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# WALK BIKE COLUMBIA

COLUMBIA, SOUTH CAROLINA | PEDESTRIAN & BICYCLE MASTER PLAN



## INTRODUCTION FROM MAYOR STEPHEN K BENJAMIN

JANUARY 21, 2015

My fellow Columbians,

From creating our Bicycle Pedestrian Advisory Committee (BPAC) and completing Phase I of the Vista Greenway to installing new bicycle corrals and the first HAWK pedestrian signal in South Carolina, we've made great strides towards making Columbia a truly bicycle and pedestrian friendly city because we recognize that bicycling is not only a safe, fun and convenient way to travel, but also holds a unique potential to connect our diverse communities and make our city more livable, economically vibrant and environmentally sustainable.

Because of those efforts including our groundbreaking City Employee Bike Share Program and spectacular events like the Main Street Crit, our Annual Famously Hot Mayor's Bike Ride, Bike and Walk to School Day and our first Youth and Teen Bike Ride and Bike-A-Thon, today we are a nationally designated Bicycle Friendly Community and the University of South Carolina is the first Bicycle Friendly University in the state and one of only a few dozen around the country.

Today we see students riding their bikes to campus and young professionals jogging on Main Street every day but rather than sitting back and celebrating, we're pushing harder moving forward with developing our combined Pedestrian and Bicycle Master Plan and Bike Share Plan – Walk Bike Columbia – because we're not satisfied with more bicycle lanes and wider sidewalks.

We want to be the most bicycle and pedestrian friendly city in the Southeast and, with your help, we can make it happen.

Sincerely,

A handwritten signature in cursive script that reads "Steve Benjamin". The signature is written in black ink on a white background.

Stephen K. Benjamin

Mayor

City of Columbia, SC



# TABLE OF CONTENTS

<b>Walk Bike Columbia Introduction</b> .....	4	<b>Recommendations</b> .....	<b>54</b>	<b>Appendices</b> .....	130
Project Partners .....	6	Program and Policy Recommendations .....	54	Demand and Benefits Analysis .....	131
Why Plan for Pedestrians, Transit, and Bicyclists? .....	7	Program Recommendations .....	56	WFC/BFC Analysis, Application, and Action Plans .....	142
Demand and Benefits Overview .....	10	Policy Recommendations .....	60	Planning, Policy, Code, and Programs Review .....	150
Project Vision, Goals and Objectives .....	12	Pedestrian and Bicycle Network .....	64	Public Input and Bicycle Counts .....	182
<b>Existing Conditions Analysis</b> .....	16	Pedestrian and Bicycle Infrastructure Types .....	67	Existing Conditions Detailed Analyses .....	208
Plans Policies and Design Analysis .....	16	Pedestrian and Bicycle Network Recommendations .....	72	Intermodal Transit Analyses .....	240
Walk-Friendly Community and Bike-Friendly Community Assessment: Going for Gold! .....	18	Bicycle Parking Assessment and Recommendations .....	90	Bikespace Analysis .....	250
Planning & Policy Review .....	20	Implementation Plan .....	97	Potential Implementation Funding Sources .....	256
User Needs Analyses .....	26	Capital Improvements Plan .....	98	Complete Streets Design Guidelines .....	270
Public Involvement .....	26	Catalyst Projects to Build Momentum .....	114	Recommended Project Master Tables .....	332
Pedestrian and Bicycle Counts .....	30	Walk Friendly Bike Friendly Community Action Plans .....	120		
Multi-modal Network Analysis .....	32				
Existing Walking and Bicycling Conditions .....	32				
Safety Analysis .....	40				
Pedestrian and Bicycle Level of Service Analysis .....	46				
Intermodal Transit Analysis .....	52				

**PEOPLE OF ALL AGES  
AND ABILITIES ENJOY  
WALKING AND BIKING  
AND BENEFIT FROM  
ENHANCED QUALITY  
OF LIFE, PUBLIC HEALTH,  
AND ECONOMIC  
OPPORTUNITY.**





## WALK BIKE COLUMBIA: INTRODUCTION

*Columbia, SC is a thriving community and hub of South Carolina. It is the hub geographically, with great access to the mountains and sea, as well as other major cities and centers of commerce and trade such as Charlotte, Atlanta, Charleston and Greenville. As the State capital, it is the hub of government and a center of culture and history. Finally it is the hub of education; being home to the most colleges and universities in the State, as well as other centers of learning.*

*The City's position as the face of the State, its relatively mild year-round climate and relatively flat terrain, its compact downtown core, and high concentration of young people all make it an ideal setting for a future where walking, bicycling, and transit are a safe, enjoyable and normal part of daily life. As such, this Plan is a collaborative effort to to capitalize on these positive characteristics and establish a path towards making Columbia the State hub for healthy and sustainable transportation.*





# Project Partners

The Walk Bike Columbia Pedestrian and Bicycle Master Plan and Bike Share Plan was commissioned by The Central Midlands Council of Governments (CMCOG) in partnership with the City of Columbia in 2014 with major funding granted by the Federal Transit Administration, and additional support provided by Palmetto Health and Abacus Planning.

Key partners that have been integral to this planning effort include the Central Midlands Regional Transit Authority (The

COMET), the City of Columbia Bicycle and Pedestrian Advisory Committee, South Carolina Department of Transportation, and The University of South Carolina. Collaboration with numerous other communities, agencies and local partners has also been integral to the development of this plan. Other key partners have included surrounding municipalities within the Columbia region; other State agencies such as the South Carolina Department of Health and Environmental Control; Allen University and other institutions of higher education; business

district associations; and , bicycle and transit advocacy groups such as Palmetto Conservation Foundation and Palmetto Cycling Coalition.

Finally, substantial and valuable input and feedback was gathered throughout the planning process from engaged and concerned citizens, and the Walk Bike Columbia Project Advisory Committee.

## Advisory Committee Members

- Jim Love, AARP
- Erin Letts, Abacus Planning
- Kimberly Tissot, Able SC
- Dana Higgins, City of Columbia
- John Fellows, City of Columbia
- Lucinda Statler, City of Columbia
- Jeff Caton, City of Columbia
- Robert Anderson, City of Columbia
- Gregory Sprouse, CMCOG
- Reginald Simmons, CMCOG
- Paige Tyler, Coldwell Banker United
- Samuel Scheib, COMET
- Natalie Britt, Palmetto Conservation Foundation, Chairperson Bike and Pedestrian Advisory Committee
- Mary Roe, Palmetto Conservation Foundation, Vice Chairperson Bike and Pedestrian Advisory Committee
- Amy Johnson, Palmetto Cycling Coalition
- Candace Knox, Palmetto Health
- Hope Hasty, Richland County
- Tom Dodds, SCDOT
- Ed Sawyer, SCDOT
- Mike Sullivan, SCDOT
- Mark Pleasant, SCDOT
- Rob Bedenbaugh, SCDOT
- Catherine Graham, SC Interagency Office of Disability & Health
- Lauren Angelo, United Way of the Midlands
- Jenny Rooney, University of South Carolina
- Gene Bell, Watson Tate Savory, Bike and Pedestrian Advisory Committee Representative

## Partnering Organizations





# Why Plan for Pedestrians, Bicyclists, and Transit?

Imagine Columbia in 20 years as a place where people choose to walk, bike and/or take transit for some trips – not out of necessity, but because it is a convenient and enjoyable transportation choice. Development is dense and well-designed so that people have many of their everyday needs available by a short walk, bike ride or transit trip. Programs such as walking school busses and bike safety rodeos are commonplace in schools, and walk, bike and transit-friendly streets are prevalent so that parents feel perfectly safe letting their children walk or bike to and from school (freeing up valuable time in their daily lives as well). Transit is as reliable and convenient as driving a car and is easily accessible by anyone. As a result, it is utilized by people of all ages, backgrounds and abilities; providing better access for families without cars to get to jobs, retail and school; creating additional viable transportation options for elderly citizens; and allowing more college students and families to live car-free.

An increasing number of communities and their leadership are seeing the potential of a future like this one; a future where better walking, bicycling and transit are critical parts of transforming and revitalizing our communities, making them more desirable places to live and visit. This movement is a direct result of the nationwide demand for more livable communities and transportation options. In 2010, Transportation for America conducted a nationwide survey that showed 59% of Americans in rural and urban areas preferred a transportation future that “[improves] public transportation and making it easier to walk and bike over building more roads and expanding existing roads.” In addition, “66% [of respondents said] that they ‘would like more transportation options so they have the freedom to choose how to get where they need to go.’ And 73% [of respondents felt] they ‘have no choice but to drive as much as they do’, with 57% desiring to spend less time in the car.”

---

*If Americans themselves were crafting the transportation bill, we would see a doubling of the share for public transportation; an ironclad system of accountability for restoring existing roads and bridges before simply building more of them, and a strong commitment to making all our streets safe enough for kids to bicycle to school or so seniors can walk to nearby restaurants or the drug store.”*

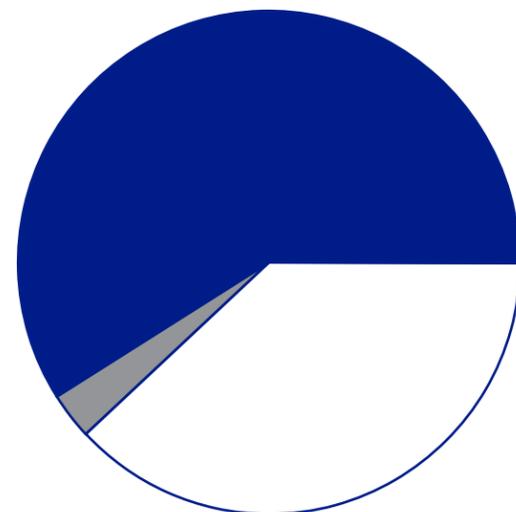
*- Geoff Anderson, T4 America*

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## Preference to Reduce Traffic Congestion

### Transportation for America - Future of Transportation National Survey

\*Source: Transportation For America: <http://t4america.org/maps-tools/polling/2010survey/>



**59% - We need to improve public transportation, including trains and buses, to make it easier to walk and bike to reduce traffic congestion**

**38% - We need to build more roads and expand existing roads to help reduce traffic congestion**

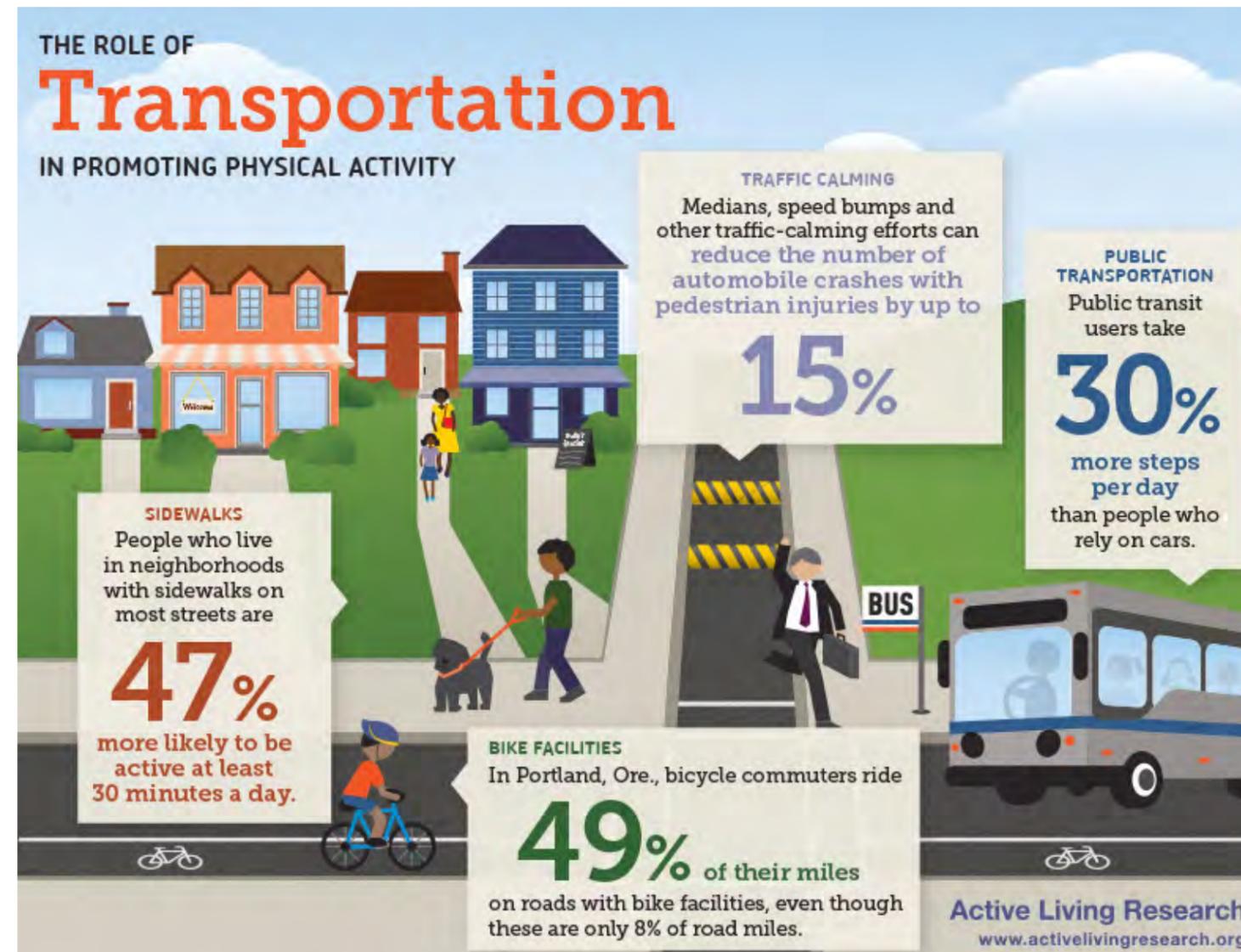


## Benefits of Walking and Bicycling Summary

The “Facts on Active Transportation” shared on the following page present some of the acute health, safety and economic issues many cities today face and the ways in which improved active transportation and recreation can have a positive impact on these. In the following section, a summary of the estimated, quantified benefits that would result from increasing walking and bicycling rates and safety in Columbia is presented. These benefits offer a powerful statement regarding Columbia’s return on investment for implementing the recommendations in this Plan.

*Active transportation can play a major role in building healthier and wealthier communities. The infographic to the right depicts some of the data collected showing just how much of a positive impact it can have.*

*(infographic source: Active Living Research)*





# The Facts on Active Transportation

## ECONOMY

### Issues

- **Traffic congestion in 2011 caused Americans in cities to travel an additional 5.5 billion hours, purchase an additional 2.9 billion gallons of fuel, and spend an additional \$121 billion in gas.** This means, on average, each car commuter spends roughly 40 hours and over \$800 per year waiting in traffic.

### Opportunities

- Reducing the number of vehicular lane-miles through road-diets and other methods decreases wear and tear from motor vehicles. Replacing these with pedestrian facilities, bicycling facilities or transit capacity increases transportation capacity with less investment.
- Reducing the dependence on personal motor vehicles decreases personal and family expenditures on autos, potentially saving thousands of dollars per family annually.
- Reports have shown that pedestrians and bicyclists spend more, on average, than motorists.
- Bikeways and trails across many regions and cities have been shown to have a major economic impact. For example, following the opening of the Greenville, SC Swamp Rabbit Trail in 2011, **most businesses along the trail saw a 30%-50% increase in sales after the trail opened, and businesses that relocated to the trail observed a 30% to 90% increase in sales.**
- **Pedestrian and bicycle infrastructure projects create 8–12 jobs per \$1 million of spending.** Road infrastructure projects create 7 jobs per \$1 million of expenditures (Garrett-Peltier, 2011)
- Focusing investment in Pedestrian and Bicycle Infrastructure Improvements has proven to be more cost effective than vehicular infrastructure across the board.

## SAFETY

### Issues

- Higher traffic speeds result in reduced driver response times and increased accident severity. **A chance a pedestrian would survive if hit by a car travelling at 20 mph is 95%. This percentage is reduced to 60% at 30mph and 20% at 40mph.**
- Nationally, there were over 33,500 traffic fatalities reported in 2012. **The Alliance for Bicycling and Walking reports that 14.9% of traffic fatalities are pedestrians or bicyclists, while only 11.4% of all trips are made either walking or bicycling.**

### Opportunities

- Increasing the number of pedestrians and bicyclists along a corridor, and network-wide, by itself creates a safer environment for these users. Motorists expect the presence of these users and drive more cautiously as a result.
- Complete Streets Improvements that reduce crossing distances for pedestrians and bicyclists, highlight conflict zones, create dedicated roadway space for non-motorized users, reinforce safe roadway behavior, increase visual stimulation or a sense of enclosure, and/or actively reduce speeds through geometric roadway changes foster safer speeds and behavior among all roadway users.

## HEALTH

### Issues

- **“Obesity costs American companies \$225.8 billion per year in health-related productivity losses.”**
- **“The estimated annual health care costs of obesity-related illness are a staggering \$190.2 billion or nearly 21% of annual medical spending in the United States.** Childhood obesity alone is responsible for \$14 billion in direct medical costs.”

### Opportunities

- A recent study shows that people who live within 0.6 miles of a pedestrian and bicycle path get 45 minutes more of exercise a week, on average.
- “A 5% increase in walkability [has been found] to be associated with a per capita 32.1% increase in time spent in physically active travel, a 0.23-point reduction in body mass index, 6.5% fewer vehicle miles traveled, 5.6% fewer grams of oxides of nitrogen (NOx) emitted, and 5.5% fewer grams of volatile organic compounds (VOC) emitted.”
- Studies have shown that increased amounts of physical exercise, including walking and bicycling, improves mental well-being.



# Columbia Active Transportation Demand and Benefits

The project team conducted a demand and benefits analysis to estimate the potential benefits that Columbia could realize by becoming a more walk and bicycle-friendly City. The analysis calculated these benefits based on existing data gathered from sources such as the US Census combined with economic impact assumptions, health assumptions, and environmental/air quality impact assumptions gathered from nationally-accepted studies. A detailed breakdown of this analysis and the results can be found in **Appendix A**.

In summary, the demand analysis revealed that Columbia residents are already walking, biking, and accessing transit with a combined total of **40 million trips annually. This equates to a total of 30 million miles traveled by bike or on foot each year and about 9 million hours of moderate intensity physical activity.**

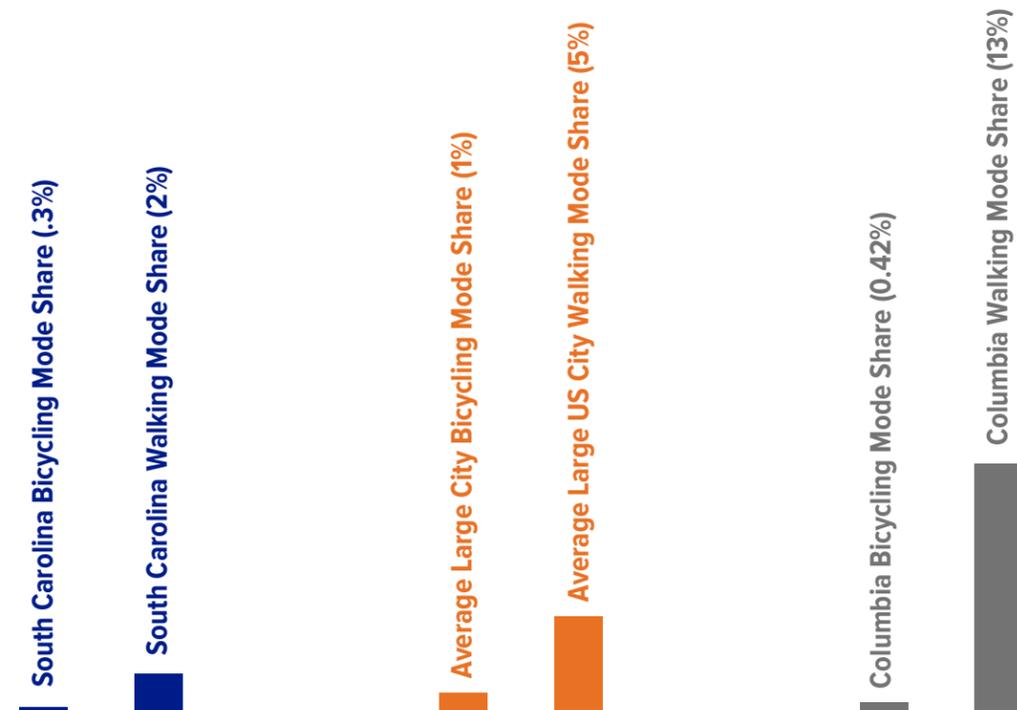
When translating existing demand into measurable benefits to the Columbia community, the analysis revealed that **Columbia**

**is already realizing over \$14 million in community-wide benefits from existing walking activity, and over \$1 million in community-wide benefits from existing bicycling activity.**

With incremental increases in mode share for walking and bicycling, those monetary benefits will grow exponentially, equating to a significant return on investment when it comes to walking and bicycling infrastructure, policies, and programs.

