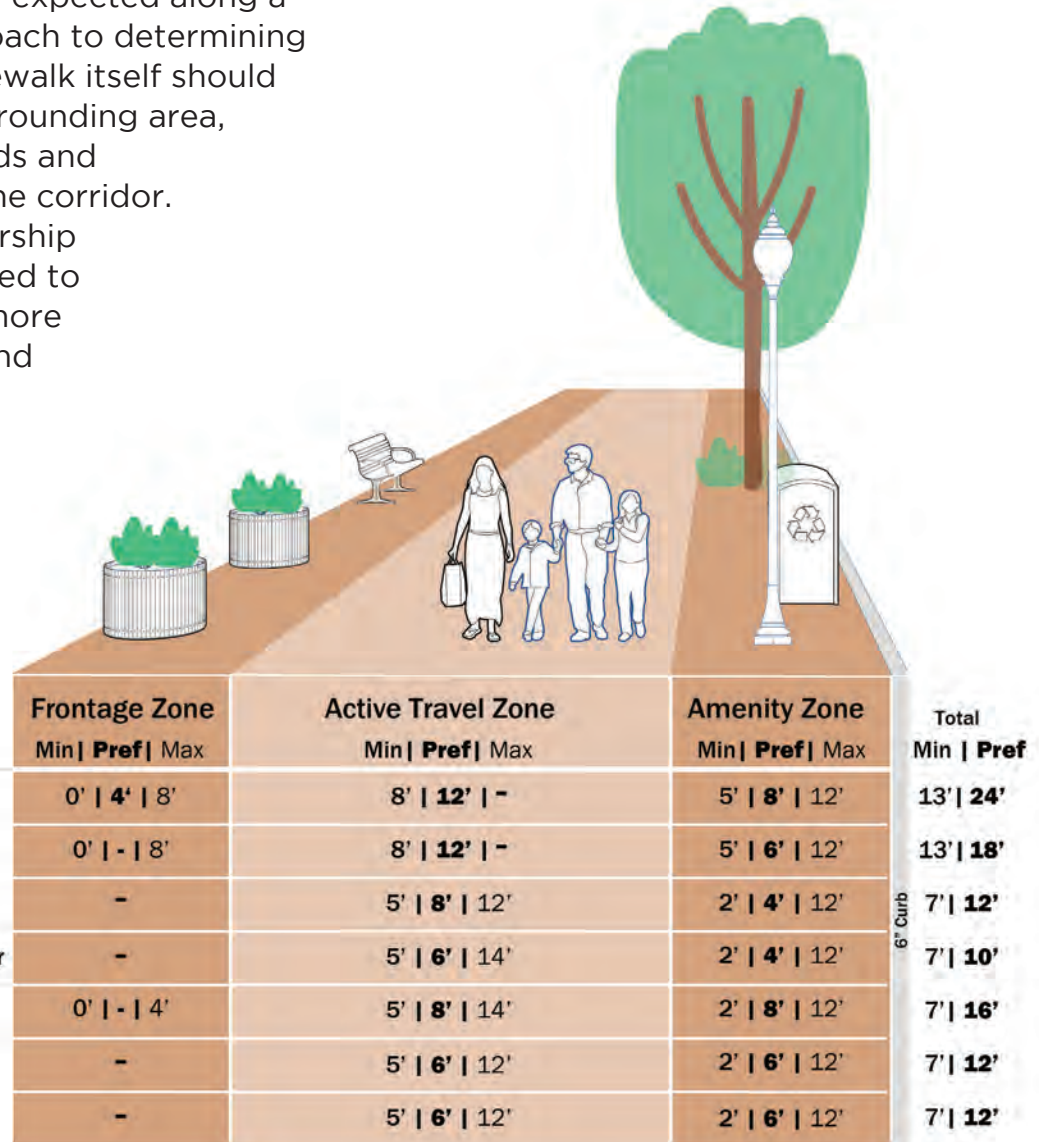
- South Carolina Pedestrian and Bicycle Safety Action Plan, 2022
- SCDOT Complete Streets Policy, Departmental Directive #28
- SCDOT Crosswalk Implementation Guidelines
- SCDOT Traffic Calming Guidelines
- SCDOT Roadway Design Manual

Other Standards

- Massachusetts Department of Transportation (MassDOT), Separated Bike Lane Planning & Design Guide, 2016

O2: Preferred Widths for Sidewalk Zones

Sidewalk zones will vary in width depending on the Corridor Type, available right of way, modes to be served, scale of adjacent buildings, and the intensity and type of uses expected along a particular street segment. A balanced approach to determining the widths of the various zones and the sidewalk itself should consider the character or context of the surrounding area, anticipated pedestrian activity, and the needs and demands of multimodal transportation on the corridor. For instance, if a street is part of a high-ridership transit route, then the amenity zone may need to be larger to accommodate larger shelters, more seating, and additional room for boarding and alighting. Similarly, if the street has a large number of retail and restaurant uses, then additional frontage zone width would be appropriate for window shopping and outdoor dining.



*Some Corridor Types may not have every sidewalk zone.

03: Curb Ramps

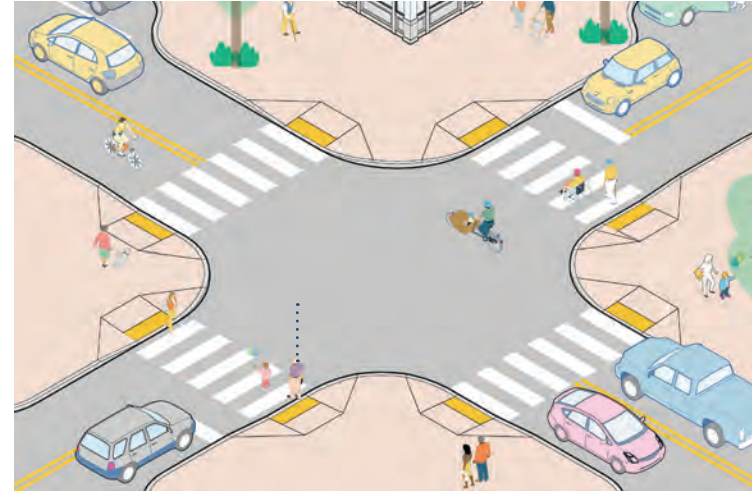
Curb ramps, or ADA ramps, are required at all intersection, midblock, and other crossings where vertical elevation changes occur. Curb ramps support independent mobility for all people, including people with physical disabilities, people pushing strollers, or people pulling suitcases or other wheeled objects.

Guidance

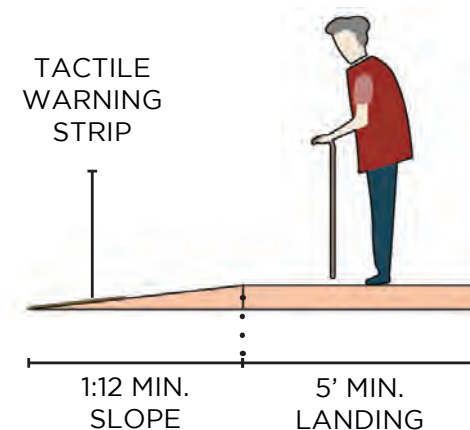
- Provide a clear level landing zone of no less than 4' by 4' at the sidewalk at the back of the ramp.
- Provide a ramp that is no less than 3' in width; 5' wide is preferable. When possible, match the width of the ramp to the width of the crosswalk.
- Ensure ramp slope is not greater than 1:12.
- Install detectable warning surfaces at the bottom of the ramp immediately behind the curb.
- Provide ramp flares with a maximum slope of 1:10 when pedestrians may travel across the ramp. When a level landing is not possible, the maximum slope of ramp flares should be 1:12.

Additional Considerations

- Use two parallel curb ramps at corners rather than a single diagonal curb ramp to improve navigability for low-vision and blind people.
- Lengthen ramp and reduce slope beyond maximum allowable standards where possible.
- Widen ramp to sidewalk's clear width when the connecting sidewalk is wider than 8'.
- Widen ramp to accommodate multiple user types when connecting to a shared use path.



DIRECTIONAL CURB RAMP



References

- NACTO Urban Street Design Guide (2013)
- FHWA Traffic Calming ePrimer 3.7

04: Curb Extensions

Extending the curb beyond the sidewalk increases visibility of people walking and wheeling and shortens their crossing distance, particularly when on-street parking is present. Curb extensions can also be effective at narrowing streets or tightening intersections to reduce motor vehicle turning speeds. Extensions may also be used to create a bus bulb.

Use

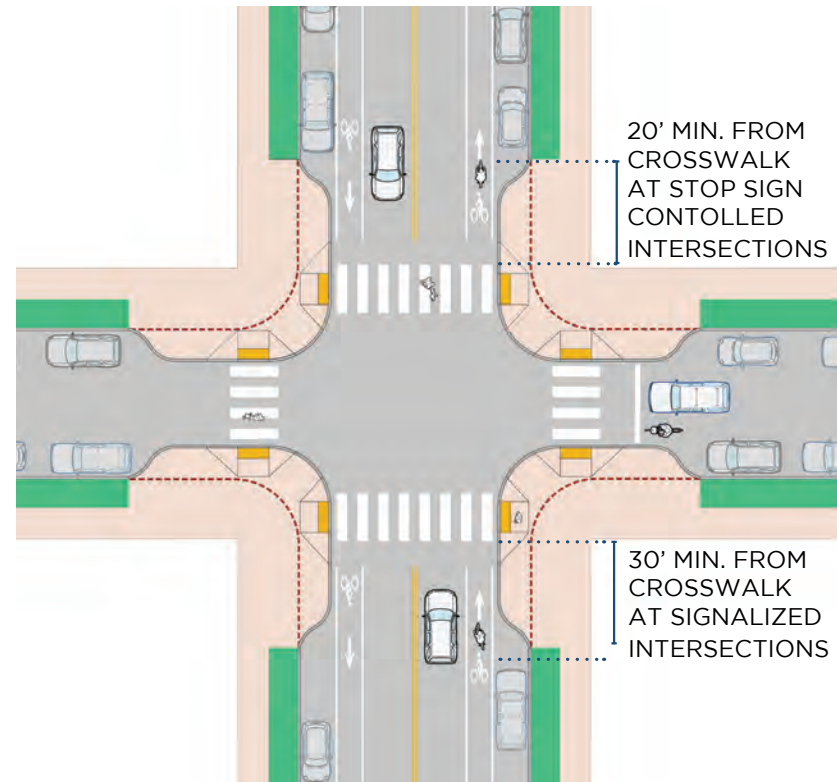
- Corners of intersections with on-street parking.
- Entries to connecting residential corridors .
- Bus stops as bus bulbs.
- Midblock locations where traffic calming or improved sightlines are desired, including multi-use paths, bus stops, or major destinations.

Guidance

- Extend curb extensions no less than 20' from the crosswalk at stop sign controlled intersections and 30' from signalized intersections.
- Keep corner radii as small as possible and accommodate the design vehicle at crawl speed.
- Ensure curb extensions do not impeded stormwater management. In retrofit conditions, it may be necessary to preserve the original curb and gutter flow path by leaving 1' to 2' between the existing curb and the curb extension.

Additional Considerations

- Consider incorporating green infrastructure into curb extensions to collect stormwater and provide planting areas.



- Integrate street furniture or other public space elements such as art, bike parking, wayfinding, micromobility hubs, and lighting.
- Design corner radii for the vehicle that turns most frequently at that intersection.
- Accommodate larger design vehicles with mountable curbs or truck aprons while keeping corner radii tight to maintain slow turning speeds.

