Appendix E
Transportation

Transportation is a vital part of everyday life in Columbia. As the City grows, it is crucial to plan for a transportation network that provides for the needs of current and future residents, as well as works towards the City's economic development, urban design, and sustainability goals. This report details the current state of the City's transportation system and identifies key challenges and opportunities to be addressed in Columbia.

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IN THIS SECTION

TOPICS

Pedestrian Safety, Multimodal Design, Biking, Commute, Greenways, Roadways, Rail, Transit

APPENDIX E

Introduction

The study of existing transportation conditions and an assessment of policies which impact transportation in Columbia provide a snapshot of the factors affecting transportation locally. The information that follows was researched and compiled by Kimley-Horn and Associates, and includes an analysis of available data and policies.

A review of existing transportation conditions includes a study of commuting patterns, existing and proposed multimodal infrastructure, safety issues, freight, passenger rail, air transportation, parking, and resiliency. This review concludes with the identification of challenges and opportunities facing the City and metropolitan area.

The policy analysis examines the City's zoning and land development codes (both the code currently in effect, as well as the adopted but not yet effective update), as well as the City's engineering regulations and other potential areas for improvement.

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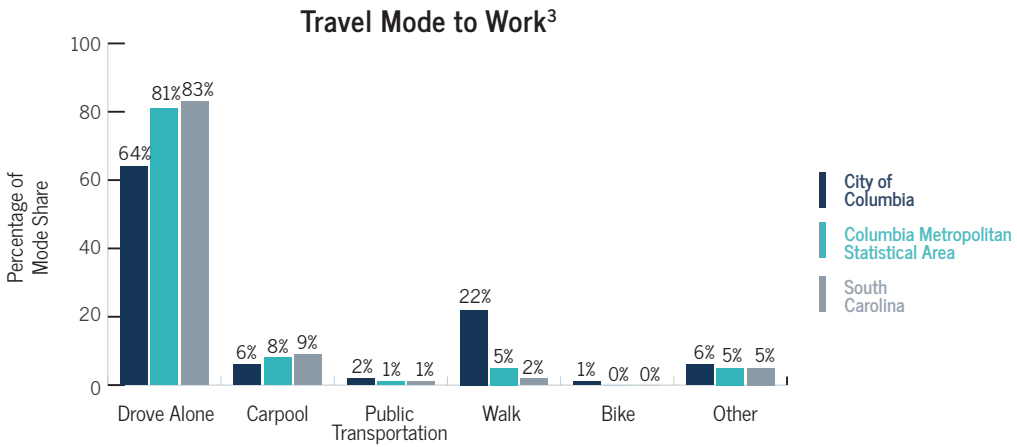
Existing Conditions

COMMUTE

Columbia residents commute to work by a variety of means. While the larger Columbia metro area is very auto-centric, a very high proportion of Columbia residents walk to work. This is due largely to the presence of the University of South Carolina. According to U.S. Census data, the median age of all walking commuters in Columbia is 20.2 years, compared to an aggregate median age of 31.7 for all City commuters.

It is worth noting that while the commute mode share for Columbia residents is relatively diverse, the travel patterns of the larger Columbia metro area bear a much closer resemblance to the statewide average. Since roughly **85% of Columbia workers live outside the City**, metro area statistics more closely reflect the experience's of the City's total workforce.



Columbia's position as the job center of the region is particularly evident when examining regional commuting trends. Over 40% of Columbia residents work within the City, while just 15% of the City's total workforce resides within the City's borders. This creates a major strain on the City's arterial roadways as over 100,000 commuters (mostly from outside the City) travel between dispersed residential areas to a few centralized job centers at predictable times each day.

Top Work Destinations for Columbia Residents[1]

Location	Workers	Share
Richland County	29,136	60.0%
Lexington County	8,496	17.0%
Columbia	20,254	41.7%
Forest Acres	1,903	3.9%
West Columbia	1,391	2.9%
Cayce	977	2.0%

Top Home Locations for Columbia Workers[2]

Location	Workers	Share
Richland County	59,487	44.5%
Lexington County	28,321	21.2%
Columbia	20,254	15.2%
Town of Lexington	2,192	1.6%
Forest Acres	2,173	1.6%
Irmo	1,824	1.4%

Existing Conditions

COMMUTE, CONTINUED

Over 28,000 workers commute into Columbia from Lexington County, highlighting the importance of maintaining mobility and traffic flow on connections across the Congaree River. By contrast, just 8,000 commuters travel the other direction for employment.

Commuting patterns between City of Columbia and Lexington County[4]

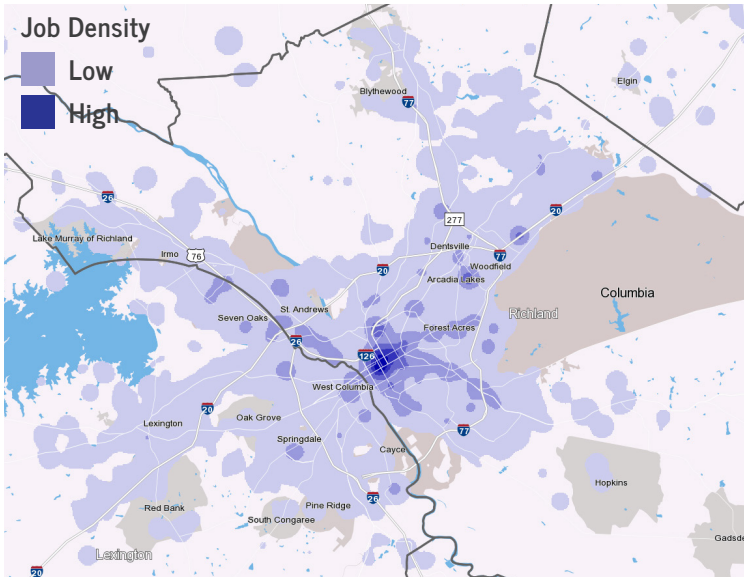
The average Columbia resident has a very short commute, with the **mean travel time to work being just 15.2 minutes**. Commutes are longer in the Metropolitan Statistical Area (MSA), at 23.7 minutes. Over 65% of Columbia residents travel less than 10 miles to work. The region's jobs are highly centrally located in downtown Columbia and near the USC campus, and this commute pattern is indicative of City residents having a high level of accessibility to the region's major job centers. The maps on the following page depict the different spatial patterns surrounding work locations for Columbia residents, and home locations for those who work in Columbia. As shown, **while jobs in Columbia are highly centralized in the downtown area, home locations of Columbia workers are highly dispersed**, mostly following transportation corridors.

Existing Conditions

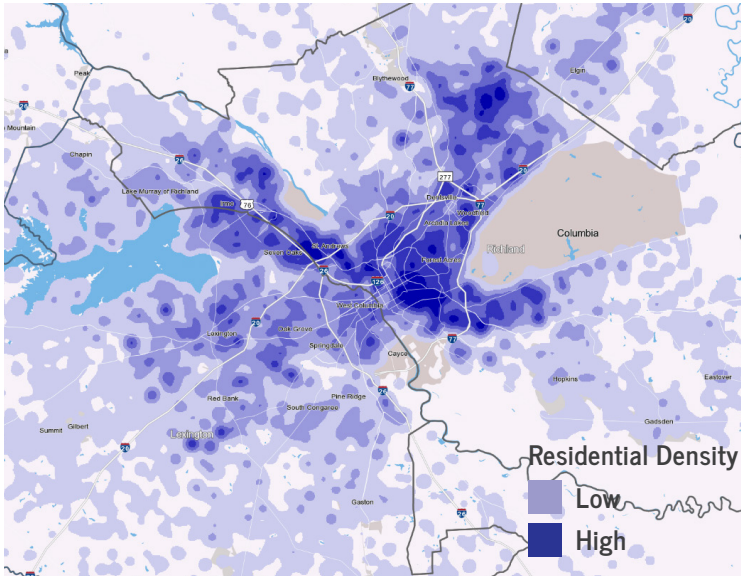
COMMUTE, CONTINUED

As shown to the right, while jobs in Columbia are highly centralized in the downtown area, home locations of Columbia workers are highly dispersed, mostly following transportation corridors. The following corridors within the City limits could be characterized as major commuter corridors facilitating trips into and out of Columbia daily.

- US 378 (Sunset Boulevard)
- Gervais Street
- Huger Street
- Jarvis Klapman Boulevard
- I-26
- I-126
- I-20
- SC 277
- I-77
- Bull Street
- Elmwood Avenue
- Forest Drive
- Garners Ferry Road
- Broad River Road
- River Drive/Sunset Drive
- Blossom Street
- Two Notch Road



Above: Work location of Columbia residents.
Below: Home locations of those who work in Columbia.[5]

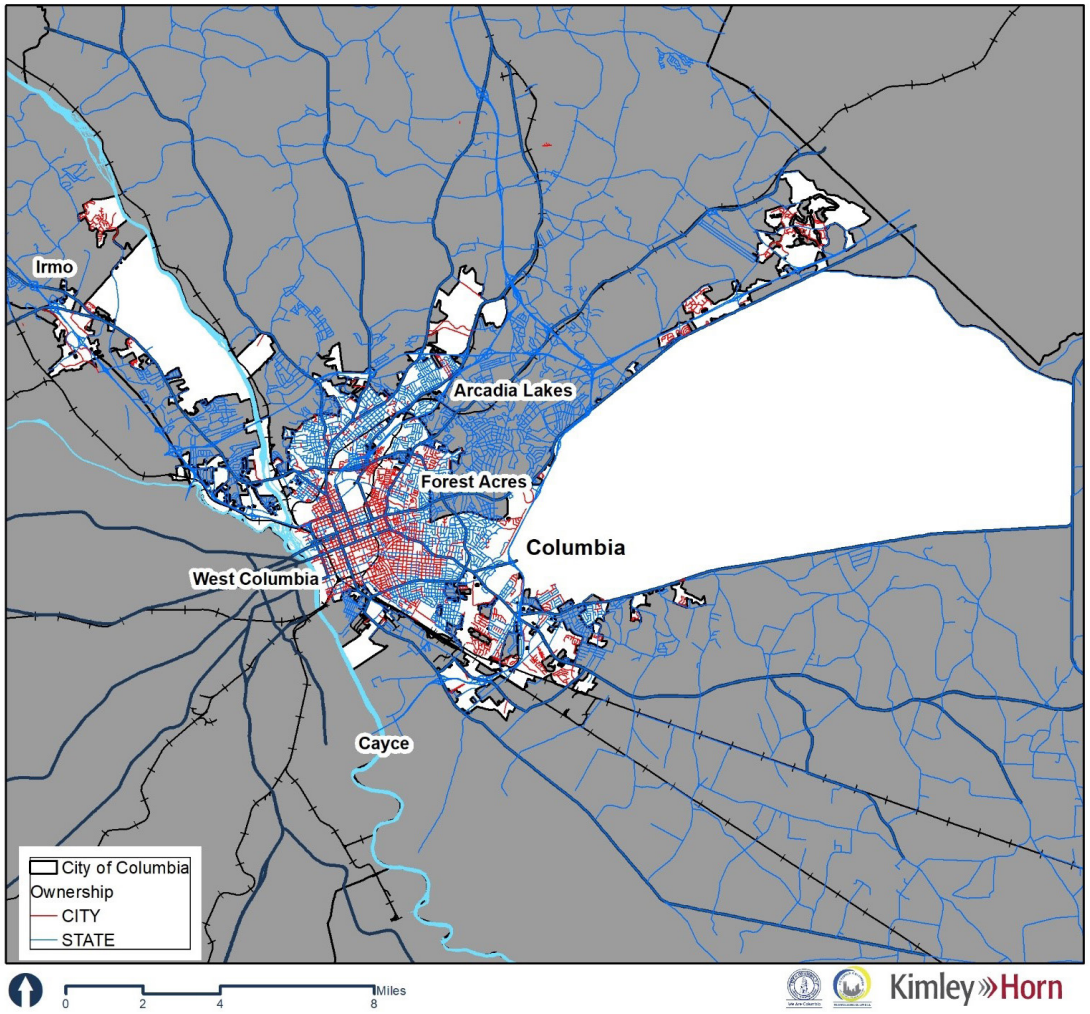


Existing Conditions

STREET OWNERSHIP

One of the major challenges facing Columbia, and many South Carolina cities, is the question of roadway ownership. South Carolina has the fourth-longest network of state-owned roads in the country at more than 41,000 miles. As shown in the table below, the majority of streets within City limits are owned and maintained by the South Carolina Department of Transportation (SCDOT), including many of the City's major arterials. This presents unique challenges, including a lack of control over street design and improvements, and a heightened need for continued coordination on local transportation challenges. In recent years, SCDOT has begun a pilot program to provide local governments the option of taking over maintenance and control of certain state roads. However, the number of streets turned over to local control have been limited thus far.

Because of the unique structure of Columbia's roadway system, continued coordination and a good relationship with the City's SCDOT partners will be crucial to advancing local transportation goals.



Road Ownership within the City of Columbia[6]	Centerline Miles
City of Columbia	194 (25%)
State of South Carolina	425 (55%)
Other (Federal, Private, University, etc)	146 (19%)
Total	**765 miles**

Existing Conditions

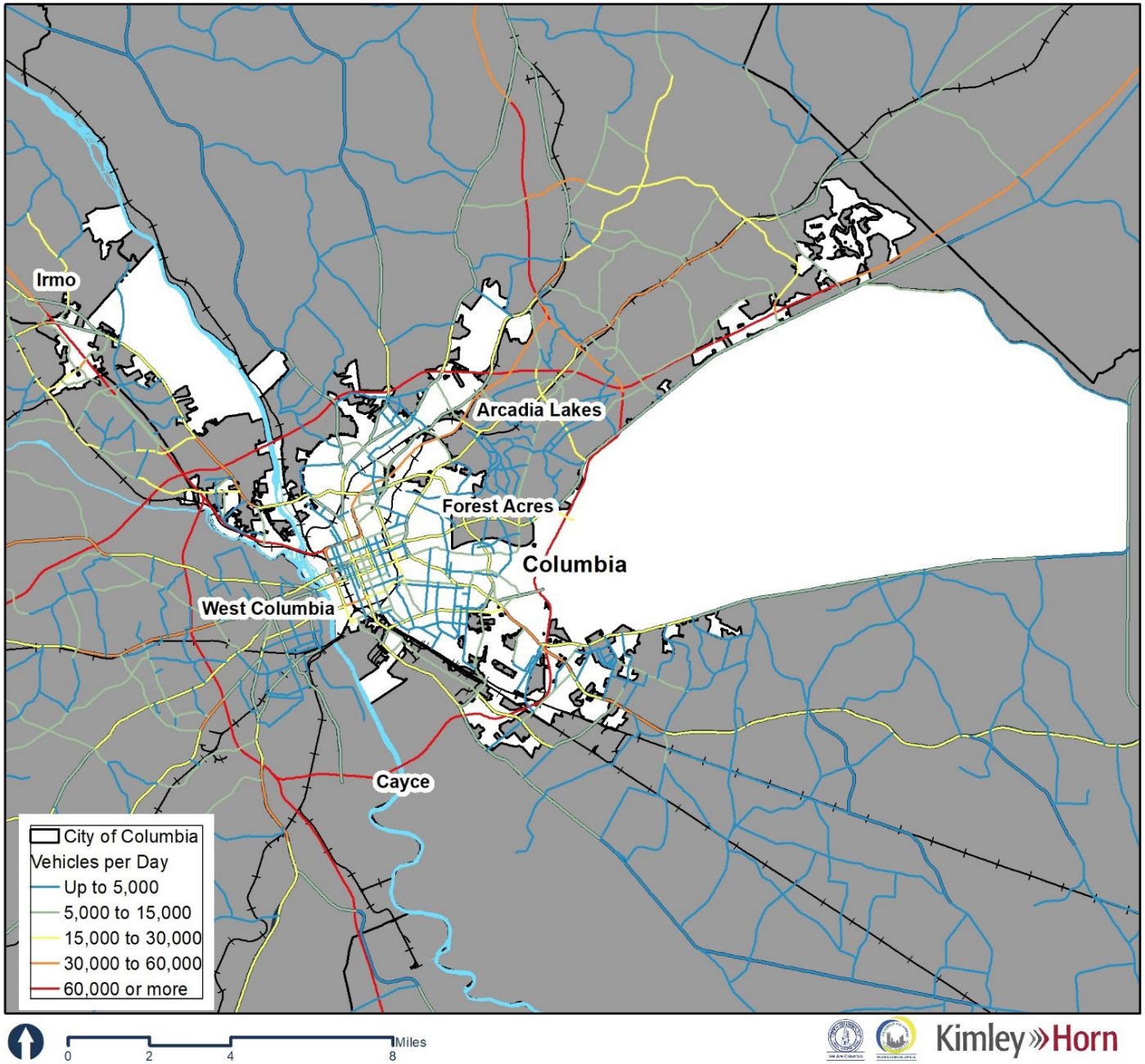
ROADWAYS

As in most of the South, getting around Columbia is easiest by automobile due to heavy investments in roadway capacity, affordable and easily available parking, and a dispersed development pattern. Despite these challenges, the City supports a comprehensive and connected roadway network in the downtown core and established older neighborhoods, with some mobility challenges resulting from natural and man-made barriers.