By increasing walking rates by two percentage points and doubling the current bicycle mode share, Columbia could increase those benefits to more than \$19 million in community-wide impact. By increasing walking mode share by a total of four percentage points and reaching the bicycling mode share of a peer Silver-level Bicycle Friendly Community (see text box for more info on the Bicycle Friendly America Program) [insert text box], **Columbia could realize an estimated \$27.7 million in economic benefits resulting from walking and bicycling activity, nearly doubling the current estimated benefits.**

*The following page presents a snapshot of the benefits of increasing walking and bicycling in Columbia. Increasing walking and bicycling rates not only have positive qualitative impacts on resident health, livability and the environment, but can have substantial economic benefits as well.*

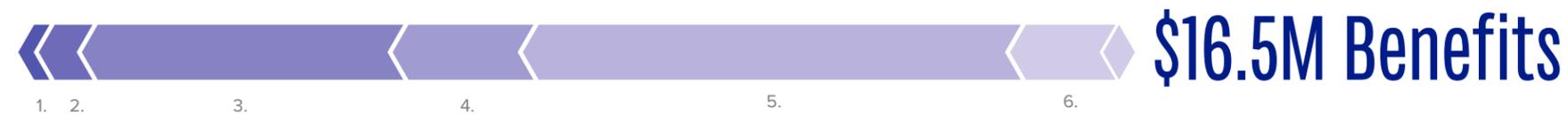


*The graphics to the left show how Columbia compares with averages for walking and bicycling and national large city averages. While Columbia ranks high in the Country for existing walking rates, there is ample room to improve in terms of walking and bicycling rates and safety.*



# BENEFITS SNAPSHOT

**Columbia Current Walking Mode Share (13%) and Current Bicycling Mode Share (0.42%)**



**2% Walking Mode Share Increase (15%) and Double Bicycling Mode Share (0.84%)**



**Example 4% Walking Mode Share Increase (17%) and Silver-Level Bicycle Friendly Community Bicycling Mode Share**



- 1. Reduced Vehicle Emissions Costs
- 2. Reduced Traffic Congestion Costs
- 3. Reduced Vehicle Crash Costs
- 4. Reduced Road Maintenance Costs
- 5. Household Vehicle Cost Savings
- 6. Health Care Cost Savings

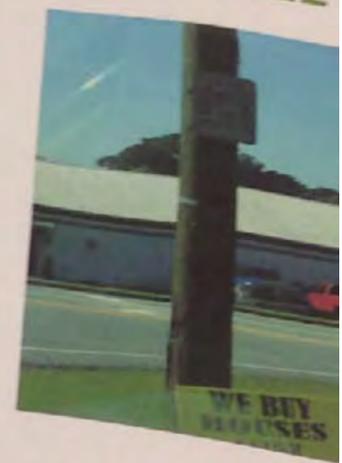
# ACCESS TO TRANSIT

## EVERY TRANSIT-USER IS A PEDESTRIAN AND/OR BICYCLIST

Pedestrian and bicycle access to transit stops is critical to the safety and convenience of transit users in Columbia. Share your thoughts on how to create more transit stops in Columbia that provide safe and comfortable access for pedestrians and bicyclists.



A LACK OF SIDEWALKS, ADA-ACCESSIBLE FEATURES, OR OTHER KEY ELEMENTS OF PEDESTRIAN CONVENIENCE, AND OVERALL

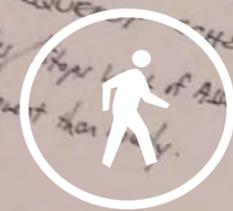
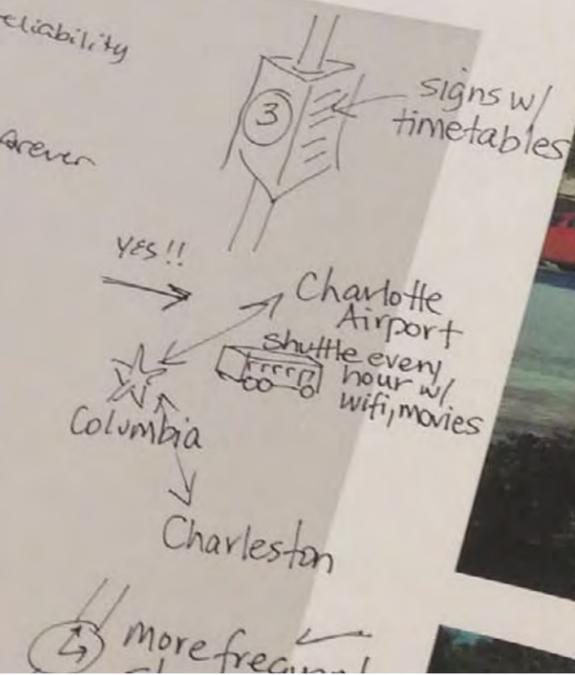


TRANSIT STOPS/ROUTES  
IN NEED OF BETTER  
AND BICYCLE ACCESS?

### WHAT WOULD MAKE TRANSIT IN COLUMBIA MORE CONVENIENT AND PRACTICAL FOR YOU?

### BICYCLE RACKS ON BUSES, VEHICLE FEATURES ARE CRITICAL TO PEDESTRIAN PRACTICAL, AND INVITING C

*Handwritten notes:*  
Cheaper non-stop buses to Charlotte's Charleston  
Better communication of bus/shuttle times & ensure reliability  
Bus shelters  
More frequent stops  
Cues that come more frequently so you don't wait forever for the next bus.  
Shade - @ Stops and sidewalks to stops  
Many stops don't feel safe -- sketchy areas  
Smart streets - sidewalks + protected bike lanes  
Neighborhood connections to Greenway + major East West North South bike routes  
Timeliness! #8 is always late  
Enforcing existing laws w/regard to sharing the road.  
FREQUENT SCHEDULES FOR THE MALLS!  
Rides for bus if Assembly SE  
More frequent than...





# WALK BIKE COLUMBIA: PROJECT VISION, GOALS AND OBJECTIVES

## Introduction

The infrastructure improvements, policies, and programs recommended in Walk Bike Columbia are shaped by the Plan's vision, goals and objectives. The vision, goals, and objectives are developed by the Project Advisory Committee with input from agency staff and based, in part, on:

- stakeholder focus groups and broad public outreach
- existing vision and goal statements of prior city and regional planning efforts,
- nationally-recognized performance measures for pedestrian and bicycle planning, and
- the League of American Bicyclists' (LAB) feedback for Columbia's 2013 Bicycle Friendly Community application.

The following is a unique vision statement and related goals and objectives for Walk Bike Columbia. The objectives serve as performance measures, allowing Columbia and its partners to evaluate its progress towards and the impact of implementing the Plan's recommendations:

*Transit is an important component of this planning effort . To increase the use of transit, and effectively increase the range of pedestrians, transit stops must be accessible by sidewalks. In addition, bicycles and bike share are both effective at extending the effective range of transit.*

## Vision Statement

*Walk Bike Columbia envisions an expanded and ADA-accessible network of transit, sidewalks, greenways, trails, and on-street bicycle connections linking people to jobs, schools, destinations, adjacent communities, and one another. The network serves residents, commuters, students, and visitors alike. Walking, biking and transit are an integral part of City projects, policies, and programs and are perceived as routine, efficient, safe, and comfortable options for both transportation and recreation. People of all ages and abilities enjoy walking and biking and benefit from enhanced quality of life, public health, and economic opportunity.*





# Goals and Objectives

## GOAL 01

**Choice** - Provide a range of transportation options to advance Columbia’s multimodal linkages and transportation culture.

**Objective 1-1: Expand the range of ways to move** throughout the city.

**Objective 1-2: Implement a phased bike share system** that complements and expands the transit and pedestrian networks.

**Objective 1-3: Connect walking and bicycling infrastructure improvements** with transit stops for **last-mile linkages**.

**Objective 1-4: Increase the number of bike-on-bus trips** by 50% by 2018, and 100% by 2020.

## GOAL 03

**Connectivity and Convenience** – Biking, walking, and using transit for transportation will be easy, efficient, and routine activities.

**Objective 3-1: Connect residents and visitors with on- and off-street pedestrian and bicycle facilities** to destinations and activity centers throughout the city.

**Objective 3-2: Integrate transportation and land use policies** to encourage sustainable growth that encourages walking, bicycling and transit.

**Objective 3-3: Prioritize pedestrian and bicycle routes between the Three Rivers Greenway, the Statehouse, USC campus, and each of the major business districts** in downtown.

**Objective 3-4: Prioritize pedestrian and bicycle routes from neighborhoods to transit stops, and from neighborhood to neighborhood.**

## GOAL 02

**Accessibility** – Institutionalize universal design principals to meet the needs of all modes and all users, including children, families, the aging, and those with disabilities.

**Objective 2-1: Update design guidelines** to meet current best practices of ADA-accessibility, transit access, and safe and innovative pedestrian and bicycle facilities.

**Objective 2-2: Upgrade streets of all typologies**, including transit corridors, based on improved accessibility guidelines to meet the needs of all users.

**Objective 2-3: Expand development standards** to require bicycle parking at retail, commercial, civic, and employment uses and multi-family housing.

**Objective 2-4: Establish short-term and long-term bicycle parking** at all major transit stops.

**Objective 2-5: Establish form-based codes** or similar development standards to ensure setbacks, parking lots, and other street-level design elements prioritize pedestrian and bicycle access.

**Objective 2-6: Reduce the demand for costly paratransit trips** as result of infrastructure improvements aimed towards pedestrians with mobility or visual impairments.

## GOAL 04

**Safety and Comfort** – Improve pedestrian and bicyclist safety while designing attractive, welcoming, and comfortable streets, trails, and greenways for all users.

**Objective 4-1: Reduce the number of bicyclist injuries and fatalities** by 20% by 2018 and by 40% by 2020.

**Objective 4-2: Reduce the number of pedestrian injuries and fatalities** by 20% by 2018, and by 40% by 2020.

**Objective 4-3: As a long-term goal, strive to eliminate all traffic fatalities**, across all transportation modes.

**Objective 4-4: Continue Columbia’s tradition of tree-lined streets** while incorporating low-stress facilities such as wider sidewalks and innovative bike treatments.

**Objective 4-5: Incorporate intersection safety and accessibility improvements** for pedestrians and bicyclists within corridor improvement projects.

**Objective 4-6: Develop off-street facilities to meet national best practices in design**, providing a safe and inviting environment for all ages and ability levels.



**GOAL**  
**05**

**Awareness** - Education, encouragement, and enforcement related to biking and walking will ensure all residents and visitors feel confident biking and walking throughout Columbia.

**Objective 5-1: Generate awareness among motorists, pedestrians, and bicyclists** of their rights related to safe and courteous use of roadways.

**Objective 5-2: Provide educational opportunities and encouragement programs** specifically targeted to the “interested but concerned” group of existing and potential bicyclists, including families and children.

**Objective 5-3: Ensure that education and encouragement programs for transit, walking, and biking reach all** socioeconomic groups, geographic locations, genders, races, and walks of life.

**Objective 5-4: Utilize targeted enforcement to discourage unsafe behaviors** of motorists, Licensed Commercial Drivers, pedestrians, bicyclists, and transit users.

**Objective 5-5: Develop and promote an easy-to-read User Map & Guide,** supported by wayfinding signage, for the combined transit, pedestrian, and bicycle network.

**GOAL**  
**07**

**Implementation** – Local leadership, coordination, and funding will allow the continued growth of the pedestrian and bicycle network as well as opportunities for bike sharing.

**Objective 7-1: Work across jurisdictions, departments, and organizations** to achieve coordination on short-, medium-, and long-term transportation-related goals and plans.

**Objective 7-2: Establish dedicated funding amounts** and fundraising goals for implementation of the Plan.

**Objective 7-3: Implement at least six recommendations of the Plan within six months of adoption** with a goal of implementing at least one recommendation in each of the 5 E categories within 1 year of adoption.

**Objective 7-4: Establish an annual work plan of programmatic, policy, and infrastructure recommendations** ready for implementation, for pedestrians, bicyclists, and transit users.

**Objective 7-5:** Closely follow the Implementation Plan included as a component of this planning effort to **build 50 miles of on-street bike facilities by 2017.**

**Objective 7-6:** 30 miles of greenway are currently programmed with penny sales tax funds within the Columbia urban services area. The city should **build 20 miles of off-street, paved shared-use paths or greenways by 2020.**

**Objective 7-7: Identify non-profit and private sector partners to lead community-based education and encouragement programs.**

**Objective 7-8:** Designate a staff member and/or **establish a new staff position dedicating at least 50% of time to implementation of the Plan.**

**GOAL**  
**06**

**Usage** – The transit-, walking-, and biking-environment will inspire movement in everyday life.

**Objective 6-1: Maintain a walking mode share at or above current levels,** remaining one of the highest in the country.

**Objective 6-2: Double transit mode share by 2020,** establishing a level of usage comparable to the national average.

**Objective 6-3: Double bicycle mode share by 2020,** establishing a level of usage comparable to peer BFC-designated cities.

**Objective 6-4: Establish and maintain an annual counts program,** documenting trends in pedestrian and bicycle activity.

**Objective 6-5: Document an annual increase in physical activity levels** among Columbia residents, ultimately reducing rates of obesity and related chronic diseases.

**GOAL**  
**08**

**Evaluation** – The City will measure progress towards advancing the vision and goals of Walk Bike Columbia.

**Objective 8-1: Develop and publish a bi-annual report summarizing progress in implementing** the transit, walking, and bicycling recommendations of the Plan.

**Objective 8-2: Coordinate annual pedestrian and bicycle counts with planned infrastructure investments** to measure impacts.

**Objective 8-3: Conduct bi-annual analysis of pedestrian and bicycle collision data** to measure progress towards safety goals and objectives.

**Objective 8-4: Maintain up-to-date GIS inventory of pedestrian, bicycling, and transit facilities** including ADA improvements.

**Objective 8-5: Achieve Silver-level BFC by 2018 and Gold-level BFC by 2020.**

**Objective 8-6: Achieve WFC status by 2015, Gold-level by 2018, and Platinum-level by 2020.**

**TRANSPORTATION IS ABOUT MORE THAN ASPHALT, CONCRETE AND STEEL. ULTIMATELY IT IS ABOUT PEOPLE. IT IS ABOUT PROVIDING PEOPLE WITH THE OPPORTUNITY FOR A SAFER, HAPPIER AND MORE FULFILLING LIFE.**



-- RODNEY SLATER,  
FORMER US SECRETARY OF TRANSPORTATION



## EXISTING CONDITIONS: PLANS, POLICIES, AND DESIGN

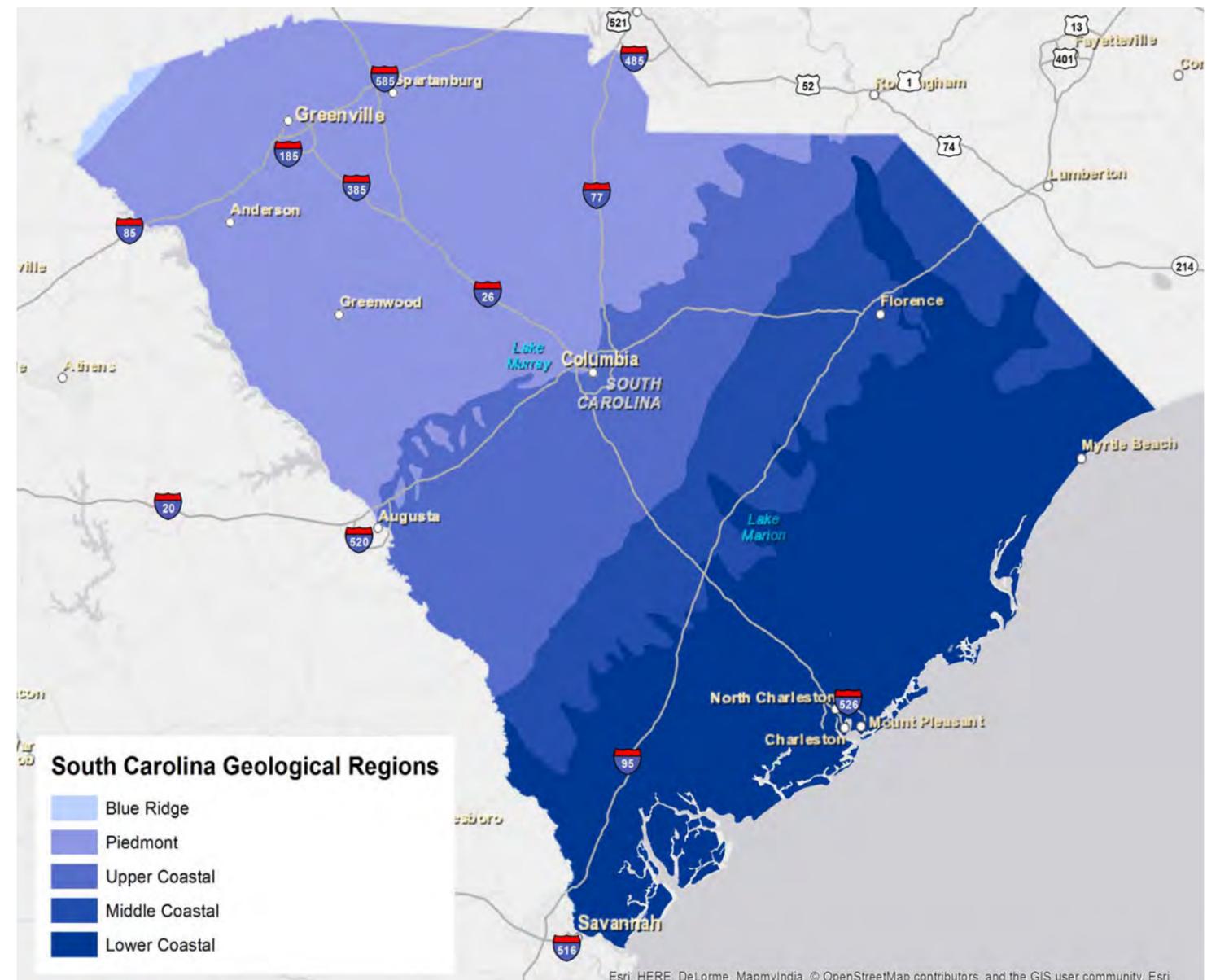
*The scope of this planning effort encompasses pedestrian, bicycle and transit activity within the Columbia, SC city limits. However, this plan acknowledges that the City of Columbia's transportation patterns are affected by several surrounding jurisdictions such as Cayce, West Columbia, Irmo, Forest Acres, Arcadia Lakes, Lexington, and Springdale. It also considers several areas around the Columbia city limits that are priority areas for annexation into the city limits.*

Columbia is a mid-sized city in the Midlands region of South Carolina. The City is within the Upper Coastal or Sandhills landform region, which is characterized by flat terrain and rolling hills. However, the rivers and creeks that transect the city - such as The Broad/Saluda/Congaree Rivers to the west and Gills Creek to the east - are the cause of a substantial amount of grade change in areas such as south of downtown Columbia. Columbia's climate is characterized by hot summers and mild falls, winters and springs, with an average of 217 sunny days a year. All of these conditions make Columbia an ideal city for active transportation most of the year.

Walk Bike Columbia is a master plan for the pedestrian and bicycle network, with a focus on walking and bicycling as "feeder modes" for Columbia's larger transit network. A safe and accessible pedestrian network is key to an effective transit network and vice versa. Without accessible pedestrian connectivity to stops, the effective transit network is greatly reduced; and a strong transit network can greatly expand the effective range of someone heading to a destination by foot.

Likewise, an accessible bike network can expand the range of transit significantly. If a transit station is a 20 minute walk from someone's origin, but only a 5 minute bike ride, this may be the difference in choosing to take a car or take transit. The key to encouraging people to bike to transit is to make it convenient,

comfortable and safe. For example, installing separated bike facilities to the transit stop, providing end-of-trip facilities such as secure bike parking at the stop, or planning bike share station placement around transit lines.





# Going for Gold! Walk-Friendly and Bike-Friendly Community Assessment



## Introduction

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

The BFC program is administered by the League of American Bicyclists, a national bicycling advocacy organization based in Washington, D.C. Since the program began, the League has awarded over 300 communities with “bicycle-friendly” status. There are currently 6 BFCs in South Carolina. In 2011, the Pedestrian and Bicycle Information Center, based in Chapel Hill, North Carolina, announced the development of the WFC Program. There are currently 47 “walk-friendly” designated communities around the country, but none yet in South Carolina.

**Both the WFC and BFC program use the five “E’s” of pedestrian and bicycle planning as the framework for identifying successful biking and walking communities. The five “E’s” are: Engineering, Encouragement, Education, Enforcement, and Evaluation.** Each program has its own detailed questionnaire that a city or town must complete online in order to apply for recognition. Five levels of award

designation are possible in the BFC program: Bronze, Silver, Gold, Platinum, and Diamond. The WFC program offers four award levels: Bronze, Silver, Gold, and Platinum. Both programs offer an Honorable Mention category, as well.

In 2008, Columbia applied for BFC designation and received a Bronze level award in 2008 and 2013. **Columbia is one of five Bronze level communities in South Carolina**, alongside Charleston, Greenville, Spartanburg, and Rock Hill. Hilton Head is the only Silver level community in the state; no South Carolina communities have reached Gold, Platinum, or Diamond BFC designation. There are two opportunities each year to apply to both the BFC and WFC programs: BFC deadlines are in the spring and fall of each year, and WFC deadlines are in the summer and winter of each year.

Appendix B of Walk Bike Columbia provides a BFC Action Plan setting clear action steps for Columbia to reach Gold level BFC status. This project also includes a completed WFC application for Columbia to be submitted in the spring of 2015, along with a WFC Action Plan for Columbia to become the first Walk Friendly Community in the state.

The following sections show the team’s initial walk-friendly and bicycle-friendly community assessment of Columbia. This evaluation provides a baseline for the BFC and WFC Action Plans as well as the City’s WFC application.



## WFC Assessment

The WFC application involves a detailed list of questions organized around the 5 “E’s”. For the purposes of Walk Bike Columbia, the project team developed a BFC scorecard, which uses the WFC application framework to evaluate the current walking environment in Columbia. This scorecard is not intended to be a complete picture of WFC-readiness, but rather a useful snapshot of Columbia’s strengths and weaknesses based on our understanding of the selection criteria.

Based on the WFC scorecard:

- Columbia has been **successful at implementing a variety of Education & Encouragement programs** related to walking.
- Some Engineering and Enforcement practices and policies are positively influencing the walking environment, while others currently limit pedestrian activity and safety.
- **Evaluation & Planning for pedestrians is the area most in need of improvement.** The City currently lacks a dedicated pedestrian coordinator position, a full range of planning initiatives and policies related to pedestrian safety and accessibility, and long-term tracking of valuable pedestrian-related data such as crashes, motor vehicle traffic volumes and speeds, and pedestrian counts to target improvements and track progress.

With a total score of 15 out of 32 possible points, the City of Columbia is identified as a candidate for Bronze level WFC status. A higher range of points are needed to evidence a likelihood of attaining Silver (19-25) or Gold (26-32) level status.

**Table 1** gives an overview of how Columbia scored in the 5 “E” categories for walking, and the complete results of the review can be found in **Appendix B**.

## BFC Assessment

The BFC application involves a detailed list of questions organized around the 5 “E’s”. For the purposes of Walk Bike Columbia, the project team developed a BFC scorecard, which uses the BFC application framework to evaluate the current bicycling environment in Columbia. This scorecard is not intended to be a complete picture of BFC-readiness, but rather a useful snapshot of Columbia’s strengths and weaknesses based on our understanding of the selection criteria.