References

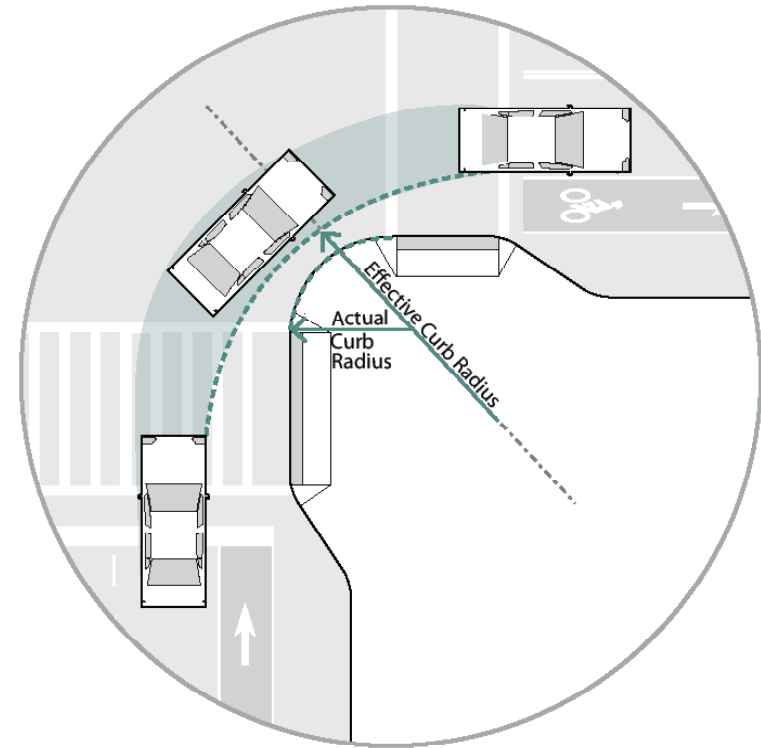
NACTO Urban Street Design Guide (2013)

05: Corners and Curb Radii

Pedestrian safety and comfort is directly impacted by the width and configuration of street corners; however, streets must accommodate large turning vehicles. Determining methods of accommodating large vehicles while keeping intersections as compact as possible is challenging. This requires design flexibility and engineering judgment, as intersections are unique in terms of angles of approach and departure, number of travel lanes, median presence, and a number of other features.

A variety of strategies can be employed to minimize curb radii:

- On-street parking and bicycle lanes may provide the larger effective radii to accommodate the appropriate design vehicle.
- On low volume, two-lane streets, corner design should assume that large vehicles will use the entire width of the departing and receiving travel lanes, including the oncoming traffic lane.
- At signalized intersections, corner design should assume the large vehicle will use the entire width of the receiving lanes on the intersecting street.
- At signalized intersections where additional space is needed, consideration can be given to recessing the stop bar on the receiving street to enable the vehicle to use the entire width of the receiving roadway.
- In cases where there are alternative access routes, it is possible to restrict turning movements by large vehicles at intersections to enable tighter curb radii.



Guidance

- The design vehicle should be selected according to the types of vehicles using the intersection with considerations to volumes and frequencies.
- Intersection design should strive for an actual curb radii that is between 10' to 25'. The default curb radii for two intersecting Neighborhood Residential Streets is 10'. For all other street classifications corner design should strive for an actual curb radius that is no more than 15'.

References

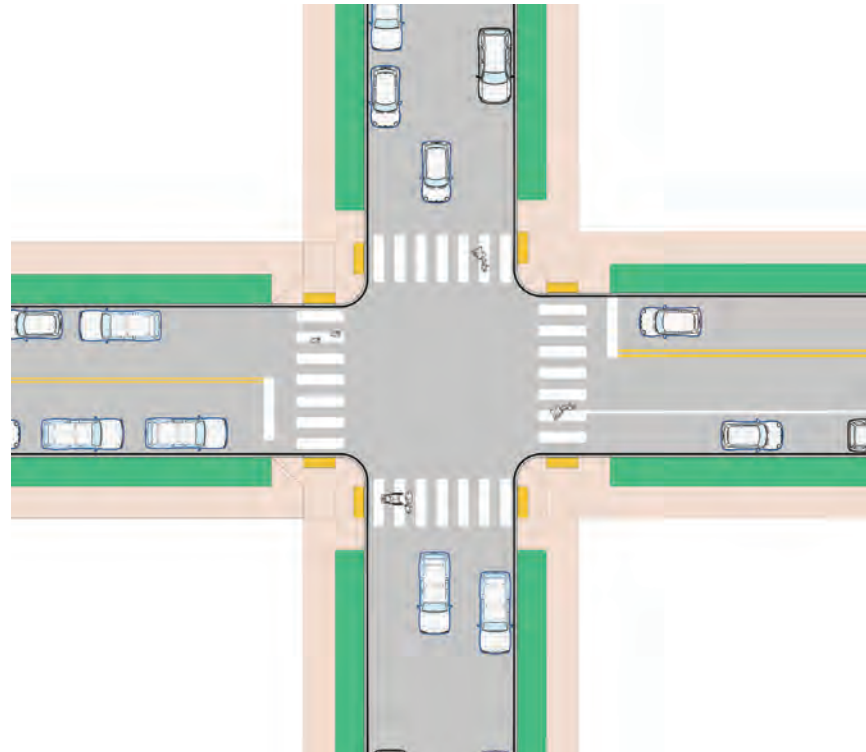
NACTO Urban Street Design Guide (2013)

06: Marked Crosswalks

Crosswalks clearly designate a path for people walking or wheeling through an intersection, at high-demand midblock points, and across wide driveways. Create crosswalks that incorporate art into the crosswalk marking may be appropriate a select locations to reinforce and celebrate community character and culture. Crosswalks should be used at all signalized intersections, at intersections and midblock locations with bus stops, and at midblock locations with significant walking trip generators. Crosswalks should also be implemented across wide, at-grade commercial driveways.

Guidance

- Install ADA-compliant curb ramps to connect to accessible routes when constructing new crosswalks. Parallel curb ramps are preferred to diagonal.
- At controlled intersections, provide a stop bar in advance of the crossing and consider signal timing guidance at signalized intersections.
- Provide yield lines and YIELD HERE TO PEDESTRIAN sign (R1-5) in advance of uncontrolled midblock crossings.
- Restrict on-street parking no less than 20' in advance of the crossing to provide adequate sight distance.
- Where mid-block crossings are desired consider a rectangular rapid flashing beacon (RRFB) or high-intensity activated crosswalk beacon (HAWK signal) to highlight people walking across the street.
- Crosswalks should be as wide or wider than the connecting sidewalk.



- Where creative crosswalks are implemented, artistic elements must not interfere with the white, regulatory markings used for the crossing and may only be applied between the markings.

References

NACTO Urban Street Design Guide (2013)

Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations: Final Report and Recommended Guidelines (2005)

Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG; 2011)

ADA Accessibility Guidelines (2004)

Manual on Uniform Traffic Control Devices (2009)

07: Raised Crosswalks

Raised crosswalks provide better visibility of pedestrians by motorists, calm traffic, and improve motorist yielding to people walking, wheeling, biking, and using other micromobility devices at intersections and midblock crossings. Elevating the crosswalk reduces or eliminates transitions from the sidewalk to the street crossing. Transition aprons on each approach to the raised crossing are marked with pavement markings to alert drivers of the grade change.

Use

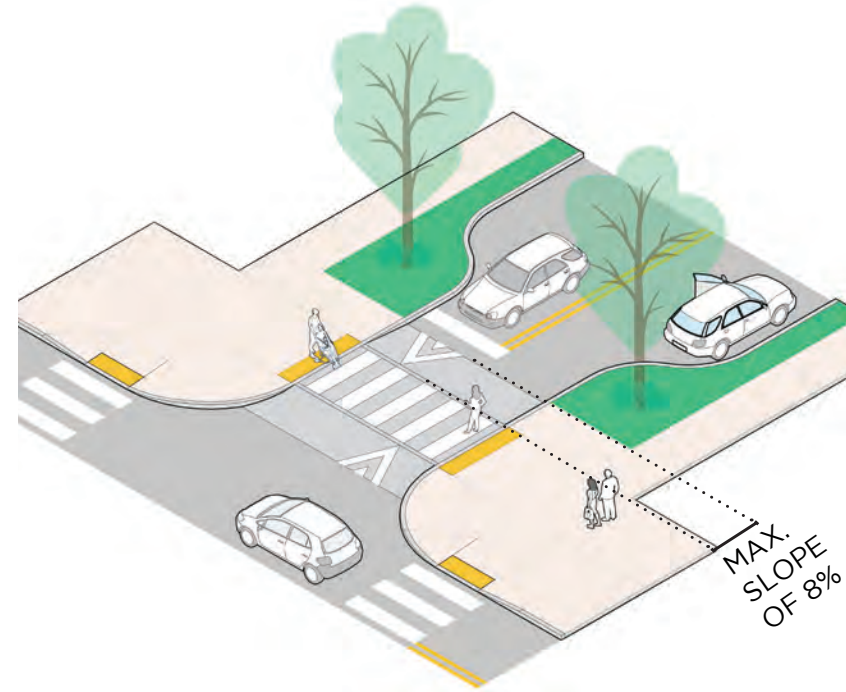
- Intersections where the speed of left turn movements need to be slowed.

Guidance

- Install a narrow (1' to 2' in width) raised median along the path of the centerline; precast concrete or modular medians work well.
- Add flexposts or other vertical delineators for additional deterrence.

Additional Considerations

- Consider the turning movements of larger vehicles, like trucks and buses, when determining how much of the centerline to harden.
- While hardened centerlines provide a significant enough obstacle to keep motor vehicles from “cutting the corner,” they are also low-profile enough to allow for emergency vehicle access.



References

NACTO Don't Give Up at the Intersection

08: Pedestrian Refuge island

Pedestrian islands provide a protected refuge in the center of two-way streets for people walking and wheeling, allowing them to cross the street in two phases. Crossing islands provide particular benefit where crossing distance is long or where multiple lanes in a single direction must be crossed. Islands can also calm traffic by visually and physically narrowing the roadway.

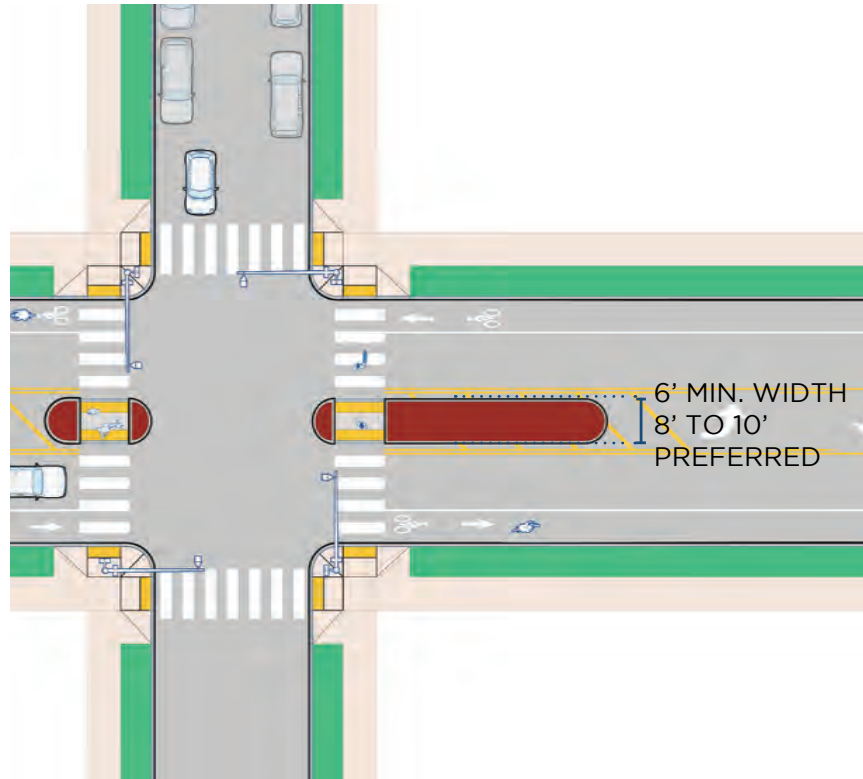
Implement islands at crossings where roadway width or prevailing vehicle speeds make people crossing the street feel unsafe or where traffic speeds and volumes prohibit people from crossing.

Guidance

- Provide a minimum island width that matches the width of crosswalk or that is at least 6' wide.
- Maintain accessible path through crossing island.
- Provide detectable warning strips at entrance and exit of crossing island or any time a person crossing will enter the vehicle travelway.
- At signalized intersections, orient and time pedestrian signals to serve people in crossing island. If pedestrian signalization is not on automatic recall, locate a push button in island.
- Follow MUTCD guidance for signage, signalization, and pavement markings.

Additional Considerations

- Maximize width of island to narrow travel lanes and provide additional refuge for pedestrians. An island width of 8' to 10' is preferred over



6' minimum. A width of 10' is needed where bicyclists may also be crossing.

- Consider utilizing the interior of the island for bioretention, street trees, or other stormwater management, while not impacting visibility.