While congestion is a growing concern in Columbia, it is still a relatively minor issue compared with other U.S. cities of its size. The INRIX 2017 Traffic scorecard indicated that **drivers within the City of Columbia spend an average of 4% of their total driving time per year in congestion**. This is comparable to the amount of congestion in Greenville, and less than the 7% of total time spent in congestion experienced by drivers in Charleston. As congestion in the City and region continues to grow, traditional and alternative congestion mitigation methods will continue to compete with perceived notions of quality of schools, availability of less expensive property and housing methods further outside the central City core. In addition to the provision of alternative mobility options, a change in mindset regarding overall cost of commute (fuel, time, environmental, health) needs to occur with citizens inside and outside the City.

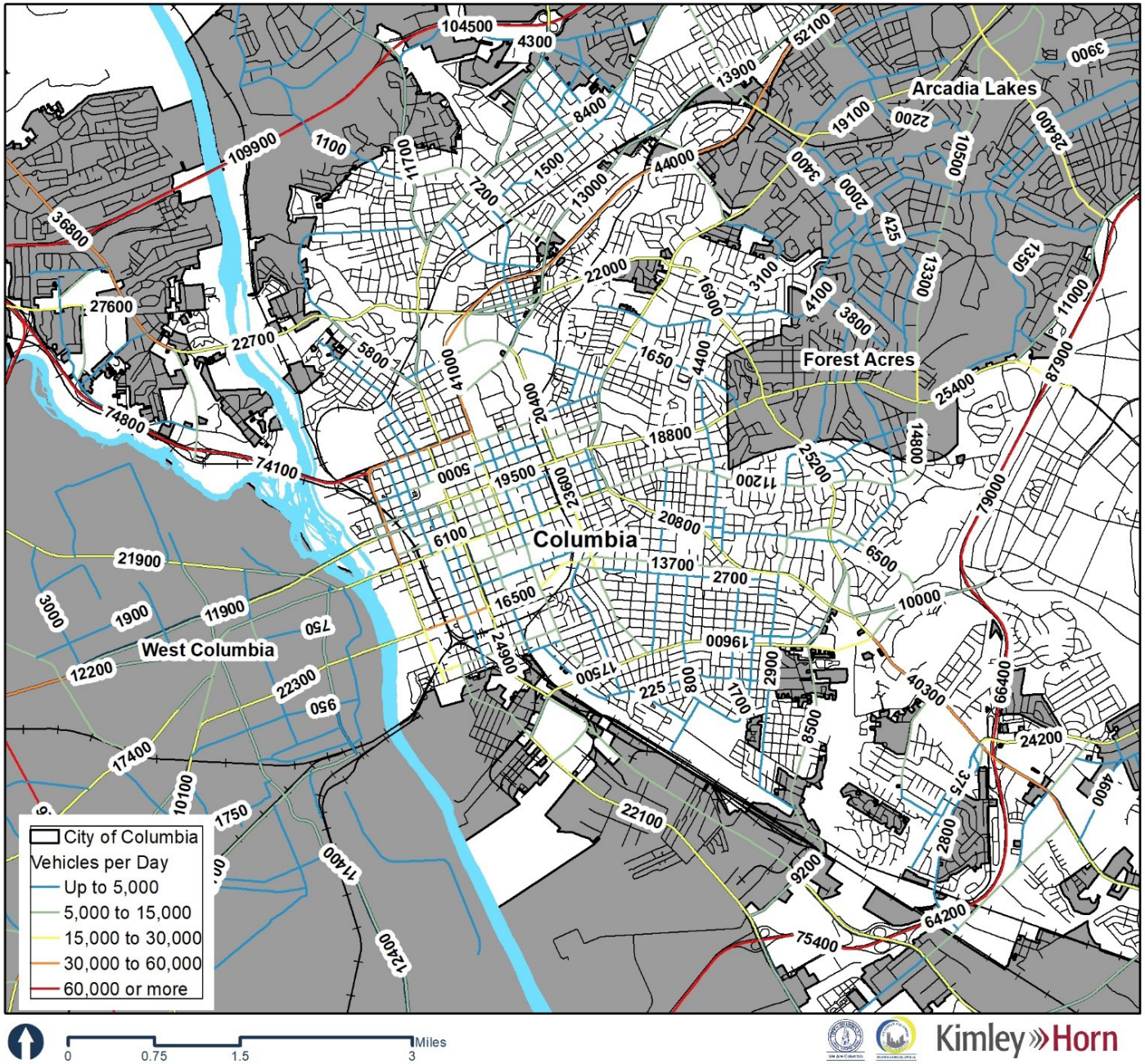
According to 2017 SCDOT data, the most heavily traveled roadways in the City were the interstates, which routinely see upwards of 80,000 to 100,000 vehicles per day (see map next page). It is worth noting that SCDOT does not collect data for City-owned streets, and the City of Columbia has no current vehicular traffic count program (though the Planning Division does take part in the National Bicycle and Pedestrian Documentation Project annually in an annual effort to count pedestrians and bicyclists at a number of screenline locations throughout the City each September). Therefore, no reliable vehicular count data is available for non-SCDOT managed roadways within the City limits. Anecdotally, most local roads within the City are much less frequently traveled, with a handful of collector routes seeing the majority of heavy traffic and most local routes seeing very little. As noted earlier, due to the concentration of employment, routes that provide direct mobility into downtown are the most heavily traveled, including I-277, US 176, I-126, Devine Street, and the bridges across the Congaree River.

Average Annual Daily Traffic



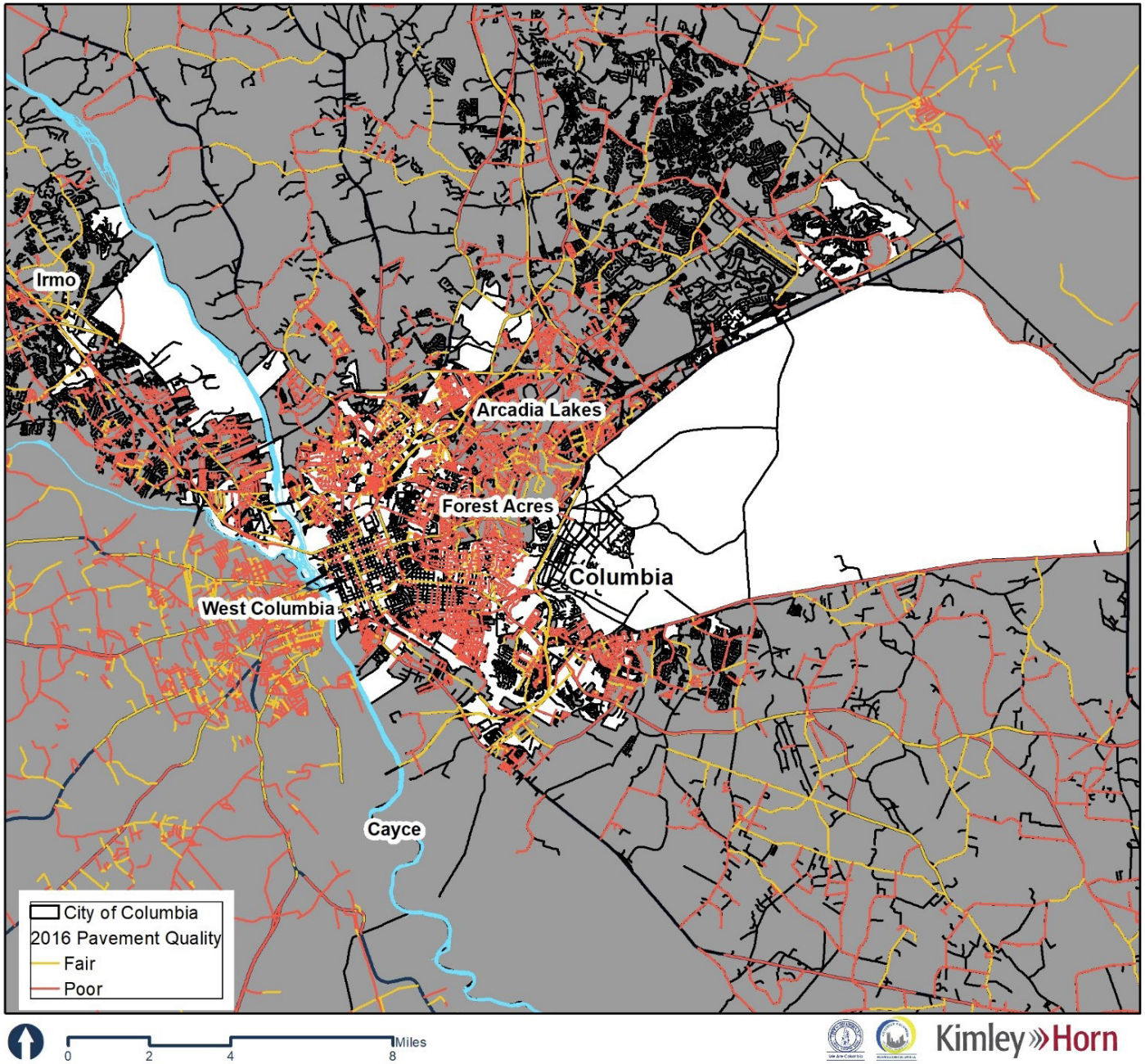
SCDOT, 2017

Average Annual Daily Traffic (downtown)



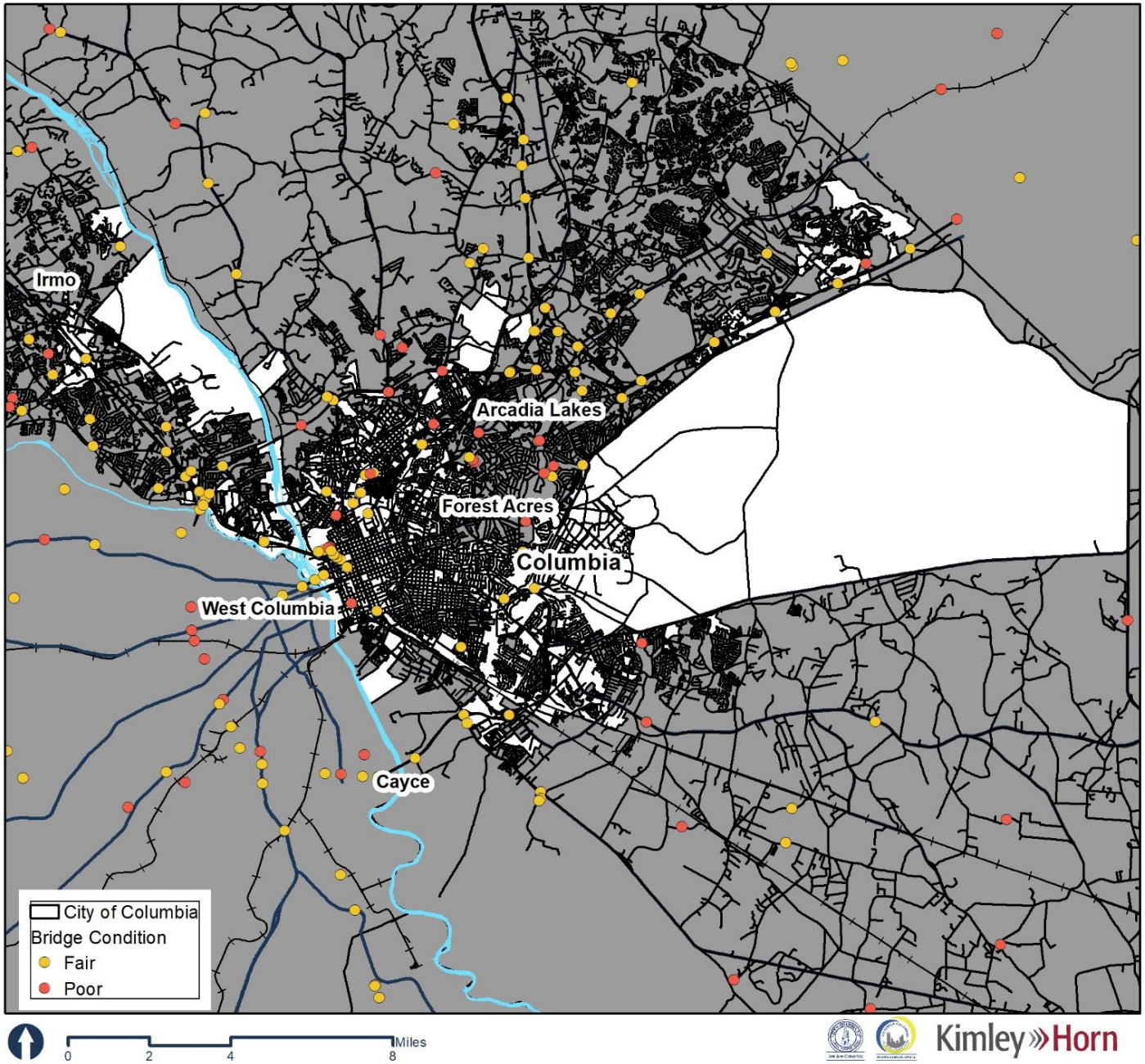
SCDOT, 2017

Pavement Quality



SCDOT, 2016 data

Bridge Conditions



SCDOT, 2016 data

Existing Conditions

ROADWAYS, CONTINUED

The quality of the region's SCDOT-maintained roads is measured through a "pavement quality index" provided by SCDOT. It is estimated that 13% of the roadways in the Columbia MSA were in "Poor" condition in a 2017 report, compared to 17% in the Charleston area and 17% in Greenville-Spartanburg. Likewise, of the 126 bridges SCDOT lists within Richland County, 40 are listed in "Fair" condition and 10 of them are rated to be in "Poor" condition.

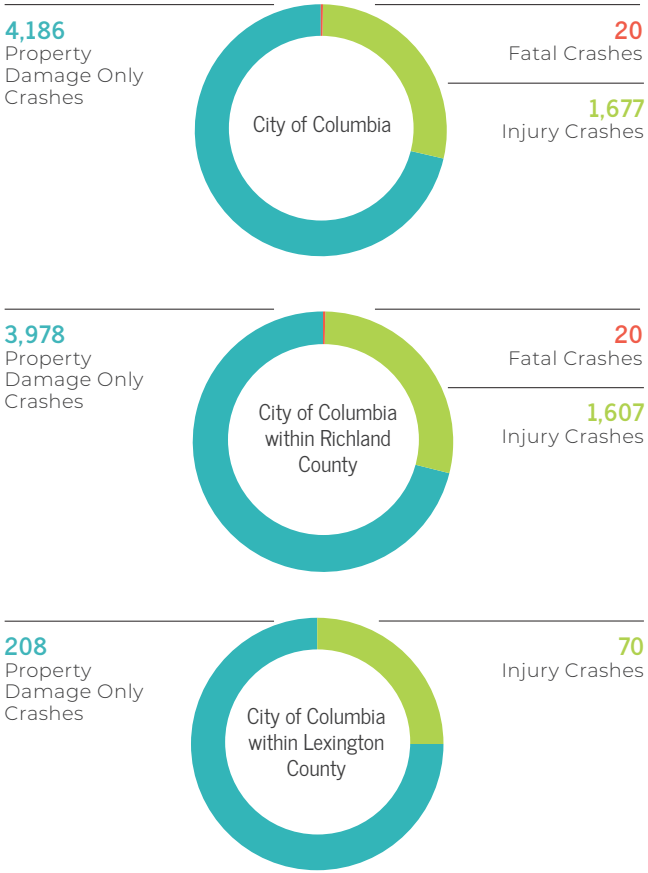
The City does not currently maintain a local infrastructure quality assessment, so data is only available on state-maintained facilities. These statistics suggest that the region's transportation resources are not keeping up with regular maintenance needs.

SAFETY

According to the South Carolina Department of Public Safety (SCDPS), there is a collision in South Carolina every 3.7 minutes, an injury collision every 13.3 minutes, and a collision resulting in fatality every 9.5 hours. As of 2017, South Carolina was the highest in the nation, with an overall traffic fatality rate of 1.80 per 100 million vehicle miles traveled. In 2017, there were 924 fatal crashes in South Carolina. Most crashes are Property Damage Only (PDO) crashes where no injuries are sustained. While no injuries are sustained, PDO crashes have an significant impact on congestion, delay and contribute to secondary crashes adjacent to the origin crash.

In 2017, 20 fatal crashes took place within the Columbia City limits (including both Richland and Lexington County). According to SCDPS data, collisions involving fatalities or injuries primarily took place on US Primary Routes. Crash severity for the portions of Richland County and Lexington County within the City of Columbia are shown below.

