



Three Rivers Bike Share Study

June 2023

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1 | Executive Summary

Blue Bike SC is a long-running and successful bikeshare program. It has broad community support and has increased access to bicycling and enhanced visitor experience and mobility options since starting in 2018. However, the dock-based system has a small footprint because of the upfront capital required for stations and the funding available for program operations, which results in relatively low ridership.

Sponsored by the Central Midlands Council of Governments (CMCOG), this Three Rivers Bike Share Expansion Feasibility Study presents a financial analysis for the expansion of the Blue Bike SC program within the City of Columbia and new expansion for service in the combined area of the City of Cayce, the City of West Columbia, and the Town of Springdale (West Metro). It considers the cost of expanding service into the West Metro and making Blue Bike SC a regional system, but also considers ways that the program can enhance ridership, increase its presence in these communities, be more cost-effective, increase revenues, and leverage the skills of its various partners.

Existing System

The existing program is overseen by the City of Columbia with Blue Cross Blue Shield of South Carolina (BCBS) sponsoring the system with initial capital for the purchase of stations and bikes and ongoing funding for program operations. The COMET provided additional capital through an FTA grant to add docks to stations that were virtual at launch. Operation, maintenance, and promotion of the program is conducted by Bewegen, who is also the equipment provider, under a 5-year contract that ends June 2023.

Local Context

Bike share systems are most successful where there is higher density of people, jobs, attractions, and destinations all in the same area, with comfortable and intuitive connections to transit. Analysis and comparison of demographics such as population density, age, where workers live, where residents live to their proximity to the Blue Bike SC system, The COMET transit system, and the existing bike and pedestrian network, was conducted to demonstrate the current and future potential support of the bike share system in City of Columbia and the West Metro areas.

Affordable and convenient transportation, like transit and connections to bike share, is key for thriving communities and is also essential for historically underserved populations. This study includes analysis to understand where the region's historically underserved and transportation disadvantaged communities are located based on percent of people who identify as Black, Indigenous, People of Color (BIPOC) and median household income

In addition to analysis of demographics for potential and equitable use, analysis was conducted on gaps and barriers in the existing network to connectivity between transit and bike share station locations and other key destination opportunities. To help track and demonstrate the progress and success of the implementation of the potential bike share expansion, an equity analysis was performed to determine what percentage of the existing service areas are within Equity Emphasis Census Tracts to create performance measures. The analysis looked at four demographic factors like income, vehicle access, race, and English language proficiency for Lexington and Richland Counties.

Public Outreach and Stakeholder Engagement

A variety of outreach strategies were used throughout this process to engage the community resulting in close to 450 contacts. This was not the typical feasibility study, where the goal is to seek the public's input on specific locations on where to place the proposed expanded network stations. Therefore, the preliminary engagement was less involved as would normally be observed for a feasibility study. The information collected was to inform barriers to bicycling and walking and perceptions about current and future needs. It was also to inform potential for future ridership.



Public engagement activities included an interactive online map and survey and attendance at local pop-up events held at locations such as the Soda City Market, college and university campuses, parks, and at existing bike share stations. These events and activities were advertised using a QR code that linked to the project website and was printed on 250 business cards, 50 window clings, and numerous flyers. Stakeholder outreach included a focus group meeting and Project Advisory Committee (PAC) meetings as well as interviews conducted with representatives from the Cities of Columbia and West Columbia, CMOG, BCBS of SC, The COMET, and Bewegen. A summary of public and stakeholder engagement can be found in Chapter 6, Stakeholder Engagement.



Soda City Market Pop-up Event
Photo: Planners for Environmental Quality (PEQ)

Implementation

Expansion

Scenarios for bike share system expansion were developed to understand the potential scale of bike share in the region with plans developed based on analysis of potential trip origins and destinations and input received from the public outreach and the stakeholder engagement process. This study does not identify specific bike share station locations but considers expansion areas or corridors within the City of Columbia and within the combined area of Cayce, West Columbia, and Springdale (West Metro).

The following principles were developed from feedback from the PAC and guided the development of the expansion plans:

- **Separate expansion plans:** having separate expansion plans for Columbia and the West Metro communities allows each community to move at their own pace.
- **One fleet:** While system assets will be owned by the entities that purchased them, bicycles will move between participating municipalities on both sides of the river.
- **Contiguous expansion areas:** new stations should be built within bicycling distance of other stations.
- **System-wide target of 1.8 docks-per-bike:** setting a consistent dock-to-bike ratio across the entire system.
- **Transition to a 100% pedelec bike fleet:** given the higher ridership and revenues of pedelec bicycles with only a marginal increase in capital cost.
- **Relocate underutilized docks and stations:** for stations that are not well used or where there are more docks than needed.

City of Columbia Expansion

The following is a list of options developed as an approach for the expansion of the Blue Bike SC system within the City of Columbia. The equipment needed to serve this expansion will vary depending on the amount of equipment that can be repurposed. The preferred expansion scenario will also impact expected ridership, which is discussed in more detailed in Chapter 7 Expansion Scenarios.

- Four potential expansion areas were identified that are contiguous with the existing system footprint that will accommodate up to six new stations with 60 new docks. The expansion areas are:
 - Devine Street – from Harden Street to Millwood Avenue
 - University of South Carolina – south of Blossom Street
 - Benedict College – additional new station
 - Cottontown – area next to Bull Street or Segra Park Station
- Some of the five most underperforming stations (out of a total of eighteen) should be considered for a reduction in the number of docks or for wholesale relocation. This could make stations and docks available for deployment elsewhere.
- Of the existing top five performing stations, three could be considered for an increase in the number of docks due to above-average utilization.

West Metro Expansion

- Two potential expansion areas were identified in the cities of West Columbia and Cayce. These expansion areas could accommodate up to five new stations and 50 new docks. The expansion areas are:
 - Riverwalk – from Moffatt Street to Lyles Street trailheads
 - Meeting Street – from Riverwalk to Triangle City
- As right-of-way is owned by SCDOT and not the local municipality, station location placement and related space considerations will be crucial in any expansion in the West Metro area.
- By prioritizing expansion in areas of West Columbia and Cayce in close proximity and relatively well connected to Columbia, this study is laying the groundwork for the phasing of the expansion of the West Metro system to help connect adjacent communities, like the Town of Springdale.

Funding

This study presents a financial analysis for the expansion of the Blue Bike SC program. It considers the cost of expanding service into new areas, but also considers ways that the program can enhance ridership, increase its presence in the community, be more cost-effective, increase revenues, and leverage the skills of its various partners. Some of the key points include:

- Continuing to build out the bikeway infrastructure is essential.
- E-bikes are ridden almost 3 times more than regular bicycles and continued electrification of the fleet is key to increased ridership.
- Docked-based infrastructure is capital-intensive and limits the footprint of the program and the flexibility for riders to easily access their destination. The project partners should pilot using bike corrals as virtual stations.
- Grant funding may help to offset the capital funds used for expansions.
- Reserving assets space and actively increasing sponsorships will help to increase revenue.

- There are creative ways through user fee structures, and other examples, to increase ridership and achieve other program goals.
- Program contracts can be arranged to incentivize private and public partnerships to work to increase ridership effectively and innovatively.

Early Action

To seamlessly move toward implementation and maintain momentum, early action projects were developed for each of the participating communities. The goal of these recommendations is to have low to no cost projects that could serve as catalysts for more bicycle investments and lead to an increase in enthusiasm for the bike share system and its expansion. Two projects are identified for each community - one event or bike share expansion project and one physical infrastructure project. The projects are listed in Table 1. Early Action Projects.

Table 1: Early Action Projects

| City | Project Type | Location | Project |
|-----------------------|----------------|---|---|
| City of Cayce | Infrastructure | Naples Avenue at State Street | High Visibility Crosswalks |
| | Event | Local public celebration or event | Host an e-bike demonstration |
| City of Columbia | Infrastructure | Harden Street | Improving Bus Stop and Bike Share Station |
| | Event | Area south of Blossom Street or along Devine Street | Host pilot virtual stations |
| City of West Columbia | Infrastructure | Oliver Street at Alexander Road | High Visibility Crosswalks |
| | Event | Local public celebration or event | Host an e-bike demonstration |
| Town of Springdale | Infrastructure | Boston Avenue at Walterboro Street | High Visibility Crosswalk, Sidewalks, and Curb Extensions |
| | Event | RH Fulmer Middle School | Host a bicycle safety event |

2 | Introduction

Launched in the fall of 2018, in its four years of operations (to October 2022) the Blue Bike SC bike share system has contributed to the City of Columbia's transportation system by serving over 12,000 members and recording over 117,500 miles traveled, improving health benefits with users burning 11 million calories, and saving 48 tons in carbon emissions from entering the atmosphere.¹ The system has proven its viability even through the duration of the pandemic.

Since the launch of the Blue Bike SC system, trends in the bike share industry have seen an expansion of dockless and hybrid shared micromobility systems that allow users to park a device at, or closer to, their destination. There is also a shift to move to electrify shared micromobility systems with e-bikes and e-scooters. Many cities are also reconsidering the balance of their public-private partnership models with some programs being converted to permit-based models where private operators pay for the use of the right-of-way and take on cost responsibilities in exchange for program revenues.

Blue Bike SC is a docked bike share system with a mix of regular and e-bikes. The system was purchased with funds from BlueCross BlueShield of South Carolina and an FTA grant obtained by The COMET, which is the Central Midlands Regional Transit Authority (CMRTA) for Richland County, the City of Columbia and Lexington County, SC. BlueCross BlueShield also provides funds to operate the program. The City of Columbia currently manages the contract with Bewegen, who is the vendor that operates, maintains, and promotes the Blue Bike SC system. This contract ends in June 2023. With the approaching contract deadline looming, the Central Midlands Council of Governments (CMCOG) in coordination with the City of Columbia, The COMET, City of Cayce, City of West Columbia, Town of Springdale, and the South Carolina Department of Transportation (SCDOT), collaborated on this feasibility study. The Three Rivers Bike Share Expansion Feasibility Study expounds on the City of Columbia's bike share plans and opportunities to expand the current Blue Bike SC system within its city limits; and explores opportunities to expand the Blue Bike SC or implement a new bike share system in the Cayce, West Columbia, and Springdale communities, collectively referred to as West Metro.



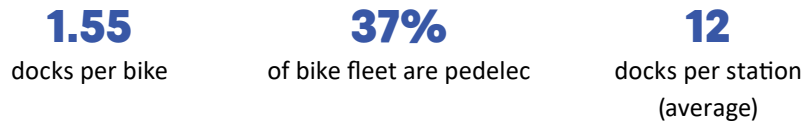
¹ <https://bluebikesc.com/news/detail/blue-bike-fourth-anniversary>



3 | Existing Bike Share System

The Blue Bike SC system currently includes 134 bikes spread out over 18 stations. Specifically, its assets include 84 regular 8-speed bicycles, 50 pedal-assist electric bicycles (pedelec), 208 recharging docks, and 18 two-sided ad panels with integrated electronics that control the locking and unlocking of bicycles (also known as station hubs). Some of these station hubs also have an integrated payment kiosk. The system is purchased from Bewegen Technologies, a bike share equipment vendor based in Quebec, Canada with a presence in North America and Europe. The City of Columbia purchased ten stations and all the bikes in the system with funding provided by BlueCross BlueShield of South Carolina, while The COMET purchased and owns equipment for eight stations that helped convert initially virtual stations into docked stations and expand the system further. Bewegen is also contracted to operate the system on behalf of the City of Columbia with financial support from the presenting sponsor, BlueCross BlueShield of South Carolina, through the end of June 2023.

Key system statistics:



Current Use

Trip and membership data from Blue Bike SC was analyzed to provide a snapshot of the system from its launch in October 2018, through the disruption caused by the COVID-19 pandemic, and until the end of 2022. The data shows a resilient docked bikeshare system that has almost fully recovered from the interruptions caused by the pandemic. A high proportion of ridership seems to be recreational, but transportation trips do make up a significant proportion of trips (estimated to be around 40% of all trips).

Ridership

The operator provided raw trip data collected since the system's launch until December 31, 2022. For each trip, the following data were provided. No user identifying data was provided with the trip data.

- Ride Start and End Date and Time
- Ride Duration
- Start and End Station
- Ride Distance (collected through on-board GPS)
- User Membership Type
- Bicycle Serial Number
- Bicycle Type (pedal or electric)

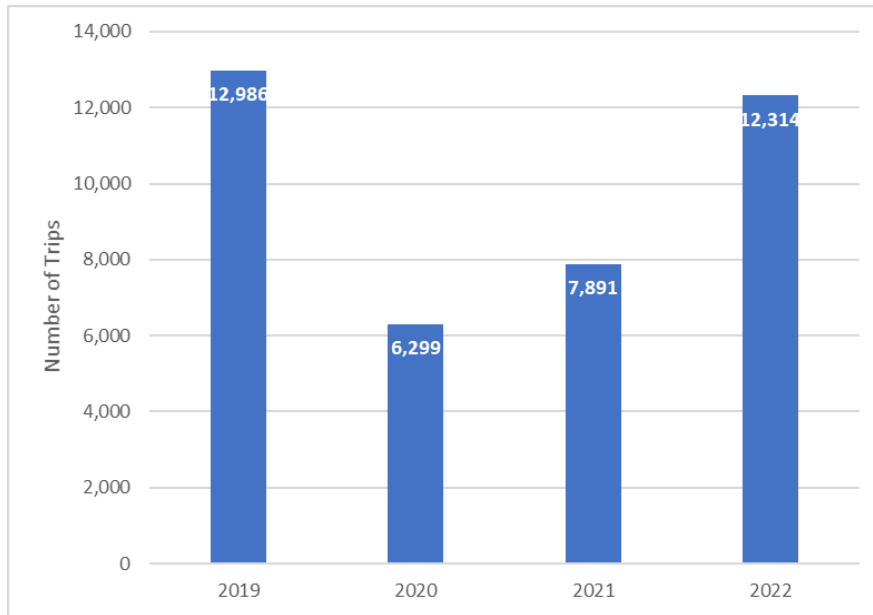
Trip data was screened to remove rides that were likely invalid or not public ridership. This included rides of less than 1 minute, rides longer than 24 hours, rides that started or ended at the warehouse and undetermined locations, and check-outs made using a Bewegen staff account. A total of 41,398 valid rides remained after this initial screening.

Trips per Year

Blue Bike SC's first full year of operations in 2019 saw its highest ridership so far with 12,963 rides taken (see Figure 1). For reference, the system did not meet the 29,000 trips projected for the first year in the 2015 Columbia Bike Share Plan. Ridership was impacted by COVID-19 starting in 2020 with the system closed in April and May 2020, and then reopening in June 2020 with a steady increase in trips since then. While the recovery of Blue Bike SC was a little slower than the recovery in ridership across all shared micromobility systems in North America,¹ by year-end 2022 the system had recaptured 95% of 2019 ridership (see Figure 2).

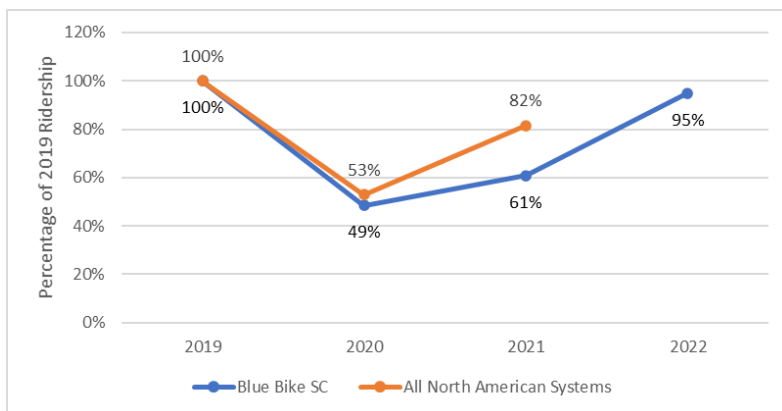
¹ NABSA Shared Micromobility State of the Industry Report (2021), pg. 2

Figure 1. Blue Bike SC Ridership by Year



Data Source: Blue Bike SC/Bewegen

Figure 2. Percentage of 2019 Ridership on Blue Bike SC Compared to all North American Shared Micromobility Systems



Data Source: Blue Bike SC/Bewegen and NABSA

Trips by Bike Type and Utilization

While comprising only 50 of the 134 bikes (37%) in the system, Blue Bike SC's pedelec bicycles consistently saw a disproportionately high share of rides, making them nearly three times more popular than the 8-speed bikes. In 2019 and 2022, trips taken on pedelec bikes comprised approximately 60% of all trips and across all years they represented 55%.

A common measure of bike share system utilization is the number of trips per bike per service day (t/b/d). This measure accounts for variability in system fleet sizes, systems which operate seasonally, and days when bicycles are otherwise out of service (e.g., for maintenance or storage).

Blue Bike SC has a system that operates 365 days a year with, at most, 134 bikes. Due to a lack of data on the average number bikes in service each day, a base estimate of utilization was computed with the assumption that all bikes were operational throughout the year. The actual t/b/d for Blue Bike SC is likely to be higher as some bikes are likely to be in storage or undergoing maintenance at any given time.

Overall utilization was highest in 2019 at 0.27 t/b/d; in 2022 it was at 0.25 t/b/d. This is about a third of the average 0.8 t/b/d for bike share systems in small cities less than 200K in population as calculated in the 2021 NABSA report and about 60% of the average 0.4 t/b/d for medium-sized cities of 200-500K, which could include the Columbia Metro Area.

Table 2: Ridership and Utilization by Bike Type and Year

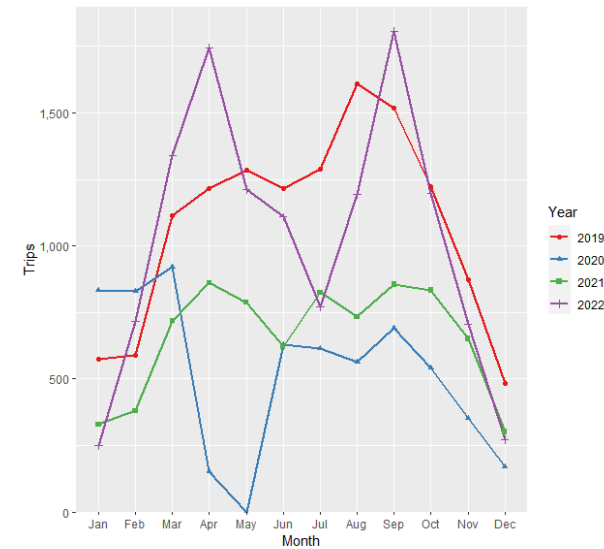
| Bike Type | Metric | 2019 | 2020 | 2021 | 2022 | Total |
|--------------|---------------------|---------------|--------------|--------------|---------------|--------------|
| 8-speed bike | Ridership | 5,395 (42%) | 3,578 (57%) | 4,364 (55%) | 4,606 (37%) | 17,943 (45%) |
| | Utilization (t/b/d) | 0.18 | 0.12 | 0.14 | 0.15 | 0.14 |
| Pedelec bike | Ridership | 7,591 (58%) | 2,721 (43%) | 3,527 (45%) | 7,708 (63%) | 21,547 (55%) |
| | Utilization (t/b/d) | 0.42 | 0.15 | 0.19 | 0.42 | 0.30 |
| Total | Ridership | 12,986 (100%) | 6,299 (100%) | 7,891 (100%) | 12,314 (100%) | 39,490 |
| | Utilization (t/b/d) | 0.27 | 0.13 | 0.16 | 0.25 | 0.20 |

Data Source: Blue Bike SC/Bewegen

Trips by Month

An analysis of trips taken by month was conducted to understand seasonal variations in ridership. The highest month of ridership occurred in April 2022, while zero rides were taken in May 2020 when the system was closed as a precautionary measure to the COVID-19 pandemic. The analysis also shows two peaks in 2022, one in the spring and one in the fall. This seasonal ridership pattern can be seen in systems located in college towns where students leave for the summer and cities that experience very hot summers, both of which apply to the City of Columbia. However, it is notable that the 2022 dip in ridership over the summer was not experienced in 2019 despite similar average summer temperatures for both years.² It is unknown what other factors may have contributed to this significant drop in summer ridership, but a potential interpretation of this data is that people using Blue Bike SC for recreation are likely to continue using it during the summer while those using it for transportation are less likely to do so.

Figure 3. Trips by Month



Data source: Blue Bike SC/Bewegen

Data Source: Blue Bike SC/Bewegen

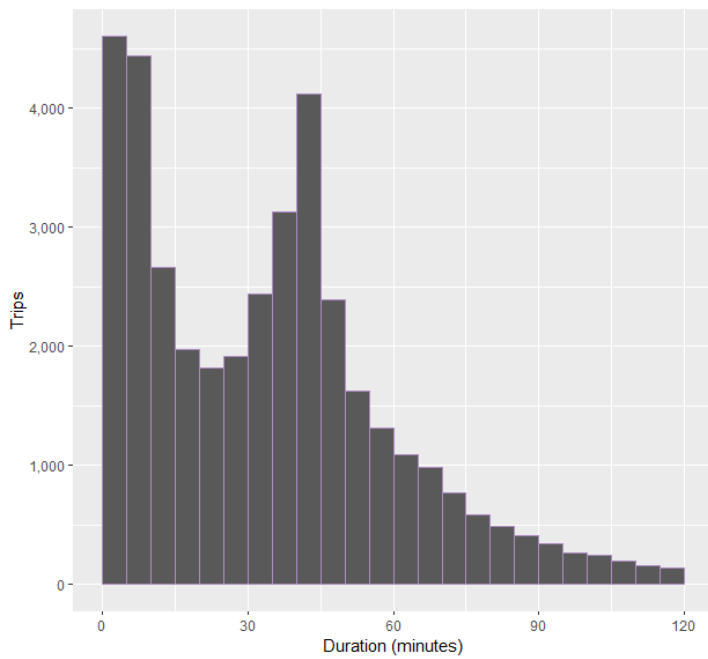
² NOAA Online Weather Data for Columbia Area (2022), <https://www.weather.gov/wrh/Climate?wfo=cae>.

Trips by Ride Duration

Trips were analyzed based on the length of time users checked bikes out. The analysis shows an average trip duration of 44 minutes across all rides since 2018. For comparison, the average bike share trip duration in North America is 15 minutes³, suggesting a higher use of recreational trips in Columbia, which are often longer in mileage and duration than trips made for transportation.

A histogram of trip duration data (see Figure 4) shows there are two peaks, one in the 1–10-minute range consistent with bike share usage for transportation and the other around the 40–45-minute range consistent with recreational trips. The 45-minute mark is also the time limit for most pass types, at which point the user would start incurring overage charges unless the bike is checked back into a station.

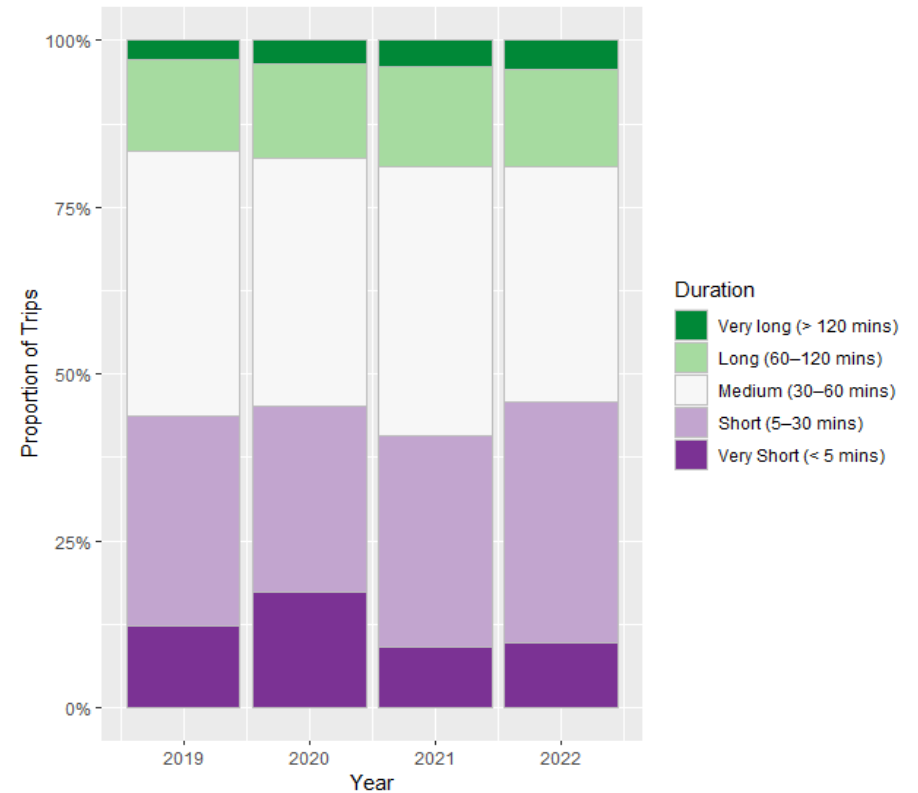
Figure 4. Trips by Duration (5-min increments, 2019-2022)



Data Source: Blue Bike SC/Bewegen

By grouping the trip durations into five more general categories, we can see that the proportion of very short (0-4 mins), short (5-29 min), medium (30-59 min), long (60-120 mins), and very long duration (120+ mins) has stayed relatively constant since 2019. Short and very short trips, which are more likely to be transportation-related trips, consistently made up 37-40% of all trips per year (see Figure 5).

Figure 5. Percentage of Trips by Duration and Year (2019 – 2022)



Data Source: Blue Bike SC/Bewegen

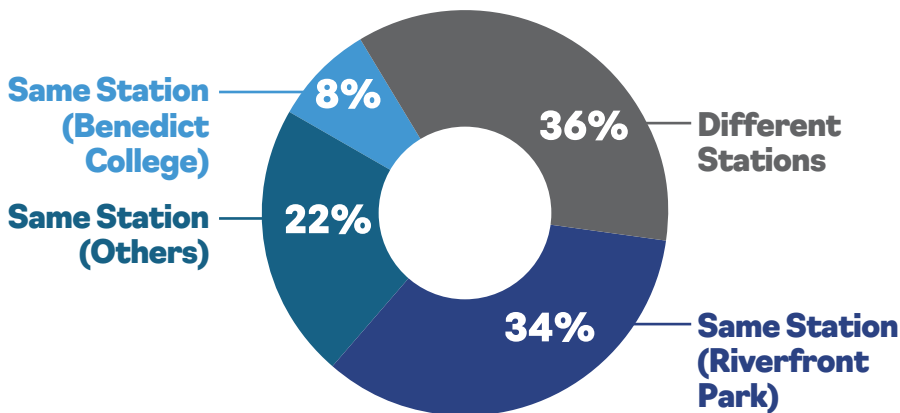
³ NABSA Shared Micromobility State of the Industry Report (2021), pg. 15

Trips by Start and End Station

An analysis was conducted to determine how many trips started and ended at the same station versus a different station. The former is more indicative of a recreational trip (e.g., starting and ending at a trailhead) while the latter is more indicative of transportation trips where people go from A to B. The analysis revealed that 64% of all trips taken on Blue Bike SC are same-station trips while 36% are different-station trips. Most tellingly, over half of same-station trips (i.e., 34% of all trips in the system) started and ended at the Riverfront Park station, a popular recreational destination in Columbia that is a trailhead for a four-mile multi-use trail paralleling the historic Columbia Canal.

The level of same-station ridership was also high at the Benedict College station, which is the system’s second-highest ridership station after Riverfront Park. In-person engagement at Benedict College suggests that high ridership may be partly driven by first-year students, who are not allowed to bring vehicles on campus and therefore use bike share to explore the area around campus. Partnering with colleges to introduce bike share during freshmen orientation week may be a good opportunity to expand ridership among students at Benedict and other area colleges and universities.

Figure 6. Trips by Same and Different Origin-Destination Stations



Data Source: Blue Bike SC/Bewegen

Table 3: Top 10 of 18 Stations by Trip Starts (2019-2022)

| Rank | Station Name | Trip Starts | Pct. of Total |
|------|---------------------------------|-------------|---------------|
| 1 | Riverfront Park | 14290 | 36.27% |
| 2 | Benedict - Swinton Center | 3688 | 9.36% |
| 3 | Main & Gervais | 2856 | 7.25% |
| 4 | Vista Greenway - Lady Street | 2210 | 5.61% |
| 5 | Foundation Square | 2029 | 5.15% |
| 6 | Main Street - Washington Square | 1957 | 4.97% |
| 7 | Five Points - Saluda Avenue | 1826 | 4.63% |
| 8 | UofSC - Hamilton College | 1660 | 4.21% |
| 9 | City Hall | 1526 | 3.87% |
| 10 | UofSC - Sumter & Devine | 1293 | 3.28% |

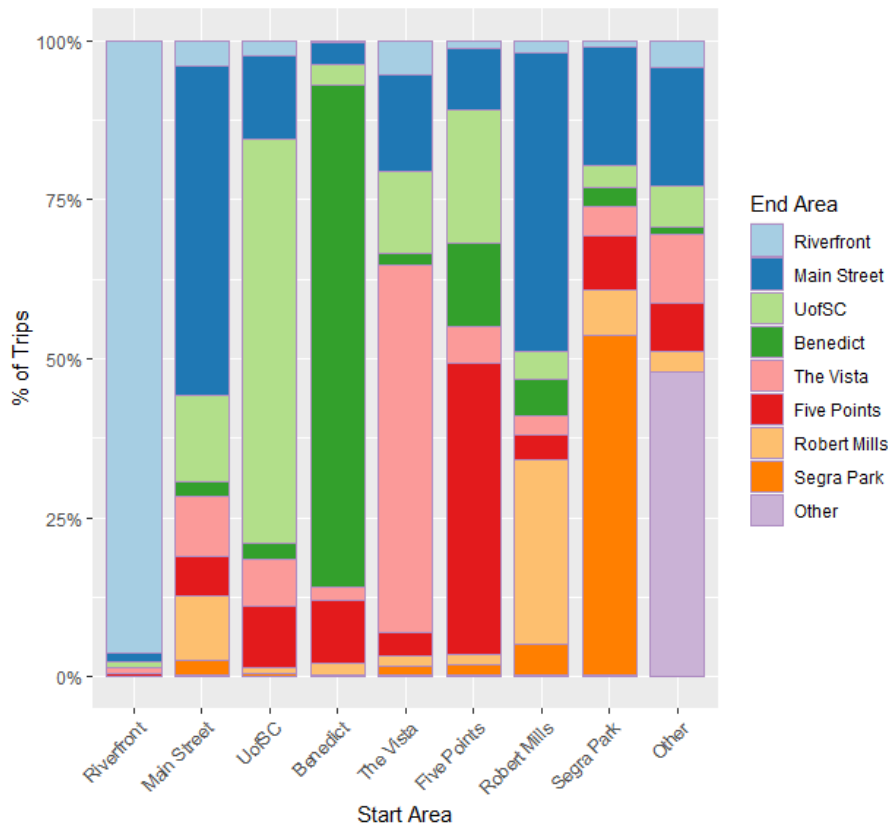
Data Source: Blue Bike SC/Bewegen

While most trips in the system started and ended at the same station, this is not the case across all stations in the system. For the analysis shown in Figure 7, the system’s 18 stations were grouped into eight station areas roughly corresponding with the City’s prescribed neighborhood boundaries (note that “Other” includes trips that started and ended at temporary stations created for special events). Most of the trips originating in the Five Points and Robert Mills areas ended in other areas, often the areas that were immediately next to them. These are likely transportation trips for distances that are too long to walk but too short for public transit or private/hired vehicles to serve efficiently.

Trips by Membership Type

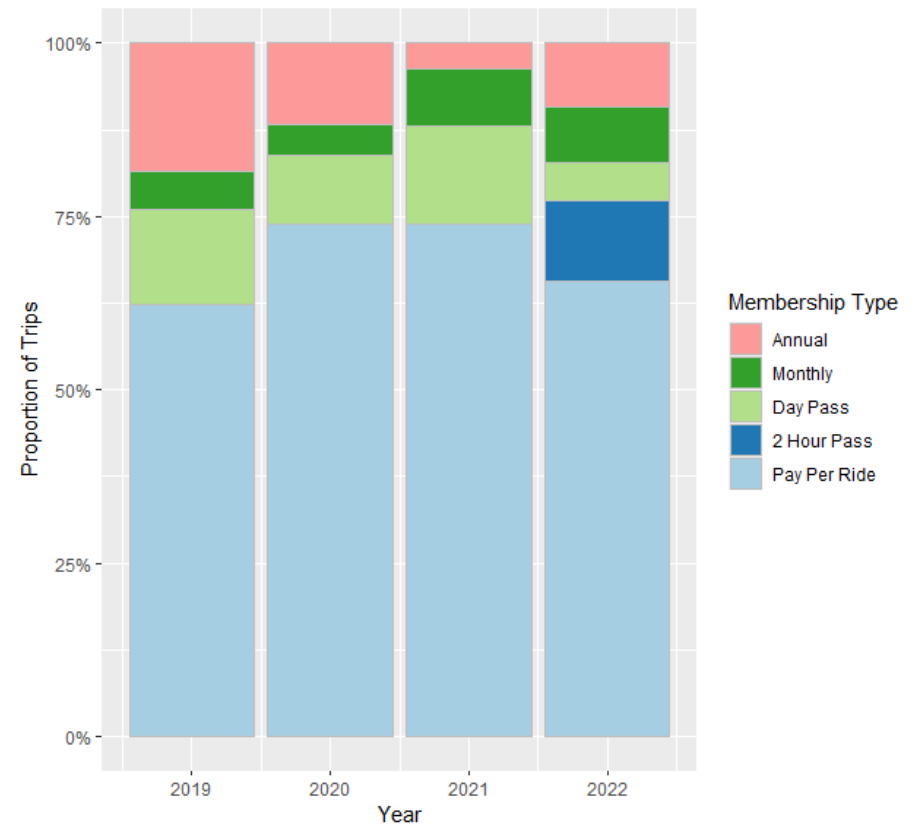
The membership type used for each trip was analyzed (See Figure 8) and it shows that most rides were taken using short-term passes including the Pay-per-Ride Pass (formerly called a Go Pass) which is a \$2 for 45-minute pass, the Day Pass, and the 2-Hour Pass (introduced in 2022 to replace the Day Pass). Monthly and Annual Pass members took a much smaller percentage of trips.

Figure 7. Proportion of Trips by Origin-Destination Station Areas



Data Source: Blue Bike SC/Bewegen

Figure 8. Trips by Membership Type by Year



Data Source: Blue Bike SC/Bewegen

Membership

Membership information was provided by Bewegen and the City of Columbia in two formats: a list of membership signups with timestamps, pass type, and ZIP codes; and aggregated results from opt-in end-of-season surveys sent to riders in 2020 and 2021 which contained demographic questions. No data was provided that could be used to identify individual users' personal or demographic information.

Registrations by Year

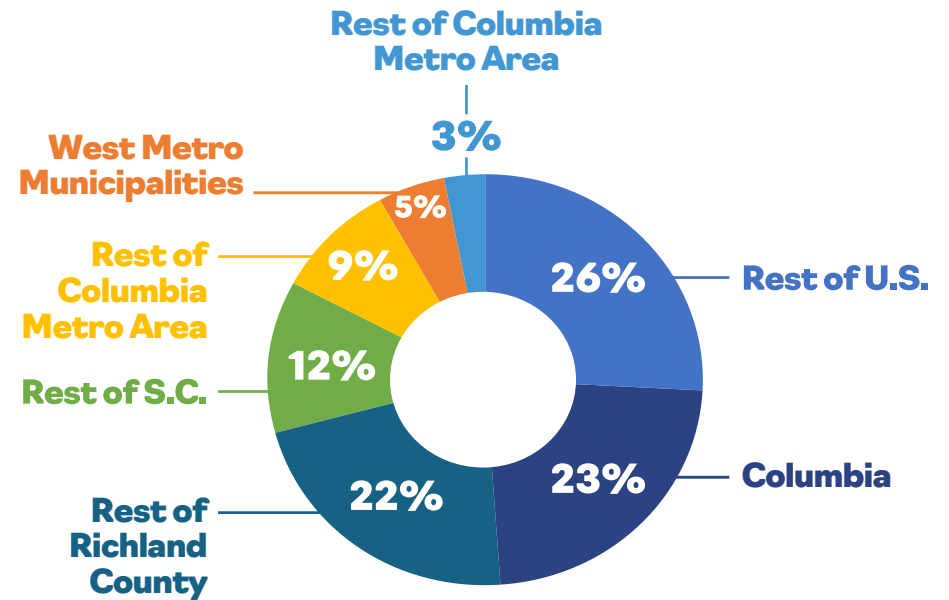
Annual and monthly pass registrations are generally low. Annual passes, which include regular and discounted annual passes as well as founding member passes, peaked at 63 registrations in 2019 before falling during the pandemic, but rebounded to approximately 60 sales in 2022. Monthly passes also peaked in 2019 at 99 registrations and dropped during the pandemic. Approximately 70 monthly passes were sold in 2022.

Passes serve as a source of upfront revenue for a bike share system that helps moderate seasonal fluctuations in more casual bike share ridership and their associated trip revenue. However, they are less frequently used in newer systems because they typically generate lower per trip revenues.

ZIP Code Analysis

ZIP codes were collected from members during the registration process. Of the over 9,100 valid ZIP codes collected, approximately 23% were from within the City of Columbia and 5% were from the West Metro municipalities of Cayce, Springdale, and West Columbia. Approximately 34% were from the rest of Richland County, Lexington County, and the rest of the West Metro Area. Approximately 12% of ZIP codes were from other parts of South Carolina and 26% were from other states, which shows significant use of the system by out-of-town visitors and temporary residents, such as college students.

Figure 9. Percentage of Memberships by ZIP Code Location



Data Source: Blue Bike SC/Bewegen

Summary of Year-End User Surveys

An opt-in year-end survey was sent out to Blue Bike SC riders in 2020 and 2021 to gather feedback about the system and demographic data of the users themselves. There were 117 respondents in 2020 and 139 in 2021.

Questions were asked about users' gender, race/ethnicity, and age. For gender, 53% of respondents identified as female in 2020 and 59% identified as female or nonbinary/gender nonconforming in 2021. This over-representation of people who are not male is unique as other micromobility systems often find that male users are overrepresented in their ridership by an average of 13 percentage points.⁴

For race and ethnicity, people who identify as white or Caucasian are overrepresented among survey respondents and, conversely, people who identify as persons of color are underrepresented. This is also the case with other shared micromobility systems in North America, and an issue the industry is trying to address with initiatives such as the Better Bike Share Partnership.

4 NABSA (2021).

Table 4: Race & Ethnicity Responses in Blue Bike SC Year-End Surveys Compared to Census Data

| Race/Ethnicity (select all that apply) | 2020 Survey | 2021 Survey | Columbia, SC ⁵ |
|--|-------------|-------------|---------------------------|
| White or Caucasian | 65.8% | 62.6% | 50.7% |
| Black or African American | 26.5% | 31.7% | 40.9% |
| Hispanic or Latino | 4.3% | 1.4% | 5.6% |
| Asian or Asian American | 3.4% | 4.3% | 2.6% |
| American Indian or Alaska Native | 0.9% | 0.7% | 0.2% |
| Native Hawaiian or Pacific Islander | 0.0% | 0.0% | 0.2% |
| Other (please specify) | 2.6% | 2.9% | 4.0% |

Data Source: Blue Bike SC/Bewegen and US Census Bureau

For age, people between 25-44 are overrepresented among respondents compared to the population of Columbia, SC, as is often the case in other systems; however, people between 45-64 are also overrepresented, which is different to other systems in North America where this demographic is underrepresented by an average of 11 percentage points. There is also a significant under-representation of people ages 18-24 (e.g., college-aged students) in Columbia, whereas in other systems in North America, this demographic is over-represented by an average of 4 percentage points.

Table 5: Age Responses in Blue Bike SC Year-End Surveys Compared to Census Data

| Age | 2020 Survey | 2021 Survey | Columbia, SC ⁶ |
|-----------------|-------------|-------------|---------------------------|
| 18-24 years old | 16.2% | 13.0% | 31.5% |
| 25-34 years old | 23.9% | 30.2% | 20.5% |
| 35-44 years old | 17.1% | 20.1% | 14.5% |
| 45-54 years old | 15.4% | 14.4% | 9.3% |
| 55-64 years old | 24.8% | 17.3% | 11.5% |
| 65 + years old | 2.6% | 5.0% | 12.7% |

Data Source: Blue Bike SC/Bewegen and US Census Bureau

Program Operations

The Blue Bike SC program is a public-private partnership between the City of Columbia, BlueCross BlueShield of South Carolina, The COMET (local transit agency), and Bewegen Technologies and its subsidiaries. The City and The COMET are the owners of the system’s equipment – the bikes, docks, and stations – while BlueCross BlueShield is the presenting sponsor and The COMET provides additional operational funding support. The annual contributions of BCBS-SC and The COMET are critical to the operations of the program. Service level agreements were not available to the consultant team at the time of writing. The City of Columbia does not provide ongoing operational funding.

Bewegen Technologies is the equipment vendor of the bikes, docks, and stations used in the Blue Bike SC system and it is also the parent company of various subsidiaries that support the day-to-day operations of Blue Bike SC (i.e., fleet rebalancing and maintenance, customer service, advertising, and marketing) and other Bewegen systems around the world. Outsourcing operations to an entity that manages multiple bike share systems is likely beneficial for a smaller system like Columbia’s because it allows for economies of scale in functions that can be centralized and shared amongst various systems, such as management staff and running a call center, while keeping a local operating staff presence in Columbia

⁵ US Census Bureau, 2021 5-Year American Community Survey (2022).

⁶ US Census Bureau (2022). Note: Percentages normalized for population 18 and over.

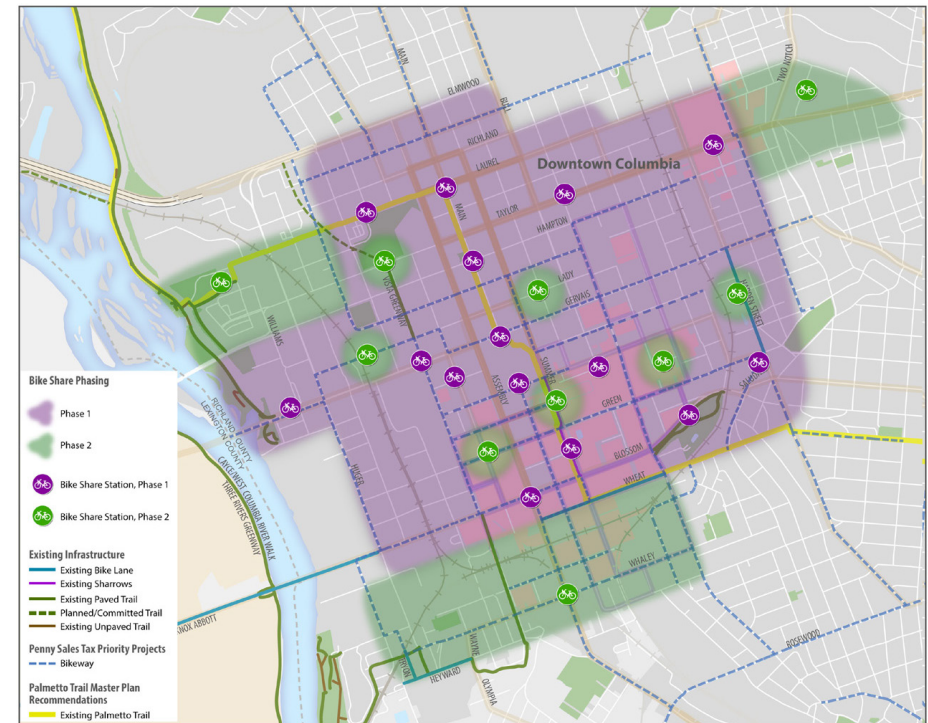
for fleet rebalancing and maintenance and other functions that must be done in person. The on-the-ground staff in Columbia includes one bicycle mechanic and one fleet technician, both of whom report to a remote Manager of Operations for BWG Field Ops, the Bewegen subsidiary in charge of fleet management. The same staff are also involved in the logistics of marketing and outreach with the support of contracted brand ambassadors and staff from partner agencies and organizations. Until recently, a marketing coordinator was also part of the on-the-ground team in Columbia.

Blue Bike SC has been an active participant in community events in Columbia since the system’s launch, partnering with the City, local colleges, and local health and wellness and community organizations in over 30 events in 2022 alone. After its 2019 launch year, the system rolled out programs that are often found in other bike share systems such as employer-sponsored passes, discounted passes for college students, and annual pass sales. Blue Bike SC has also replaced its Day Pass with a 2-Hour Pass to capitalize on recreational riders that were previously limited by the 45-minute time limit on casual passes, and it has introduced a method to link transit passes from The COMET to a Blue Bike SC account so that transit riders can take free bike rides up to 2 hours. This level of integration with transit exceeds bike share-transit integration seen in other communities.

