
REGIONAL CONDITIONS

In preparing for the future it is important to understand the present. The Regional Conditions Report describes current travel behavior and the existing conditions for all transportation modes, including roadway, transit, bicycle, pedestrian, and freight. A review of policy and a summary of directions for recommendations concludes this report.



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by the numbers

There are numerous data sources that provide insight into travel patterns and trends in the CHATS planning area. This section of the report highlights what the data says about transportation in the CHATS area.

How do we move? Data from the American Community Survey (ACS) paints a picture of travel in the region: the CHATS area is very car-dependent, and has become even more so over time. In 2014, over 80% of commuters drove alone to work, a little more than the 77% found across the United States. However, commuting patterns in the region are changing. From 2000 to 2014, there was a drop in the percentage of commuters carpooling to work, but a noticeable increase in the percentage of commuters working from home or telecommuting.

Figure 2-1: Means of Transportation to Work 2000 and 2014 Comparison

Means of Transportation to Work (2000)



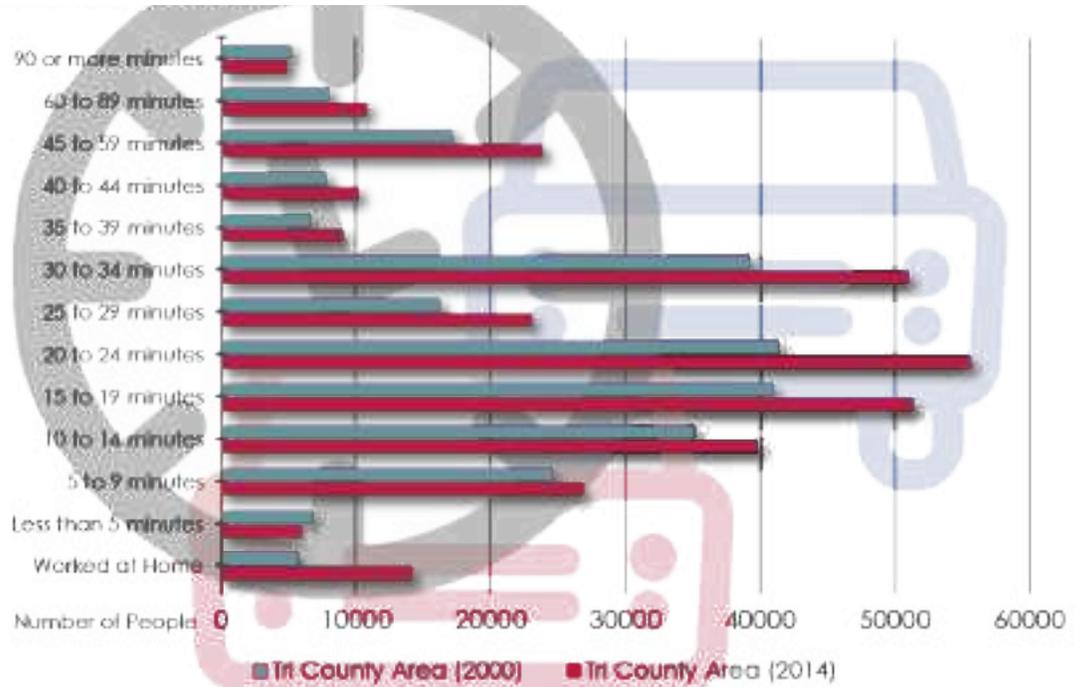
Means of Transportation to Work (2014)



How long does it take?

According to ACS data, average commute times in the CHATS planning area have risen slightly from 2000 to 2014. Again, we can see that working from home is becoming a more prevalent employment option for many in the area. The only trip length where the real number of commuters trended downward was the shortest, less than five minutes.

Figure 2-2: Travel Time to Work



How much does it cost?

In 2016, residents of the CHATS Metropolitan Planning Organization (MPO) study area were spending an average of just over \$8,000 per household per year on automobile expenses. That represents approximately 15% of the median income of \$53,400 in the Charleston-North Charleston Metropolitan Statistical Area, and is slightly higher than the 12% nationwide.

Annual driving mileage has increased in much of the country over time, including the CHATS planning area. The estimated annual miles put on car(s) is 20,146 per household. All of this driving impacts greenhouse gas emissions from vehicular sources, spurring climate change that is of particular concern to coastal communities.

Figure 2-3: Percent of Income Spent on Transportation

Note: Charleston Consolidated Metropolitan Statistical Area (CMSA) is household; U.S. is family or household unit ("consumer unit")
Source: Esris Consumer Spending Report 2017



20146

Annual Household Vehicle Miles Traveled

CHATS Metropolitan Planning Organization, Center for Neighborhood Technology

=



8.38 Tons of Greenhouse Gas

Per Household, CHATS Metropolitan Planning Organization, Center for Neighborhood Technology

how do we compare?

Table 2-1 on the following page shows several metrics on the performance of the CHATS area transportation network, which provide a baseline understanding of regional transportation performance. These figures are derived from the most recent Texas A&M Transportation Institute (TTI) Annual Urban Mobility Scorecard, a study of over 400 metropolitan regions in the U.S. The table also includes metrics for thirty-three peer metropolitan regions throughout the country; these regions are all categorized as “medium-sized” metropolitan areas in TTI’s analysis. The list of the peer cities can be found in the TTI report.

Looking specifically at the 2014 data, it is notable that, while the CHATS planning area has a lower number of commuters and freeway and arterial vehicle miles traveled (VMT) than the average of its peer metros, the percentage of time spent in congested conditions and the percentage of congested lane-miles are higher in the CHATS planning area than the peer-metro average. This translates into a relatively high number of hours of delay per commuter in the region. The cost of this congestion was approximately \$470 million in 2014.