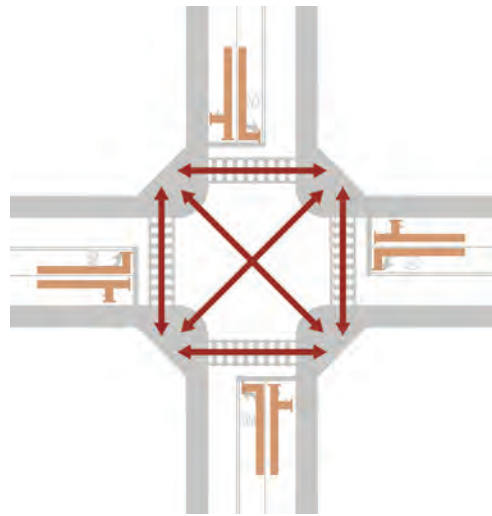
References

NACTO Urban Street Design Guide (2013)

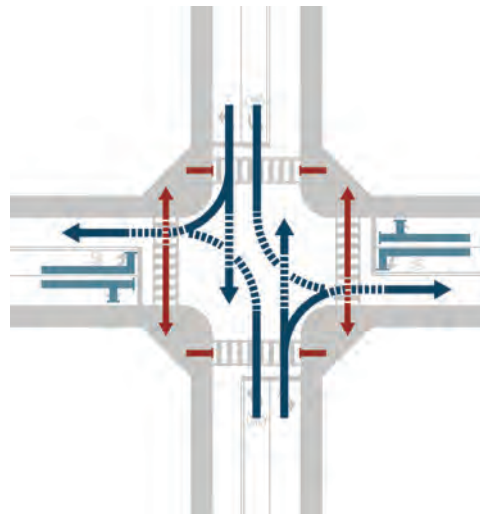
Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG; 2011)

Manual on Uniform Traffic Control Devices (2009)

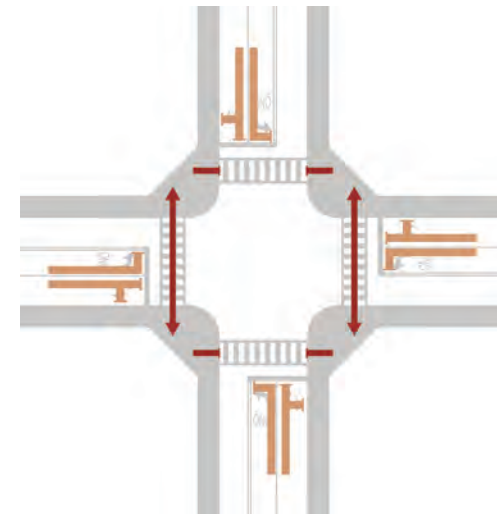
09: Traffic Signal Operations for Pedestrian Mobility



EXCLUSIVE PHASING



CONCURRENT PHASING



LEADING PEDESTRIAN INTERVAL

To moderate which legs of an intersection have the right of way, intersections are either stop sign controlled or signal controlled. Pedestrian signals are part of the traffic signal system at signalized intersections that are specifically designed to control intersection operations for people walking and wheeling. Pedestrian signal phasing should be designed to minimize exposure of people walking to motor vehicles, minimize delay for people waiting to cross the street, reduce non-compliant and unsafe crossing behavior, and provide accessibility benefits to disabled people. Pedestrian phasing can be described by three categories:

Concurrent phasing allows people to walk or wheel across the street at the same time as motor

vehicle traffic that is moving in the same direction, minimizing delay for all users.

Exclusive phasing gives a separate, dedicated phase for people walking and wheeling in all directions while prohibiting motor vehicle movements. Exclusive phasing can provide safety benefits by eliminating modal conflicts; however, it does create longer delays for all modes, which can lead to non-compliant crossing behavior if delay is excessive.

Hybrid phasing uses concurrent phasing to minimize delay for pedestrians on legs of an intersection where conflicts are minimal, while also providing an exclusive phase for more challenging legs. Hybrid phasing is typically used at complex intersections.

Guidance

- A walking speed of 3' per second should be used to time pedestrian phases to ensure adequate time is provided for people to cross the street.
- Use concurrent phasing unless high turning movement volumes (250 or more per hour) create a strong safety concern.
- Employ leading pedestrian intervals (LPIs) where concurrent phasing is used to give people crossing the street a head start before other street users are allowed to proceed. LPIs encourage drivers to yield to people walking and wheeling while they are turning and improve visibility between all users. No Turn on Red restrictions should be considered at all locations where LPIs are used.
- When protected left-turn phases are provided, lagging left turns (left turn signal at the end of the green phase) should be used to preserve the ability to use LPIs with concurrent phasing.
- When using concurrent phasing on streets with high pedestrian traffic or in proximity to high-demand bus stops, signals should be placed on automatic pedestrian recall.
- Consider use of exclusive phasing at intersections with high pedestrian traffic or at least 250 motor vehicles turn right per hour along any approach.

- Implement No Turn on Red restrictions at all locations where exclusive phasing is used.

Additional Considerations

- Ensure all pedestrian signal heads are correctly oriented to be visible to all users who are directed to follow the signal indications, including people riding bicycles or using other micromobility devices.
- Time signal phases so that people walking or wheeling have adequate time to cross the entirety of the street during a single walk phase.
- Provide accessible pedestrian signals (APS) to assist people with disabilities.
- Install pedestrian countdown signals to further assist people in crossing the street.

References

Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG; 2011)

Manual on Uniform Traffic Control Devices (2009)

FHWA Achieving Multimodal Networks (2016)

10: Daylighting

Daylighting ensures that appropriate sightlines and visibility are maintained by restricting stopping, parking, or loading and unloading in proximity to crossings, intersections, and driveways. Daylighting can be provided through the use of signs, pavement markings, flexposts, and/or curb extensions. Intersection design should ensure the ability of pedestrians, cyclists, and motorists to make eye contact and facilitate street corners as locations for gathering, transit stops, bicycle parking, and other elements.

Use

- Locations where there is on-street parking, loading/unloading, or excess pavement width approaching crosswalks, intersections, or driveways.

Guidance

- Sign and/or mark no less than 20' of space from a crosswalk or 30' of space from the stop bar at a controlled intersection as “No Parking” or “No Stopping.”
- Sign or mark no less than 5' of space from a lower volume driveway as “No Parking” or “No Stopping.”

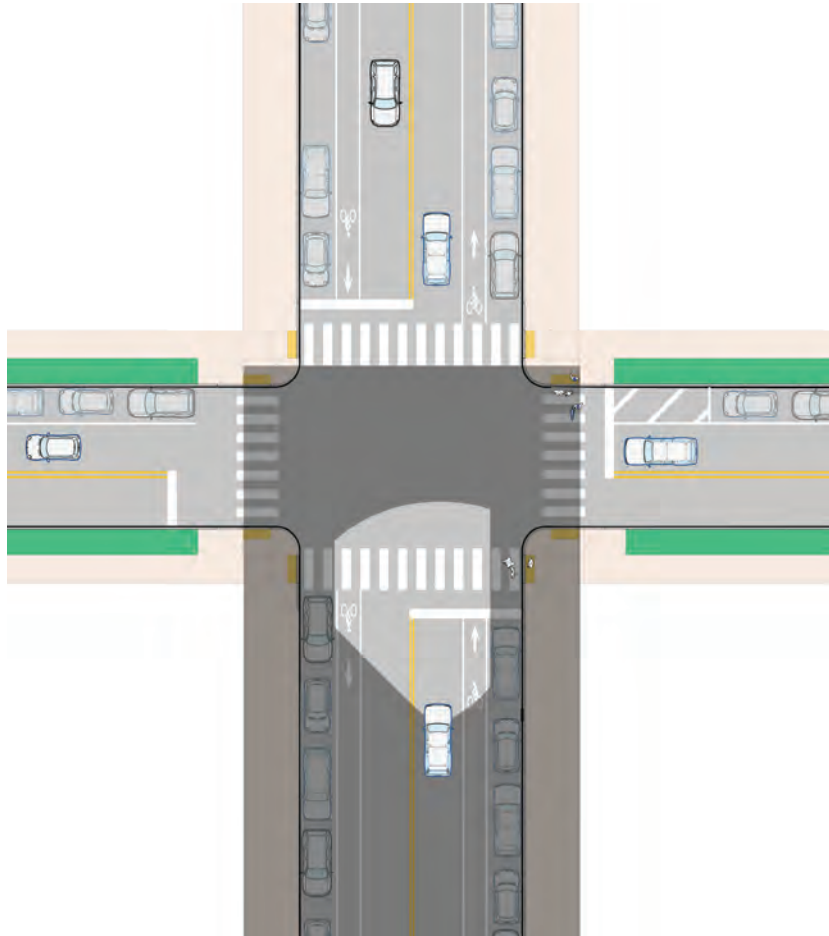
Additional Considerations

- Use engineering judgment to determine if longer daylighting areas should be implemented based on prevailing vehicle speeds or other intersection features.
- Use physical barriers or delineators such as flexposts or curb extensions to prevent vehicles from stopping or parking in daylighted areas.
- Consider the use of street murals, low level landscaping or planters, bike parking, or multimodal hubs in daylighted areas
- Street trees should be sited at least 5' from intersections, 3' from the curb return and a minimum of 5' from stop signs.

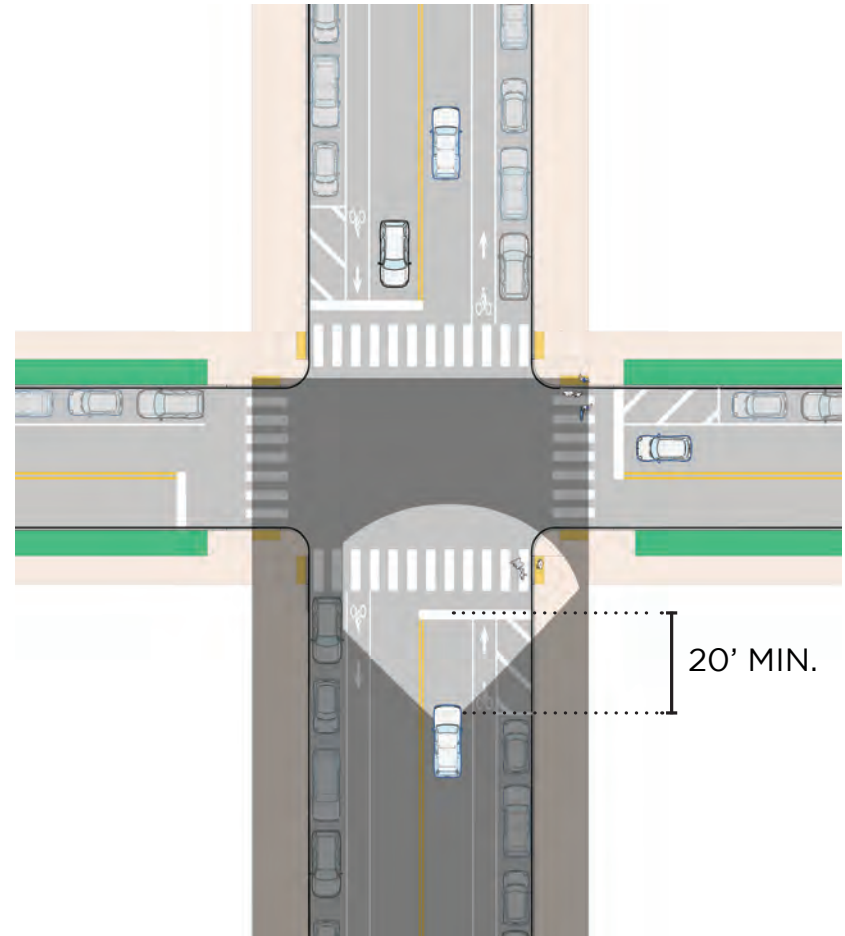
References

NACTO Urban Street Design Guide (2013)
Manual on Uniform Traffic Control Devices (2009)

BEFORE



AFTER



20' MIN.

11: Neighborhood Traffic Circle

Neighborhood traffic circles, sometimes called mini roundabouts, can effectively calm traffic on low-volume neighborhood streets. Neighborhood traffic circles can be implemented with vertical or mountable curbing, depending on specific turning radius requirements. This countermeasure also allows for opportunities for landscape, special identifying neighborhood signage, or public art.