Crash Severity, 2017[7]



Existing Conditions

SAFETY, CONTINUED

For the State of South Carolina in 2017, there were 160 pedestrian deaths involved in a collision with a motor vehicle of a total of 925, equating to 17% of the overall fatal collisions. When adding the 18 bicyclist fatalities in 2017, a combined 19% of all fatal crashes involved either a bicyclist or pedestrian. This percentage of fatalities (19%, 178) for the vulnerable roadway users is greater than the mode share, bicycle and pedestrian, for the State of South Carolina as compared to those who use motor vehicles as their primary mode of transportation.

The adjacent table highlights the locations of fatal crashes within the City of Columbia, including crash route, route classification, and primary cause.

Location	Cause	Route Class	Motor Vehicle	Bicycle	Pedestrian	Moped Motorcycle
Broad River Rd at Canal Dr	Failed to yield R/W	US Primary	1			
Broad River Rd at Beatty Rd	Failed to yield R/W	US Primary	1			
Broad River Rd at Carrison St	Improper crossing	US Primary	1		1	
Bush River Rd at I-26	Illegally in road	Secondary	1		1	
Court Ridge St at Hillcrest Ave	Improper driving action	County	1		1	
Farrow Rd at Standish St	Speeding	SC primary	1			
Heathwood Cir at Cassina Rd	Other	US Primary				1
I-126 at Greystone Blvd	Speeding	US Primary				1
I-20 at Wilson Blvd	Driver under influence	US Primary	2		1	
I-26 at Bush River Rd	Driver under influence	Secondary	1			
I-77 at Forest Dr	Driver under influence	Secondary	2			
I-77 at Forest Dr	Speeding	Secondary	2			
I-77 at Bluff Rd	Improper lane change	US Primary	2			
Leesburg Rd at Kepper Dr	Pedestrian failed to yield	SC Primary	1		1	
Millwood Ave at Page St	Illegally in road	US Primary	1		1	
Rosewood Dr at Fulton St	Driver under influence	County	1			1
Screaming Eagle Rd at McCords Ferry Rd	Disregarded signs or signals	US Primary	1			
Screaming Eagle Rd at Melton Rd	Speeding	Secondary	1			
Taylor St at Assembly St	Improper crossing	SC primary	1		1	
Wilson Blvd at Plumber Rd	Illegally in road	US Primary	1		1	

City of Columbia Fatal Crashes, 2017[8]

Existing Conditions

SAFETY, CONTINUED

SCDPS in conjunction with SCDOT and the National Highway Traffic Safety Administration (NHSTA) has created an action plan to address the state of fatalities within SC called "Target Zero," which highlights several major factors that contribute to the high death rates, including drivers departing from the roadway, high speed, alcohol impairment, and driver education.

Falling under Education, Enforcement, Engineering and Emergency Management Services, Target Zero looks to implement the following strategies to improve pedestrian safety in SC.

Expand & improve pedestrian facilities

- Install separated paths/sidewalks along corridors and at intersections
- Consider pedestrian safety and mobility during the needs assessment of all projects
- Enhance intersection and roadway design to encourage livable communities

Increase enforcement of laws pertaining to pedestrians

- Implement targeted enforcement campaigns for pedestrians and motorists
- Educate police officers on pedestrian-related laws

Improve pedestrian safety awareness and behaviors

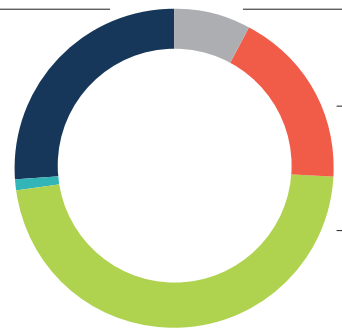
- Implement an awareness campaign emphasizing the risks to pedestrians on high volume/speed roadways
- Continue pedestrian safety campaigns for reflective apparel
- Continue driver education on pedestrian awareness
- Encourage the continued school audits performed by DHEC

Improve likelihood of pedestrian survival

- Improve response times to rural collision sites

A review of the crash types within the City indicate that the majority of crashes are occurring along US routes (47%, 2,775) and SC Primary routes (26%, 1,496). The frequency and concentration of crashes along these facility types is not surprising given the concentration of volume, speed, and frequency of driveways

Crashes by Facility Type[9]
(City of Columbia, 2017)



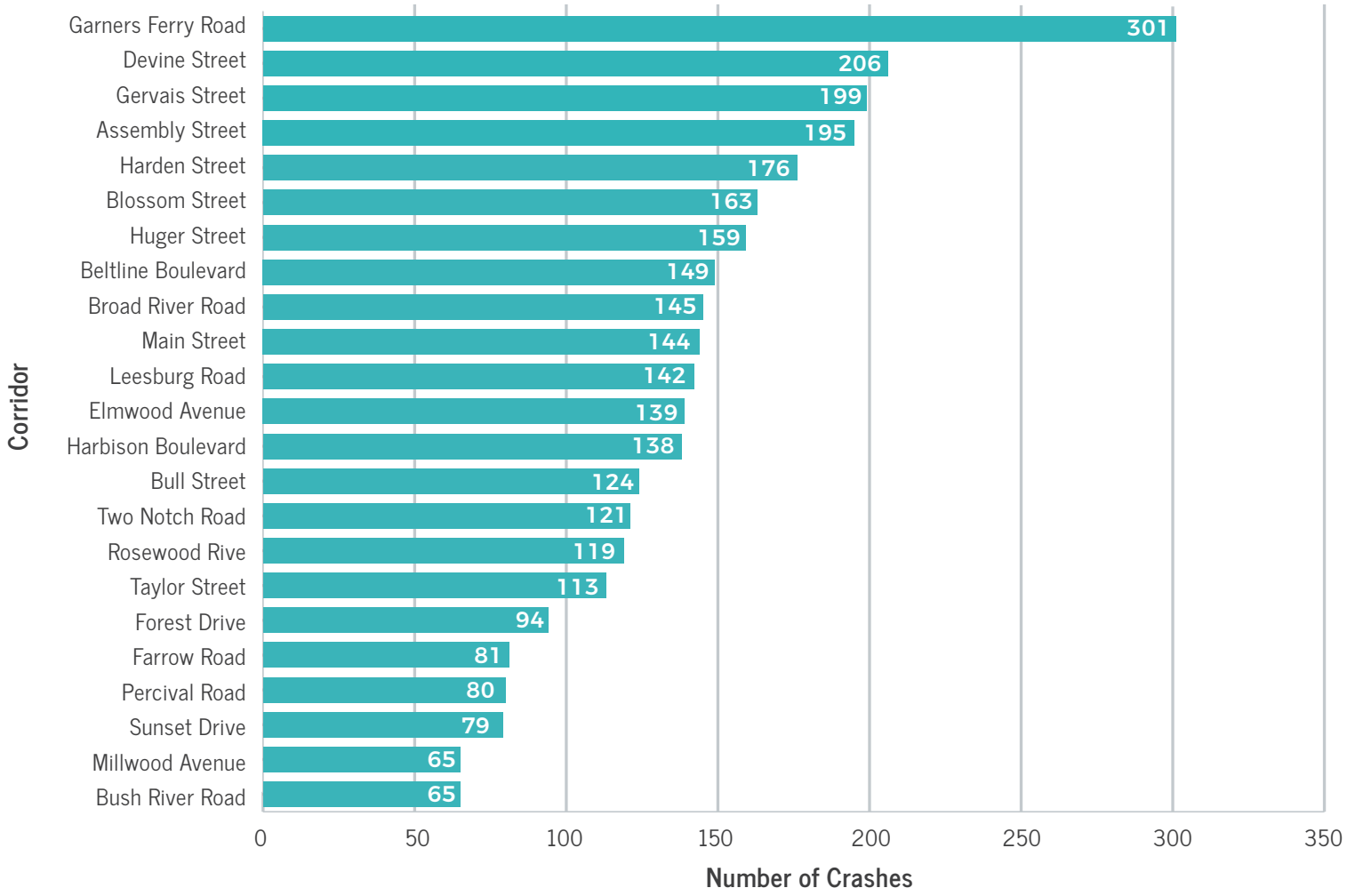
Facility	Crashes
Interstate	81
US Primary	2,775
SC Primary	1,496
Secondary	1,035
County	495

Existing Conditions

SAFETY, CONTINUED

A review of the crashes along corridors within the City limits of Columbia shows the following corridors having the highest concentration of crashes. The following list depicts the corridor and the number of crashes occurring in 2017. It is important to note that the interstates of I-77, I-20 and I-26 have been removed from this list.

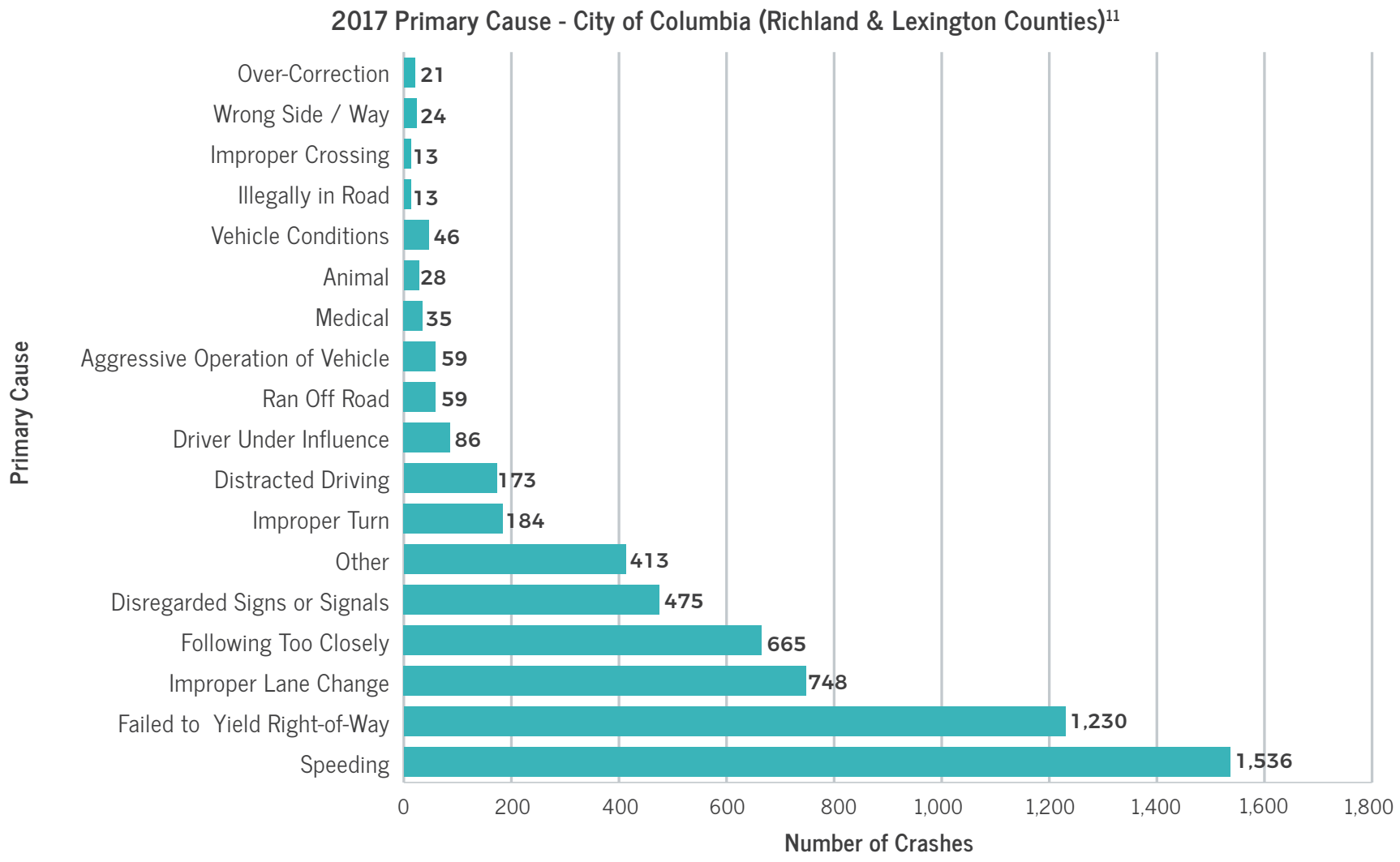
High Crash Corridors within the City of Columbia - 2017[10]



Existing Conditions

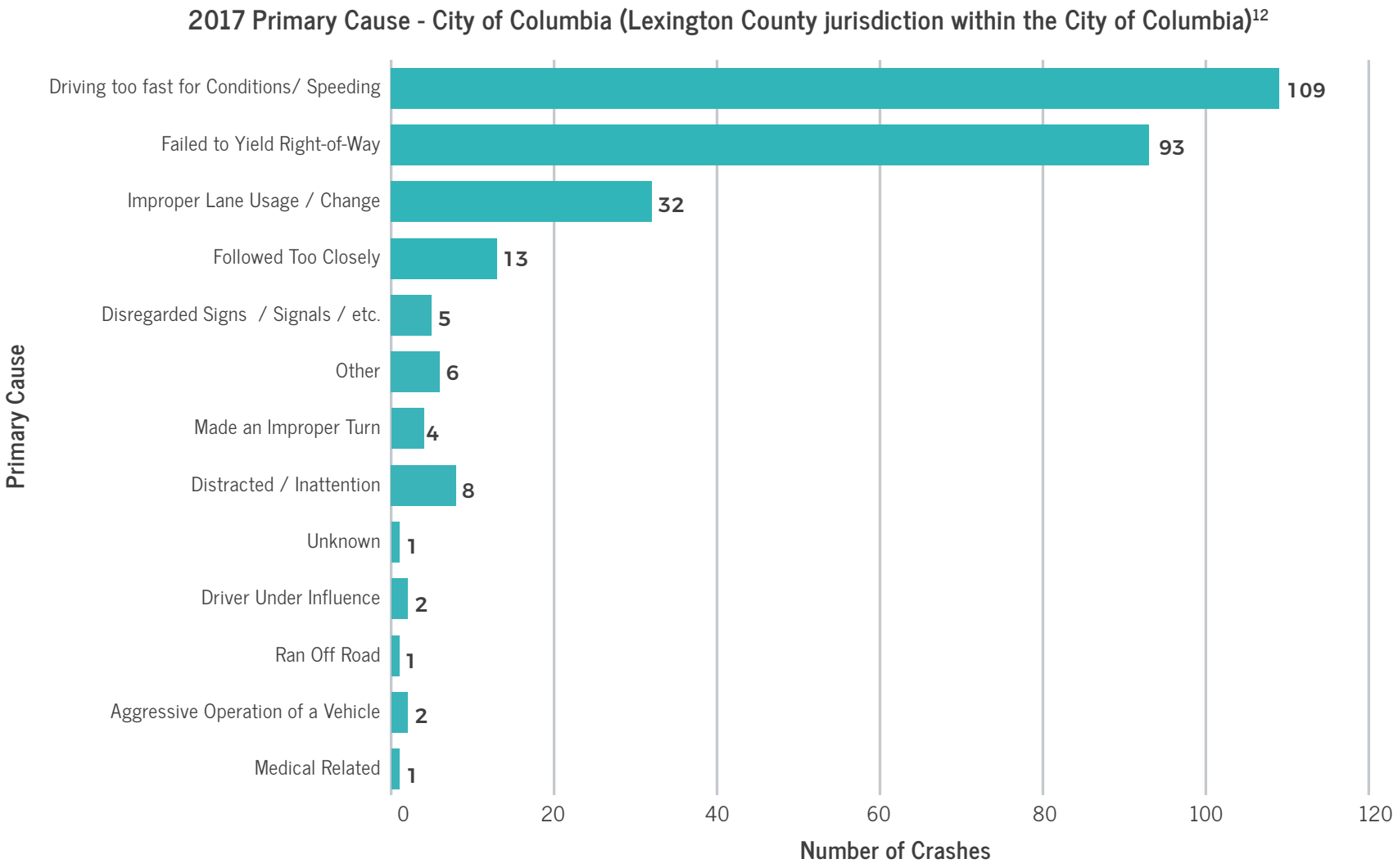
SAFETY, CONTINUED

In 2017 the primary cause for the majority of vehicle crashes in the City of Columbia was due to speeding (1,536). The next leading cause for crashes was failing to yield the right of way (1,230), followed by improper lane change (748), following too closely (665), and disregarding signs or signals (475).