Existing Plans and Policies Review

The Bike Share Plan within the Walk Bike Columbia Plan was prepared in 2015 and laid the groundwork for the current Blue Bike SC system. It envisioned a docked bike share system rolling out over two phases: an initial phase of 15 stations and 135 bikes in downtown Columbia, the Vista District, the University of South Carolina campus, and Five Points; and a second phase of an additional 10 stations and 90 bikes as infill stations in the existing footprint and expansion stations into the Canalside development, off-campus housing south of USC, and Providence Hospital. Today’s Blue Bike SC footprint, which is composed of 18 stations around Columbia, utilized recommendations from Phase 1 and Phase 2 and added locations based on new developments and transit connections, such as the stations at Segra Park and COMET Central.

Figure 10. Columbia Bike Share Plan Phasing Map



Source: Walk Bike Columbia Bike Share Plan, 2015.

The West Metro Bike Share Feasibility Study, a part of the West Metro Bike and Pedestrian Master Plan, was conducted in 2017 and was reflective of the pre-launch state of Columbia’s bike share plans and the bike share industry at the time. It ultimately recommended that if Columbia established a bike share system and there is an opportunity for other jurisdictions to join the program, West Metro communities should consider joining the program. If Columbia had not established a bike share system or other jurisdictions were not invited to join, the report recommended West Metro communities consider starting their own docked bike share system or explore partnering with a private dockless bike share company. In project advisory committee (PAC) meetings held for this project, stakeholders from all municipalities represented have expressed continued desire to have a regional bike share program; that is, that the same system be used in communities on both sides of the river.

Trends Analysis

The shared micromobility industry has seen many changes since the initial plan for Columbia’s bike share system was developed. Dockless bike share was just starting to roll out in cities in the United States in 2017 when the City of Columbia had issued an RFP for the system, which eventually became Blue Bike SC. Cities with docked bike share systems responded to dockless mobility in various ways. Some, like Seattle, WA and Charleston, SC, replaced their docked systems entirely with one or multiple dockless bike share providers, while others have started permitting dockless shared micromobility vendors to operate side-by-side with a docked bike share system, as is the case in Washington, DC. Lastly, some cities like Philadelphia, PA, Boston, MA, and Columbia, have continued to invest in their established docked technologies and some have even instituted bans on the operation of dockless bikes or e-scooters.

Initially, dockless systems were exclusively bike share systems, but over time these were supplanted by dockless e-scooter systems given their higher utilization and lower capital costs. However, there has been a recent comeback of dockless e-bike systems with more support available for the upfront capital costs through federal and state grants and local incentives. Despite some of the issues of parking management and right-of-way clutter, dockless shared micromobility is currently the most prevalent system type in North America. In 2021, dockless bikes and scooters made up 55% of all shared micromobility trips.⁷

Technology has advanced in the bike share industry such that bikes can be checked out using a smartphone and electric pedal-assist bicycles are being added to docked bike share fleets. The Bewegen technology was early in adapting to these trends; Blue Bike SC bikes already have built-in locks to allow for trips outside of the docked system and e-bike integration into the bike share fleet. The region should continue to explore innovations that can help increase ridership and the utility of bike share in and around Columbia. Given the advanced technology incorporated in the Bewegen system, some of these innovations could be implemented using the existing system. However, stakeholders should keep an open mind in case a different operating model can provide similar or greater benefits to the community.



Lime e-bikes in Charleston, SC are sponsored by Medical University of South Carolina
Source: Medical University of South Carolina

Electrification has improved the bike share experience by making it easier to bike. The pedal-assist motor on Bewegen bikes help riders start pedaling faster and maintain a consistent speed over changing terrain and over longer distances with less physical exertion. Their popularity over regular pedal bicycles has been proven – while pedelec bikes made up 37% of the Blue Bike SC fleet, they served 63% of trips in 2022. Increasing the proportion of pedelec bikes in an expanded Blue Bike SC fleet would support ridership growth with a moderate increase in capital costs if using Bewegen equipment (i.e., there is only a 12% price difference between Bewegen’s 8-speed and pedelec bike models).⁸ If there was ever a need to rebid the system, other operators may be interested in exclusively providing electric bikes, electric scooters, or a mix of both because electric vehicles net higher ridership and revenues compared to traditional bicycles.

⁷ NABSA (2022).

⁸ Bewegen Equipment Cost Columbia, SC. (2022)

Other operators are likely to operate electric bikes or scooters in a dockless system. This can work because in newer models of e-bikes and scooters, batteries are designed to be swapped in the field during the course of rebalancing operations, which reduces the need to bring entire vehicles to a warehouse for recharging.



Bird e-scooters parked next to a Capital Bikeshare station in Washington, DC
Source: AP News/Pablo Martinez Monsivais

There are several cities that have created a framework for docked and dockless systems to co-exist; these are often larger cities with a well-established and expansive docked bike share system in place. This may not be possible in Columbia given the footprint of the system is relatively small and a dockless service would likely operate more widespread. There are some techniques used by docked bike share systems to better compete with dockless systems that could be employed in Columbia. Some docked systems have introduced bicycles that can be locked to any bike rack for an additional fee, and this is a mode of operation that is possible with the Bewegen system. Some have also expanded the service area of their docked bike share systems by introducing more stations and adding infill stations in the existing service area to better approximate the door-to-door convenience of dockless micromobility options. To lower the cost of deploying more stations, some systems have split up existing larger stations into smaller ones so docks can be reused for infill stations, or they have created additional “virtual” stations using bike corrals, groups of bike racks, or just with signage and striping. These may be strategies that Blue Bike SC consider adopting in a future expansion to pilot new service areas, lower the cost of expansion, and increase ridership and utilization. The ability for a system to operate in a docked and dockless “hybrid” model may be part of the considerations in choosing a new system as well.

Cities that have ceased their docked bike share systems in favor of dockless bikes or scooters often chose to do so to capitalize on the increased convenience that these systems provide and to lower costs to the municipality. Dockless systems were and still are being offered to interested cities by private micromobility operators such as Bird, Lime, Spin, Veo, and others often at no direct cost to the municipality, though there are indirect costs to the municipality to oversee the program and provide support. This model may provide less control over the operation of the system and the risk of service being lost if an operator decides to discontinue service. However, dockless operators can often serve a greater area and provide more bikes and scooters than a docked system, which expands the reach and utility of a micromobility system. Negative externalities associated with dockless mobility can be managed through education, enforcement of system rules, and provision of more bicycle parking areas.

As new shared micromobility technologies and operating models are developed, it is important that opportunities presented by these options be considered against the continued investment in the established system to determine which option best delivers on the transportation and community goals of the program.

Bike Share and Accessibility

The standard bicycle, the most common fleet type in bike share systems, can be challenging or not possible to use by people with disabilities and older adults, especially those with mobility or balance impairments. To meet the cycling needs of these groups, bike share operators have experimented with incorporating adaptive cycles – adult tricycles, hand cycles, and recumbents – into their systems. Two options are discussed here.



Example of 5 adaptive cycles that are part of Detroit's Adaptive MoGo program.
Source: MoGo Bike Share

Option 1. Integrating adaptive cycles into the existing fleet: Some systems, such as Bublr Bikes in Minneapolis, MN, have tried integrating adult tricycles into their existing system to provide an experience as close as possible as traditional bikeshare. This option is likely not to be feasible in Columbia because the equipment manufacturer of the system does not provide adaptive bicycles as a possible fleet type (most manufacturers do not). Systems that have tried this option have often reverted to the second option due to logistics and the challenge of meeting diverse needs using the bike share model.

Option 2. Starting or partnering with an adaptive cycle “library”, bike share systems have found success in accommodating the different needs that people with disabilities have by partnering with an existing group or business that offers adaptive cycle rentals or starting their own bike/trike “library.” Adaptive cycle libraries can offer greater fleet selection and provide in-person support tailored to the rider’s needs and capabilities (e.g., equipment fittings, support getting on/off bicycle). Trips usually start and end from the library’s location, which makes them more akin to bicycle rental rather than bike share. However, the bike share system supports the operations of the adaptive cycle library by subsidizing the cost of rentals (Portland, OR) or operating the library out of their existing facilities (Detroit, MI). Successful libraries are often operated seasonally next to popular multi-use trails, as new riders prefer to bicycle on routes with few to no motor vehicles present. Libraries may also induce greater use of an existing nearby bike share station as able-bodied companions check out standard bikes to go on group rides.

4 | Local Context Analysis

GIS Analysis

Demographic Analysis

The expansion of a bike share program is highly influenced by the population and employment characteristics of a region. Bike share systems are most successful where there is a high concentration of jobs, people, and activities in the same area, and comfortable and intuitive connections to transit.

Population Density

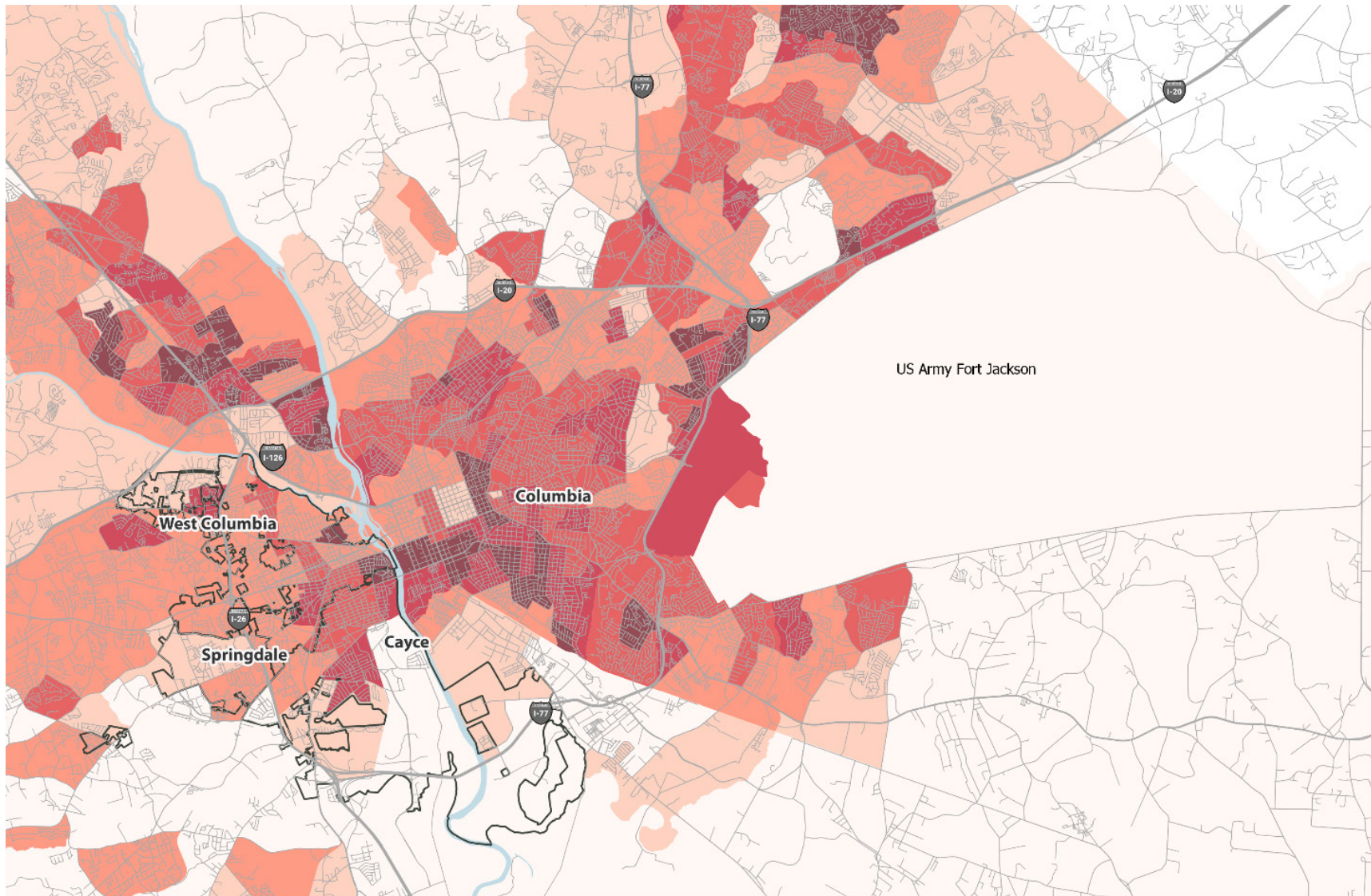
The population of each of the four communities is growing, which increases the user base for The COMET and Blue Bike SC as well as increases the demand on local roads and resources. Columbia has the highest population density as expected once Fort Jackson is excluded. Clusters and areas of high population density can be a determining factor in station placement.

Table 6: Population Density

| Community | Population (2020) | Population Change (since 2010) | Area (square miles) | Population Density (people/sq. mi.) |
|-----------------------------------|-------------------|--------------------------------|---------------------|-------------------------------------|
| Cayce | 13,781 | 1,253 (10.0%) | 17.7 | 777 |
| Columbia (including Fort Jackson) | 136,632 | 7,360 (5.7%) | 140.7 | 972 |
| Columbia (without Fort Jackson) | 122,150 | 5,839 (4.78%) | 59.9 | 2,039 |
| Springdale | 2,744 | 115 (4.5%) | 2.7 | 1,006 |
| West Columbia | 17,416 | 2,428 (16.2%) | 9.5 | 1,839 |

Source: U.S. Census, Decennial Census, 2020

Figure 11. Population Density Map



Population Per Square Mile



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Three Rivers
Bike Share Plan

Age

Blue Bike SC system is only accessible to people aged 18 or older. Table 7 presents the percentage of the population that is age 18 or older and the average age of each community. Columbia has the youngest population, with an average age of 28 likely influenced by the University of South Carolina and Fort Jackson. Other communities have higher average ages, which may mean fewer immediate adopters of bike share.

Table 7: Over 18 Population and Average Age

| Community | 18 and over | Average Age |
|---------------|-------------|-------------|
| Cayce | 85% | 36 |
| Columbia | 80% | 28 |
| Springdale | 81% | 45 |
| West Columbia | 83% | 40 |

Source: U.S. Census, American Community Survey, 2021

Employment

The density of jobs in an area can impact usage patterns of bike share systems by providing a critical mass for commuting trips, daytime errands, and social trips. The highest employment industries in the four communities are educational services; health care and social assistance; retail trade; manufacturing; and the entertainment, hotel, and food service industry. Some of these are good candidates for bike share trips.

Table 8: Where Workers Live

| Community | Number of people employed in the community | Employees who live outside the community but work in the community | Employees who live and work within community |
|---------------|--|--|--|
| Cayce | 13,013 | 12,534 (96%) | 479 (4%) |
| Columbia | 127,511 | 109,715 (86%) | 17,796 (14%) |
| Springdale | 1,564 | 1,533 (98%) | 31 (2%) |
| West Columbia | 13,340 | 12,786 (96%) | 554 (4%) |

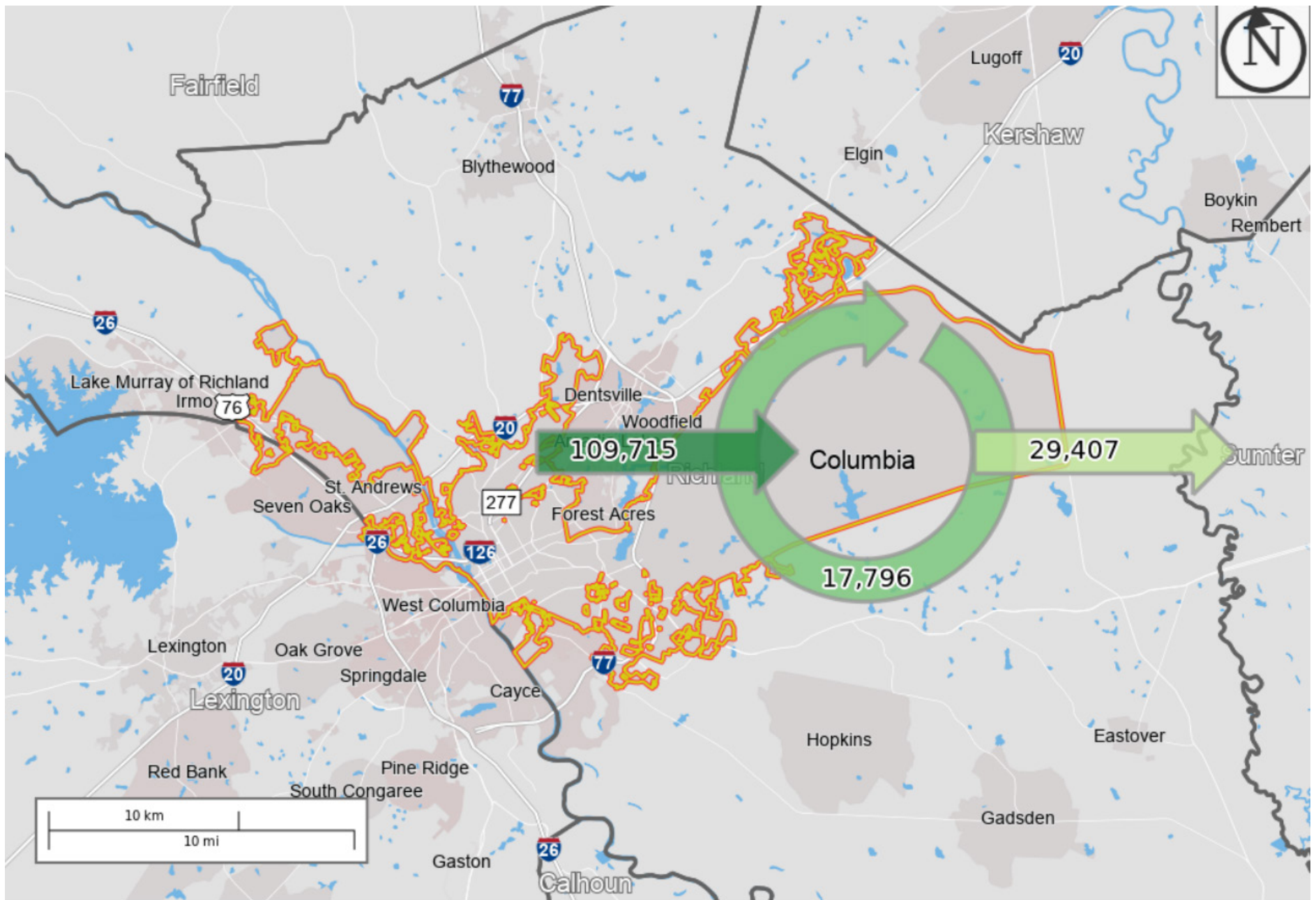
Source: Longitudinal Employer-Household Dynamics, 2019

Table 9: Where Residents Work

| Community | Number of people who live in the community | Employees who live in the community but work outside of the community | Employees who live and work within community |
|---------------|--|---|--|
| Cayce | 6,252 | 5,773 (92%) | 479 (8%) |
| Columbia | 47,203 | 29,407 (62%) | 17,796 (38%) |
| Springdale | 1,203 | 1,172 (97%) | 31 (3%) |
| West Columbia | 7,213 | 6,659 (92%) | 554 (8%) |

Source: Longitudinal Employer-Household Dynamics, 2019

Figure 12. Job Flow Graph for City of Columbia



Transportation System

The four communities are all impacted to varying degrees by congestion during peak travel times. An expanded bike share system which is more integrated with the COMET service could help to reduce vehicular congestion and provide a diversity of mobility options. Blue Bike SC's current ridership is primarily recreational oriented. However, expanding Blue Bike SC could increase its role in shifting short utilitarian trips to bicycling.

Bicycle and Trail Network

Active transportation modes, such as walking and biking, can support mobility as well as healthy lifestyles, reduced emissions, and fewer vehicle trips. For some residents, including those without access to a car, walking, biking, and taking transit are their primary means of transportation and are essential to creating equitable access to housing, jobs, and other services and opportunities.

The existing network of off-street separated facilities, such as shared use paths and greenways, is primarily focused on recreation and is mainly located within parks and along the riverfront. These facilities include the Three Rivers Greenway, Cayce/West Columbia Riverwalk, Saluda Riverwalk, Palmetto Trail, and Timmerman Trail. The Vista Greenway is the exception to the recreation focused facilities. This trail runs through downtown Columbia where it offers transportation options to residents in neighborhoods in north Columbia.

Current usage shows that the system is most used at and around Riverfront Park in Columbia. It is expected that Blue Bike SC could serve a similar role for the Riverwalk and other trails and recreational locations for the communities on the west side of the river.

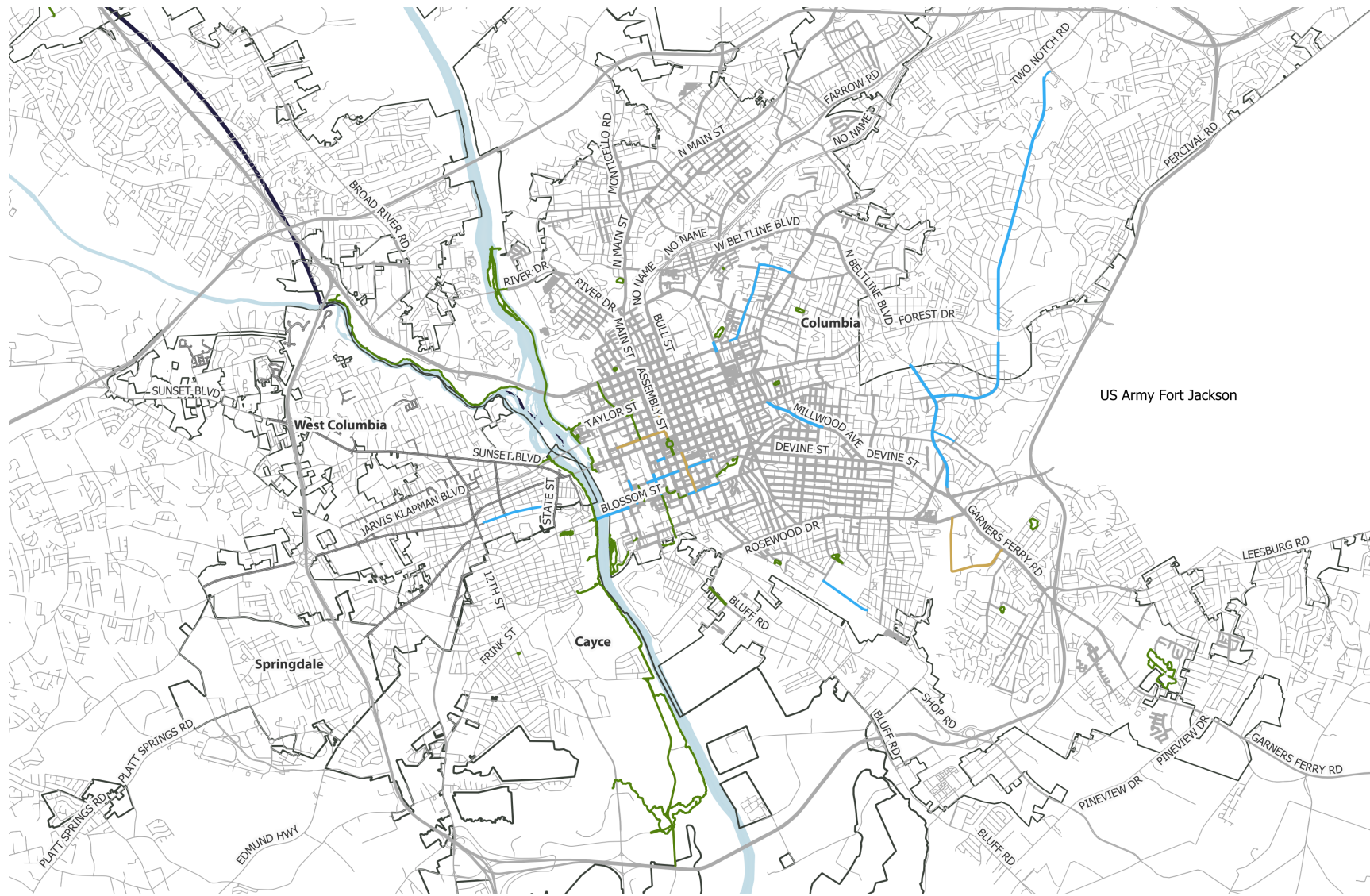
There are existing on-street bicycle facilities on lower speed roads such as Greene Street and Wheat Street in Columbia and B Avenue in West Columbia, but many of these facilities are regular bicycle lanes on 35- to 45-mile- per-hour roads like Platt Springs Road, US Highway 21, and US 378/Millwood Avenue, which are unlikely to appeal to "interested but concerned" potential bike share users.

Although experience from other jurisdictions shows that it is not necessary to have a complete network to implement a bike share program⁹, developing a network of convenient, connected, and comfortable bikeways and creating safe crossings for people walking and bicycling will be an important component of expanding bike share ridership and encouraging more widespread adoption of the program.



9 Bike Sharing in the United States: State of the Practice and Guide to Implementation. Federal Highway Administration. United States Department of Transportation. September 2012.

Figure 13. Active Transportation Network



US Army Fort Jackson

- Bike Lane
- Greenway
- Shared Lane/Sharrows
- Sidewalks
- Lakes and Rivers
- City/Town Boundaries
- Roads



Transit Service

The COMET, operated by the Central Midlands Regional Transit Authority, operates buses in Richland and Lexington Counties. According to the Columbia 2036 Comprehensive Plan (2020), most routes currently operate on a 60-minute frequency Monday-Friday, with limited-service Saturday and Sunday. At current service levels, the system operates mainly to provide a public service to those with no other transportation options and is not a convenient travel choice for those with access to a car and a plentiful supply of free or low-cost parking.

The COMET riders with a 1-day, 5-day, 7-day, 31-day, or 10-ride pass can receive a free 2-hour pass for Blue Bike SC by asking the bus operator for a code to input at a bike share station kiosk or on the app to unlock a bike at one of the 18 stations in Downtown Columbia.

The COMET operates three bus routes in Cayce, Springdale, and West Columbia, aimed at connecting these municipalities and major employment centers to Downtown Columbia. These routes offer access to locations such as the Lexington Medical Center, Columbia Metropolitan Airport, Downtown West Columbia, Downtown Cayce, and the Amazon fulfillment center. Two of these routes have frequency of every 60 minutes and bike share has an opportunity to provide on-demand transit service and be a transit option during times when these routes do not run or to be a first and last mile connection to transit or to connect between transit routes.

HOW IT WORKS



JOIN

To start riding simply purchase a membership on the website, mobile app or directly at a station kiosk.



UNLOCK

Unlock a bike with the app or place the membership card/fob on the handlebars.



RIDE

Enjoy your ride! Keep your ride under the allotted time to avoid extra time fees.



RETURN

Dock your bike at any station. Watch the bike screen to ensure it is properly secured.

BUY A PASS

PAY PER RIDE PASS

\$2*

2 HOUR PASS

\$6*

MONTHLY PASS

\$20*

STUDENT ANNUAL

\$65*

ANNUAL PASS

\$85*

Extra Time Fees

\$0.18/Minute

Rides longer than allotted time incur extra time fees of \$0.18 per minute.

* Plus applicable taxes

18+
Must be 18 years or older to ride

American Express and prepaid cards not accepted

Station Full?
Get extra time at the kiosk or call customer service to use the secondary lock

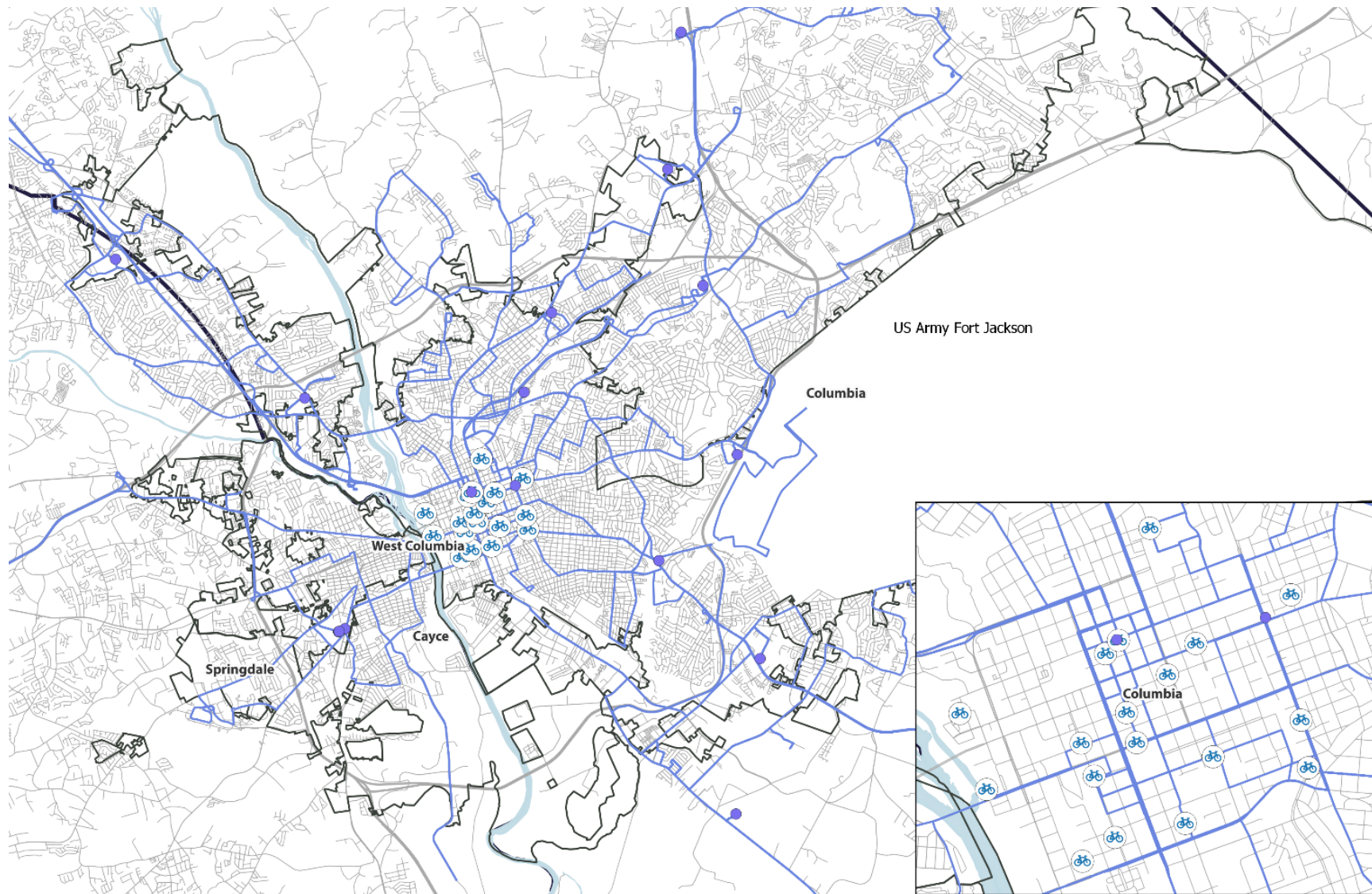
bluebikesc.com

info@bluebikesc.com

1-877-460-2435



Figure 14. Blue Bike SC Stations and The COMET Routes and Super Stop Locations



- COMET Routes
- 🚲 Blue Bike SC Stations
- COMET Super Stops
- City/Town Limits

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 **Three Rivers**
Bike Share Plan

Targeted Gaps, Barriers, and Needs Analyses

Active Transportation and Bike Share Access Needs

An effective bike share system relies on serving higher-density areas with a mixture of activities within walking distance of the stations and a network of stations that connect key destinations. The project team analyzed activity centers such as parks, libraries, schools/colleges, high density development, and employers. Creating further connectivity with the COMET stops is also important as a first- and last-mile connection for longer distance transit trips.

The expansion of the system to the west side of the river would encourage users to ride across the river and increase bidirectional access to destinations on both sides. The COMET and an enhanced active transportation network could open more opportunities for safe travel in all parts of the expanded service area.

Examples of specific destinations on the west side of the river that could be areas of potential focus are:

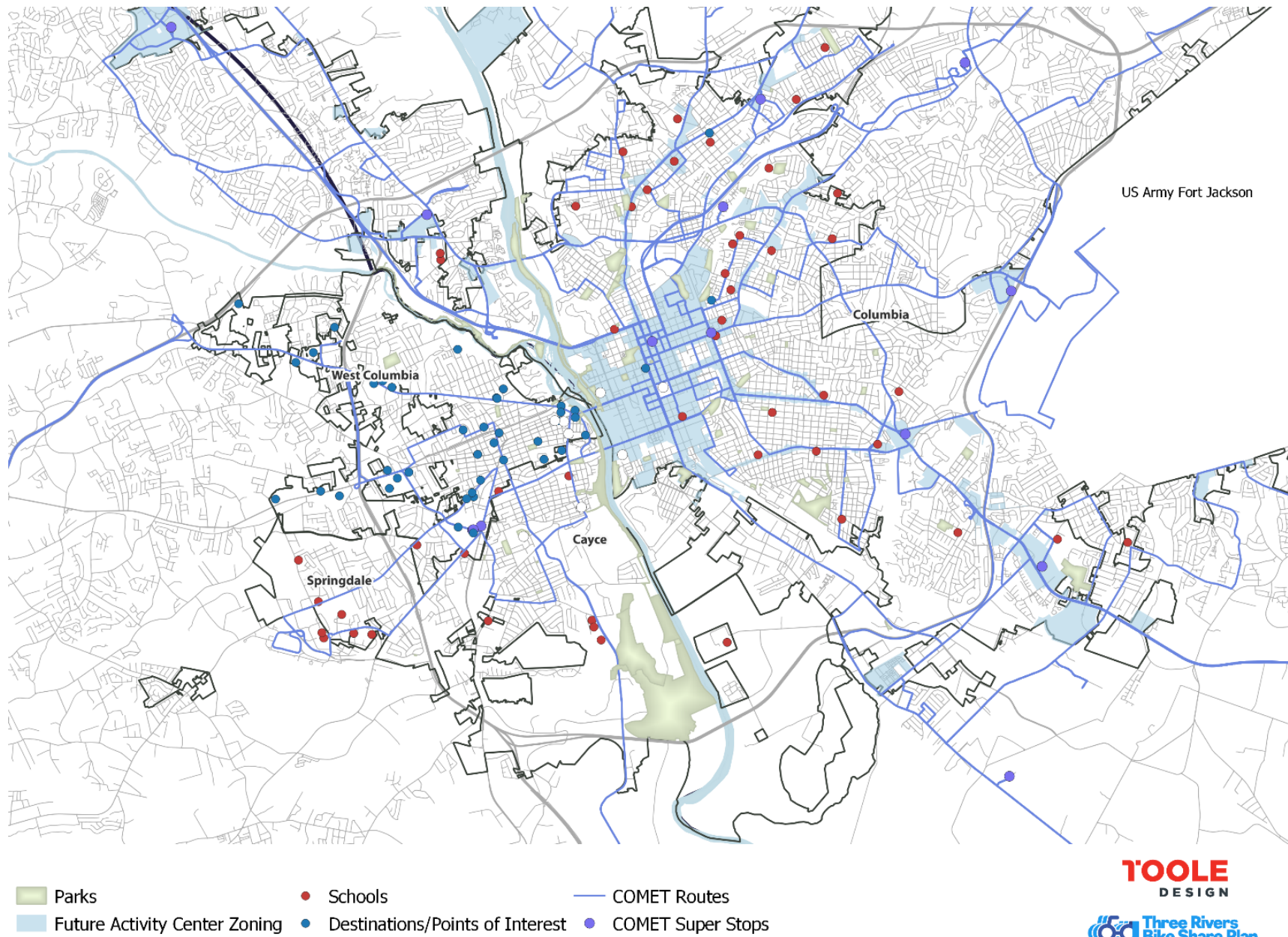
- Cayce-West Columbia Branch Library
- West Columbia Riverwalk/Cayce Riverwalk/Three Rivers Greenway
- Cayce River Arts District
- Cayce Historical Museum/Granby Gardens Park
- Guignard Park
- West Columbia Community Center
- Savage Craft Ale Works
- State Street Corridor
- Meeting Street Attractions

Destinations in Columbia are plentiful and include:

- State Museum
- Founders Park
- SC State House
- University of South Carolina
- Benedict College/Allen University
- Columbia Canal and Riverfront Park

Connecting to these destinations on both sides of the river and others like them is important for the success of the system in terms of effectiveness.

Figure 15. Local and Regional Destinations in Metro Columbia



Equitable Access

Access to affordable and convenient transportation, including walking and bicycling facilities, transit, and bike share, is essential for low-income and historically underserved communities to access basic services such as health care, healthy food, and opportunities for education, employment, and recreation. When transportation projects are developed with demographic and socioeconomic equity in mind, they can serve a role in addressing the lingering impacts of historical inequities, including disparities based on race or ethnicity, such as segregation of housing as a result of red-lining policies and the subsequent underinvestment in marginalized communities and communities of color.

The project team conducted an equity analysis to understand where historically underserved and transportation-disadvantaged communities are located. The analysis used U.S. Census data from the American Community Survey (Five-year estimates, 2016 to 2020) and considered two variables at the Census block group level: people identifying as Black, Indigenous, and People of Color (BIPOC); and median household income. BIPOC and lower income populations have been shown to be more likely underserved by transportation facilities and community amenities and may be more dependent on walking, bicycling, and transit to meet their daily needs.

Distribution of Black, Indigenous, and People of Color

The distribution of BIPOC varies across the four communities with Columbia having the highest percentage (49% - almost half of the population), followed by Cayce and West Columbia (35% to 36%), and Springdale (23%).

Most of the current service area (and much of the immediately surrounding area being considered for expansion) is under-represented by BIPOC below the median percentage for Lexington and Richland County of 35%. The areas with higher densities of BIPOC in the Metro region are on the periphery of Downtown Columbia and in southern Cayce.

Table 10: BIPOC Population Data

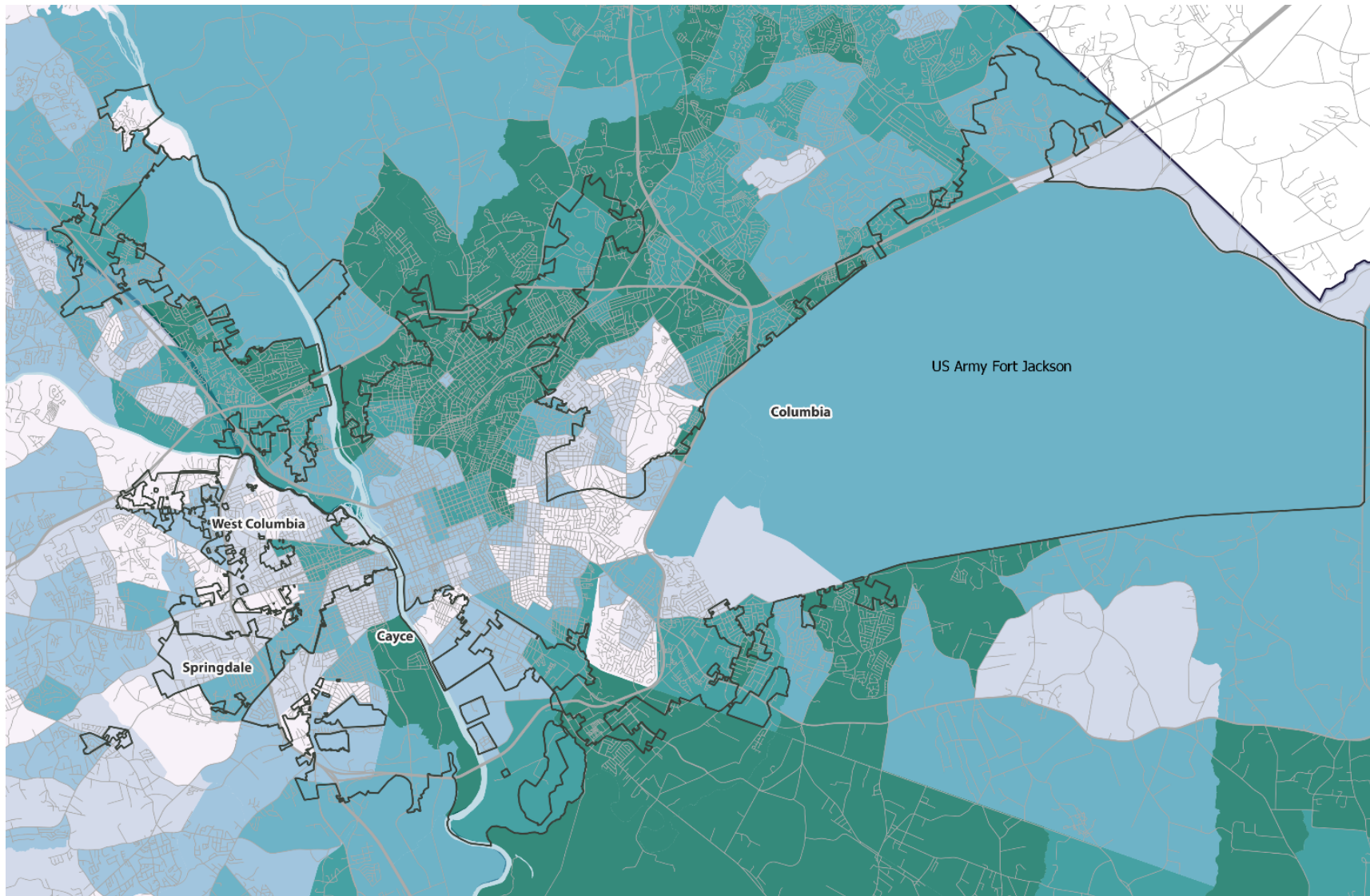
| Community | Population (2020) | Percentage of Population who identify as BIPOC | Largest Minority Population | Second Largest Population |
|-----------------------|-------------------|--|-----------------------------|---------------------------|
| City of Cayce | 13,781 | 36% | Black (22%) | Hispanic or Latino (6%) |
| City of Columbia | 136,632 | 49% | Black (38%) | Hispanic or Latino (6%) |
| Town of Springdale | 2,744 | 23% | Black (14%) | Hispanic or Latino (4%) |
| City of West Columbia | 17,416 | 35% | Black (17%) | Hispanic or Latino (12%) |

In Columbia, there is a large Census block between Millwood Avenue and Bull Street which includes the Waverly Neighborhood and Benedict College/Allen University. This area has three Blue Bike SC station locations with one of them being the second highest usage station in the system. This area is approximately 66% BIPOC.

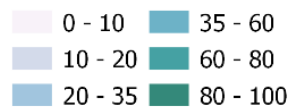
In Cayce, the Census block with the highest representation of BIPOC (approximately 87%) is a large, mostly rural industrial block group between the Congaree River and the railroad that also includes the Congaree Creek Heritage Preserve. This is generally a low-density residential area but is connected to the Three River Greenway/Cayce Riverwalk and is one mile away from the Cayce River Arts District.

Important to the proposed service area expansion is the area around the central triangle of West Columbia (the area between Sunset Boulevard and Meeting Street close to the river). Two block groups between those streets and a small block group along N Lucas Street that includes a large apartment complex both have a high percentage of BIPOC population (approximately 66% of the population).

Figure 16. Population Identifying as BIPOC



Percent of People who identify as BIPOC



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Bike Share Plan

Distribution of Lower-Income Populations

In terms of income, Columbia and West Columbia have a higher proportion of low-income households with over 50% of households earning less than \$50,000. Cayce has a slightly higher median household income (approximately \$55,000) and Springdale has the highest median household income (approximately \$65,000). For reference, the median household income for the State of South Carolina is \$59,318.