The BFC scorecard shows that:

- Columbia has a **strong collection of Education and Encouragement efforts** to develop a safer and more welcoming bicycling environment.
- Some Engineering and Enforcement initiatives promote bicycle safety, convenience, and comfort, but several policies and programs are lacking in these categories that could further improve Columbia’s bicycling environment.
- **Columbia scores weakest on Evaluation & Planning;** this planning process, the Bicycle and Pedestrian Advisory Committee, and the Safe Streets Save Lives Campaign provide a good foundation, but there is room for improvement. In particular, the City currently lacks a dedicated bicycle coordinator position and long-term tracking of valuable bicycle-related data, such as crashes, motor vehicle traffic volumes and speeds, and bicycle counts to target improvements and track progress.

**With a total score of 18.5 out of 29 possible points, the City of Columbia shows its commitment to maintaining its BFC status and potential for a Silver level designation within the near-term.** A higher range of points are needed to evidence a likelihood of attaining Silver (20-24) or Gold (25-29) level status.

**Tables 2** gives an overview of how Columbia scored in the 5 “E” categories for bicycling, and the complete results of the review can be found in **Appendix B**.

**TABLE 1 – WALK-FRIENDLY COMMUNITY ASSESSMENT**

Evaluation Category	Columbia Score	Total Points Possible
Engineering	4.5	8
Education and Encouragement	5.5	9
Enforcement	1.5	4
Evaluation and Planning	3.5	11
<b>Total Score</b>	<b>15</b>	<b>32</b>

**TABLE 2 – BICYCLE FRIENDLY COMMUNITY ASSESSMENT**

Evaluation Category	Columbia Score	Total Points Possible
Engineering	5.5	8
Education and Encouragement	8.5	11
Enforcement	2	4
Evaluation and Planning	2.5	6
<b>Total Score</b>	<b>18.5</b>	<b>29</b>





# Planning and Policy Review

## Introduction

This section provides a summary of pedestrian, bicycle, and transit planning-related efforts in Columbia. Twenty relevant plans were reviewed for information and recommendations relevant to walking and bicycling. The documents reviewed for this Plan are listed in **Table 3**, and detailed reviews of the documents listed here can be found in **Appendix C**.

**Figures 1 and 2** on the following pages show existing conditions and planned pedestrian and bicycle projects within the City of Columbia.

## Key Findings

These plans, studies, and reports help to identify the gaps that exist in the current pedestrian and bicycle network and underscore the demand for investment in improved facilities for walking and bicycling. **Several of the plans repeatedly stress the importance of developing complete streets that make the transportation network and local and regional destinations accessible not just by automobile, but also by foot, bike, and transit.** Key themes from previous planning efforts include:

- Improve pedestrian and bicycle connections to schools, parks, and employment centers; along major corridors; within commercial nodes; and within and between neighborhoods.
- Provide multi-use trails to link destinations throughout Columbia and the surrounding region.
- Improve pedestrian and bicycle access to transit with more sidewalks, bikeways, and amenities.
- Integrate complete streets design on new and existing roadways.

**TABLE 3 – DOCUMENTS INCLUDED IN WALK BIKE COLUMBIA! BACKGROUND REVIEW**

Plan	Agency	Year
<i>Columbia Owens Master Plan</i>	South Columbia Development Corporation and Columbia Empowerment Zone	2002
<i>A Plan for the Redevelopment of East Central City</i>	East Central City Consortium, City of Columbia	2004
<i>The Master Plan for The Villages of North Columbia</i>	City of Columbia	2005
<i>Five Points “FutureFive” Redevelopment and Master Plan</i>	The Five Points Association	2006
<i>Lower Waverly Catalyst Redevelopment Plan</i>	City of Columbia Planning Department	2006
<i>Bike and Pedestrian Pathways Plan</i>	CMCOG	2006
<i>Central Midlands Commuter Rail Feasibility Study</i>	CMCOG	2006
<i>Innovista Master Plan</i>	University of South Carolina, City of Columbia	2007
<i>Midlands Tomorrow Household Travel Survey Report</i>	CMCOG	2007
<i>Midlands Tomorrow – 2035 Long Range Transportation Plan</i>	CMCOG	2008
<i>South Carolina Statewide Multimodal Transportation Plan – At a Crossroads</i>	South Carolina Department of Transportation (SCDOT)	2008
<i>The Columbia Plan: The Comprehensive Plan for Columbia, South Carolina, 2008-2018</i>	City of Columbia Planning Department	2008
<i>Southeast Lower Richland Sub-Area Transportation Study</i>	Central Midlands Council of Governments (CMCOG)	2008
<i>Columbia Area Transportation Study Transportation Improvement Program</i>	CMCOG	2009
<i>Regional Pathways Plan</i>	CMCOG	2010
<i>University of South Carolina Vision for a Sustainable Future: 2010 Master Plan</i>	University of South Carolina	2010
<i>Broad River Road Corridor and Community Master Plan</i>	CMCOG and Richland County	2010
<i>Irmo/Dutch Fork Sub-Area Transportation Study</i>	CMCOG	2010
<i>Central Midlands Regional Transportation Authority Comprehensive Operational Analysis Report</i>	Central Midlands Regional Transit Authority (CMRTA)	2010
<i>Central Midlands Regional Transportation Authority Park-and-Ride Study</i>	CMRTA	2010
<i>Columbia Connectivity: Linking Main Street and the Vista</i>	Urban Land Institute - South Carolina	2011
<i>COMET Vision: 2020</i>	CMRTA	2012
<i>Rosewood Plan: A Corridor &amp; Neighborhood Plan</i>	City of Columbia Planning & Development Department	2012
<i>Joint Land Use Study Implementation for Fort Jackson – McGrady Training Center – McEntire JNGB</i>	CMCOG	2013
<i>City of Columbia Parks and Recreation Master Plan</i>	City of Columbia	2013
<i>Newberry-Columbia Alternatives Analysis</i>	CMCOG	2014
<i>Devine Street/Fort Jackson Boulevard Commercial Node Plan</i>	CMCOG	2014



# Municipal Code Review

## Introduction

The consultant team reviewed existing development policy and regulatory documents for the City of Columbia. This task included a review of available policies and standards directly related to pedestrian and/or bicyclist safety within the City. The review focused on the City’s Code of Ordinances (CO), but also included a review of the City of Columbia 2010 Complete Streets Resolution.

The full policy and regulatory review is provided in the Policy Matrix found in **Appendix C**.

Planning and development regulations provide guidelines and requirements for most of what is developed in the City and as such are fundamental to the area’s walk- and bike-friendliness. **Since most new development in Columbia is provided through private investment or investment by non-City agencies, the provision of walk- and bike-friendly development policies and ordinances are one of the most cost-effective means that the City has to establish walkable and bikeable infrastructure for its neighborhoods and districts.**

## Key Findings

The City of Columbia has a number of very positive policies and regulations that support walkable and bikeable environments. However, it is also evident that the City could significantly strengthen many areas of policy regarding complete streets (including transit access), bicycle parking, and pedestrian and bicycle facility requirements and enhancements within the context of development ordinances. Policies and standards geared toward retrofit of existing facilities are also recommended and discussed within the attached policy matrix. below describes key strengths identified within the existing ordinances and policies of the City, as well as priority areas for improvement.

## Conclusion

What is evident is that a more holistic approach to facilitating walkable and bikeable new development is required. The City development standards are very much oriented towards automobile access first and foremost. Walkability begins with access to destinations and to the extent politically feasible, the City and its partners at County and State agencies should promote development that is proximate to existing infrastructure, residential development, and existing destinations for education, employment, commerce, and civic activities. This begins with allowing and promoting a mixture of land uses and density of land uses that support walking and bicycle access in the built up areas of the city. For current residents who do not drive or have access to a car and for future residents and visitors who are looking to visit or invest in a place where walking and biking are part of the transportation options, walkable land use patterns are critical to quality of life.

Second, promoting “complete” infrastructure and transportation linkages between land uses is what is required to make sure that places that are proximate in distance are indeed comfortable and safe to walk or bike to and from. This will require a thorough review and refinement of existing development standards to ensure that pedestrian and bicycle access and access to transit is considered in every requirement from the development of sidewalks to provision of bicycle parking and street trees and pedestrian-scaled lighting. Development standards should also consider whether or not buildings and lots are oriented for pedestrian and bicycle access. **The City of Columbia recently adopted a Complete Streets resolution and endorsed the NACTO Urban Bikeway Design Guide, which are great first steps in this direction.**

The comments in the **Appendix C** tables outline many opportunities for making local development standards more pedestrian and bicycle friendly. This plan suggests that City staff and appropriate appointed committees develop proposed text amendments for any “low hanging fruit” amendments noted.

**For more holistic changes, staff, committees, and the Plan committee members should incorporate changes into the upcoming comprehensive audit and rewrite of development standards over the next 12-18 months.** The outcome of such an effort will be development standards that are predictable and sustainable for investors and developers, but that also promote active living, aging in place, quality of life, and transportation and recreation choices; and respect the local character of the City.

**TABLE 4 – KEY STRENGTHS AND AREAS FOR IMPROVEMENT IN COLUMBIA ORDINANCES.**

City of Columbia Ordinances and Policies	
Strengths	Priority Areas for Improvement
Complete Streets Resolution	Development of comprehensive Complete Streets design guidance for new development and public investment
Adoption of NACTO Urban Bikeway Design Guide	Require pedestrian improvements with new development and redevelopment (sidewalks, lighting, street trees, etc.)
Good base of ordinances supporting pedestrian and bike safety (including prohibition on using mobile devices while driving, etc.)	Develop bicycle parking requirements
Good ordinance language requiring property owner participation in sidewalk maintenance	Update very suburban, auto-oriented development standards to be more context-based and pedestrian-friendly
Clear language prohibiting obstructions to sidewalks	Develop policy and ordinances for improved access to transit and improved safety requirements for heavy commercial vehicle operation within the City



FIGURE 1 - EXISTING AND PLANNED PEDESTRIAN INFRASTRUCTURE

### Existing and Planned Pedestrian Infrastructure

#### Existing Infrastructure

- Existing Paved Trail
- - - Planned/Committed Trail
- Existing Unpaved Trail
- Existing Sidewalk

#### Penny Sales Tax Priority Projects

- Intersection Enhancement
- - - Sidewalk

#### Other Planned Infrastructure

- Planned Sidewalk

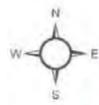
#### Palmetto Trail Master Plan Recommendations

- Existing Palmetto Trail
- - - Palmetto Trail Gap Options

#### Legend

- COMET Route
- USC Shuttle Route
- Commuter Rail Line (Proposed)
- Other Rail Line
- Park
- College
- City of Columbia Limits
- Potential Future Annexation Areas
- Other Jurisdiction
- Water Body

0 1 2 Miles



Data obtained from the City of Columbia and Central Midlands Council of Governments. Map created November, 2014.

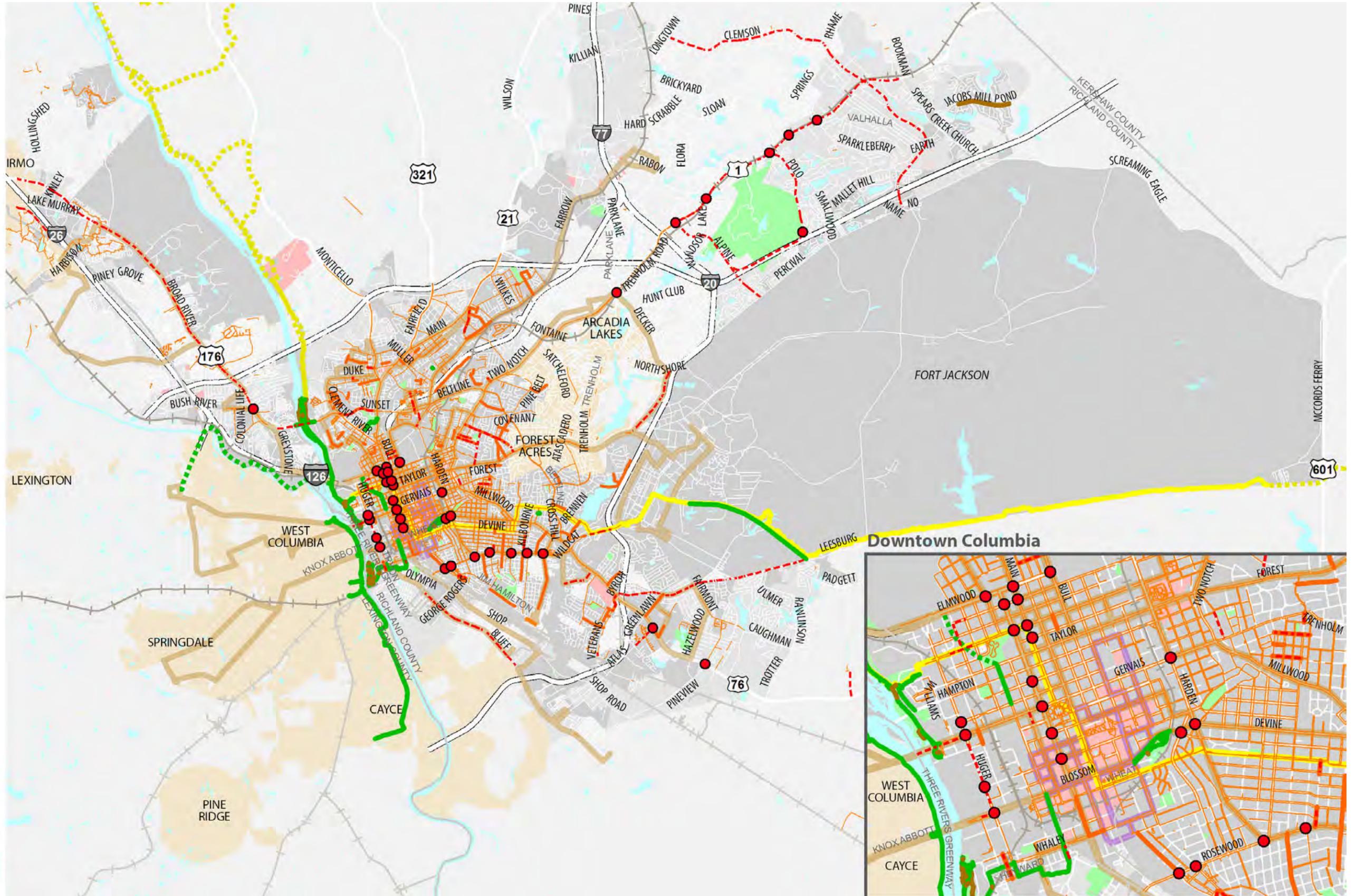


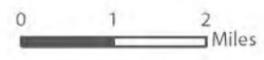


FIGURE 2 – EXISTING AND PLANNED BICYCLE INFRASTRUCTURE

### Existing and Planned Bicycle Infrastructure

- Existing Infrastructure**
- Existing Bike Lane
  - Existing Sharrows
  - Existing Paved Trail
  - Planned/Committed Trail
  - Existing Unpaved Trail
- Penny Sales Tax Priority Projects**
- Intersection Enhancement
  - Bikeway
- Palmetto Trail Master Plan Recommendations**
- Existing Palmetto Trail
  - Palmetto Trail Gap Options

- Legend**
- COMET Route
  - USC Shuttle Route
  - Commuter Rail Line (Proposed)
  - Other Rail Line
  - Park
  - College
  - City of Columbia Limits
  - Potential Future Annexation Areas
  - Other Jurisdiction
  - Water Body



Data obtained from the City of Columbia and Central Midlands Council of Governments. Map created November, 2014.

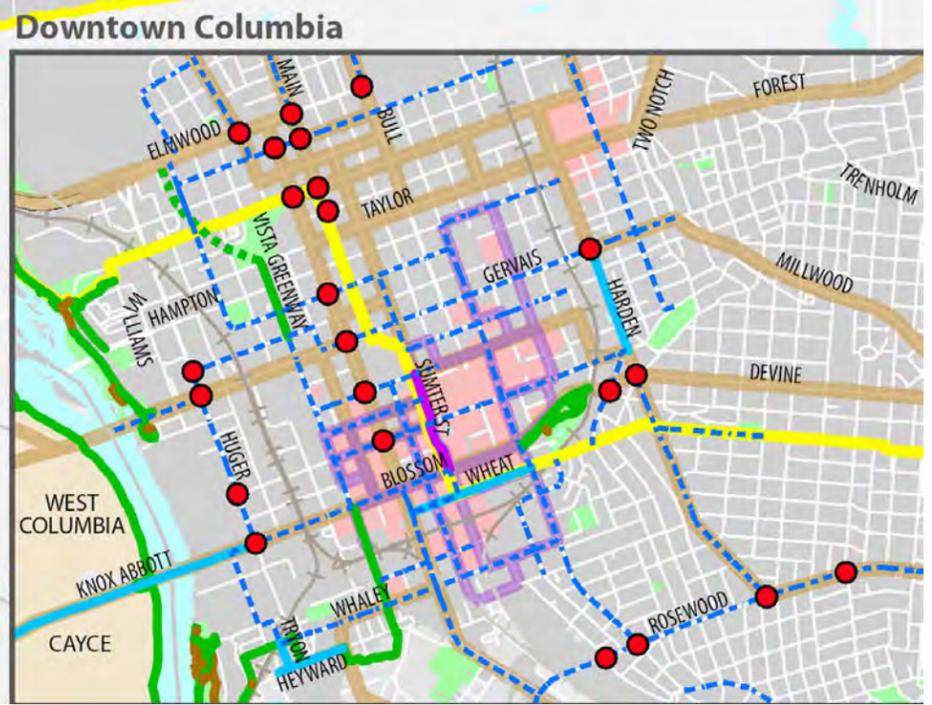
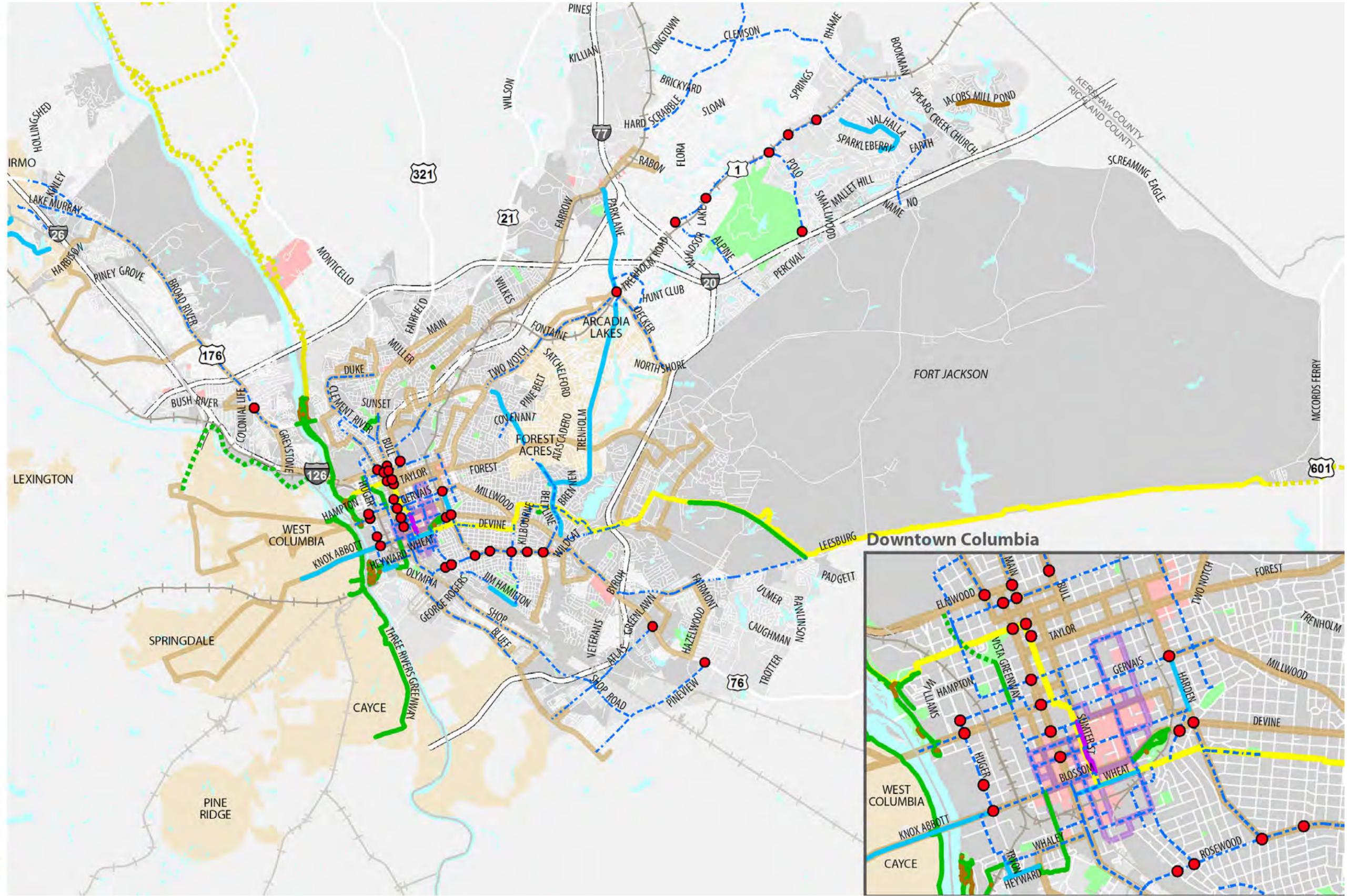