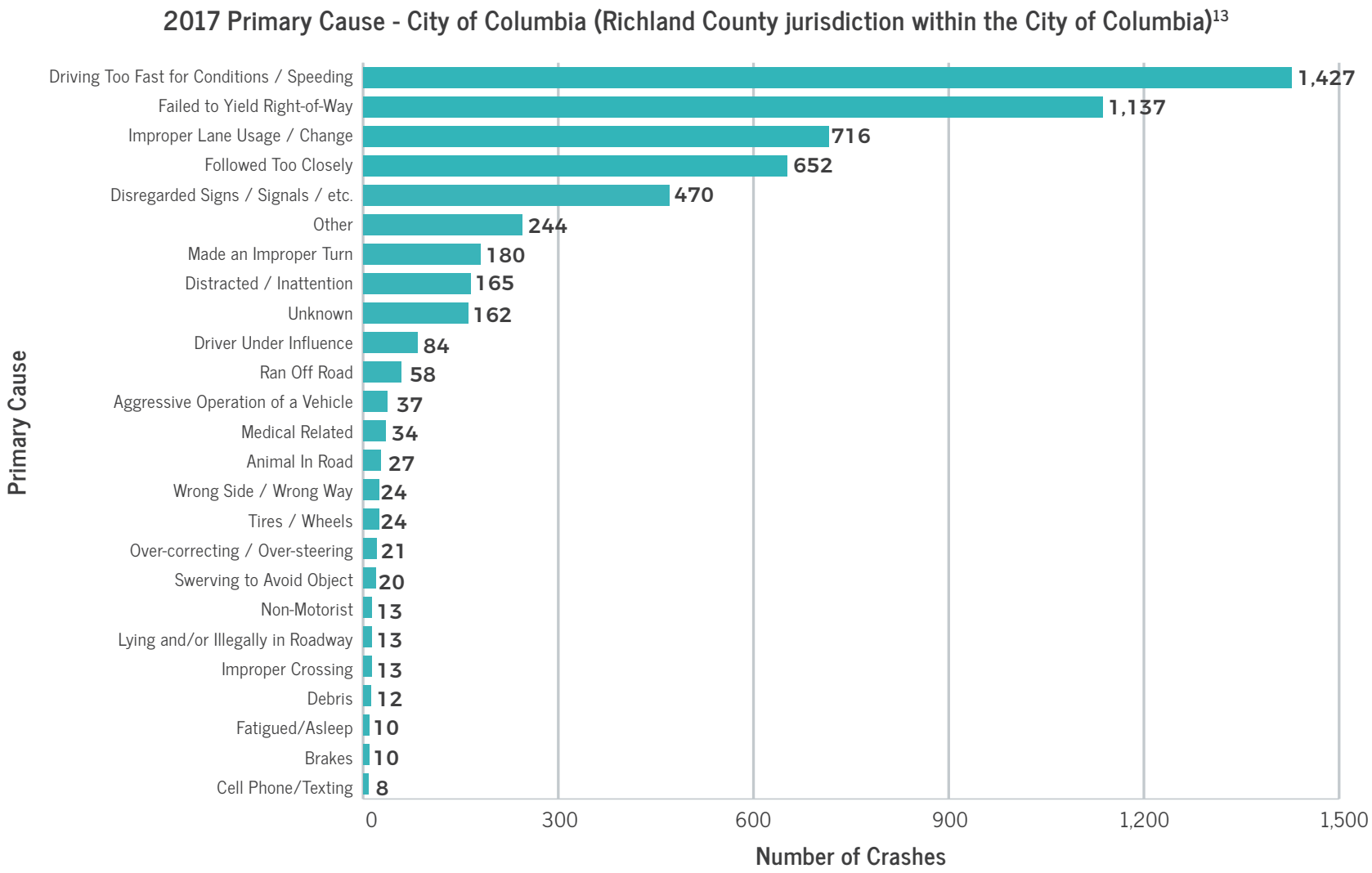
Existing Conditions

SAFETY, CONTINUED



Existing Conditions

SAFETY, CONTINUED



Existing Conditions

SAFETY, CONTINUED

The data shown in the previous three graphs suggests that enforcement for speeding has the potential to reduce the overall number of crashes within the City limits. For the 20 fatalities, three (3) were directly attributed to speeding and with the others speeding was most likely a contributing factor.

Enforcement, unlike design, requires continued dedication of resources to maintain a positive impact or correction on driver behavior. In conversations with the City of Columbia Police Department, staffing levels for enforcement remain below the current necessary levels, partially due to a high number of vacant positions. Any additional campaigns to curb speeding within the City may require dedicating additional staff resources to traffic enforcement above the current levels. However, as shown in previous efforts, while enforcement does have an immediate impact on driver behavior, it does require long term engagement of the activities to have a meaningful impact, until such time that a design change can be made. Furthermore, as enforcement actions can disproportionately impact lower-income populations, it is important that any enforcement efforts are cognizant of equity concerns and focus on building awareness over taking punitive action.

PEDESTRIAN INFRASTRUCTURE

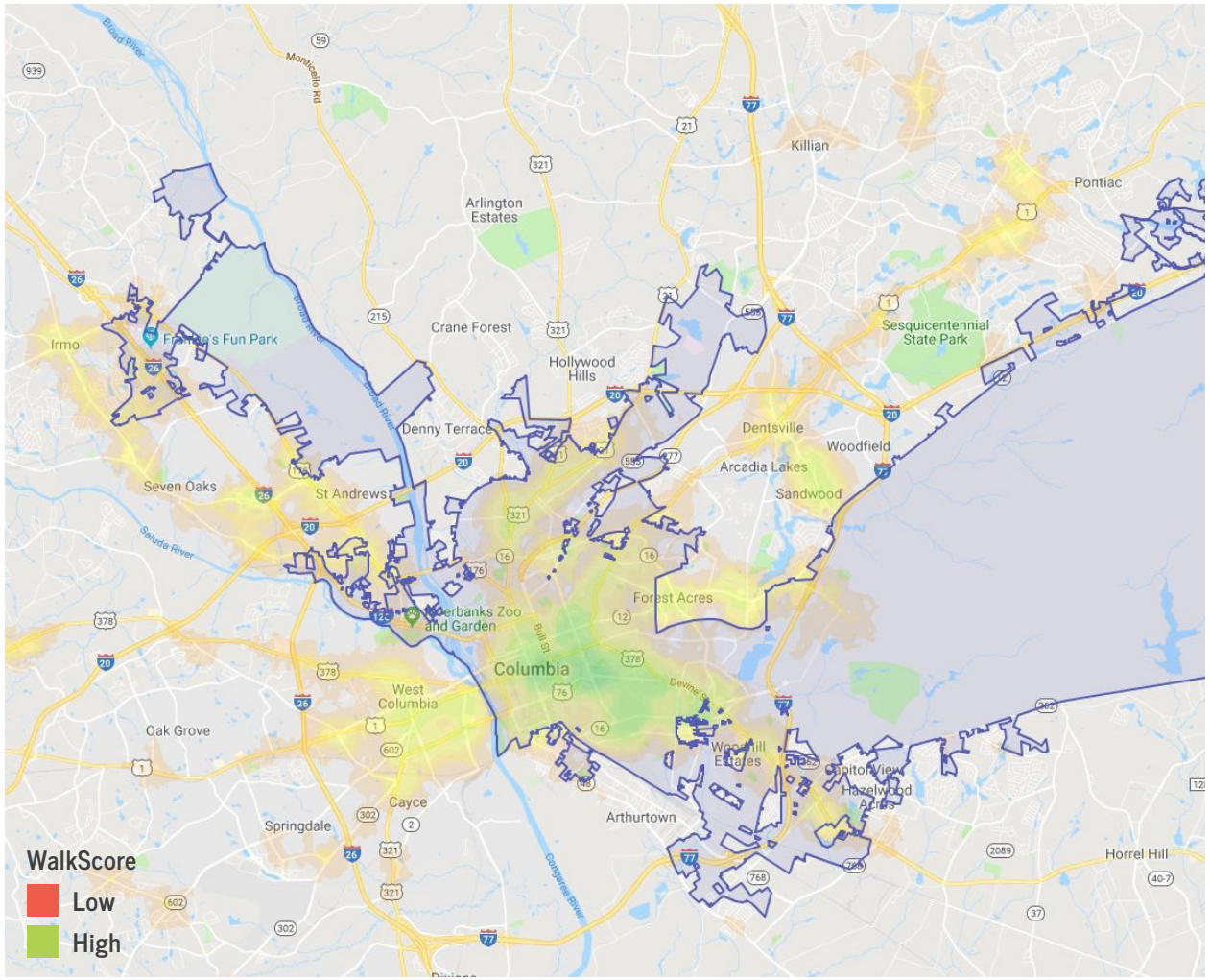
The City completed a pedestrian and bicycle master plan called *Walk Bike Columbia* in 2015, which provides extensive background on the current challenges facing active mobility, as well as the City's priorities for upcoming investments.

The City of Columbia maintains an extensive sidewalk network, especially in the downtown core and the City's older established neighborhoods. However, many barriers remain that make walkability a challenge, including ADA accessibility, lack of improved pedestrian crossings, lack of shade, and poor sidewalk maintenance. Most large vehicular thoroughfares, including many SCDOT-maintained streets, lack improved crossings and act as barriers for pedestrians even if they include sidewalks (which many do not). Outside the downtown core, many activity centers are difficult to access by foot, including many parks, job centers, and schools as the residential streets do not have sidewalk infrastructure in place, many of which are owned by SCDOT. The City of Columbia does not currently designate any amount of the annual capital improvements budget toward sidewalk construction, and thus is not adding to its pedestrian network in a methodical manner.

Existing Conditions

PEDESTRIAN INFRASTRUCTURE, CONTINUED

As an indicator of the challenges, WalkScore.com currently gives the City of Columbia a score of 38 out of 100, designating the City as "car-dependent." WalkScore takes into account many metrics, including the density of community amenities, block length, population density, and pedestrian amenities. Columbia's WalkScore is on par with other major South Carolina cities, and higher than that of many other Southeastern cities. Coming out of the analysis provided during the *Walk Bike Columbia* process, the City of Columbia was designated as a Bronze-level Walk Friendly Community (WFC) by the Pedestrian and Bicycle Information Center in 2015. Walk Friendly Communities is a national recognition program aimed to encourage communities to establish or recommit to a higher level of walking. The City of Columbia is the first Bronze level community within the state and the only community within the state to receive the designation at any level.

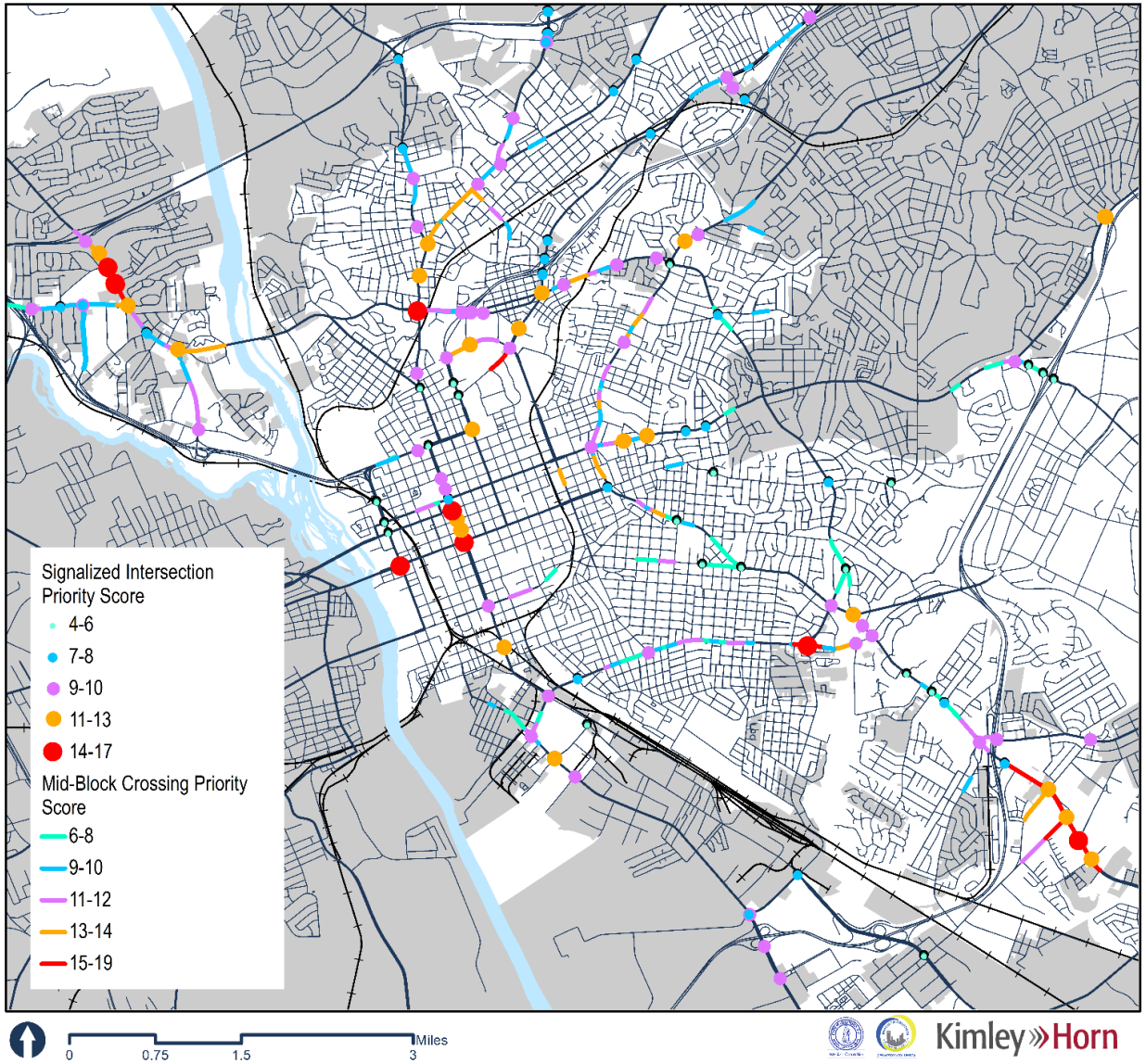


WalkScore.com heatmap indicating high and low walk scores.

Existing Conditions

PEDESTRIAN INFRASTRUCTURE, CONTINUED

Walk Bike Columbia included a level of service analysis for the City's pedestrian network, which indicated that the downtown core and area surrounding the university have the highest demand for pedestrian facilities and are generally well served. Many other areas outside the downtown core near schools, medical districts, shopping centers, and high traffic crossings lack low-stress facilities, and were identified as priority improvements.

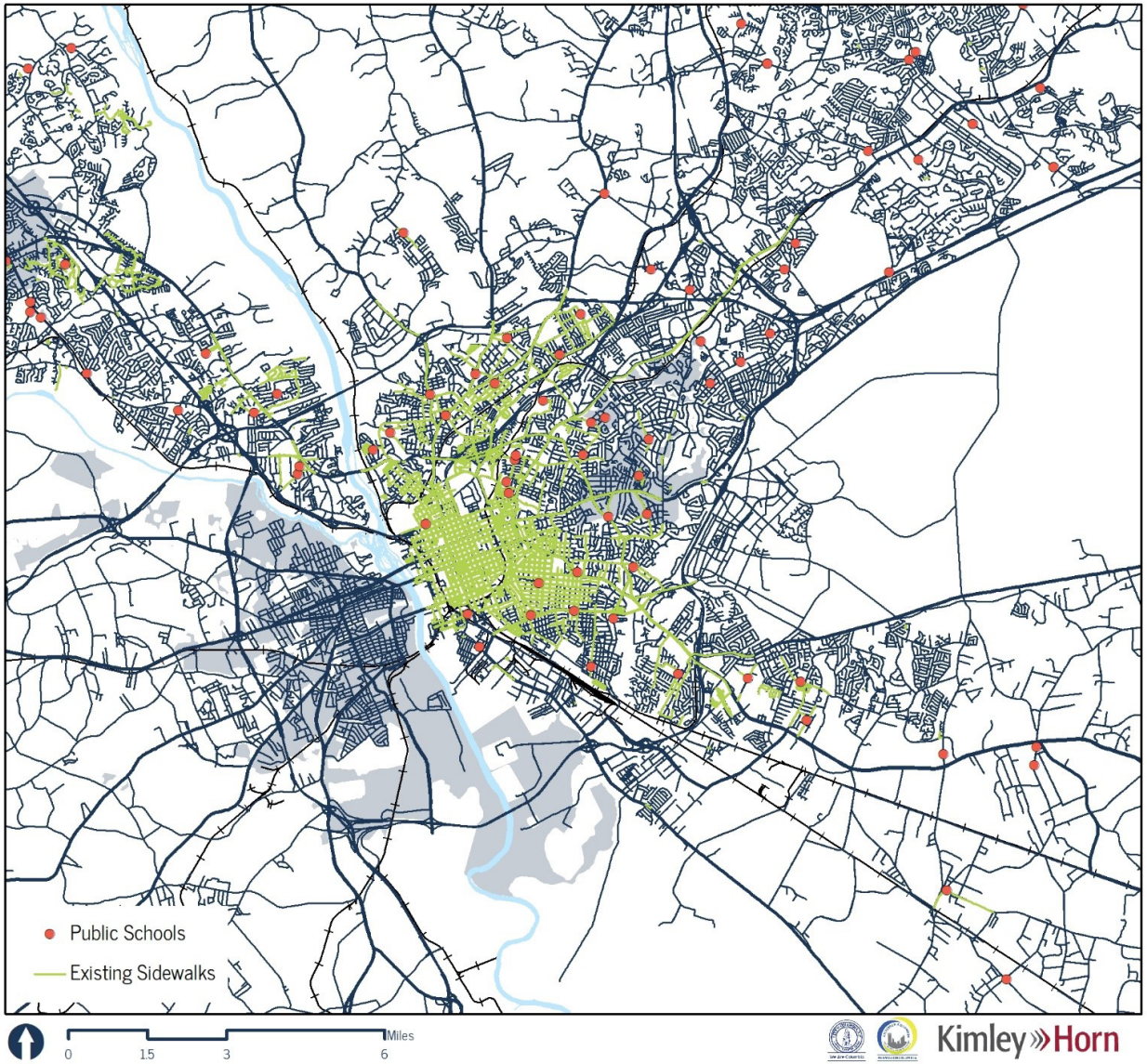


Signalized intersection improvements recommended by *Walk Bike Columbia*

Existing Conditions

PEDESTRIAN INFRASTRUCTURE, CONTINUED

Several schools within the City also operate a Safe Routes to School Program, receiving funding directly from the SCDOT. As shown in the adjacent map, many of the public schools within the City limits do not have sidewalk coverage in the surrounding neighborhoods, limiting the ability of students to travel to and from school under their own power.