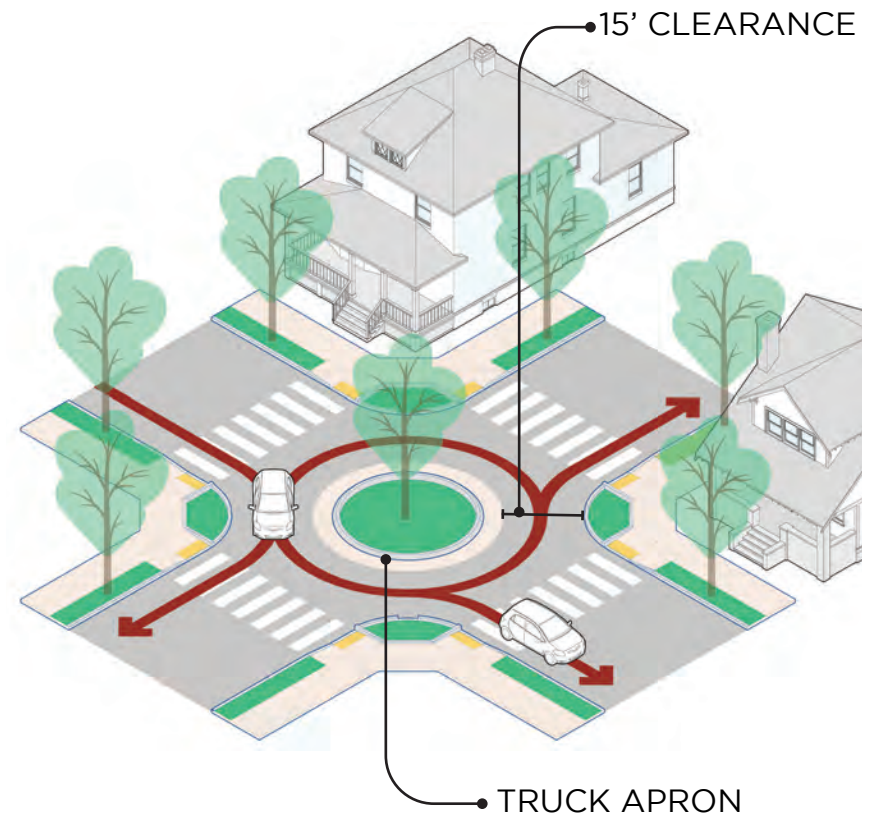
Implement at Intersections in residential areas where vehicle volumes for all approaching legs are less than 15,000 vehicles per day. Do not use on primary emergency vehicle access routes.

Guidance

- Provide 15' clearance from intersection corners to edge of traffic circle, which may include a mountable truck apron.

Additional Considerations

- Use the largest traffic circle radius possible to encourage slower speeds.
- Mark crosswalks ahead of each approach/entrance to the traffic circle.



References

NACTO Urban Street Design Guide (2013)

Federal Highway Administration (FHWA) Traffic Calming e-Primer 3.7

12: Hardened Centerlines

Hardened centerlines prevent “cutting the corner” by blocking the diagonal path through a crosswalk, forcing drivers to slow their left turning movements at intersections. To “harden” the centerline, narrow concrete or modular medians, flexposts, or other vertical elements are added along the roadway centerline to discourage high-speed turning movements by effectively reducing a vehicle’s turning radius. Slower speeds give drivers more time to react to people walking, wheeling, bicycling, or using other micromobility devices.

Use

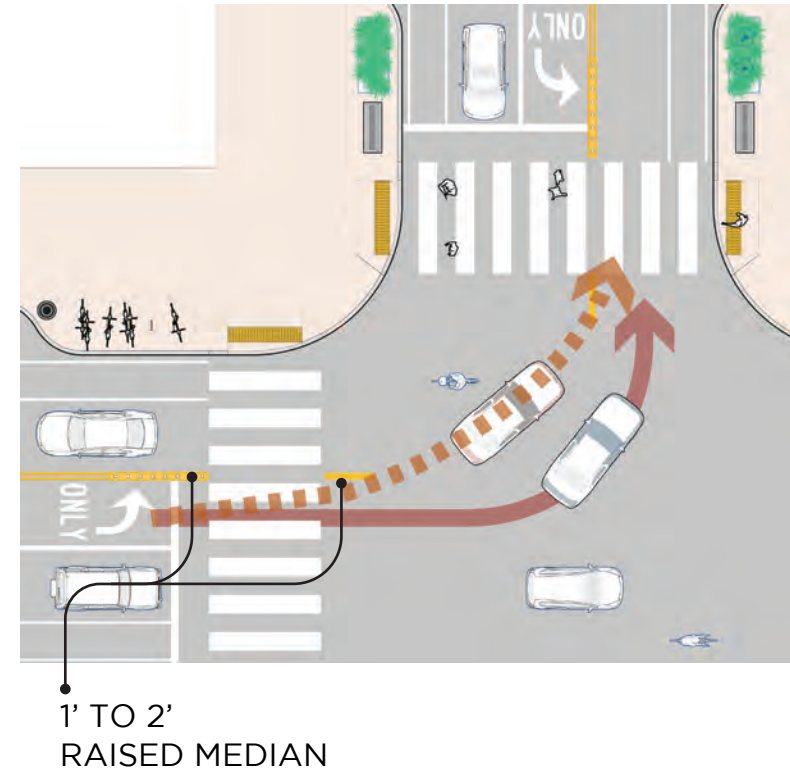
- Intersections where the speed of left turn movements should to be slowed.

Guidance

- Install a narrow (1’ to 2’ in width) raised median along the path of the centerline; precast concrete or modular medians work well.
- Add flexposts or other vertical delineators for additional deterrence.

Additional Considerations

- Consider the turning movements of larger vehicles, like trucks and buses, when determining how much of the centerline to harden.
- While hardened centerlines provide a significant enough obstacle to keep motor vehicles from “cutting the corner,” they are also low-profile enough to allow for emergency vehicle turning flexibility.



References

NACTO Don't Give Up at the Intersection (2019)

13: Driveway Crossings

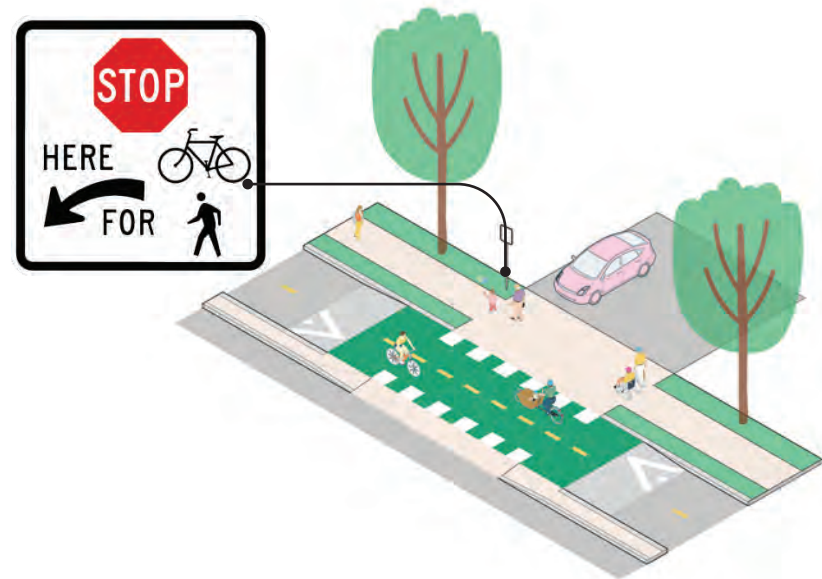
Residential and commercial driveways should be constructed to be level with the sidewalk or pedestrian path of travel and provide a minimum clear width of 4' across the driveway. A level, continuous sidewalk eliminates the need for curb ramps while also indicating priority for people walking or wheeling along the sidewalk.

Guidance

- Maintain a continuous sidewalk grade crossing width of no less than 4' across all driveway crossings.
- Maintain a cross slope of no more than 2%.
- Design for adequate sight distance for people driving using daylighting where necessary.
- Align the edge of the transition apron with the face of the curb.

Additional Considerations

- Contain driveway apron to the sidewalk buffer, where provided, to maintain sidewalk grade for entire length of the driveway crossing.
- Maintain sidewalk and path materials (usually concrete) across driveway crossings to communicate priority for people walking, riding bicycles, and using other micromobility devices.
- Raise street-level separated bike lanes and Urban Trails to sidewalk grade for major driveway crossings. Where the density of major driveway crossings would result in a repaid succession of transition ramps, practitioners should consider raising the entire bike lane or Urban Trail to sidewalk level.



Note: The use of this treatment requires a Request to Experiment from FHWA

- Use bike/micromobility crossing pavement markings at high-volume or wide driveway crossing when a bike lane or Urban Trail is present.
- At crossings where pedestrian and bicycle activity is high, consider adding a STOP HERE FOR BIKES AND PEDS sign (MUTCD R1-5b) (Note: The use of this treatment requires a Request to Experiment from FHWA).
- Include audible warning for people walking across major driveways in commercial areas and where parking garage exits cross sidewalks.
- Where low-clearance vehicles are expected to use driveways, the elevation should be reduced to 4 inches or less.

Reference

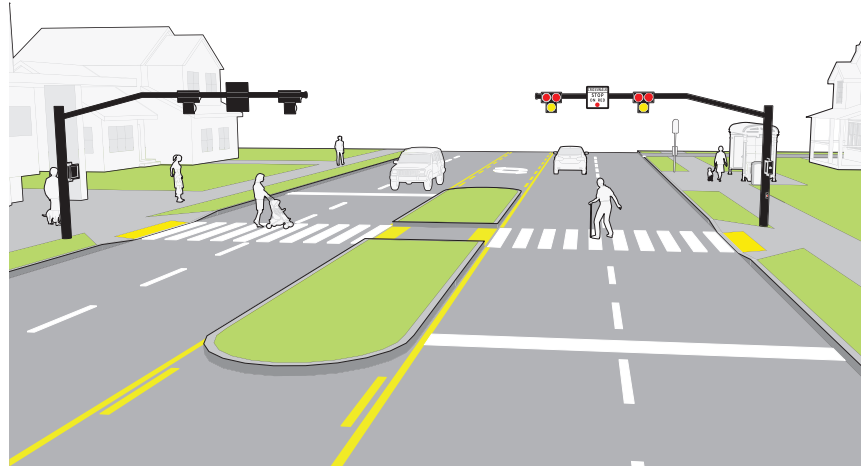
Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG; 2011)

14: High Intensity Activated Crosswalk Beacon

Pedestrian-activated beacons, including the High-intensity Activated Crosswalk Beacon (HAWK), are a type of hybrid signal intended to allow pedestrians and bicyclists to stop traffic to cross high-volume arterial streets. This type of signal may be used in lieu of a full signal that meets any of the traffic signal control warrants in the MUTCD. It may also be used at locations which do not meet traffic signal warrants but where assistance is needed for pedestrians or bicyclists to cross a high-volume arterial street.

Guidance

- The MUTCD recommends minimum volumes of 20 pedestrians/cyclists an hour for major arterial crossings.
- This type of device should be considered for all arterial crossings in a bicycle network and for path crossings if other engineering measures are found inadequate to create safe crossings.
- Pushbutton actuators should be “hot” (i.e., respond immediately when pressed), be placed in convenient locations for all users, and abide by other ADA standards. Passive signal activation, such as video or infrared detection, may also be considered.
- See FHWA’s Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations publication and the MUTCD to determine warrants for traffic control at midblock crossings.