FIGURE 3 - COLUMBIA TRANSIT NETWORK

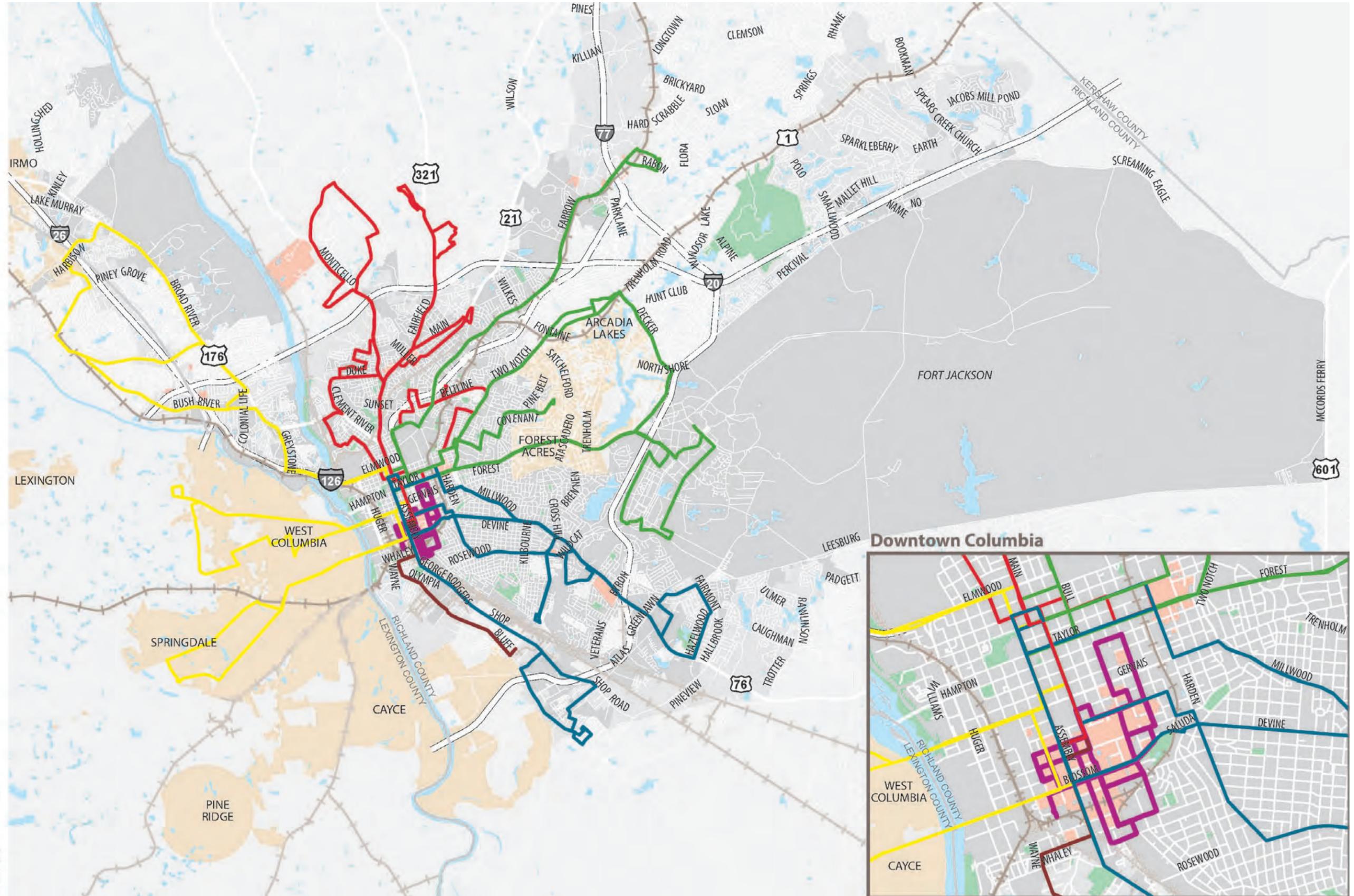
## Columbia, SC Transit Routes

### City of Columbia Transit Routes

- North Routes (6, 11/12, 30, 31, 101)
- South Routes (42, 201, 401, 601)
- Garnet Route
- East Routes (5, 15, 16, 17, 23)
- West Routes (26, 28, 34, 348)
- USC Shuttle Routes

### Legend

- Commuter Rail Line (Proposed)
- Other Rail Line
- Park
- College
- City of Columbia Limits
- Potential Future Annexation Areas
- Other Jurisdiction
- Water Body



0 1 2 Miles

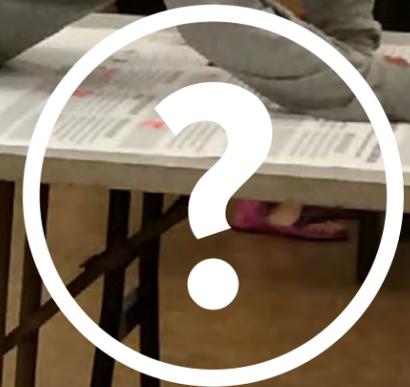


Data obtained from the City of Columbia and Central Midlands Council of Governments.  
Map created December, 2014.



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# EXISTING CONDITIONS: USER NEEDS ANALYSIS

## Public Involvement

The consultant team conducted a multifaceted public outreach effort over a period of four months, from May 2014 to August 2014. The purpose of the effort was to gather local knowledge and community input to guide the plan's development. The project team's public engagement events and efforts included the following:

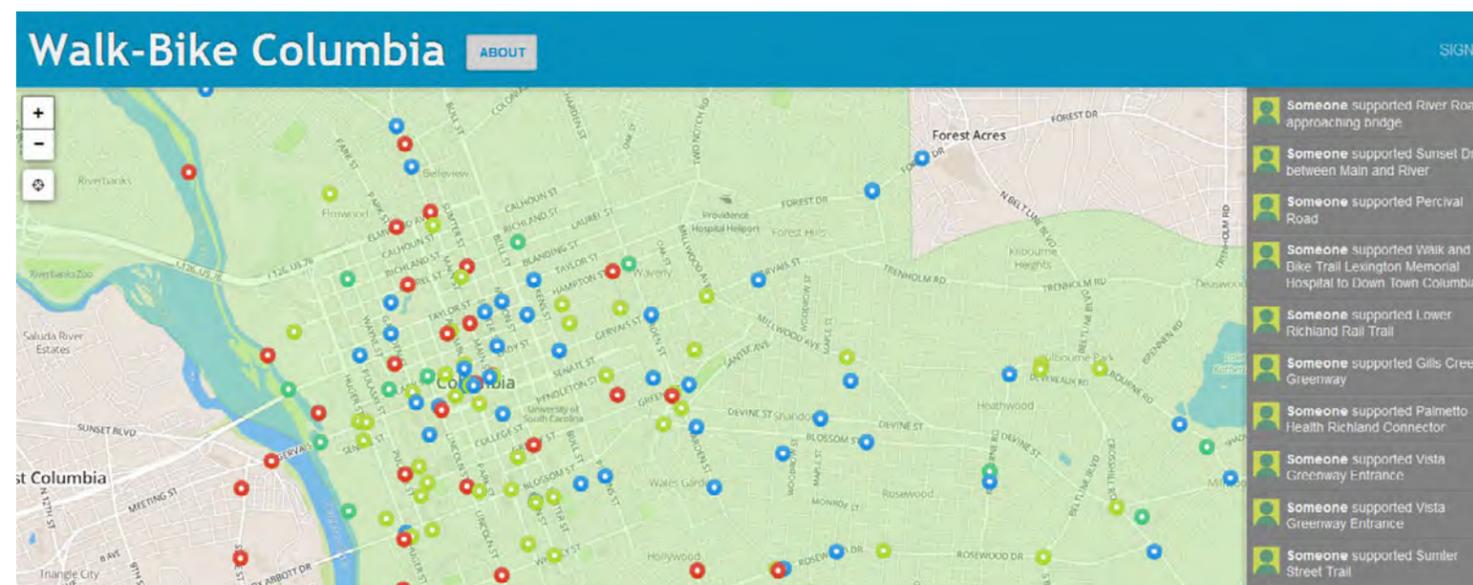
- 4 Steering Committee meetings: 25 committee members
- 4 public workshops with interactive project boards and maps: over 120 attendees

- 8 stakeholder focus groups: 90 invited stakeholders
- Citizen survey (available both online and in hard copy): 825 respondents
- Project website with project information, videos, and relevant links: 3,300 unique viewers
- Online interactive map and input tool: 282 points on the map and comments
- Staffed information booth on multiple days at the downtown transit center and Main Street Farmer's Market

The project team promoted these public involvement opportunities through broad distribution of flyers, posters, and postcards, social media, press releases, and TV ads on the City access channel. Spanish language interpreters attended public events and The COMET bus with bike rack was available for public meeting attendees to explore.

**Public outreach efforts were offered across the city and through a variety of media in order to provide the representatives and residents of Columbia with many opportunities and different mechanisms for contributing to the Plan's development.**

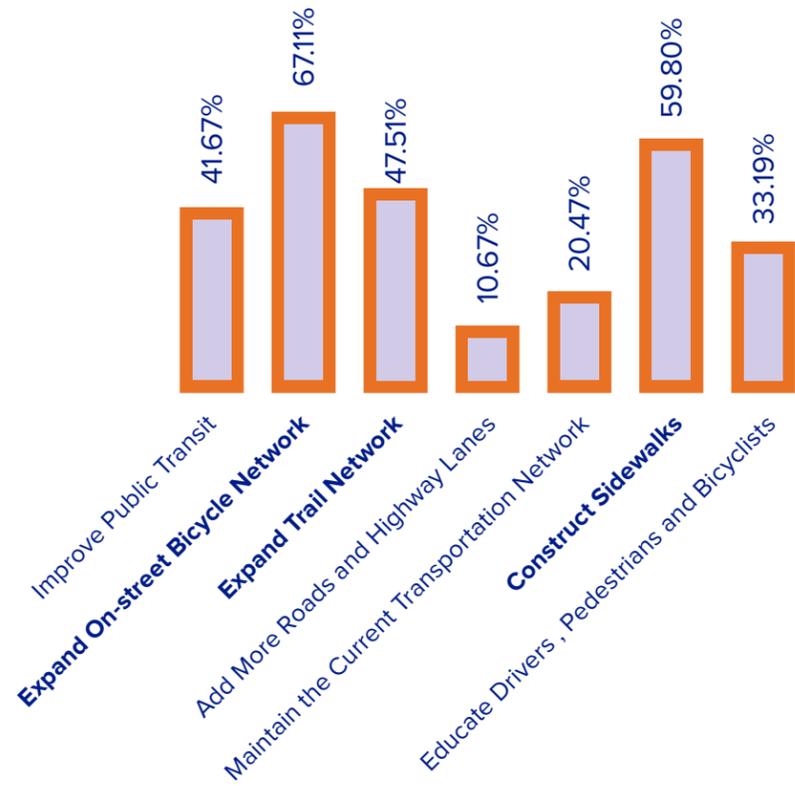
The Walk Bike Columbia public outreach process confirmed that Columbia citizens value access to active transportation and public transit. This is reflected in the low marks given to Columbia's existing pedestrian and bicycle network and its transit operations, as well as in the fact that 81 % of survey respondents said walking and bicycling improvements are "very important" and 61% of respondents said that transit improvements are "very important." Comments received through the public meetings and focus group meetings underscored this.



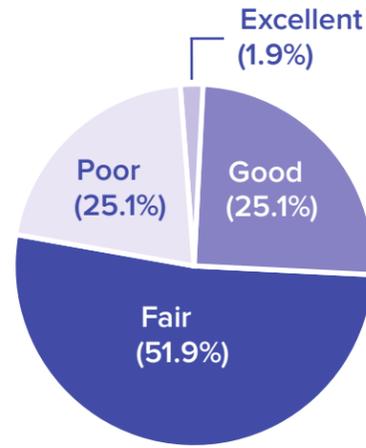
The image to the right shows a screenshot from the public online interactive mapping tool that allowed Columbia residents to input specific challenges and opportunities for walking, bicycling and transit access. The full report summarizing the public input process and results can be found in **Appendix D**.



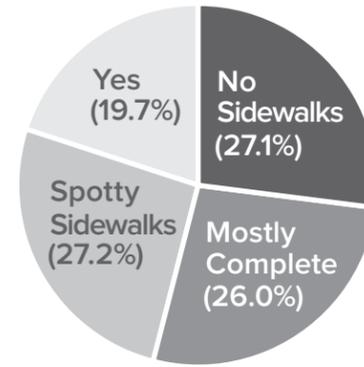
**PLEASE SELECT YOUR TOP THREE TRANSPORTATION PRIORITIES FOR SPENDING OF TAXPAYER MONEY (WEB SURVEY QUESTION)**



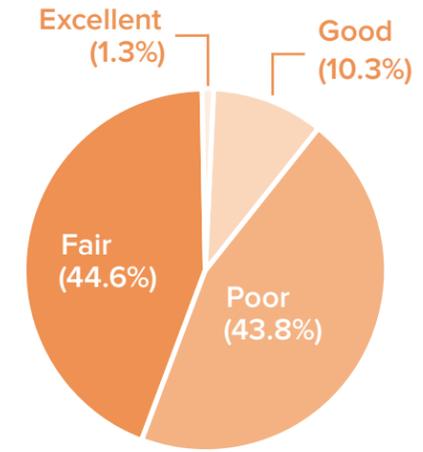
**WALKING AND BICYCLING CONDITIONS QUESTIONS (WEB SURVEY QUESTIONS)**



**HOW DO YOU RATE OVERALL WALKING CONDITIONS IN COLUMBIA?**

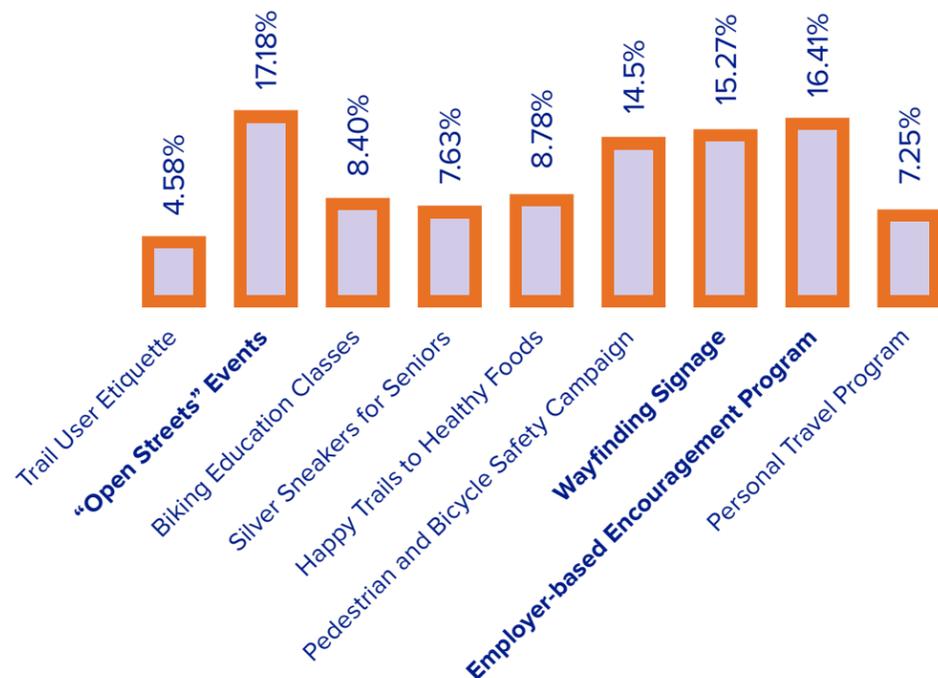


**IS THE SIDEWALK NETWORK NEAR YOUR HOME COMPLETE?**

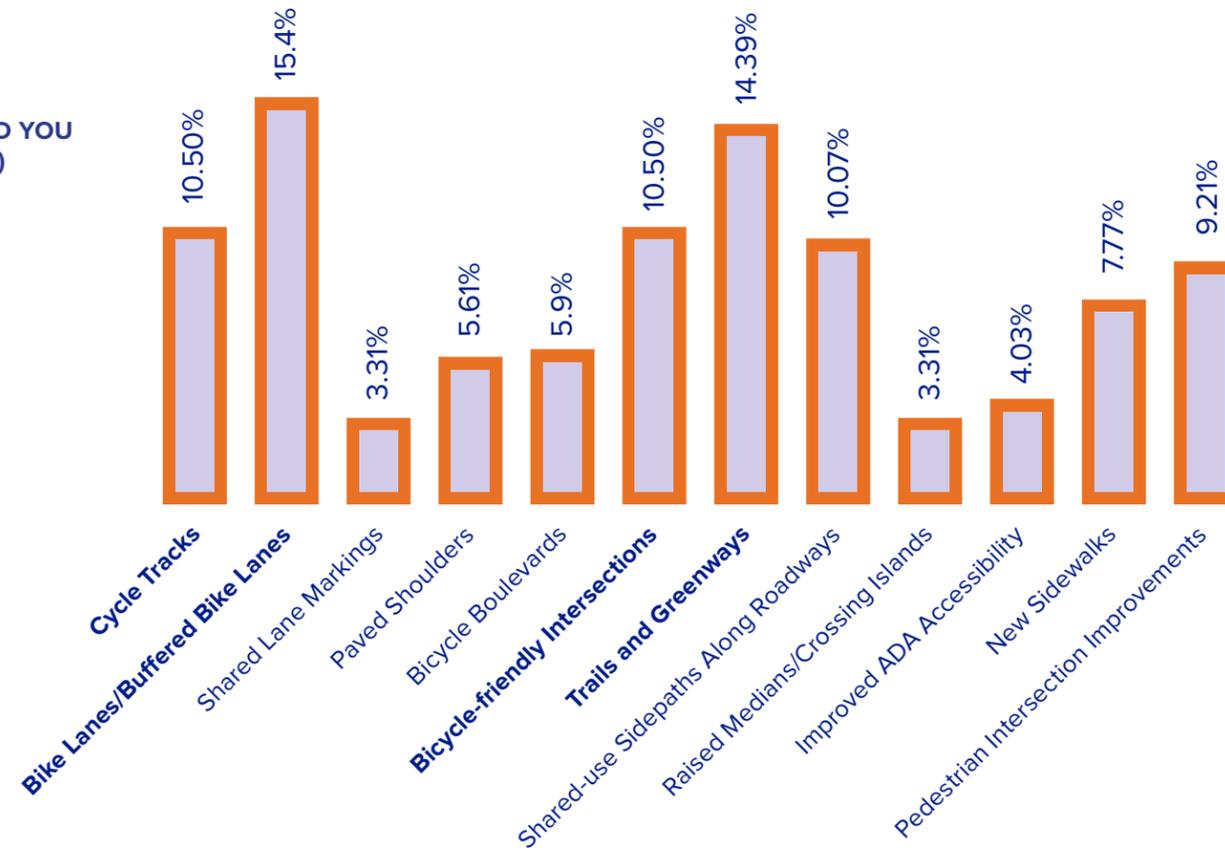


**HOW DO YOU RATE OVERALL BICYCLING CONDITIONS IN COLUMBIA?**

**WHAT EDUCATION, ENCOURAGEMENT AND ENFORCEMENT PROGRAMS WOULD YOU LIKE TO SEE AROUND COLUMBIA? (PUBLIC WORKSHOP QUESTION - 262 VOTES)**



**WHAT PEDESTRIAN AND BICYCLE INFRASTRUCTURE IMPROVEMENTS WOULD YOU MOST LIKE TO SEE IN COLUMBIA? (PUBLIC WORKSHOP QUESTION - 695 VOTES)**





## Infrastructure and Transit Priorities

The primary concerns of residents when it comes to both walking and biking are the lack of safe roads and/or sidewalks, the need for improved design and/or maintenance of existing facilities, and the distance between destinations. The latter item points to a critical link between land use planning/land development and transportation planning/network development. The current efforts by the City and County to work collaboratively to update their land use plans and policies present a unique opportunity to address that important element. In addition to these priority concerns, citizens also noted lack of bicycle parking as a key deterrent to bicycling activity and transit users stressed the need to improve and enhance transit operations (route network, headways, and reliability) while improving walking and biking access to transit.

Regarding infrastructure improvements, Columbia citizens expressed a preference for sidewalks, trails, and shared-use paths and intersection improvements for both pedestrians and bicyclists. For on-street bicycle facilities, buffered bicycle lanes and cycle tracks are preferable to standard bicycle lanes or shared roadways. Citizens also clearly stated neighborhood connectivity and access to parks and trails as city-wide priorities.

## Non-infrastructure Priorities

Based on the public input, the key non-infrastructure strategies for encouraging safe walking, bicycling, and transit usage that are likely to have an impact in Columbia fall into the following categories:

### EDUCATION & ENFORCEMENT PRIORITIES:

- Safety education media campaigns
- Law enforcement stings targeted to motorists, pedestrians, and bicyclists
- Awareness campaign regarding the benefits and availability of walking, bicycling, and transit usage

### ENCOURAGEMENT PRIORITIES:

- Employer-based incentives
- Wayfinding signage for the complete multi-modal network
- Informal, family-friendly events like 'Open Streets' (also known as Ciclovía)

### EVALUATION PRIORITIES:

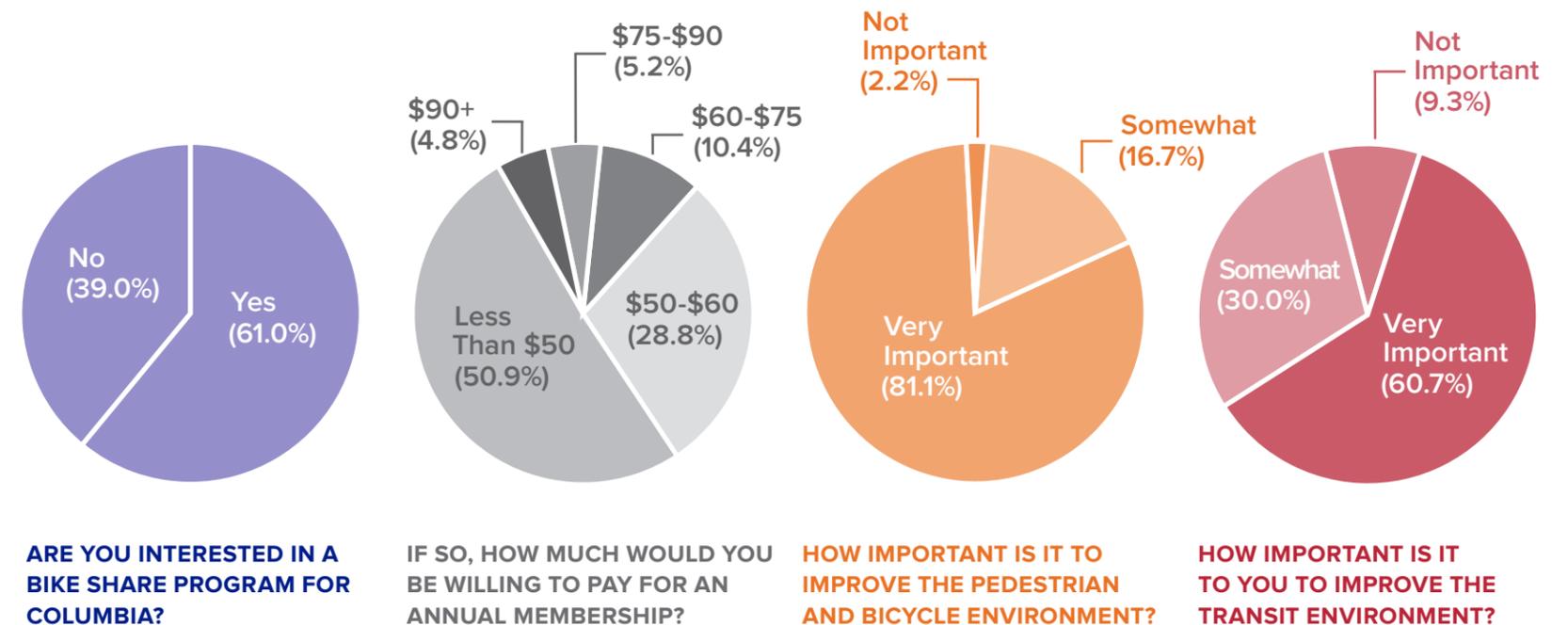
- Policies, plans, programs, and funding that prioritizes Safe Routes to Schools
- Policies, plans, programs, and funding that prioritizes Safe Routes to Transit
- Coordination of land use planning and transportation planning
- Updated and improved design standards and design guidance for pedestrian and bicycle infrastructure, transit stop infrastructure, bicycle parking, and ADA accessibility

## Bike Share Priorities

A majority of public outreach responses support the concept of bike share in Columbia. Concerns regarding the distance between destinations in Columbia and the low levels of bicycling for transportation that currently exist were expressed in terms of potential bike share usage. For a local bike share program to be deemed successful, citizens and stakeholders identified the following as the primary outcomes:

- Improve transportation options and access to healthy living and active transportation.
- Reduce the number of cars on the road.
- Reduce the number of car trips and vehicle miles traveled in private vehicles.