Public schools and existing City of Columbia sidewalks, City of Columbia

Existing Conditions

BICYCLE

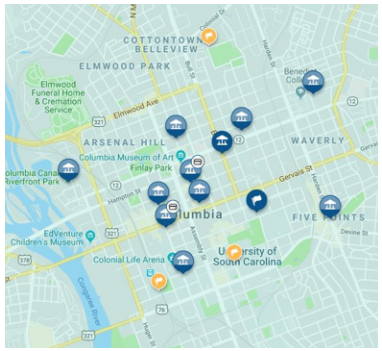
Columbia is rated as a Bronze level bicycle-friendly community by the League of American Bicyclists, due largely to a high emphasis on bicycle education, bike-friendly events, and a Bicycle Pedestrian Advisory Committee that meets frequently. Ridership within the City is still low overall, but is higher in the neighborhoods surrounding the University. The census tract with the highest bicycle commute ridership is found just south of the University, with 5.2% of local residents riding a bicycle to work. This is somewhat lower than the neighborhoods with the highest bicycle ridership in other peer communities (southeast cities with major college campuses, as well as South Carolina peer cites), as shown in the below.

City	Neighborhood Bicycle Ridership[14]
Charleston, SC (downtown)	10.8%
Athens, GA (University of Georgia)	10.5%
Greenville, SC (downtown)	6.6%
Knoxville, TN (University of Tennessee)	6.5%
Tallahassee, FL (Florida State University)	5.6%
Columbia, SC (University of South Carolina)	5.2%

Though dedicated bicycle facilities are currently limited, the City's connected street grid of low-traffic roadways and wide rights-of-way is well positioned for future road diet and restriping opportunities to create a comprehensive bicycle network.

Similar to the challenges faced by pedestrians, the City's large vehicular thoroughfares pose a challenge to bicyclists, and street connectivity decreases as one travels away from the downtown core, limiting access to activity centers. Additionally, bicycle parking is limited throughout the City, creating unnecessarily difficulties for those who wish to use the mode as their primary mode of transportation.

The City also implemented a bike share system, Blue Bike SC, in 2018. The system, centered on downtown, offers 12 short-term bicycle rental stations, with additional stations planned. Between the system's launch in August 2018 and end of December 2019, the system's 135 bikes have been ridden over 47,000 miles in 18,000 trips. The COMET invested in the program in 2019 to fund an expansion. The money will fund the construction of 8 additional stations (5 of which were upgrades to existing virtual stations) and allows COMET riders to ride a Blue Bike free of charge.



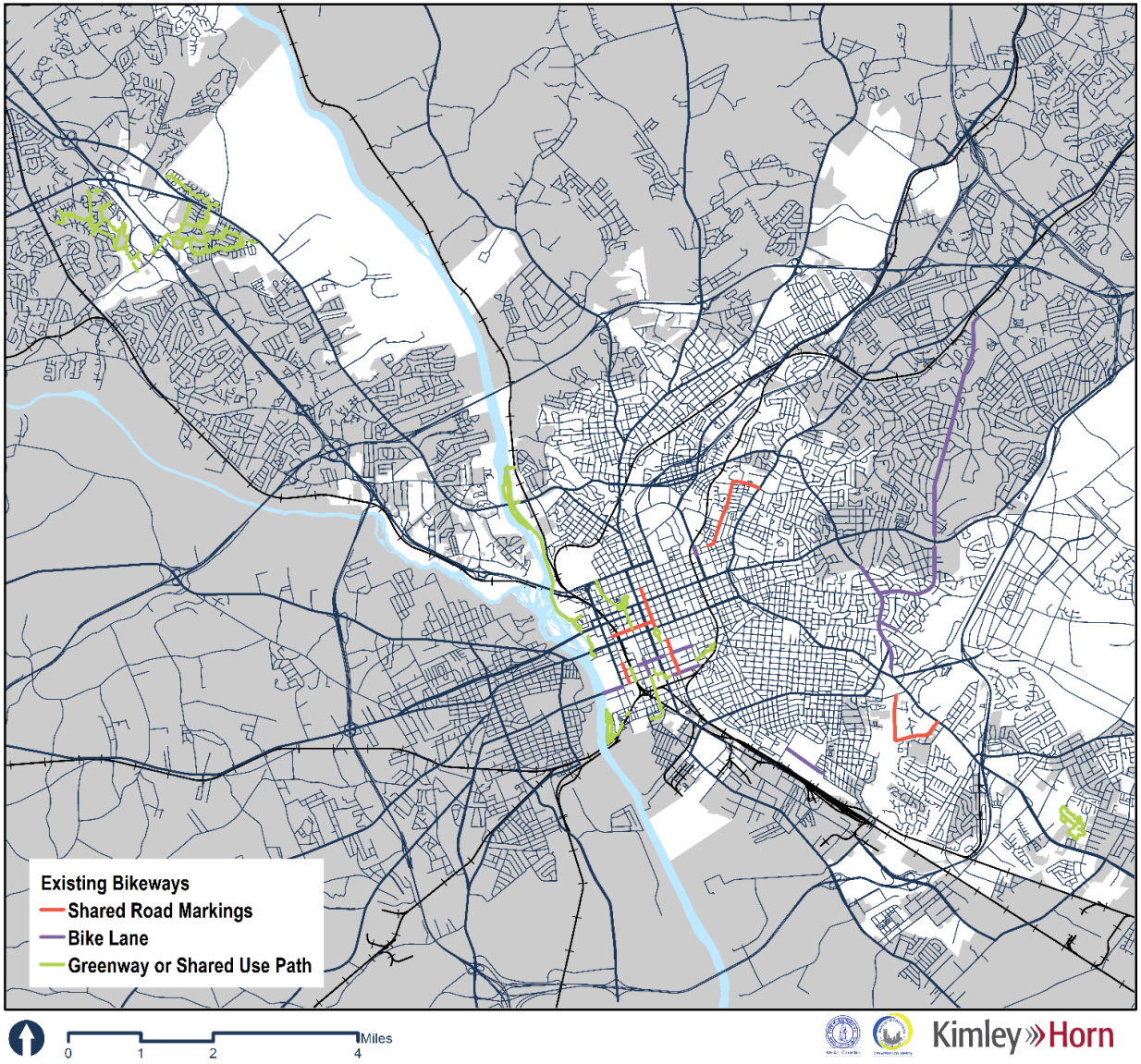
Bikeshare locations

Bikeshare facility at Lincoln Street and Lady

Existing Conditions

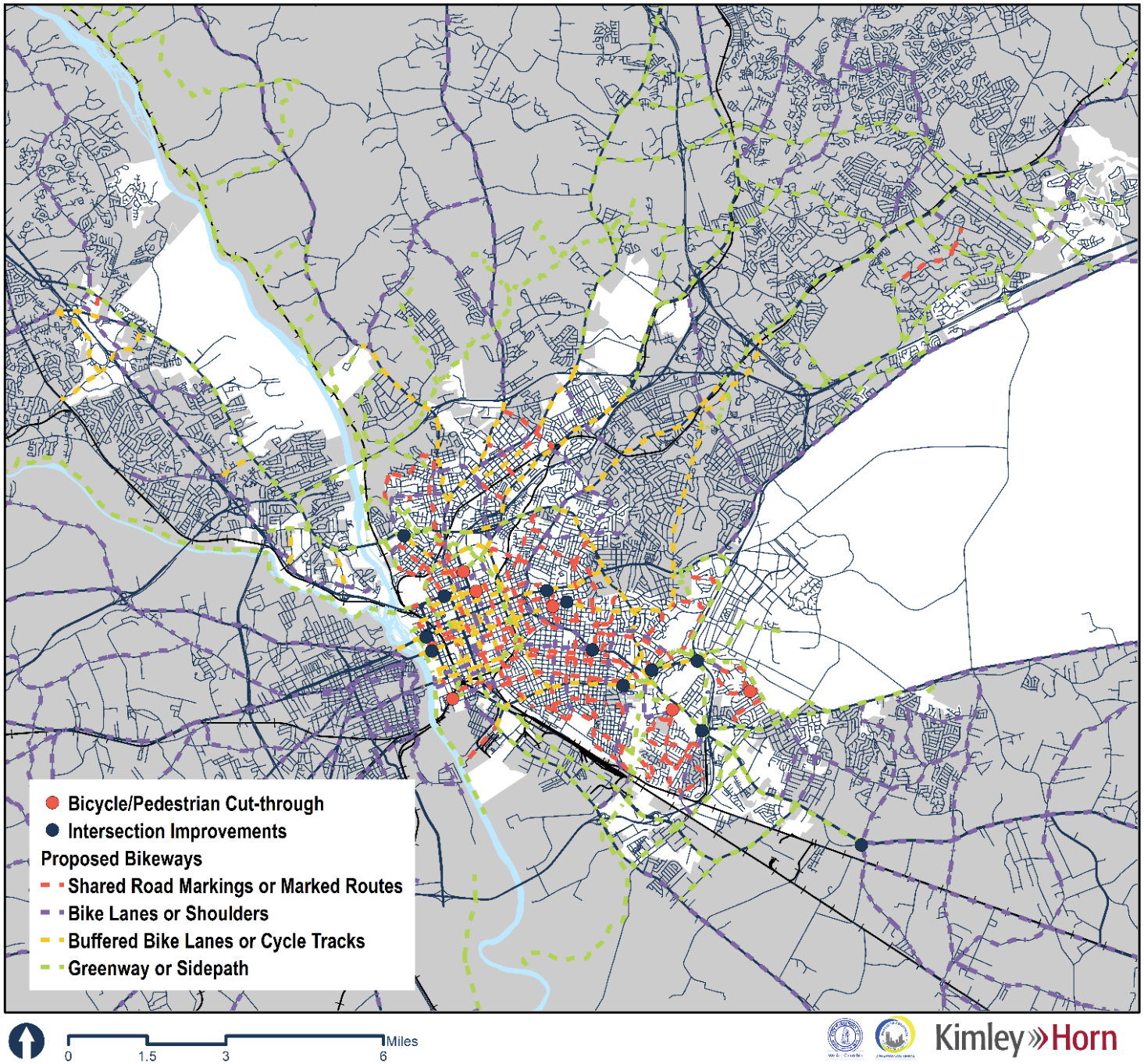
BICYCLE, CONTINUED

Many bicycle improvements are recommended by the City's *Walk Bike Columbia Pedestrian & Bicycle Master Plan*, including the addition of 285 miles of greenways, cycle tracks, or bike lanes. Those projects were prioritized through the *Walk Bike Columbia* process. The adjacent map shows the existing bikeways. The maps on the following pages depict the planned bikeways.

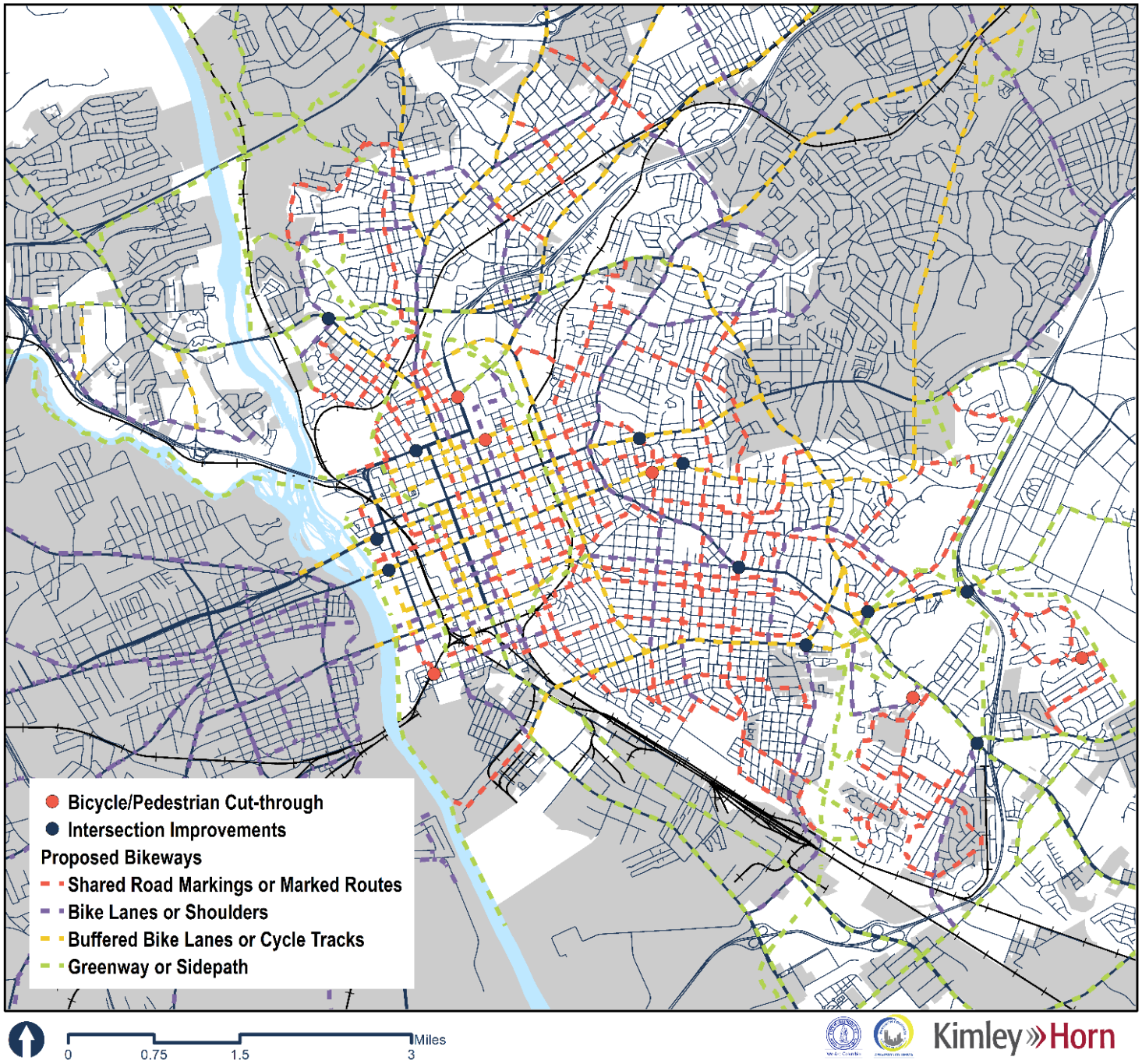


Existing bikeways, City of Columbia

Walk Bike Columbia Recommended Bikeways



Walk Bike Columbia Recommended Bikeways (Urban Core)



Existing Conditions

GREENWAYS

There are currently 25 miles of greenways and shared use paths within the City of Columbia, with the Three Rivers Greenway downtown and the shared use path network throughout the Harbison development making up the majority of the mileage. Not all of these facilities are maintained by the City of Columbia. Another 165 miles are recommended as part of the *Walk Bike Columbia Pedestrian & Bicycle Master Plan*.

These expansions to the greenway system will expand the trail network to all corners of the City and link the local network with surrounding cities to provide regional mobility.