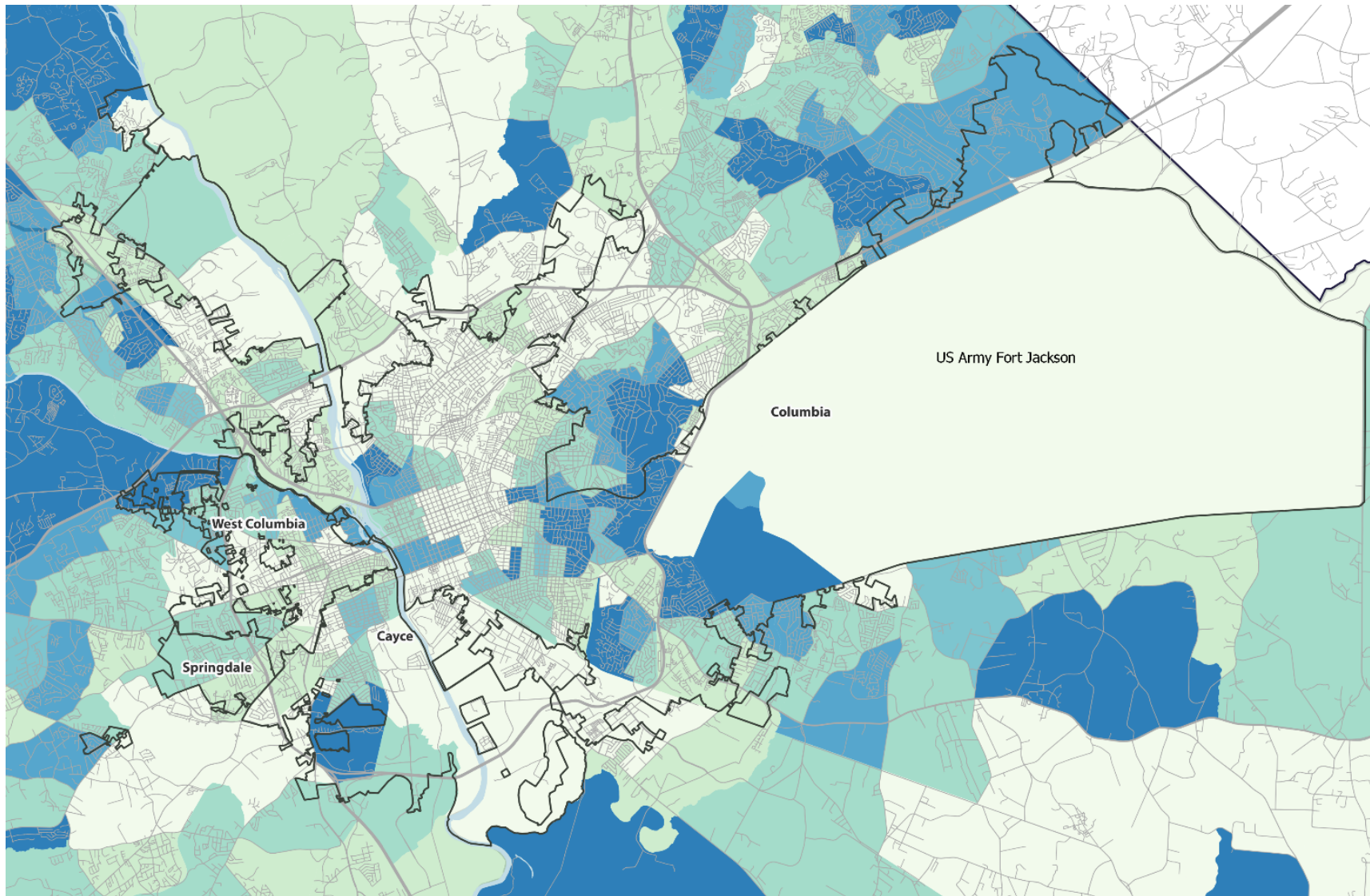
The Metro Area has pockets of high-income block groups with large swaths of middle to low-income areas. The existing service area has 10 stations in block groups with low median household incomes (below \$40,000) and 8 stations in block groups with median household incomes of \$62,000 and \$75,000.

On the west side of the river, the incomes are more varied. The center of the potential West Columbia service area is a low-income pocket (under \$35,000) which is next to a high-income block group (\$80,000) and low middle-income block groups (\$40,000-\$45,000).

Low- to middle-income block groups also cover parts of Cayce's potential service area along with two upper middle class block groups of \$57,000 and \$67,000 and a low-income area (\$22,000). Springdale is difficult to measure in terms of block groups as it is split across several.



Figure 17. Median Household Income



Median Household Income



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Bike Share Plan

Gap Analysis

The project team analyzed available GIS data to identify facility gaps (i.e., streets with no infrastructure that create a gap in the network) and low-stress bicycle and pedestrian network gaps (i.e., streets with a lower standard bikeway between a higher standard bikeway that is otherwise comfortable for interested but concerned bicyclists). Gaps located in higher-density activity centers and near key destinations should be prioritized to serve the greatest number of people and have a greater impact on creating visible walking and bicycling activity. In terms of the pedestrian network, gaps are defined as missing sidewalk. A more in-depth review of the pedestrian network issues such as sidewalks of inadequate width, poor condition sidewalks, missing pedestrian signals and crossings is better addressed in a Pedestrian Master Plan. Sidewalks can allow walking to be a safe, comfortable, and enjoyable alternative for short- to medium-distance trips.

There is a lack of data on where sidewalks exist in Cayce and Springdale which makes identifying areas of need difficult. West Columbia has sidewalks along several major roads (Sunset Boulevard, Meeting Street, 9th Street, 12th Street, Augusta Road, State Street, and Platt Springs Road) along with some of the minor streets in the area between Sunset Boulevard and Meeting Street. The potential new stations would likely be added along one or more of the above major streets as they have a high density of destinations and sidewalk. But the lack of sidewalks can limit the ability of people to walk to access the stations.

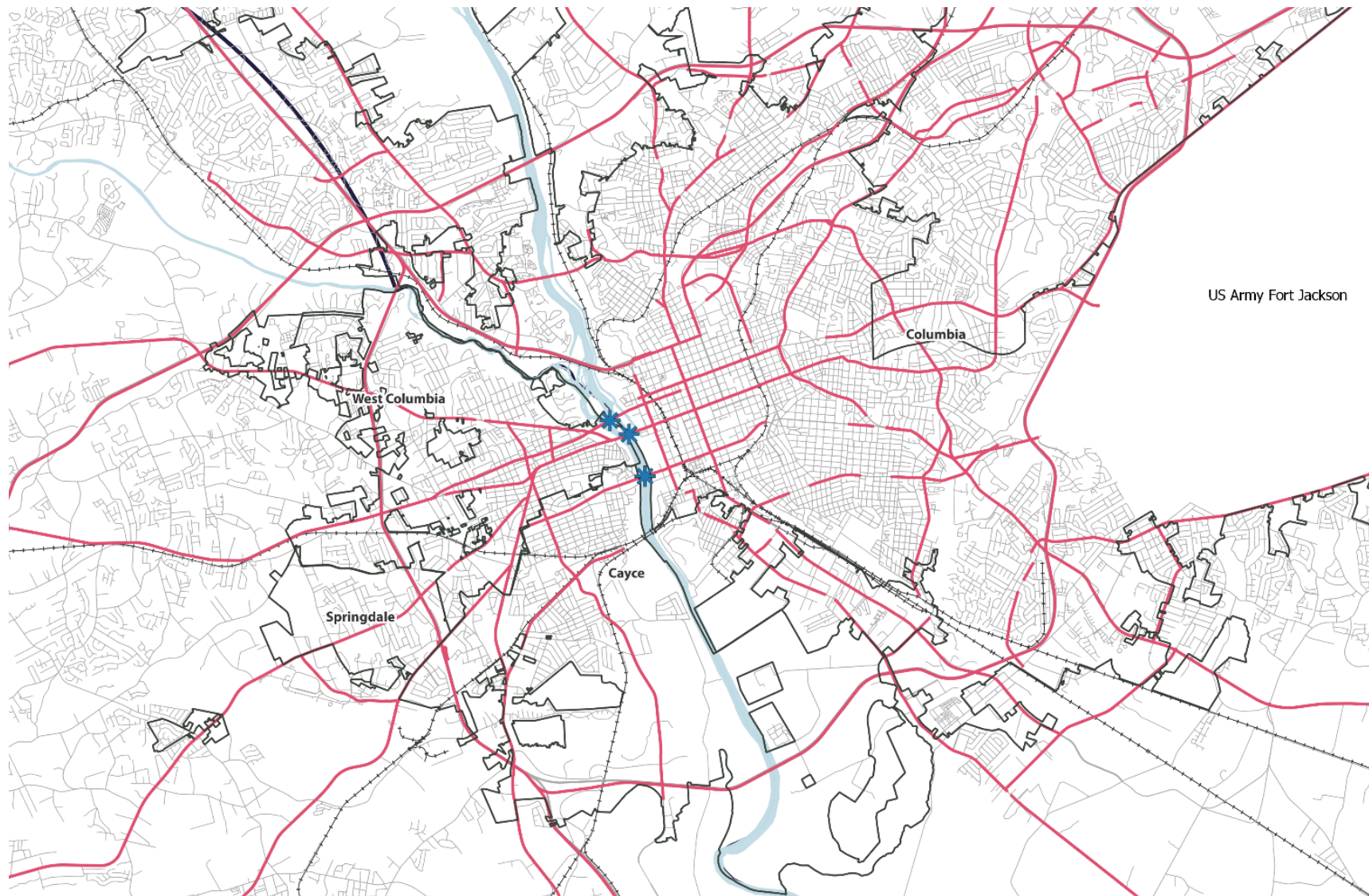
It is important to provide a convenient, connected, and comfortable network of bikeway infrastructure that appeals to bicyclists of all ages and abilities. Many bike share users are first-time bicyclists or people that have not ridden for some time. They are often “interested but concerned” about safety and comfort. See Appendix A4 Design Guidance Comfort Typology of Bicyclist for the definition of “interested but concerned”. Gaps in the network can result in users having to detour significantly out of direction to use lower stress streets or may be so inconvenient or uncomfortable that they choose travel using another mode (often an automobile).

Barriers to Connectivity

There are several natural and human-made barriers to accessing key services and destinations in the project area. This includes the Congaree River, with limited crossing points for non-motorized users, and the I-26 and I-20 highways, and other wide, high-speed roads (>35 MPH). Future growth in West Columbia, and along with Cayce and Springdale, will likely be focused along arterial corridors and these areas will continue to be both barriers and destinations for bike share.



Figure 18. Barriers to Biking and Walking



- Over 35 MPH Speed Limit
- ★ Bridges
- Rivers
- - - Railroads



Major Network Gaps

There are three bridges over the Congaree River from Columbia into West Columbia and Cayce: Jarvis Klapman Boulevard, Gervais/Meeting Street, and Blossom Street. Of these bridges, only the Blossom Street bridge has a bike facility with a narrow-striped bike lane. The Gervais Street bridge has a sidewalk but no marked bike lane and a posted speed limit of 35 miles per hour. The Jarvis Klapman bridge is a six-lane, high-speed freeway bridge with no bike lanes or sidewalks. Currently, only the Blossom Street bridge is accessible by bike.

On the Columbia side of the river, the sidewalk network is relatively complete, but the City has a system of disconnected bike lane segments. Users can access Blue Bike SC stations by foot, but they must be comfortable riding with traffic once they check the bike out. The high-speed and high traffic volume conditions are not conducive to attracting a broad range of bicyclists, especially those that are “interested but concerned”. Improving the comfort and connectivity of the bike network in the service area could boost system ridership.

Existing bicycle infrastructure on the west side of the river is limited to a short section on B Avenue, a continuation of the Blossom Street bike lane on Knox Abbott Drive to 12th Street, and the bike lane on Platt Springs Road that starts in West Columbia and extends through Springdale out into the County. These bike facilities are not close enough to form a network and as such using these facilities to travel to destinations requires riding with traffic or switching to lower stress side streets.

Transit Connections

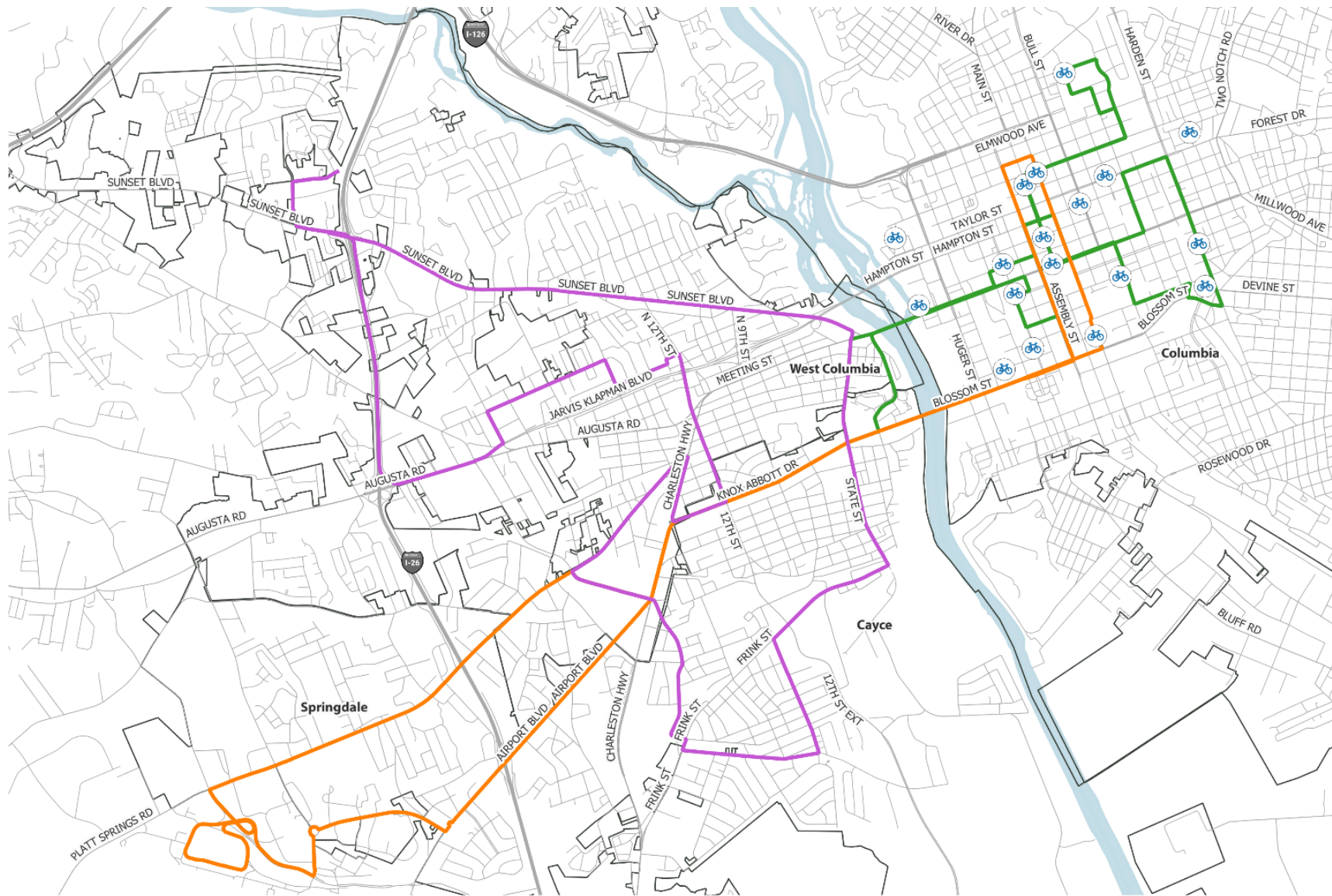
Bike share could form a first- and last-mile connection to transit. Given that only one of the three bridges that cross the river has a bike facility, The COMET will play a key role in connecting bike share users between the east and west sides of the river. For example, a network of feeder stations could deliver users to the Soda Cap Connector that would take riders from West Columbia Riverwalk Park into Downtown Columbia. The West Columbia/Cayce local route (96L) also serves the West Columbia retail/commercial core which is another potential bike share station location.

An expanded sidewalk network would allow for increased access and more utility for potential Blue Bike SC stations. For example, the sidewalks connecting the Cayce River Walk trailhead on Lyles Street to the two transit stops on the West Columbia/Cayce local route (96L) on State Street (at Oakland and at Frink), and along State Street to several key destinations (Cayce River Arts District and West Columbia retail corridor) would increase the utility and service area of a station in this area.

Platt Springs Road has both sidewalk and a striped bike lane which offers a safe route from Springdale to West Columbia. This road also includes both a COMET route (Route 91: Springdale/Cayce) and major Springdale destinations. Feeder stations into this COMET route would connect Springdale to the Riverwalk, by the way of one of the Knox Abbott Drive stops, which offers a sidewalk connection to the Cayce Riverwalk.



Figure 19. Transit Routes in Expansion Area



- Soda Cap Connector
- 91: Springdale/Cayce
- 96L: West Columbia/Cayce Local
- Blue Bike SC stations



Blue Bike SC Equity Analysis

As part of the performance measures for Blue Bike SC (see Chapter 6), an equity analysis was performed to determine what percentage of the existing service areas are within an Equity Emphasis Census Tract. Establishing a baseline review now is important for attaining the study's proposed goals and benchmarks for in the future.

The methodology used is a version of the Composite Social Equity Tiers analysis from the 2014 Walk Bike Columbia Plan. This methodology is a relatively simple set of analysis which creates a straightforward process for replicating the analysis as the system expands and changes in response to this study.

The analysis looks at four demographic factors for Lexington and Richland County:

- Percentage of families earning less than twice the poverty level
- Percentage of households without access to a vehicle
- Percentage of the population that is not 'white alone'
- Percentage of the population over 5 years of age that speaks English 'Not well' or 'Not at all'

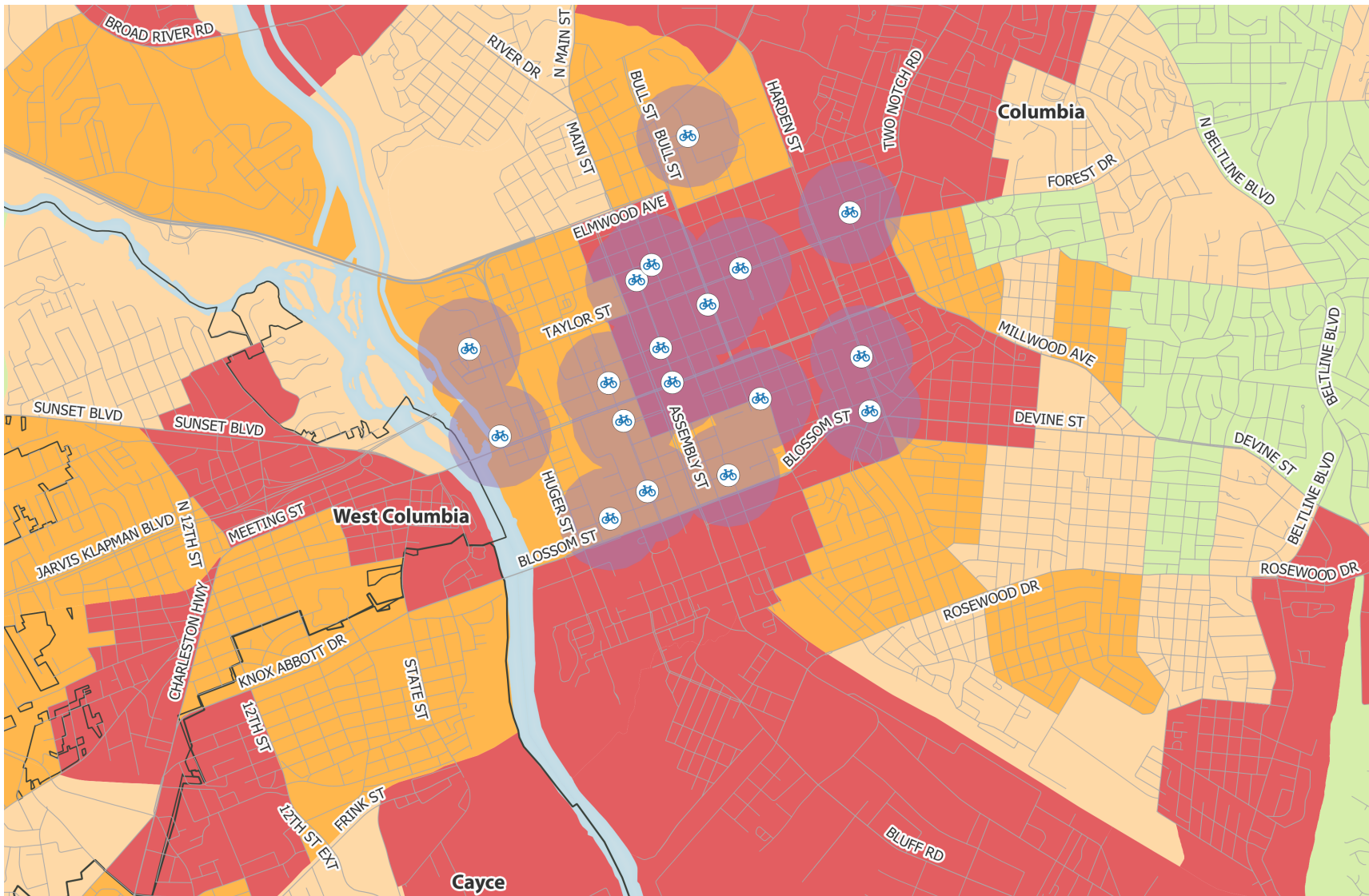
The Census block groups in both counties are then broken into four tiers based on each factor and given a 1-4 score. Those scores are then added up to form the equity score for the block groups. Block groups that land in the first and second quartiles are equity-emphasis census block groups. The Quarter mile buffers around each existing station are merged to measure the percentage of the system that serves the equity emphasis areas.

Distribution of Near-Poverty Households in the Service Areas

While the equitable access analysis looked at wider swaths of the population (under the state's median household income), this analysis focuses in on those that are at or barely above living in poverty. The current service area includes a high percentage of this population. College students play a role in the high percentage in some areas, but downtown is a high poverty area when compared to the rest of the two-county area.



Figure 20. Percentage of families earning less than twice the poverty level



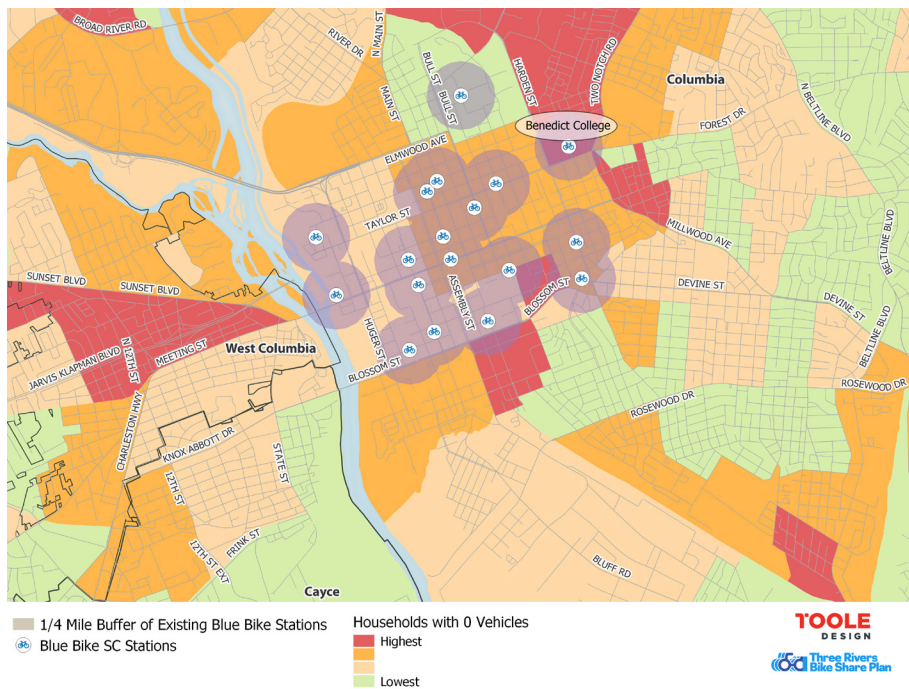
- 1/4 Mile Buffer of Existing Blue Bike Stations
- 🚲 Blue Bike SC Stations
- Highest
- Low Income Households
- Lowest



Distribution of households without access to a vehicle

A safe and accessible multimodal network (transit, biking, or walking) is essential for connecting people without access to a vehicle with employment and education opportunities, as well as key community destinations. Blue Bike SC and bikeshare in general can aid in this goal when the system can cover both ends of a desired trip or a destination can be reached and returned from within the allotted rental time. Benedict College housing represents some of the highest quartile locations in the service area.

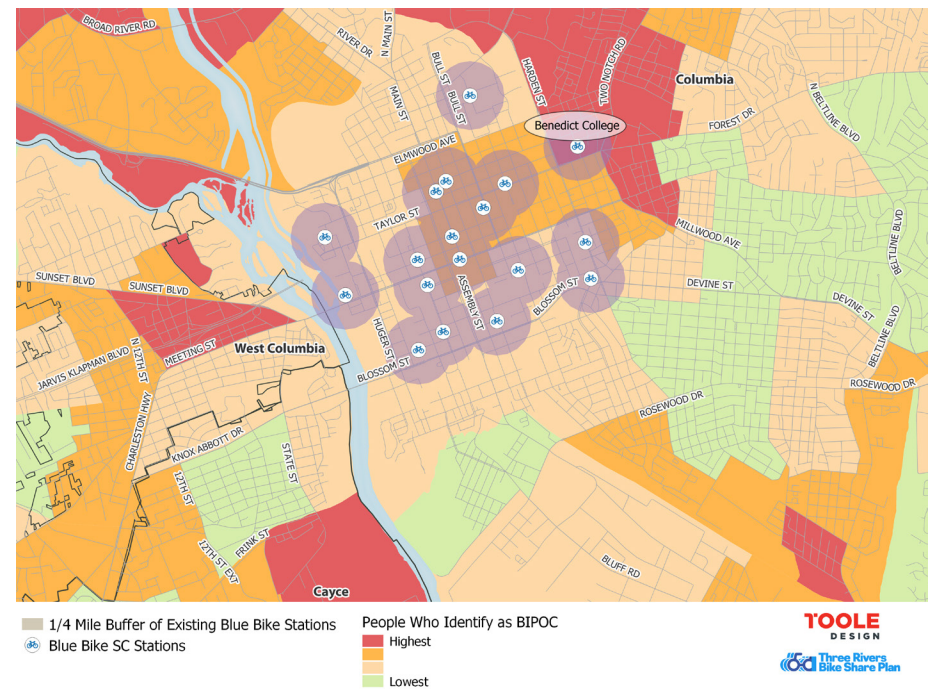
Figure 21. Percentage of households without access to a vehicle



Distribution of Black, Indigenous, and People of Color

The highest tier area contains the bike share station at Benedict College, which is a historically black college and university (HBCU), as well as Allen University, also a HBCU. The Waverly neighborhood which is on the high end of the next highest tier contains two additional bike share station. Outside the service area, north of the Benedict College station, there is the heavily BIPOC neighborhoods of Colonial Heights and Roberts.

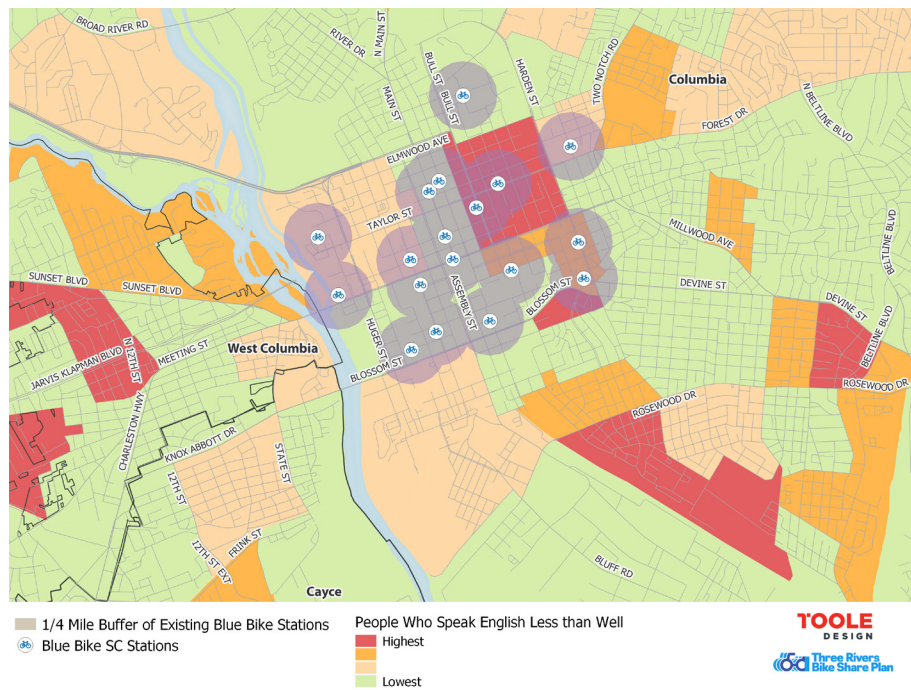
Figure 22. Percentage of Individuals identifying as BIPOC (in existing service area)



Distribution of Individuals that speak English 'Not well' or 'Not at all'

This indicator was less impactful to the overall score than the others but is worth including as it is one indicator of a growing immigrant community. Over the coming years, the City of Columbia and the surrounding area may see an increase in both this population along with this indicator.

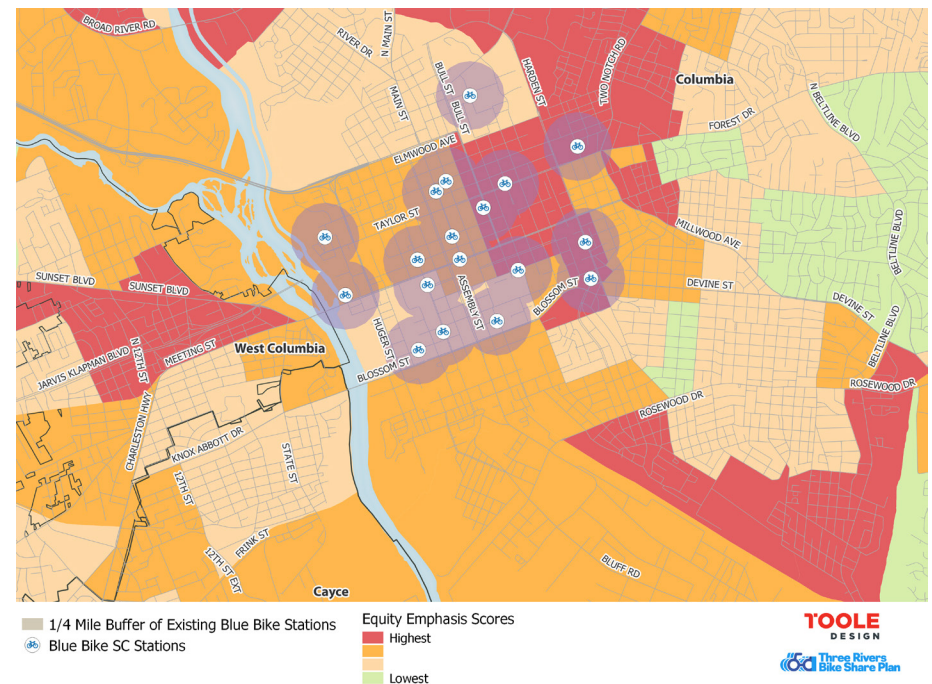
Figure 23. Population that speaks English Less Than Well



Equity Emphasis Score

The analysis found that 72% of the service area, which translates 1.86 square miles out of the total service area's 2.6 square miles, is in an equity emphasis area. If the system is considered for expansion, this analysis will be a useful tool for viewing the communities and areas that are reachable if new stations are added. Additional analysis of the demographics of the system's current users will also be an essential companion analysis to determine if the residents of the equity emphasis areas are actually using the system and what can be done to increase ridership.

Figure 24. Equity Emphasis Scores and the Existing Service Area



5 | Public Engagement

The Three Rivers Bike Share Feasibility Study included a multifaceted public outreach process which included opportunities to review and provide input on current bike share experiences and suggest improvements for the future. Outreach activities included working with a Project Advisory Committee (PAC), a project web page on the CMCOG web site, conducting an online survey, distribution of collateral materials, intercepting the public and sharing draft recommendations.

Online Engagement

To ensure public participation during the pandemic, a variety of online tools were utilized. Business cards, window clings and flyers with QR codes that link people to these online resources were produced and distributed to advertise website, project, and events.

Project Web Page – the CMCOG web site was the host of a dedicated web page with project content including an overview and tasks associated with the study process, the project survey and project documents. All project information and material are created in a viewable, downloadable, and printable format. When completed, the final study will be posted on the page.

Survey – to learn more about bike share user experiences and suggestions, an online survey tool was created and distributed by the project partners and project advisory team members. The survey also contained a link that guided users to the interactive map allowing users to identify location specific suggestions for current and future bike share locations, maintenance, and trends in bike share services, bicycling and transit usage. The paper survey was available upon request.

Stakeholder Participation

Project Advisory Committee – a committee of representatives from various perspectives was established to serve as a sounding board and support for the study process. The committee met three times and provided invaluable input on project goals and objectives, community outreach opportunities, and draft recommendations for improvements. The committee members included project partners from each

municipality, Blue Cross/Blue Shield, the COMET staff, local college and university representatives, Richland County library and the Richland County School system.

Stakeholder Interviews – The team conducted six stakeholder interviews to include representatives from the City of Columbia, City of West Columbia, CMCOG, BCBS, The COMET, and Bewegen. General topics and themes that came out of the interviews are discussed in more details in Chapter 6, Stakeholder Engagement.

Public Outreach

Pop-up Events – Intercept and pop-up events were conducted with residents, students, and park users at locations with existing bike share stations and areas that may be considered for future stations. The purpose of the pop-up events was to supplement the online survey with in-person interactions to obtain feedback on knowledge of the bike share system, user experiences, preference for bike share locations and services, and share information about the bike share expansion study.

- Saluda River Park
- Benedict College Campus
- Riverfront Park
- Soda City Market

Focus Group - Through coordination with university administration and students, a virtual focus group meeting was conducted with six students from the University of South Carolina, to engage a representative sample of students about their experiences and suggestions for bike share expansion on campus. The participants represented several student organizations including wellness, sustainability, athletics, and student government. Several questions were posed to students to obtain input. The questions and their response can be found in Appendix A1 Public Outreach Summary.

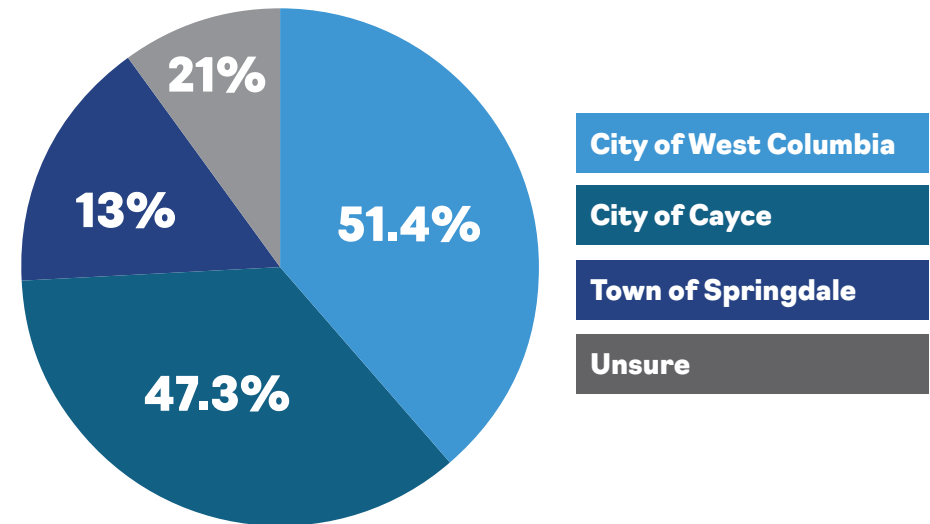
BY THE NUMBERS

| | | | | |
|---------------------------------|---------------------------|----------------------------|-------------------------------|---------------------------------|
| 160 | 151 | 114 | 6 | 6 |
| <i>Interactive Map Visitors</i> | <i>Survey Respondents</i> | <i>Pop-up Participants</i> | <i>Stakeholder Interviews</i> | <i>Focus Group Participants</i> |

Engagement Takeaways

- It is not easy to bike in the Columbia area.
 - There is a need for more safe bike routes and larger focus on bicyclists in regard to road safety.
- Crossing the Congaree River bridges is challenging and/or impossible.
- There is need for increased maintenance of bicycle infrastructure.
 - Damaged Blue Bike SC bikes
 - Debris in bike lanes
- 93% of people had heard of Blue Bike but only 33% have used it.
- When asked why they don't use Blue Bike SC, the most common answers were:
 - Liked own bike
 - No Bike Lanes
 - Stations not near where I need them

Would you use bike share in any of the following communities?



Do you support the following service expansions (e.g., new stations) to Blue Bike SC?

| | Yes | No | Unsure |
|--|-----|----|--------|
| Expansion in the City of Columbia | 91% | 4% | 5% |
| New service in the City of Cayce | 87% | 4% | 9% |
| New service in the Town of Springdale | 66% | 7% | 27% |
| New service in the City of West Columbia | 88% | 4% | 8% |

6 | Stakeholder Engagement

The team held six stakeholder interviews to gain more in-depth feedback on the system’s performance and their feelings on expansion and ways the system could improve overall. The groups interviewed were:

- City of Columbia
- City of West Columbia
- Central Midlands Council of Governments
- BlueCross BlueShield of South Carolina
- The COMET
- Bewegen and BWG Field Ops

The following general topics and themes came out of the interviews:

- Satisfied with existing system performance, especially given the pandemic
- See value in system and would like expansion to serve more of the community
- Happy with dual purpose of transportation and recreation, want more transportation-related use
- Satisfied with current operator (Bewegen), but would like to see more community outreach and partnerships from them
- BCBS would like to see more parties joining to support the system, can justify greater sponsorship if not alone
- Appreciate support provided by The COMET to better tie transit to bike share
- USC an untapped market, should partner with USC and coordinate student activities fee
- Interest from Lexington County communities, but want financials first before committing

Themes from the interviews were categorized in the “Strengths, Weaknesses, Opportunities, Threats” (SWOT) analysis below, which categorizes the themes into characteristics that are helpful or harmful to system expansion and whether those

characteristics are internal or external to the bike share stakeholders. The SWOT analysis informed the goals and objectives developed for the system, influenced the expansion areas covered in this study, and helped home in recommendations for financing and coordination that limit the impact of weaknesses.

| | Helpful | Harmful |
|----------|---|---|
| Internal | Strengths Benefit of bike share clear amongst partners Desire for expansion amongst stakeholders Stable backing from BCBS, The COMET Bike share system is top-of-the-line High recreational use | Weaknesses Limited number of current sponsors Responsibility for finding new sponsors on operator, who has fewest local connections Substantial cost to expand Ridership not at initially projected levels |
| External | Opportunities Universities, students are untapped market New housing increasing people downtown Active neighborhoods right next to current service area Riverwalk on west side currently unserved | Threats Limited number/leverage of potential new sponsors Existing bike infrastructure is limited Overreliance on driving for short trips SCDOT controls a lot of ROW |

Goals and Objectives

Based on stakeholder feedback, there is an interest in making the Blue Bike SC system more visible by increasing ridership, expanding to new areas, and encouraging the use of the system for more than just recreational trips. These three goals support one another and ultimately help to improve wider community goals such as lessening the environmental impact of transportation and supporting better public health outcomes.

Performance measures were identified to accompany each goal and track their progress over time. These were selected considering the availability of data that is readily collected, such as trip data that is provided by the vendor or simple GIS data analyses.

Increase System Ridership

Increasing overall system ridership was identified as the primary goal amongst all stakeholders. It is a direct measure of the system's utility and would help the system financially by increasing the revenue collected by fares.

Two performance measures were identified to track ridership and its impact over time:

A. Total Annual Ridership

This is a simple measure that is already being provided by the system vendor. Similar to the ridership analysis performed in this report, raw data should be reviewed to remove trips that are likely invalid. This includes very short duration trips and trips starting or ending at stations that are not publicly accessible.

B. Average Trips per Bike per Day (t/b/d)

This is a calculated performance measure that shows the utilization of the system. It accounts for the system's fleet size and operational idiosyncrasies. Ideally, data would be provided by the vendor that shows how many bikes are in service each day. If that is not available (as was the case for this report), this measure can be estimated by taking the total annual ridership and dividing it by the total fleet size and the number of days the system was in operation.¹⁰ This measure is also useful in comparing the performance of individual stations (see Chapter 7) and in comparing Blue Bike SC's performance with peer systems (e.g., comparing to the national averages for similar-sized cities in NABSA's annual reports).

Expand Coverage to New Areas

Expanding the footprint of the Blue Bike SC system will allow more neighborhoods and communities to participate in the program and improve system utility by increasing access to the system and the number of potential destinations a rider can get to. Measuring expansion and coverage of the system is also a way to track whether the system is serving neighborhoods equitably across Columbia and West Metro communities.

Two performance measures were identified to track coverage:

A. Total Service Area

This performance measure can be generated by taking the existing station locations and placing a ¼ mile buffer around them, which is a common measure of the typical walking catchment area for a bike share station. The total service area should be calculated in a way that does not double-count overlapping catchment areas. This simple analysis can be done in GIS.

B. Percentage of Service Area in Equity-Emphasis Census Tracts

This derivative measure can be generated by computing the fraction of the total service area that overlaps with census block groups identified to be important for equity purposes. A composite equity score of various demographic data such as poverty level, race, households with no vehicles, and English language proficiency was used in the Walk Bike Columbia Plan and could be used to determine where equity-emphasis census block groups are (see Chapter 4 for details on the equity analysis performed for Blue Bike SC). This is a useful analysis to use in understanding the potential equity impacts of system expansion or changes in service area.

Increase Share of Trips for Transportation

Blue Bike SC's current ridership is weighted towards recreational trips and in particular a high percentage of rides start and end at the Riverfront Park Station. The system should build on this success, but also make sure that it increases the market segment of trips used for transportation. Tracking progress on this goal will help understand whether service expansions and other strategies to boost transportation-based ridership are effective over time.

While it is difficult to ascertain the purpose of all bike share trips, two measures can be easily tracked that approximate the transportation-based use of the system:

A. Percentage of One-Way Trips

Bike share trips that are recreational often start and end at the same station, such as the case with Riverfront Park. Tracking the percentage of annual trips that start and end at different stations (i.e., one-way trips) can be an approximate measure of the percentage of trips that are for transportation purposes. This measure can be

¹⁰ Note that this estimate will show a lower utilization because a portion of the fleet may be out-of-service at any given time due to storage and maintenance of bikes.

computed using spreadsheet-based analysis of raw trip data.

B. Percentage of Trips Under 15 Minutes in Duration

People using bike share for recreation often take longer trips, e.g., along a recreational trail or sightseeing around the city. Oftentimes, these trips make full use of the allotted time for a casual single-use pass before overage charges apply (45 minutes in the Blue Bike SC system). Calculating the percentage of annual trips under 15 minutes will give another approximate measure of transportation-based trips. This measure can be computed using spreadsheet-based analysis of raw trip data.

The following table summarizes the goals and performance measures identified for the Blue Bike SC system, as well as a baseline of these measures calculated from 2022 system data.

These performance measures are a starting point and were developed using data points that are consistently available from any bike share operator. System stakeholders should consider collecting additional data points, such as trip purpose and demographics, through a standardized annual user survey that should be compulsory on the system operator to distribute. Survey results can contextualize the performance measures and provide a better look at the system’s effectiveness at meeting its goals, particularly in how it serves underserved populations and transportation-based trips.

| Performance Measure | Data Source | Baseline (2022) |
|--|----------------------------------|-------------------|
| Goal #1: Increase Overall Ridership | | |
| 1A Total Annual Ridership | From Operator | 12,314 |
| 1B Average Trips per Bike per Day (t/b/d) | From Operator | 0.25 |
| Goal #2: Expand Coverage to New Areas | | |
| 2A Total Service Area | GIS Analysis | 2.6 sq. mi. |
| 2B Percentage in Equity-Emphasis Census Tracts | GIS Analysis | 73% (1.9 sq. mi.) |
| Goal #3: Increase Share of Trips for Transportation | | |
| 3A Percentage of One-Way Trips | Analyzed Trip Data from Operator | 40% |
| 3B Percentage of Trips with Duration 0-15 Minutes | Analyzed Trip Data from Operator | 32% |



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7 | Expansion Scenarios

Scenarios for bike share system expansion were developed to understand the potential scale of bike share in the region and to estimate future funding requirements. System expansion plans were developed based on an analysis of potential trip origins and destinations, input received from stakeholders including staff from local and regional agencies, and public input collected through an online crowdsourcing map.

The online crowdsourcing map showed that demand was highest adjacent to the current system area, especially along the Devine Street corridor in Columbia and the Meeting Street corridor in West Columbia. In Columbia, infill and contiguous expansion is the most logical way to increase the footprint and utility of the existing system and minimize the increase in operating costs. Expansion considerations into the West Metro communities should include how expansion links to the existing system – both in terms of the distance from the system and the comfort of bicycling connections, particularly on the bridges over the Congaree River. It is recommended that expansion plans reflect where ridership will be highest so that the system can have early success and build traction for future expansion into lower density areas.

Stakeholders and the public also expressed a strong preference for more of the fleet to be pedelec bikes and to see increased levels of maintenance and rebalancing. Stakeholders were also concerned about the potential cost of expansion. Funding capacity is an important consideration for expansion as well as relocating underutilized assets to optimize the system and testing lower-cost options such as virtual stations and hubs to increase the footprint of the system.