### BICYCLE SHARE AND TRANSIT PRIORITIES (WEB SURVEY QUESTIONS)





# Pedestrian and Bicycle Counts

## Overview

Annual counts conducted in a systematic manner provide strong benchmarking information on walking and bicycling activity and related benefits. Count data adds to Columbia’s understanding of existing pedestrian and bicycling patterns and needs, allows for more strategic planning of future bikeway and walkway investments, and provides a means of evaluating the impact of programs and facilities. **While count data will not provide comprehensive mode share data, it offers a snapshot of peak pedestrian and bicycle activity on a typical day.** It can also provide important baseline data for before-after studies where new investments are planned and provide insight into overall trends in Columbia’s walking and bicycling environment over time.

As a component of this Planning effort, the **consultant team developed a recommended yearly, manual counts program for the City of Columbia** based off of the National Bike and



Pedestrian Documentation Project. The project team also implemented the recommended program in September 2014. The program collected data at 28 sites around Columbia based on access to transit, proximity to main entrances for shopping or employment areas, and high density downtown or residential areas. Locations with recently completed or planned pedestrian or bicycle projects were also considered.

## Counts Summary

As seen from both the weekday and the weekend counts, Columbia has a substantial amount of pedestrian and bicycle traffic occurring throughout the City. **Much of this traffic observed during the counts implementation is occurring around popular destinations for walking and bicycling such as recreation centers, civic buildings, college and university campuses and downtown.**

Pedestrian levels are indicative of the City’s census-reported high rates of walking commuting. Anecdotally, many surveyors noted unsafe jaywalking occurring at several of the count locations. Weekend events such as the Soda-City Market, South Carolina Pride Festival and Greek Festival also likely increased walking rates.

The count results suggest that many people in Columbia are bicycling for commuting purposes to work and/or school as higher numbers of these users are bicycling during typical weekday commute times. The counts also show a high instance of sidewalk bicycle riding, even occurring on streets with existing bike lanes. This is typically an indicator that users don’t feel comfortable riding in the roadway due to inadequate bicycle facilities for roadway conditions.

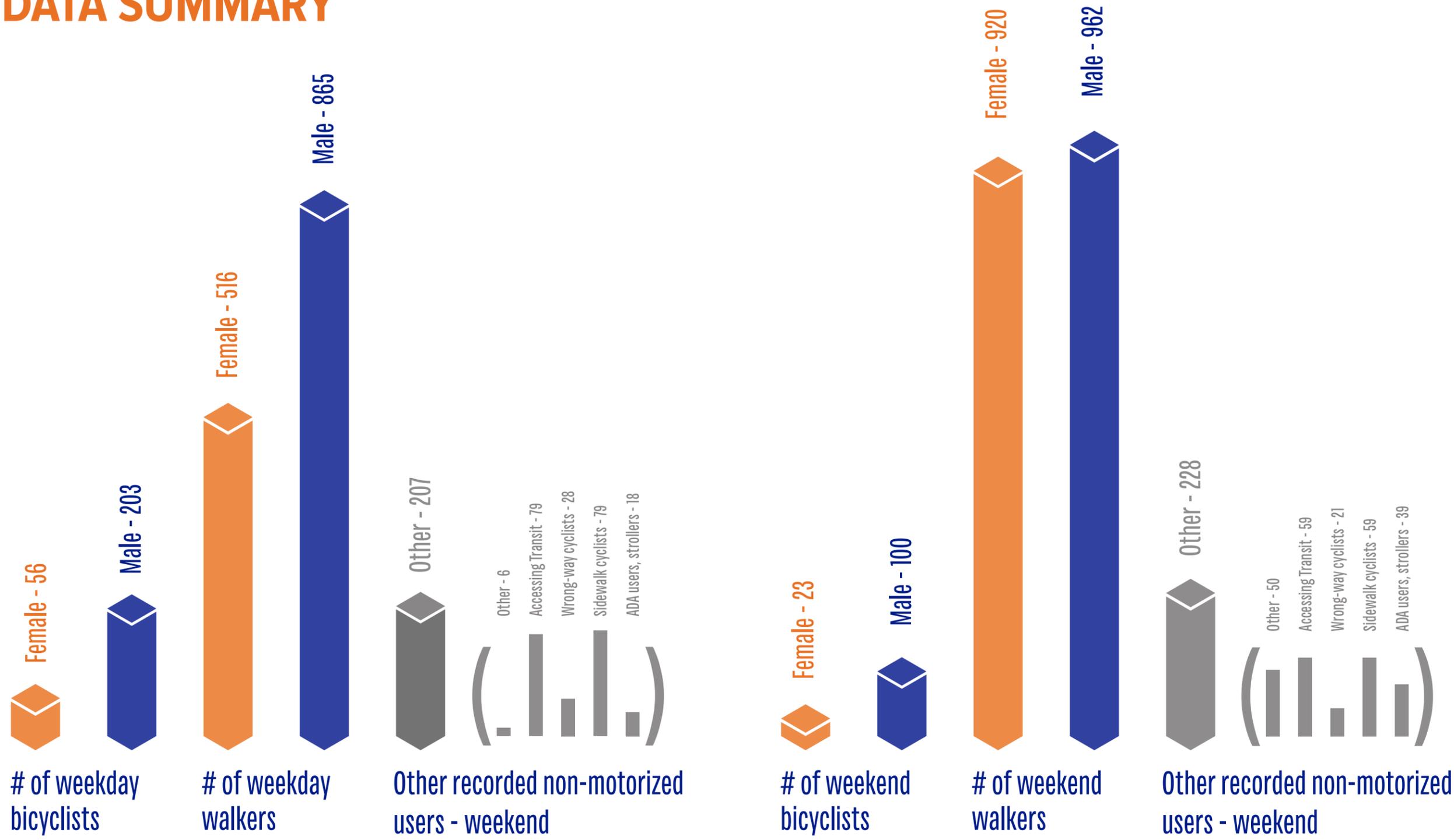
A comparison of the weekday and weekend count numbers are provided below as well as the top count locations. Full count methodology and the results can be found in **Appendix D.**

**TABLE 5 – TOP PEDESTRIAN AND BICYCLE COUNT LOCATIONS**

Top 3 Locations for Bicyclists from Weekday Counts:	
Wheat Street between Pickens Street and Sumter Street	47 bicyclists
Greene Street between Laurens Street and Saluda Ave	45 bicyclists
Harden Street between Greene Street and Devine Street	29 bicyclists
Top 3 Locations for Pedestrians from Weekday Counts	
Blossom St between Park St and Lincoln St	185 pedestrians
Harden St between Greene St and Devine St	121 pedestrians
Laurel St between Sumter St and Main St	128 pedestrians
Top 3 Locations for Bicyclists from Weekend Counts:	
Broad River Rd between St. Andrews Pkwy and Farrington Way	18 bicyclists
Sumter St between Greene St and Pendleton St – 11 bicyclists	11 bicyclists
Wheat St between William St and Huger St – 9 bicyclists	9 bicyclists
Top 3 Locations for Pedestrians from Weekend Counts	
Hampton St between Assembly and Park St	462 pedestrians
Sumter St between Greene St and Pendleton St	329 pedestrians
Gervais St between Lincoln St and Park St	279 pedestrians



# PEDESTRIAN AND BICYCLE COUNTS DATA SUMMARY







# EXISTING CONDITIONS: MULTI-MODAL NETWORK ANALYSIS

## Introduction

*Columbia has the foundation to become a premiere walking and bicycling-friendly City. However, as indicated in the public outreach, bike and walk-friendly community audit, network analysis and safety analysis there are many significant safety concerns, physical barriers and gaps in network connectivity that must be addressed in order to reach these goals.*

The overall multi-modal network analysis is based on the following quantitative and qualitative assessments:

- Equity and Natural Resource Mapping
- Summary of Field Conditions
- Safety Analysis
- Pedestrian and Bicycle Level of Service Analysis
- Intermodal Transit Analysis

*The picture to the right shows the project stakeholder team in the field analyzing existing conditions. The presence of a bus stop and worn turf indicate heavy pedestrian use in this area. Considerations like these were incorporated into the prioritization of the network.*

The following sections discuss the current strengths and barriers of the transportation network for walking and bicycling and present a map of existing and proposed network conditions.

**Figures 9 and 10** present maps depicting an equity analysis and natural resources overview including street tree coverage in Columbia. Considerations for equity ensure that the proposed improvements of this Plan reach populations that

may need or use pedestrian and bicycle facilities the most. Since shade is a major determinant of comfortable walking and bicycling conditions in a city like Columbia throughout the warmer months, and the City would like to preserve and expand upon its street tree network wherever possible, the project team also considered connecting these and other natural resources when developing pedestrian and bicycle recommendations.





## Pedestrian Network

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

- **The street and sidewalk network is well connected** in the downtown core and surrounding older neighborhoods of Columbia. There are many existing streets in this area that are walk friendly and easy to cross.
- **Recent crossing improvements along Assembly Street** make this roadway easier for pedestrians of multiple abilities to cross.
- **The existing greenways, downtown business district, Five Points and Congaree Vista offer walk-friendly environments** that many residents and students currently utilize.
- **Planned pedestrian improvements at key intersections** along many of Columbia's major corridors such as Huger Street, Rosewood Drive and Elmwood Avenue will improve pedestrian safety and encourage people to walk.
- **Many civic destinations such as schools, libraries and parks are accessible by walking**, especially in older areas of Columbia where street networks are well connected and sidewalk coverage is good.
- **Many bus stops in Columbia have amenities** such as benches and shelters for pedestrians.
- The City utilizes **high-visibility crosswalk markings in some highly-trafficked pedestrian areas** such as near schools and in business or retail centers.
- Several **ADA accessibility improvements at curb ramps have been made** throughout Columbia in recent years.

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

- **Large vehicular corridors** such as (but not limited to) Garners Ferry Road, Fort Jackson Boulevard, Two Notch

Road, Broad River Road and North Main Street are **barriers for pedestrians trying to cross** or traverse these roads due to large distances between safe crossings, long distances across roadways and long wait times for traffic signals to change. Also, some of the major corridors in Columbia don't currently have sidewalks.

- **Many of the City's busiest retail, employment, recreation and learning centers are difficult to access by foot due to their location along high-traffic, high-speed and wide roadways.** Also, the low density of development, high-frequency of curb-cuts and large parking lots in front of businesses along these corridors decreases walking comfort and increases walking distances and potential safety issues.
- **Access to significant City parks and green spaces along the river is limited by foot** which discourages the use of these areas. The area adjacent to Columbia's riverfront has the potential to be a rich pedestrian-oriented work/live/play destination – one key to realizing this potential will be improving connectivity to the riverfront from adjacent neighborhoods.
- **As one moves away from the City core, presence of sidewalks, sidewalk connectivity and street connectivity worsens**, rendering many areas of town virtually un-walkable.
- **Some existing sidewalks are narrow or constrained by obstructions** such as utility poles or maintenance issues. This forces pedestrians with assisted mobility devices to ride within the roadway in some areas.
- **Several bus stops lack sidewalk connectivity**, especially as one moves away from the City core.
- **Many crosswalks lack curb ramps or do not meet ADA requirements** for accessibility. In some areas, median islands at pedestrian crossings do not have cut-throughs necessary for pedestrians with mobility impairments.



*The photo above shows a substantial barrier for pedestrians. Not only is the sidewalk narrow and uninviting, it may be inaccessible by some with physical impairments.*



## Bicycling Network

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

- **Much of the City, especially around the downtown core, offers good street connectivity** which provides alternate routes for bicyclists wanting to travel off of heavily trafficked streets.
- **Many roadways in Columbia have more capacity than their traffic volumes warrant.** This creates an opportunity to reutilize this space for other uses that are more human-scaled. For example, road diets can be implemented to add space for on-street parking, landscaping, pedestrian crossing improvements, and/or bike facilities.
- **Most Columbia primary schools are located in walkable or bikeable areas.** Relatively minor improvements can be made to make walking and bicycling to school a more attractive and safe activity.
- **The City's growing greenway network, and the presence of the Palmetto Trail provide many opportunities for recreational riding.** These facilities can help prospective bicycle commuters hone their skills as grow confidence towards a goal of bicycling for transportation needs. As these facilities become more connected with the on-street bicycling network, they can become the backbone of a strong citywide bicycling system.
- **The City and SCDOT have made on-street bicycling improvements** to many corridors in recent years, including Beltline Blvd, Wheat St and Hardin Street.
- **Recent intersection improvements that will make crossing conditions safer for pedestrians and bicyclists** have been made on Assembly Street.
- **The pathway across the Broad River Road Bridge** will provide an important and high-quality pedestrian and

bicycle connection across the Broad River and to the Three Rivers Greenway.

- **The future Gills Creek Trail** will provide an important connection both along and across Gills Creek.

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

- **Large vehicular corridors** such as (but not limited to) Assembly Street, Elmwood Avenue, Bull Street, Gervais Street, Blossom Street, Huger, Two-Notch Road and Garners Ferry Road **pose a barrier** for many prospective cyclists, primarily due to their width, traffic speed and volumes, and lack of separated bicycle facilities.
- **Many of the City's busiest retail, employment, recreation and learning centers are difficult to access by bike** due to their location along high-traffic, high-speed and wide roadways. Also, the low density of development, high-frequency of curb-cuts and large parking lots in front of businesses along these corridors decreases bicycling comfort and increases bicycling distances and potential safety issues.
- **As one moves away from the City center, street network connectivity and development density decreases.** This makes bicycling more difficult as prospective riders are typically forced onto major roadways and must travel longer distances to reach their destinations. Strategic improvements in street network connectivity and policy affecting new development can help to improve this.
- **Bike connectivity across the Congaree River is limited** due to a lack of separated bicycle facilities across many of the bridges.
- **Separated bike facilities, such as bike lanes or off-street paths are limited.** These are important as they create a

more comfortable environment for bicyclists of multiple ages and abilities.

- **Design of some existing bikeways are uncomfortable and/or dangerous for bicyclists.** Harden Street is an example of this (see Existing Conditions photo inventory in following sections).
- **Surface condition and debris on some roadways make it difficult for bicyclists,** who are more susceptible to poor maintenance conditions.
- **Short and long-term bicycle parking is limited throughout town,** especially as one moves away from central business districts.



*Many roadways exist in Columbia with under utilized space or parking. These are great opportunities for adding bicycle facilities, sometimes by simply re-striping the existing roadway.*

# Existing Conditions Photo Inventory



1. Columbia has a high existing demand for walking and bicycling due to the high and dense populations of college students and downtown businesses and amenities. The relatively mild climate and flat terrain also make the environment very amenable to walking and bicycling. An abundance of wide roadways with relatively low-volumes in Columbia can easily be retrofitted to include bicycle and walking. (Blossom Street and Sumter Street)



2. Sidewalks like this not only discourage walking by making it an uncomfortable activity, but they are an accessibility and safety issue to those with visual or mobility impairments. The lack of a curb ramp and narrow functional width of the sidewalk make this a difficult environment for users with mobility impairments, as well as pedestrians walking side by side or passing each other. (photo: Forest Drive)



5. Bicycle improvements on Pickens Street would provide a comfortable, low-volume connection to major destinations such as the USC campus, future development on the former State hospital property, and downtown. The gate shown above is an opportunity to provide a pedestrian and bicycle cut through to the future development on the State hospital property.



6. Additional bike parking is needed throughout Columbia, especially at key work and shopping destinations. Secured short and long-term bike parking shows the community that Columbia is supportive of bicycling for transportation. (photo: Five Points business district)



9. Some corridors throughout Columbia have existing on-road infrastructure for bicycling. While bike lanes such as the ones shown above on Beltline Boulevard offer designated space for bicyclists, only the most confident bicyclists would likely feel comfortable on such a facility due to the bike lane's narrow width, higher traffic volumes and speeds, and little separation from traffic. Bike lanes like this could be enhanced by adding buffers, bollards and/or green pavement to improve visibility and comfort for users.



10. Some corridors throughout Columbia are sub-standard facilities for bicycling such as the bike lanes on Harden Street. Bike lanes adjacent to parking should be at minimum 5', and preferably wider or with added buffers, to give bicyclists adequate space to ride safely outside of the "door zone" of parked vehicles.



3. There have been some traffic calming efforts made in the Cottontown neighborhood that can help to make the streets safer for pedestrians and bicyclists. Traffic calming tools such as diverters and restricted turns should have cut throughs or exceptions for bicyclists to encourage the use of these low-volume streets. (photo: Bull Street and Franklin Street)



4. Many corridors throughout Columbia have some existing well-placed marked mid-block crossings such as the one pictured above. These should be enhanced with high-visibility markings, mid-block refuges, and actuated pedestrian beacons where feasible. Additional mid-block crossings should be considered where warranted, and all arterial and collector roadways should have mid-block crossings at minimum every 1/4 mile. (Rosewood Drive at the Rosewood School)



7. Several roadways throughout Columbia have more vehicular capacity than warranted by traffic volumes. These roadways are good opportunities for reducing the number of vehicular lanes to improve overall roadway safety and add bicycle facilities. (photo: Farrow Road)



8. Columbia has a substantial number of residents who bike for recreation. Fort Jackson is a popular destination for both on-road recreational bicyclists and users of the Palmetto Trail system. Improving bicycle connectivity to this area would improve safety and access for these users, as well as residents who reside in Fort Jackson. (photo credit: <http://www.army.mil/article/46896/wheel-power-wtu-soldiers-ride-on-road-to-recovery/>)



11. Sidewalks are needed on many corridors throughout Columbia, especially outside the downtown and core neighborhoods. Colonial Drive (pictured) is an example of a corridor that connects job centers but isn't currently served by pedestrian facilities.



12. Many bus stops have amenities such as benches and shelters, but many stops outside of the downtown core lack sidewalk connectivity. The bus stop and pedestrian crossing pictured above poses a serious obstacle for pedestrians with mobility impairments due to the improperly designed ramp. In addition, bicycle connectivity to transit could be further enhanced by providing secure bicycle parking at bus stops.



FIGURE 9 - COLUMBIA EQUITY ANALYSIS

## Equity Analysis

The Composite Social Equity Tiers reflect the average of four social groups with higher concentrations of:

- 1) Families living below or near the poverty line
- 2) Households with no vehicle available
- 3) Non-White populations
- 3) Households with a limitation on English speaking ability

A higher tier represents a higher relative concentration of these groups.

### Equity Tier

- Highest
- 
- 
- Lowest

### Legend

- Intersection Improvement
- Recommended Sidewalk
- Recommended Greenway
- Recommended Bikeway
- Water Body
- Study Area

0 1 2 Miles



Data obtained from the City of Columbia and Central Midlands Council of Governments.  
Map created November, 2014.