TRANSIT

The COMET, operated by the Central Midlands Regional Transit Authority, operates buses in Richland and Lexington Counties. The system had undergone many recent upgrades, funded largely by the Richland County Penny Tax, which dedicated $300 million to transit funding beginning in 2012. Reliable transit service is especially important in Columbia, as **11.4% of City of Columbia households do not have access to vehicles according to Census data**. The COMET system offers comprehensive service throughout the City, with most routes operating on a modified hub-and-spoke system, based around the downtown Transit Center. This means many riders must transfer routes to reach a final destination.

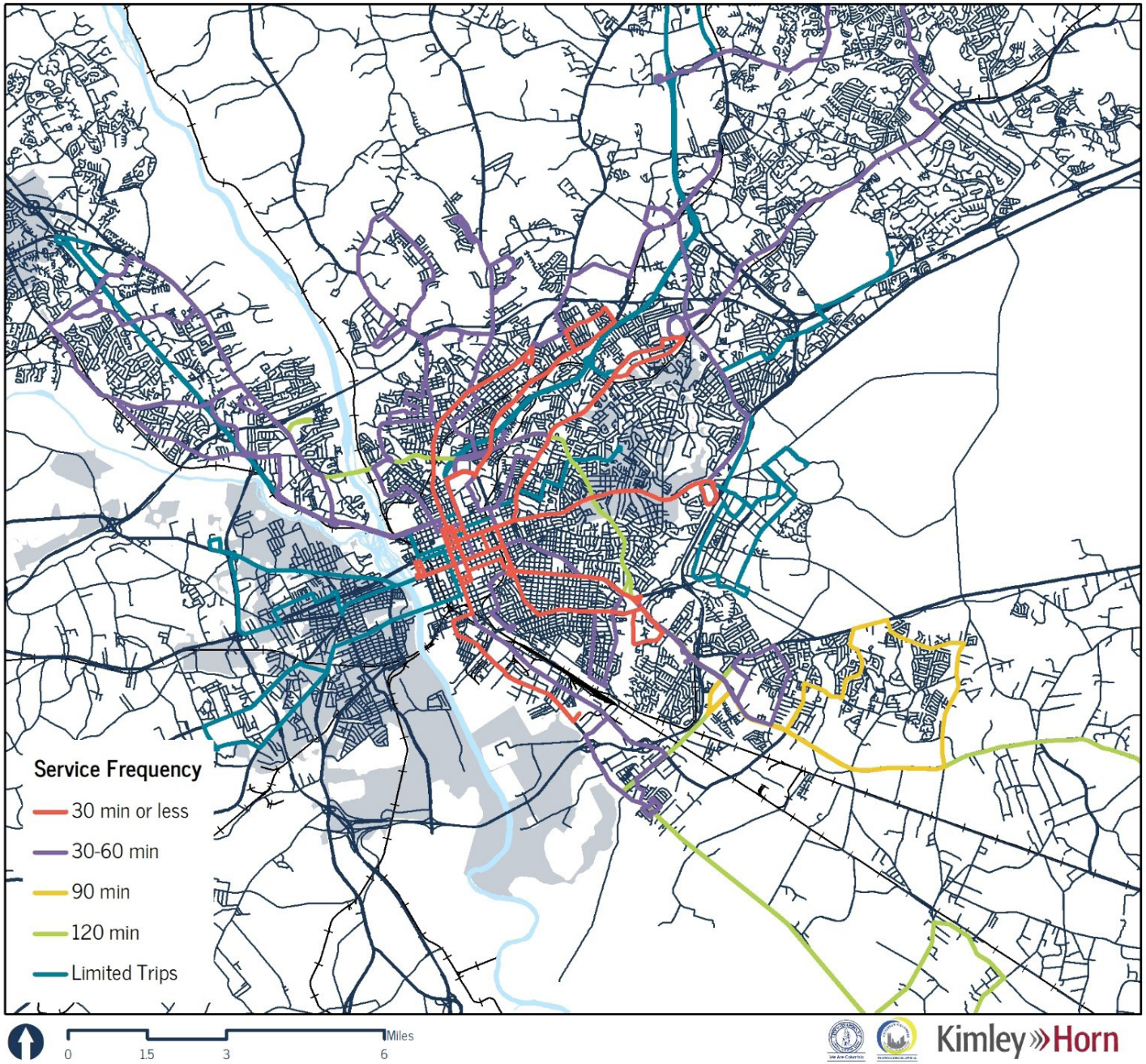
The Soda Cap Connector, a branded downtown circulator service, launched in 2017. The Connector provides service to the State House grounds , the University, and other downtown destinations every 20 minutes. Rides on the Soda Cap are currently free, with the hope of continuing that service if funding allows. The route is intended to encourage a “park once” philosophy for downtown visitors.

Since 2012, the number of boardings throughout the system have increased by 71%, from 1.5 million to 2.5 million. The system now offers online bus tracking, on-board wifi and phone chargers, and upgraded buses that are intended to provide a premium experience to attract riders. The system’s main challenge remains finding ways to provide frequent service on high ridership routes. 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 seen as a viable travel choice for those with the means to travel by car.

A number of other alternative transit services are available in Columbia as well, with varying frequency and quality of service. Uber and Lyft both operate within the City, along with traditional taxi services. The University of South Carolina operates a special event shuttle service along with safe evening rides for students and staff. In addition, the COMET is in preparation to deploy a microtransit pilot in downtown Columbia, which would operate via an app. Microtransit is a form of demand-responsive transport which can offer flexible routing and/or scheduling of smaller public transit vehicles.

The map on the following page depicts traditional transit service frequency throughout The COMET’s service area.

Transit Service Frequency

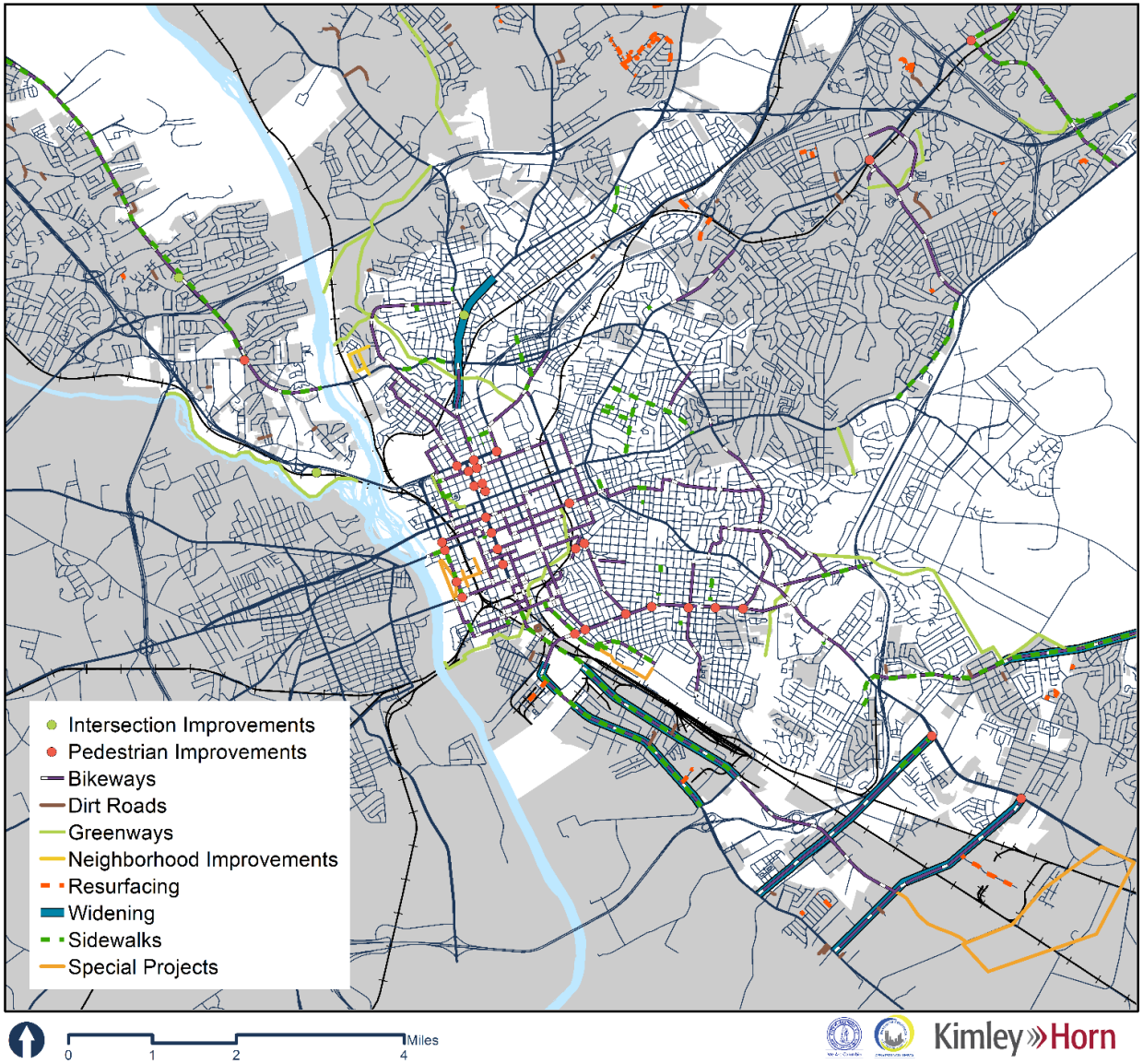


The COMET data

Existing Conditions

RICHLAND PENNY TAX

In 2012, Richland County voters approved a 1% transportation sales tax program to help fund transportation improvement projects for 22 years or until a total of $1.07 billion in revenue was collected. The program has proven to be one of the major mechanisms for funding transit, bicycle, and pedestrian improvements throughout the county, including several miles of projects and intersection improvements within the City. $234 million has been invested through the end of 2017.



Richland Penny Tax for Transportation projects, Richland Penny data

Existing Conditions

FREIGHT

Columbia is a strategic freight location in South Carolina due to its central geography and location at both an interstate and railroad crossroads. South Carolina designates freight routes throughout the state to ensure the proper maintenance and construction of highways suitable for heavy freight users. In Columbia, these routes include the major interstates, which provide regional mobility around the City, plus US 378, which provides a freight route into the urban core.

The 2014 *South Carolina Statewide Freight Plan* identified several freight bottlenecks in the Columbia areas, including:

- The I-20/I-26 interchange
- I-26 and St. Andrews Road
- I-77 southbound approaching the Forest Drive interchange (Thursdays, due to weekly graduation ceremonies at Fort Jackson)

This plan also predicted that freight traffic on the stretch of I-26 from Columbia south to I-95 near Charleston will grow by over between 25 and 50 million tons – **one of the highest growth rates of any state roadway**. Columbia is likely to see continued freight growth in the coming decades, as traffic increases between the Port of Charleston and the Inland Port near Greer. To prepare for continued freight growth, corridor improvements were recommended on all major interstates in the Columbia area.

In addition to the statewide plan, the Central Midlands Council of Governments (CMCOG) also identified the key challenges and opportunities facing the regional freight network in a 2017 *Central Midlands Regional Freight Mobility Plan*. The study found that over 95 million tons of freight moved across the region in 2011, with most of it (62 million tons) traveling through the Midlands with both an origin and destination outside of the region. Trucks move the majority of the region's freight (68%), but rail also moves approximately 32% of the total tonnage. Less than 1% of the region's freight (tonnage) moves by air, however, that which is moved via air has an average value of $138,227/ton (*Central Midlands Regional Freight Mobility Plan*, 2017).

Some of the key findings of this study include:

- The region's highest truck volumes are found on I-77, I-20, and I-26. Many of the areas with highest truck volumes are located near or on future growth areas.
- Many of the region's major freight bottlenecks are located within the City of Columbia, which will cause major challenges as the City continues to grow.
- Chemical and related products are the most frequent commodity shipped through the region. With much of the region's infrastructure aging, this can raise many questions about the hazards of transporting chemical products through a densely populated region on less-than-adequate infrastructure.
- Truck freight is the region's largest economic generator, with 129,000 people employed in an industry related to truck freight,

Existing Conditions

FREIGHT, CONTINUED

and over $9 billion value added to the regional economy per year.

Safety, pavement condition, and congestion bottlenecks are all major freight concerns in the Midlands region and in Columbia. New proposed projects in the 2017 *Central Midlands Regional Freight Mobility Plan* in Columbia include:

- Intersection improvements at Huger Street and Elmwood Avenue
- Interchange Improvements at I-77 and I-277
- Rail crossing improvements at Greene Street crossing
- Synchronize traffic signals in downtown Columbia

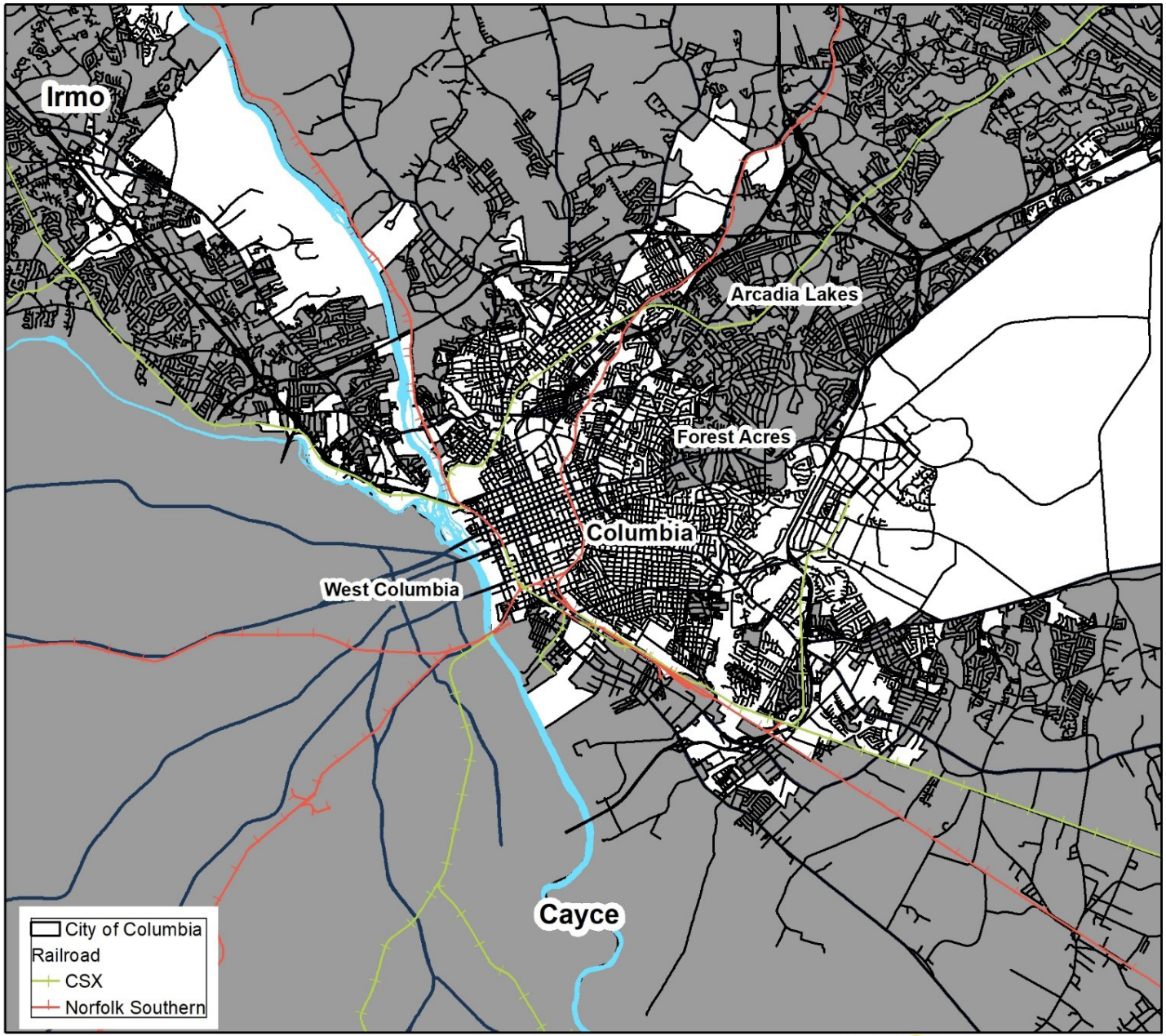
Columbia sits at the crossing of the Norfolk Southern and CSX railroads, both of which provide direct access to the Port of Charleston. A large volume of at-grade rail crossings and the frequency of freight train traffic have caused frequent challenges throughout the City. The problem is most obvious in the Assembly Street area, where CSX and Norfolk Southern rail lines often run parallel or cross, creating frequent conflicts when two freight trains meet. A 2014 application for the Upper Midlands Multimodal Corridor Improvement Project noted, "When trains occupy both tracks simultaneously, one train has to stop and wait for the other to free the tracks, so it may cross. This common occurrence can last upwards of 20 minutes. This congestion is exacerbated at peak hours for automotive traffic and creates delays for all involved."