Expansion Principles

The following principles were developed from feedback from the Project Advisory Committee (PAC) and guided the development of the expansion plans:

- **Separate expansion plans:** having separate expansion plans for Columbia and the West Metro communities allows each community to move at their

own pace. These plans can be implemented exclusively or could happen simultaneously.

- **Contiguous expansion areas:** new stations should be built within bicycling distance of other stations rather than being disconnected satellites of the existing system. This way, riders can make use of existing stations to connect to new expansion areas and vice versa, increasing the number of potential trips that can be made in the system.
- **System-wide target of 1.8 docks-per-bike:** setting a consistent dock-to-bike ratio across the entire system provides consistent and equitable guidance for the purchase of assets, increases the chance that a dock is available for a user to park in, and reduces the amount of rebalancing the operator must provide and the overall operating cost. Given that a certain number of bikes are out of service at any given time, a 1.8 dock-to-bike ratio translates to an on-the-ground ratio in the order of 2.0 docks per bike.
- **Transition to a 100% pedelec bike fleet:** given the higher ridership and revenues of pedelec bicycles with only a marginal increase in capital cost, the system should begin transitioning to a fully electrified fleet by exclusively purchasing e-bikes for system expansion and capital replacement.
- **Relocate underutilized docks and stations:** for stations that are not well used or where there are more docks than needed, these assets should be considered for relocation so that the equipment can be better utilized and to reduce the amount and cost of new equipment needed. Decisions on relocation should consider other factors, such as the equitable distribution of stations. This process should be repeated periodically to optimize the performance of the system.

Figure 25. Map of Existing Blue Bike SC Service Area and Proposed Service Area



Existing and Proposed Blue Bike SC Zones

- 1/4 Mile Buffer of Blue Bike Stations
- 🚲 Blue Bike SC Stations
- Potential Station Service Areas
- Parks
- Greenways



Optimization and Expansion in the City of Columbia

Four potential expansion areas were identified in the City of Columbia that are contiguous with the existing system footprint. These expansion areas could feasibly accommodate up to six new stations and 60 new docks.

The current system has some under-performing stations and an excess of bikes compared to the preferred ratio of 1.8 docks-to-bikes. As part of system optimization, docks could be relocated to support system expansion at a lower capital cost than buying all brand-new equipment and existing bicycles may be counted against the new target ratio, reducing the number of new bikes necessary to adequately service the system.

Optimization

Underutilized stations in the system were identified by calculating the number of trips per bike per day for each station in 2022.¹¹ Stations were split into quartiles to identify the top and bottom performing stations.



Performance of Existing Station
 ● Riverfront Park Station ● First Quartile ● Third Quartile ● Parks
 ● Second Quartile ● Fourth Quartile ● 1/4 Mile Buffer

Table 11: Top Five (1st Quartile + Outlier) Blue Bike SC Stations

| Station Name | Trips | T/B/D |
|------------------------------|-------|-------|
| Riverfront Park | 3768 | 1.73 |
| Benedict – Swinton Center | 1480 | 0.68 |
| Upper Five Points | 489 | 0.45 |
| Main Street – Washington Sq. | 782 | 0.36 |
| Five Points – Saluda | 677 | 0.36 |

Table 12: Bottom Five (4th Quartile) Blue Bike SC Stations

| Station Name | Trips | T/B/D |
|-------------------------------|-------|-------|
| Gervais & River | 205 | 0.13 |
| Township - Robert Mills House | 187 | 0.10 |
| Bull Street - Segra Park | 236 | 0.10 |
| COMET Central | 91 | 0.08 |
| YMCA | 69 | 0.06 |

¹¹ This calculation uses ridership data (i.e., bicycle checkouts) normalized by the capacity of the station in terms of bikes calculated from the existing in-service dock-to-bike ratio of 1.7. This method normalizes ridership data so that smaller stations with fewer docks are not penalized for their expected lower ridership.

Of the existing top five stations, three could be considered for an increase in the number of docks due to above-average utilization.

| Station Name | Owner | Docks | Suggested Optimization Action |
|---------------------------|------------------|-------|---|
| Riverfront Park | City of Columbia | 13 | Addition of docks: this station has very high ridership and utilization, indicating potential unmet demand if all the bikes are checked out or challenges parking if the station is full. |
| Benedict – Swinton Center | City of Columbia | 13 | Addition of docks or new station: this station has high utilization, indicating potential unmet demand. The existing station could be expanded or another station could be identified at Benedict College to provide additional service. |
| Upper Five Points | The COMET | 7 | Addition of docks: this station has above-average utilization for its size, indicating potential unmet demand. Expansion may be limited by available space. |

Ridership and utilization at the Riverfront Park station is a very high due to its proximity to the greenway. Demand is also high at the Benedict - Swinton Center station. In-person engagement at Benedict College suggests that high ridership may be partly driven by first-year students, who are not allowed to bring vehicles on campus and therefore use bike share to explore the area around campus. Partnering with colleges to introduce bike share during freshmen orientation week may be a good opportunity to expand ridership among students at Benedict and other area colleges and universities.

Of the bottom five underperforming stations, some should be considered for a reduction in the number of docks or for wholesale relocation. This could make up to three stations and 36 docks available for deployment elsewhere.

| Station Name | Owner | Docks | Suggested Optimization Action |
|-------------------------------|------------------|-------|---|
| Gervais & River | The COMET | 10 | Consider for reduction of docks or station relocation in the future: this station has low demand but that may increase when the nearby trail is reconnected to the Riverfront Trail. Dock reduction or relocation should be considered in the future if the trail is not reconnected or ridership continues to be low. |
| Township - Robert Mills House | City of Columbia | 12 | Reduction of docks: this station should be retained for network coverage. The station is over-sized for the ridership demand. Docks may be relocated to another station. |
| Bull Street - Segra Park | The COMET | 16 | Reduction of docks: this station is in a growing area, but is oversized for the demand. Docks may be relocated to another station. |
| COMET Central | The COMET | 7 | Station relocation: this station is on the same block as the City Hall station, duplicating service area. |
| YMCA | The COMET | 7 | Station relocation: this station is two blocks away from the Township station, overlapping service areas. |



A rider checking out a bike at Riverfront Park, Blue Bike SC's top performing station that could benefit from additional docking points and bikes.

Expansion Areas

The following expansion areas were identified within the City of Columbia. These expansion areas are contiguous to the existing system. New stations should expand with 10 docks on average based on the average utilization of the system. However, stations should be sized to the expected demand at each station, availability of space, and other operator considerations.

| Expansion Area | # of Stations | Rationale |
|--|---------------|---|
| Devine Street from Harden to Millwood | 2 | Crowdsourcing map feedback, variety of potential destinations, distance from system core, availability of right-of-way on side streets. |
| University of South Carolina south of Blossom Street | 2 to 3 | Additional student housing and athletic and academic buildings, distance from system core and other campus stations, potential to build closer relationship with USC. |
| Benedict College | 1 | Potential for new on-campus station (e.g., on Harden Street or at dormitories), potential to build closer relationship with Benedict College and Allen University. |
| Cottontown | 1 | Growing area next to Bull Street – Segra Park Station, variety of potential destinations, availability of right-of-way on side streets. |

The equipment needed to serve this expansion varies depending on the amount of equipment that can be repurposed after adopting new system-wide dock-to-bike ratio targets and relocating docks and stations from system optimization. The equipment requirements for two scenarios, one that just expands the existing system and another that accounts for optimization, are presented in the chart below to serve as a “maximum” and “minimum” range for what the inventory of docks and bikes will be once this phase of expansion is complete.

| Scenario | Stations | Docks | Bikes (Electric 8-Speed) | Dock-to-Bike Ratio | Projected Annual Ridership |
|--------------------------------------|----------|-------------------|-----------------------------|--------------------|----------------------------|
| Existing | 18 | 224 | 129 (47 82) ¹² | 1.7 | 12,243 |
| Expansion with no Optimization (Max) | 24 | 284 | 158 (76 82) | 1.8 | 14,526 |
| <i>Change from Existing</i> | +6 | +60 | (+29 0) | +0.1 | +2,283 |
| Expansion with Optimization (Min) | 21 | 256 | 142 (60 82) | 1.8 | 15,053 |
| <i>Change from Existing</i> | +3 | +32 ¹³ | (+13 0) | +0.1 | +2,810 |

Forecasting ridership is difficult given there are numerous factors that influence usage. The ridership projections in the two expansion scenarios above factor in the change in dock-to-bike ratio (which lowers ridership modestly as fewer bikes are in service), the change in fleet size and type (which increases ridership as more pedelec bikes are in service), and a 5% increase in ridership from a continued rebound from the pandemic. In the scenario with optimization, the change in fleet size and type is more modest, but the increase in ridership factors in station expansions at Riverfront Park and Benedict College as well as a shift of three stations from the fourth quartile to the third quartile in utilization, both of which increase ridership. Expected ridership in either scenario could also increase from network effects from building new stations close to existing ones, increasing the utility of the system and attracting latent demand.



Expansion at USC could stretch as far south as the athletic facilities by Hayward and Marion Streets. A public plaza next to the Rice Athletics Center could be a location for a new station.

¹² While 135 bikes were initially available, 6 bikes (3 pedelec and 3 8-speed) have been deemed inoperable or missing by the operator and should be replaced fully with pedelec bikes.

¹³ Of the 60 docks needed for expansion, 28 can be relocated from underperforming stations, leaving a net total of 32 new docks in the system.

West Metro Expansion

Two potential expansion areas were identified in the cities of West Columbia and Cayce: along the Riverwalk and up Meeting Street. These areas received most of the public interest west of the Congaree River and are relatively well connected to the existing system with bike facilities on the Blossom Street Bridge and the Three Rivers Greenway providing connection to the existing system east of the Congaree River. These expansion areas could feasibly accommodate up to five new stations and 50 new docks.

| Expansion Area | # of Stations | Rationale |
|--|----------------------------------|---|
| Riverwalk from Moffatt St to Lyles St Trailheads | 2 in West Columbia 1 in Cayce | Crowdsourcing map feedback, regional recreational destination with shared use path, trailheads with parking. |
| Meeting Street from Riverwalk to Triangle City | 2 in West Columbia | Crowdsourcing map feedback, growing retail and cultural scene, civic destinations (e.g., city hall, library). |

New stations should expand with 10 docks on average based on the average utilization of the system. However, stations should be sized to the expected demand at each station, availability of space, and other operator considerations. Station location placement and related space considerations will be crucial in any expansion in the West Metro area as most right-of-way is owned by SCDOT and not the local municipality. See Station Siting for strategies on bike share station placement in constrained locations. The equipment needed for expansion is shown below.

| Scenario | Stations | Docks | Bikes | Dock-to-Bike Ratio | Projected Ridership |
|---------------|----------|-------|-------|--------------------|---------------------|
| West Columbia | 4 | 40 | 22 | 1.7 | 2,449 |
| Cayce | 1 | 10 | 6 | 1.7 | 920 |
| TOTAL | 5 | 50 | 28 | 1.7 | 3,369 |

As is the case with Columbia going forward, all bicycles purchased for operation in West Metro communities should be pedelec bicycles, which attract nearly three times higher ridership than standard 8-speed bikes. An estimate of the projected annual ridership is calculated based on the average utilization of electric bicycles in Columbia (0.42 TBD). Ridership may vary given the actual performance of the new stations (some are in the Riverwalk while others are in more remote areas) and differences in land use and visitation between Columbia and West Metro communities, among other factors.

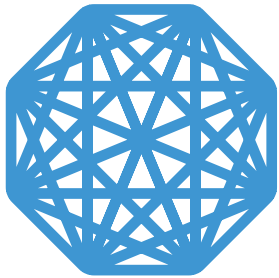
While system assets will be owned by the entities that purchased them, bicycles will move between participating municipalities on both sides of the river. The bike share operator will treat all bicycles as one shared fleet. However, the operator should try to rebalance the stations on the West Metro side with pedelec bicycles given the higher rate of purchase of these assets, when possible.



The Riverwalk in West Columbia and Cayce are likely to be popular areas for bike share.

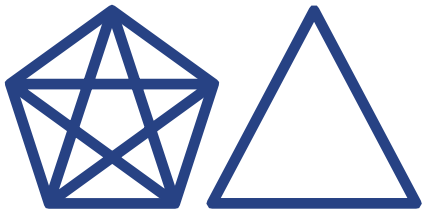
Future Phasing

Parts of West Columbia and Cayce and all of Springdale are not being considered for this phase of expansion of the Blue Bike SC system due to cost constraints, lower density and potential demand, and the long distances between these areas and the current footprint of the system (i.e., downtown Columbia).



Expansion works best when it is contiguous and extends the footprint of the existing system, with good coverage in between. This increases the utility of the system by exponentially increasing the number of origins and destinations that are served by the system.

Example: 8 stations = 28 possible station pairs



New stations that are built far from the existing service area function as satellite systems with very few connections between destinations.

Example: 5 stations + 3 satellite stations = 13 possible station pairs



Gervais Street Bridge connects West Columbia to downtown Columbia.

By prioritizing expansion in areas of West Columbia and Cayce in close proximity and relatively well connected to Columbia, the groundwork is being laid for expansion further into West Metro communities in the future. Further expansion of the bike share system should be linked with expansion of a high-quality bikeway network that better connects these communities and provides users of the bike share system a safe and comfortable place to ride. For example, a future phase of bike share expansion that serves the Town of Springdale should consider placing stations along the length of Platt Springs Road, especially if there are plans to upgrade the existing bicycle lane to a facility that is more comfortable for people of all ages and abilities.

8 | Financial Planning and Regional Coordination

A financial analysis was conducted to understand the cost implications of the potential expansion scenarios and how these could be funded. The system currently operates in just one municipality, but if it is to expand into other cities, it will be important for the various partners to coordinate so that the system is seamless for users.

Cost Analysis

Bike share costs can generally be divided into capital and operations.

Capital Costs

These include costs for the equipment including the bicycles, station plates, docks, kiosks, map panels, and additional spare parts; as well as costs related to the equipment such as site planning and permitting, station assembly and installation, electrical connections, map printing, shop tools, and supplies.

Capital costs were developed from 2023 prices quoted by Bewegen and assume an average station size of 10 docks, 5-6 bicycles, and a double-sided ad panel that contains station hub equipment. All new bike purchases are assumed to be pedelec bikes. These bikes are only a few hundred dollars more per bike but are ridden up to three times as much as a regular 8-speed bike.

The existing equipment is aging, and the cost analysis assumes that four bikes are replaced each year as part of capital replacement. This assumes that other equipment does not need replacement except for regular maintenance and spare parts replacement that is factored into operating costs.

New equipment costs include a 3% annual inflation and a 10% fee for shipping and customs. Equipment-related costs were accounted for with a 20% contingency.

Actual equipment cost will need to be determined through a formal purchase order with Bewegen.

The expected capital cost for each scenario described in the previous section is shown in Table 13. In the City of Columbia, expansion with optimization requires less capital expense as equipment in underperforming stations is relocated to new or expanded stations, thereby reducing the need to purchase all-new equipment. In the West Metro area, capital cost responsibilities should be apportioned to each municipality based on the number of stations and bikes necessary to operate in their respective communities.

Table 13: Capital Costs for Potential Expansion Scenarios

| Expansion Scenario | Capital | Capital Replacement (5 Year Total) |
|--|-----------|------------------------------------|
| Expansion in Columbia with No Optimization | \$244,780 | \$108,200 |
| Expansion in Columbia with Optimization | \$116,240 | \$108,200 |
| Expansion in West Metro (Combined) | \$223,520 | Not Applicable |
| <i>West Columbia</i> | \$176,770 | Not Applicable |
| <i>Cayce</i> | \$46,750 | Not Applicable |

Operating Costs

Operating costs include personnel and direct costs for the management, operation, and maintenance of the program. These estimated costs were provided by the current bike share operator (Bewegen) and remain constant for the duration of the contract, which is through the end of June 2023. These costs would change based on the vendor providing the service.

These costs generally include compensation and benefits for management and operating staff to perform station rebalancing, station cleaning and maintenance, bicycle maintenance, responding to customer calls, administration, marketing, and promotions as well as direct costs related to administration, insurance, marketing, system branding, professional services, vehicle maintenance, tools, supplies, operating software fees, rent, and other costs for a local office and operations center.

Operating cost forecasts were developed from rates quoted by Bewegen that reflect expected service levels, expected staff levels and competitive wages, and other factors consistent with the existing level of service. An inflation rate of 3% per year was applied to operating costs.

The expected additional operating cost for each scenario is shown in Table 14. Operating cost responsibilities should be apportioned to each municipality based on the number of docks assigned to each municipality. Docks are a relatively stable element of infrastructure with costs that do not vary daily due to repairs, rebalancing, and seasonality, unlike bicycles. In the City of Columbia, expansion with optimization has a lower operational cost compared to the expansion with no optimization as fewer bikes will be needed to serve the number of stations and docks in the expanded and optimized system.

Table 14: Operating Costs for Potential Expansion Scenarios

| Expansion Scenario | Operating Cost (Annual) | Operating Cost (5 Year Total) |
|--|-------------------------|-------------------------------|
| Expansion in Columbia with No Optimization | \$85,260 | \$452,660 |
| Expansion in Columbia with Optimization | \$38,220 | \$202,920 |
| Expansion in West Metro (Combined) | \$82,320 | \$437,050 |
| <i>West Columbia</i> | \$64,680 | \$343,400 |
| <i>Cayce</i> | \$17,640 | \$93,650 |

Cost Reductions

There may be ways that system costs can be reduced. These include:

- Rebidding the operating contract once the current contract is complete**
 This is a chance to obtain competitive cost bids based on current industry trends and an opportunity to incentivize the operator to take on more financial risk in exchange for a greater share of system revenues.
- Purchasing less expensive equipment**
 While double-sided ad panels are the system standard for Blue Bike SC stations, Bewegen offers other types of station hubs that are less costly, such as a simple wayfinding panel or no signage at all. Other bike share equipment manufacturers may also offer less expensive equipment, albeit it is likely not compatible with the existing system equipment.
- Municipalities providing in-kind services or contributions to offset program costs**
 A municipality or other system stakeholder could provide low- or no-cost rent for office and shop space for the operator, create streamlined site identification and planning processes, waive permit fees, etc.
- Service level changes that reduce operational overhead**
 Adjusting service level agreements to reduce the frequency that bikes or stations are cleaned or checked or increase the time required for an operator to address service issues could help lower operating costs.

Another strategy could be testing the use of virtual stations and hybrid operations. The Bewegen equipment has an independent lock that allows the bikes to be parked outside of a docking station. Using bike racks, signing, striping, and geofencing to create virtual stations would reduce capital costs, but would likely increase operating costs to locate, redistribute, and recharge bikes. While the current operator has provided cost estimates for hybrid operation that make virtual stations more costly than docked stations, this is something that could be piloted to determine the true cost impact to operations before fully committing to this operational change. Alternatively, other operators may have a different cost structure that favors virtual stations if the contract was to be rebid.

Projected User Revenues

Given the current price structure, there are two drivers of user revenues: (a) the number of memberships and passes sold; and (b) the number of trips and the length of time riders go beyond the free-ride period of 45 minutes. User revenues are currently estimated to contribute a low percentage of the funding needed to operate the program. There may be ways to increase user revenues, such as moving exclusively to a pay-by-the-minute model similar to many dockless bike share programs that have a nominal check-out fee plus a per minute cost.

Table 15 shows expected user revenue increases for the different expansion scenarios based on the projected increase in ridership for each scenario (see previous section) and the existing pricing scheme. It shows the additional revenue gained from pay-per-ride, 2-hour passes, and overage fees attributable to the expected increase in ridership, while additional monthly and annual pass revenues grow in relation to the number of stations.

Table 15: Estimates of Additional Revenue for Potential Expansion Scenarios

| Expansion Scenario | User Revenue (Annual) |
|--|-----------------------|
| Expansion in Columbia with No Optimization | \$13,530 |
| Expansion in Columbia with Optimization | \$15,080 |
| Expansion in West Metro (Combined) | \$18,940 |
| <i>West Columbia</i> | \$13,920 |
| <i>Cayce</i> | \$5,020 |

The introduction of more pedelec bikes is expected to increase ridership and user revenues. Pedelec bikes are used up to three times more than regular 8-speed bikes. However, the rate of increase in revenue will depend on whether these additional trips are made as part of a membership purchase (where users can take as many trips as they like under a monthly or annual membership) or whether they are checked out and paid for each time on pay-per-ride passes. The pedelec bikes operate at higher speeds than the regular bikes, which may also reduce the duration of trips and result in less overage fees for trips going beyond the 45-minute free ride period.

For this analysis, user revenues were forecast by applying the average revenue per trip and extrapolating it for the number of trips expected under each expansion scenario. Ridership projections (see Chapter 7) accounted for the increase in the number of pedelec bikes and for the network effects of adding new stations (i.e., the system will become more attractive because it is more convenient with a greater range of origins and destinations).

Alternatively, given how little user revenue contributes to funding the operational costs of the system, this could be an opportunity to trial “fare-free” service that removes cost altogether as a potential barrier to riding bike share. This has been done successfully in places such as Aspen and the Roaring Fork Valley where the transit agency “sponsors” the fare-free service (i.e., offsets the lost revenue), which has increased the number of short trips made on bike share and trips connecting to transit.

Funding

Apart from membership and usage fees, traditional bike share systems such as Blue Bike SC generally use three other types of funding: public, private, and advertising/sponsorship. While most programs use a variety of these sources, in most cases, public funds and grants and private contributions are used for capital whereas membership and usage fees, some private sector contributions, and advertising/sponsorship revenues are used for operations. Based on the projected user revenues, funds other than fare revenue will be needed for all capital costs and for approximately 61-84% percent of additional operational costs, depending on the expansion options chosen.

The different funding sources are reviewed in this section.

Public Funding

Federal, state, and local funds are all important sources of funding for bike share. Federal funds typically come from the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) and are generally limited to capital expenses. Different restrictions apply depending on which federal agency provides the funds. Consideration should be given to where the 20% (or lower) local match requirement will come from.

FTA funding for bike share is often sought from 5307 Urbanized Area Formula Grants, which is a source of funding that is provided to transit systems to support capital and mobility management expenses. When funding bike share equipment with this grant, it can only be used for docks, stations, and other equipment associated with bicycle parking, but not for the bicycles themselves. In addition, bike share projects are only eligible for FTA funds if they are within a three-mile radius of existing transit stops. This is the source of funding that The COMET used in 2019 to implement docks and expand the number of stations in the Blue Bike SC system,¹⁴ and it is a source of funding that is provided annually to transit agencies in urban areas (amounts vary year-by-year based on the formula). The board of The COMET approves how this grant is allocated annually to various projects based on staff guidance.

FHWA funds have fewer restrictions and can also be used to purchase the bicycles. Cities often consider the Transportation Alternatives Program (TAP) set-aside from Surface Transportation Block Grants to fund bike share equipment, including docks and bicycles. While this source of funding is often competitive in other regions, as it is usually used for sidewalks and bike lanes, this could be a potentially fruitful source of federal grant funding to tap into due to the unique circumstances in South Carolina, and especially because the allocation of funding is controlled locally. Interested municipalities should coordinate with CMCOG on TAP applications for bike share equipment.

Other municipalities also access Congestion Mitigation and Air Quality (CMAQ) grants to fund their bike share systems; however, this source of funding is not available in the Columbia area as the area is in attainment of air quality standards set by the Clean Air Act. Additional grants from FHWA could be accessed for bike share; however, they are often competitive grants at a national level. The FHWA's Bicycle and Pedestrian Program compiles an [online table](#) of all sources of federal funding that can support bicycle and pedestrian infrastructure, such as bike share.

Private Funding

Private funding is most likely to come in the form of partnerships with private companies and organizations or through developer incentives and travel demand management programs. These opportunities may include:

- Bulk membership commitments from large employers, the University of South Carolina, Benedict College, and other large organizations.
- Developer incentives to encourage direct station purchase, site preparation, or collection of development fees to go towards bike share stations near their site development.

Additionally, grant-making non-profit organizations and private philanthropies may be interested in funding bike share operations or special programming in support of bike share. Organizations such as the Better Bike Share Partnership offer several grant programs to help create more equitable bike share systems. These include “mini-grants” of \$10,000 to \$25,000 for community-based organizations, cities, or operators conducting smaller, time-bound programs.¹⁵

Private philanthropies, particularly those that are devoted to improving public health or environmental outcomes in a particular community, may be interested in funding existing and expanding bike share operations without the need to be acknowledged to the degree that a sponsor might need to be.

Sponsorship and Advertising

Sponsorship is an important funding stream for the existing Blue Bike SC program with BlueCross BlueShield of South Carolina being the primary sponsor of the system paying most of the initial capital and ongoing operating costs. In return, the system is branded with their logo and color palette on all the bikes and most of the stations.

The operating contract with Bewegen stipulates that the system operator is responsible for seeking additional sponsors. It is uncertain how much effort has gone into securing sponsors beyond BlueCross BlueShield, but in general, obtaining sponsorship is time-consuming and costly. Additional sponsors need to be consistent with the mission and brand of the major sponsor and can be more difficult to find at-scale if there are only minor assets left for branding.

There may be opportunities to adjust the sponsorship model to get more sponsors involved and offset some of the cost to expand the system. This could include:

¹⁴ The COMET Annual Budget Fiscal Year Ending June 30, 2021, p. 42, <https://catchthecometsc.gov/wp-content/uploads/2021/10/The-COMET-FY-2020-2021-Budget.pdf>

¹⁵ <https://betterbikeshare.org/grants-and-grantees/>

- Making available some portion of existing assets for branding for another sponsor. This could include freeing up a portion of an existing asset (e.g., a percentage of the fenders on the bike fleet or a select number of stations) or freeing up an entire asset category (e.g., all the bike baskets).
- Creating new asset categories and partnerships (e.g., logo placement on the side of all docks) or sponsorship of the payment system (e.g., MasterCard sponsorship in New York City); sponsoring the website, mobile app, or other digital assets; providing the power connections for the stations (e.g., this could be an in-kind or paid partnership with the local utility provider); or sponsoring a fare-free service (e.g., RFTA in Aspen).



Branding for The COMET on a Blue Bike SC station. A similar approach could be used to acknowledge new sponsors on remaining stations or different parts of the bikes, such as fenders or baskets.

Selling advertising on one side of the double-sided ad panel may also be an option in the participating cities depending on any existing outdoor advertising contracts and local regulations. Many cities and public entities have street advertising contracts with vendors that sell and manage advertising on transit stops, bike share stations, and other street furniture. The COMET currently has an existing outdoor advertising contract with Gateway Outdoor Advertising for ad panels on its bus stops. Outdoor advertisers typically price advertising space based on factors such as traffic counts, the visibility of the location, and the demographic profile of the surrounding community.

Preliminary discussions with the partner cities did not identify any constraints to sponsorship or advertising on stations (except stations in SDOT right-of-way), but deeper analysis would be needed before pursuing advertising. This option may require competitive procurement or a partnership with The COMET that expands their existing outdoor advertising contract to include Blue Bike SC stations.

A number of cities with lower-than-expected sponsorship revenues have recently changed their model to incentivize public and private partners to seek sponsorship. Philadelphia is a recent example of a system that was re-bid with the successful operator taking on more financial risk for the system with the incentive of keeping revenues secured from sponsorship.¹⁶ This may be an option once the current contract is up.

Regional Coordination

There are numerous bike share programs in the United States that operate regionally across jurisdictional boundaries. This expands the benefits of bike share to new communities, grows the potential ridership pool, and improves the utility of the program by increasing the number of potential origins and destinations for bike share trips.

A single bike share or shared micromobility program that is shared across municipalities in the region can:

- Create a more recognizable brand and reduce user confusion from having multiple operators.¹⁶
- Reduce barriers to using the program (e.g., avoiding multiple accounts, apps, etc.).

¹⁶ The Philadelphia Inquirer (2020), <https://www.inquirer.com/transportation/indego-philadelphia-bicycle-transit-systems-independence-blue-cross-20200610.html>

- Reduce costs to the individual (e.g., only having to pay for one program rather than multiple).
- Encourage spontaneity and provide access no matter where someone is in the region.
- Increase transit utility by providing first and last mile service at both ends of a transit trip.
- Leverage the resources and shared experience of participating agencies to provide coordinated decision-making about the program.
- Utilize economies of scale that come with a single operator, such as a shared procurement process and shared management and oversight duties.

Technology platforms play a large role in regional interoperability. Most bike share vendors manufacture products that only work in their system platform (e.g., one vendor’s bikes are not compatible and will not lock into another vendor’s docks), and the software platforms between vendors are different and do not allow members to access multiple platforms with one account.

Stakeholders in this study have already expressed desire to be part of a single regional system. Given that platform compatibility is critical in being able to provide a regionally consistent bike share program, West Metro municipalities should use the Bewegen platform that is used in Columbia, or all stakeholders should coordinate choosing a new platform in the case a replacement is warranted. Having a shared regional system will also make it easier and more effective to coordinate and integrate the bike share program with transit initiatives.

Considerations for Regional Coordination

Bike share systems that set up regional operations need to consider how the various public and private partners coordinate to provide a consistent and coherent system. Some of the key considerations include:

- **Identifying who is ultimately responsible for the program, takes on the financial risk, and leads regional coordination.**
Currently, the City of Columbia oversees the operating contract with Bewegen while BlueCross BlueShield of SC takes on the financial risk for the program as Blue Bike SC’s title sponsor. This arrangement may still be the case for a future bike share program with each jurisdiction having an arrangement with the operator

after the approval of BlueCross BlueShield, who will shoulder the additional operational cost of expansion or have a role in vetting additional sponsors. Participating municipalities will also need to be coordinated, which could be a role for a regional agency such as CMCOG to bring the partners together. Communities have also looked to their public transit agency to be the lead agency for managing the bike share system given their regional jurisdiction and complementary mission. This often takes the form of the transit agency assuming the responsibility of managing the contract with a private or non-profit bike share operator. Examples of systems where the transit agency is the lead agency can be found in Aspen, CO (RFTA/WE-Cycle), Los Angeles, CA (LA Metro/Metro Bike Share), and Albany, NY (CDTA/CDPHP Cycle!).

- **Determining how decisions are made that influence the whole program.**
Ideally, where decisions impact the fundamental structure of the system, program stakeholders should make them based on consensus. However, it may be necessary to identify the voting power of different partners and different-sized jurisdictions, who gets to vote when formal votes are needed, how service expansions are accommodated, how new communities can enter the program, and what happens if a jurisdiction leaves the program. These rules should be established and documented before issues arise.
- **Creating an appropriate contractual mechanism between the various partners.**
Some regional systems have a Memorandum of Understanding between partners that specifies the roles and responsibilities of each party and how decisions will be made. However, some regional programs (e.g., Capital Bikeshare) do not have any formal agreements, but there is a mutual understanding between partners that participate in the program. In terms of operations, some programs have a centralized operating contract that local jurisdictions buy into, whereas other programs have separate agreements between the operator and each jurisdiction. There is no single way to do this as contracting mechanisms are often developed based on the contexts of each region. For example, Capital Bikeshare became the regional bike share system in the Washington, D.C. area because of a [COG-supported clause](#) that was added to the contract the operator had with the first municipality (Arlington County, VA), which allowed other governments in the COG to bypass their own procurement and ride the awarded contract whenever they were ready to join the system.

- **Determining what decisions are regional versus local.**

Core program elements such as the type of technology, the operator, branding and colors, and the fare structure should be regional decisions that are consistent across jurisdictional boundaries. However, there may be local flexibility around the size and extent of the service, service levels, the length of the commitment, etc. in each jurisdiction.

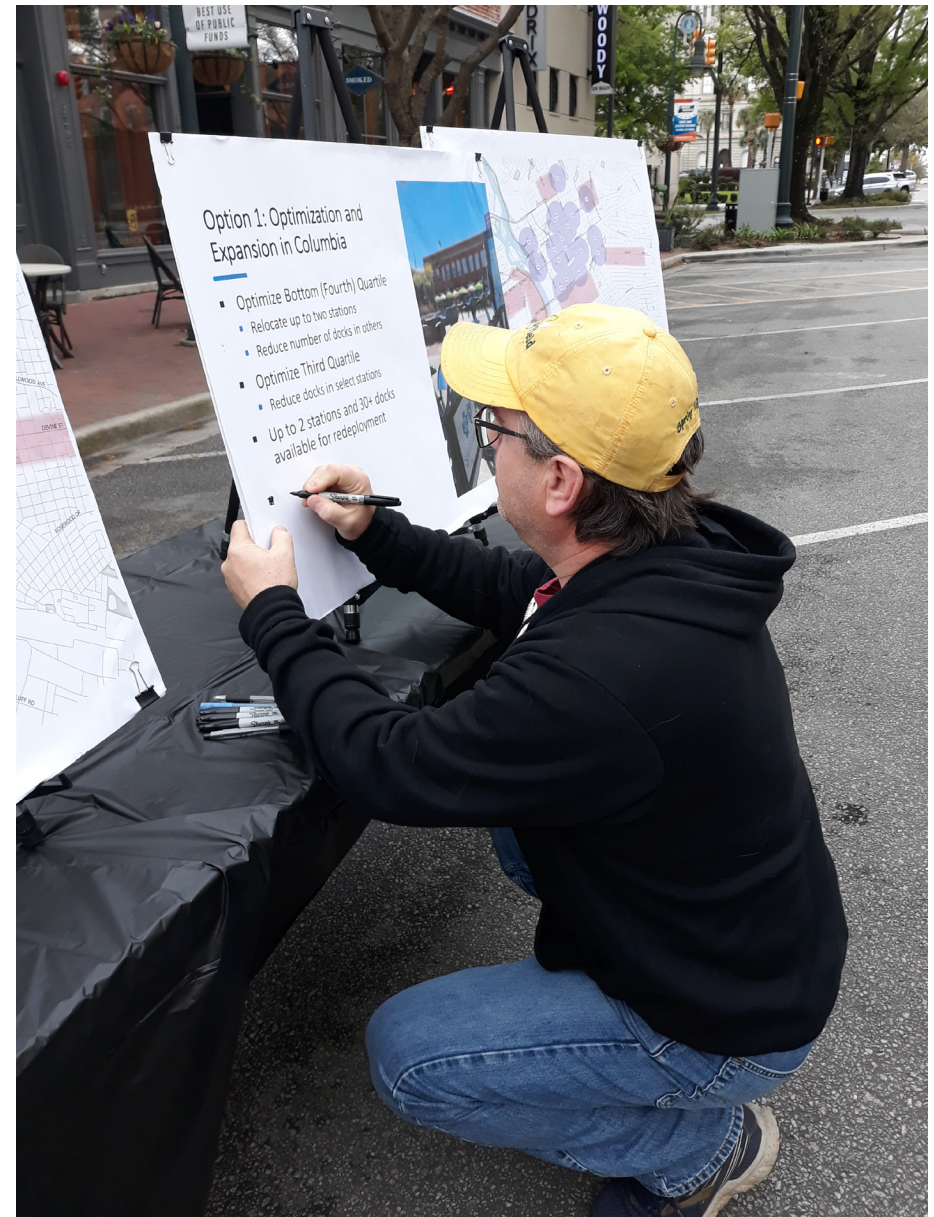
- **Determining how costs will be shared.**

On the capital side it is important to establish who owns the assets, who will pay for new stations and bikes, who funds capital replacement, how in-kind support will be accounted for, and the funding obligation of each partner. For operations, it will be important to determine whether individual price agreements will be established with each jurisdiction or whether it will be one operational price agreement with responsibility distributed amongst the partners.

- **Determining how revenues will be shared.**

Even though user revenues are likely to go back into the system to support operations, there may be a need to determine how revenues should be apportioned amongst the different stakeholders and what metrics are used for this apportionment, especially if the operational costs are apportioned to each municipality. Some systems share membership revenues based on the ZIP code of the purchaser and distribute trip revenues based on the start or end station location. Sponsorship revenues also need to be considered, including how system-wide sponsorship funding is apportioned and what local sponsorship assets are available for local jurisdictions to offset their cost.

Other considerations such as ensuring the regional model is flexible enough to allow for innovation and changes in technology, integration with transit and other modes, and the ability to leverage the strengths of public, private, and non-profit partners are also important.



Soda City Market Pop-up Event
Photo: Planners for Environmental Quality (PEQ)

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9 | Network Development

First-Mile/Last-Mile Network Development

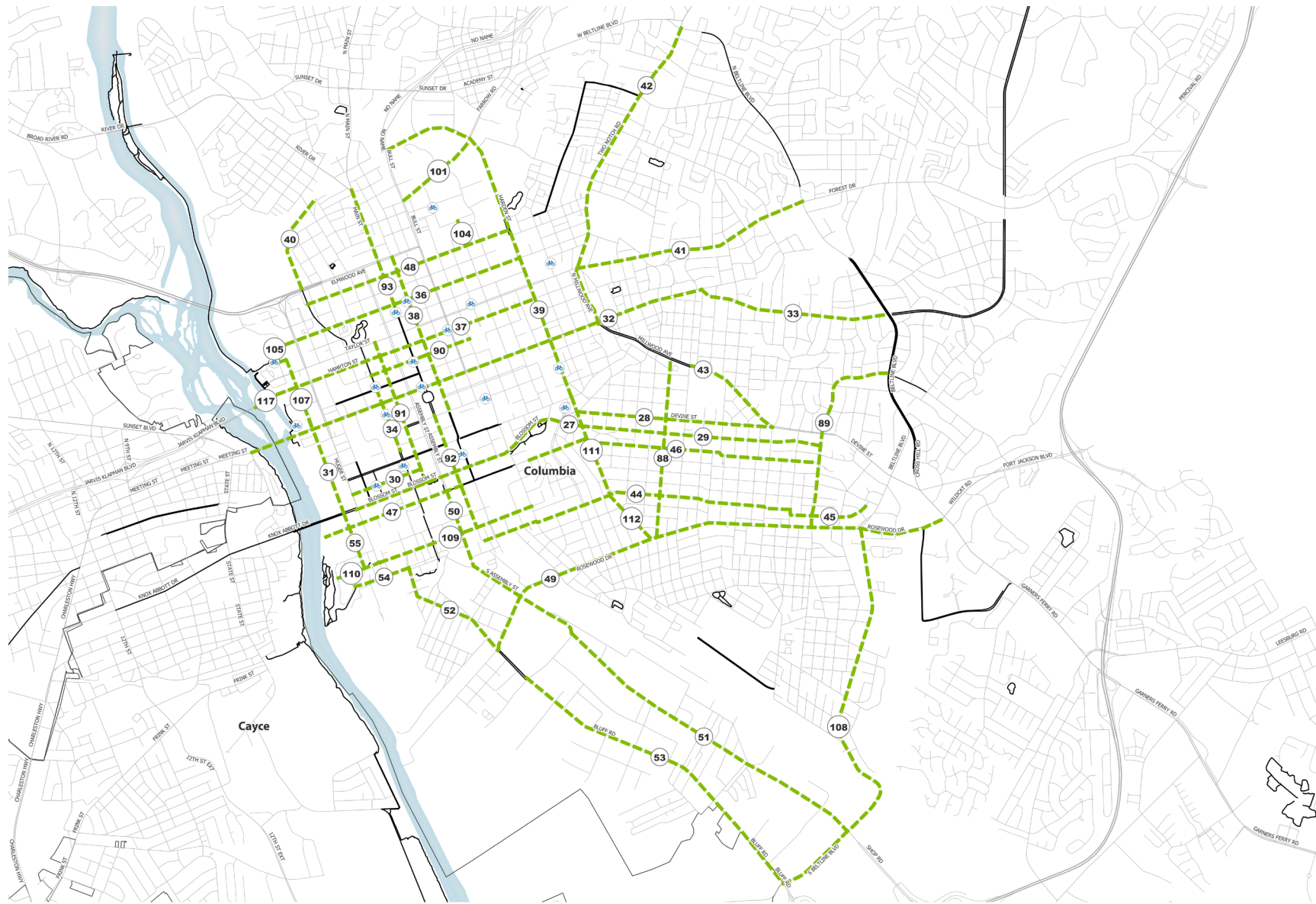
To grow the Blue Bike SC system in the City of Columbia and support the expansion of the system across the river to Town of Cayce, Town of Springdale, and City of West Columbia, there needs to be a connected network of safe bicycle facilities to ride on and a continuous sidewalk network to allow users to reach the bike share stations on foot safely. To further that goal, the Three Rivers Bike Share Expansion Feasibility Study created a network of bicycle and pedestrian recommendations based off previous planning efforts and professional judgement on where facilities are needed to create a safe connected network of facilities. The intention of this part of the study process was to create targeted network recommendations that are representative of the community and advance projects that increase safety, connectivity, and equity, while inviting new users. A key aspect of this task was to identify projects that are needed to address gaps and missing links in the network. A comprehensive list of the previously proposed and newly proposed projects can be found in the Appendix A2 Bicycle Projects Table and Appendix A3 Sidewalk Projects Table.

The study pulled from were the 2014 Walk Bike Columbia plan, the 2018 West Metro Bike and Pedestrian Master Plan, and further network development efforts done by the City of West Columbia. This feasibility project does not include the scope to perform prioritization or cost estimates of the proposed network, so further analysis will be needed to begin implementation of this network.

The geographic focus of this study is centered on the existing bike share network located within the City of Columbia and new expansion areas around this existing service area. With this scope in mind, the proposed network for Columbia covers the downtown and the area around it that might be reachable by Blue Bike SC. This caveat is necessary as the Walk Bike Columbia plan produced recommendations for large portions of the city that are not within the study area and thus were excluded from this network development.