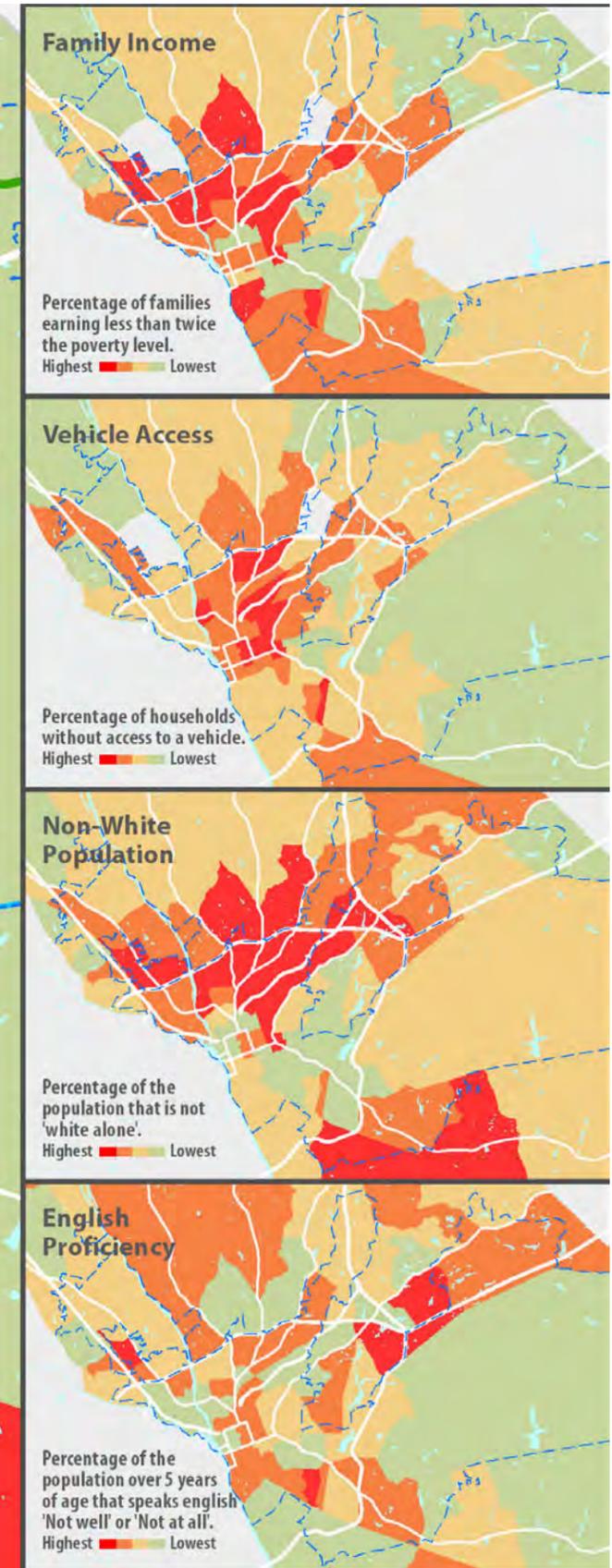
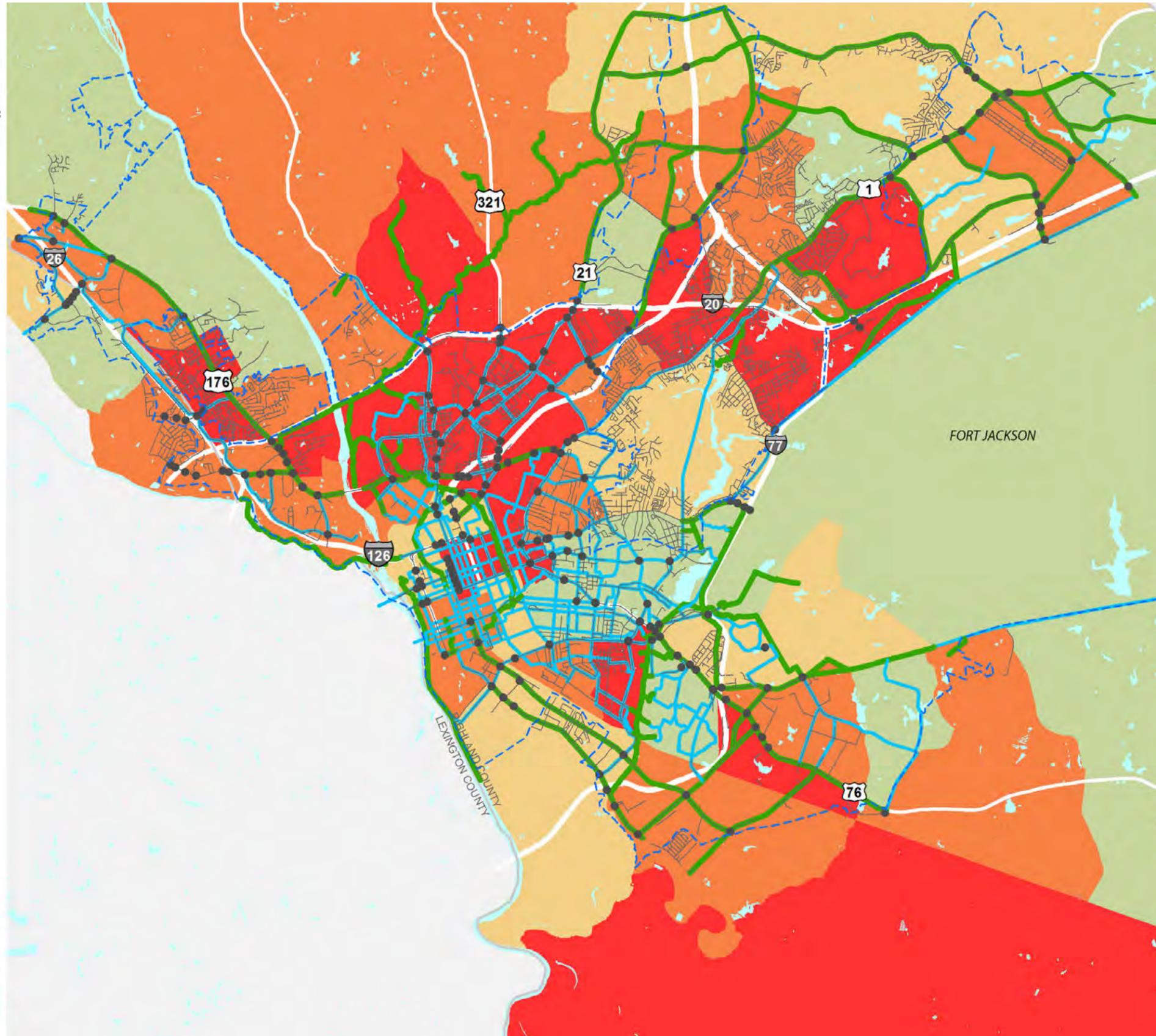
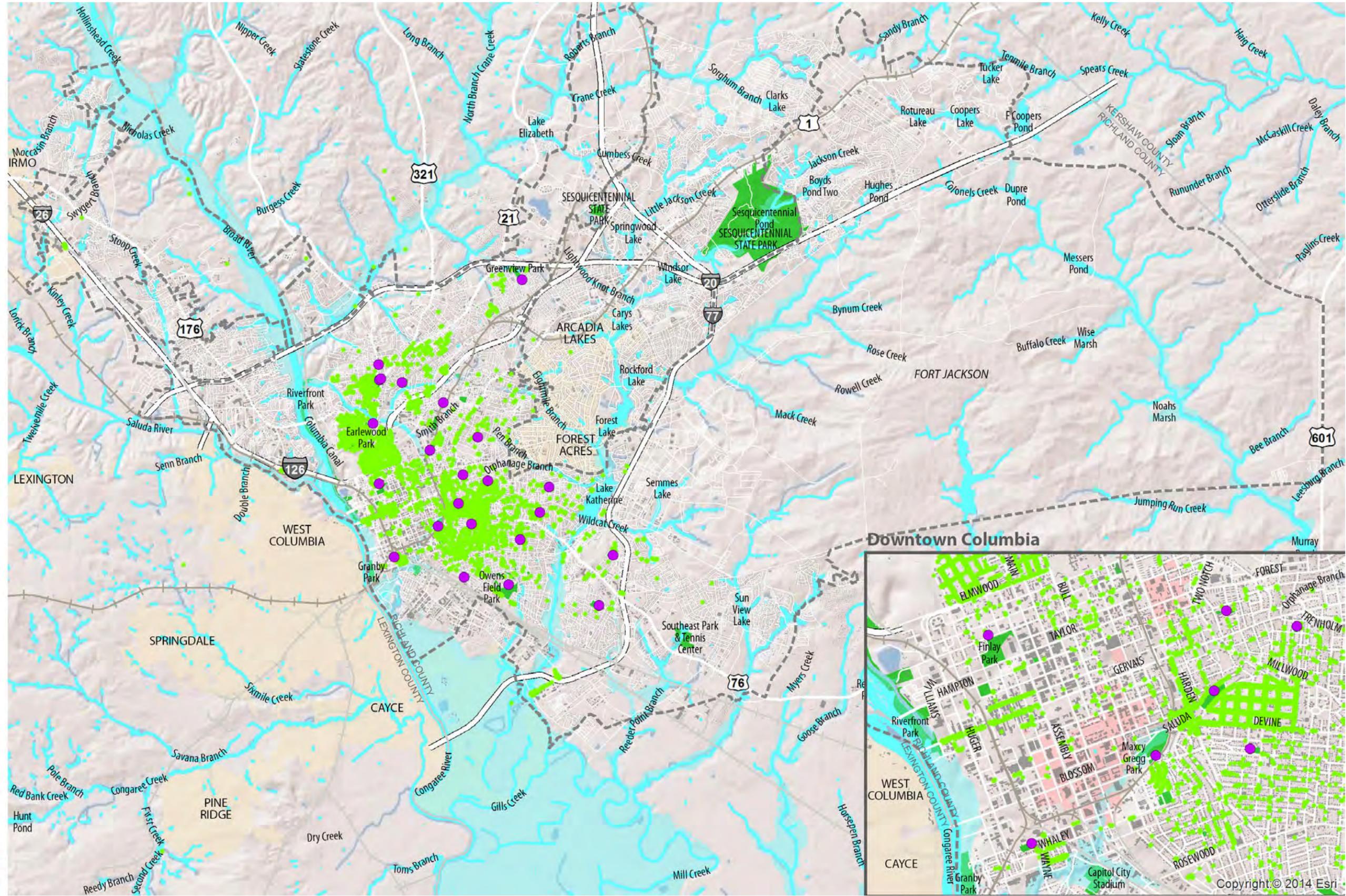




FIGURE 10 – EXISTING COLUMBIA NATURAL RESOURCES

### Natural Resources

- Legend**
- Park Community Center
  - Public Works Tree Inventory
  - Park
  - Stream, Canal, or Artificial Path
  - Water Body
  - Floodplain
  - Commuter Rail Line (Proposed)
  - Other Rail Line
  - Building Footprint
  - Other Jurisdiction
  - Study Area



Data obtained from the City of Columbia and Central Midlands Council of Governments.  
Map created November, 2014.





# SAFETY ANALYSIS

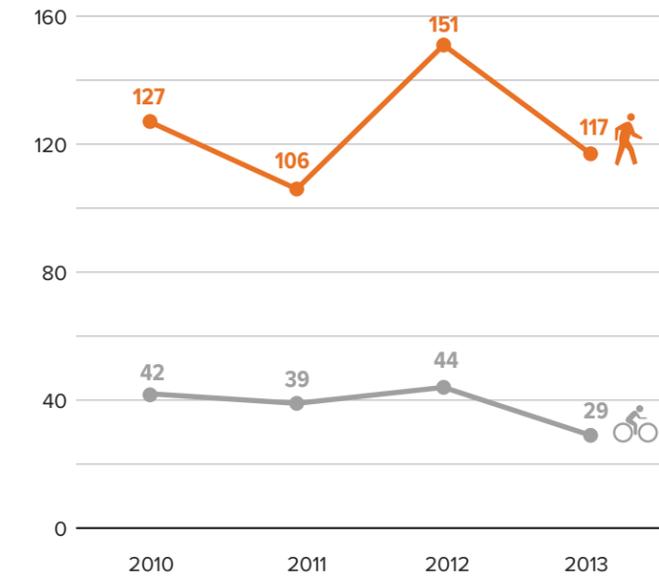
## Overview

Analysis of crash data can provide insight as to the major areas of concern for safety within the existing pedestrian and bicycle network. While this information is helpful in determining both infrastructure and non-infrastructure priorities, it should always be utilized in conjunction with other sources of information such as walking and bicycling counts and demographic information. For instance, an absence of crashes does not necessarily denote safe conditions for walking and bicycling – it could also imply that the corridor is lacking the key elements that make it an inviting and safe place to bike and walk, and therefore is not being utilized.

The safety analysis shows that while pedestrian and bicycle crashes are distributed fairly evenly throughout Columbia, the majority of pedestrian and bicycle crashes have occurred on major roadways. **Broad River Road, Two Notch Road and Bluff Road are among the corridors which have seen the greatest number of pedestrian and bicycle accidents in Columbia.** The highest concentration of pedestrian collisions occurred in the central part of town – west of Main/N. Main Street and east of US 1 and US 76.

The figures on the following pages provide an overview of where the majority of pedestrian and bicycle crashes occurred in Columbia.

**FIGURE 3 – RICHLAND COUNTY TOTAL PEDESTRIAN AND BICYCLE COLLISIONS REPORTED (JANUARY 2010 – DECEMBER 2013)**



**TABLE 6 – PEDESTRIAN AND BICYCLE COLLISION DATA FOR CITIES WITH CHARACTERISTICS SIMILAR TO COLUMBIA**

City	Population	Average Annual Pedestrian Collisions	Average Annual Bicycle Collision	University/College Presence
Columbia, SC	133,000	132	41	USC
Cary	136,278	29	19	N/A
Fayetteville	208,615	96	28	N/A
Durham	229,014	114	39	Duke
Winston-Salem	229,986	55	16	Wake Forest University
Greensboro	269,696	150	48	UNC-G and others
Raleigh	406,056	195	86	NC State



*Improvements such as high-visibility crosswalks and mid-block crossings make pedestrians more visible and encourage safe pedestrian behavior.*



**TABLE 7 – TOP PEDESTRIAN CRASH INTERSECTIONS AND CORRIDORS IN COLUMBIA**

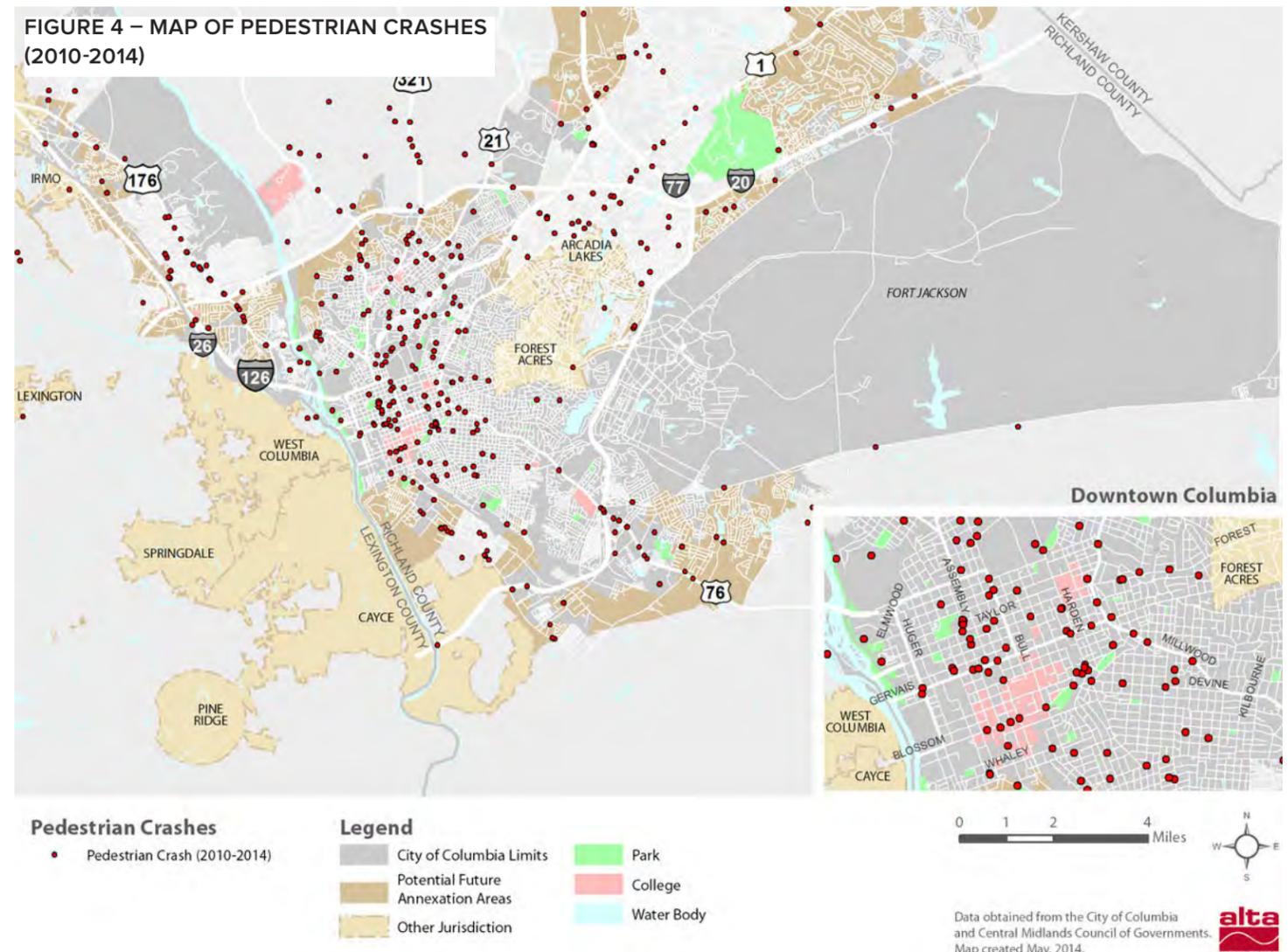
Top Intersections	Number of Collisions
Bull & Whaley	3
Forest & McDuffie	3
Devine & Santee	3
Devine & Harden	3
Greenlawn & Garners Ferry	3
Top Corridors	Number of Collisions
Broad River Rd	27
Two Notch Rd	17
Bluff Rd	12
Garners Ferry Rd	11
Farrow Rd	9
Harden St	9
Blossom St	8
Devine St	8

### Distribution of Pedestrian Crashes

Pedestrian crashes are relatively evenly distributed in Columbia and the surrounding areas (see **Figure 4**). **The highest concentration exists in the central Columbia area, immediately west of Main/N. Main Street and east of US 1 and US 76.** Additionally, several arterials present long stretches of high levels of pedestrian collisions and pedestrian collisions are clustered at several key intersections. **Table 7** shows the top intersections and corridors for pedestrian collisions in the study area.

### Distribution of Bicycle Crashes

Bicycle crashes are evenly distributed in Columbia and the surrounding areas (see **Figure 5**). The majority of crashes are along streets with no dedicated bikeway facility, however three occurred on the Beltline Boulevard bike lane, one on the Wheat Street bike lane, and four along the Trenholm Road bike lane (outside of the project study area). Collisions occur on arterials, collector roads, and neighborhood streets alike. Collisions occurred on both the Hampton Street and Gervais Street bridges across the Broad River. **Broad River Road and Bluff Road bear the highest numbers of bicycle collisions.**





## Crash Analysis Summary

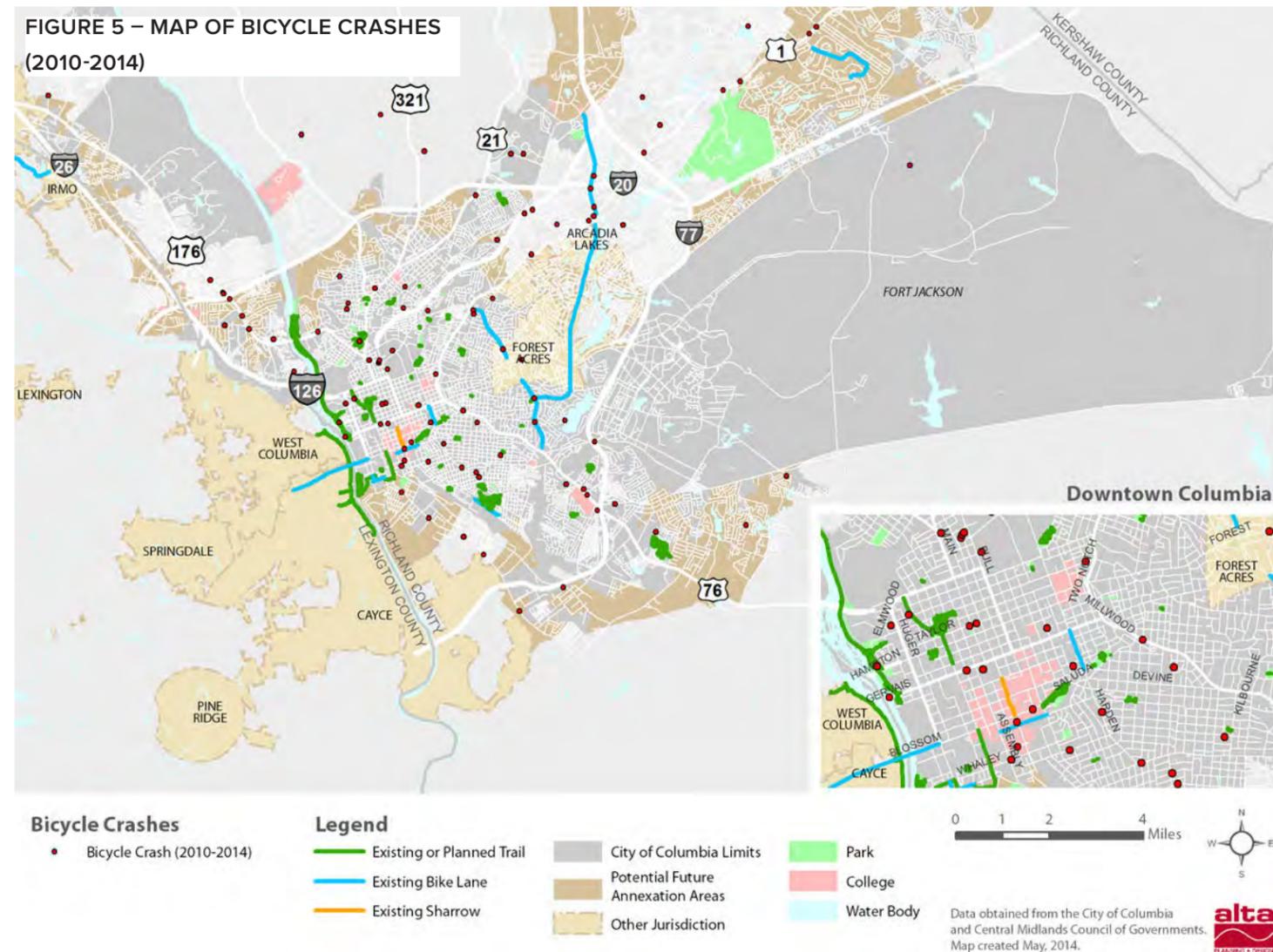
Analysis of reported contributing factors to pedestrian and bicycle accidents provides some insight as to what may be needed as priority infrastructure and non-infrastructure improvements. **For pedestrians:** motorists failing to yield the right of way, pedestrian improper crossing, and pedestrian lying and/or illegally in the roadway are all recorded as primary contributing factors of collisions involving pedestrians.

### Potential solutions to address these issues include:

- **Motorists failing to yield the right of way could be improved through both educational and infrastructure improvements** such as signs that highlight the State law to yield to pedestrians, improvements to the visibility of pedestrian crossings through enhanced pavement markings or actuated signals, and general traffic calming improvements that slow down traffic and improve stopping sight distances for motorists.
- **Improper pedestrian crossing is primarily caused by an infrequency of designated crosswalks** along a roadway. Crosswalk infill along corridors could help improve this safety issue.
- **Pedestrians illegally in the roadway may be linked to a lack of adequate pedestrian facilities.** For example, many users, especially those who depend on assisted mobility devices, often have no choice but to travel in the roadway in areas where sidewalks are absent or don't meet ADA requirements. This can be addressed through infrastructure improvements.