The final three columns of the table present how the CHATS planning area’s transportation system has performed over time, showing the change from 2009 to 2014. For many of the indicators in this table, the region did not improve from 2009 to 2014 in absolute terms; however, when controlling for the region’s population growth (last column), transportation performance in the area has actually done a relatively good job of keeping pace with the increased traffic caused by population growth of 17% over the five-year period.

The two metrics at the bottom of the table illustrate the relatively static nature of congestion. The Travel Time Index compares peak travel delay to free-flow speeds; the Commuter Stress Index uses the same comparison, but only looks at peak direction travel. Both of these metrics show little to no change from 2009 to 2014, which indicates that congestion in the CHATS planning area has remained relatively stable in spite of rapid population growth.

Table 2-1: Regional and Peer Region Performance, 2009 - 2014

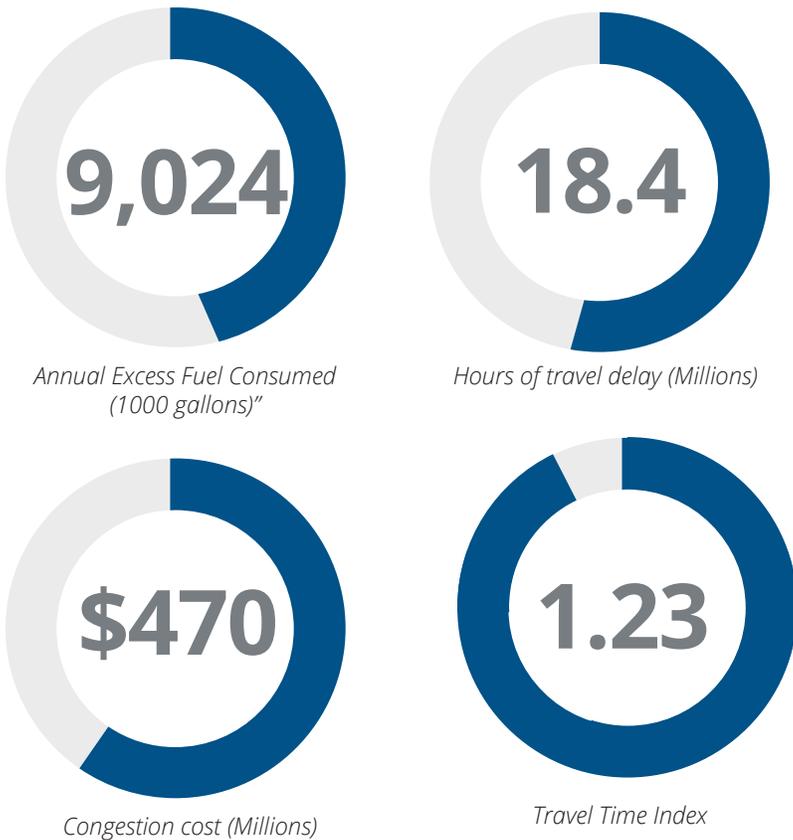
Metric	Average of Metro Peers		Charleston Metro		Charleston Metro Difference (2009-2014)	Charleston Metro Change Better from 2009-2014?	
	2009	2014	2009	2014		Absolute Change	Relative to Population Change
Population (1,000)	669	704	515	600	17%	N/A	N/A
Commuters (1,000)	336	355	258	298	16%	No	Yes
Freeway Vehicle Miles Traveled (1,000)	5,456	5,663	3,610	3,971	10%	No	Yes
Arterial Vehicle Miles Traveled (1,000)	6,330	6,417	5,900	6,141	4%	No	Yes
Gasoline (\$ per gal)	2.29	3.34	2.12	3.00	42%	No	N/A
Diesel (\$ per gal)	2.64	3.68	2.39	3.43	44%	No	N/A
Percent of Time Spent in Congested Conditions	Data Not Available	24	Data Not Available	33	Data Not Available	Data Not Available	Data Not Available
Percent of Lane Miles Congested	Data Not Available	22	Data Not Available	27	Data Not Available	Data Not Available	Data Not Available
Number of Rush Hours	Data Not Available	2	Data Not Available	3.8	Data Not Available	Data Not Available	Data Not Available
Excess Gallons Fuel (1,000)	8,926	9,813	8,092	9,024	12%	No	Yes
Gallons per Commuter	16	18	18	20	11%	No	N/A
Total Hours of Delay (1,000)	18,194	20,001	16,519	18,422	12%	No	Yes
Hours of Delay Per Commuter	35	36	43	41	-5%	Yes	N/A
Congestion Cost (\$mil)	475	474	466	470	1%	No	Yes
Congestion Cost (\$ per commuter)	856	854	1,037	1,047	1%	No	N/A
Travel Time Index	1.17	1.18	1.23	1.23	0%	Neutral	Yes
Commuter Stress Index	1.21	1.22	1.27	1.27	0%	Neutral	Yes

Source: 2015 Annual Urban Mobility Scorecard, Texas A&M Transportation Institute (TTI)

how does the nation see us?

There are a few readily available data sources that people and businesses use to understand transportation in a region. These sources, which admittedly have some limitations, are nevertheless the face of the region as people and businesses decide to relocate. The following graphics provide a snapshot of what the world sees when it uses commonly accessed information to learn about the CHATS planning area's transportation system. (Texas A&M Transportation Institute (TTI) 2015 Annual Urban Mobility Scorecard)

Figure 2-4: The Cost of Congestion



Cost of Congestion: The CHATS metro region is in the “middle-of-the-pack” compared to similarly sized peer regions in excess fuel consumption, travel delay, and congestion cost. However, the region’s travel time index, which is a measure of reliability of the system, is worse than many of its peers. (Texas A&M Transportation Institute (TTI) 2015 Annual Urban Mobility Scorecard)