Figure 26. City of Columbia Previously Proposed Bicycle Facilities



- Previously Proposed
- Existing Bicycle Facilities
- Bicycle Project ID (corresponding table included in Appendix A2)
- 🚲 Blue Bike SC stations

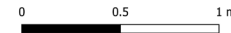
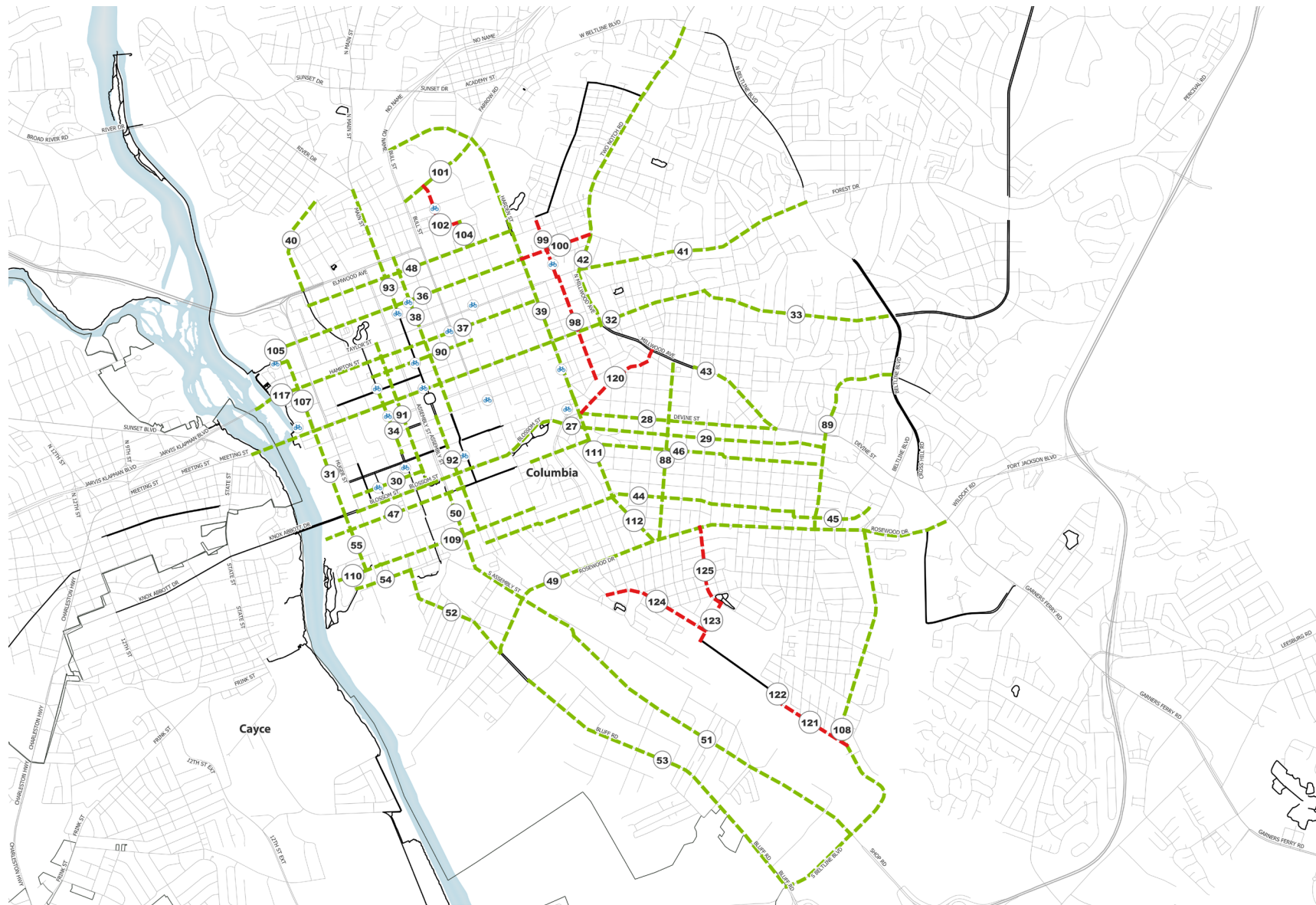


Figure 27. City of Columbia New Proposed Bicycle Projects



- Toole Design Proposed Project
- Previously Proposed
- Blue Bike SC stations
- Existing Bicycle Facilities
- Bicycle Project ID (corresponding table included in Appendix A2)

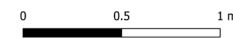
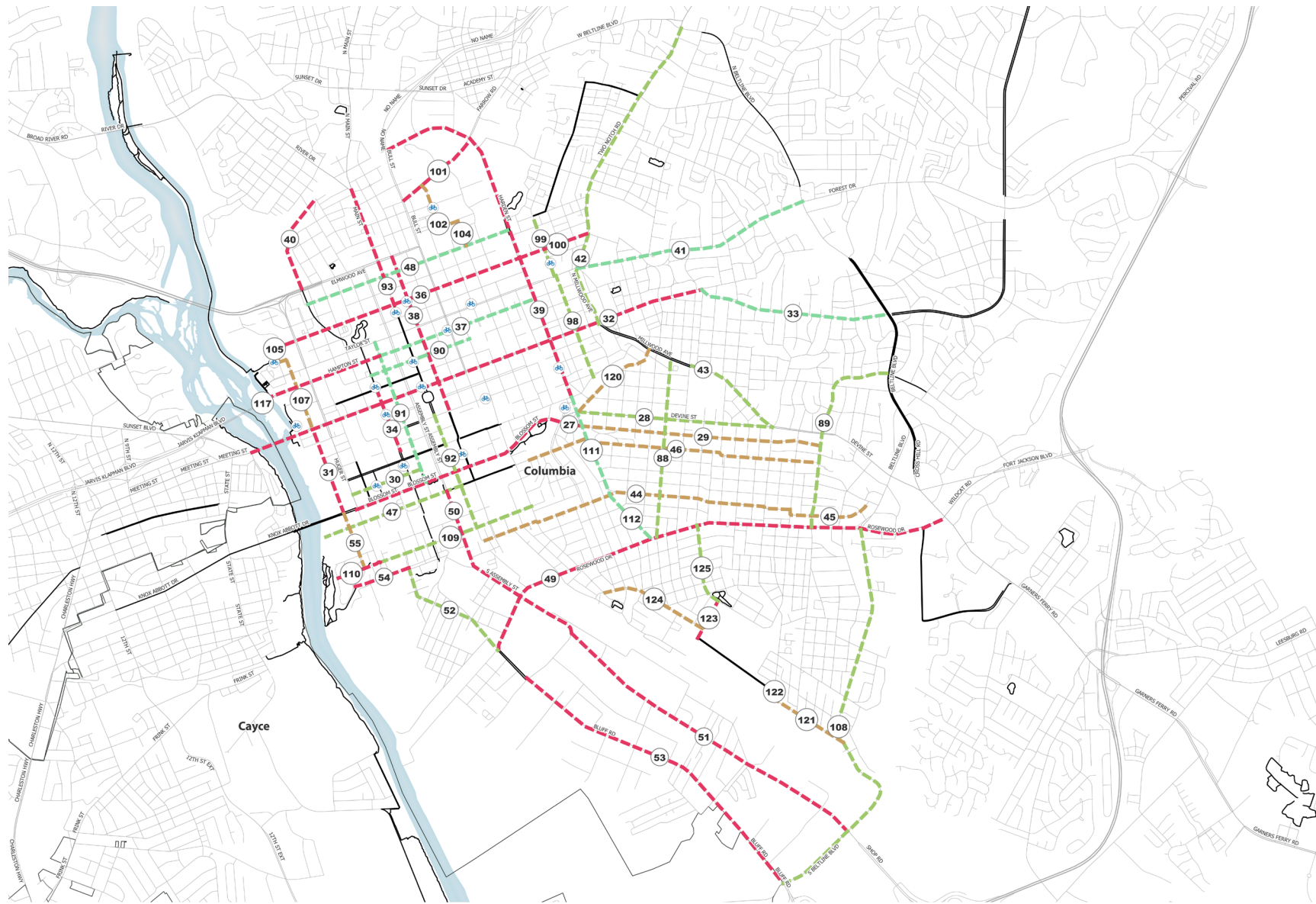


Figure 28. City of Columbia New Proposed Bicycle Network By Facility Type



- Bike Boulevard
- Bike Lane
- Buffered Bike Lane
- - - Physically Separated Facility
- Existing Bicycle Facilities
- Bicycle Project ID (corresponding table included in Appendix A2)
- Blue Bike SC stations

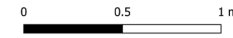


Figure 29. West Metro Previously Proposed Bicycle Facilities

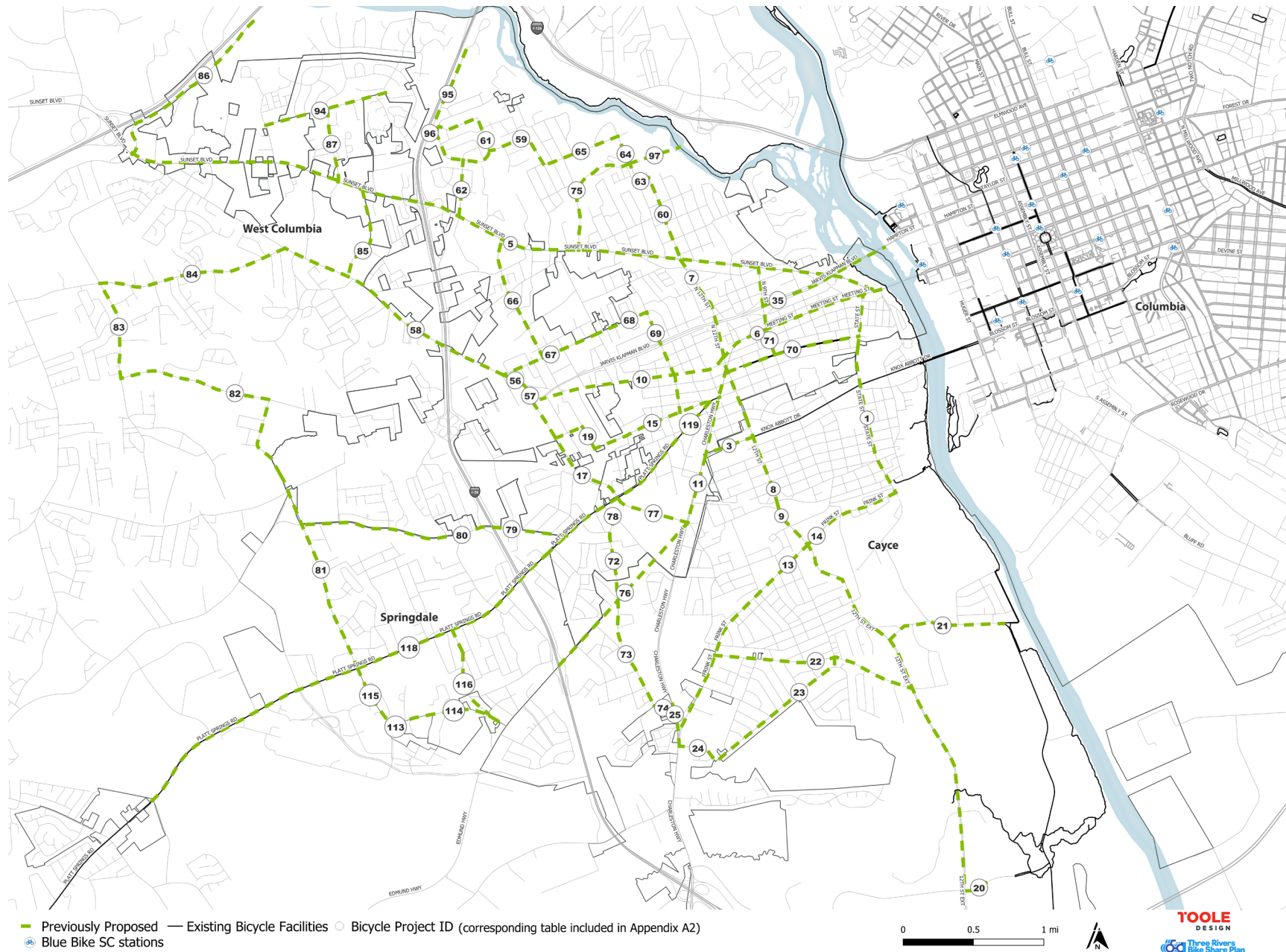


Figure 30. West Metro New Proposed Bicycle Projects

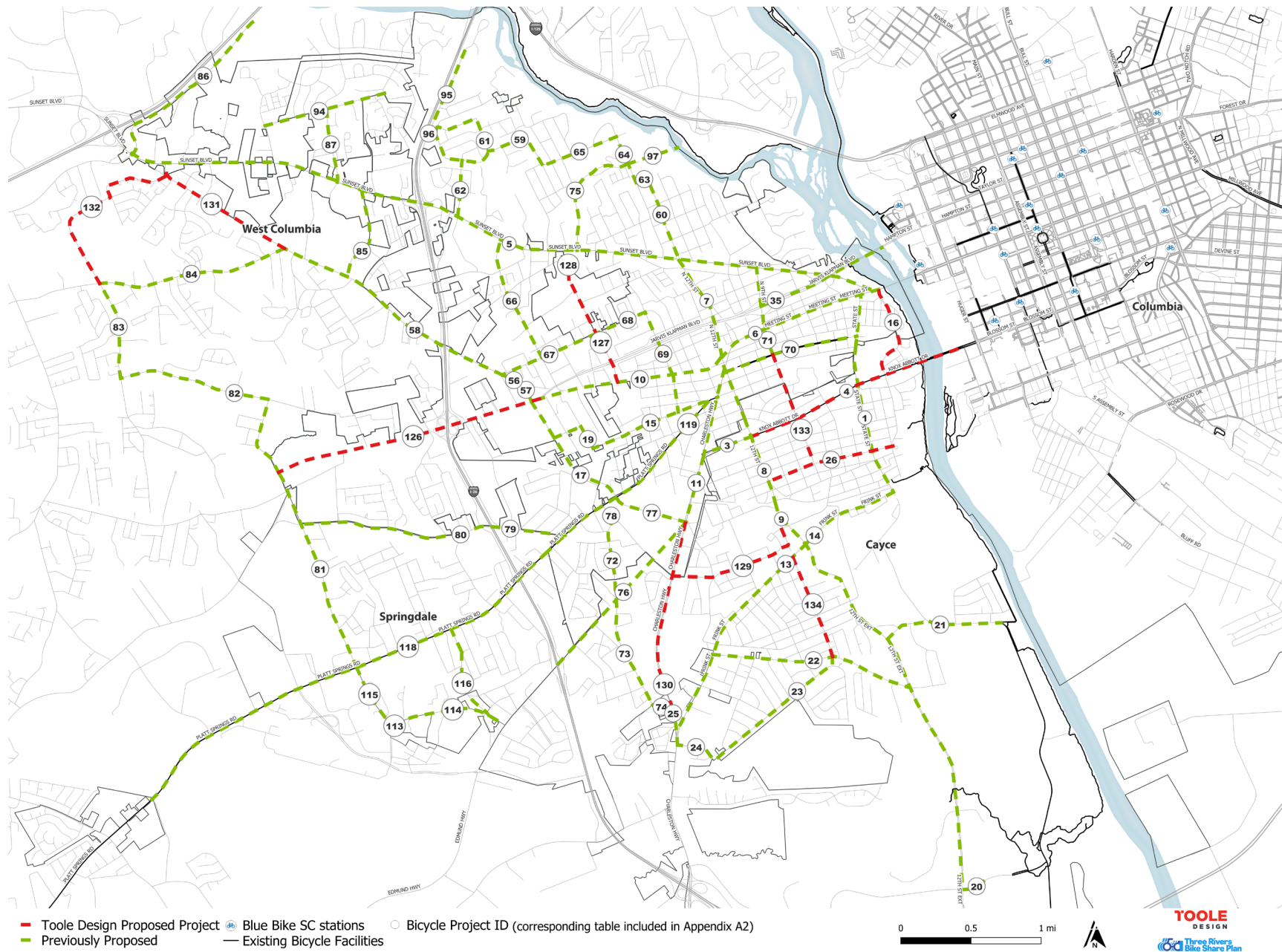


Figure 31. West Metro New Proposed Bicycle Network By Facility Type

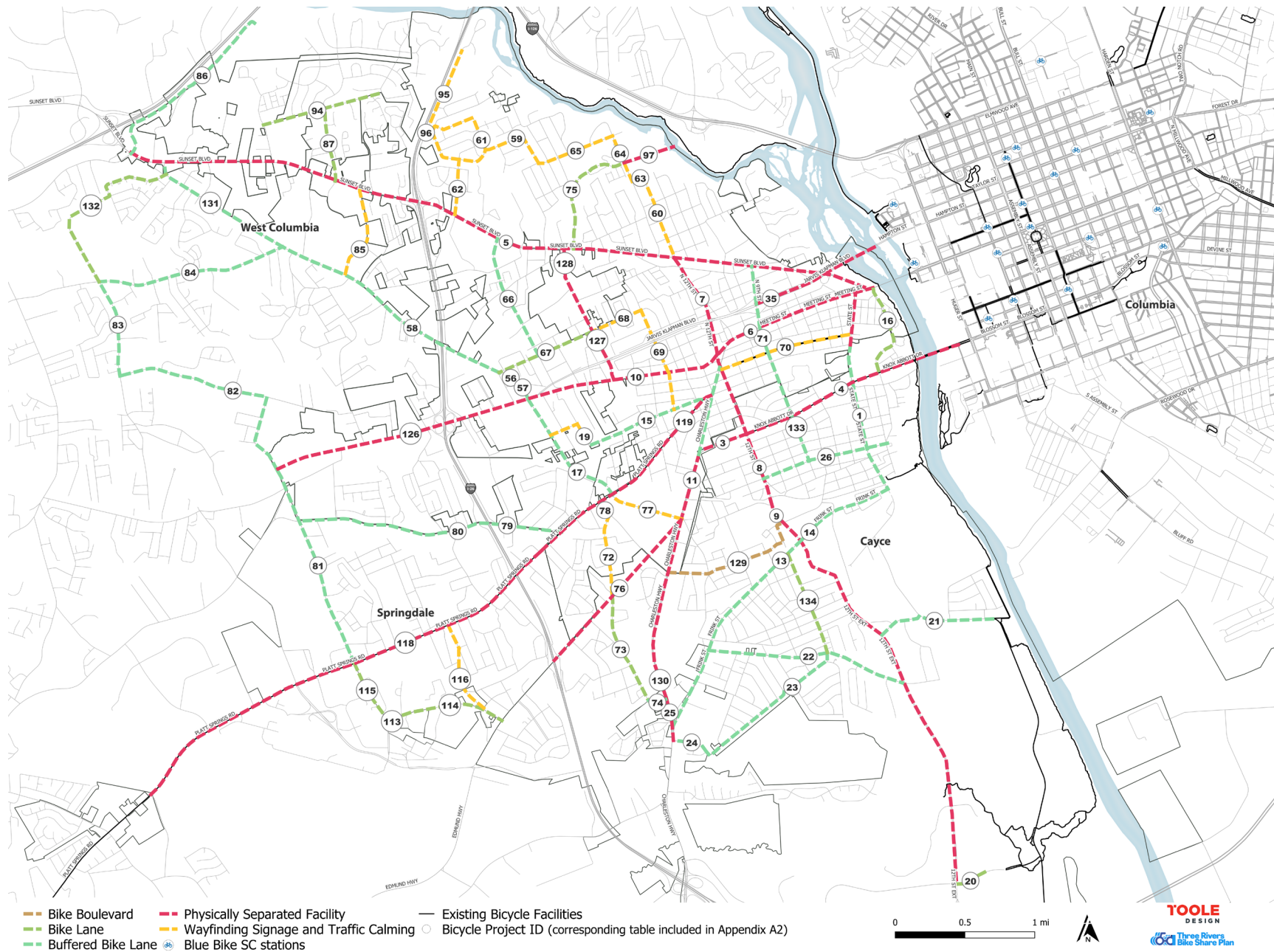
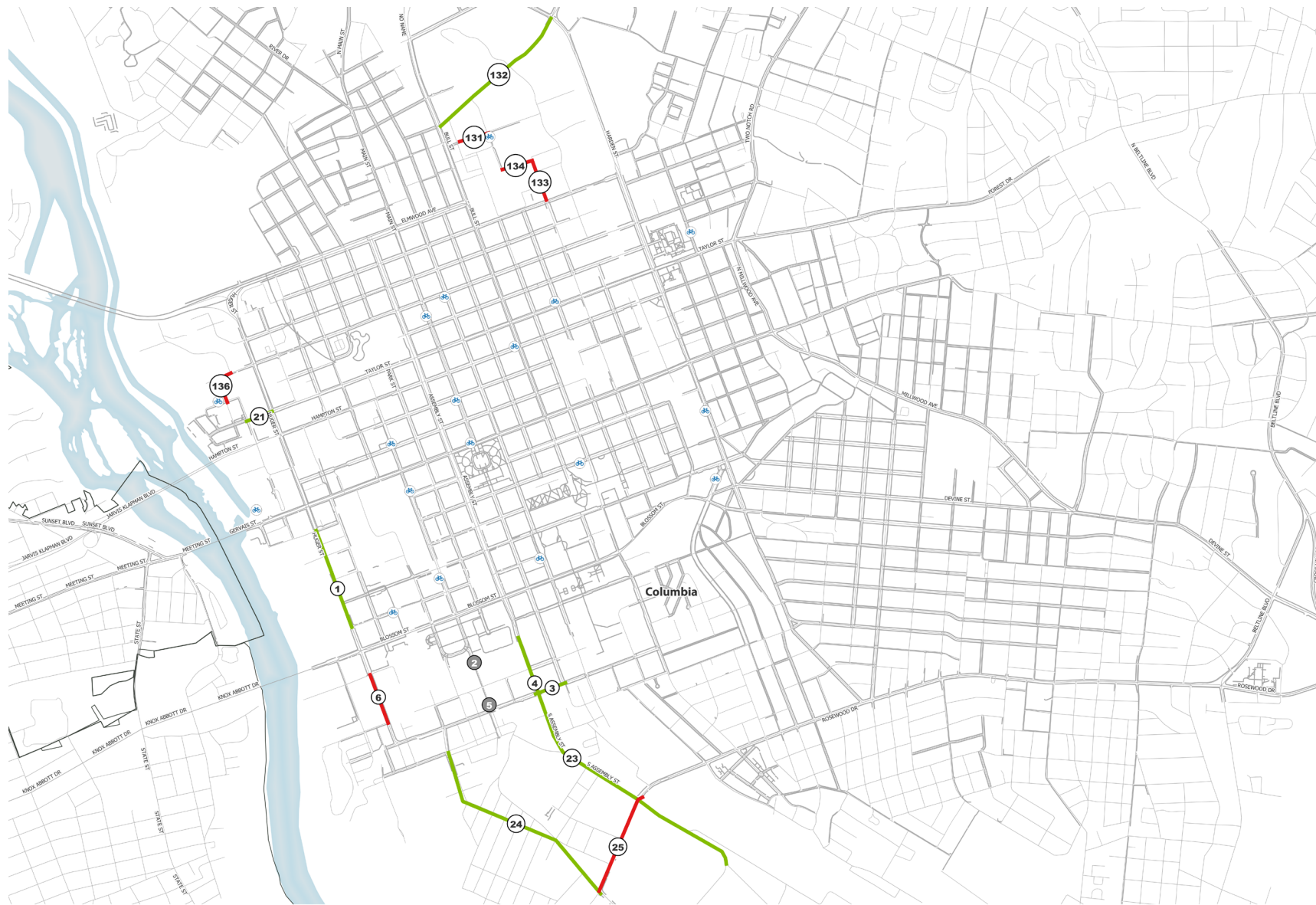


Figure 32. City of Columbia Sidewalk Projects



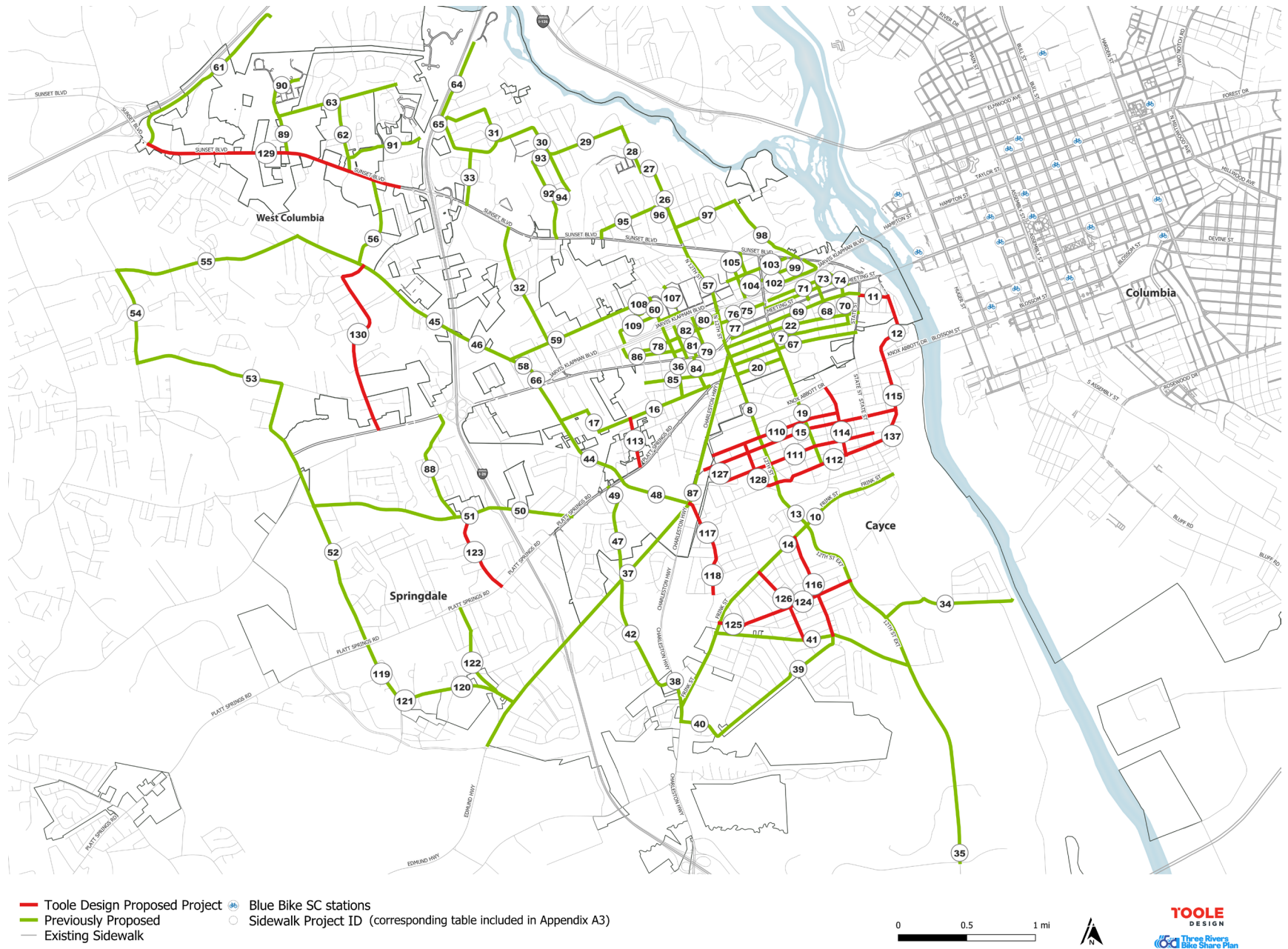
- Toole Design Group
- Previously Proposed
- Existing Sidewalk
- Blue Bike SC stations
- Sidewalk Project ID (corresponding table included in Appendix A2)
- Railroad Crossing ID (corresponding table included in Appendix A2)

0 0.5 1 mi

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DESIGN

Three Rivers
Bike Share Plan

Figure 33. West Metro New Sidewalk Projects



Station Siting

Expanding Blue Bike SC will require locating and installing new stations, some of them in jurisdictions west of the Congaree River that will be new to the system. Most of the existing bike share stations in Columbia are installed in the public right-of-way in the sidewalk or in publicly owned parking lots. Some stations are located on privately-owned, but publicly accessible, sidewalk frontage through an agreement with the property owner.



Vista Greenway/Lady Street station is installed on City-controlled property on the greenway itself.

Stations installed on the sidewalk are located either in the frontage zone (next to the buildings) or in the furniture zone (next to the curb), leaving the sidewalk zone clear for pedestrians to walk through unimpeded. Stations can also be installed in parks or other publicly accessible spaces that are outside of the right-of-way. In other cities, stations might also be placed in-street with the station immediately next to the curb in the curbside lane typically used for parking, loading, daylighting, and other curbside uses, similar to a bike parking corral.

The City of Columbia has an established station siting process. It is not recommended that that process be changed, although there may be information in this guide that can support trialing new types of station placements if needed. This guide builds on practices in Columbia and from NACTO's *Bike Share Station Siting Guide* and experience from other cities.

General Siting Criteria

Stations are the most visible part of a docked bike share system and drive recognition of the program and ridership. As such it is important that they be placed in the most visible locations feasible following the general criteria adapted from NACTO's *Bike Share Station Siting Guide* (see Design Guidance Appendix for specifics on site placement):

- **Accessible and Convenient:** stations should be located in places where people are likely to want to use bike share at any time and in any season, such as parks and trails, lively retail or entertainment districts, and denser residential areas.
- **Designed for Safety:** stations should be located in visible areas with higher pedestrian traffic and good lighting to discourage vandalism or theft.
- **Operationally Feasible:** station locations should provide power hookups and be easily accessible for bike share maintenance and rebalancing crews.
- **Enhance the Pedestrian Realm:** stations should support pedestrians by leaving enough uninterrupted space on the sidewalk for people to walk by and, when possible, serving as a buffer for pedestrians from traffic and curbside uses.
- **Part of the Streetscape Hierarchy:** stations should not impede permanent objects such as fire hydrants, bus stops, and curb ramps, but impermanent objects such as trash cans and regular bike racks can be relocated to accommodate the station.

SCDOT and Bike Share Stations

A unique feature of South Carolina’s transportation system is that the state’s Department of Transportation (SCDOT) owns many of the local roads. This is particularly true in Lexington County, where almost all rights-of-way located in West Columbia, Cayce, and Springdale are owned and maintained by SCDOT. Encroachment permits are required to do construction impacting SCDOT right-of-way, and the department has historically not allowed the installation of items which constitute “private use” of the right-of-way under South Carolina law, specifically citing Sections 57-7-210 barring placement of any obstruction in the highway system and 57-25-10 barring outdoor advertising on the right-of-way except in discrete circumstances (i.e., ad panels on bus shelters and benches which are explicitly allowed under state law).

Communities such as Columbia and Charleston have avoided placing stations on SCDOT right-of-way due to these constraints and the complexity and timeliness of advocating for changes to these regulations. For the short-term, municipalities in Lexington County will need to take the same approach despite it placing significant limitations on the sites available for high-visibility bike share stations. Longer-term, there may be appetite for South Carolina communities to coordinate with SCDOT to ascertain whether bike share stations qualify as highway obstructions, whether branding on bicycles constitutes advertisement, and whether advertisements on bike share stations could be exempted in the same way as bus shelters. Given the near-total ban on advertisements on the right-of-way, creating a statewide precedent to allow for outdoor advertising on bike share stations could open up an additional source of revenue to support bike share in Columbia and across the state.

Station Siting Locations

Given the limitations placed on SCDOT right-of-way, bike share stations should be considered on municipally owned rights-of-way or on municipally owned properties and private properties that are publicly accessible.

Municipally Owned ROW

The City of Columbia retains control over some of its local streets and have placed stations where these streets intersect with busier arterials that are controlled by the state. For example, this strategy was used for the YMCA and Township Auditorium stations, which are located on City-owned minor cross streets that intersect SCDOT-owned Bull Street and Taylor Street respectively. This strategy could also be used for the proposed expansion stations along Devine Street and other areas within the City of Columbia but will be harder in expansion areas in Lexington County where a lot more of the street network is owned by SCDOT.

Municipally Owned Property

Stations could be placed on publicly owned properties such as parks, plazas, parking lots, and municipal buildings. This is the approach used to install the City of Columbia’s Riverfront Park and Five Points – Saluda Avenue stations, and it is the recommended approach to install most of the stations in the expansion areas in West Columbia and Cayce.

Municipalities could also collaborate to install stations on properties controlled by other public entities to expand the range of locations available for bike share stations. These could include county-owned buildings and green spaces, libraries, public schools, health and human services centers, and public colleges and universities.

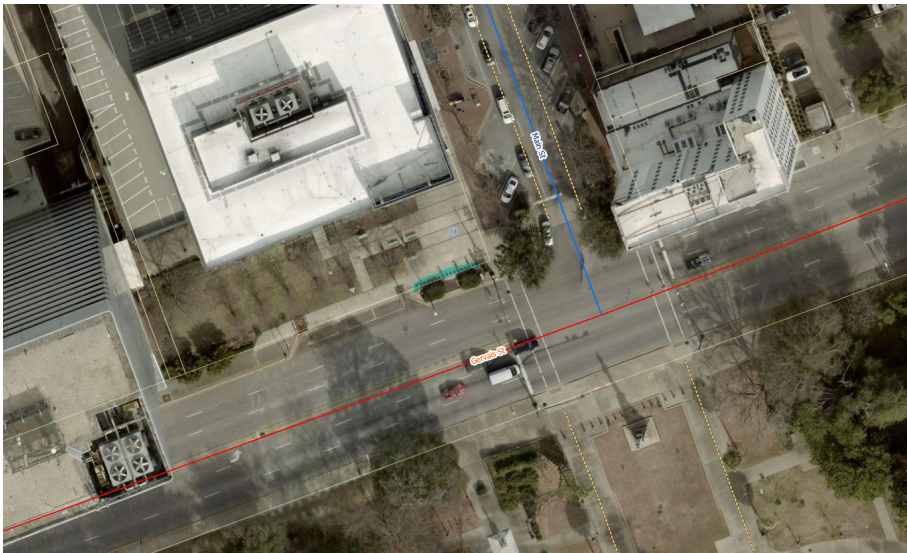
In all cases, stations need to be visible and publicly accessible at all times of the day so that users can enter the property to borrow and return a bike. An example of this is the Main Street –Washington Square station, where the bike share station is located underneath the overhang of a City of Columbia building fronting Main Street.

Some form of agreement is often required when working with other departments or other public entities. These are often in the form of a Memorandum of Understanding or License Agreement that sets the terms of use for these sites including who is responsible for installation and maintenance, connecting and paying for electrical connections, outlining expected service levels, and

requirements for insurance and liability. Often these agencies are added as an additional insured party to the bike share operator’s liability insurance.

Private Property

Using only municipally owned rights-of-way and properties can limit the choices for bike share stations. The Cities of Columbia and Charleston have both installed bike share stations on private properties, often in areas where the frontage zone along a sidewalk is owned by the adjacent building. In Columbia, an example of this type of partnership is at the Main Street – Gervais Street station, where the bike share station is placed on a part of the sidewalk that is controlled by the adjacent property owner.



Main Street - Gervais Street station (in teal) is located within the parcel of the adjoining building while fronting Gervais Street, a SCDOT-maintained road.
Source: City of Columbia GIS

Some property owners may see the value of having a bike share station on their premises and be willing to work with the municipality and the operator. Interested property owners are often in retail or entertainment districts, businesses oriented to tourists and visitors (e.g., hotels and museums), and developers interested in providing more travel options for their development. Locations where The COMET has installed bus stops or Super Stops may also be good candidates to locate bikeshare stations given pre-existing easements between the transit agency and property owner.

Some municipalities have created policies to incentivize property owners and developers to accommodate bike share. This could be in the form of density bonuses or parking or development fee offsets when developers pay for bike share stations or provide space on their development for a station to be installed. Property owners may also be encouraged to sponsor stations and pay for electricity costs in return for acknowledgment on the station or discounted passes.

10 | Early Action Projects

Overview

In an effort to keep the momentum of the Three River Feasibility Study going as expansion considerations are coordinated, part of the study recommendations includes early action projects for each community. The goal of these recommendations is to have low to no cost projects that could serve as catalysts for more bicycle investments and lead to an increase in enthusiasm for the bike share system and its expansion.

Two projects are identified for each community, to include one event or bike share expansion project and one physical infrastructure project.

The event or pilot programs fall into two categories. The projects for the City of Cayce, the Town of Springdale, and City of West Columbia aim to boost enthusiasm and educate the public on bike share and bicycle safety. While in the City of Columbia, the goal is to test one or more of the possible expansion station locations by having temporary stations that last for a set period of time.

The infrastructure projects represent spot treatments that are intentionally small in cost and effort but provide big improvements for safety, accessibility, and connectivity to key destinations; transit stops; and proposed and existing bike share station locations. Working on these projects in the immediate future will jump-start the implementation of the study and boost awareness and enthusiasm for bike share across the region. Early Action Projects should be considered along with pre-existing project concepts and plans that improve walking and biking conditions in the region.

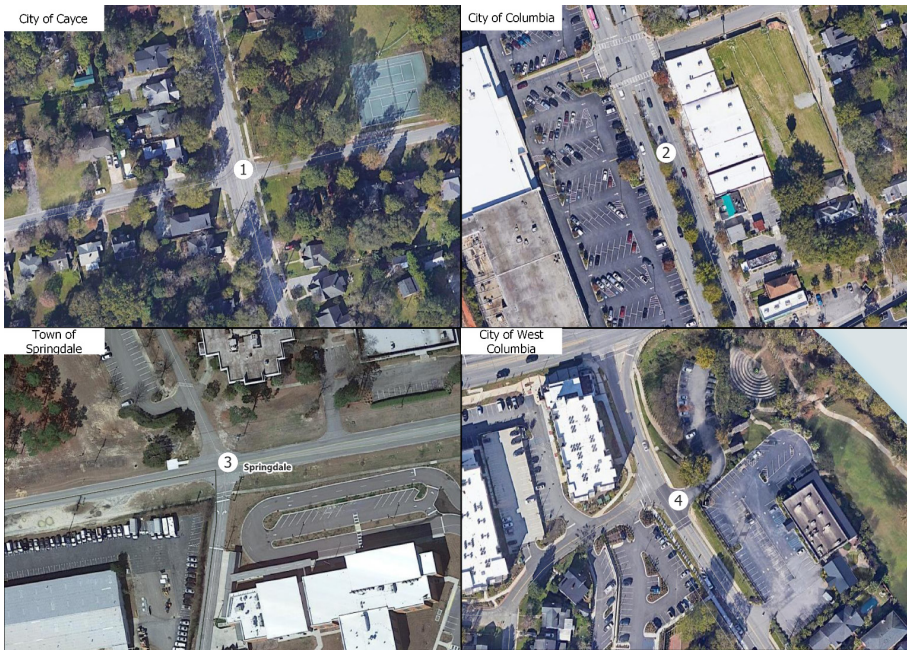
Approach

Early Action projects were identified in areas with significant safety concerns for people walking and biking and to generate momentum for implementation of the Three River Bike Share Feasibility Study. To keep costs low, these projects are also in locations where additional striping, milling, or changes to the curb line would not be needed.

Table 16: Early Action Projects

| Project ID | City | Location | Project |
|------------|-----------------------|------------------------------------|---|
| 1 | City of Cayce | Naples Avenue at State Street | High Visibility Crosswalks |
| 2 | City of Columbia | Harden Street | Improving Bus Stop and Bike Share Station |
| 3 | Town of Springdale | Boston Avenue at Walterboro Street | High Visibility Crosswalk, Sidewalks, and Curb Extensions |
| 4 | City of West Columbia | Oliver Street at Alexander Road | High Visibility Crosswalks |

Figure 34. Map of Early Action Projects



Bicycle and Bike Share Events

The project team recommends that the Cities of Cayce and West Columbia pursue opportunities to have a bike share operator attend a meeting/ event in their community to perform an e-bike demonstration and share the benefits of bike share with the community. This could be done as part of a larger event such as Rhythm on the River, Soiree on State, Christmas in Cayce, etc. Another option is to do it as a city sponsored event such as a bike safety event at a school or a bike rodeo/training in a park in partnership with a local bike advocacy group or business such as Pedego Electric Bikes.

In Columbia, the recommended event is to host a pilot virtual station for a set period (such as two weeks to a month). The recommended study areas for the early action stations are south of Blossom Street or along the Devine Street corridor. Possible locations in those study areas might be near the Carolina Indoor Track and Field Complex or Emily Douglas Park.

For Springdale, it is not recommended to do a bike share demonstration event at this time, due to the recommendation that the expansion of the system into the Springdale area be at a much later phase. However, it is proposed that Springdale would promote bicycle culture through hosting a safety event in collaboration with the school system. To that effect, the proposed event could be held at RH Fulmer Middle School with a focus on how to ride a bicycle, bicycle safety, and connect the attendees to places where they could bike (Guignard Park, West Columbia/Cayce Riverwalk, Saluda Shoals Park, Three River Greenway, etc.).

City of Cayce Early Action Project

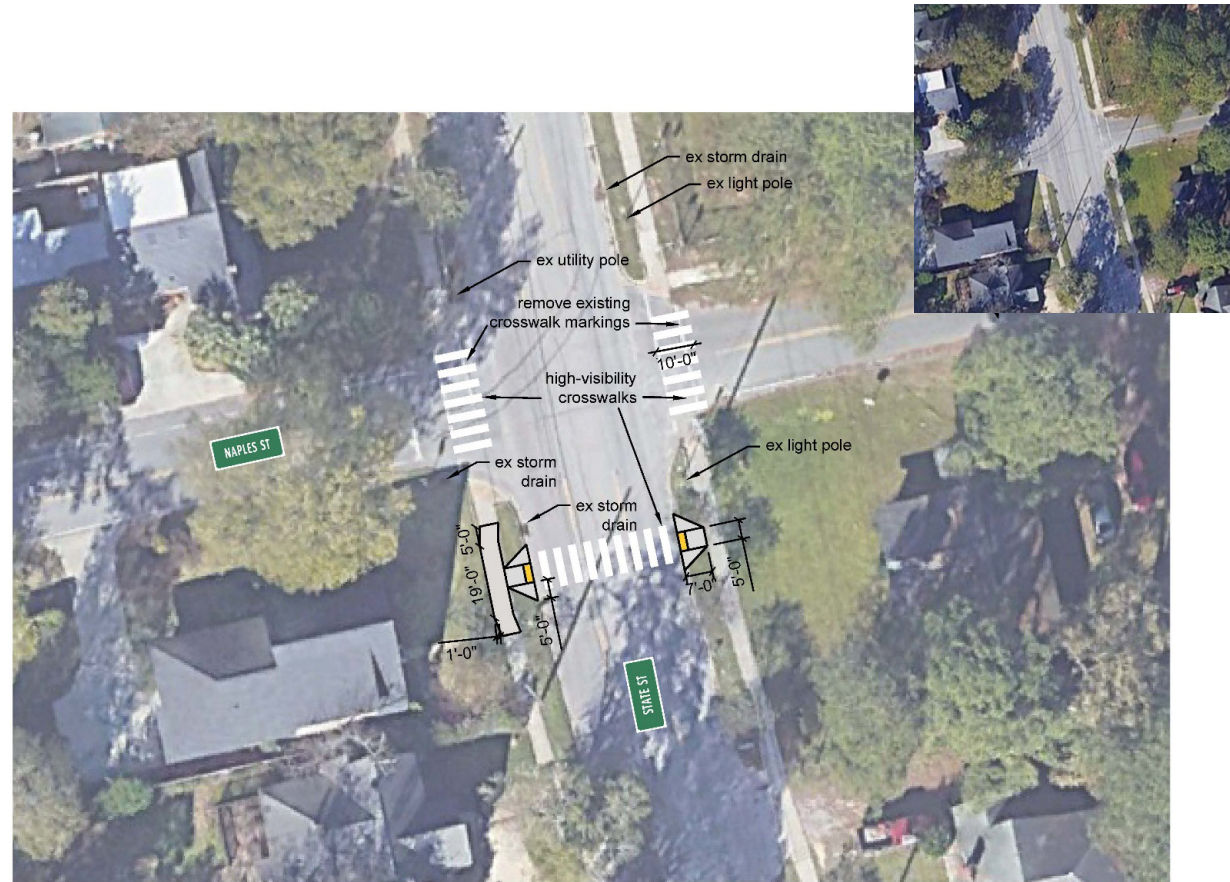
Improving access to the Riverwalk is important to the community fabric currently and in the future as the bike share system takes shape. With this goal in mind, the focus of the infrastructure projects is creating crosswalks across State Street to connect the residential areas west of this major corridor to the Riverwalk. Increasing connectivity with the Riverwalk is important to the future expansion of Blue Bike SC as that will be a key part of the new service area.

Location

- Access to WMJ Cayce Memorial Park and Cayce Riverwalk
- Connectivity for residents

Recommendations

- High visibility crosswalk
- ADA ramps



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DESIGN

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

CENTRAL MIDLANDS COUNCIL OF GOVERNMENTS
CAYCE EARLY ACTION PROJECT
PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

City of Columbia Early Action Project

Updating the Harden Street at Pendleton Street COMET stop which is also a Blue Bike SC station would help transit access and potentially improve the attractiveness of the bike share system. The Blue Bike SC station has the third highest ridership in the system; however, the addition of the bike share station reduced the seating available for The COMET riders. To rebalance the functionality of the location, examining the viability of removing the parking space next to the stop to make room for a bench and potentially expand the shelter if the need presents itself. Additionally, rebranding/repainting the station to give the location a cosmetic update is also desired by the City. The location could have the existing equipment refurbished and add Blue Bike SC branding to increase the visibility of the system.



Remove parking space to make room for shelter expansion

Town of Springdale Early Action Projects

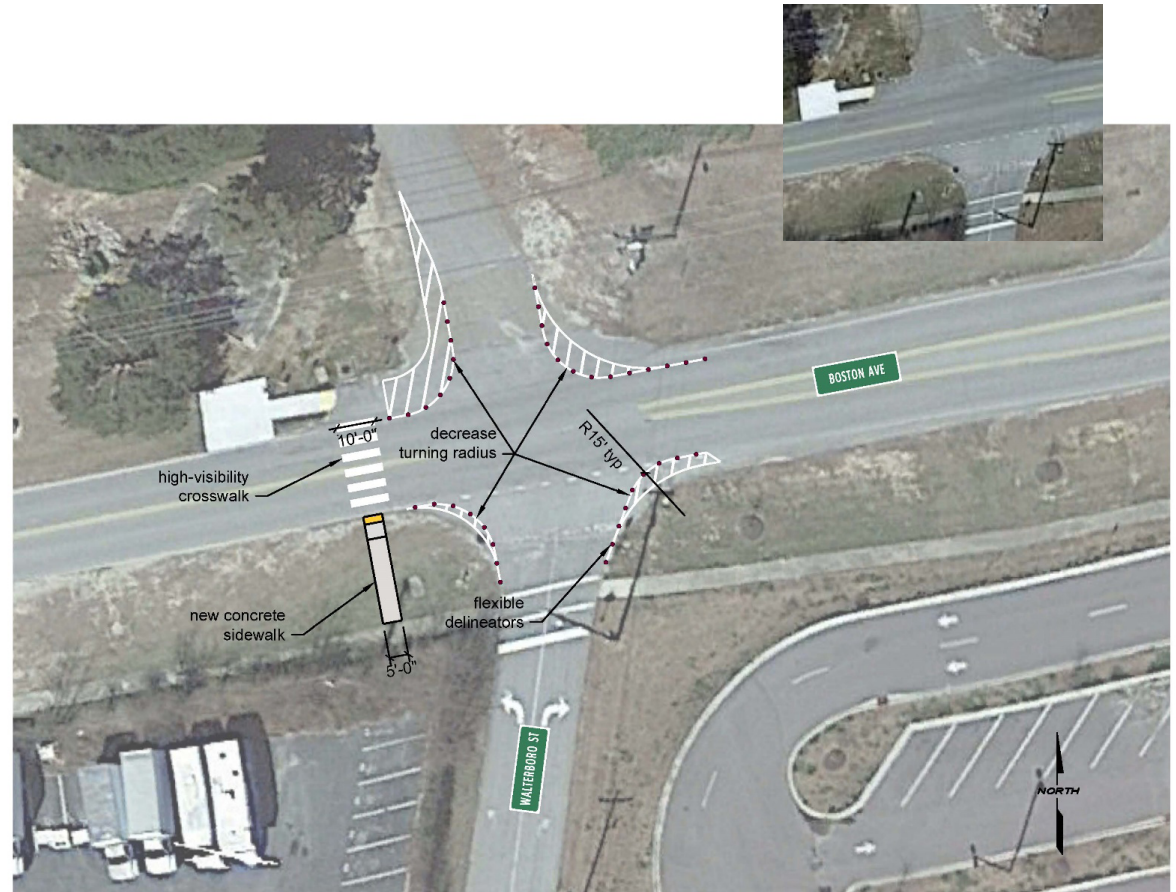
Given that the bike share system expansion for the Town of Springdale is essentially postponed as a phase three recommendation, the early action project focuses on a transit connectivity project.