**For bicyclists:** bicyclists disregarding signals, bicyclists failing to yield the right of way, motorists failing to yield the right of way and bicycling wrong side/way riding were all listed as major contributing factors to bicycle collisions. **Potential solutions to address these issues include:**

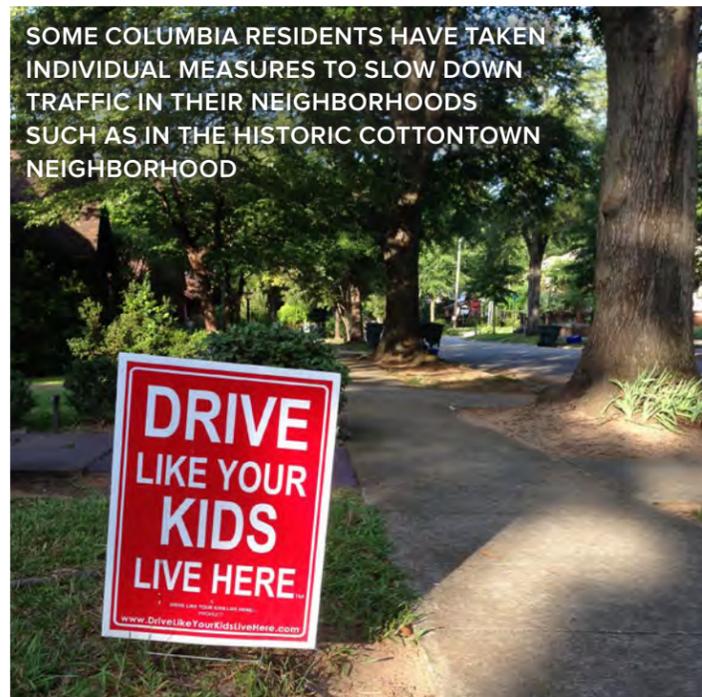
- **Bicyclists disregarding signals could potentially be addressed through programs which encourage good bicycling behavior,** or bicycle-specific traffic signals or signs in key areas.
- **Motorists failing to yield the right of way may be addressed through better educational programs for motorists and clearer delineation of a bicyclist's path of travel** through pavement marking improvements along roadways and at intersections.
- **Bicycling wrong side/way riding can be improved through educational programs and bicycle infrastructure** that clearly delineates the expected direction of travel such as bike lanes and shared-lane markings.





# Collisions, Injuries and Fatalities

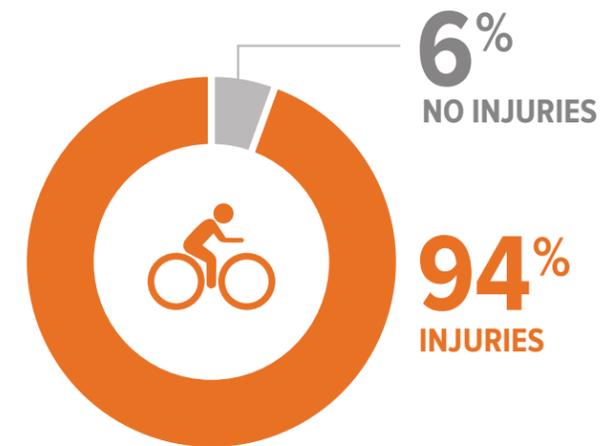
Figure 6 shows the percent of total collision fatalities attributable to each transportation mode. As shown, between 11.8% (in 2013) and up to 18.8% (in 2014 to-date) of reported collision fatalities in Richland County are pedestrian fatalities, with an annual average (excluding 2014) of 13.0%. No bicyclist fatalities are shown in this time period, however, the Columbia community has suffered the loss of several bicyclists over the last few years. The tragic deaths of 19 year old Jesse Gamble in 2008 and 45 year old Mandy Kennedy, a mother of two, in March of 2014 rattled the community. Each was commuting to/ from work at the time of their motor vehicle collision. The March 2014 fatality is not included in this data because the incident is under investigation at the time of this study.



## Bicycle Injuries and Fatalities

Figure 7 shows the ratio of bicyclist injuries and of fatalities to the total collisions reported in Richland County that involved a bicycle from 2010 through May 9, 2014. As shown, there have been no bicyclist fatalities as a result of reported collisions in Richland County over the time period. However, the majority of bicycle collisions (94.4%) result in an injury.

FIGURE 7: RATIO OF BICYCLIST INJURIES AND FATALTIES TO TOTAL COLLISIONS REPORTED (2010-2014)



## Pedestrian Injuries and Fatalities

Figure 8 shows the ratio of pedestrian injuries and of fatalities to the total collisions reported in Richland County that involved a pedestrian during the data time period. As shown, 86.6% of the pedestrian collisions resulted in one or more injuries, and 9.1% resulted in a fatality. Only 4.3% of pedestrian collisions during the data time period did not result in an injury or fatality.

FIGURE 8: RATIO OF PEDESTRIAN INJURIES AND FATALTIES TO TOTAL COLLISIONS REPORTED (2010-2014)

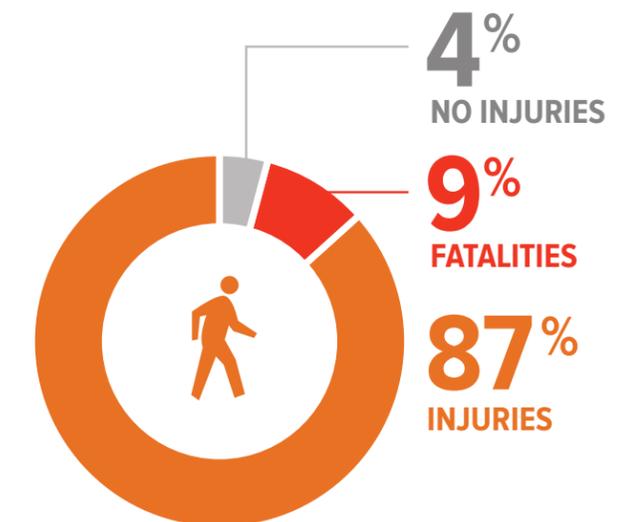
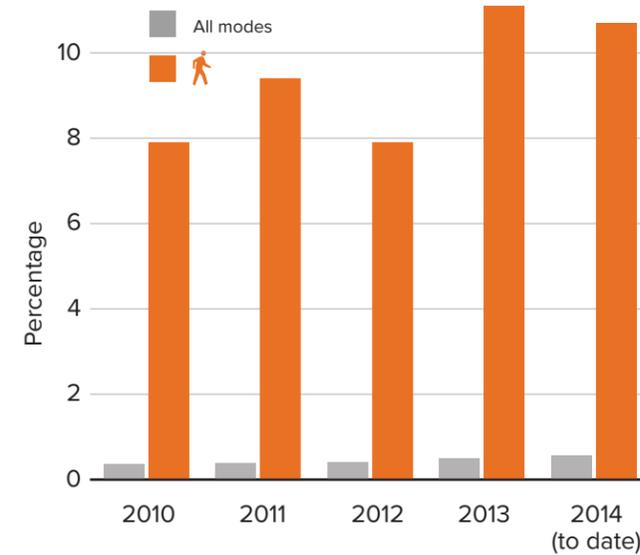


FIGURE 6: FATALITY RATES PER MODE CHOICE 2010-2014





*In South Carolina, 11.5% of all traffic fatalities are pedestrians and 1.6% are bicyclists. While there have been no documented bicyclist fatalities in the last four years, Columbia's pedestrian fatality rate is significantly higher than the State's average (as high as 18%).*

*Currently in Columbia, nearly one in ten pedestrian collisions results in a fatality. One of the most effective means of increasing safety across all modes is through reducing vehicular speeds. The chances of a pedestrian fatality are reduced from 85% to 45% to 5% when the speed of the vehicle is reduced from 40 mph to 30 mph to 20 mph, respectively. System-wide vehicular speed reduction can be accomplished through a combination of education, enforcement and design.*

## Collision Conditions

A total of 529 pedestrian collisions and 162 bicycle collisions were reported in Richland County from January 1, 2010 through May 9, 2014. **Table 8** presents the characteristics of these collisions, such as the road surface conditions, lighting conditions, weather conditions, and where the collision occurred.

As shown in **Table 8**, most crashes for pedestrians and bicyclists occurred during dry road surface conditions (96% and 87%, respectively) and on clear days (89% and 83%, respectively). The majority of bicycle collisions occurred during daylight hours (70%), but only 43% of pedestrian collisions occurred during daylight. In addition, most collisions occurred on the roadway (89% for bicyclists and 87% for pedestrians).

**TABLE 8 – RICHLAND COUNTY COLLISION CHARACTERISTICS**

	Bicycle		Pedestrian	
	Total	% of Total	Total	% of Total
Total Collisions Reported	162	100%	529	100%
Road Surface Conditions				
Wet	6	4%	65	12%
Dry	155	96%	461	87%
Lighting Conditions				
Daylight	114	70%	230	43%
Dawn / Dusk	9	6%	29	5%
Dark (Street Lamp Lit)	20	12%	121	23%
Dark (Lighting Unspecified)	7	4%	53	10%
Dark (Unlit)	12	7%	96	18%
Weather Conditions				
Clear	144	89%	440	83%
Cloudy	10	6%	38	7%
Fog,Smog,Smoke	2	1%	3	1%
Rain	4	2%	45	9%
Snow	1	0.6%	2	0.4%
Unknown	1	0.6%	1	0.2%
First Harmful Event Location				
On Roadway	144	89%	458	87%
Median/Shoulder	3	2%	18	3%
Off Roadway	15	9%	45	9%
Unknown	0	0%	8	2%

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# Pedestrian and Bicycle Level of Service Analyses

## Analysis Summary

The consultant team conducted several different analyses for the Walk Bike Columbia Master Plan. This includes the following analyses which sequentially build upon each other to provide a comprehensive look at pedestrian and bicycle levels of comfort and safety overlaid with areas of pedestrian and bicycle supply and demand.

## Pedestrian Level of Service and Bicycle Level of Traffic Stress Analyses (PLOS and BLTS)

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

Each analysis incorporates the recent research on factors that impact pedestrian and bicycle comfort and safety, and was tailored to the City of Columbia using the data available. Each model analyzed the full roadway network within Columbia's Urban Service Area (and adjacent areas where they border the urban service area on both sides), excluding limited access highways, to provide a full picture of connectivity around the city.

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

## Pedestrian and Bicycle Suitability Analyses (PSA and BSA)

To build upon the Level of service analyses presented in the previous section, the consultant team conducted a Pedestrian Suitability Analysis (PSA) and Bicycle Suitability Analysis (BSA) for Walk Bike Columbia. The PSA and BSA build on the Pedestrian Level of Service and Bicycle Level of Traffic Stress models completed previously. These models identify areas of demand for pedestrian and bicycle travel, and then overlay supply (Pedestrian Level of Service and Bicycle Level of Traffic Stress) and demand. The results can be used to identify areas in need of improvement and to prioritize pedestrian and bicycle projects where infrastructure need meets trip demand.

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

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

## Pedestrian Composite Results

**Figure 11** displays demand and supply results in **downtown Columbia** and the adjacent areas. The majority of downtown and the University of South Carolina have high demand for walking, with a good supply of facilities. Several other locations indicate a need for improved crossings or facilities, including the following:

- The cluster of schools along US 321 north of downtown, including Lutheran Theological Southern Seminary and Columbia College, are in need of improved crossings, along with sidewalk improvements on local roads.
- The medical district around Palmetto Health Richland and Providence Hospital are in need of improved crossings, and may need midblock crossings along long stretches of Harden Street, Forest Drive, and Two Notch Road.
- Improvements are needed along Colonial Drive from Harden Street to English Avenue.
- Improved crossings are needed in the commercial cluster and area around Midlands Technical College southeast of downtown.

**Figure 12** displays demand and supply results in **southeast Columbia**. In addition to the area between Garners Ferry Road, Rosewood Drive, and Beltline Boulevard, the following areas should be priorities for improvement:

- Garners Ferry Road is in need of linear improvements, intersection improvements, and may need midblock crossings. The segment near the University of South Carolina's School of Medicine and the segment between Greenlawn Drive and Patterson Road have the highest need.
- The neighborhood roads north of Hampton Memorial Park are in need of linear improvements in the form of sidewalks or traffic calming.



**Figure 13** displays demand and supply results in **northwest Columbia**. The following areas need improvement:

- Linear improvements are needed on Dutch Square Boulevard and crossing improvements are needed along Bush River Road to serve the Dutch Square shopping center.
- Crossing improvements are needed on Broad River Road and Greystone Boulevard near their intersection.
- Linear improvements are needed on Stoneridge Drive.
- Crossing improvements are needed on Bush River Road near the Outlet Pointe Shopping Center.
- Linear improvements are needed on Harbison Boulevard near Columbiana Drive.

**Figure 14** displays demand and supply results in **northeast Columbia**. The following areas need improvement:

- Linear and crossing improvements are needed on Farrow Road near Providence Hospital Northeast.
- Linear and crossing improvements are needed along Two Notch Road south of Clemson Road to serve the Village at Sandhill shopping center. Midblock crossings may also be warranted to serve the neighborhoods east of Two Notch Road.
- Linear improvements are needed on Polo Road near Two Notch Road, and linear and crossing improvements are needed along Two Notch Road near this intersection.
- Linear and crossing improvements are needed along Sparkleberry Lane near Spring Valley High School and near the intersection with Clemson Road.

## Bicycle Composite Results

**Figure 15** displays demand and supply results in **greater downtown Columbia**. The following areas need improvement:

- A few key low-stress corridors in the north-south and east-west direction are needed in downtown to improve mobility and provide better access to the University of South Carolina from the northern half of downtown and adjacent northern neighborhoods.
- Crossing opportunities are needed across Beltline Boulevard near Palmetto Health Richard to link the high demand neighborhood north of Route 277. Linear improvements along US 321 would link this neighborhood to downtown, and additional crossing opportunities of Main Street and Monticello Road would improve mobility around this neighborhood.
- Crossing opportunities are needed along Beltline Boulevard between Two Notch Road and Craig Road.

**Figure 16** displays demand and supply results in **southeast Columbia**. The following areas need improvement:

- Garners Ferry Road provides the only connection between downtown and the University of South Carolina School of Medicine, along with its adjacent neighborhoods. Connectivity could be greatly improved by low-stress greenway links across Gills Creek to these neighborhoods.
- Leesburg Road and Garners Ferry Road east of Interstate 77 need additional crossing opportunities to serve the neighborhood around Annie Burnside Elementary School.

**Figure 17** displays demand and supply results in **northwest Columbia**. The following areas need improvement:

- Short greenway connections between low-stress neighborhood roadways could increase the low-stress

connected network in the area south of Interstate 20 and west of the river.

- Crossing opportunities are needed along Broad River Road.
- Improvements are needed along Bush River Road to connect neighborhoods to shopping destinations in Dutch Square.

**Figure 18** displays demand and supply results in **northeast Columbia**. The following areas need improvement:

- Bicycle travel increasingly requires travel on collector and arterial roadways in the northeast area as roadway connectivity decreases. Improvements are needed along Parklane Road and Farrow Road to connect neighborhoods to schools, stores, and health services along Farrow Road.
- Short greenway connections are needed in the neighborhood east of Two Notch Road near Clemson Road.
- Crossing opportunities are needed along Sparkleberry Lane and additional connectivity is needed in the neighborhood to its south.

## Conclusion

The Walk Bike Columbia Pedestrian and Bicycle Suitability Analyses provide a data-driven illustration of the quality of infrastructure serving pedestrians and bicyclists in the study area and the demand for infrastructure. **The results demonstrate the need to improve pedestrian facilities around schools, medical districts, and shopping centers, and focus on improving crossings of collector and arterial roadways for pedestrians and cyclists.** Together, the supply and demand models will guide prioritization of infrastructure investments where they will be most useful to residents and visitors and have the greatest impact on safety.

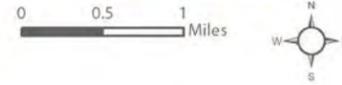


FIGURE 11: PEDESTRIAN SUPPLY AND DEMAND RESULTS FOR GREATER DOWNTOWN



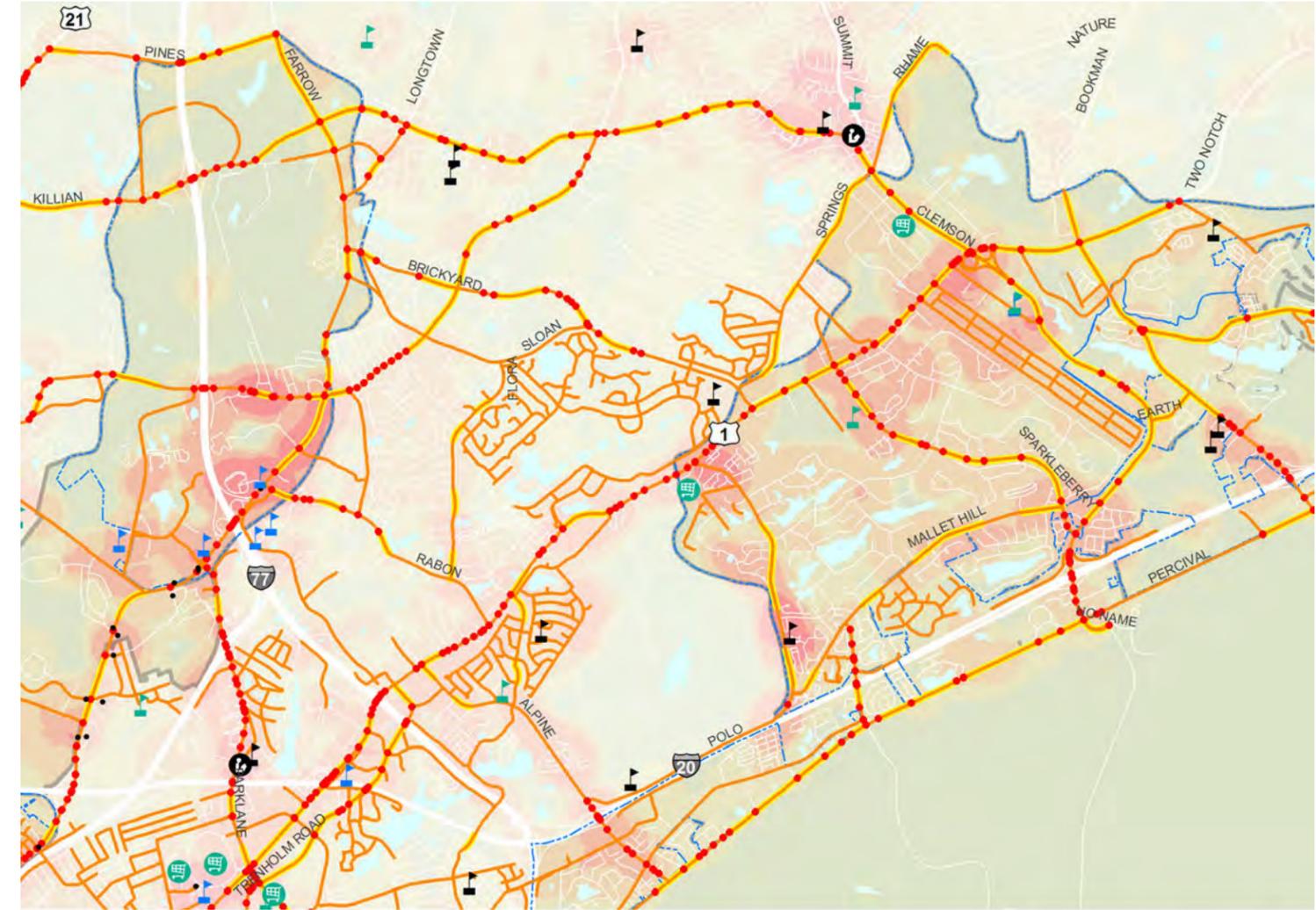
**Greater Downtown Supply and Demand Results**

<b>Supply</b>	<b>Demand</b>	<b>Destinations</b>	Shopping Center
Low Crossing PLOS (6-8)	Highest	Elementary School	Library
Low Segment PLOS (4-5)	High	High School/Middle School	Bus Stop - May 2013
Low Midblock Crossing PLOS (4-5)	Medium	College/Higher Education	City Limits
	Lowest	Hospital	Potential Future Annexation Area



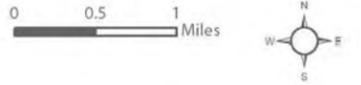
Data obtained from the City of Columbia and Central Midlands Council of Governments. Map created June, 2014.

FIGURE 12: PEDESTRIAN SUPPLY AND DEMAND RESULTS FOR NORTHEAST COLUMBIA



**Northeast Supply and Demand Results**

<b>Supply</b>	<b>Demand</b>	<b>Destinations</b>	Shopping Center
Low Crossing PLOS (6-8)	Highest	Elementary School	Library
Low Segment PLOS (4-5)	High	High School/Middle School	Bus Stop - May 2013
Low Midblock Crossing PLOS (4-5)	Medium	College/Higher Education	City Limits
	Lowest	Hospital	Potential Future Annexation Area



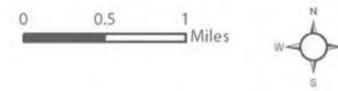
Data obtained from the City of Columbia and Central Midlands Council of Governments. Map created June, 2014.