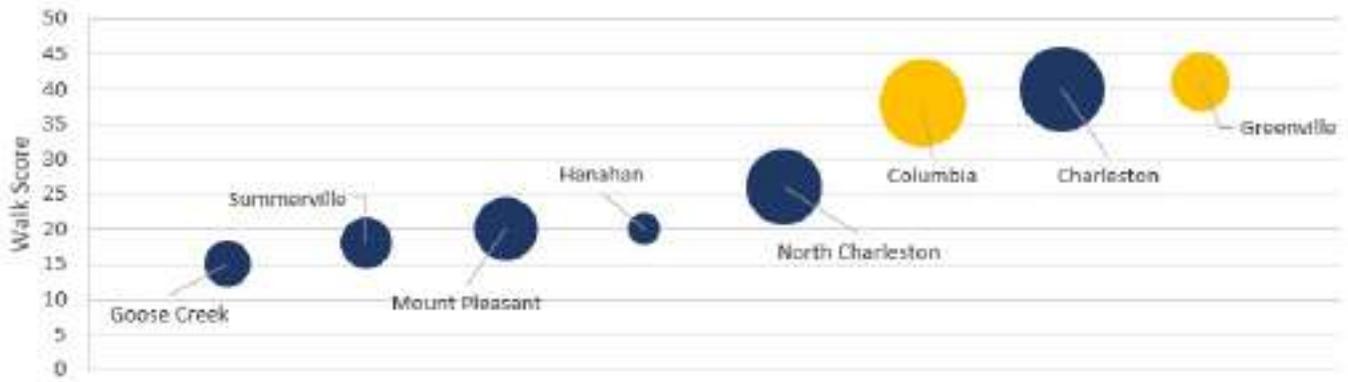
Commuter Stress Index (2014):

Congested conditions in the region can lead to commuter stress. Charleston has a higher stress index than the majority of its peers, at 1.27. The Columbia, SC metro outperforms our region with a commuter stress index of only 1.18, one of the best in the peer group of medium-sized cities as defined by the TTI annual congestion report.

Getting to Work:

Commuting in the metro area varies greatly depending on where you are going and how you are getting there. Data from the real estate website *trulia.com* show that more centrally located destinations, such as North Charleston, are located within a relatively short driving commute from most other urbanized places in the region. With the exception of Downtown Charleston, most locations are nearly inaccessible within an hour of travel on public transit.

Figure 2-5: Municipality Walk Score Comparison



Walk Score: The City of Charleston has the highest “Walk Score” (a measure of proximity of various origins and destinations) in the region, with Goose Creek lagging behind other municipalities. Charleston barely beats out its peer city of Columbia, but is outperformed by Greenville, perhaps due to that city’s more compact size – a key factor in the destination-drive Walk Score methodology. In this chart, the size of the bubble represents the city’s population.

Table 2-2: Getting to Work

Driving To/From	Downtown Charleston	Mt. Pleasant	West Ashley	Folly Beach	Kiawah/Seabrook Island	Johns Island	James Island	North Charleston	Goose Creek	Summerville	Moncks Corner	Sullivan’s Island	Hanahan
Downtown Charleston	Green	Green	Yellow	Yellow	Red	Orange	Green	Green	Green	Yellow	Orange	Yellow	Yellow
Mt. Pleasant	Green	Green	Yellow	Orange	Red	Orange	Green	Green	Green	Yellow	Yellow	Green	Green
West Ashley	Yellow	Yellow	Green	Red	Red	Yellow	Orange	Green	Green	Yellow	Orange	Orange	Yellow
Folly Beach	Yellow	Orange	Orange	Green	Red	Orange	Green	Orange	Orange	Red	Red	Red	Red
Kiawah/Seabrook Island	Red	Red	Red	Red	Green	Orange	Red	Red	Red	Red	Red	Red	Red
Johns Island	Yellow	Orange	Yellow	Orange	Red	Green	Green	Orange	Orange	Red	Red	Red	Orange
James Island	Green	Yellow	Yellow	Green	Red	Green	Green	Green	Green	Orange	Orange	Yellow	Orange
North Charleston	Green	Green	Green	Orange	Red	Orange	Green	Green	Green	Green	Yellow	Green	Green
Goose Creek	Yellow	Green	Green	Orange	Red	Orange	Yellow	Green	Green	Green	Green	Green	Green
Summerville	Orange	Yellow	Yellow	Red	Red	Red	Orange	Green	Green	Green	Orange	Orange	Yellow
Moncks Corner	Orange	Orange	Orange	Red	Red	Red	Orange	Green	Green	Orange	Green	Orange	Yellow
Sullivan’s Island	Green	Green	Yellow	Red	Red	Orange	Green	Green	Green	Orange	Orange	Green	Orange
Hanahan	Yellow	Green	Green	Red	Red	Orange	Orange	Green	Green	Yellow	Orange	Orange	Green

5 min. >60 min.

Note: The travel time is indicated by the color box in the matrix. Green indicates shorter travel times and red indicates longer travel times.

roadway conditions

Arterial roadways serve as the prime movers of people and goods in the CHATS planning area, carrying the majority of the transportation system users on any given day. Twelve (12) of the most important highway corridors were selected for analysis (Map 2-1) based on travel data, such as traffic counts and congestion times as well as regional stakeholder input. These corridors are crucial for congestion management in the CHATS area, and are explored specifically in the Congestion Management Process (CMP) that was completed in 2018.

Purpose

Understand congestion, crash, and other auto-related concerns.

Map 2-1: Study Corridors and Counties



Figure 2-6: Peak Hour Travel

Using data about travel times gathered through satellite, GPS, and cellular carriers, the typical time it takes to traverse the 12 study corridors, both in the off-peak hours and in the peak hours, was calculated to better understand the effects that congestion is having on mobility in the CHATS planning area. The chart below shows not only the additional increase in absolute time that it takes to traverse a corridor during the peak hours, but also the percentage difference between the typical peak and off-peak travel times. Some corridors saw very little difference between peak and off-peak travel times (e.g. I-26 / US 78 / US 176) while others, including I-526 (East) and US 17 (South), have close to a 25% increase in typical travel times during peak hours.