In the 1980s an ambitious project to alleviate congestion in the Vista was undertaken to separate rail traffic from vehicular traffic. The project involved lowering the rail below Gervais Street, Lady Street, Hampton Street and Taylor Street in the Vista. This alleviated the conflict between the rail and vehicular traffic. The second phase of the project was to install a flyover between the rail line and Huger Street. The project was shelved due to cost and concerns raised by residents that Olympia Avenue would become a major thoroughfare.

Though train schedules are not publicly available, between 20 and 30 trains cross through the City daily, and the issue has recently risen to local prominence. Freight train traffic through the region is likely increased since the opening of the Greer Inland Port. The Assembly Street Rail Separation Project, managed by SCDOT, is exploring ways to consolidate rail corridors in that area and improve vehicle connectivity to minimize disruptions from frequent train crossings. The City has also assembled a committee to investigate implementing "quiet zones" to limit the amount of train noise in residential areas.

The map on the following page depicts the rail lines in and around Columbia.

Rail Locations in Columbia, SC



0 1.5 3 6 Miles

SC State data

Existing Conditions

AVIATION

The Columbia Metropolitan Airport provides commercial passenger and freight service for the metropolitan area. It has two runways and provides nonstop service to ten US destinations. In 2017, over 530,000 passengers departed through the airport. In 2018, the airport is reporting an almost 10% year-to-date increase in passengers through November, likely reflecting an increase in airport capacity and the number of nonstop flights offered. The airport is located outside the City limits but is within six miles of downtown and conveniently located to the City's interstate loop and easily accessed by personal vehicles from most parts in the region.

Many Columbia residents also utilize nearby airports including Charlotte, Greenville, and Charleston. While these other airports are in relative proximity to Columbia, the Charlotte airport is larger in size and has more nonstop connections to both national and international destinations. However, the regional economic impact of the airport cannot be ignored. The Columbia Metropolitan Airport serves as the only air to truck facility in the state. United Parcel Service (UPS) currently operates this hub. The growing economic impact of freight mobility as well as future evolution of air mobility further highlights the need for regional coordination between municipalities in the Columbia Metropolitan area.

The Jim Hamilton – L.B. Owens Airport, informally know as Owens Field, was built in the 1929 and served as the area's primary operating terminal until the 1960s. Located in the heart of the Rosewood neighborhood, the airport primarily serves as a local municipal field for private air service for general aviation. It was originally named the Columbia Municipal Airport before changing to Columbia Owens Downtown Airport after WWII to honor the former mayor of Columbia, Lawrence B. Owens. In 2008, the airport's name was again changed to honor Jim Hamilton, the former airport manager. The airport's central location and proximity to residential housing can create challenges for surrounding development, in the form of land use restrictions regarding height and noise.

The Jim Hamilton- L.B. Owens Airport is home to the historically significant Curtiss-Wright hangar which was the first to be constructed at the airport in 1929. The hangar has served many roles during its life including housing planes for passenger and mail service and operations and maintenance. It has recently been restored and is a brewery and restaurant.

PASSENGER RAIL

Amtrak provides passenger rail services to Columbia, on the Silver Service/Palmetto line, which connects to New York, Washington, DC, Charleston, Savannah, and destinations in Florida. One train per day each way services the station in the middle of the night due to scheduling. Amtrak is a secondary user to the primary users, CSX and Norfolk Southern and as such operates at their discretion. Even with the late-night arrival and departure times, approximately 29,000 passengers boarded an Amtrak train in Columbia in 2018, with an average trip length of 521 miles. New York City was the top destination.

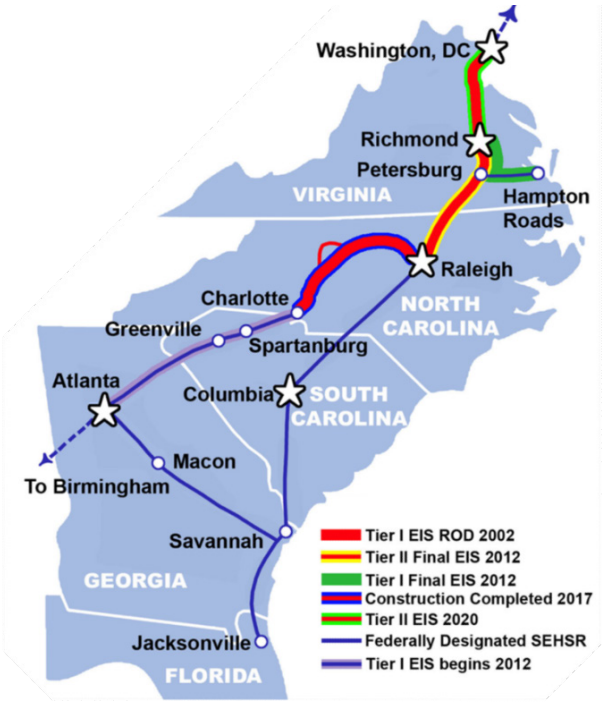
Existing Conditions

PASSENGER RAIL, CONTINUED

Regional conversations regarding the future of rail service include several feasibility studies to extend high speed corridors to many areas of the southeast. One possible alignment would connect South Carolina's three largest cities by paralleling I-26. Other conversations have centered on connecting Columbia to Charlotte and Atlanta. All proposed routes are in the early stages of implementation, and the region is unlikely to see high speed rail before 2050.

The Georgia Department of Transportation (GDOT) in conjunction with the North Carolina Department of Transportation (NCDOT) and SCDOT are working in collaboration on the develop of a Tier 1 Environmental Impact Study (EIS) evaluating the impacts of a high-speed rail corridor between Charlotte and Atlanta. The corridor will pass through South Carolina, most likely along or near the I-85 corridor. The Passenger Rail Corridor Investment Plan (PRCIP) is a part of the larger high-speed rail program that intends to improve service between Washington, D.C. and Atlanta. The Southeast High-Speed Rail (SEHSR) corridor is currently being implemented in parts of North Carolina and Georgia. The overall intent is to improve rail service and mobility outside of the current motor vehicle conduit along I-85. The mobility choice will also provide connectivity to Washington, D.C. and other linkages in the northeast.

Two of the alignments being evaluated in the Charlotte to Atlanta PRCIP study connect Charlotte, NC with Columbia. One proposed alignment follows an existing CSX freight line, while the other is a Greenfield alignment roughly parallel to I-77. The Tier 1 Environmental Review for the Atlanta to Charlotte Passenger Rail Corridor Investment Plan was completed in Fall 2019.



In addition to the Charlotte to Atlanta PRCIP, FRA selected the Southeast region for a fully funded, USDOT-led, Southeast Multi-State Rail Planning Study in July 2015. This effort continues and will facilitate coordination with neighboring states and will assist with funding for freight and passenger rail projects in the Southeast. SCDOT serves as a member of the project Steering Committee and hosted the first meeting for the Southeast Regional Rail Planning Study in Columbia in September 2016. Independent of the studies to determine whether high-speed rail service will be feasible, interest has been expressed in passenger rail service between Charlotte, North Carolina and Columbia that would connect to the expanding passenger rail network being developed in the Charlotte region.

Existing Conditions

PASSENGER RAIL, CONTINUED

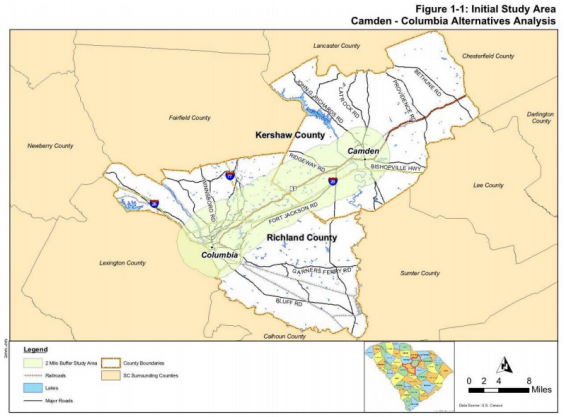
CMCOG has been exploring commuter rail service since 2000 when it completed its first study. The results of that study, which assessed nine corridors, identified three that possessed characteristics that would benefit from commuter rail service. They were: Columbia to Newberry; Columbia to Camden; and, Columbia to Batesburg-Leesville. Another commuter rail feasibility study was conducted in 2006 by CMCOG to further evaluate the three corridors previously identified. Of the three corridors, the Columbia-Camden corridor was the clear choice receiving the highest ranking overall in four of the five criteria. It also compared favorably with the peer corridors in Albuquerque, Charlotte and Nashville. Ridership was estimated to range between 1,900-2,300 per day and the capital cost estimated at $80 million.

As a follow-up to the 2006 *Commuter Rail Feasibility Study for the Central Midlands Region of South Carolina*, in May of 2011, CMCOG completed its *Camden / Columbia Alternatives Analysis Study*. Three "build" alternatives were identified: one commuter rail and two bus rapid transit (BRT). Ultimately, however, the study found that the three build alternatives were too costly relative to the need for transit service at the time. Instead, low cost investments enhancing mobility options for traveling within Columbia were recommended, as well as between suburban areas and downtown Columbia.

CAMDEN - COLUMBIA ALTERNATIVES ANALYSIS

In 2011, CMCOG completed a comprehensive study to identify and evaluate the need and potential for implementing rapid transit service for the corridor between Camden and Columbia, including urbanized portions of Columbia, suburbanized areas in northeast Richland County and more rural areas in Kershaw County. This study is a follow-up to the *Commuter Rail Feasibility Study for the Central Midlands Region of South Carolina* completed in July 2006, which identified this corridor as a strong potential corridor for enhancing commuter transit opportunities, mainly identifying commuter rail as the preferred technology. This study is sponsored by CMCOG and SCDOT.

Within the project area, the Camden-Columbia corridor extends approximately 38 miles from Columbia, SC east to Camden, SC. The roadway network within the corridor ranges from local neighborhood roads to major thoroughfares. The corridor is centered along two major thoroughfares: Interstate 20 (I-20) and US Highway 1 (US-1). The corridor encompasses an existing CSX Transportation rail corridor that operates freight rail service and two Amtrak passenger trains.
The study recommended the transformation of the corridor from a single occupancy vehicle corridor to a multimodal transportation corridor, by providing: enhanced bus service; express bus service; land uses that serve transit-oriented development; and connectivity between major activity centers.



Camden - Columbia Alternatives Analysis[15]

Existing Conditions

PASSENGER RAIL, CONTINUED

NEWBERRY - COLUMBIA ALTERNATIVES ANALYSIS

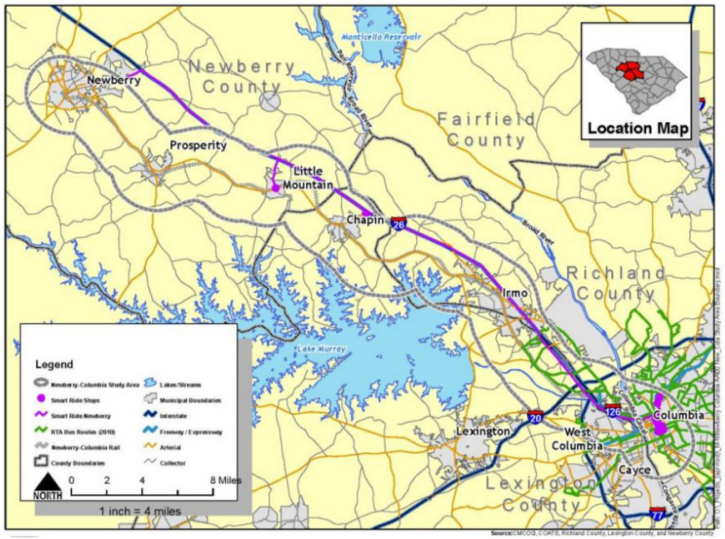
In 2013, CMCOG developed the *Newberry - Columbia Alternatives Analysis* to evaluate enhanced transit improvements in the Newberry-Columbia corridor which passes through Richland, Lexington, and Newberry counties. The Newberry-Columbia corridor is centered on the CSX rail line, traveling through the towns of Prosperity, Little Mountain, Chapin, and Irmo along a 40-mile alignment between its termini in the downtown areas of the cities of Newberry and Columbia.

The *Alternatives Analysis* builds upon previous transit studies and related enhancements implemented in the region. The 40-mile Newberry-Columbia corridor experiences high travel demand that is predominately confined to the existing roadway network. I-26, I-126, and US 76 all operate at or near capacity during peak hour travel periods. Expansion of the roadway network is limited, and demand is expected to increase as commuting patterns, employment trends, and a strong mix of local and regional destinations all contribute to increased levels of traffic volume.

In support of the detailed evaluation of alternatives, the *Newberry - Columbia Alternatives Analysis* recommends further definition following this initial screening. The following alternatives are proposed for development to further facilitate cost estimating and ridership forecasting:

- BRT in mixed traffic on US 76/176;
- Commuter rail within the existing CSX right-of-way;
- BRT in mixed traffic on I-26/I-126; and
- BRT in dedicated lane/right-of-way on I-26/I-126.

The major objective of this analysis was the identification of a locally-preferred alternative (LPA) to compete for federal funds under FTA's Major Capital Investment program. As of early 2020, no additional analysis or direction has been made regarding the Newberry Columbia Collector project.



Newberry - Columbia Alternatives Analysis[16]

If any new or expanded passenger rail service is to occur for Columbia, it will be up to the State of South Carolina to make it happen. The Federal Railroad Administration and Amtrak look to the states to plan, organize and finance passenger rail improvements. Federal funding for rail passenger improvements has been made available in the past and may become available again in the future, but the clear majority of the financial burden for passenger rail improvements in South Carolina will rest on the state.

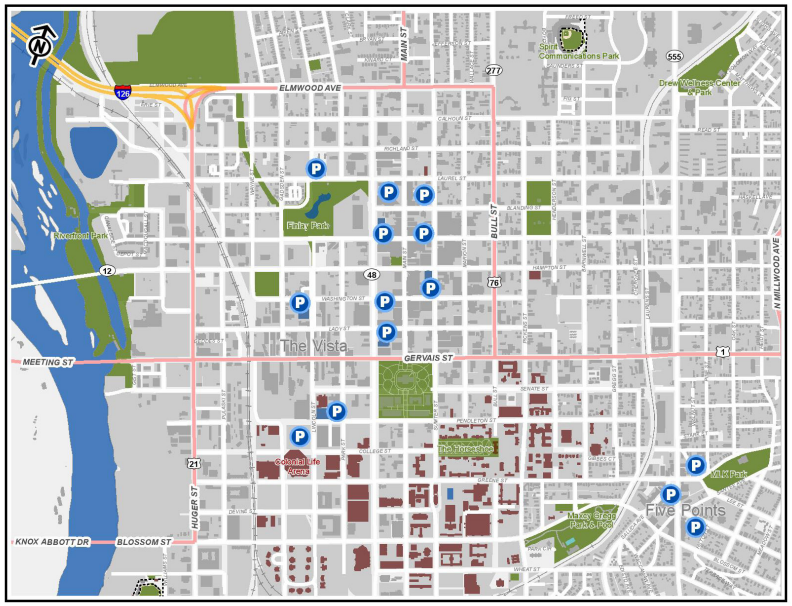
Existing Conditions

PARKING

Parking can be viewed through two lenses: as an opportunity or as a challenge. If there is a deficit of adequate parking in the community this can contribute to undue congestion and a loss in revenue. If there is a surplus in available spaces, the visual representation of empty spaces can indicate a struggling downtown or lack of demand. Finding the balance between enough parking and too much parking is something many communities struggle with.

The City of Columbia maintains and operates several parking facilities within the City limits with approximately 4,700 spaces in seven parking decks. The map to the right, as provided by the City of Columbia parking services, indicates the current facilities that they maintain and operate. The table below depicts the number of spaces by facility within each.

Facility	Type	Spaces
ARSENAL HILL – 1812 LINCOLN ST	Garage	350
LADY STREET – 1100 LADY ST	Garage	944
PARK STREET – 1007 PARK ST	Garage	900
PJ CANNON – 1227 TAYLOR ST	Garage	532
SUMTER STREET – 1400 SUMTER ST	Garage	957
TAYLOR STREET – 1600 ASSEMBLY ST	Garage	520
WASHINGTON STREET – 1100 WASHINGTON ST	Garage	550
SUMTER STREET – 1700 SUMTER ST	Lot	113
DEVINE STREET – 2126 DEVINE ST	Lot	41
PAVILION STREET – 800 BLOCK OF PAVILION ST	Lot	20
FIVE POINTS LOT – 700 BLOCK OF HARDEN STREET	Lot	34



Map of City of Columbia parking facilities

Existing Conditions

PARKING, CONTINUED

The current parking rates for ticketed parking facilities is $1.00 for the first half hour, second half hour and for each additional hour with the daily maximum being $10.00. The table below highlights the reserved parking/monthly spaces cost by facility.