FIGURE 13: PEDESTRIAN SUPPLY AND DEMAND RESULTS FOR SOUTHEAST COLUMBIA

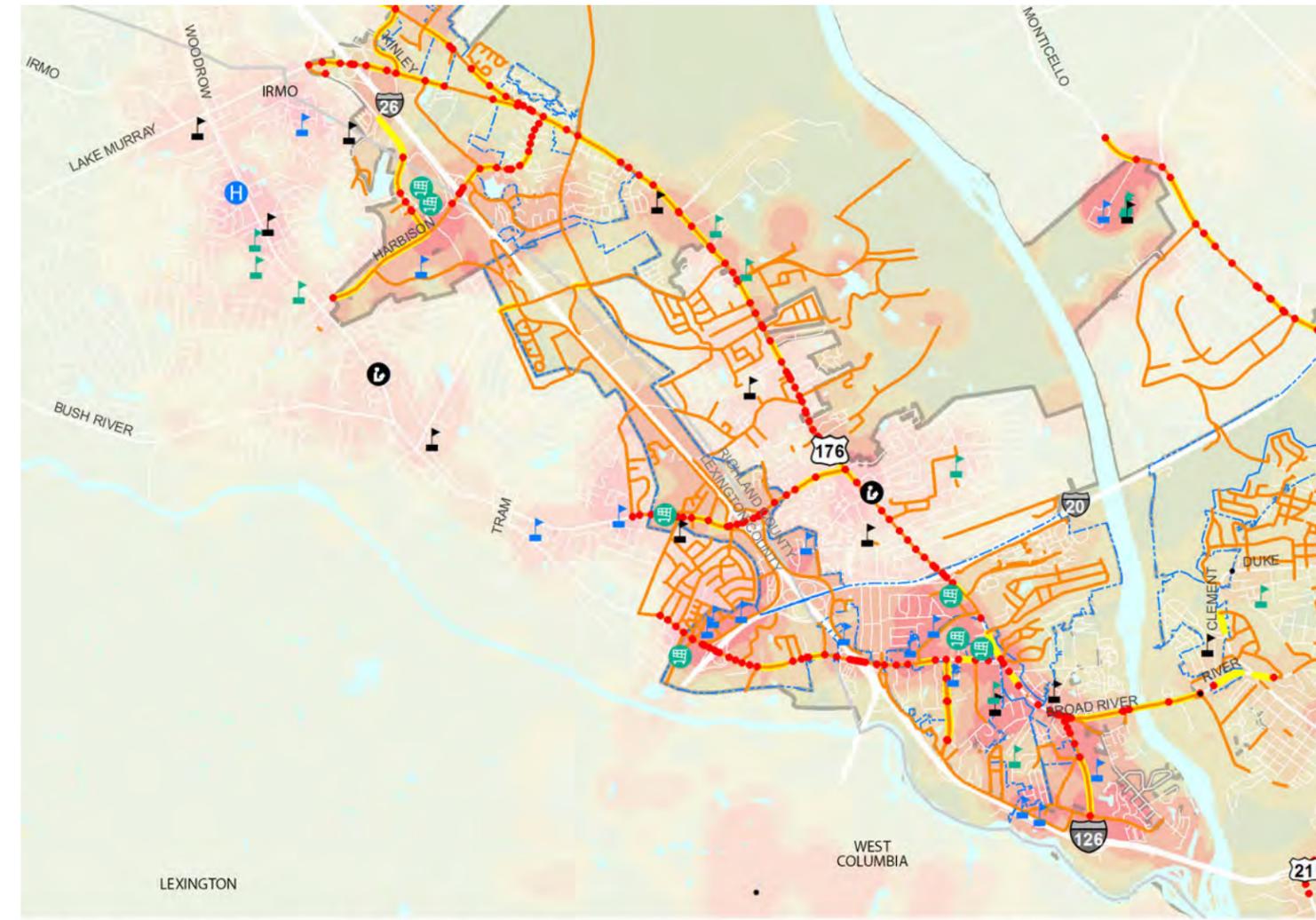


### Southeast Supply and Demand Results

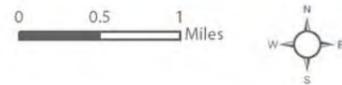


Data obtained from the City of Columbia and Central Midlands Council of Governments. Map created June, 2014.

FIGURE 14: PEDESTRIAN SUPPLY AND DEMAND RESULTS FOR NORTHWEST COLUMBIA



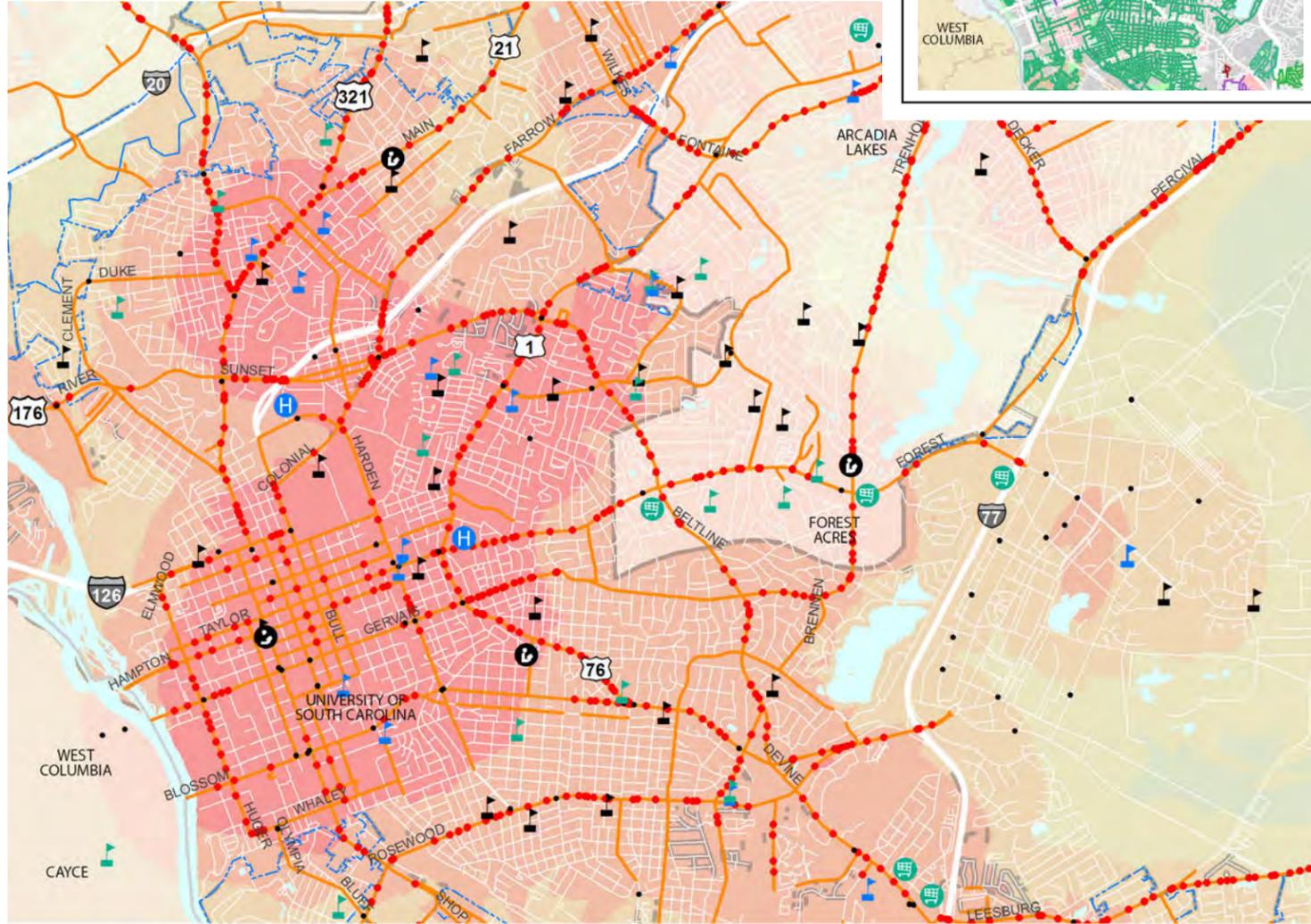
### Northwest Supply and Demand Results



Data obtained from the City of Columbia and Central Midlands Council of Governments. Map created June, 2014.

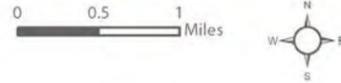


FIGURE 15: BICYCLE SUPPLY AND DEMAND RESULTS FOR GREATER DOWNTOWN COLUMBIA



**Greater Downtown Supply and Demand Results**

<b>Supply</b>	<b>Demand</b>	<b>Destinations</b>	Shopping Center
High Stress Crossing (3-4)	Highest	Elementary School	Library
High Stress Segment (3-4)	High	High School/Middle School	Bus Stop - May 2013
	Low	College/Higher Education	City Limits
	Lowest	Hospital	Potential Future Annexation Area



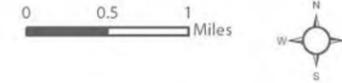
Data obtained from the City of Columbia and Central Midlands Council of Governments. Map created June, 2014.

FIGURE 16: BICYCLE SUPPLY AND DEMAND RESULTS FOR SOUTHEAST COLUMBIA



**Southeast Supply and Demand Results**

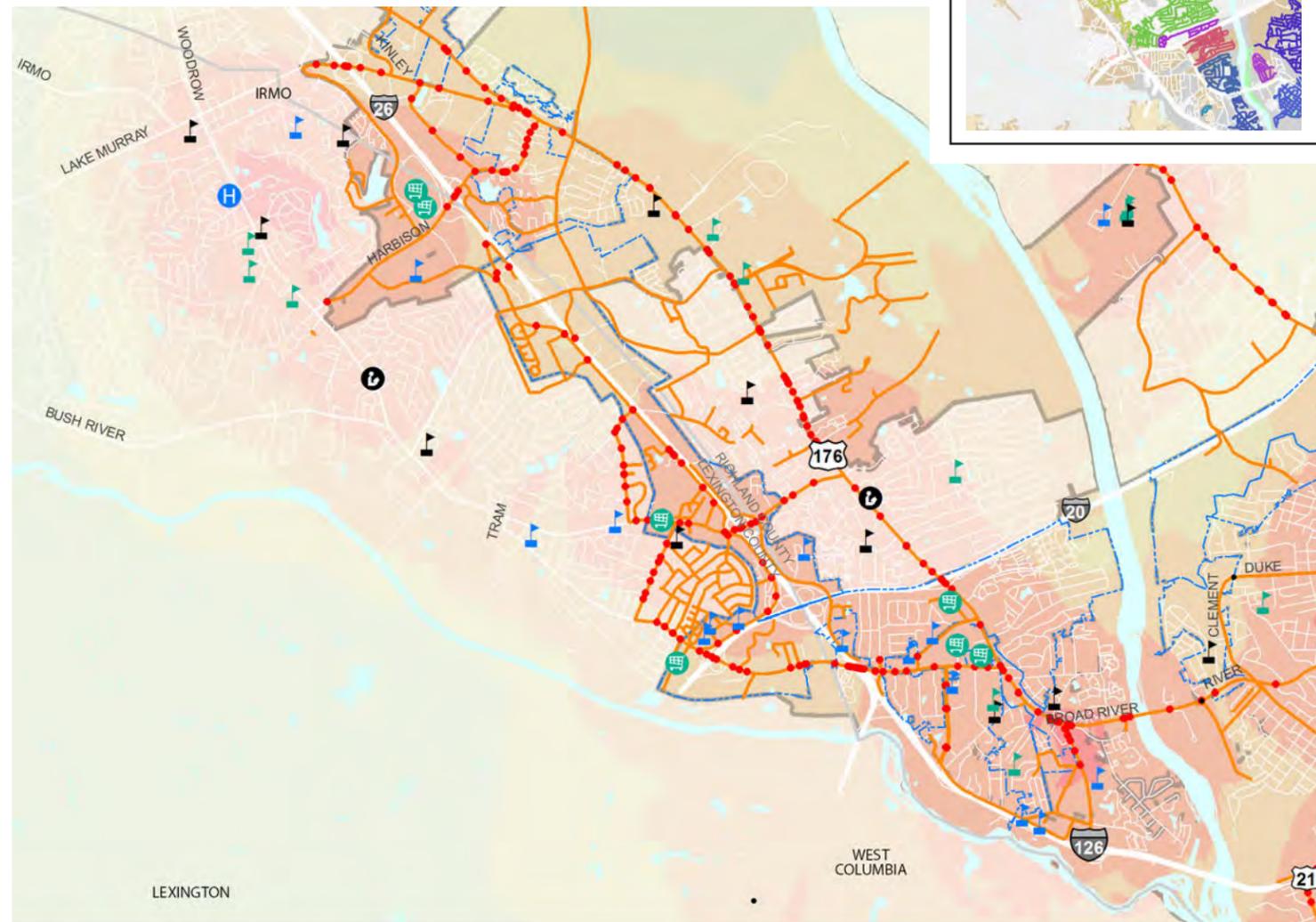
<b>Supply</b>	<b>Demand</b>	<b>Destinations</b>	Shopping Center
High Stress Crossing (3-4)	Highest	Elementary School	Library
High Stress Segment (3-4)	High	High School/Middle School	Bus Stop - May 2013
	Low	College/Higher Education	City Limits
	Lowest	Hospital	Potential Future Annexation Area



Data obtained from the City of Columbia and Central Midlands Council of Governments. Map created June, 2014.



FIGURE 17: BICYCLE SUPPLY AND DEMAND RESULTS FOR NORTHWEST COLUMBIA



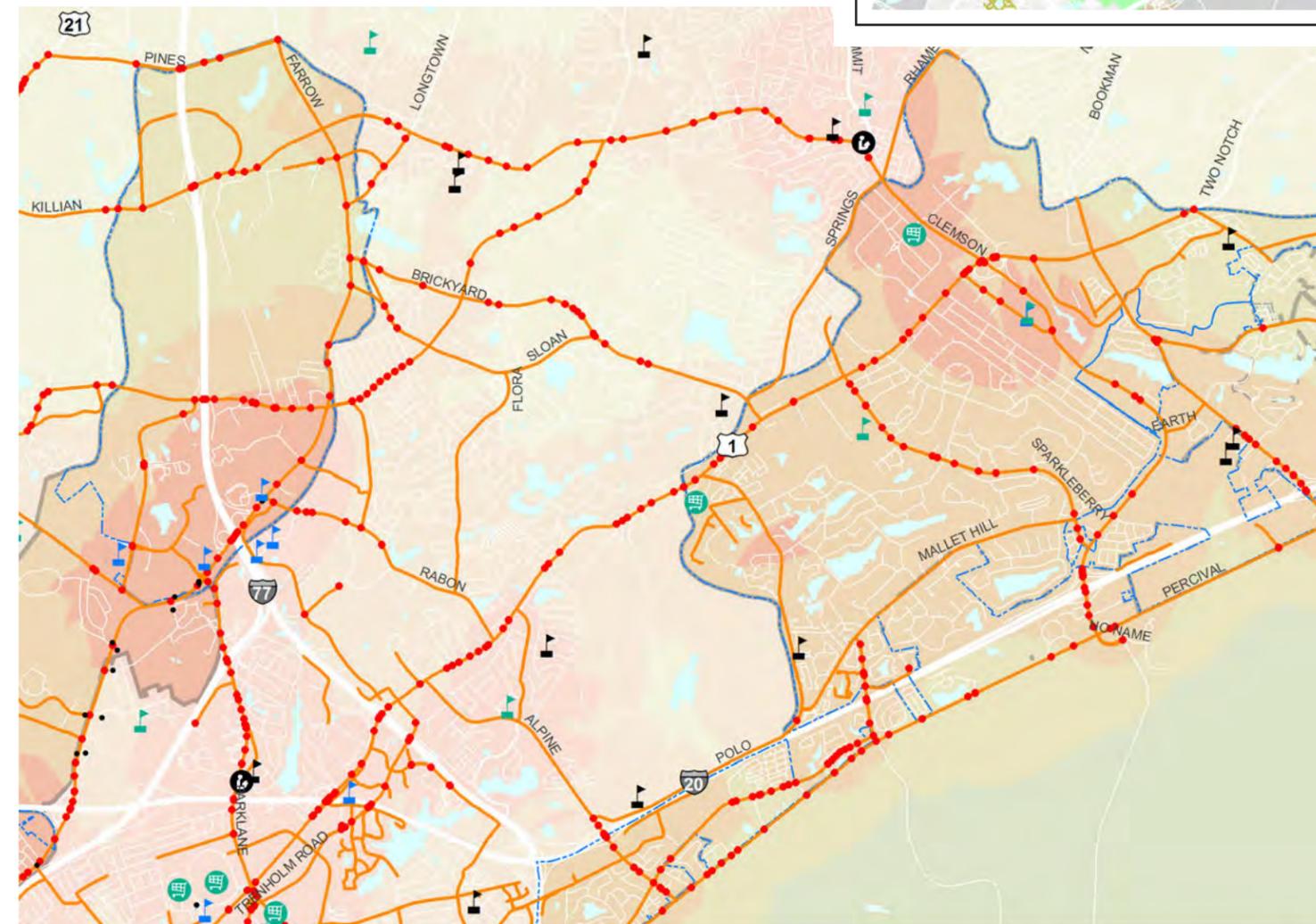
**Northwest Supply and Demand Results**

- |                            |               |                           |                                  |
|----------------------------|---------------|---------------------------|----------------------------------|
| <b>Supply</b>              | <b>Demand</b> | <b>Destinations</b>       | Shopping Center                  |
| High Stress Crossing (3-4) | Highest       | Elementary School         | Library                          |
| High Stress Segment (3-4)  | High          | High School/Middle School | Bus Stop - May 2013              |
|                            | Medium        | College/Higher Education  | City Limits                      |
|                            | Lowest        | Hospital                  | Potential Future Annexation Area |

0 0.5 1 Miles

Data obtained from the City of Columbia and Central Midlands Council of Governments. Map created June, 2014.

FIGURE 18: BICYCLE SUPPLY AND DEMAND RESULTS FOR NORTHEAST COLUMBIA



**Northeast Supply and Demand Results**

- |                            |               |                           |                                  |
|----------------------------|---------------|---------------------------|----------------------------------|
| <b>Supply</b>              | <b>Demand</b> | <b>Destinations</b>       | Shopping Center                  |
| High Stress Crossing (3-4) | Highest       | Elementary School         | Library                          |
| High Stress Segment (3-4)  | High          | High School/Middle School | Bus Stop - May 2013              |
|                            | Medium        | College/Higher Education  | City Limits                      |
|                            | Lowest        | Hospital                  | Potential Future Annexation Area |

0 0.5 1 Miles

Data obtained from the City of Columbia and Central Midlands Council of Governments. Map created June, 2014.



# Intermodal Transit Analysis: Safe Routes to Transit

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## Existing Columbia Area Public Transportation Options:

- *The COMET, a public transit agency operated by the Central Midlands Regional Transit Authority (CMRTA)*
  - *University of South Carolina Transportation Services, private student transportation*
  - *The Santee Wateree Regional Transit Authority serving Elgin, Lugoff, Sumter, Hopkins, Camden, and Columbia*
  - *Newberry Express from Newberry*
  - *Intercity services, Greyhound Lines and Southeastern Stages, Megabus*
  - *Private taxi, limousine, and shuttle providers*
- 

## Introduction

A major theme emerging from the Bike Walk Columbia Plan and the long-range vision for the Columbia area is that the region must develop a transportation system that creates and encourages the use of more travel choices, such as transit, biking, walking and ridesharing, and begin to reduce the degree of reliance on the single-occupant automobile for vehicle travel.

**Well-designed, strategically located pedestrian and bicycle facilities can increase ridership on public transit by providing people with safe, pleasant access to these transit options.** With geographically strategic investments in pedestrian and bicycle system improvements, together with the implementation of smart land use strategies and better education and incentive programs, many short auto trips could be shifted to walking, biking or transit trips to help reduce vehicles miles traveled (VMT) and emissions for a relatively low cost.

## Summary of Regional Transit Strengths

Over the past 10 years, there has been a strong national emphasis for livable communities that provide a range of transportation choices available to all residents within the community, including transit, walking and bicycling. The transit services within Columbia and surrounding areas (shown at left) offer some transportation options to residents. Building upon these existing systems is a goal for many agencies in the area. The state of coordination among the transit providers is present, but limited within the community.

- The COMET has bicycle racks on all buses, which has been a priority for the agency for several years. New buses ordered by The COMET buses will have racks for three bikes.

- USC does not have bike racks on buses, but does have many bicycle racks located on campus to accommodate student and faculty bike riders. Future buses should include bicycle racks on the front of the vehicles to accommodate the high usage of bicycles on campus. USC should continue to provide bicycle racks around campus to accommodate the bicycle mode share.
- The COMET, in coordination with USC, began in August 2014 the Garnet route, which provides service every 20 minutes from the student complexes on Bluff Road to the USC campus. Currently the apartment complexes on Bluff Road provide small shuttle vans for USC students to/from campus. Over the next year, The COMET and USC will continue to work together for future funding of this route.
- The COMET began in August 2014 more frequent service in the core downtown from the Downtown Transit Center to the USC campus. The goal of the reconfiguration of routes is to provide convenient and frequent service to downtown employees, students, and staff.
- Local government agencies involved in the High Speed Rail initiatives continue to recognize the necessary link between bus and rail services for the future.
- The COMET has approximately 900 bus stops located across Columbia. One goal of the agency is to have accessibility at all bus stops. This goal will improve accessibility to pedestrian facilities within the community.



## Best Practices

The following provide examples of effective policies supporting coordination of transit, pedestrian and bicycle modes.

- **Promote convenient intermodal connections between all elements of the Columbia transportation network,** including a transit system that incorporates easy pedestrian and bike access.
- **Promote transportation improvements that support the redevelopment of lower-density, auto-dominated arterials** to become more pedestrian and transit compatible urban transportation corridors.
- **Promote the development of local street patterns and pedestrian routes that provide access to transit services** within convenient walking distance of homes, jobs, schools, stores, and other activity areas.
- **Develop a coordinated network of facilities for pedestrians and bicycles which provides effective local mobility,** accessibility to transit services and connections to and between centers.
- **Support opportunities to redevelop the road system as multimodal public facilities** which accommodate the needs of pedestrians, bicycles, transit, automobiles, and trucks.
- **Provide opportunities for creation of town centers in urban areas** that: (1) serve as focal points for neighborhoods and major activity areas; (2) include a mix of land uses, such as pedestrian-oriented commercial, transit stops, recreation and housing; and (3) encourage transit use, biking and walking through design and land use density.
- **Support the transformation of low-density auto-oriented transportation corridors to higher-density mixed-use urban transportation corridors** when redevelopment

would not detract from centers or compact communities. Corridors that offer potential include those that are located near significant concentrations of residences or employment, and have the potential to support frequent transit service and increased pedestrian activity. Encourage the redevelopment of these arterials through:

- Addition of transit facilities, pedestrian-oriented retail, offices, housing, and public amenities,
- Building design and placement, street improvements, parking standards, and other measures that encourage pedestrian and transit travel, and
- Provision of pedestrian and bicycle connections between transportation corridors and nearby neighborhoods.

**As the Midlands region continues to grow over the next decade, providing a viable transportation network for all modes becomes critical.** The data included in this summary, and the full report in **Appendix F** provide guidance for policy and decision makers to improve transportation for all modes, including pedestrian, transit and bicycle connections.

*The COMET (above, right) offers bus service throughout Columbia. USC also offers localized bus service (below, right) connecting the campus to local destinations.*