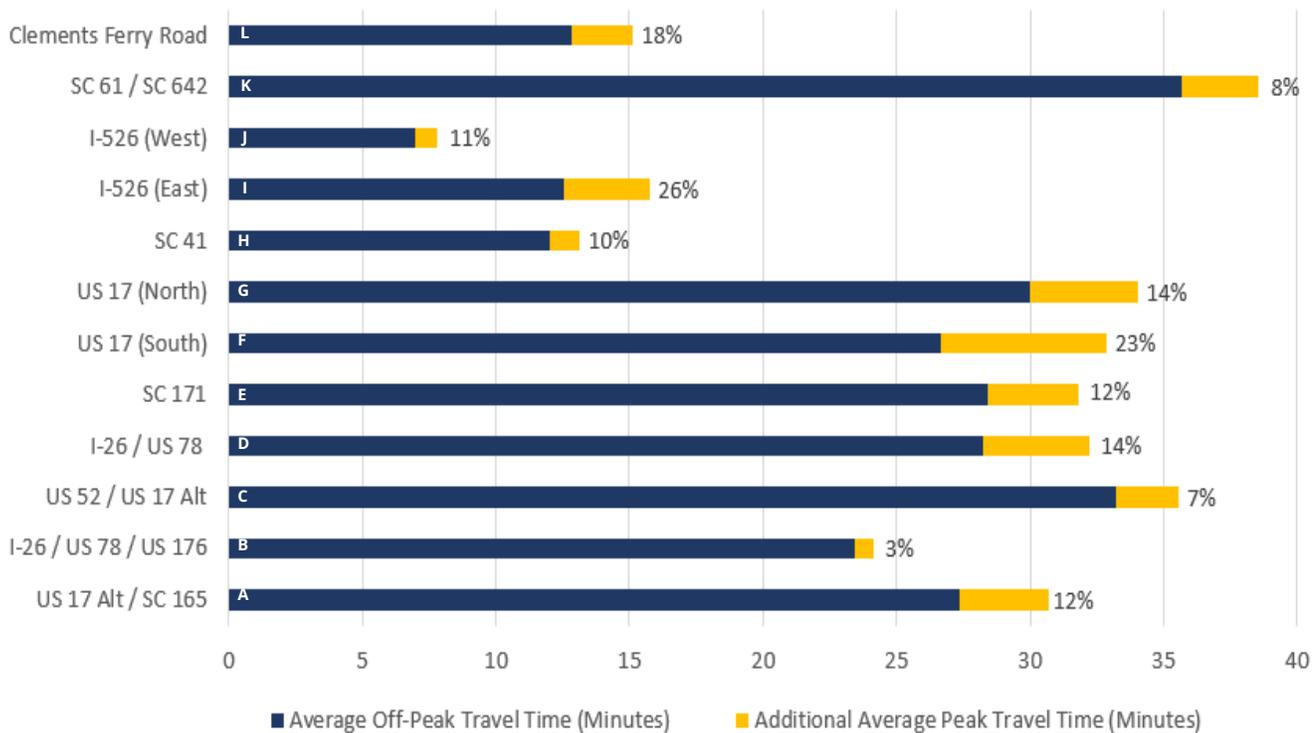
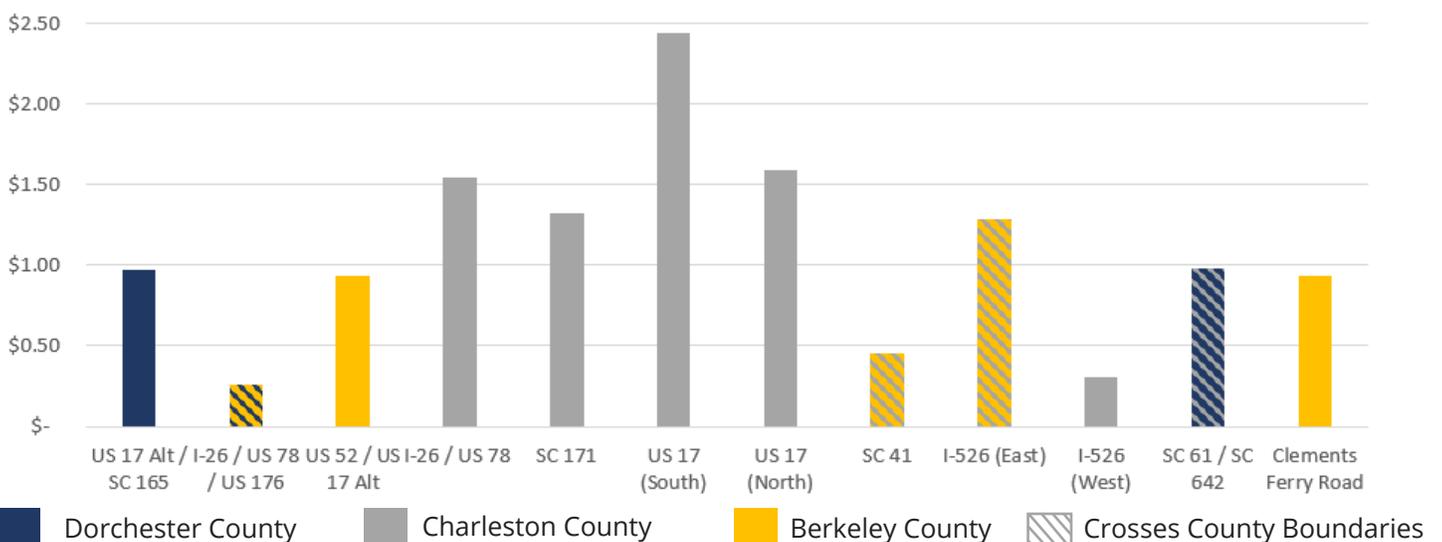