Location

- Would improve the transit connection to RH Fulmer Middle School and Airport High School
- Improve safety for students at nearby schools

Recommendation

- New sidewalk
- High visibility crosswalk
- Curb extensions to narrow turn radii



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DESIGN

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

CENTRAL MIDLANDS COUNCIL OF GOVERNMENTS
SPRINGDALE EARLY ACTION PROJECT
PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

City of West Columbia Early Action Projects

West Columbia Riverwalk Park is a preferred location for a future bike share station and thus safer access to the location will offer benefits to the community immediately and in the future.

Location

- Creates a safe connection to Riverwalk from the playground in Carraway Park
- Missing ADA ramps

Recommendations

- High visibility crosswalks
- ADA ramp



TOOLE
DESIGN

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

CENTRAL MIDLANDS COUNCIL OF GOVERNMENTS
CAYCE EARLY ACTION PROJECT
PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

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Appendices

A1. Public Outreach Summary

The Three River Bike Share Feasibility Study employed a robust public engagement strategy which included opportunities to review and provide input on current bike share experiences and suggest improvements for the future. Two of these strategies consisted of pop-up events at a variety of locations and the facilitation of a focus group with the University of South Carolina students. The following is a summary of the location and the information received at these events.

River Parks

36 interactions

Canalside apartment/condominiums

- The leasing office manager confirmed that residents use the facilities at the Riverfront Park but do not necessarily communicate about their experiences.

Riverfront Park

- Bike users indicated a need for more bikes. The park is a destination on weekends especially and unless visitors arrive early, the bikes are typically rented by mid-morning. Bike users not only ride along the river but venture into the city and other areas, so the bikes are out for extended periods of time.
- Would be good to have some bike etiquette points located at the stations (how to share trails and sidewalks with pedestrians).
- More awareness in the form of media and other communication would increase interest. A lot of people in the City are not aware of the Bike Share unless they visit a location where they are located.

Saluda River Park

- As the park expands, a bike station would do well at this location.
- Some park users bring their own bikes and ride around the “island” and back which is about a mile round trip.

- The park is also quickly becoming a destination; particularly on weekends but weekday visitors are increasing as well.

Benedict College

25 interactions

Team members participated in the Weekly Wednesday Benedict College pop up event sponsored by the student government association. The set up was near the existing docking station at the college which is highly used by students. Interactive boards provided the opportunity for students to share their experiences and suggestions for improvement of the bike station.

Q. How can bike share be improved at Benedict?

- Consider a discounted fare and incentives program for students
- Bikes are often broken – more consistent maintenance (especially tires)
- Add electrical bikes and scooters
- Review the app – sometimes it is slow to upload for payment
- Work with the City to improve road conditions for bikers including:
 - Taylor Street
 - Little Five Points area

Q. Where would you like to see bike share expanded?

- Downtown Mainstreet
- Forest Drive
- Decker Blvd.

Q. What would convince you to use bike share?

- Sidewalks – not all streets around and near campus have sidewalks
- Bike lanes
- Trash/hazards removed from streets more consistently

University Of South Carolina Focus Group

6 participants

Through coordination with university administration and students, a virtual focus group meeting was conducted to engage students about their experiences and suggestions for Bike Share Expansion on campus. The participants represented several student organizations including wellness, sustainability, athletics, and student government. Several questions were posed to students to obtain input.

Q. Have you used Blue Bike SC? Why or why not?

- Use for last mile connecting from the Comet transit and will use the nearest Bike Share location
- Truist Building for work
- No do not use but wish like to. Have a parking pass on campus for a car but can walk faster on campus due to having to stop.

Q. Where would you like to go using Blue Bike but currently don't/can't? Why?

- Area Greenway Trails with better access
- Boyd Foundation building – would increase the usage
- Better marketing – University 101 process, many students do not know about Bike Share
- Include with Freshman Orientation
- Majority of students live on campus – Freshman required – Rosewood and Shannon area, HUB area

Q. Where on campus would you place a new Blue Bike station?

- West Campus, South Campus, Campus Village, Green Quad (near soccer stadium) – Blossom St. is the dividing line between north/south and Assembly St. for west
- USC growing to the west
- The campus is bike friendly but needs extend beyond current locations
- Roads need bike lanes especially along Assembly St. and the Stadium area
- Some locations are dangerous (near Stadium)
- The school is planning 1,800 beds for new students and coordination should occur with this development

Q. What could get you to start biking or bike more often in and around Columbia?

- The City of Columbia and USC have conflicting issues, zoning, transportation, etc.
- The administrations from both the City and USC are slow to change which hinders progress on campus
- SCDOT transportation has a quota of bike lanes – studies, complete streets should use
- Contracted with Comet to use the system – has on demand service
- Parking pass is \$800 for year which is expensive– many students use surface lots in the City
- The USC Office of Sustainability did a study identifying improvements to transportation issues around the campus (study shared with the team)
- Maintenance of the biking facilities is an issue and can be a challenge but is getting better
- Enhance and pay for student passes on the Carolina Card for Bike Share
- App is good – love the integration with Comet –
- Think the rates are pretty affordable – have changed - Student pass is \$70 a year

Soda City Market

53 interactions

The draft recommendations for Bike Share expansions and improvements were shared during a pop-up event at a Saturday weekly Soda City Market. Information boards were prepared that included images of the study area with locations of existing bike stations, and recommendations for new and expanded locations in Columbia, West Columbia, and Cayce. In addition, images were shared with suggestions for improved infrastructure and equipment including electric bikes which are supported by current users. Visitors were very supportive of the study and possible expansions and included a mix of demographics. Some comments were made after reviewing the boards including:

- Bike Lanes in NE Columbia – Summit/Hardscrabble
- Limit/Restrict Use of Electric bikes in some portions of Riverwalk for safety
- Expand access to Earlewood/Elmwood & North Main Street and Sunset

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A2. Bicycle Projects Table

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|-----------------------|---------------------|-----------------------|--------------------------|-------------------------------|---------------|-----------------------|
| 1 | State Street | Buffered Bike Lane | C Street | Frink Street | West Metro Bike and Ped Plan | Cayce | 5715.25 |
| 2 | State Street | Separated Bike Lane | Meeting Street | C Street | West Metro Bike and Ped Plan | West Columbia | 1910.52 |
| 3 | Knox Abbott Drive | Separated Bike Lane | 12 Street | Charleston Highway | West Metro Bike and Ped Plan | Cayce | 1787.59 |
| 4 | Knox Abbott Drive | Separated Bike Lane | Blossom Street Bridge | 12th Street | Three Rivers Bike Share Study | Cayce | 8716.26 |
| 5 | Sunset Boulevard | Separated Bike Lane | Meeting Street | Mathias Road | West Metro Bike and Ped Plan | West Columbia | 28605.2 |
| 6 | Meeting Street | Separated Bike Lane | Alexander Street | 12th Street | West Metro Bike and Ped Plan | West Columbia | 6456.19 |
| 7 | 12th Street | Separated Bike Lane | Sunset Boulevard | Garden Avenue | West Metro Bike and Ped Plan | West Columbia | 6547.95 |
| 8 | 12th Street | Separated Bike Lane | Garden Avenue | Poplar Street | West Metro Bike and Ped Plan | Cayce | 3369.91 |
| 9 | 12th Street Extension | Separated Bike Lane | Poplar Street | Saxe Gotha | West Metro Bike and Ped Plan | Cayce | 16938.19 |
| 10 | Augusta Road | Separated Bike Lane | 12th Street | Jarvis Klapman Boulevard | West Metro Bike and Ped Plan | West Columbia | 7065.97 |
| 11 | Charleston Highway | Separated Bike Lane | Knox Abbott Drive | Airport Boulevard | West Metro Bike and Ped Plan | West Columbia | 2562.07 |
| 12 | Charleston Highway | Buffered Bike Lane | 12th Street | Knox Abbott Drive | West Metro Bike and Ped Plan | West Columbia | 3388.73 |
| 13 | Frink Street | Buffered Bike Lane | 12th Street | Charleston Highway | West Metro Bike and Ped Plan | Cayce | 8617.33 |
| 14 | Frink Street | Buffered Bike Lane | State Street | 12th Street | West Metro Bike and Ped Plan | Cayce | 3879.42 |
| 15 | D Avenue | Buffered Bike Lane | Platt Springs Road | Alexandria Street | West Metro Bike and Ped Plan | West Columbia | 4582.49 |

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|---|--|-------------------------------|--------------------|-------------------------------|---------------|-----------------------|
| 16 | Alexander Road | Bike Lane | Meeting Street | Knox Abbott Drive | Three Rivers Bike Share Study | West Columbia | 3631.82 |
| 17 | Dreher Road | Buffered Bike Lane | Augusta Road | Platt Springs Road | West Metro Bike and Ped Plan | West Columbia | 4960.72 |
| 18 | Grove Street | Wayfinding Signage and Traffic Calming | Dreher Road | Alexandria Street | West Metro Bike and Ped Plan | West Columbia | 1088.78 |
| 19 | Alexandria Street | Wayfinding Signage and Traffic Calming | Grove Street | D Avenue | West Metro Bike and Ped Plan | West Columbia | 936.36 |
| 20 | Fort Congaree Trail | Bike Lane | 12th Street Extension | Greenway | West Metro Bike and Ped Plan | Cayce | 1254.06 |
| 21 | Godley Street/New State Road | Buffered Bike Lane | 12th Street Extension | Cayce Riverwalk | West Metro Bike and Ped Plan | Cayce | 4565.64 |
| 22 | Taylor Road | Buffered Bike Lane | 12th Extension | Frink Street | West Metro Bike and Ped Plan | Cayce | 7622.05 |
| 23 | North Eden Drive/Julius Felder Street | Buffered Bike Lane | Taylor Road | Russell Road | West Metro Bike and Ped Plan | Cayce | 6281.54 |
| 24 | North Eden Drive | Buffered Bike Lane | Russell Road | Charleston Highway | West Metro Bike and Ped Plan | Cayce | 1397.15 |
| 25 | Charleston Highway | Separated Bike Lane | Memorial Drive | North Eden Drive | West Metro Bike and Ped Plan | Cayce | 1606.61 |
| 26 | Naples Avenue | Buffered Bike Lane | Cayce Riverwalk | 12th Street | Three Rivers Bike Share Study | Cayce | 4889.34 |
| 27 | Blossom Street | Separated Bike Lane | Riverwalk | Harden Street | Walk Bike Columbia | Columbia | 8762.13 |
| 28 | Devine Street | Bike Lane | Harden Street | Millwood Avenue | Walk Bike Columbia | Columbia | 6832.77 |
| 29 | Blossom Street | Bike Boulevard | Harden Street | Kilbourne Road | Walk Bike Columbia | Columbia | 8420.93 |
| 30 | Devine Street | Bike Lane | Huger Street | Park Street | Walk Bike Columbia | Columbia | 2546.58 |
| 31 | Williams Street (Infill Street) | Separated Bike Lane | Blossom Street | Gervais Street | Walk Bike Columbia | Columbia | 3091.21 |
| 32 | Gervais Street | Separated Bike Lane | Cayce/West Columbia Riverwalk | Trenholm Road | Walk Bike Columbia | Columbia | 16791.25 |
| 33 | Trenholm Road | Buffered Bike Lane | Gervais Street | Beltline Boulevard | Walk Bike Columbia | Columbia | 6748.86 |
| 34 | Lincoln Street | Separated Bike Lane | College Street | Lacy Street | Walk Bike Columbia | Columbia | 2308.27 |
| 35 | Hampton Street/Jarvis Klapman Boulevard | Separated Bike Lane | 9th Street | Park Street | West Columbia (2021) | West Columbia | 5058.44 |

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|---|---------------------|-------------------------|---------------------------------------|------------------------------|---------------|-----------------------|
| 36 | Laurel Street | Separated Bike Lane | Gist Street | Harden Street | Walk Bike Columbia | Columbia | 9175.67 |
| 37 | Hampton Street | Buffered Bike Lane | Park Street | Harden Street | Walk Bike Columbia | Columbia | 5790.18 |
| 38 | Sumter Street | Separated Bike Lane | Elmwood Avenue | Pendleton Street | Walk Bike Columbia | Columbia | 5798.99 |
| 39 | Harden Street | Separated Bike Lane | Bull Street | Greene Street | Walk Bike Columbia | Columbia | 12935.89 |
| 40 | New Greenway | Shared Use Path | Vista Greenway | Barrett Street | Walk Bike Columbia | Columbia | 3548.84 |
| 41 | Forest Drive | Buffered Bike Lane | Two Notch Road | Beltline Boulevard | Walk Bike Columbia | Columbia | 8387.02 |
| 42 | Two Notch Road/Millwood Avenue | Bike Lane | Gervais Street | Beltline Boulevard | Walk Bike Columbia | Columbia | 11534.61 |
| 43 | Millwood Avenue | Bike Lane | Maple Street | Devine Street | Walk Bike Columbia | Columbia | 3631.45 |
| 44 | Heyward Street | Bike Boulevard | Main Street | Bonham Road | Walk Bike Columbia | Columbia | 11135.11 |
| 45 | Yale Avenue | Bike Boulevard | Bonham Road | Wilmot Avenue | Walk Bike Columbia | Columbia | 3147.69 |
| 46 | Wheat Street | Bike Boulevard | Henderson Street | Kilbourne Road | Walk Bike Columbia | Columbia | 10403.48 |
| 47 | Wheat Street | Bike Lane | Main Street | Future Three River Greenway Extension | Walk Bike Columbia | Columbia | 5103.52 |
| 48 | Calhoun Street | Buffered Bike Lane | Vista Greenway | Harden Street | Walk Bike Columbia | Columbia | 7492.31 |
| 49 | Rosewood Drive | Separated Bike Lane | Olympia Avenue | Garners Ferry Road | Walk Bike Columbia | Columbia | 17585.65 |
| 50 | Assembly Street/George Rogers Boulevard | Shared Use Path | Blossom Street | Shop Road | Walk Bike Columbia | Columbia | 7025.14 |
| 51 | Shop Road | Shared Use Path | George Rogers Boulevard | Beltline Boulevard | Walk Bike Columbia | Columbia | 11967.59 |
| 52 | Olympia Avenue | Bike Lane | Olympia Park | Rosewood Drive | Walk Bike Columbia | Columbia | 4539.62 |
| 53 | Bluff Road | Shared Use Path | George Rogers Boulevard | Beltline Boulevard | Walk Bike Columbia | Columbia | 11724.78 |
| 54 | Heyward Street | Shared Use Path | Wayne Street | Granby Park Trails | Walk Bike Columbia | Columbia | 1986.89 |
| 55 | Williams Street | Bike Boulevard | Whaley Street | Blossom Street | Walk Bike Columbia | Columbia | 2030.52 |
| 56 | Leaphart Road | Buffered Bike Lane | Augusta Road | Holland Street | West Metro Bike and Ped Plan | West Columbia | 963.62 |
| 57 | Leaphart Road | Buffered Bike Lane | Augusta Road | Holland Street | West Metro Bike and Ped Plan | West Columbia | 585.09 |
| 58 | Leaphart Road | Buffered Bike Lane | Holland Street | Mineral Springs Road | West Metro Bike and Ped Plan | West Columbia | 9521.25 |

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|--------------------|--|--------------------|--------------------|------------------------------|---------------|-----------------------|
| 59 | Cardinal Drive | Wayfinding Signage and Traffic Calming | Saluda River Drive | Robin Crest Drive | West Metro Bike and Ped Plan | West Columbia | 2683.9 |
| 60 | Seminole Drive | Wayfinding Signage and Traffic Calming | Apache Trail | Choctaw Trail | West Metro Bike and Ped Plan | West Columbia | 3084.18 |
| 61 | Robin Crest Drive | Wayfinding Signage and Traffic Calming | Cardinal Drive | Cardinal Drive | West Metro Bike and Ped Plan | West Columbia | 6012.47 |
| 62 | Whippoorwill Drive | Wayfinding Signage and Traffic Calming | Robin Crest Drive | Sunset Boulevard | West Metro Bike and Ped Plan | West Columbia | 2088.37 |
| 63 | Choctaw Trail | Wayfinding Signage and Traffic Calming | Seminole Drive | Mohawk Drive | West Metro Bike and Ped Plan | West Columbia | 442.63 |
| 64 | Mohawk Drive | Wayfinding Signage and Traffic Calming | Choctaw Trail | Saluda River Drive | West Metro Bike and Ped Plan | West Columbia | 1874.23 |
| 65 | Saluda River Drive | Wayfinding Signage and Traffic Calming | Mohawk Drive | Cardinal Drive | West Metro Bike and Ped Plan | West Columbia | 2989.42 |
| 66 | Hook Avenue | Buffered Bike Lane | Holland Street | Sunset Boulevard | West Metro Bike and Ped Plan | West Columbia | 4853.65 |
| 67 | Holland Street | Bike Lane | Leaphart Road | Greenwood Road | West Metro Bike and Ped Plan | West Columbia | 3861.81 |
| 68 | Holland Street | Wayfinding Signage and Traffic Calming | Greenwood Road | N Brown Street | West Metro Bike and Ped Plan | West Columbia | 2000.18 |
| 69 | Brown Street | Wayfinding Signage and Traffic Calming | Holland Street | D Avenue | West Metro Bike and Ped Plan | West Columbia | 3994.07 |
| 70 | B Avenue | Wayfinding Signage and Traffic Calming | 12th Street | State Street | West Metro Bike and Ped Plan | West Columbia | 5078.82 |
| 71 | 9th Street | Buffered Bike Lane | Sunset Boulevard | B Avenue | West Columbia (2021) | West Columbia | 3346.58 |
| 72 | Sox Street | Wayfinding Signage and Traffic Calming | Glenn Street | Airport Boulevard | West Metro Bike and Ped Plan | Cayce | 3146.79 |
| 73 | Memorial Drive | Bike Lane | Edmund Highway | Backman Drive | West Metro Bike and Ped Plan | Cayce | 4287.11 |
| 74 | Memorial Drive | Buffered Bike Lane | Backman Drive | Charleston Highway | West Metro Bike and Ped Plan | Cayce | 751.02 |
| 75 | Botanical Parkway | Bike Lane | Sunset Boulevard | Mohawk Drive | West Columbia (2021) | West Columbia | 4683.43 |
| 76 | Airport Boulevard | Separated Bike Lane | Charleston Highway | I-26 | West Metro Bike and Ped Plan | Cayce | 7201.33 |

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|--------------------------------|--|-------------------------|---------------------------------|------------------------------|---------------|-----------------------|
| 77 | Williams Street | Wayfinding Signage and Traffic Calming | Platt Springs Road | Charleston Highway | West Metro Bike and Ped Plan | West Columbia | 2820.51 |
| 78 | Glenn Street | Wayfinding Signage and Traffic Calming | Sox Street | Platt Springs Road | West Metro Bike and Ped Plan | West Columbia | 614.71 |
| 79 | Rainbow Drive | Buffered Bike Lane | Platt Springs Road | Wilton Road | West Metro Bike and Ped Plan | Springdale | 4003.98 |
| 80 | Wilton Road | Buffered Bike Lane | Rainbow Drive | Watting Road | West Metro Bike and Ped Plan | Springdale | 6093.9 |
| 81 | Wattling Road | Buffered Bike Lane | Platt Springs Road | Augusta Road | West Metro Bike and Ped Plan | Springdale | 7916.96 |
| 82 | Woodberry Road | Buffered Bike Lane | Augusta Road | Jessamine Road | West Metro Bike and Ped Plan | West Columbia | 8866.06 |
| 83 | Jessamine Road | Buffered Bike Lane | Woodberry Road | Mineral Springs Road | West Metro Bike and Ped Plan | West Columbia | 3743.94 |
| 84 | Mineral Springs Road | Buffered Bike Lane | Leaphart Road | Jessamine Road | West Metro Bike and Ped Plan | West Columbia | 7208.47 |
| 85 | Mathias Road | Wayfinding Signage and Traffic Calming | Leaphart Road | Sunset Boulevard | West Metro Bike and Ped Plan | West Columbia | 3592.17 |
| 86 | Davega Drive | Buffered Bike Lane | Sunset Boulevard | Columbia Presbyterian Community | West Columbia (2021) | West Columbia | 7332.64 |
| 87 | Fairlane Drive/Pine Lake Drive | Bike Lane | Sunset Boulevard | Ephrata Drive | West Columbia (2021) | West Columbia | 2758.67 |
| 88 | Woodrow Street | Bike Lane | Rosewood Drive | Millwood Avenue | Walk Bike Columbia | Columbia | 6281.15 |
| 89 | Kilbourne Road | Bike Lane | Rosewood Drive | Beltline Boulevard | Walk Bike Columbia | Columbia | 7078.87 |
| 90 | Washington Street | Buffered Bike Lane | Lincoln Street | Pickens Street | Walk Bike Columbia | Columbia | 3673.79 |
| 91 | Park Street | Buffered Bike Lane | Taylor Street | Blossom Street | Walk Bike Columbia | Columbia | 5239.42 |
| 92 | S Main Street | Bike Lane | Pendleton Street | Whaley Street | Walk Bike Columbia | Columbia | 4212.46 |
| 93 | Main Street | Separated Bike Lane | River Drive | Laurel Street | Walk Bike Columbia | Columbia | 4304.75 |
| 94 | Ephrata Drive | Bike Lane | Quail Hollow Lane | Henbet Drive | West Columbia (2021) | West Columbia | 4663 |
| 95 | McSwain Drive | Wayfinding Signage and Traffic Calming | Residential Development | Terrace View Drive | West Metro Bike and Ped Plan | West Columbia | 3375.22 |
| 96 | Terrace View Drive | Wayfinding Signage and Traffic Calming | Robin Crest Drive | McSwain Drive | West Metro Bike and Ped Plan | West Columbia | 239.94 |

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|---|--|--------------------|-------------------|-------------------------------|---------------|-----------------------|
| 97 | Mohawk Drive to Riverbank Zoo/Garden Bridge | Separated Bike Lane | Mohawk Drive | Riverbank Bridge | West Columbia (2021) | West Columbia | 1957.86 |
| 98 | Oak Street | Bike Lane | MLK Park | Taylor Street | Three Rivers Bike Share Study | Columbia | 3780.28 |
| 99 | Oak Street | Bike Lane | Taylor Street | Elmwood Avenue | Three Rivers Bike Share Study | Columbia | 2218.37 |
| 100 | Laurel Street | Separated Bike Lane | Huger Street | Harden Street | Three Rivers Bike Share Study | Columbia | 2533.21 |
| 101 | Colonial Drive | Shared Use Path | Bull Street | Harden Street | Walk Bike Columbia | Columbia | 3154.28 |
| 102 | Boyce Street | Bike Boulevard | Colonial Drive | Saunders Street | Three Rivers Bike Share Study | Columbia | 1617.58 |
| 103 | Saunders Street | Bike Boulevard | Boyce Street | Barnwell Street | Three Rivers Bike Share Study | Columbia | 671.49 |
| 104 | Barnwell Street | Bike Boulevard | Saunders Street | Calhoun Street | Walk Bike Columbia | Columbia | 910.05 |
| 105 | Gist Street | Bike Boulevard | Laurel Street | Blanding Street | Walk Bike Columbia | Columbia | 498.1 |
| 106 | Blanding Street | Bike Boulevard | Gist Street | Williams Street | Walk Bike Columbia | Columbia | 267.7 |
| 107 | Williams Street | Bike Boulevard | Blanding Street | Gervais Street | Walk Bike Columbia | Columbia | 2576.21 |
| 108 | S Beltline Boulevard | Bike Lane | Bluff Road | Rosewood Drive | Walk Bike Columbia | Columbia | 14749.72 |
| 109 | Whaley Street | Bike Lane | Pickens Street | Huger Street | Walk Bike Columbia | Columbia | 5660.87 |
| 110 | Whaley Street | Shared Use Path | Huger Street | Gransby Park | Walk Bike Columbia | Columbia | 1783.41 |
| 111 | Harden Street | Buffered Bike Lane | Greene Street | Heyward Street | Walk Bike Columbia | Columbia | 3691.05 |
| 112 | S Harden Street | Buffered Bike Lane | Heyward Street | Rosewood Drive | Walk Bike Columbia | Columbia | 2097.39 |
| 113 | Columbia Circle | Bike Lane | Lexington Drive | Boston Avenue | West Metro Bike and Ped Plan | Springdale | 962 |
| 114 | Boston Avenue | Bike Lane | Columbia Circle | Airport Boulevard | West Metro Bike and Ped Plan | Springdale | 4383.09 |
| 115 | Lexington Drive | Bike Lane | Platt Springs Road | Columbia Circle | West Metro Bike and Ped Plan | Springdale | 2366.24 |
| 116 | Kitty Hawk Drive | Wayfinding Signage and Traffic Calming | Platt Springs Road | Boston Avenue | West Metro Bike and Ped Plan | Springdale | 3671.39 |
| 117 | Hampton Street/Jarvis Klapman Boulevard | Separated Bike Lane | Congaree River | Park Street | Walk Bike Columbia | Columbia | 4722.12 |

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|---|---------------------|--------------------------|-----------------------------------|-------------------------------|---------------------|-----------------------|
| 118 | Platt Springs Road | Separated Bike Lane | Jefferson Street | Lake Dogwood Drive | West Metro Bike and Ped Plan | Springdale | 17824.84 |
| 119 | Platt Springs Road | Separated Bike Lane | Charleston Highway | Jefferson Street | West Metro Bike and Ped Plan | West Columbia | 8846.92 |
| 120 | Santee Avenue | Bike Boulevard | Millwood Avenue | Harden Street | Three Rivers Bike Share Study | Columbia | 3423.9 |
| 121 | Plowden Road | Bike Boulevard | S Beltline Boulevard | Ott Road | Three Rivers Bike Share Study | Columbia | 2892.3 |
| 122 | S Ott Road | Bike Boulevard | Plowden Road | Jim Hamilton Boulevard | Three Rivers Bike Share Study | Columbia | 329.91 |
| 123 | Airport Boulevard | Shared Use Path | Jim Hamilton Boulevard | Holly Street | Three Rivers Bike Share Study | Columbia | 1485.44 |
| 124 | Holt Drive/Superior Street | Bike Boulevard | Airport Boulevard | S Pickens Street | Three Rivers Bike Share Study | Columbia | 3801.3 |
| 125 | S Holly Street | Bike Lane | Airport Boulevard | Rosewood Drive | Three Rivers Bike Share Study | Columbia | 2881.9 |
| 126 | Augusta Road | Separated Bike Lane | Jarvis Klapman Boulevard | Wattling Road | Three Rivers Bike Share Study | West Columbia | 10208.96 |
| 127 | Greenwood Road | Shared Use Path | Augusta Road | Proposed Off Road Shared Use Path | Three Rivers Bike Share Study | West Columbia | 4297.66 |
| 128 | Shared Use Path in Utility Easement | Shared Use Path | Sunset Boulevard | Greenwood Road | Three Rivers Bike Share Study | West Columbia | 1076.52 |
| 129 | Morlaine Road/Lavern Jumper Road/Dunbar Road/Glenn Street | Bike Boulevard | Charleston Highway | 12th Street | Three Rivers Bike Share Study | Cayce | 5592.05 |
| 130 | Charleston Highway | Separated Bike Lane | Airport Boulevard | Memorial Drive | Three Rivers Bike Share Study | Cayce | 6982.42 |
| 131 | Leaphart Road | Buffered Bike Lane | Mineral Springs Road | Sunset Boulevard | Three Rivers Bike Share Study | West Columbia | 5640.81 |
| 132 | Jessamine Road | Bike Lane | Leaphart Road | Mineral Springs Road | Three Rivers Bike Share Study | West Columbia | 7270.33 |
| 133 | 9th Street | Buffered Bike Lane | B Avenue | Naples Avenue | Three Rivers Bike Share Study | Cayce/West Columbia | 4388.77 |
| 134 | Julius Felder Street | Bike Lane | Taylor Street | Frink Street | Three Rivers Bike Share Study | Cayce | 4043.67 |

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A3. Sidewalk Projects Table

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|--------------------|--|--------------------------------|--------------------------|-------------------------------|-------------------------|-----------------------|
| 1 | Huger Street | Sidewalk | Senate Street | Devine Street | Walk Bike Columbia | Columbia | 2110.94 |
| 2 | Lincoln Street | Pedestrian and Bicycle Railroad Crossing | Existing Shared Use Path | Existing Shared Use Path | Three Rivers Bike Share Study | Columbia | 102.85 |
| 3 | Whaley Street | Sidewalk | Assembly Street | Main Street | Walk Bike Columbia | Columbia | 654.53 |
| 4 | Assembly Street | Sidewalk | South of Wheat Street/Railroad | Flora Street | Walk Bike Columbia | Columbia | 2142.08 |
| 5 | Lincoln Street | Pedestrian and Bicycle Railroad Crossing | Existing Shared Use Path | Existing Shared Use Path | Three Rivers Bike Share Study | Columbia | 96.01 |
| 6 | Huger Street | Sidewalk | Wheat Street | Catawba Street | Three Rivers Bike Share Study | Columbia | 1055.36 |
| 7 | B Street | Sidewalk | State Street | 12th Street | West Columbia (2021) | West Columbia | 5096.81 |
| 8 | 12th Street | Sidewalk | B Avenue | Knox Abbott Drive | West Columbia (2021) | Cayce | 2582.49 |
| 9 | Charleston Highway | Sidewalk | B Avenue | Knox Abbott Drive | West Columbia (2021) | West Columbia | 3139.79 |
| 10 | Frink Street | Sidewalk | State Street | 12th Street | West Metro Bike and Ped Plan | Cayce | 3879.42 |
| 11 | Norfolk Street | Sidewalk | Carpenter Street | State Street | Three Rivers Bike Share Study | West Columbia | 1033.52 |
| 12 | Alexander Street | Sidewalk | Norfolk Street | US Highway 21 | Three Rivers Bike Share Study | Cayce and West Columbia | 2834.54 |
| 13 | 12th Street | Sidewalk | Knox Abbott Drive | Frink Street | West Metro Bike and Ped Plan | Cayce | 4625.32 |
| 14 | Frink Street | Sidewalk | 12th Street | Charleston Highway | West Metro Bike and Ped Plan | Cayce | 8617.33 |
| 15 | Lafayette Avenue | Sidewalk | State Street | Charleston Highway | Three Rivers Bike Share Study | Cayce | 6613.95 |
| 16 | D Avenue | Sidewalk | Platt Springs Road | Alexandria Street | West Columbia (2021) | West Columbia | 4575.98 |
| 17 | Alexandria Street | Sidewalk | D Avenue | Grove Street | West Columbia (2021) | West Columbia | 936.81 |
| 18 | Grove Street | Sidewalk | Alexandria Street | Dreher Road | West Columbia (2021) | West Columbia | 1052.75 |
| 19 | 9th Street | Sidewalk | B Avenue | Popular Street | West Columbia (2021) | Cayce | 5147.34 |
| 20 | D Avenue | Sidewalk | 12th Street | 9th Street | West Columbia (2021) | West Columbia | 1793.96 |
| 21 | Taylor Street | Sidewalk | Huger Street | Williams Street | Walk Bike Columbia | Columbia | 559.98 |
| 22 | Augusta Street | Sidewalk | 12th Street | State Street | West Columbia (2021) | West Columbia | 5250.8 |

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|---|----------------|-----------------------|----------------------|-------------------------------|--------------------------------------|-----------------------|
| 23 | Assembly Street/George Rogers Boulevard | Sidewalk | Flora Street | Shop Road | Walk Bike Columbia | Columbia | 4507.11 |
| 24 | Olympia Avenue | Sidewalk | Olympia Park | Rosewood Drive | Walk Bike Columbia | Columbia | 4539.62 |
| 25 | Rosewood Drive | Sidewalk | Assembly Street | Olympia Avenue | Three Rivers Bike Share Study | Columbia | 2144.1 |
| 26 | Seminole Drive | Sidewalk | Apache Trail | Choctaw Trail | West Columbia (2021) | West Columbia | 3084.18 |
| 27 | Choctaw Trail | Sidewalk | Seminole Drive | Mohawk Drive | West Columbia (2021) | West Columbia | 442.63 |
| 28 | Mohawk Drive | Sidewalk | Choctaw Trail | Saluda River Drive | West Columbia (2021) | West Columbia | 1874.23 |
| 29 | Saluda River Drive | Sidewalk | Mohawk Drive | Cardinal Drive | West Columbia (2021) | West Columbia | 2989.42 |
| 30 | Cardinal Drive | Sidewalk | Redbird Lane | Robin Crest Drive | West Columbia (2021) | West Columbia | 4277.64 |
| 31 | Robin Crest Drive | Sidewalk | Cardinal Drive | Cardinal Drive | West Columbia (2021) | West Columbia | 6012.47 |
| 32 | Hook Avenue | Sidewalk | Holland Street | Sunset Boulevard | West Columbia (2021) | West Columbia | 4853.65 |
| 33 | Whippoorwill Drive | Sidewalk | Robin Crest Drive | Sunset Boulevard | West Columbia (2021) | West Columbia | 2088.37 |
| 34 | Godley Street/New State Road | Sidewalk | 12th Street Extension | Cayce Riverwalk | West Metro Bike and Ped Plan | Cayce | 5169.37 |
| 35 | 12th Street Extension | Sidewalk | Frink Street | Saxe Gotha Road | West Metro Bike and Ped Plan | Cayce | 14988.38 |
| 36 | Brown Street | Sidewalk | D Avenue | Shull Street | West Columbia (2021) | West Columbia | 2177.58 |
| 37 | Airport Boulevard | Sidewalk | Charleston Highway | Edge of Cayce | West Metro Bike and Ped Plan | Cayce, Springdale, and West Columbia | 12122.33 |
| 38 | Charleston Highway | Sidewalk | North Eden Drive | Memorial Drive | West Metro Bike and Ped Plan | Cayce | 1597.83 |
| 39 | North Eden Drive/Julius Felder Street | Sidewalk | Taylor Road | Russell Road | West Metro Bike and Ped Plan | Cayce | 6281.54 |
| 40 | North Eden Drive | Sidewalk | Russell Road | Charleston Highway | West Metro Bike and Ped Plan | Cayce | 1397.15 |
| 41 | Taylor Road | Sidewalk | 12th Extension | Frink Street | West Metro Bike and Ped Plan | Cayce | 7622.05 |
| 42 | Memorial Drive | Sidewalk | Edmund Highway | Backman Drive | West Metro Bike and Ped Plan | Cayce | 4287.11 |
| 43 | Memorial Drive | Sidewalk | Backman Drive | Charleston Highway | West Metro Bike and Ped Plan | Cayce | 751.02 |
| 44 | Dreher Road | Sidewalk | Augusta Road | Platt Springs Road | West Columbia (2021) | West Columbia | 4960.72 |
| 45 | Leaphart Road | Sidewalk | Holland Street | Mineral Springs Road | West Columbia (2021) | West Columbia | 9521.25 |
| 46 | Holland Street | Sidewalk | Greenwood Road | N Brown Street | West Columbia (2021) | West Columbia | 11521.43 |
| 47 | Sox Street | Sidewalk | Glenn Street | Airport Boulevard | West Metro Bike and Ped Plan | West Columbia | 3146.79 |

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|--------------------------------|----------------|-------------------------|---------------------------------|------------------------------|---------------|-----------------------|
| 48 | Williams Street | Sidewalk | Platt Springs Road | Charleston Highway | West Metro Bike and Ped Plan | West Columbia | 2820.51 |
| 49 | Glenn Street | Sidewalk | Sox Street | Platt Springs Road | West Metro Bike and Ped Plan | West Columbia | 614.71 |
| 50 | Rainbow Drive | Sidewalk | Platt Springs Road | Wilton Road | West Columbia (2021) | Springdale | 4003.98 |
| 51 | Wilton Road | Sidewalk | Rainbow Drive | Watting Road | West Columbia (2021) | Springdale | 6093.9 |
| 52 | Wattling Road | Sidewalk | Platt Springs Road | Augusta Road | West Columbia (2021) | Springdale | 7916.96 |
| 53 | Woodberry Road | Sidewalk | Augusta Road | Jessamine Road | West Metro Bike and Ped Plan | West Columbia | 8866.06 |
| 54 | Jessamine Road | Sidewalk | Woodberry Road | Mineral Springs Road | West Metro Bike and Ped Plan | West Columbia | 3743.94 |
| 55 | Mineral Springs Road | Sidewalk | Leaphart Road | Jessamine Road | West Metro Bike and Ped Plan | West Columbia | 7208.47 |
| 56 | Mathias Road | Sidewalk | Leaphart Road | Sunset Boulevard | West Columbia (2021) | West Columbia | 3592.17 |
| 57 | 12th Street | Sidewalk | Sunset Boulevard | B Avenue | West Columbia (2021) | West Columbia | 4620.29 |
| 58 | Leaphart Road | Sidewalk | Augusta Road | Holland Street | West Columbia (2021) | West Columbia | 963.62 |
| 59 | Holland Street | Sidewalk | Leaphart Road | Greenwood Road | West Columbia (2021) | West Columbia | 3861.81 |
| 60 | Brown Street | Sidewalk | Holland Street | D Avenue | West Columbia (2021) | West Columbia | 3994.07 |
| 61 | Davega Drive | Sidewalk | Sunset Boulevard | Columbia Presbyterian Community | West Columbia (2021) | West Columbia | 7332.64 |
| 62 | Fairlane Drive/Pine Lake Drive | Sidewalk | Sunset Boulevard | Ephrata Drive | West Columbia (2021) | West Columbia | 2758.67 |
| 63 | Ephrata Drive | Sidewalk | Quail Hollow Lane | Henbet Drive | West Columbia (2021) | West Columbia | 4663 |
| 64 | McSwain Drive | Sidewalk | Residential Development | Terrace View Drive | West Columbia (2021) | West Columbia | 3375.22 |
| 65 | Terrace View Drive | Sidewalk | Robin Crest Drive | McSwain Drive | West Columbia (2021) | West Columbia | 239.94 |
| 66 | Leaphart Road | Sidewalk | Augusta Road | Holland Street | West Columbia (2021) | West Columbia | 585.09 |
| 67 | C Avenue | Sidewalk | 12th Street | State Street | West Columbia (2021) | West Columbia | 4885.54 |
| 68 | Witt Street | Sidewalk | Violet Street | Augusta Street | West Columbia (2021) | West Columbia | 1478.21 |
| 69 | Center Street | Sidewalk | Charleston Highway | State Street | West Columbia (2021) | West Columbia | 5182.22 |
| 70 | Shuler Street | Sidewalk | Meeting Street | B Avenue | West Columbia (2021) | West Columbia | 1415.52 |
| 71 | Lucas Street | Sidewalk | Meeting Street | End of Road | West Columbia (2021) | West Columbia | 699.3 |
| 72 | Leaphart Street | Sidewalk | Meeting Street | Violet Street | West Columbia (2021) | West Columbia | 807.16 |

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|---------------------------------------|----------------|--------------------|--------------------|------------------------------|---------------|-----------------------|
| 73 | Violet Street | Sidewalk | Leaphart Street | End of Road | West Columbia (2021) | West Columbia | 2544.58 |
| 74 | Shull Street | Sidewalk | Leaphart Street | 9th Street | West Columbia (2021) | West Columbia | 3042.29 |
| 75 | Shull Street | Sidewalk | End of Road | Roof Street | West Columbia (2021) | West Columbia | 1308.17 |
| 76 | Lexington Street | Sidewalk | End of Road | Meeting Street | West Columbia (2021) | West Columbia | 803.32 |
| 77 | Roof Street | Sidewalk | End of Street | Meeting Street | West Columbia (2021) | West Columbia | 767.26 |
| 78 | Shull Street | Sidewalk | Roof Street | Caughman Street | West Columbia (2021) | West Columbia | 3667.68 |
| 79 | Senn Street | Sidewalk | Lacy Street | Augusta Road | West Columbia (2021) | West Columbia | 1529.6 |
| 80 | Jensen Street | Sidewalk | End of Road | Senn Street | West Columbia (2021) | West Columbia | 907.1 |
| 81 | Meeting Street | Sidewalk | Senn Street | Brown Street | West Columbia (2021) | West Columbia | 1172.25 |
| 82 | Parson Street | Sidewalk | Augusta Road | Lacy Street | West Columbia (2021) | West Columbia | 1314.61 |
| 83 | Parnell Street | Sidewalk | Augusta Road | Lacy Street | West Columbia (2021) | West Columbia | 1238.58 |
| 84 | Parson Street | Sidewalk | Augusta Street | D Avenue | West Columbia (2021) | West Columbia | 1204.15 |
| 85 | C Avenue | Sidewalk | 17th Street | Charleston Highway | West Columbia (2021) | West Columbia | 2992.06 |
| 86 | Burnham Street | Sidewalk | Lacy Street | Brown Street | West Columbia (2021) | West Columbia | 2096.85 |
| 87 | Charleston Highway | Sidewalk | Knox Abbott Drive | Williams Street | West Metro Bike and Ped Plan | West Columbia | 2649.64 |
| 88 | Woodside Parkway | Sidewalk | Augusta Road | Rainbow Drive | West Columbia (2021) | West Columbia | 4421.09 |
| 89 | Henbet Drive | Sidewalk | Sunset Boulevard | Existing Sidewalk | West Columbia (2021) | West Columbia | 2272.41 |
| 90 | Henbet Drive | Sidewalk | Proposed Sidewalk | Existing Sidewalk | West Columbia (2021) | West Columbia | 1192.03 |
| 91 | Hulon Lane | Sidewalk | Two Mac Lane | Fairlane Drive | West Columbia (2021) | West Columbia | 2875.59 |
| 92 | Hummingbird Drive | Sidewalk | Saluda River Drive | Sunset Drive | West Columbia (2021) | West Columbia | 3140.83 |
| 93 | Saluda River Drive | Sidewalk | Hummingbird Drive | Cardinal Drive | West Columbia (2021) | West Columbia | 722.78 |
| 94 | Redbird Drive | Sidewalk | Hummingbird Drive | Cardinal Drive | West Columbia (2021) | West Columbia | 739.13 |
| 95 | Duke Street | Sidewalk | Gilvie Avenue | Mohawk Drive | West Columbia (2021) | West Columbia | 2237.37 |
| 96 | Duke Street-Seminole Street Connector | Sidewalk | Mohawk Drive | Ottawa Trail | West Columbia (2021) | West Columbia | 765.71 |
| 97 | Comanche Trail | Sidewalk | Seminole Drive | Lucas Street | West Columbia (2021) | West Columbia | 2529.99 |