References

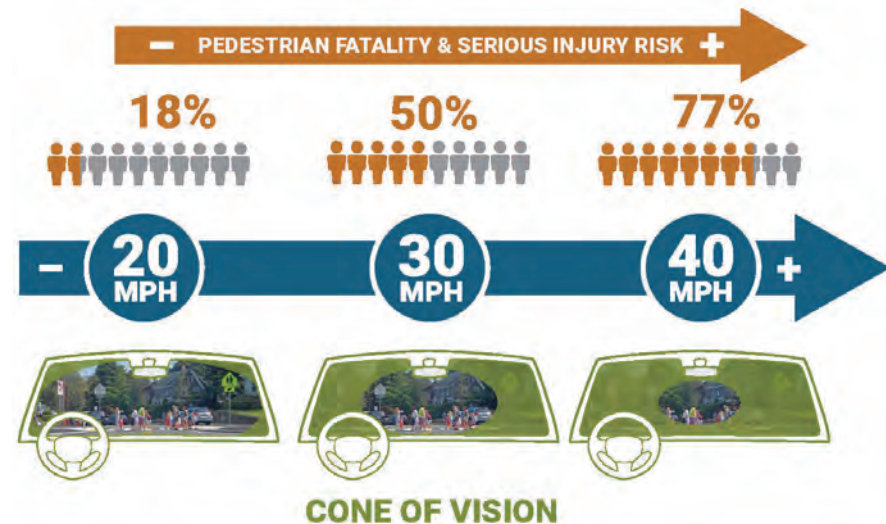
- NACTO Urban Street Design Guide (2013)
- Manual on Uniform Traffic Control Devices (2009)
- CDOT Roadway Design Guide, Chapter 14 (2015)
- Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations (2005)

15: Traffic Calming

Traffic calming aims to slow the speeds of motorists to a “desired speed” (usually 20 mph or less for residential streets and 25 to 35 mph for collectors and minor arterials). The greatest benefit of traffic calming is increased safety and comfort for all users on and crossing the street. Compared with conventionally designed streets, traffic calmed streets typically have fewer collisions and far fewer injuries and fatalities. These safety benefits are the result of slower speeds for motorists that result in greater driver awareness, shorter stopping distances, and less kinetic energy during a collision.

Prior to permanently implementing a traffic calming measure, it may be useful to introduce a temporary measure using paint, cones, or street furniture, as changes can easily be made to the design.

A formal policy or procedure can help a community objectively determine whether traffic calming measures should be installed on a street or in a neighborhood. Such a procedure should include traffic and speed studies and a way to gather input and approval from neighborhood residents.



References

Huang and Cynecki (2001). The Effects of Traffic Calming Measures on Pedestrian and Motorist Behavior. FHWA

ITE Traffic Calming Web site

NACTO Urban Street Design Guide (2013)

16: Traffic Calming Vertical Treatments

Vertical traffic calming treatments compel motorists to slow speeds. By lowering the speed differential between bicyclists and motorists, safety and bicyclist comfort is increased. These treatments are typically used where other types of traffic controls are less frequent, for instance along a segment where stop signs may have been removed to ease bicyclist travel.

Guidance

- Speed humps and raised crosswalks impact bicyclist comfort. The approach profile should preferably be sinusoidal or flat.
- Where traffic calming must not slow an emergency vehicle, speed cushions or raised tables (crosswalks) should be considered. Speed cushions provide gaps spaced for an emergency vehicle's wheelbase to pass through without slowing.
- Consider using raised crosswalks at intersections to slow traffic turning onto the neighborhood greenway from a major street.
- Vertical traffic calming should be considered when measured or observed speeding issues are present, with 50th percentile of traffic exceeding 25mph.
- Continuous devices, such as speed humps and raised crosswalks, are more effective to achieve slower speeds than speed cushions.

References

NACTO Urban Bikeway Design Guide (2013)



Speed cushion



Raised crosswalk



Speed hump



Curve profile options

17: Traffic Calming - Horizontal Treatments

Horizontal traffic calming reduces speeds by narrowing lanes, which creates a sense of enclosure and additional friction between passing vehicles. Narrower conditions require more careful maneuvering around fixed objects and when passing bicyclists or oncoming automobile traffic. Some treatments may slow traffic by creating a yield situation where one driver must wait to pass.

Guidance

- Horizontal traffic calming treatments must be designed to deflect motor vehicle traffic without forcing the bicycle path of travel to be directed into a merging motorist.
- Neighborhood traffic circles should be considered at local street intersections to prioritize the through movement of bicyclists (by removing stop control or converting to yield control) without enabling an increase in motorist's speeds.
- Infrastructure costs will range dependent upon the complexity and permanence of design. Simple, interim treatments such as striping and flexposts are low-cost. Curbed, permanent treatments that integrate plantings or green infrastructure are higher-cost.
- Horizontal traffic calming treatments can be appropriate along street segments or at intersections where width contributes to higher motor vehicle speeds. It can be particularly effective at locations where on-street parking is low-occupancy during most times of day, and where there is desire to remove or decrease stop control at a minor intersection.
- Horizontal treatments are most effective if they deflect motorists midblock (with chicanes) or within intersections (with neighborhood traffic circles).

References

NACTO Urban Bikeway Design Guide (2013)



Neckdown



Neighborhood traffic circle



Chicane



Curb extension

18: Lane Narrowing

Lane narrowing can improve comfort and safety for vulnerable road users. Narrowing lanes creates space that can be reallocated to other modes, in the form of wider sidewalks, bike lanes, and buffers between cyclists, pedestrians and motor vehicles. Space can also be dedicated to plantings and amenity zones, and reduces crossing distances at intersections.

Narrowing existing motor vehicle lanes may result in enough space to create separated bicycle lanes, widened sidewalks and buffers, or a combination of on-street bike lanes and enhancements to the pedestrian corridor.

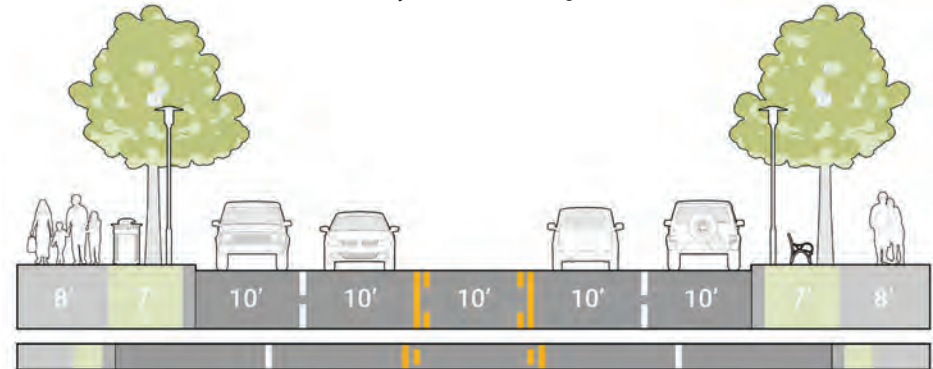
Narrower lanes can contribute to lower operating speeds along the roadway, which may be appropriate in dense, walkable corridors.

Guidance

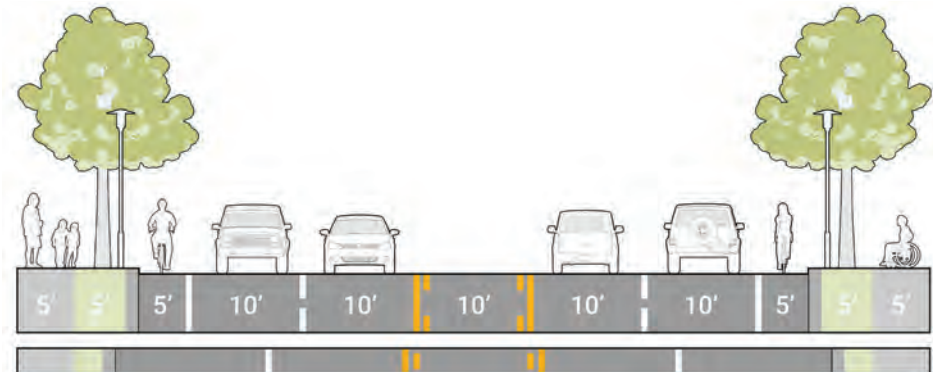
- Motor vehicle travel lanes as narrow as 10' are allowed in low-speed environments (45 mph or less) according to the AASHTO Green Book.
- 10' travel lanes are not appropriate on 4-lane undivided arterial roadways.



Roadway Before Narrowing



Narrowing Motor Vehicle Lanes to increase Sidewalk and Amenity Zones



Narrowing Motor Vehicle Lanes to increase Amenity Zone and add Bicycle Lanes

References

FHWA Achieving Multimodal Networks (2016)

19: Lane Reconfiguration

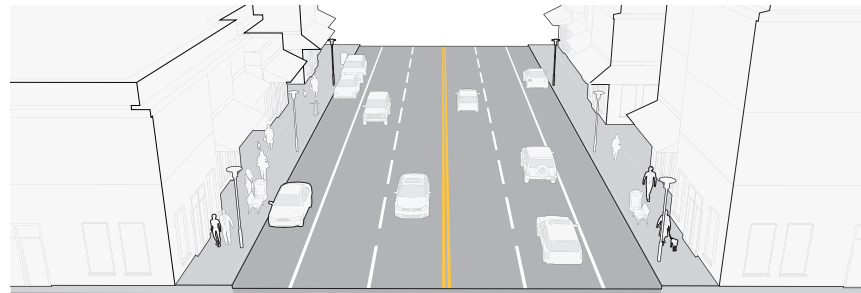
Road Diets are the reconfiguration of one or more travel lanes to calm traffic and provide space for bicycle lanes, turn lanes, streetscapes, wider sidewalks, and other purposes. Four- to three-lane conversions are the most common Road Diet, but there are numerous types (e.g., three to two lanes, or five to three lanes).

The most common road diet configuration involves converting a four-lane road to three lanes: two travel lanes with a turn lane in the center of the roadway. The center turn lane at intersections often provides a great benefit to traffic congestion. A three-lane configuration with one lane in each direction and a center turn lane is often as productive (or more productive) than a four-lane configuration with two lanes in each direction and no dedicated turn lane.

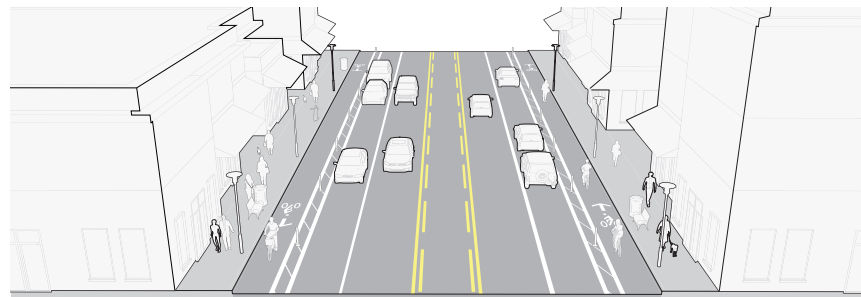
The space gained for a center turn lane is often supplemented with painted, textured, or raised center islands. If considered during reconstruction, raised center islands may be incorporated in between intersections to provide improved pedestrian crossings, incorporate landscape elements and reduce travel speeds.

Guidance

- Four-lane streets with volumes less than 15,000 vehicles per day are generally good candidates for four- to three- lane conversions.
- Four-lane streets with volumes between 15,000 to 20,000 vehicles per day may be good candidates



Typical 4-lane Road with on-street parking



Three-lane Road Diet (with center two-way left-turn lane), with on-street parking and separated bicycle lane

for four- to three- lane conversions. A traffic analysis is needed to determine feasibility.

- Six-lane streets with volumes less than 35,000 vehicles per day may be good candidates for six- to five-lane (including two-way center turn lane) conversions. A traffic analysis is needed to determine feasibility.