Figure 2-7: Cost of Congestion County Comparisons

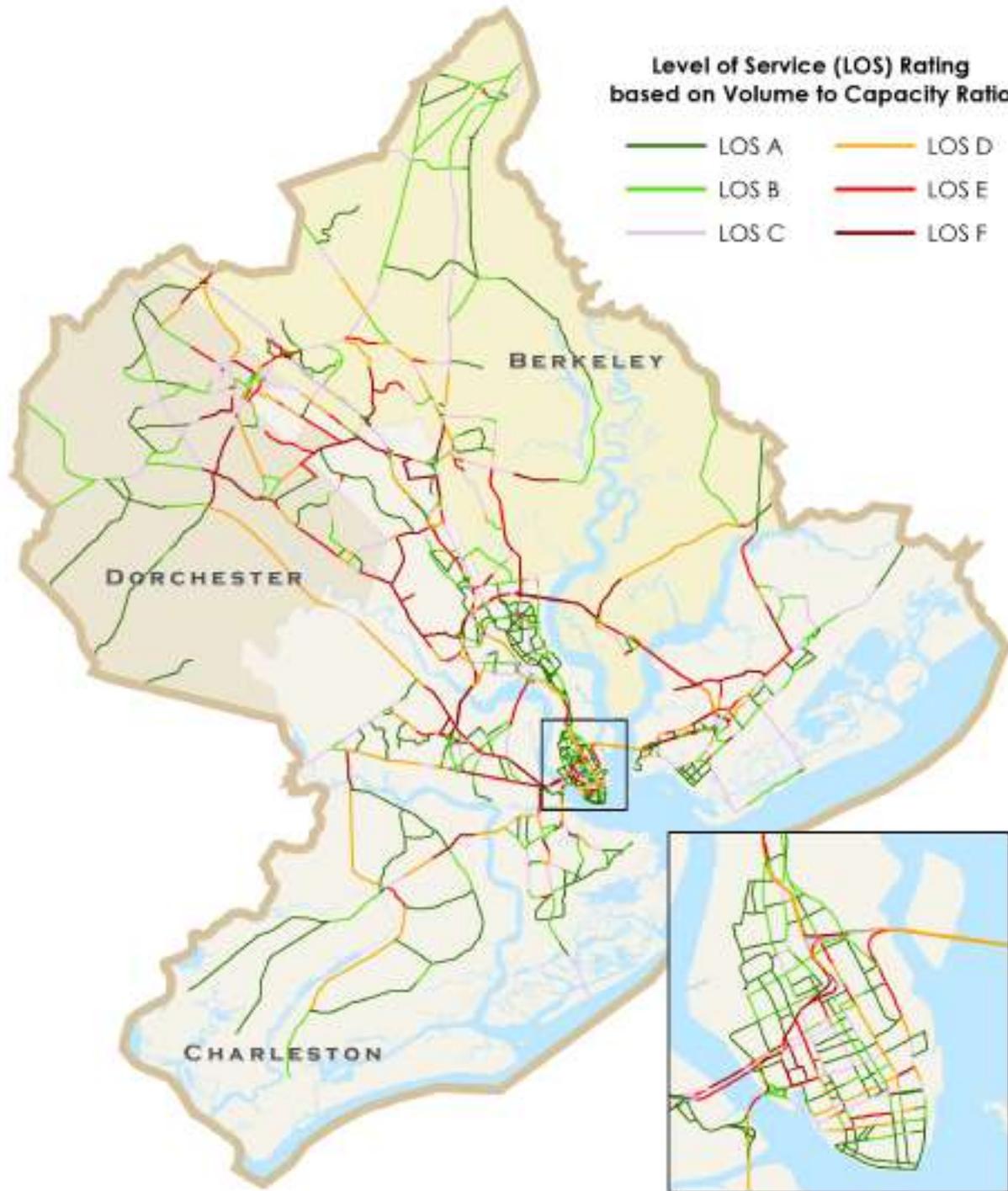
For every trip along a corridor during congested conditions, the extra time spent driving is associated with a cost to the driver. The average wage rates for each county were used to determine the cost of time. (Note: for corridors that cross county boundaries, indicated by hatched bars, the additional time was split between the counties to generally determine overall cost). In Charleston County, where the wage rate is relatively high, the average cost of congestion traversing an entire corridor is over \$1.00 per trip in several corridors.



Map 2-2 illustrates the Level of Service rating of roadways in the CHATS planning area. Level of service (LOS) is a qualitative measure used to relate the quality of traffic service. Volume-to-Capacity Ratio (V/C) is a measure that reflects mobility and quality of travel by comparing roadway demand (vehicle volumes) with roadway supply (carrying capacity). Using the calculated V/C, a level for service rating is applied. The LOS rating describes the flow of traffic, where an A is free flow, B is reasonably free flow, C is stable flow, D is approaching unstable flow, E is unstable flow signifying the roadway is operating at capacity, and F is forced or breakdown flow.