Facility	Type	Monthly Reserved Fee
ARSENAL HILL – 1812 LINCOLN ST	Garage	$57 (unassigned) $85 (assigned)
LADY STREET – 1100 LADY ST	Garage	$78 (unassigned) $105 (assigned)
PARK STREET – 1007 PARK ST	Garage	$65 (unassigned) $80 (assigned)
PJ CANNON – 1227 TAYLOR ST	Garage	
SUMTER STREET – 1400 SUMTER ST	Garage	
TAYLOR STREET – 1600 ASSEMBLY ST	Garage	$52 (unassigned) $105 (assigned)
WASHINGTON STREET – 1100 WASHINGTON ST	Garage	$78 (unassigned) $105 (assigned)
SUMTER STREET – 1700 SUMTER ST	Lot	
DEVINE STREET – 2126 DEVINE ST	Lot	

In addition to the parking facilities highlighted above, the City of Columbia has approximately 1,700 on street parking spaces in the urban core. Hours of control are 9 am to 6 pm Monday through Saturday within the urban core (Downtown, Five Points, Vista, etc.) where the majority of the on-street parking facilities are located.

Up to two additional parking deck(s) are currently being evaluated at the Bull Street District development that would provide increased parking for the Columbia Fireflies Baseball stadium. These new parking deck(s) would be built by the City of Columbia, and would provide approximately 800 new spaces. The location of the proposed parking deck(s) has yet to be determined and would be developed in conjunction with the City of Columbia and the Bull Street District development group.

PJ Cannon Garage, 1227 Taylor Street

Existing Conditions

RESILIENCY

Much like our nation, Columbia depends on a reliable and comprehensive transportation system to move goods and services within the City, the Midlands region, and through the State. This transportation system must move food, energy, and other goods among homes and businesses, as well as people to their jobs and other activities at an acceptable level of service.

Resilience is the ability of a system to continue to function at an acceptable level of efficiency once a disruptive event has been placed upon the system. The concept of resilience and the ability of a community's transportation system to absorb and maintain a level of service after a threat or event has given rise to the term transportation resiliency.

Often defined as the ability of a transportation network to move goods and services at a functional level of service, transportation resiliency is becoming a forefront topic of discussion for communities and state departments of transportation as they deal with increased levels of threats to their transportation systems. These threats that impact a systems ability to operate take the form of extreme weather events, major incident events, and infrastructure failure or reduction in capacity. More specifically, transportation resiliency and its implications can be broken down to a finer grain impact to the following groups:

- **Individuals** – the ability of an individual to move within the system and managing or mitigating threats in the form of loss of a personal vehicle, transit service breakdown, personal mobility challenges, and changes in income.
- **Communities** – the accessibility of public transit system by its constituents, ability of the roadway network to provide a reasonable level of service when experiencing accidents, special events, construction projects, and failure of key infrastructure pieces.
- **System Design** – the transportation network has built-in redundancy, additional capacity, or mobility choices to deal with changes in traffic patterns, weather events, and unanticipated threats.
- **Economics** – the ability of an individual to continue to maintain mobility within the system even under circumstances where necessary resources become unavailable or prohibitively expensive. These include petroleum products, electricity, and other resources.

Existing Conditions

RESILIENCY, CONTINUED

- **System Evolution** – the ability of a transportation network to evolve to accommodate growth in population and changes in mobility means and methods.

Each of these elements have a direct impact on the individual and supporting community's ability to maintain a level of resiliency under an event. At the day-to-day level, the greatest impact is realized on the individual and the supporting community. Communities, the supporting businesses that drive the economic viability of the community, and the individual must work together in developing a sustainable transportation system given the symbiotic relationship between each group, as they are all critical to the overall vitality of the community.

The impacts of climate change and extreme weather events present a significant risk to the community's ability to provide a safe, reliable, and sustainable transportation network. The City of Columbia is familiar with disruptive weather events and the impacts they have to the community. Disruptions to any part of the transportation system can trigger impacts across the entire community causing delays and economic impacts. Building resilience into the transportation system allows the community to recover with minimal downtime.

The October 2015 flooding event in SC caused approximately $12 billion in damage with 160,000 homes impacted in over 22 counties in South Carolina. The following year, Hurricane Matthew cost the State of South Carolina $64 million in impacts; $33.5 million to public buildings and debris removal and $30.4 million to state roadway infrastructure. As a community, city, and state, these entities can no longer afford to not be resilient in their approaches to transportation design, infrastructure, and the transportation network.

Community assets including roadways, bridges, railroads, airports and distribution systems for water, sewer, and electric are the most vulnerable and impactful assets for the community and its ability to endure system threats.

ND-GAIN
Notre Dame Global Adaptation Initiative

The Notre Dame Global Adaptation Initiative (ND-GAIN) aims to help public sectors prioritize climate adaptation, to lower the risk to the community and increase their readiness. One of the ways ND-GAIN is accomplishing this goal is through the Urban Adaptation Assessment (UAA). The UAA measures the climate risk and readiness for 278 U.S. cities, Columbia, SC being one of them. The UAA looks at climate hazards including flooding, extreme heat, extreme cold, drought and sea-level rise. With Columbia's geographic location, some of these stresses are not applicable, however, a risk assessment for the City of Columbia was prepared, as summarized on the following page.

Existing Conditions

RESILIENCY, CONTINUED

The City of Columbia has an overall risk score according to the NC-GAIN UAA of 20.25 which indicates a low risk for these stressors. Conversely, the City's overall readiness score is 61.48 indicating a high level of readiness.

Stressor	Score	Probability of Event
FLOODING		
RISK	35.1	Low
SENSITIVITY TO (LOWER IS BETTER)	35.4	
EXPOSURE TO (LOWER IS BETTER)	42.1	
ADAPTIVE CAPACITY (HIGHER IS BETTER)	79.2	
HEAT		
RISK	17.2	Medium
SENSITIVITY TO (LOWER IS BETTER)	44.4	
EXPOSURE TO (LOWER IS BETTER)	6.2	
ADAPTIVE CAPACITY (HIGHER IS BETTER)	87.9	
COLD		
RISK	17.3	Low
SENSITIVITY TO (LOWER IS BETTER)	44.4	
EXPOSURE TO (LOWER IS BETTER)	6.2	
ADAPTIVE CAPACITY (HIGHER IS BETTER)	87.6	
DROUGHT		
RISK	11.4	Medium
SENSITIVITY TO (LOWER IS BETTER)	33.3	
EXPOSURE TO (LOWER IS BETTER)	6.2	
ADAPTIVE CAPACITY (HIGHER IS BETTER)	100.0	

CHALLENGES & OPPORTUNITIES

This review of existing conditions, along with robust engagement with the public and stakeholders, was critical in determining the challenges and opportunities faced by the City and the region with regard to the transportation network. The following list of challenges and opportunities was developed as a result of this analysis.

- As is the case throughout South Carolina, SCDOT controls a high proportion of the City's roadways. This means that any identified projects must be coordinated through SCDOT and meet state standards, limiting potentially innovative options and "quick win" projects.
- The centrality of the region's jobs in downtown Columbia present both challenges and opportunities for the City. This highly centralized commute pattern highlights the importance of the preserving mobility to regional job centers and providing a range of transportation commute options. The presence of major institutional employers presents opportunities for a robust regional transportation alternatives program that may include sponsored vanpools, transit incentives, and flexible work hours.
- A highly connected grid system throughout the downtown area and surrounding residential neighborhoods presents key opportunities for enhanced bicycle and pedestrian mobility options through intentional road diets and dedicated facilities on a strategic selection of roadways.
- Rain events with increased frequency and intensity are likely to recur and intensify in the future. Columbia must improve its drainage facilities and capabilities as part of all future street projects to improve its response to flooding events.

Existing Conditions

CHALLENGES & OPPORTUNITIES, CONTINUED

- Many SCDOT-maintained roadways throughout the City are in disrepair and will likely be slated for resurfacing in the near future. This presents key opportunities to partner with the state to advance low-cost complete streets improvements, such as road diets and the inclusion of bicycle facilities, in conjunction with regularly scheduled maintenance.
- The current overlap of between rail infrastructure and infrastructure supporting vehicles, bikes and pedestrians will continue to act as a barrier for mobility of all modes. The City of Columbia must continue to partner with local and state partners as well as private owners to advance opportunities to improve safety and mobility. With the continued increase in miles traveled by all modes, the level of conflict will only continue to increase.
- As the percentage share of alternative modes increases within the City, the need for a new intermodal transit facility will continue to increase. The new facility will need to integrate not only The Comet and Soda Cap, but also for hire bus service and potentially Amtrak service. Incorporation of the U of SC shuttle service into the facility should be explored.
- As the University of South Carolina (U of SC) continues to grow, coordination between the City, SCDOT and U of SC will become increasingly more important for all modes of transportation. Consideration for incorporation of operations under the Comet should be explored.
- South Carolina continues to maintain a reputation for the most dangerous roads in America. On average over 1,000 people per year die in traffic related incidents across SC. This presents the City with both an opportunity and a challenge to enhance partnerships between SCDOT, the City, and other regional entities, both public and private. These partnerships are critical to reducing traffic-related fatalities for all modes.
- Growth of connected and autonomous vehicles in Columbia will undoubtedly continue to increase at a faster pace in the 2020's. An electronically and physically well connected network of streets will maintain Columbia as a growing metropolitan area. This presents an opportunity for the City to support infrastructure that enhances this level of connectivity and promotes improved and safer mobility of all modes.

Policy Analysis

UNIFIED DEVELOPMENT ORDINANCE

The City of Columbia has recently adopted an update and revision of its zoning ordinance and land development regulations, though this update is not yet in effect. The updated Unified Development Ordinance (UDO) aims to modernize the current zoning code, which dates from 1979, and strengthens the access, mobility & connectivity guidelines that govern the shape of new development.

An analysis of the key changes contained within the UDO is included in the following chart, along with select recommendations to better integrate the City's policies with the adopted Columbia Compass plan or strengthen the overall recommendations.

Existing Ordinance	Proposed UDO	Notes / Recommendations
Block Length		
Residential block lengths must be between 600 and 1,800 feet	Block length updated to between 600 and 1,100 feet	Recommend reducing this measurement. Many residential blocks in Columbia's traditional neighborhood developments are less than 600 ft long - this precludes that type of development.
Nonresidential blocks. Blocks for other than residential use shall be of such length and width as may be suitable for their prospective use, including adequate provision for off-street parking and service.	Carried forward	Consider adopting block length guidelines by land use context.
Street Trees		
Planting of street trees is not required.	Street trees are required where ROW exceeds 60 feet	New requirement in updated UDO, provides additional aesthetic benefits, green infrastructure and traffic calming features.
Connectivity		
Cul-de-sac length. Culs-de-sac shall not exceed 1,000 feet.	Carried forward.	Consider amending to discourage culs-de-sac in all cases except where necessary due to topographical or environmental hardships.
Missing: Consolidated driveways and shared driveway access	Requires vehicular, pedestrian and bicycle cross-access to adjoining parcels	This is an addition to the existing UDO, and strengthens the overall policy.
Requires extension of existing street grid into new developments, as well as dedicated of space for future arterials	Carried forward, and adds dedicated of space for future arterials.	Strengthened in new UDO, but could consider adding more objective measures of connectivity, such as link/node ratios. Also consider requiring stub-outs to connect with future development on adjoining property.

Policy Analysis

UNIFIED DEVELOPMENT ORDINANCE, CONTINUED

Existing Ordinance	Proposed UDO	Notes / Recommendations
Traffic Calming		
Missing: Traffic Calming Program or Policy	Identifies traffic calming options applicable on streets longer than 800 feet long	Good addition to the UDO. Consider the creation of more robust guidelines or criteria to determine when it might be appropriate to utilize each treatment.
Multimodal Requirements		
Missing: Sidewalk requirements	Sidewalks required on both sides of all streets in most districts, one side of streets in LI and HI districts.	Strengthens the existing policy, which only requires sidewalks on one side of the street in most locations.
Missing: Bicycle connectivity requirements	Requires bicycle facilities sufficient to allow safe and efficient bicycle access and circulation	This addition strengthens the overall policy and promotes multimodal circulation
Missing: Bicycle connectivity requirements	Requires connections to existing or proposed bicycle facilities within 1,000 feet of subdivision	Good amendment to the existing ordinance.
Subdivision required improvements do not include sidewalks	Sidewalks and street trees added	Consider also amending list to include any required bicycle or multimodal facilities, as determined by the planning commission or policy.
Missing: ROW dedication for trails and greenways	Still missing.	Consider including requirement to dedicate right of way to multimodal pathways where shown on existing plans

Policy Analysis

ENGINEERING / DESIGN STANDARDS

In addition to the Code of Ordinances, the City's Engineering Regulations were also reviewed. High level guidelines relating to the overall design of the transportation system are shown below, along with recommendations for simple improvements that may be made to modernize this code:

- Curb Radii: Mandates at least 25 foot curb radii in residential contexts. Consider reducing this in areas where large vehicles/ truck traffic is not expected and where the design speed is 25 miles per hour.
- Lane Width: Does not include typical/standard lane widths. Consider including provisions for minimum/maximum lane widths by land use context and street type (can go as low at 10 feet in certain contexts).
- Collector Streets: Requires at least four lanes on all collector streets. Consider removing this requirement and saying "four lanes may be required based on traffic engineering analysis."
- Pedestrian Crossings: Consider including standards regarding the design of safe pedestrian and bicycle crossings, as well as standards to dictate when improved crossings will be required.
- Street Typology: Currently, standards for ROW widths and design speed are based on functional classification. Consider adopting a City typology and updating all references within the engineering standards and UDO to reflect this new typology.

PRIORITY AREAS FOR IMPROVEMENT

In addition to the draft UDO, several key areas are recommended for improvement to provide a policy environment that leads to thoughtful transportation investment decisions, supports innovation, and provides meaningful mobility for users of all ages and abilities. These areas include:

Adopt a Complete Streets Ordinance or modernized policy.

The City of Columbia formally adopted a Complete Streets Policy in 2010, and endorsed the National Association of City Transportation Officials (NACTO) design guidelines in 2013. Further, the City developed a set of Complete Streets Design Guidelines in conjunction with the Walk Bike Columbia plan. These guidelines were incorporated into the City's engineering regulations to govern the shape of development as it relates to bicycle and pedestrian facilities and connectivity. However, the current policy lacks the language and enforcement measures necessary for mandate progress. A modern policy or ordinance, with codified exemptions, procedures, and performance measures, would help raise the priority of complete streets within the City.

Sidewalk Infill & Prioritization

The City currently lacks a meaningful sidewalk maintenance or construction program, and does not maintain a prioritized list of sidewalk segments needed to fill critical gaps in the City's sidewalk network. Creating, maintaining, and funding an annual sidewalk construction and maintenance program is critical to expanding and improving pedestrian accessibility, safety, and walkability throughout the City.

Policy Analysis

PRIORITY AREAS FOR IMPROVEMENT, CONTINUED

Quick Builds/Pilot Projects

Pilot projects allow for the short-term test of a street design or new multimodal facility before its ultimate construction and implementation. During the pilot project phase, which can last for only a few hours or several months, city planners and engineers gather critical data about the facility's performance, while members of the public gain comfort with the design or provide constructive feedback. Developing a formalized pilot project program can lead to faster implementation and overall better public reception of multimodal projects such as road diets, pedestrian plazas, and parklets, with relatively low cost and low risk to the City.

Data Collection & Decision Making

The City does not currently collect traffic data, pavement quality ratings, or complete any form of prioritization that guides the funding and timing of transportation investments. While the collection and maintenance of this data takes time and effort, it often contributes to a more efficient use of public resources due to objective measures and criteria. These measures should be based on SCDOT standard guidelines as much as practical to allow for standardization.

Innovation Readiness

Transportation changes quickly, and it is important that our transportation policies be flexible and prepared to respond when new technologies emerge. Automated vehicle technologies, e-mobility, and Transportation Network Companies (such as Uber and Lyft) are all examples of innovative transportation technologies that have faced significant challenges due to heavy municipal regulations. In each of those examples, and in the industry at large, innovation is market-driven, and it is up to the public sector to determine the appropriate approach to regulation. There is a fine balance between appropriate regulations that protect the safety and health of citizens and those that impede innovation and discourage investment.

Innovation readiness can include:

- Support for public-private partnerships;
- Funding and support for small-scale or limited-term pilot projects;
- Removal of government barriers to emerging technology deployment; and
- Release of open data for public use.

Endnotes

1 US Census On The Map, 2015
2 Ibid.
3 American Community Survey data, 2017 5-Year estimates
4 US Census On The Map, 2015
5 Ibid.
6 City of Columbia data
7 SC Department of Public Safety (SCDPS) data
8 Ibid.
9 Ibid.
10 Ibid.
11 Ibid.
12 Ibid.
13 Ibid.
14 American Community Survey, 2017 5-Year estimates
15 CMCOG Camden - Columbia
16 CMCOG Newberry - Columbia