References

FHWA Road Diet Guide (2014)

NACTO Urban Street Design Guide (2013)

Manual on Uniform Traffic Control Devices (2009)

20: Truck Aprons

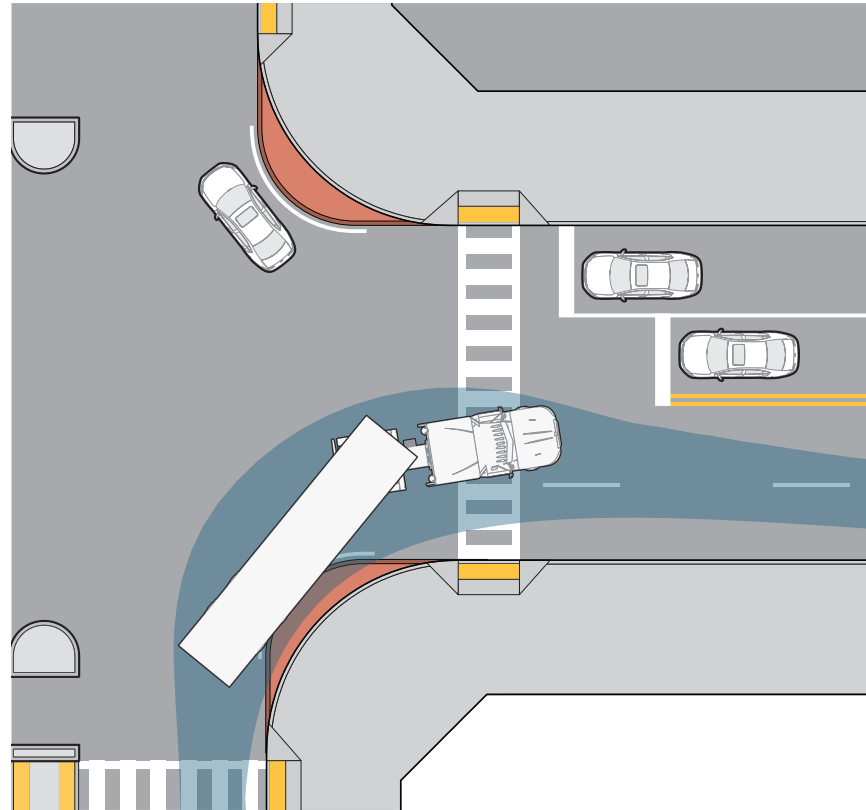
In locations where large vehicles make occasional turns, designers can consider mountable truck aprons. Mountable truck aprons deter passenger vehicles from making higher-speed turns, but accommodate the occasional large vehicle without encroachment or off-tracking into pedestrian waiting areas. Mountable truck aprons should be visually distinct from the adjacent travel lane and sidewalk.

While pedestrian and bicyclist safety is negatively impacted by wide crossings, pedestrians and bicyclists are also at risk if the curb radius is too small. Curb radii that are too small for large vehicles to navigate can result in the rear wheels of a truck tracking over queuing areas at the corner. Maintenance problems are also caused when trucks must regularly drive over street corners to make turns.

Mountable truck aprons are a solution that can reduce turning speeds for passenger vehicles while accommodating the offtracking of larger vehicles where a larger corner radius is necessary.

Guidance

- Mountable truck aprons are part of the traveled way and as such should be designed to discourage pedestrian or bicycle refuge. Bicycle stop bars, detectable warning panels, traffic signal equipment and other intersection features must be located behind the mountable surface area.



- The mountable surface should be visually distinct from the adjacent travel lane, sidewalk and separated bike lane. The heights of mountable areas and curbs should be no more than 3 inches above the travel lane to accommodate lowboy trailers.

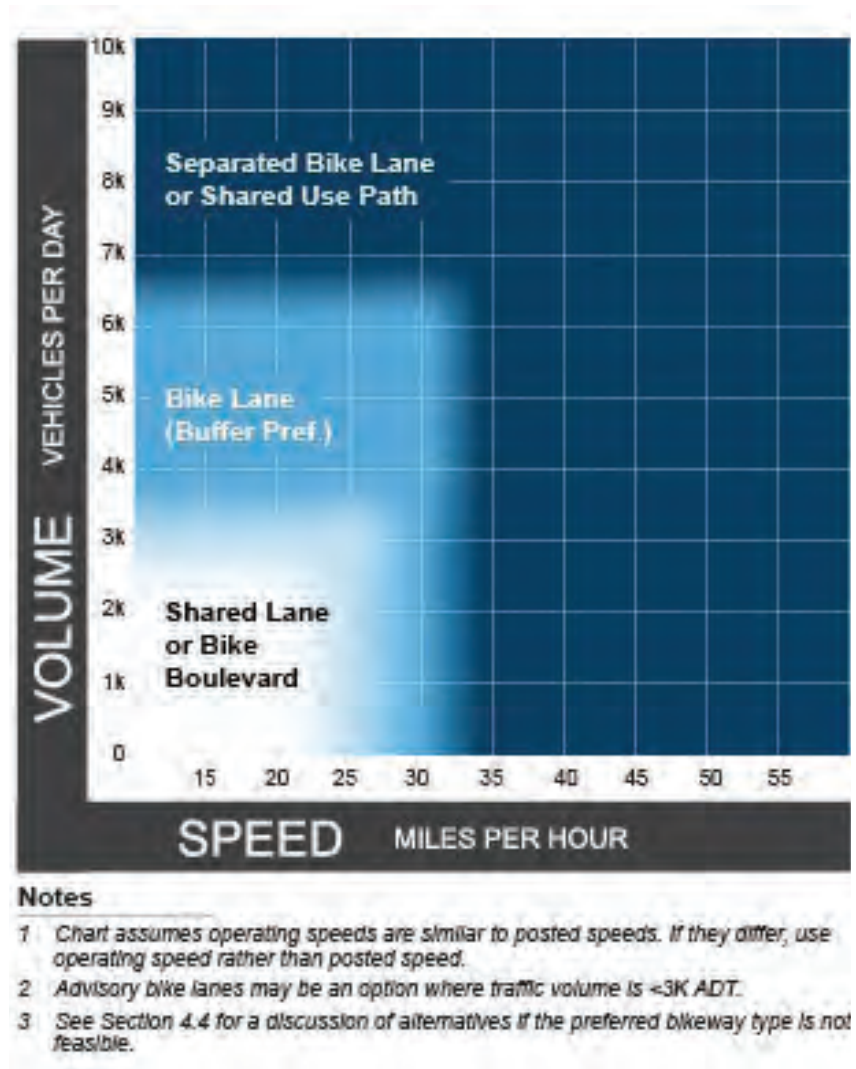
References

FHWA Achieving Multimodal Networks (2016)

MassDOT Separated Bike Lane Planning & Design Guide (2016)

21: Bicycle Facility Selection

Selecting the most appropriate bicycle facility type for any given street is one of the most important steps in realizing a truly functioning multimodal transportation network. A community can have hundreds of miles of bicycle facilities, but if they are the wrong facilities or along the wrong streets, they may experience very little use and be deemed unsuccessful. Matching the right facility type to the right street is paramount to achieve a network that attracts everyone – a network that provides a high level of user comfort, safety, and mobility. Selecting bicycle facilities requires a balance of community priorities for local land use context, analysis, engineering judgment, available funding, and physical constraints of the existing street. Keep in mind, facility selection is iterative; as more data about the street and surrounding context is gathered, use of existing facilities is documented, and land use changes occur over time, the type of facility that planners and designers deem most appropriate may change and evolve. The FHWA Bikeway Selection Guide is a valuable resource for bikeway selection. It uses vehicle speed and traffic volumes to assist practitioners with planning and designing bikeways for all ages and abilities. While vehicle speed and traffic volumes are key indicators, these factors, as mentioned previously, should be complemented by actual physical constraints, community desires, and budgetary limitations.



References

FHWA Bikeway Selection Guide (2019)

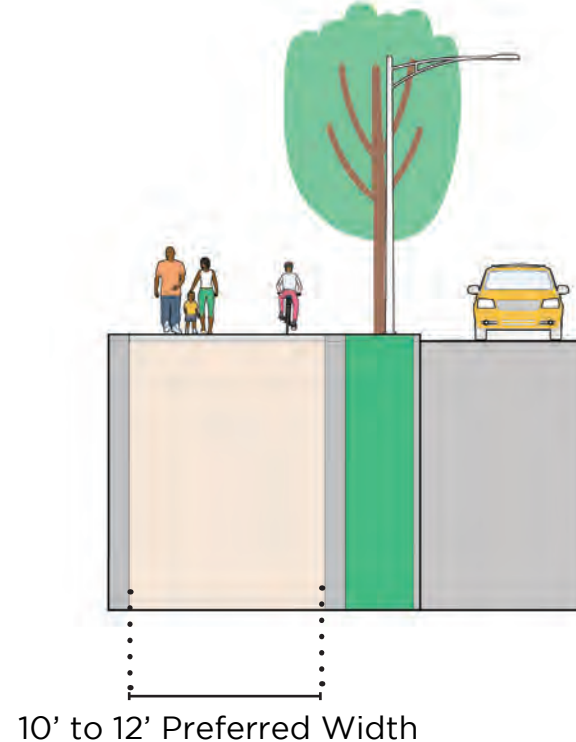
22: Shared Use Paths and Sidepaths

A shared use path or sidepath, often called a shared use paved trail in other parts of the region, is a two-way facility physically separated from motor vehicle traffic and used by pedestrians, bicyclists, and other non-motorized users. Shared use paths, also referred to as greenways, are often located in an independent alignment, such as a greenbelt or abandoned railroad. However, they are also regularly constructed along roadways; often pedestrians and bicyclists will have increased interactions with motor vehicles at driveways and intersections on these sidepaths. They will generally be considered on any road with one or more of the following characteristics:

- 3 or more traffic lanes
- Posted speed limit of 30 mph or greater
- Average daily traffic of 9,000 or greater vehicles.

Guidance

- Use a width of 10' to 12' with 8' being the minimum for short distances in constrained areas. Heavy volumes or a high proportion of pedestrians may require more than 12'.
- Design multi-use paths using state and national standards, including establishing a design speed (i.e., typically 18 mph) and appropriate geometry.
- Give priority to path users at intersections with



roadways, including physical separation and timing and high-visibility crossing treatments.

- Minimize the number of driveway and street crossings along the path.

References

- AASHTO Guide for the Development of Bicycle Facilities (2012)
- FHWA Bikeway Selection Guide (2019)
- AASHTO Guide for the Development of Bicycle Facilities (2012)

23: Separated Bike Lanes

Separated bike lanes (SBLs) (also called protected bike lanes or cycle tracks) provide a greater physical distance from motorized travel making them more attractive to a wider range of bicyclists than traditional striped bike lanes, particularly on higher volume and higher speed roads. SBLs are intended for exclusive use by bicyclists and other micromobility users; they are not intended for pedestrians. Where on-street parking is present, they eliminate the risk of a user being hit by an opening car door. The vertical physical separation of SBLs also prevents people driving cars from driving, stopping, or waiting in the bikeway. Additionally, they provide greater comfort to pedestrians by moving the sidewalk further away from motorized traffic and separating them from higher speed cyclists.

They will generally be considered on any road with one or more of the following characteristics:

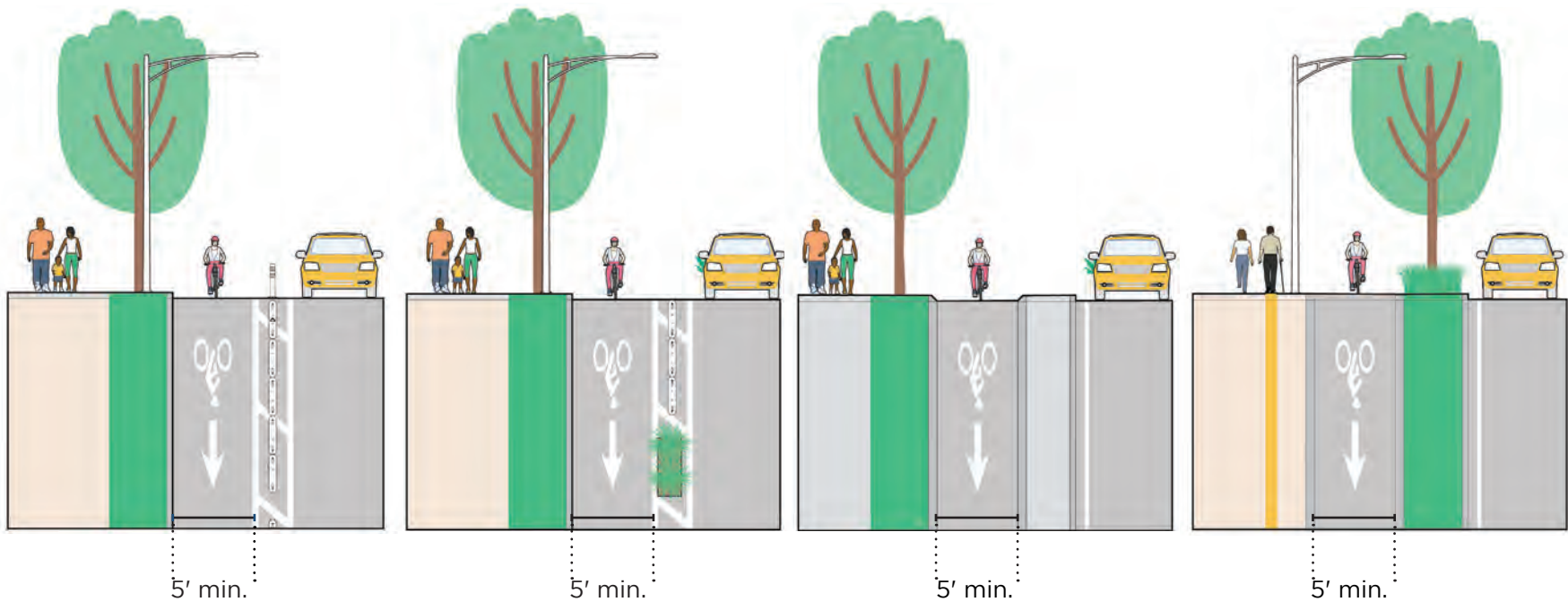
- 3 or more traffic lanes
- Posted speed limit of 30 mph or greater
- Average daily traffic of 9,000 vehicles or greater
- Frequent parking turnover
- High potential for bike lane obstruction

Guidance

- Determine bike lane width by the anticipated peak hour bicycle and micromobility volume.
- Require a street buffer that is separated from the street by vertical elements (see additional guidance on Vertical Separation).
- Narrow travel and parking lanes to minimum widths in constrained corridors before narrowing bikeway width. Prioritize reduction of the space allocated to the street before narrowing other spaces. This can include decreasing the number of travel lanes, narrowing existing lanes, and/or adjusting on-street parking.
- Avoid narrowing sidewalks beyond the minimum necessary to accommodate pedestrian demand.
- Prevent the narrowing or elimination of the street buffer, as it is critical to the safety of SBLs.
- Maintain a minimum bike lane width of 5' for one-way SBLs and 8' for two-way bikeways.