Map 2-3 illustrates crash clusters created from data collected between 2014 and 2016. Crash clusters are determined by performing a spatial analysis of crash data to identify statistically significant clusters of

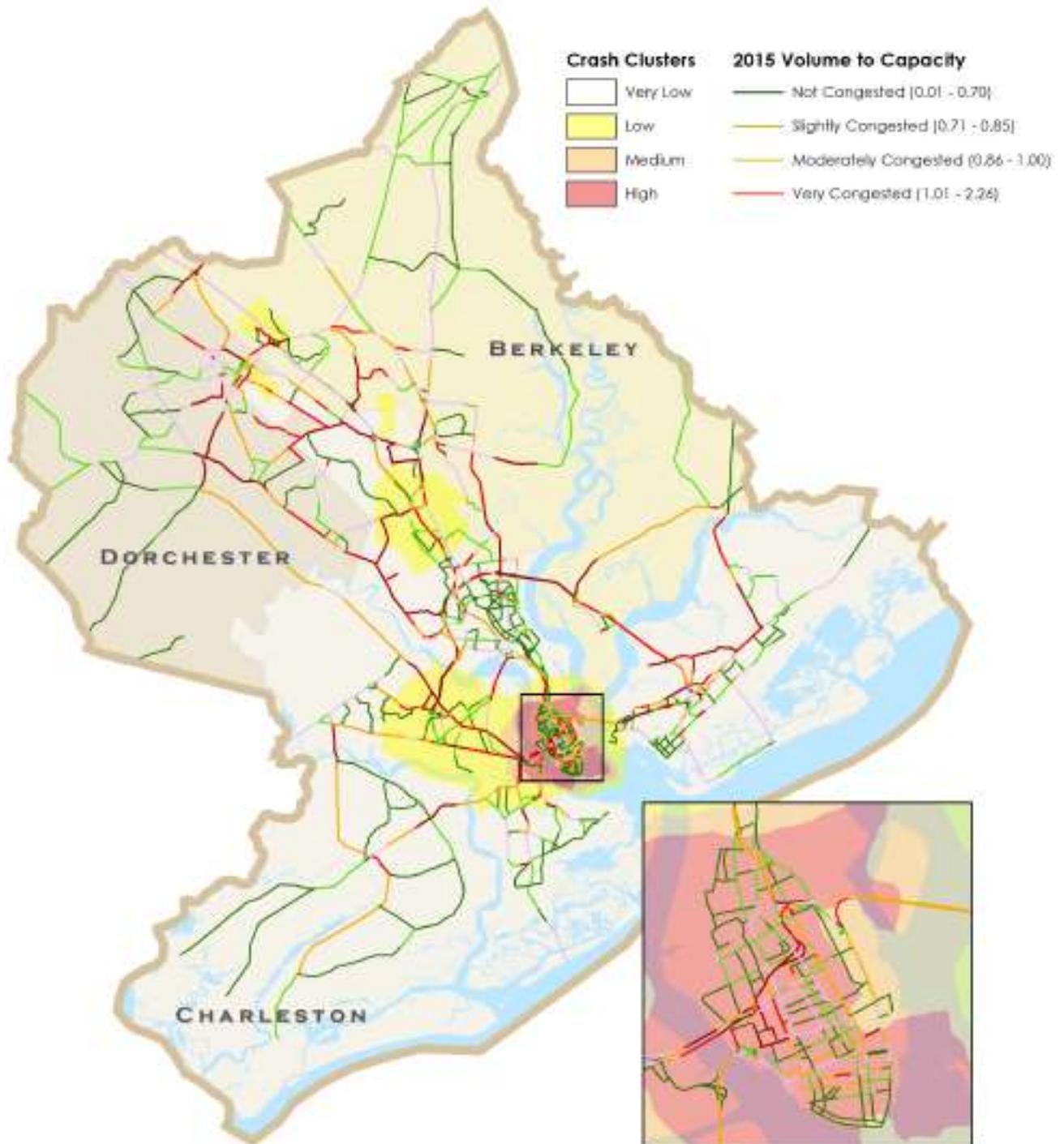
Map 2-2: 2015 Level of Service (LOS) Rating based on Volume-to-Capacity Ratio