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|----------------------|----------------|--------------------|--------------------------|-------------------------------|---------------|-----------------------|
| 98 | N Lucas Street | Sidewalk | Comanche Trail | Sunset Boulevard | West Columbia (2021) | West Columbia | 3370.41 |
| 99 | N Lucas Street | Sidewalk | Sunset Boulevard | Buff Street | West Columbia (2021) | West Columbia | 702 |
| 100 | Whisper Way | Sidewalk | End of Road | N Lucas Street | West Columbia (2021) | West Columbia | 595.1 |
| 101 | Leaphart Street | Sidewalk | Sunset Boulevard | Buff Street | West Columbia (2021) | West Columbia | 550.09 |
| 102 | Buff Street | Sidewalk | 9th Street | Leaphart Street | West Columbia (2021) | West Columbia | 2180.38 |
| 103 | Raleigh Street | Sidewalk | Koon Street | Sunset Boulevard | West Columbia (2021) | West Columbia | 2373.33 |
| 104 | Jasper Street | Sidewalk | Sunset Boulevard | End of Road | West Columbia (2021) | West Columbia | 1557.33 |
| 105 | N Line Street | Sidewalk | Leaphart Street | Lacey Street | West Columbia (2021) | West Columbia | 1434.67 |
| 106 | Batchelor Street | Sidewalk | Parson Street | N Brown Street | West Columbia (2021) | West Columbia | 784.02 |
| 107 | Parson Street | Sidewalk | Ross Street | End of Existing Sidewalk | West Columbia (2021) | West Columbia | 889.66 |
| 108 | Earl Street | Sidewalk | Holland Street | Holland Street | West Columbia (2021) | West Columbia | 1044.38 |
| 109 | Batchelor Street | Sidewalk | End of Road | Brown Street | West Columbia (2021) | West Columbia | 2015.07 |
| 110 | Karlaney Avenue | Sidewalk | 12th Street | End of Street | Three Rivers Bike Share Study | Cayce | 5019.68 |
| 111 | Naples Avenue | Sidewalk | State Street | Alex Street | Three Rivers Bike Share Study | Cayce | 6055.52 |
| 112 | Poplar Street | Sidewalk | Lorick Street | 12th Street | Three Rivers Bike Share Study | Cayce | 4870.37 |
| 113 | Denham Avenue | Sidewalk | D Avenue | Platt Springs Road | Three Rivers Bike Share Study | West Columbia | 1842.73 |
| 114 | 7th Street | Sidewalk | Knox Abbott Drive | Poplar Street | Three Rivers Bike Share Study | Cayce | 2698.17 |
| 115 | Axtell Drive | Sidewalk | Knox Abbott Drive | Naples Avenue | Three Rivers Bike Share Study | Cayce | 2718.02 |
| 116 | Julius Felder Street | Sidewalk | Frink Street | Taylor Road | Three Rivers Bike Share Study | Cayce | 4021.21 |
| 117 | Middleton Street | Sidewalk | Charleston Highway | Dunbar Road | Three Rivers Bike Share Study | Cayce | 2356.21 |
| 118 | Dunbar Road | Sidewalk | Middleton Street | Wadsworth Drive | Three Rivers Bike Share Study | Cayce | 1409.26 |
| 119 | Lexington Drive | Sidewalk | Platt Springs Road | Columbia Circle | West Metro Bike and Ped Plan | Springdale | 2366.24 |
| 120 | Boston Avenue | Sidewalk | Columbia Circle | Airport Boulevard | West Metro Bike and Ped Plan | Springdale | 4383.09 |
| 121 | Columbia Circle | Sidewalk | Lexington Drive | Boston Avenue | West Metro Bike and Ped Plan | Springdale | 962 |
| 122 | Kitty Hawk Drive | Sidewalk | Platt Springs Road | Boston Avenue | West Metro Bike and Ped Plan | Springdale | 3671.39 |
| 123 | Rainbow Drive | Sidewalk | Wilton Road | Platt Springs Road | Three Rivers Bike Share Study | Springdale | 3201.26 |

| Project ID | Street Name | Recommendation | From | To | Source | Municipality | Linear Feet (one way) |
|------------|---------------------|----------------|------------------|------------------|-------------------------------|---------------|-----------------------|
| 124 | Northland Drive | Sidewalk | Sunnyside Drive | 12th Street | Three Rivers Bike Share Study | Cayce | 4433.47 |
| 125 | Sunnyside Drive | Sidewalk | Frink Street | Northland Drive | Three Rivers Bike Share Study | Cayce | 938.89 |
| 126 | Orchard Street | Sidewalk | Frink Street | Taylor Road | Three Rivers Bike Share Study | Cayce | 3159.91 |
| 127 | Alex Street | Sidewalk | Naples Avenue | Lafayette Avenue | Three Rivers Bike Share Study | Cayce | 717.44 |
| 128 | 13th Street | Sidewalk | Karlaney Avenue | 12th Street | Three Rivers Bike Share Study | Cayce | 2349.89 |
| 129 | Sunset Boulevard | Sidewalk | W Hospital Drive | Davega Drive | Three Rivers Bike Share Study | West Columbia | 9921.08 |
| 130 | Methodist Park Road | Sidewalk | Leaphart Road | Augusta Road | Three Rivers Bike Share Study | West Columbia | 7534.26 |
| 131 | Freed Street | Sidewalk | Sabal Street | Boyce Street | Three Rivers Bike Share Study | Columbia | 616.11 |
| 132 | Colonial Drive | Sidewalk | Gregg Street | Harden Street | Walk Bike Columbia | Columbia | 3193.66 |
| 133 | Barnwell Street | Sidewalk | Calhoun Street | Saunders Street | Three Rivers Bike Share Study | Columbia | 859.49 |
| 134 | Saunders Street | Sidewalk | Barnwell Street | Boyce Street | Three Rivers Bike Share Study | Columbia | 639.24 |
| 135 | Laurel Street | Sidewalk | Williams Street | Gist Street | Three Rivers Bike Share Study | Columbia | 283.72 |
| 136 | Gist Street | Sidewalk | Laurel Street | Blanding Street | Three Rivers Bike Share Study | Columbia | 512.32 |
| 137 | Jessamine Street | Sidewalk | Axtell Drive | Poplar Street | Three Rivers Bike Share Study | Cayce | 244.81 |

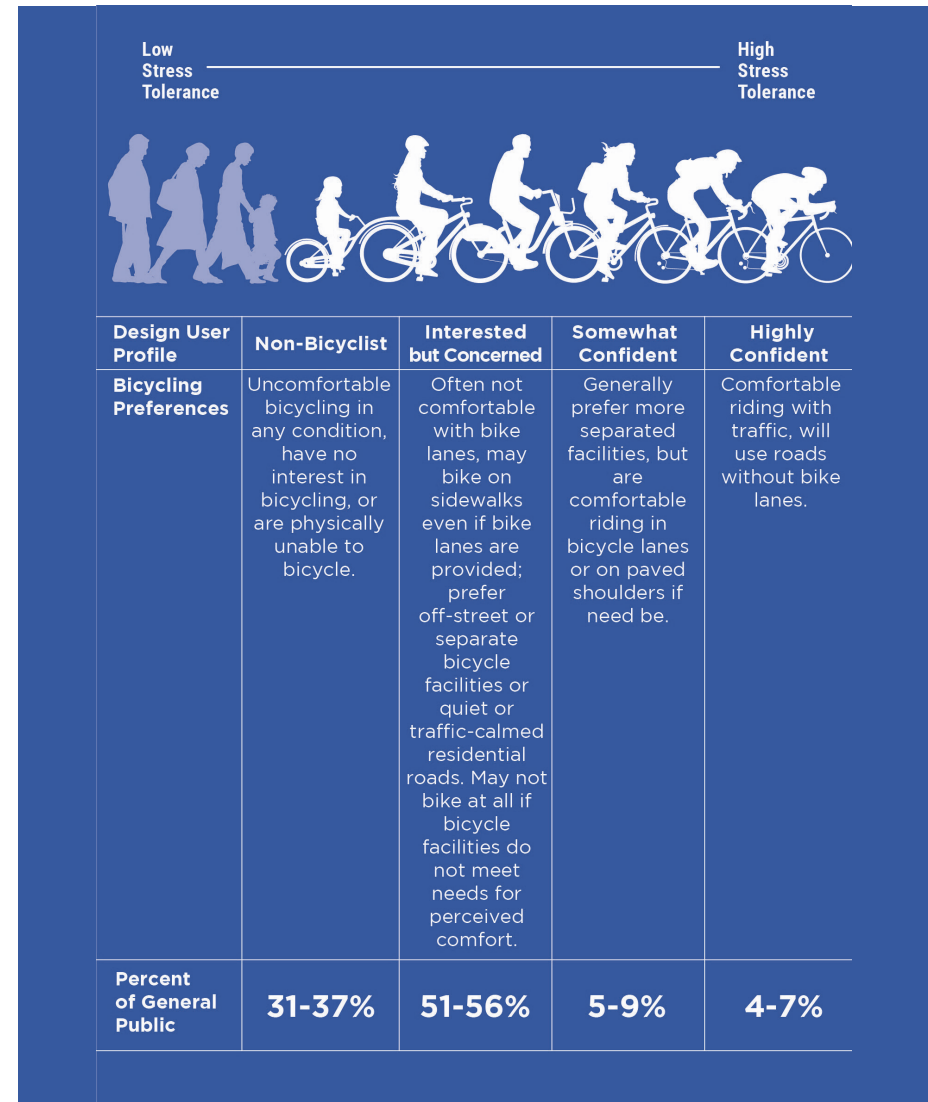
A4. Design Guidance

Summary

Recommendations that achieve a safe, connected, accessible, comfortable, and convenient bicycle and pedestrian network require design guidance that reflects best practices and can serve as a resource for the region moving forward. This design guidance should be used by planners and engineers to better understand important considerations as they plan and design safe and comfortable infrastructure. Pedestrian and Bicycle design features in this appendix may update existing local standards while others may be new treatments to be adopted by the City of Cayce, the City of Columbia, Town of Springdale and the City of West Columbia for implementation.

The following guidance is based on national standards and recommendations. Each jurisdiction should coordinate with SCDOT when considerations are being made to locate amenities within the state-owned ROW.

Comfort Typology of Bicyclists



Why design pedestrian facilities using this guidance?

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

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

Why design bicycle facilities using this guidance?

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

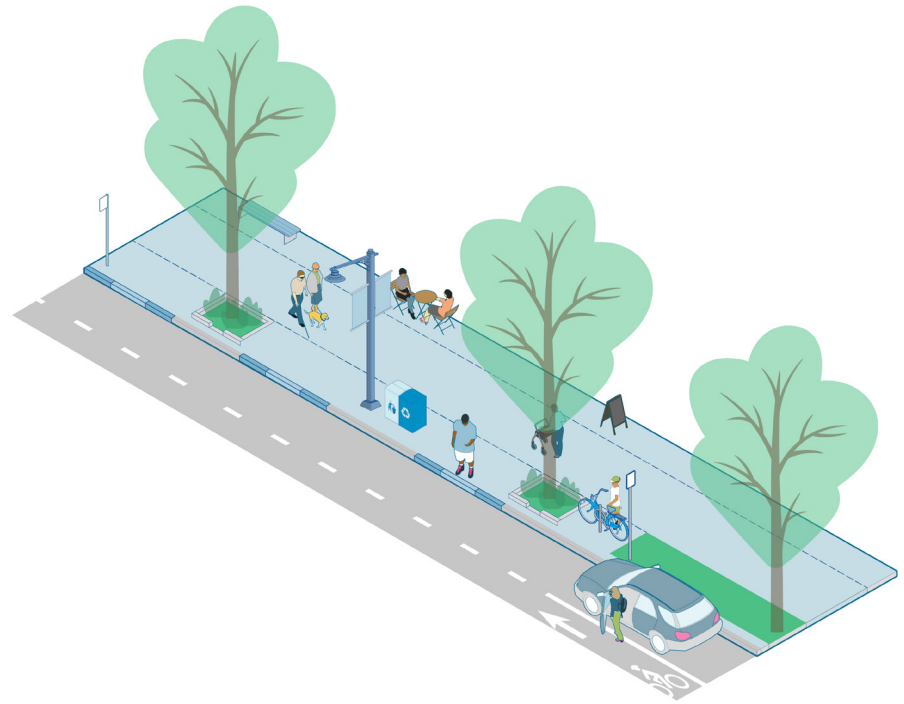
01: Sidewalks

Sidewalks play a critical role in the character, function, enjoyment, and accessibility of neighborhoods, main streets, and other community destinations. Sidewalks are the place typically reserved for pedestrians within the public right-of-way, adjacent to property lines or the building face. In addition to providing separation between vehicles and pedestrians, the spaces between sidewalks and roadways also accommodate street trees and other plantings, stormwater infrastructure, streetlights, and bicycle racks.

1. The Frontage Zone is located furthest from the curb, occupying the space closest to the building face. In commercial areas, the Frontage Zone may include architectural features, outdoor displays, café seating, awnings, signage, and other appurtenances that activate building frontages. In residential areas, the Frontage Zone may consist of front porches, stoops, lawns, or other landscape elements that extend from the front door to the sidewalk edge. Depending on context, need, and demand, Frontage Zones may vary in width from just a few feet to a much wider area.

2. The Active Travel Zone is the portion of the sidewalk where people can walk and wheel in a continuous, direct path, safe from conflicts with other travel modes and unencumbered by street furnishings, frontage improvements, and other obstacles. Special attention should be given to avoid obstacles that are added over time within and adjacent to the Active Travel Zone. Gradual individual additions can add up, resulting in a crowded, uncomfortable, and/or unsafe walking and wheeling environment.

3. The Amenity Zone is the location for street furnishings, pedestrian-scale lighting, bike parking, transit stops and shelters, and other amenities, this zone supports pedestrians as they travel along the sidewalk and transition to/from other modes at the curb. Additionally, this zone assists motorists, bicyclists, and people using other micromobility modes by housing signage, wayfinding, and street lighting.



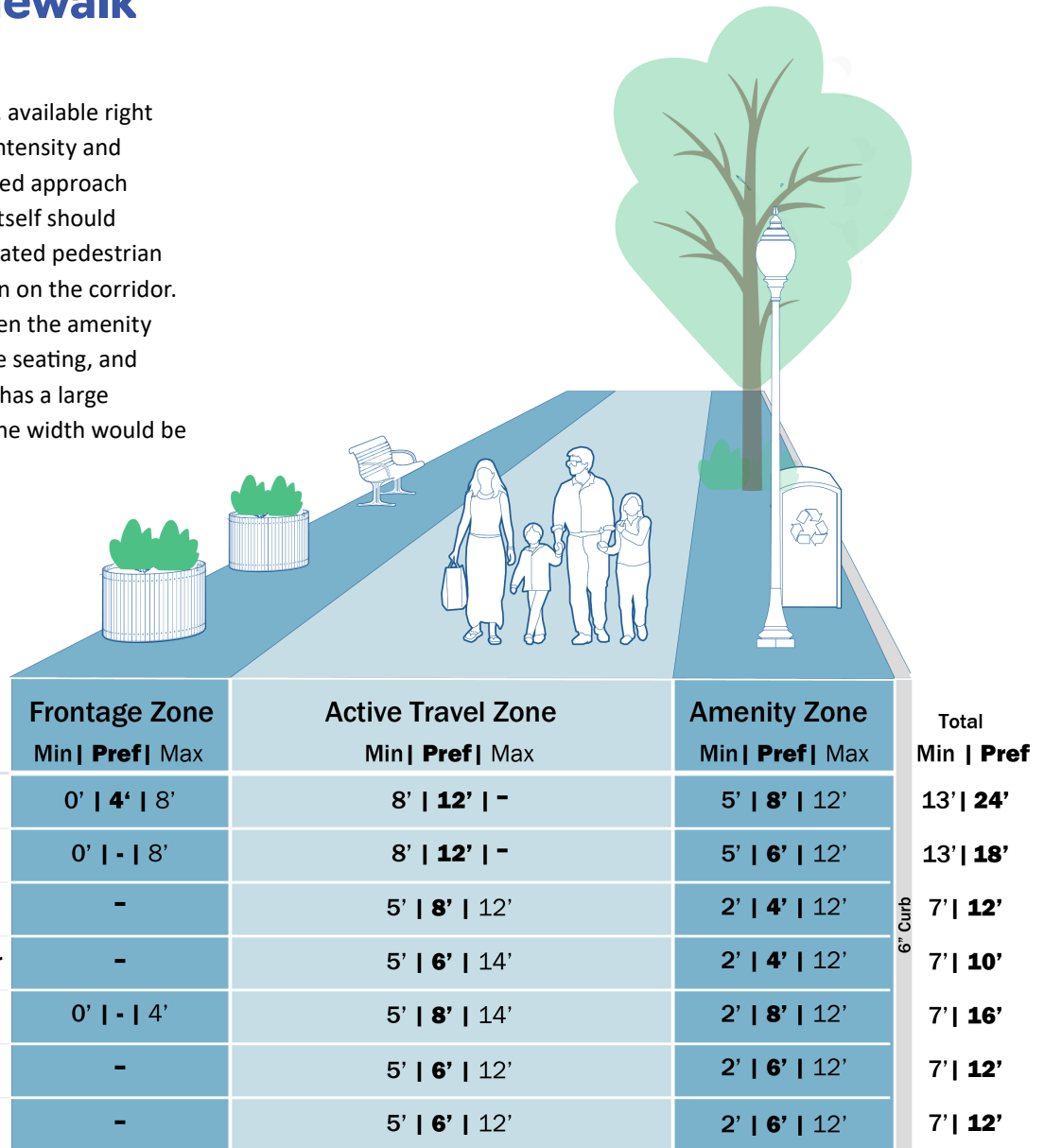
References

NACTO Urban Street Design Guide (2013)

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

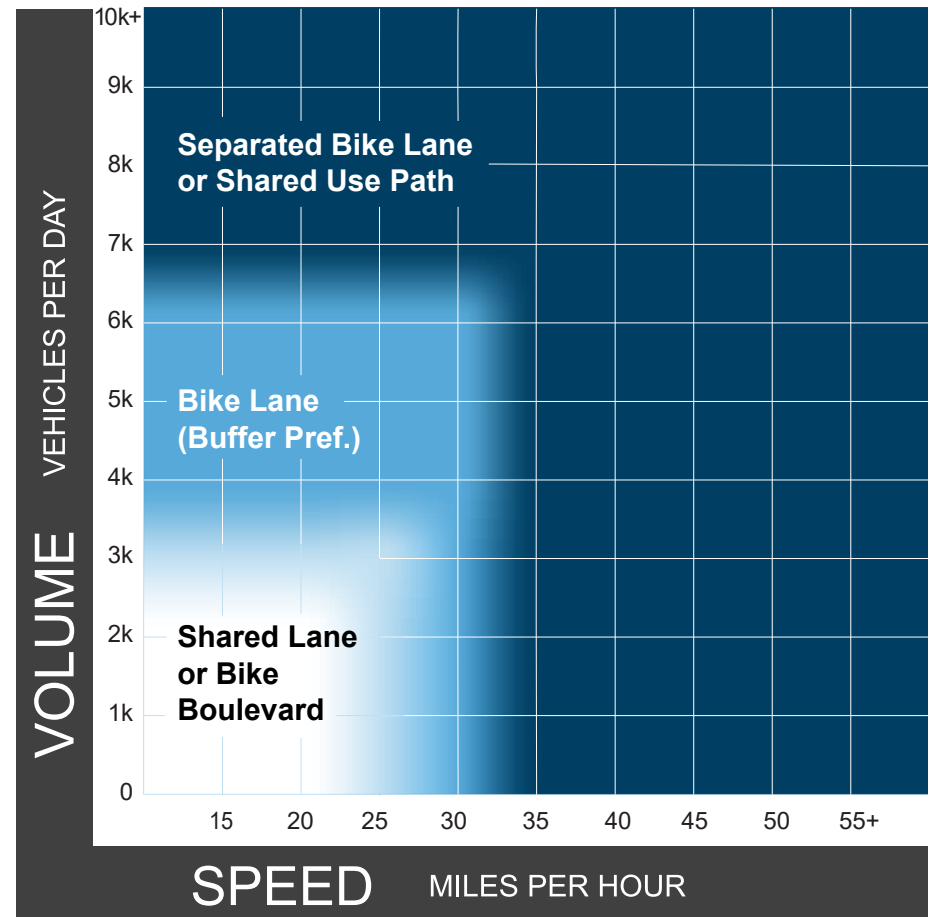
02: Preferred Widths for Sidewalk Zones

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



03: Bicycle Facility Selection

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



1. Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.
2. Advisory bike lanes may be an option where traffic volume is <3k ADT
3. See Section 4.4 of the FHWA Bikeway Selection Guide for a discussion of alternatives if the preferred bikeway type is not feasible

04: Shared Use Paths and Sidepaths

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

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

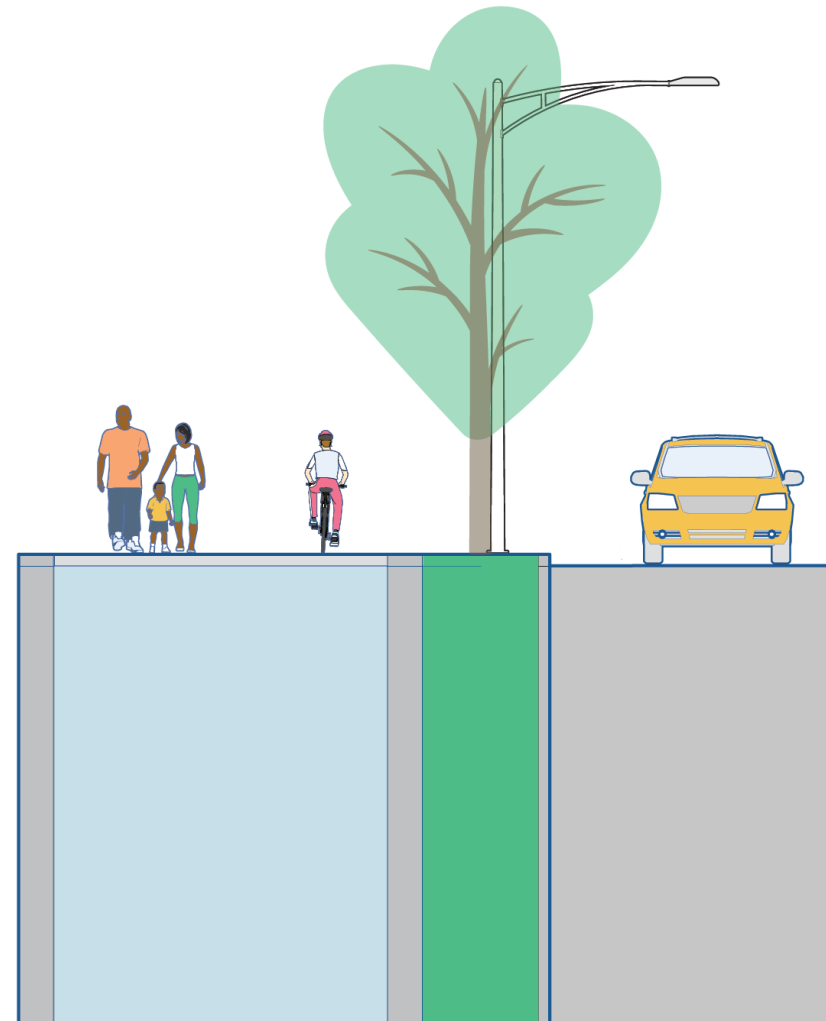
Guidance

Use a width of 10' to 12' with 8' being the minimum for short distances in constrained areas. Heavy volumes or a high proportion of pedestrians may require more than 12'.

Design multi-use paths using state and national standards, including establishing a design speed (i.e., typically 18 mph) and appropriate geometry.

Give priority to path users at intersections with roadways, including physical separation and timing and high-visibility crossing treatments.

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



References

AASHTO Guide for the Development of Bicycle Facilities (2012)

FHWA Bikeway Selection Guide (2019)

AASHTO Guide for the Development of Bicycle Facilities (2012)

05: Separated Bike Lanes

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

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

- 3 or more traffic lanes
- posted speed limit of 30 mph or greater
- average daily traffic of 9,000 vehicles or greater
- frequent parking turnover
- high potential for bike lane obstruction

Guidance

- Determine bike lane width by the anticipated peak hour bicycle and micromobility volume.
- Require a street buffer that is separated from the street by vertical elements (see additional guidance on Vertical Separation on page 90).
- Narrow travel and parking lanes to minimum widths in constrained corridors before narrowing bikeway width. Prioritize reduction of the space allocated to the street before narrowing other spaces. This can include decreasing the number of travel lanes, narrowing existing lanes, and/or adjusting on-street parking.
- Avoid narrowing sidewalks beyond the minimum necessary to accommodate pedestrian demand.

- Prevent the narrowing or elimination of the street buffer, as it is critical to the safety of SBLs.
- Maintain a minimum bike lane width of 5' for one-way SBLs and 8' feet for two-way bikeways.

Additional Considerations

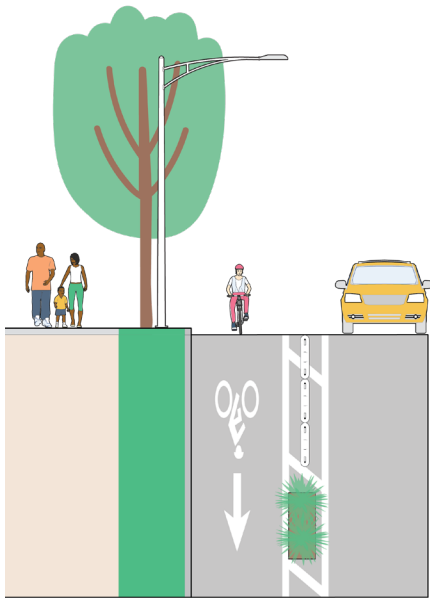
- Use of flexposts or low-profile curbs offer the least separation from traffic and should be used as an interim solution.
- Protecting bikeways with landscaping and/or on-street parking offer a high degree of separation, comfort, and safety to bicyclists and other micromobility users.
- Use of grade separation can provide an additional physical and visual cue to reinforce the distinction of the bikeway from adjacent motor vehicle travel lanes and pedestrian spaces, but these will often require roadway reconstruction.
- Employing one-way SBLs in the direction of motorized travel provides intuitive and simplified transitions to existing bike lanes and shared travel lanes.
- Implementation of two-way SBLs require special attention to properly transition contra-flow bicyclists and other micromobility users into existing bike lanes and shared travel lanes.
- Consider the need for specialized equipment to maintain separated bicycle lanes, as traditional street sweepers are too large to access them. Smaller street sweepers are available, and local governments should explore the opportunity to share the investment and use of such with one another.

References

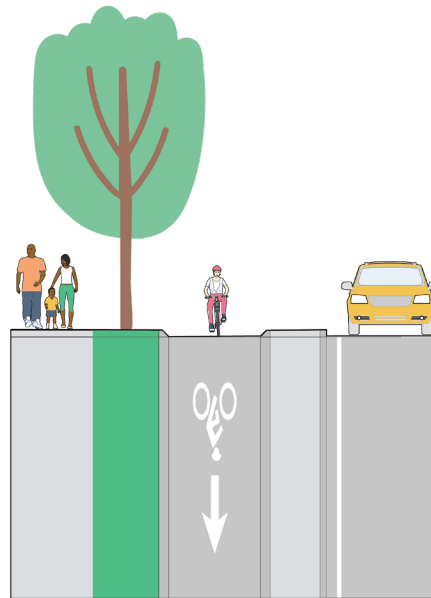
FHWA Bikeway Selection Guide (2019)

FHWA Achieving Multimodal Networks (2016)

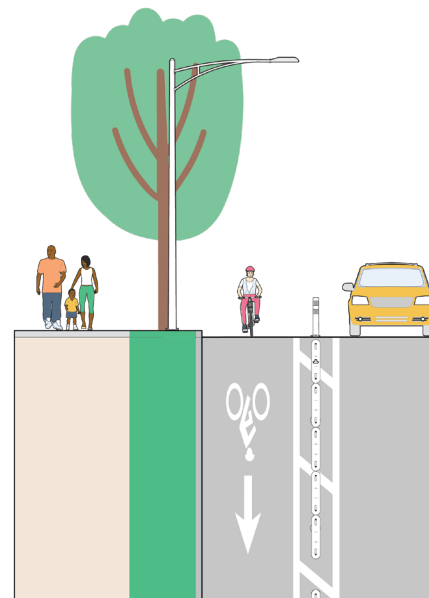
NACTO Urban Bikeway Design Guide (2013)



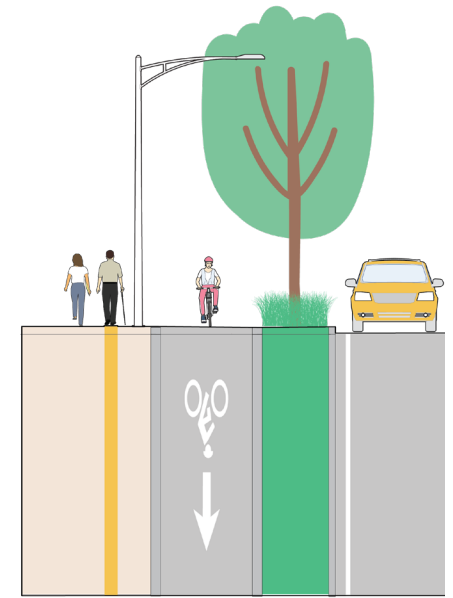
Using Flexible Bollards



Using Flexible Bollards and Planter Boxes



Using Concrete Median



Using Planted Median

06: Vertical Separations

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

Guidance

- Consider actual operating speeds of motorized vehicles, posted speed limits, and land use context when selecting the most appropriate material for vertical separation.
- Flexposts, which are commonly used in retrofit, quick-build, or interim design projects, are appropriate in both low and high-speed conditions. While less expensive than some other vertical treatments, they do require continuous maintenance and can be perceived as less attractive than other options.
- Planters provide a more attractive and sustainable atmosphere to the bikeway. They may be used on streets with operating speeds up to 40 mph. When speeds are above 30 mph, a highly durable planter material should be used.
- Precast and permanent curb are appropriate on streets with speeds up to 45 mph.
- Parking stops can be used on streets with speeds up to 40 mph.
- Locate vertical elements within the buffer or on the outside edge line of SBLs and multi-use paths. When installing vertical elements, a minimum buffer width of 2' is recommended.
- Install painted edge lines and vertical elements to guide drivers to park at least 3' from the bikeway when parking is adjacent to the bikeway.

Additional Considerations

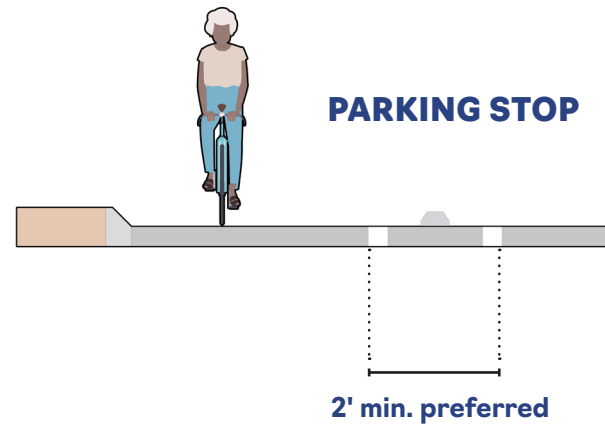
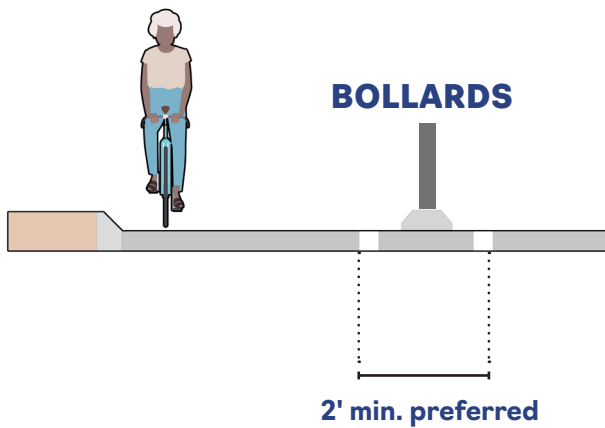
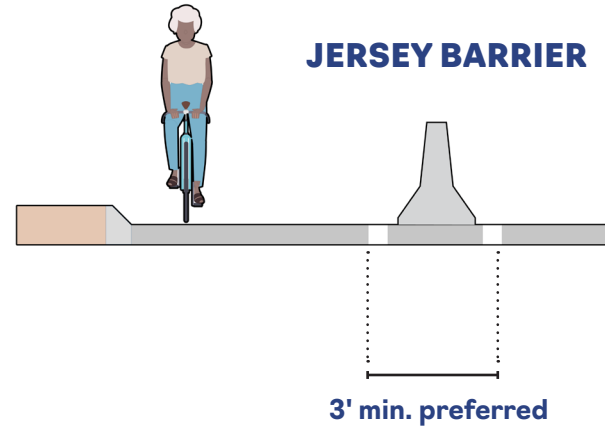
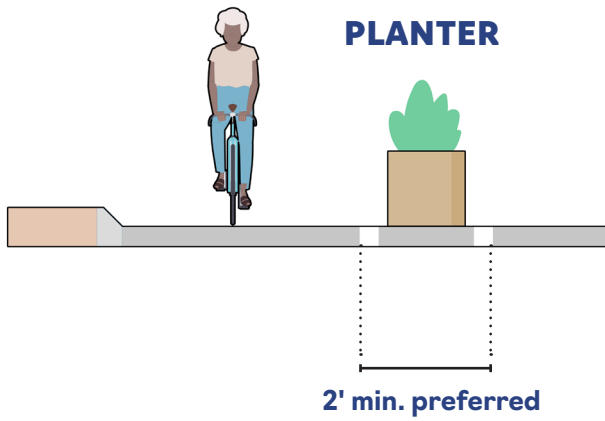
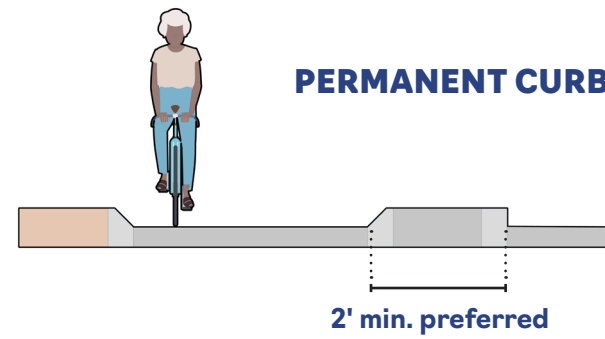
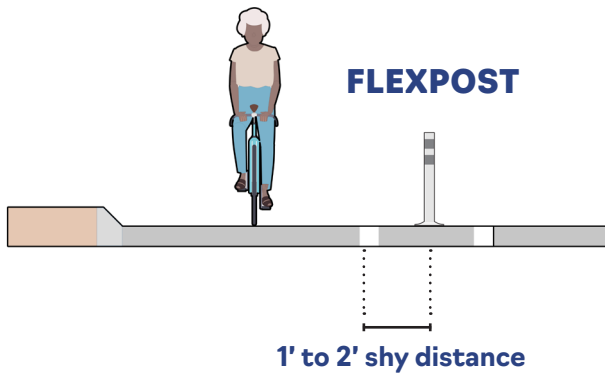
- Use of any vertical barrier introduces additional but varying maintenance considerations.
- Consider the visual environment where the vertical separation will be employed before selecting a material type.

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

References

FHWA Achieving Multimodal Networks (2016)

NACTO Urban Bikeway Design Guide (2013)



07: Buffered Bike Lane

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

Use

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

Guidance

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

Additional Considerations

- Retrofit existing street space to provide buffers through the reduction of the number of travel lanes, narrowing of existing travel lanes, or reorganization of on-street parking.
- Consider placing buffer next to on-street parking lanes. If the bikeway is between the parking lane and the curb, the buffer should be located in the door zone of parked cars.

- While not as effective as SBLs, research has documented that buffered bike lanes increase the perception of safety.
- Install buffered bike lanes where 7' of roadway width is available (on each side), rather than a striped bike lane.



References

FHWA Achieving Multimodal Networks (2016)

NACTO Urban Bikeway Design Guide (2013)

08: Striped Bike Lane

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

Use

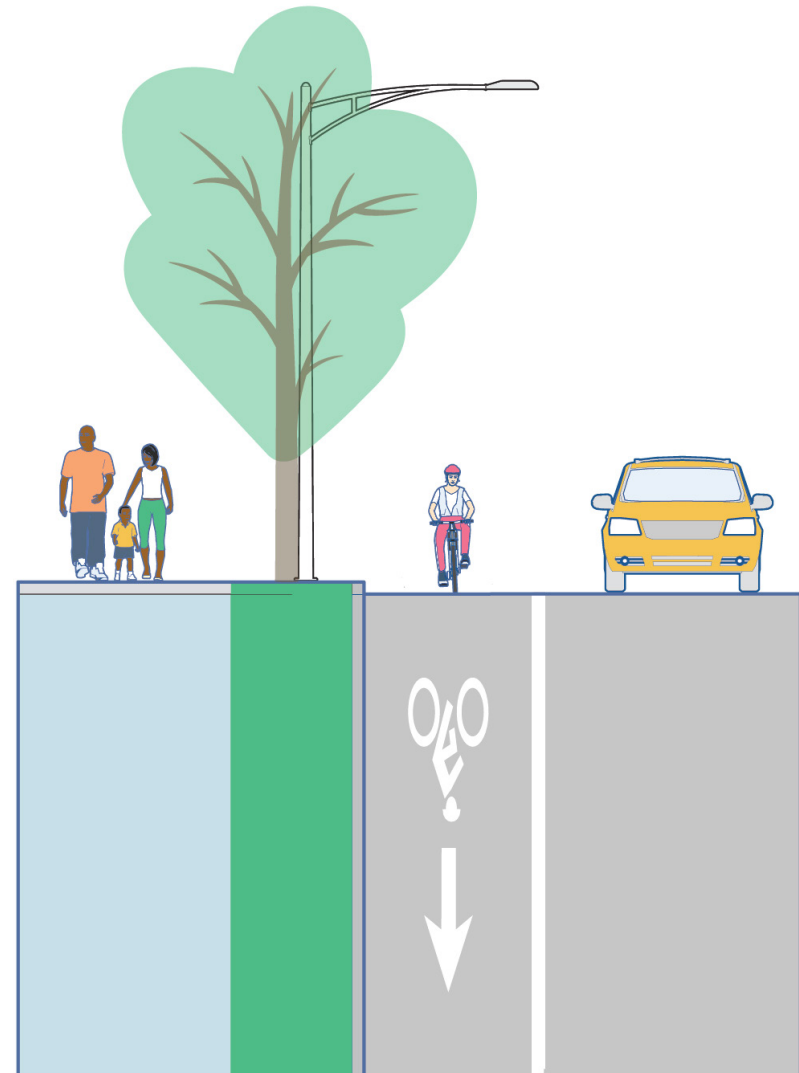
- Bikeways on streets with actual operating speeds less than 35 mph or where average daily traffic less than 6,000 vehicles per day.

Guidance

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

Additional Consideration

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



References

FHWA Achieving Multimodal Networks (2016)

NACTO Urban Bikeway Design Guide (2013)

09: Advisory Shoulder

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

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

Use

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

Guidance

Use a minimum width of 13' for the center travel lane; maximum width is 18'.

Center lanes wider than 18' may encourage excessive vehicle speeds.

Use a preferred width of 6' for advisory shoulders; 4' is acceptable in constrained right of way. Avoid the use of rumble strips, as they will greatly discourage bicycling and potentially cause damage to bicycles and injury to bicyclists.

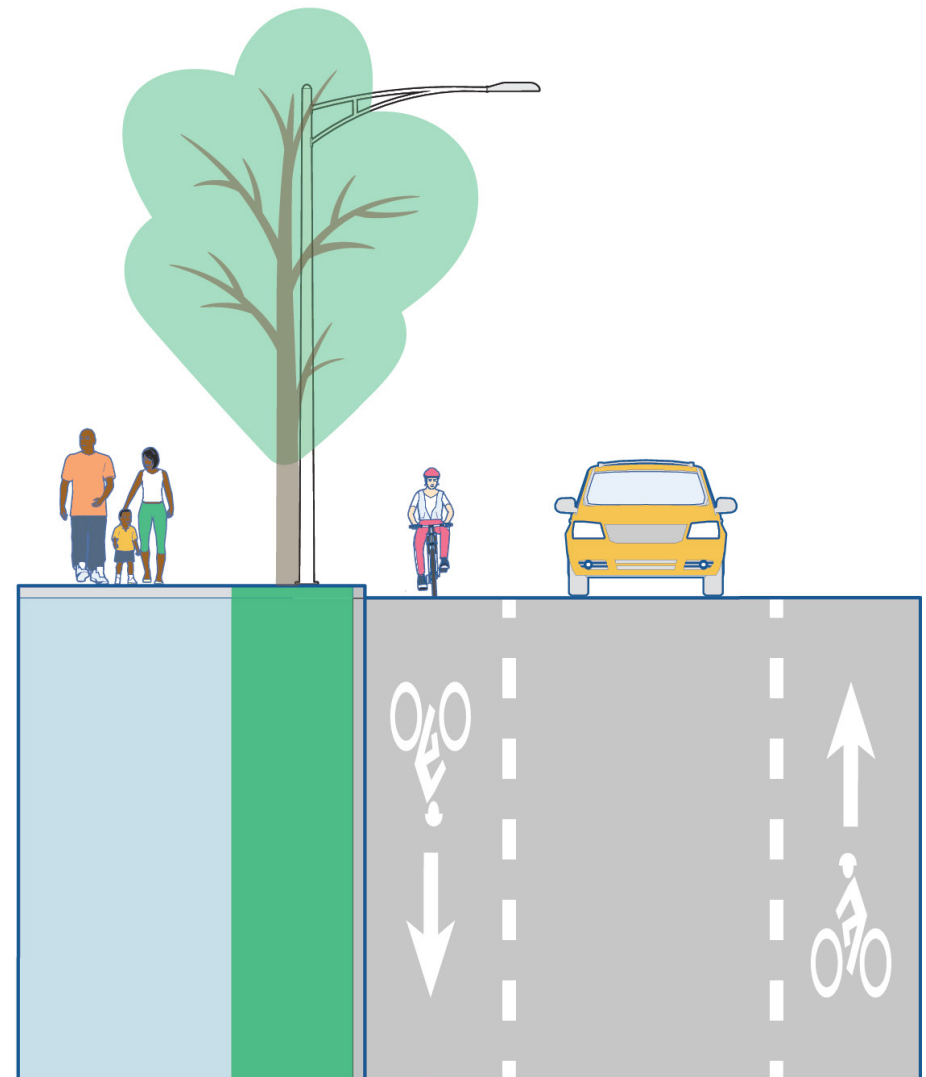
Additional Considerations

Understand that advisory shoulder treatments require FHWA permission to experiment.