Additional Considerations

- Use of flexposts or low-profile curbs offer the least separation from traffic and should be used as an interim solution.
- Protecting bikeways with landscaping and/or on-street parking offer a high degree of separation, comfort, and safety to bicyclists and other micromobility users.



- Use of grade separation can provide an additional physical and visual cue to reinforce the distinction of the bikeway from adjacent motor vehicle travel lanes and pedestrian spaces, but these will often require roadway reconstruction.
- Employing one-way SBLs in the direction of motorized travel provides intuitive and simplified transitions to existing bike lanes and shared travel lanes.
- Implementation of two-way SBLs require special attention to properly transition contra-flow bicyclists and other micromobility users into existing bike lanes and shared travel lanes.

- Consider the need for specialized equipment to maintain separated bicycle lanes, as traditional street sweepers are too large to access them. Smaller street sweepers are available, and local governments should explore the opportunity to share the investment and use of such with one another.

References

FHWA Bikeway Selection Guide (2019)
 FHWA Achieving Multimodal Networks (2016)
 NACTO Urban Bikeway Design Guide (2013)

24: Vertical Selections

SBLs require both horizontal separation and vertical separation to be effective, safe, and comfortable for users of all ages and abilities. Vertical barriers provide both a perceived and real protection from motorized vehicles and can consist of a variety of elements, including flexposts, low-profile composite curbs, planters, concrete barriers, and temporary or permanent curbs/medians. Vertical separation can also be used to protect multi-use paths.

Guidance

- Consider actual operating speeds of motorized vehicles, posted speed limits, and land use context when selecting the most appropriate material for vertical separation.
- Flexposts, which are commonly used in retrofit, quick-build, or interim design projects, are appropriate in both low and high-speed conditions. While less expensive than some other vertical treatments, they do require continuous maintenance and can be perceived as less attractive than other options.
- Planters provide a more attractive and sustainable atmosphere to the bikeway and are often used along Downtown Mixed-Use and Town Main Street corridors. They may be used on streets with operating speeds up to 40 mph. When speeds are above 30 mph, a highly durable planter material should be used.
- Precast and permanent curb are appropriate on streets with speeds up to 45 mph.
- Parking stops can be used on streets with speeds up to 40 mph.
- Locate vertical elements within the buffer or on

the outside edge line of SBLs and multi-use paths. When installing vertical elements, a minimum buffer width of 2' is recommended.

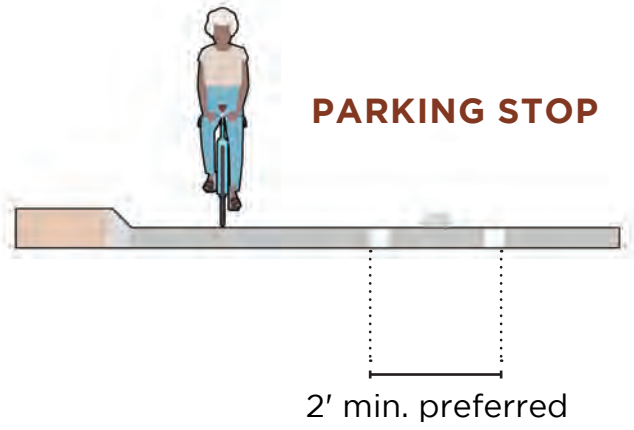
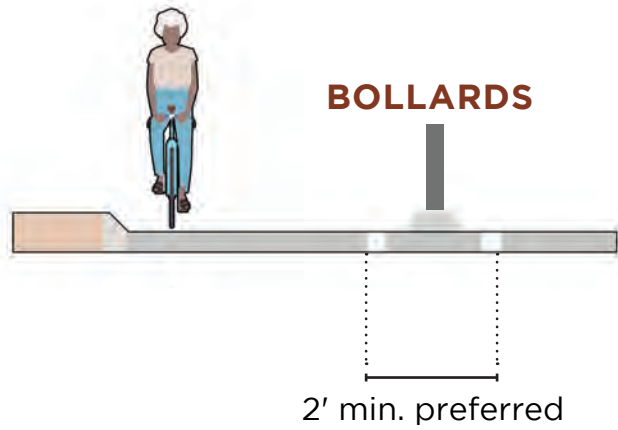
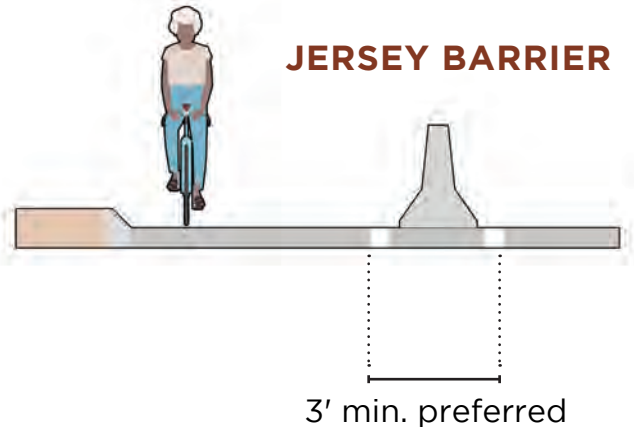
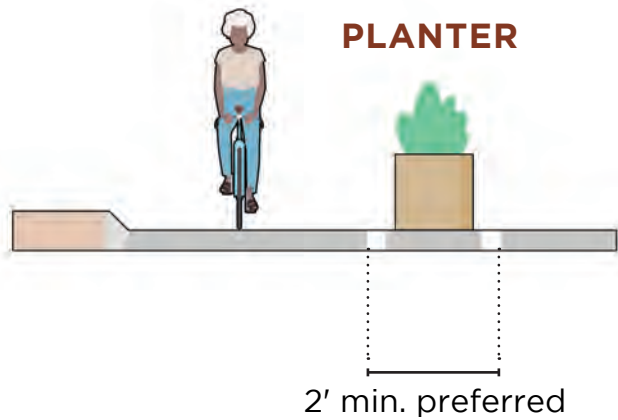
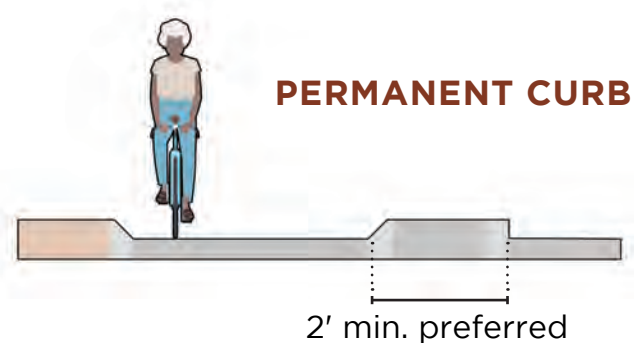
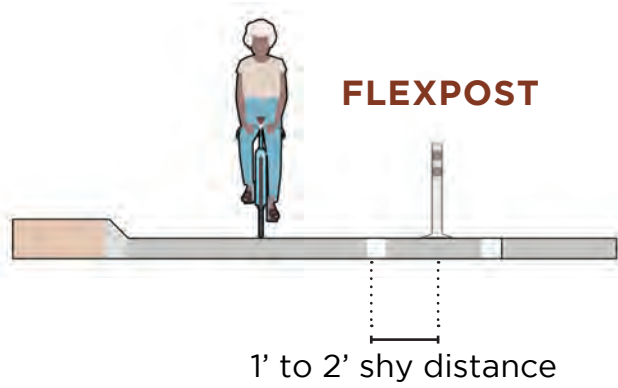
- Install painted edge lines and vertical elements to guide drivers to park at least 3' from the bikeway when parking is adjacent to the bikeway.

Additional Considerations

- Use of any vertical barrier introduces additional but varying maintenance considerations.
- Consider the visual environment where the vertical separation will be employed before selecting a material type.
- Assume a 1' to 2' shy distance from vertical elements when determining where to site vertical elements relative to the bikeway.
- Where right of way and funding are available, use of landscaped islands between bikeways and motor vehicle travel lanes provides protection for bicyclists and other micromobility users, beautification, and sustainable stormwater infrastructure
- Consider using flexposts, low-profile composite curbs, planters, and precast concrete curbs as temporary, lower-cost solutions for rapid implementation, pilot projects, and interim designs.
- Use concrete or weighted plastic barriers during construction activity to guide people walking, bicycling, or using other micromobility devices around construction zones.

References

FHWA Achieving Multimodal Networks (2016)
NACTO Urban Bikeway Design Guide (2013)



25: Buffered Bike Lane

Buffered bike lanes provide horizontal separation in the form of pavement striping, but they do not provide any vertical separation like an SBL. Buffered bike lanes are typically used as a low-cost way to quickly reallocate space on lower volume streets without the need for capital construction. They also allow bicyclists to ride side-by-side or to pass bicyclists and other users of varying speeds.

Use

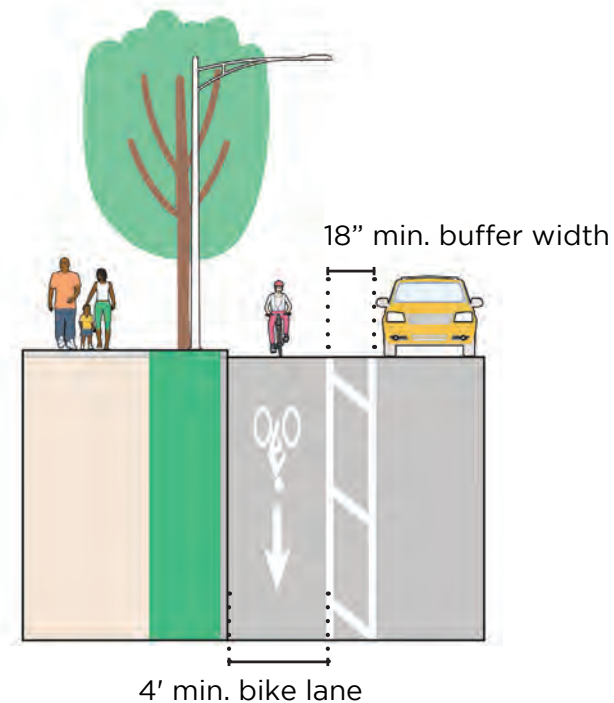
- Bikeways on streets with actual operating speeds over 25 mph or average daily traffic is between 3,000 and 6,000 vehicles per day.
- Bikeways where on-street parking is present and there is significant turnover of that parking.

Guidance

- Use a minimum width of 4' for a buffered bike lane; the preferred width is 6'.
- Use a minimum buffer width of 18". There is no maximum buffer width. Diagonal cross striping should be used for buffers that are less than 3' in width, while chevron cross hatching should be used for buffers greater than 3'.
- Break buffers where curbside parking is outside the bike lane to allow drivers to cross bike lane.
- Utilize high visibility paint for buffers.