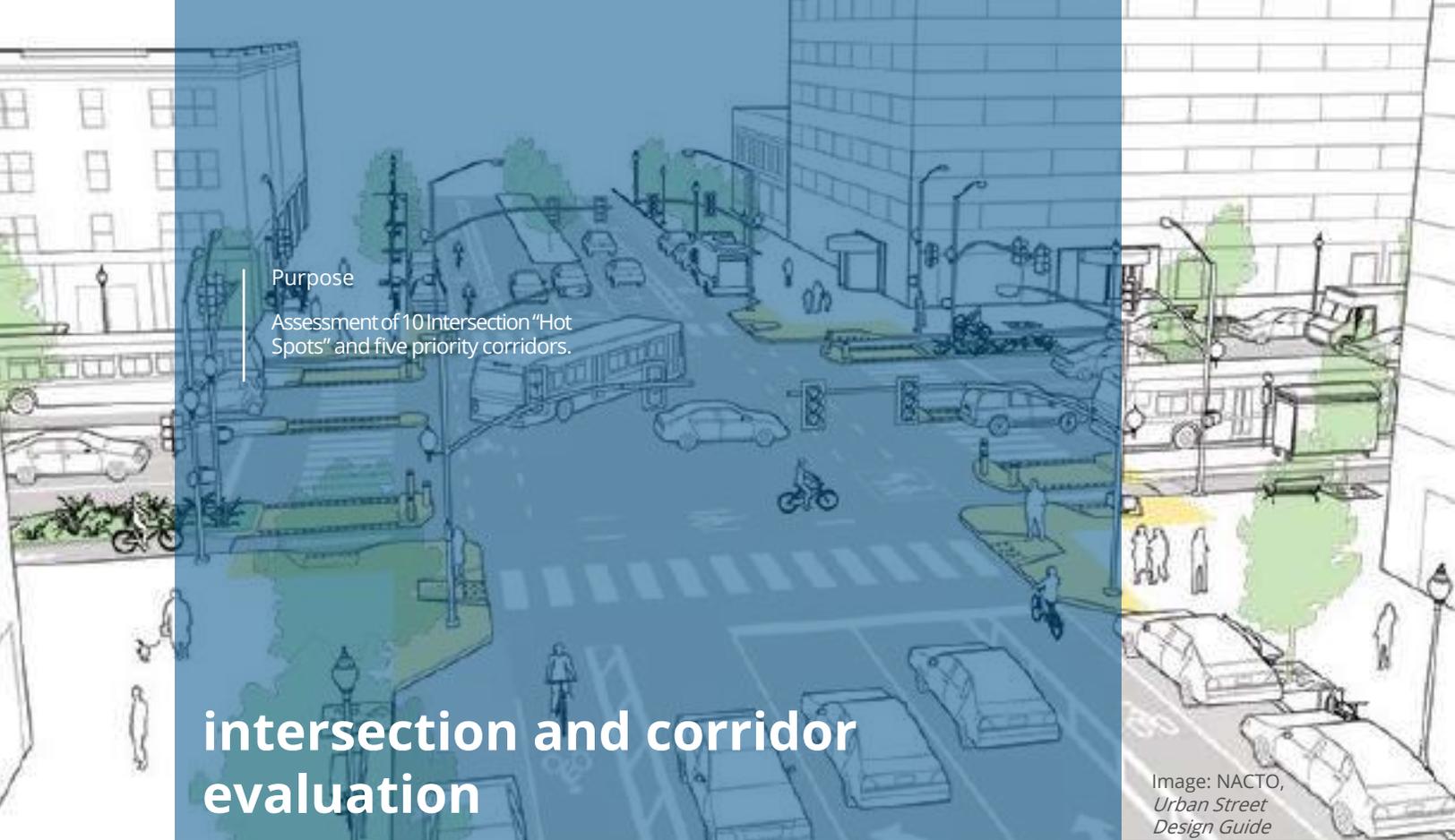


crash occurrences. As discussed in the text accompanying Figure 2-2, V-C ratios are measurements of that reflecting the quality of transportation in a network. In addition to being used to report LOS, volume-to-capacity ratios are used to describe expected patterns of congestion. By showing both V/C and crash clusters on this map, areas where high crash incidences can be compared to the V/C to determine if there is a direct correlation. The V/C reflects 2015 peak period.

Crash clusters often correlate with areas of high congestion. In locales with higher commercial and pedestrian activity, there is often a higher rate of crashes. With this in mind, it is important to take a closer look at how roadways and developments are designed to minimize these incidents and prioritize safety for all modes of transportation moving forward.

Map 2-3: Crash Clusters and Congestion





Purpose

Assessment of 10 Intersection “Hot Spots” and five priority corridors.

intersection and corridor evaluation

Image: NACTO, *Urban Street Design Guide*

Traditional regional and long-range transportation plans were typically focused on broad-brush, very long-term and usually very costly recommendations that addressed basic capacity shortfalls, usually through roadway expansions. Today, however, these plans also consider or examine more localized or location-specific problem areas, sometimes called “bottlenecks” or “Hot Spots”, in an effort to address transportation issues through more low-cost, quick-to-implement improvements or mitigation strategies that improve mobility.

The CHATS Long-Range Transportation Plan process realizes the benefits that can be gained from studying specific problem areas throughout the planning area. These benefits include developing better cost estimates, more detailed design solutions at key locations, and creating more interest and activity in the public realm. The need for this type of assessment is supported indirectly by recent federal emphases on developing practical, innovative solutions that yield measurable performance improvements.



HOT SPOTS

Hot Spot locations were reviewed and described both in terms of typical congestion as well as physical characteristics for all modes of travel (their “completeness”). Pedestrian, bicycle, street crossing, transit, and safety (crash) characteristics were noted as needing improvement, adequate, or already good.



CORRIDORS

Corridors were assessed using a multi-modal level-of-service model that provides letter grade (shown in summaries) and numerical scores that allow a “before-and-after” understanding of recommendations and their impacts.

Hot Spot and corridor locations were chosen by considering traffic, crash, and public input data gathered during the planning process. The Project Advisory Committee reviewed and suggested locations as well at their second meeting, and staff considered if project locations had recent design or reconstruction work performed that might reduce the benefit from further conceptual levels of study. The resulting nine Hot Spot and five corridor locations were studied using the approach shown at right. Of these, nine Hot Spots and three corridor segments were conceptually redesigned in the Roadway Recommendations chapter. More were designed in conjunction with the Charleston Citywide Transportation Plan and several can be found in this plan as well.

P B C T S KEY: P=Pedestrian Treatments; B=Bicycle Treatments; C=Crossing Treatments; T=Transit Provisions; S=Safety
white square=not applicable; green=good/preserve; yellow=adequate; red=improvements needed



01	US 17 ALT/MAIN & MYERS
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P	B	C	T	S
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A recent realignment of this intersection installed sidewalks and better turning provisions. However, all approaches are still congested, particularly the southbound movement. No bicycle facilities, and sidewalks abut the back of curb. Aesthetics, lighting, shade, and crossing treatments are all areas of improvement, as are any relief measures to improve traffic flow.



02	LONG POINT & US 17 NORTH
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P	B	C	T	S
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Unusual in that the intersection lacks a "hard" commercial corner, residential and institution (church) uses predominate. One missing crosswalk, discontinuous sidewalks, and abundance of pavement to accommodate relatively modest volumes (as evidenced by low levels of congestion) create a forbidding environment to cross over 110' on foot, although high-level lighting and pedestrian signals are present. There are no amenities at the transit stops 400' to the east.



03	MAYBANK HWY & MAIN/BOHICKET
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P	B	C	T	S
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In a rural area with a small pocket of development, this area has a potential for a neighborhood-scale commercial node spurred by growth in the region. A significant skew and driveway encroachment from highway-oriented retail/service land uses degrade the design. Inconsistent crossing treatments, sweeping right turns, and sporadic sidewalk treatments leave room for improvements. Posted at 45 mph, congestion on Maybank Highway suggests the need for capacity and traffic flow improvements. This area also functions as a link stop for the Tri County Link' green and blue lines.