References

FHWA Achieving Multimodal Networks (2016)

NACTO Urban Bikeway Design Guide (2013)



10: Neighborhood Bikeway

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

Use

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

Guidance

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

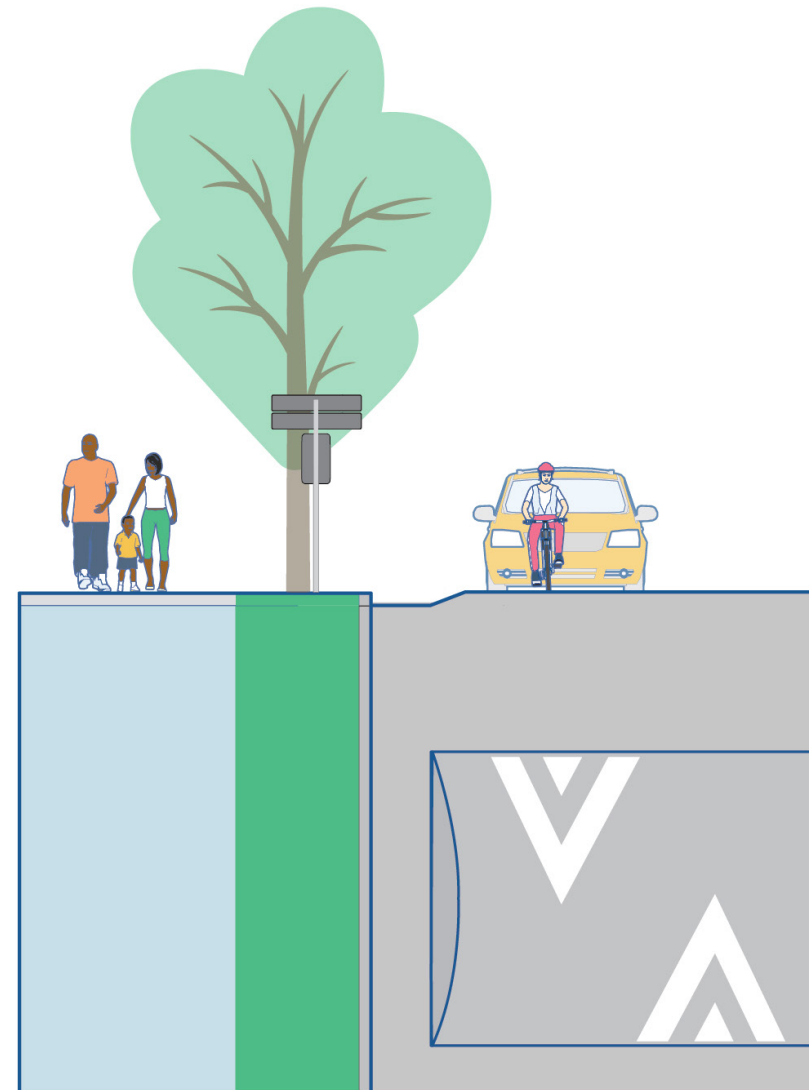
Additional Considerations

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

References

FHWA *Achieving Multimodal Networks* (2016)

NACTO *Urban Bikeway Design Guide* (2013)



11: Shared Lane

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

Use

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

Guidance

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

Additional Considerations

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

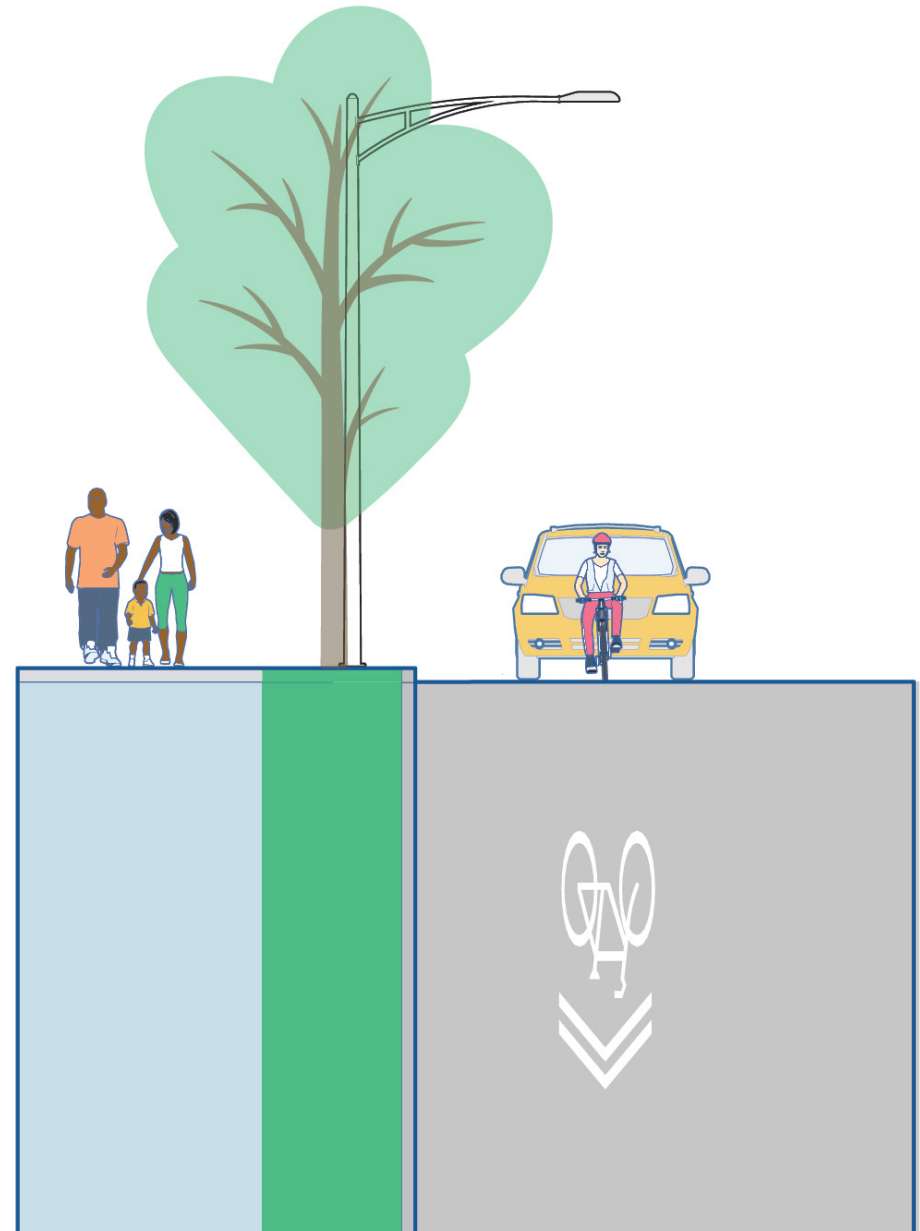
References

FHWA Achieving Multimodal Networks (2016)

NACTO Urban Bikeway Design Guide (2013)

AASHTO Guide for the Development of Bicycle Facilities (2012)

FHWA Bikeway Selection Guide (2019)



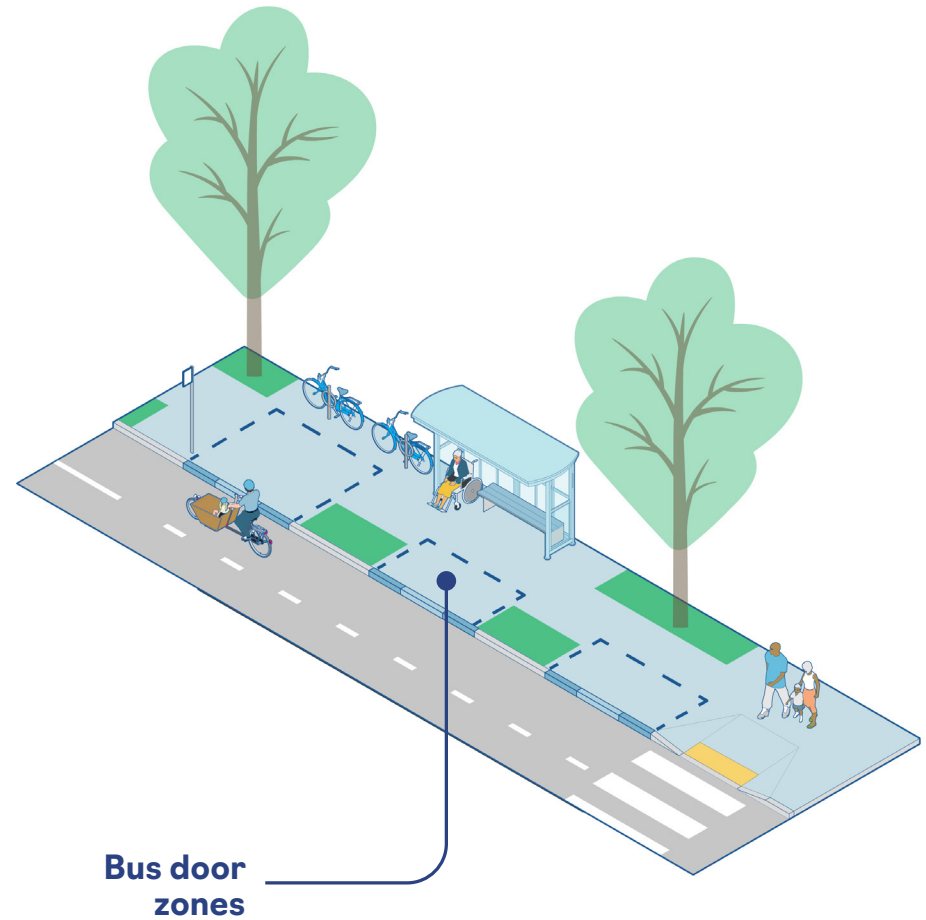
12: Bus Stops

Well-designed transit stops are crucial to the success of a transit system. They directly affect each customer's access to the system, perception of overall ease-of-use, and safety. The design of every stop must consider the relationship among the bus, the human, and the street. Stops must be visible to riders, visible to bus operators, accessible to people of all abilities, and provide capacity for waiting, boarding, and alighting without disrupting through-activity on surrounding streets and sidewalks.

More broadly, bus stops are an important component of civic infrastructure. Bus stop design and configuration can promote transit operations, activate underutilized space, double as public art, and support other multimodal activity.

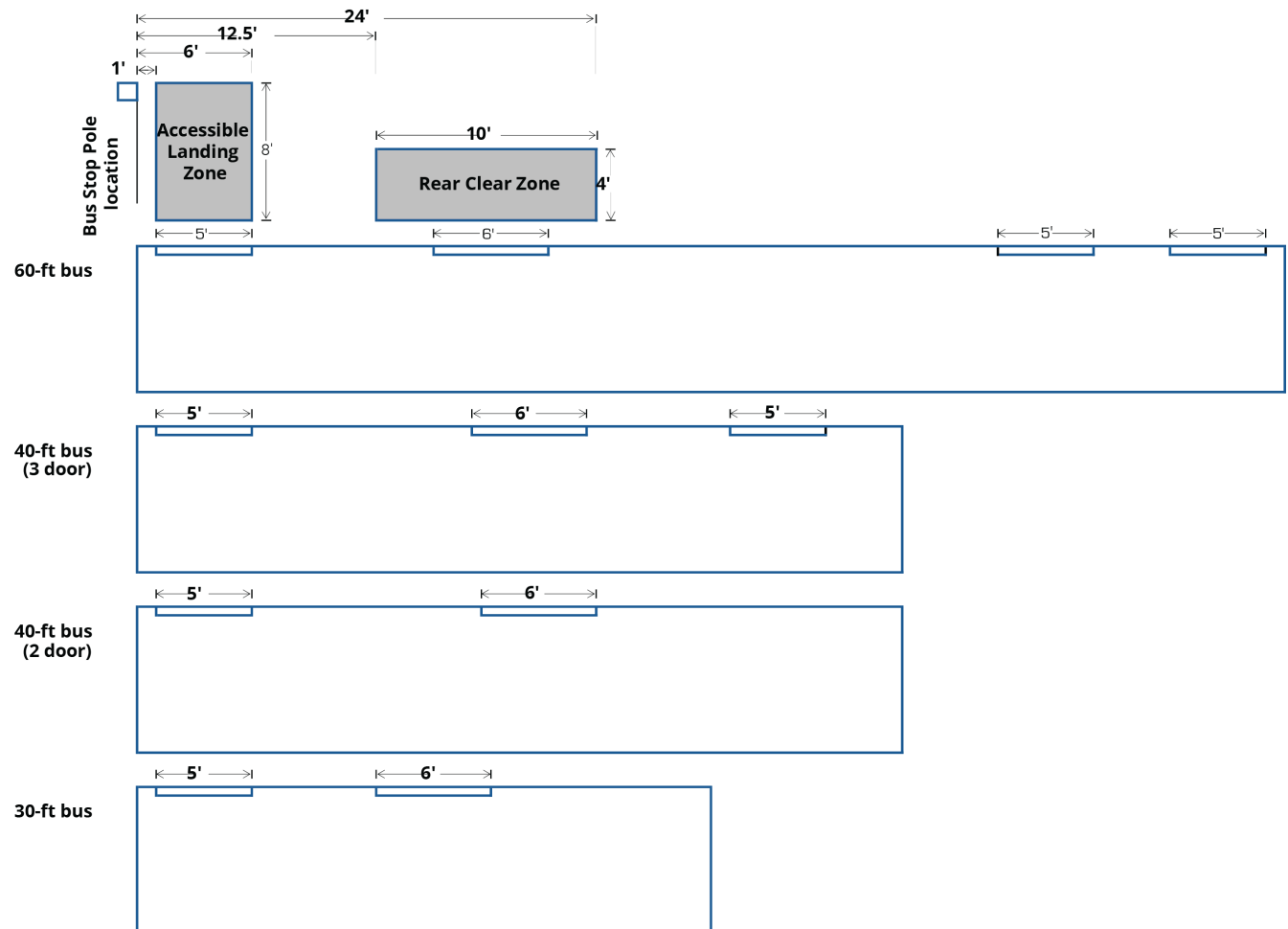
Bus Stops should:

- **Maximize Pedestrian Safety**, whether it is a person who is waiting for a bus, boarding a bus, alighting a bus, walking or bicycling near a bus, or crossing a street.
- **Be Accessible for All Ages and Abilities.**
- **Be compatible with existing and anticipated transit vehicles** to achieve accessible and fast boarding.
- **Be Designed to Elevate Transit Service and Transit Riders** by prioritizing configurations that allow for far-side, in-lane stops and use bus bulbs or floating designs to create shorter, safer pedestrian crossings, reduce conflicts with bicyclists, and provide more active space on sidewalks.



13: Bus Stop Boarding and Alighting Areas

Bus stop boarding and alighting areas should be designed for safety, ease of use, and functional interaction with other street functions. Smooth pavement at bus stops is critical to maintain accessibility. Bus stops should have an unobstructed boarding area 8' to 12' long, parallel to the curb so that boarding and alighting at front and rear doors in a typical bus can be accommodated. In a constrained location, the minimum unobstructed boarding area is 5'.

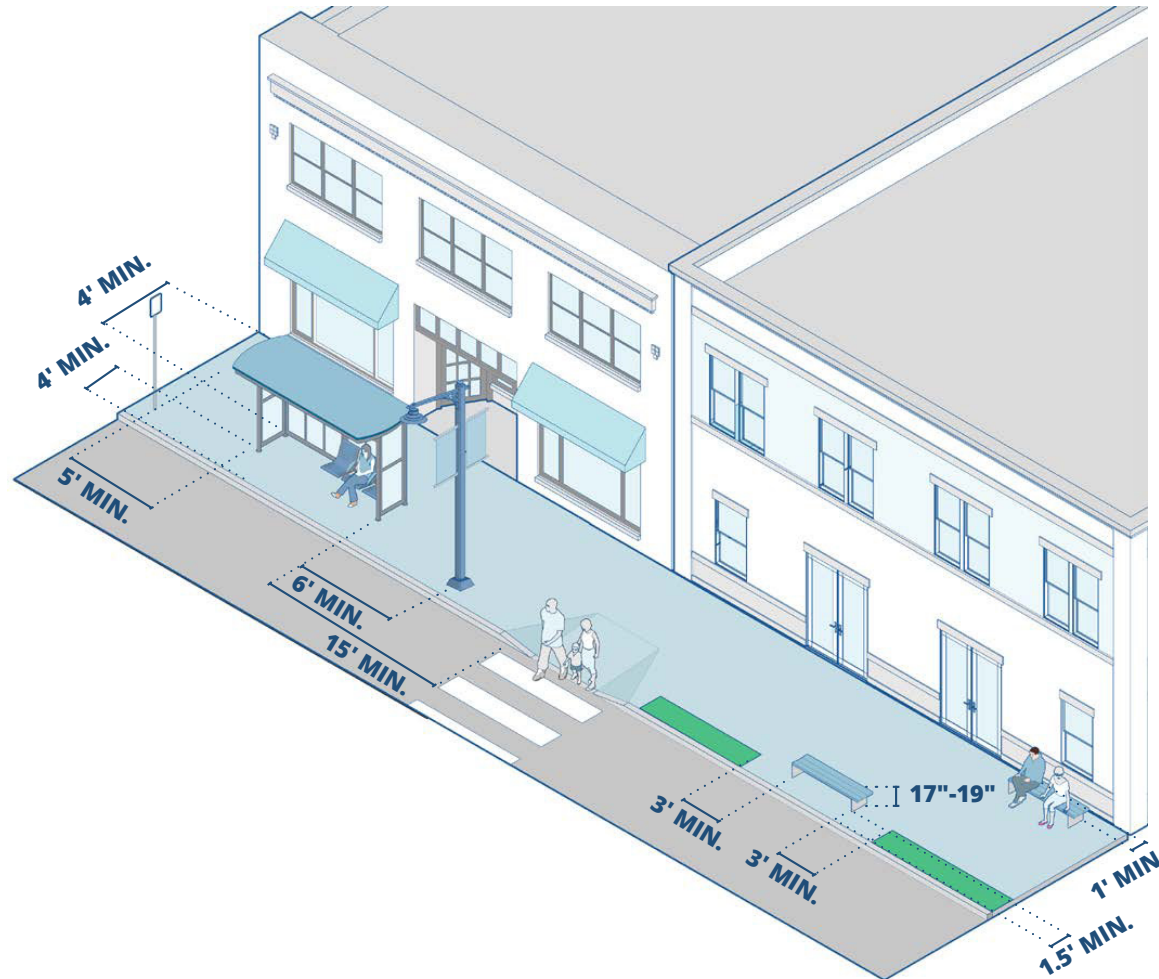


14: Bus Stop Shelter and Benches

Bus stop shelters can dramatically improve the comfort of waiting passengers by shielding them from sun, rain, or wind; providing a place to sit and travel information; and greater visibility. It is most typical for shelters to be oriented open to the curb, but they can also be oriented toward or integrated into a building. Shelters are typically 4' deep but can be narrower in constrained conditions. If seating is provided, a minimum 2'6" x 4' clear space for a wheelchair user must be provided entirely within the shelter space. The shelter, including its posts and

supporting walls, as well as associated elements such as seating, trash receptacles, and signage must not conflict with pedestrian travel paths, boarding areas, and vehicle door zones. Minimum ADA guidelines should be met at all stops.

Seating at or near transit stops improves rider comfort and overall experience. Benches should comply with ADAAG and be a minimum of 43 inches long, 20-24 inches wide, and the seat should be 17-19 inches off the ground. Seating should not block pedestrian pathways; 4' (minimum of 3') of clear distance on all sides where pedestrians are traveling should be provided.



15: Bicycle Parking

To truly encourage people to choose to ride a bicycle for transportation and recreation, it is essential to provide safe, convenient, and ample bicycle parking along their route and at destinations. Bike racks and parking corrals should provide places where people can securely lock their bicycles. Bike racks should be located in the amenity zone of the sidewalk, maintaining an unobstructed path of travel for people walking and wheeling.

As an alternative or in addition to bike racks on the sidewalk, bike parking corrals can be located in on-street parking lanes, curb bump outs, or daylighting areas. Pavement markings, curb stops, flexposts, or other elements can be used to clearly delineate corral parking areas.

Use

- In the amenity zone of sidewalks.
- Daylighting areas, curb bulb outs, and converted on-street parking space(s).
- Park entrances and points of interest along off-street multi-use paths.
- High-volume bus stops and transit hubs.

Guidance

- Only inverted U (hoop) or post and ring (hitch) rack styles should be installed in the public realm. These rack styles are versatile and intuitive, allowing bicycles of all shapes and sizes to be properly locked through the frame and at least one wheel.
- Bicycle parking should be provided at or near bus stops that serve trails, outdoor recreation areas where bicyclists may be present, and corridors frequently used for bicycle commuting.
- Bicycle racks should not encroach upon transit vehicle boarding and alighting zones, clear zones reserved for through-movement of pedestrians, nor block access to shelters or seating.

Additional Considerations

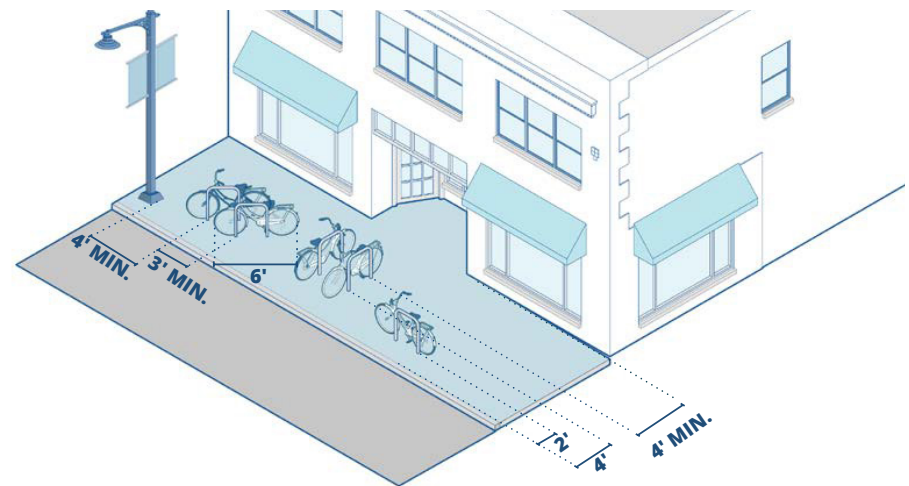
- Ensure bike racks are installed on a flat surface where the rack may be securely fastened to the ground.
- Consider use of bike corrals in high-demand areas to provide up to 12 bike spaces in what would otherwise accommodate a single vehicle parking space; this can be in an on-street or off-street parking space.

Resources

AASHTO Guide for the Development of Bicycle Facilities

FHWA Bikeway Selection Guide

NACTO Urban Bikeway Design Guide

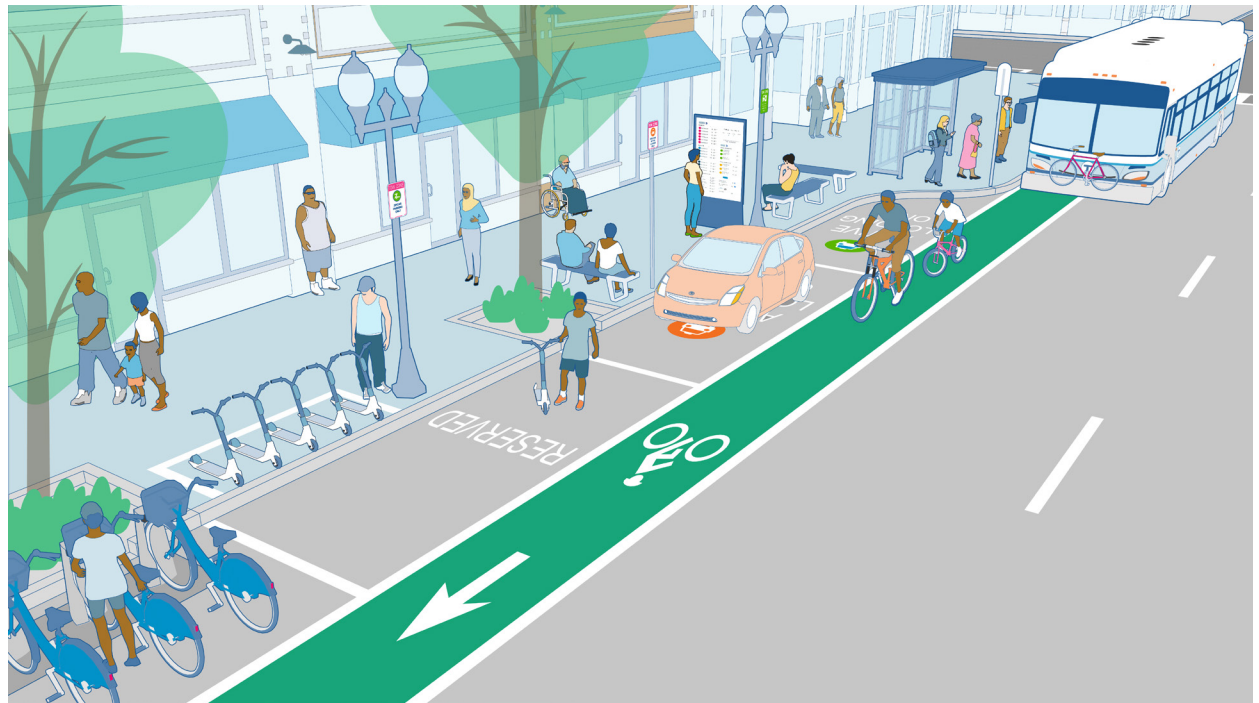


16: Micromobility Hubs

Curbside activities, whether it be micromobility (bicycle or scooter) parking, freight loading/delivery, or ride share pick up and drop off, contribute to the vibrancy of local streets and support the local economy. Because the curbside is a limited resource, management is particularly important in corridors that experience high levels of multimodal activity. Safety of all users, whether walking, wheeling, driving, or taking transit, is paramount.

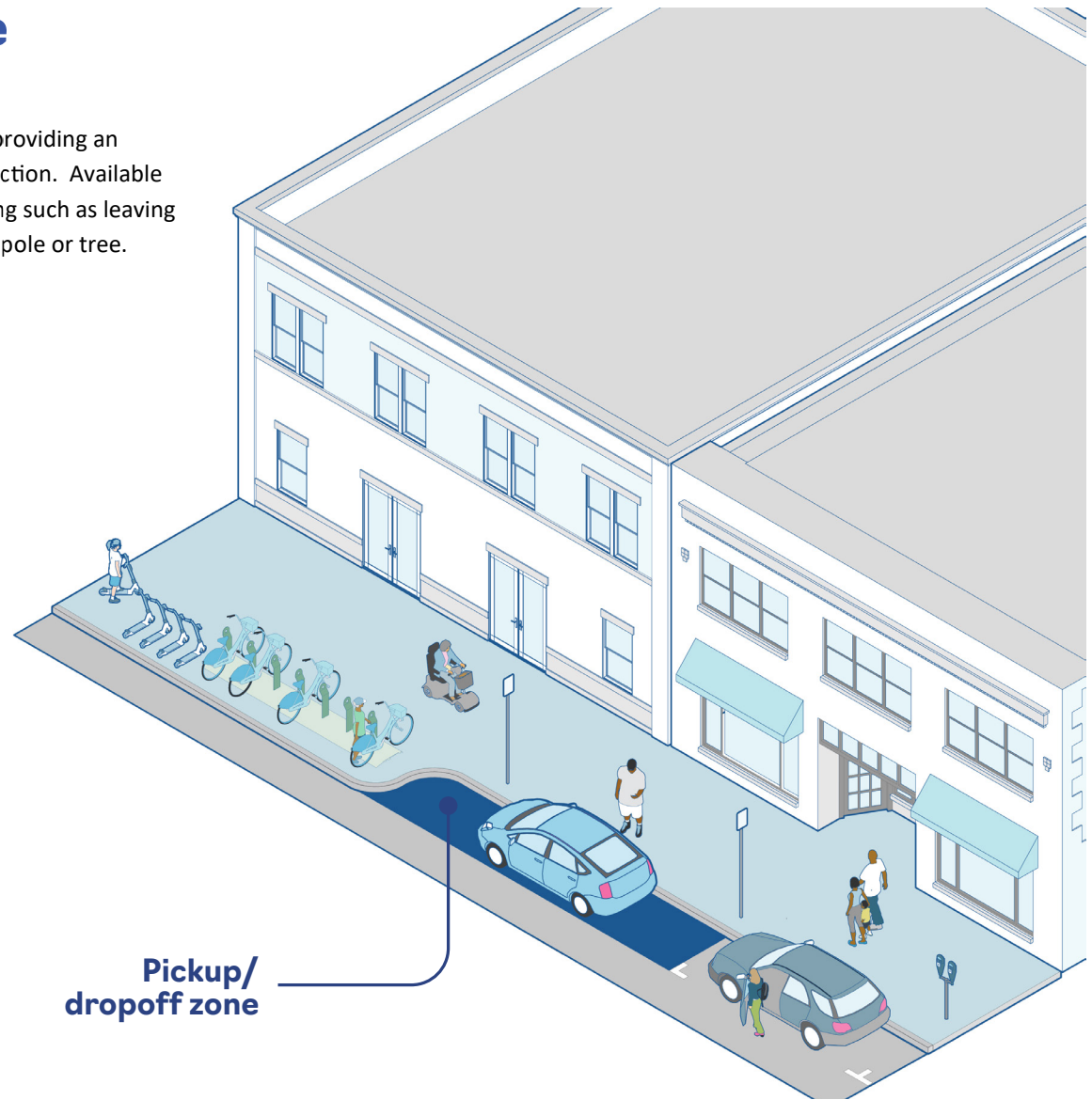
Guidance

- Allowed uses, and limits to use of the curbside should be clearly communicated through signage and design.
- Curbside use should be limited along corridors with dedicated transit/bus only lanes.
- Provide unimpeded access to transit stops.
- Provide dedicated space for vehicles to pick up and drop off passengers.
- During the peak travel period, limit, prohibit, or provide alternative loading/delivery areas for freight.



17: Scooter and Bicycle Share Parking

Bicycle and scooter share parking supports the transit system by providing an affordable and efficient way to make the first- and last-mile connection. Available dedicated parking also deters random and/or inappropriate parking such as leaving a scooter in the middle of a sidewalk or locking a bicycle to a light pole or tree.



18. Typical Bike Share Station Configurations

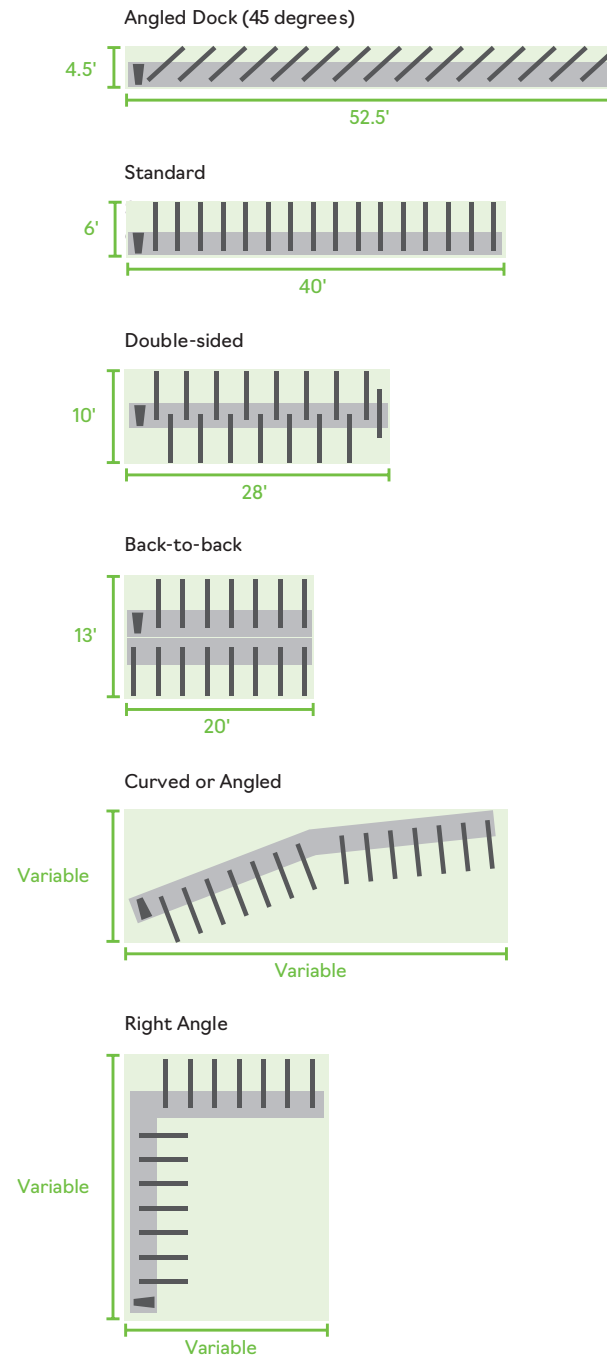
North American cities have largely opted for modular bike share equipment that can typically be deployed without trenching, excavation, or other preparatory work. Most modular bike share systems are solar powered, although some systems offer options to wire individual stations into the existing electrical grid.

In the past few years, hub-based bike share systems and systems with “dumb” docks (where the docks do not require electrical power) have been introduced in some U.S. cities. These systems may make it harder for users to intuitively know where to find a bike but have significantly lower capital costs. Because electricity is not a concern, systems that use dumb docks have greater station configuration options. However, the same basic planning principles— selecting locations that are convenient, easily accessible, feel safe, fit into the pedestrian context, and are operationally feasible— still apply.

Bike share stations can be configured to fit in a variety of spaces. For example, a station that uses angled docks is only 4.5’ wide, ideal for narrow sidewalks. However, the angled plate configuration requires more length for the same number of docks than a standard plate. In contrast, a back-to-back station layout requires significantly more width – 13’ wide – but almost half as much length.

References

NACTO Bike Share Station Siting Guide



Examples of Bike Share Station Configurations



Standard

The most common station configuration. Ideal for linear spaces like streets and sidewalks.

Capital Bikeshare. Washington, DC
Photo: Mario Durán Ortiz



Angled Docks

A good option on narrow sidewalks or where there is limited width.

Indego. Philadelphia, PA
Photo: City of Philadelphia



Double-sided

Opposite facing docks on the same plate. Good for wider spaces.

Indego. Philadelphia, PA
Photo: Ilana Wurman



Back-to-back

Double-wide or standard plates placed back-to-back. Good for wider spaces.

Capital Bikeshare. Washington, DC
Photo: Eric Gilliland



Curved or Angled

Allows stations to fit into non-linear spaces or wrap around corners and objects.

Indego. Philadelphia, PA
Photo: B-Cycle



Right Angle

Allows stations to fit into non-linear spaces or wrap around corners and objects.

B-Cycle. McAllen, TX
Photo: B-Cycle

19. Stations on the Sidewalk

Stations can only be placed on the sidewalk in places where the sidewalk is wide enough to accommodate a station without impacting people walking. Most cities require a minimum of 6' clear from the back of a docked bike in order to provide room for pedestrians and meet ADA requirements. Cities may opt for larger clearances depending on pedestrian volumes.

Depending on sidewalk width, a variety of configurations are possible for sidewalk stations. Stations can be placed along the curb, back up against a building face or property line, or sit elsewhere on the sidewalk. Stations placed at the curb next to curbside parking should be offset slightly to accommodate people getting out of cars.

Unless there is ample sidewalk width, stations should not be placed directly in front of the main entrance to high-volume buildings to avoid conflicts with people walking. Similarly, system operators caution against configurations where operations crews can only reach bikes via the sidewalk as they can be difficult to rebalance or service if the pedestrian volumes are high.

General Considerations

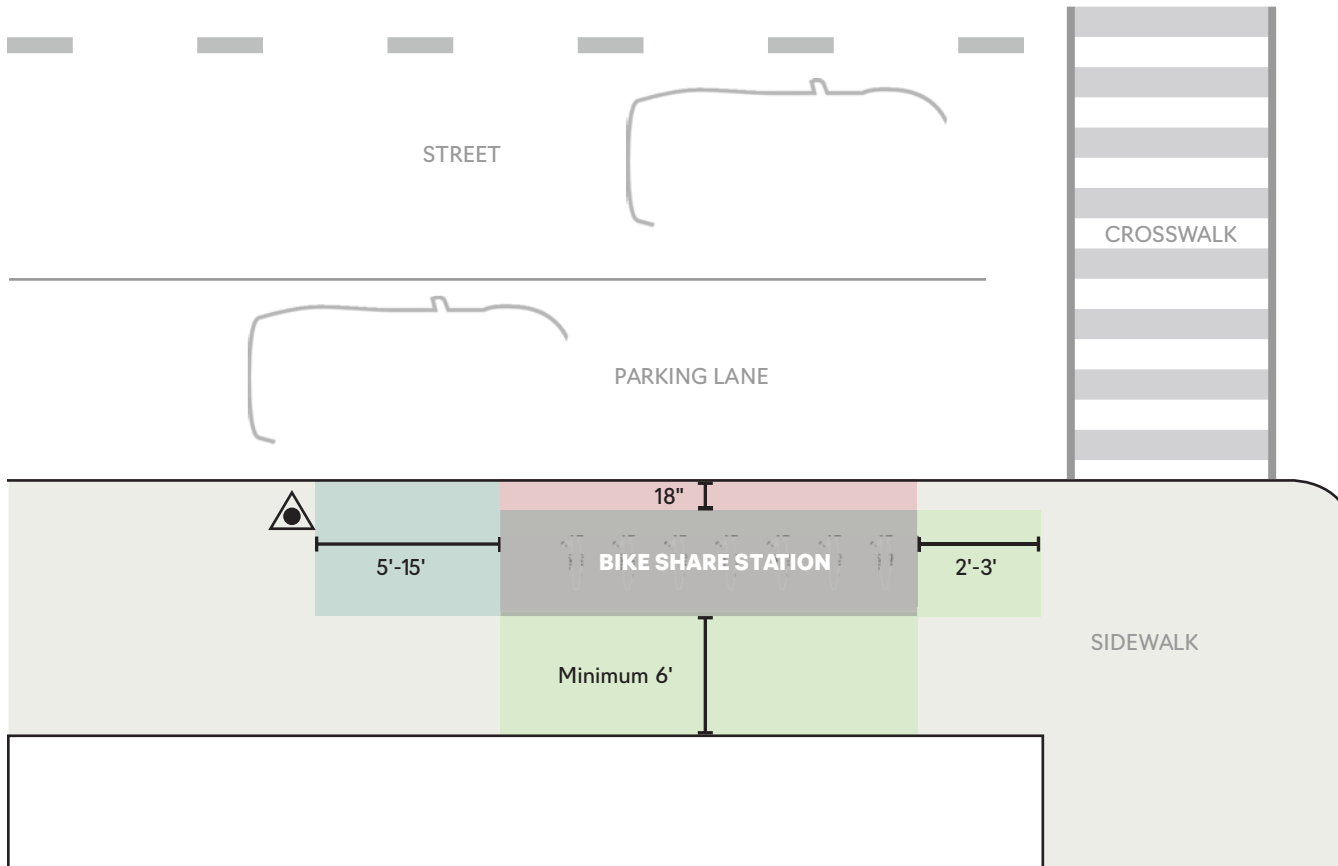
- Sidewalk stations should not impede pedestrian flow. Keeping stations in the same line as street furniture and other sidewalk features may help to maintain a pedestrian clear path.
- The payment kiosk should be oriented so that users can access the kiosk while standing on the sidewalk.
- Planners may want to consider adding other amenities such as private bike parking and seating into sidewalk station plans.
- Other streetscape features, such as traditional bike racks, can be moved to accommodate bike share stations. However, bike racks should always be relocated nearby, rather than eliminated, so that they will continue to serve the location.



References

NACTO Bike Share Station Siting Guide

Typical Sidewalk Station Placement



TYPICAL CLEARANCES

Sidewalk Placement

Most cities require a minimum of 6' clear from the back of a docked bike in order to provide room for pedestrians and meet ADA requirements.

Planners typically leave small clearances (2'-3') between the station and curb cuts and crosswalks.

Vehicle Clearance

If vehicle parking is allowed adjacent to a sidewalk station, the station is typically placed at least 18" off the curb to allow for car doors to open.

Fire Hydrants

Clearances for fire hydrants vary from city to city. They typically range from 5'-15'.

20. Stations in Open Spaces

Parks

Parks offer excellent locations for bike share stations because they can enliven public space and typically do not use on-street parking space or valuable pedestrian areas. At the same time, however, park locations also present unique challenges especially regarding late night access and ensuring user safety in off-hours. When placing stations in parks, it is important to consider the type and size of the park and the intensity of its uses and attractions.

The Divvy system in Chicago offers a number of examples of good station placements within parks. Divvy stations inside Grant Park are located immediately adjacent to the main entrances to the park or next to main attractions.

In contrast, in parks without large-scale attractions, bike share stations may be better placed along the periphery where they can be easily reached by park-goers and non-park-goers alike, regardless of time of day. For example, in New York City, planners have not placed stations inside Central Park, Riverside Park, or East River Park, opting instead to keep stations along the park edges where they are more visible and accessible at all times of day.

Plaza

Public plazas present excellent opportunities for bike share stations. Because they are modular, bike share stations can be configured in a variety of ways, a particular asset in open or unprogrammed plaza spaces. Stations can provide programming for large open areas and break up underutilized space, including in front of office buildings and transit stations. Because bike share stations are activity generators, they can also help bring in additional customers, especially to cafes and restaurants.

Designers should take care to consider pedestrian travel patterns when placing bike share stations in open spaces. Stations in plazas at sidewalk level typically do not need additional markers or protection. Stations in roadbed level plazas are typically protected from moving vehicles by flexible delineators, planters, blocks, or other street treatments

Parking Lots

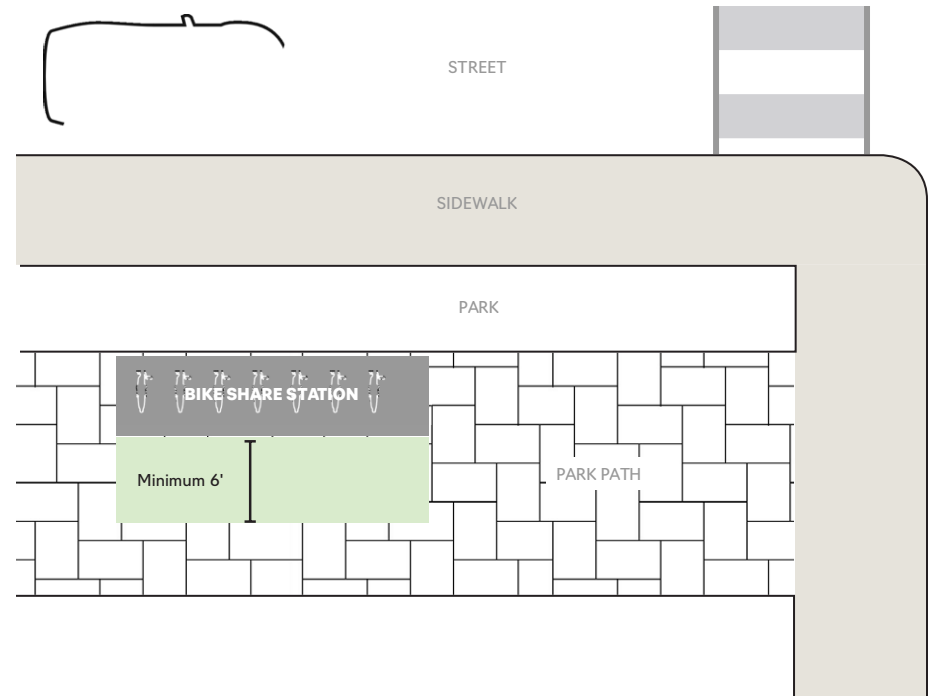
In areas with limited sidewalk space, surface parking lots may offer good options for bike share stations. Especially in less dense urban contexts, surface lots often have available space and provide access to multiple destinations. Like plaza locations, the flexibility of modular bike share equipment makes it relatively easy to site bike share stations in parking lots. Unlike sidewalk or plaza space, however, attention must be paid to make sure that cars do not park or hit station equipment.

General Considerations for Station Placement in Open Spaces

- Stations should not impede pedestrian flow. Keeping stations in the same line as street furniture and other raised amenities may help to maintain a pedestrian clear path.
- When selecting locations within parks, avoid locations that are isolated, especially in off-peak hours. Special attention should be paid to park uses and pedestrian volumes to ensure that stations will be used and accessible at all times.
- Attention should be paid to existing pedestrian desire lines. Stations should not impede pedestrian flow.
- In most cases, plaza stations should also be marked by flexible delineators, planters, blocks, or other street treatments. See 06. Vertical Separations.
- Bike share station plazas can be built into traffic calming projects and can be used to separate pedestrian space from moving traffic.
- Station plates should not cover utility access points, but the bikes can sit on utility points and drainage covers. Bridging and blank plates can create gaps to provide pedestrian access, accommodate loading, or avoid obstructions and utilities.
- Designers should pay additional attention to ensuring that stations are accessible by operations vehicles (rebalancing and maintenance), especially in parks or places with unpaved paths and free flowing pedestrian activity.

References

NACTO Bike Share Station Siting Guide



TYPICAL CLEARANCES

For stations on park paths, most cities require a minimum of 6' clear from the back of a docked bike in order to provide room for pedestrians and meet ADA requirements.

In parking lot locations, if wheelstops are used, they should be used in conjunction with vertical delineators to increase visibility.

21. Bike Share Station Surface Materials

From asphalt to cobblestones to permeable pavers, bike share stations can be installed on a wide variety of surfaces. In general, planners and operators look to site stations on hard surfaces that will not sink under the weight of the station or degrade or erode with heavy use. Ensuring that rebalancing and maintenance vehicles can reach the station without damaging lawns or getting stuck in mud is also essential.

Ensuring a generally flat surface is important for station operations as the station plates must be level in order to connect properly. Most operators caution against placing stations in locations that can only be reached by stairs or locations that have a steep gradient as stairs and steep slopes are disruptive both to potential users and maintenance and rebalancing teams.

Materials:

- Asphalt: Stations can be placed directly on asphalt.
- Concrete: Stations can be placed directly on concrete.
- Grass/Bare Ground: Stations can be placed on grass with limited success. Most operators report issues with mud, dirt and station plates sinking over time.
- Gravel: Stations can be placed on gravel with varying degrees of success. Some cities have created an enclosed gravel bed for the station. This treatment addresses most issues with mud and sinking plates. Stations that must be bolted to the ground typically cannot be placed on gravel.
- Brick: Stations can be placed on brick.
- Permeable Pavers And Porous Pavement: Stations can be placed on permeable pavers without interfering with drainage.

References

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22. Wayfinding and Sponsor/ Ad Panels

Wayfinding and ad/sponsor panels are an important part of marketing and funding bike share systems. They can be standalone panels or integrated into the kiosk and are typically placed at the ends of stations to maximize visibility.

Planners should pay additional attention to pedestrian sight lines when placing large, tall panels near intersections. Narrower wayfinding panels, such as those employed in many smart bike/ dumb dock systems or those integrated into narrow-design kiosks may avoid this issue.

Wayfinding panels should include clear maps showing the immediate area, other nearby bike share stations, and bike lanes.

More than just a map, wayfinding panels may in fact help encourage bike share use. In 2011, an intercept survey in New York City found that 24% of visitors were lost at any point in time and that 13% of locals admitted to being unfamiliar with the neighborhood they were in. The city concluded that being lost, fear of being lost, and lack of knowledge of their surroundings deterred people from biking or walking. As a result, many people took taxis, buses, or subways for short trips that could have easily been made by bike or on foot.

In addition, including wayfinding panels in bike share stations is a good way to consolidate street furniture elements and limit sidewalk clutter.

References

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The logo features a stylized blue bicycle icon with three curved lines to its left, suggesting motion or a path.

Three Rivers Bike Share Study