ADDITIONAL CONSIDERATIONS

- Retrofit existing street space to provide buffers through the reduction of the number of travel lanes, narrowing of existing travel lanes, or reorganization of on-street parking.



- Consider placing buffer next to on-street parking lanes. If the bikeway is between the parking lane and the curb, the buffer should be located in the door zone of parked cars.
- While not as effective as SBLs, research has documented that buffered bike lanes increase the perception of safety.
- Install buffered bike lanes where 7' of roadway width is available (on each side), rather than a striped bike lane.

References

FHWA Achieving Multimodal Networks (2016)
NACTO Urban Bikeway Design Guide (2013)

26: Striped Bike Lane

Striped bike lanes are located directly adjacent to motor vehicle travel lanes, providing no horizontal or vertical separation. They are delineated by a single pavement stripe and bike lane markings.

Use

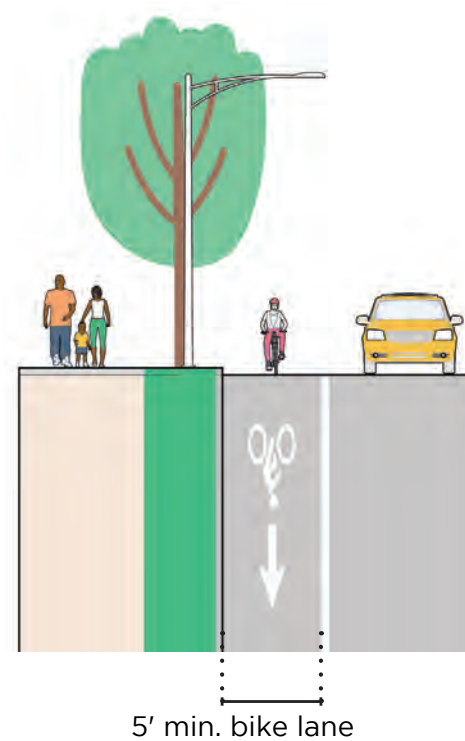
- Bikeways on streets with actual operating speeds less than 35 mph or where average daily traffic less than 6,000 vehicles per day.

Guidance

- Use a minimum width of 5' for a striped bike lane; the preferred width is 6'. The width of the lane must be exclusive from the gutter.
- Provide additional width to add a door zone marked with Parking T's or hatch marks where high on-street parking turnover is expected.
- Install contra-flow bicycle lanes on one-way streets to allow two-way bicycle travel to improve bicycle network connectivity.

Additional Consideration

- Understand that stopping, standing, and parking in striped bike lanes may be problematic in areas of high parking demand and deliveries, especially in commercial and residential areas.
- Consider wider bike lanes or buffered bike lanes in locations with high on-street parking turnover.



References

FHWA Achieving Multimodal Networks (2016)
NACTO Urban Bikeway Design Guide (2013)

27: Advisory Shoulder

Advisory shoulders are used to create narrow streets where bicyclists are provided priority movement and motorists are compelled to yield to bicyclists as well as drivers approaching in the opposing direction. Advisory shoulders are paved spaces for people walking, bicycling, and using micromobility devices on roadways where there is not enough space for typical bike lanes. Advisory shoulders use dotted lane lines, allowing motorists to enter them to yield, and are designed using dimensions based on conventional bicycle lanes. Advisory bikeways can generally be considered on any road with one or more of the following characteristics:

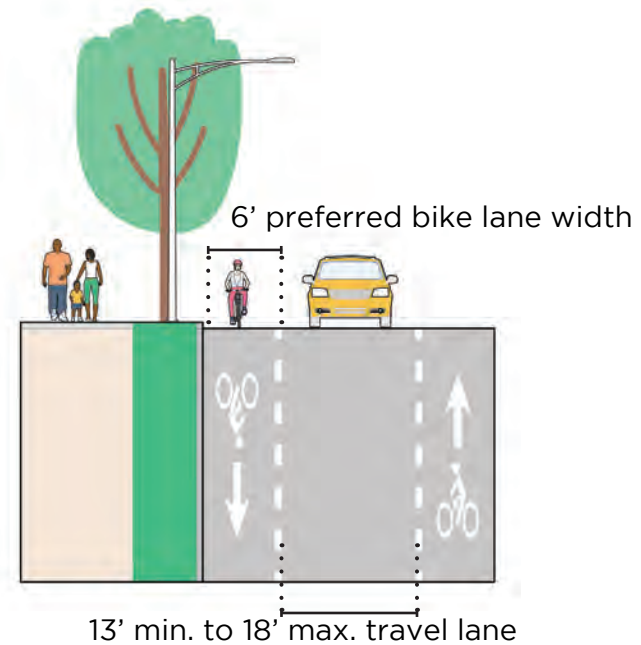
- **Traffic lanes:** 2 lanes or less
- **Posted speed limit:** 25 mph or less
- **Traffic:** 6,000 vehicles per day or less or 300 vehicles or less during the peak hour
- **On-Street parking turnover:** infrequent
- Street is not a designated truck or bus route

Use

- Streets too narrow for bike lanes and normal-width travel lanes.

Guidance

- Use a minimum width of 13' for the center travel lane; maximum width is 18'. Center lanes wider than 18' may encourage excessive vehicle speeds.
- Use a preferred width of 6' for advisory shoulders; 4' is acceptable in constrained right of way. If motor vehicle speeds exceed 50 mph, moderate to heavy volumes of traffic exist, and/



or above-average bicycle usage is present, then advisory shoulders may be need to be wider than 6'.

- Avoid the use of rumble strips, as they will greatly discourage bicycling and potentially cause damage to bicycles and injury to bicyclists.

Additional Considerations

- Understand that advisory shoulder treatments require FHWA permission to experiment.

References

- FHWA Achieving Multimodal Networks (2016)
- NACTO Urban Bikeway Design Guide (2013)

28: Neighborhood Bikeway

Neighborhood bikeways are suitable for quiet streets that connect through residential neighborhoods. They should be attractive to all ages and abilities. These treatments are designed to prioritize pedestrian, bicycle, and micromobility device through-travel, while discouraging high-volume motor vehicle traffic and maintaining relatively low motor vehicle speeds. Treatments vary depending on context, but often include elements of traffic calming, including traffic diverters, speed humps, chicanes, pavement markings, and/or signage.

Use

- Maximum Average Daily Traffic (ADT): 3,000
- Preferred ADT: up to 1,000
- Target speeds for motor vehicle traffic are typically around 20 mph; there should be a maximum < 15 mph speed differential between bicyclists and vehicles.

Guidance

- Place stop signs or traffic signals along the neighborhood bikeway in a way that prioritizes the bicycle movement, minimizing stops for bicyclists whenever possible.
- Include traffic calming measures such as street trees, traffic circles, chicanes, and speed humps.



Additional Considerations

- Consider using traffic diverters or semi-diverters to redirect cut-through vehicle traffic and reduce traffic volumes while still enabling local access to the street.
- Understand that additional treatments for major street crossings may be needed, such as median refuge islands, rapid flashing beacons, bicycle signals, and HAWK or half signals.

References

FHWA Achieving Multimodal Networks (2016)
NACTO Urban Bikeway Design Guide (2013)

29: Shared Lane

Shared lanes require bicyclists to ride in mixed traffic with motorized vehicles. They provide no dedicated space for bicyclists. Typically, only the most experienced bicyclists are comfortable in shared lane environments.

Use

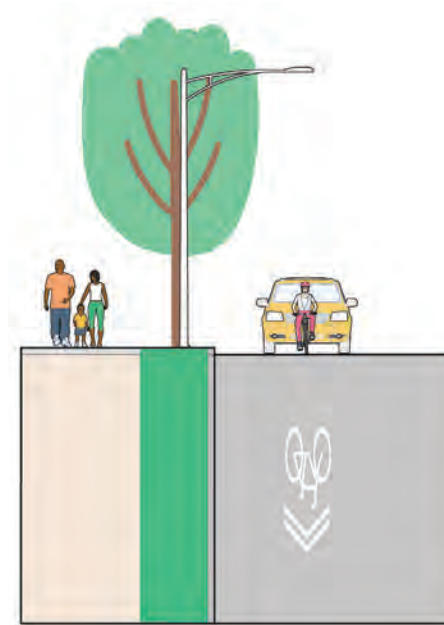
- Streets where other bicycle facility types are not possible and with operating speeds of 35 mph or less.
- Streets interior to areas where drivers intuitively drive slower like parks, school campuses, and recreation areas.

Guidance

- Include shared lane markings and signs to inform drivers that bicyclists may travel in the lane and clearly mark where bicyclists should be expected.
- Use of shared lane markings is only allowed on streets with operating speeds of 35 mph or less.

Additional Considerations

- Realize that the comfort and safety of shared lanes is variable based on motorized traffic conditions, including vehicle operating speeds, average daily volumes of vehicles, and street maintenance.
- Understand that the majority of bike/car crashes occur in shared lanes that are inappropriate for their contexts.



References

- FHWA Achieving Multimodal Networks (2016)
- NACTO Urban Bikeway Design Guide (2013)
- AASHTO Guide for the Development of Bicycle Facilities (2012)
- FHWA Bikeway Selection Guide (2019)

30: Rumble Strip Design

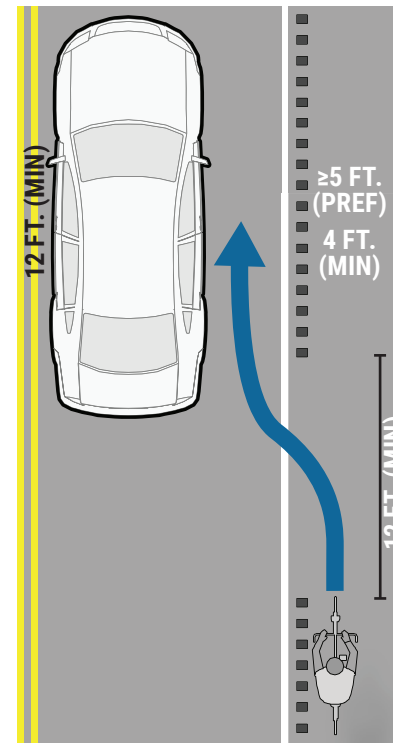
Rumble strips are an important safety feature on rural roadways due to their effectiveness in reducing run-off-road crashes. Rumble strips should be designed to ensure safety and comfort for bicyclists.

Rumble strips are a Proven Safety Countermeasure. It is important that rumble strips are designed with bicyclist safety in mind. The AASHTO Bike Guide recommends providing a 4' clear space from the rumble strip to the outside edge of a paved shoulder, or 5' to an adjacent curb, guardrail, or other obstacle. A reduced rumble strip length or edge line rumble strips, sometimes referred to as a rumble stripes, can be considered to provide additional shoulder width for bicyclists. The AASHTO Bike Guide recommends providing 12' minimum gaps in rumble strips spaced every 40–60' to allow bicyclists to enter or exit the shoulder as needed (2012, p. 4-9). Designers should consider longer gaps in locations where bicyclists are traveling at relatively high speeds.

Designers may also consider bicycle-tolerable rumble strips. Even though the strips can be made more tolerable, they are not considered to be rideable by bicyclists. Additional information on rumble strip design can be found in the AASHTO Bike Guide 2012 and the FHWA Rumble Strips and Rumble Stripes Website (http://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/).

In constrained locations with a paved shoulder width less than 4', designers should consider placing rumble strips at the far right edge of the pavement

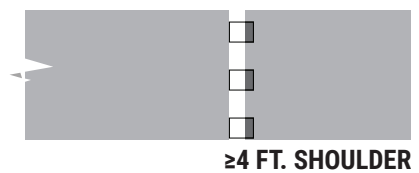
Desirable (for Bicyclists)



Undesirable



Adequate



Constrained



Graphics: FHWA Multimodal Networks

to give bicyclists additional space near the edge of the lane. Results from NCHRP Report 641: Guidance for the Design and Application of Shoulder and Centerline Rumble Strips 2009 indicate that there may not be a practical difference in the effectiveness of rumble strips placed on the edge line or 2' or more beyond the edge line on two-lane rural roads.

References

- FHWA Achieving Multimodal Networks (2016)
- AASHTO Guide for the Development of Bicycle Facilities (2012)
- FHWA Rumble Strips and Rumble Stripes Website