04	FOLLY & SOL LEGARE
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P	B	C	T	S
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This intersection is primarily hampered by an offset leg (Tern's Nest Road) to the north and east of the Sol Legare intersection. Congestion is related to seasonal flows. While there are no sidewalks present, a bicycle lane does traverse both sides of Folly Road. The nearest bus stop is a half-mile away. Grocery store, multi-family, and single-family residences line the corners, as does a power substation in the southeast quadrant. This area quickly launches into marshland before accessing Folly Beach.



05	US 78 & LADSON
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P	B	C	T	S
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Long pedestrian crossings could be mitigated by "pork chop" islands to connect the sidewalk that abuts the travelway now. There is currently no median refuge, although the driveways would support creating them. There are no bicycle treatments, and transit service stops just short of this location. Mid-day and PM peak period congestion is typical, particular Ladson Road.



06	REMOUNT & NORTH RHETT
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P	B	C	T	S
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With a park occupying the northwest quadrant and a grocery store in the southwest corner, this location has the potential to be a mixed-use enclave. CARTA transit (Route 13) is here, but is minimally provided-for on the west leg of the intersection, and with a bench on the NE corner. Sidewalks are discontinuous and about the roadway, but pedestrian signals are present. Lighting and sweeping right-turn radii present potential safety concerns. Better and more consistent streetscaping would be an asset. This location is on an Evacuation Route.



07	COSGROVE & AZALEA
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P	B	C	T	S
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This intersection is immediately off of the I-26 exit and traffic merging into Cosgrove to turn west on Azalea have little time to cross 4 lanes of traffic. This movement becomes near impossible when the left turn lane queues during peak times, with extreme cases leading to stacked traffic up the off-ramp to the interstate. Free flow turns and lack of bicycle and pedestrian amenities creates dangerous conditions non-motorized travel. Four bus stops are located within a quarter mile of this intersection.



08	DORCHESTER & LADSON
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P	B	C	T	S
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This section of Dorchester Road features a significant amount of suburban commercial development with large swathes of parking. There are a number of curb cuts on both sides of the road due to the number of business. Old Trolley Road and Ladson Road are major arterials and end at the park on the back side of the commercial development south of Dorchester Road. Sidewalks here back the curb with no buffer from traffic. Free flow turns and “porkchop” islands make this area unsafe for pedestrians and bicyclists alike. Traffic stacks in center turn lanes, impeding driveway access. A park-and-ride lot and bus stop is located at Old Trolley and Dorchester Rd, connecting this area with residential communities in Summerville and along Dorchester Road.



09	BETSY KERRISON & SEA ISLAND
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P	B	C	T	S
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Bohicket Road and River Road are two of the main thoroughfares crossing Johns Island and meet at Betsy Kerrison Parkway, connecting Seabrook and Kiawah Islands back to the mainland. Both Bohicket and River are primarily two-lane scenic byways that connect a number of communities on the island. Due to development on the islands, these smaller roads are facing increased traffic and congestion. To prevent changing the character of those two corridors, the proposed Sea Island Parkway would be constructed through the middle, becoming the spine of Johns Island and easing the congestion from the byways. This intersection would be where Sea Island connects back to these three roads.

P	B	C	T	S
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KEY: P=Pedestrian Treatments; B=Bicycle Treatments; C=Crossing Treatments; T=Transit Provisions; S=Safety
white square=not applicable; green=good/preserve; yellow=adequate; red=improvements needed

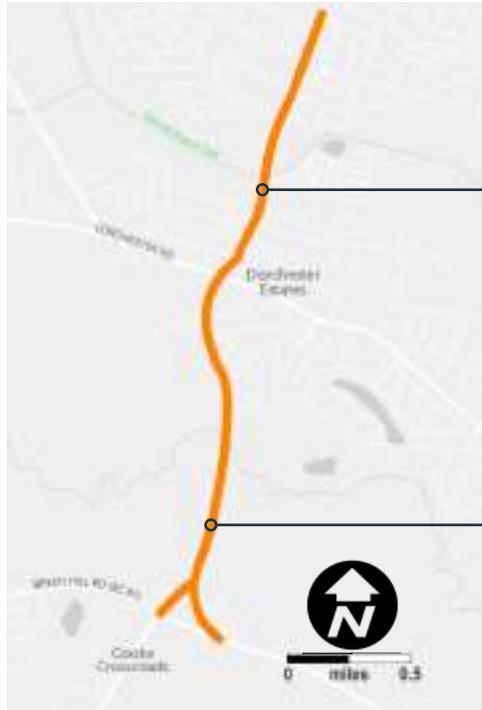
COMMONPLACE HOT SPOT ISSUES



- Crossing provisions lacked well-maintained or high-visibility crosswalks
- Design, such as skewness, hampers the flow of turning vehicles and contributes to congestion
- Transit service often ends just short of the Hot Spot; where there was service, stops were often located “near-side” to the intersection often without furniture or shelter to riders
- Basic sidewalk and bicycle provisions were missing, particularly for on-road cycling
- Streetscaping was inconsistent, missing, or poorly maintained
- Lighting, when present, was high-level and ineffective for pedestrians
- Delineation of public-private spaces, maintenance of adjacent land uses, and a lack of unique characteristics that create a sense of place may contribute to poorly perceived security

01 **CORRIDOR: SC 165 (BACONS BRIDGE ROAD)**

Note: Level of Service grades (A-F) are assigned based on LOS of each mode along route.



Northbound
Auto: B
Ped: E
Bike: D
Bus: F

DORCHESTER TO LIVE OAK

A sidepath (east side) between Dorchester and Ridge falls short of the Sawmill Branch Trail access. No fixed-route transit service. The Dorchester intersection features dual left-turn bays to accommodate heavy turns.

Southbound
Auto: B
Ped: E
Bike: D
Bus: F

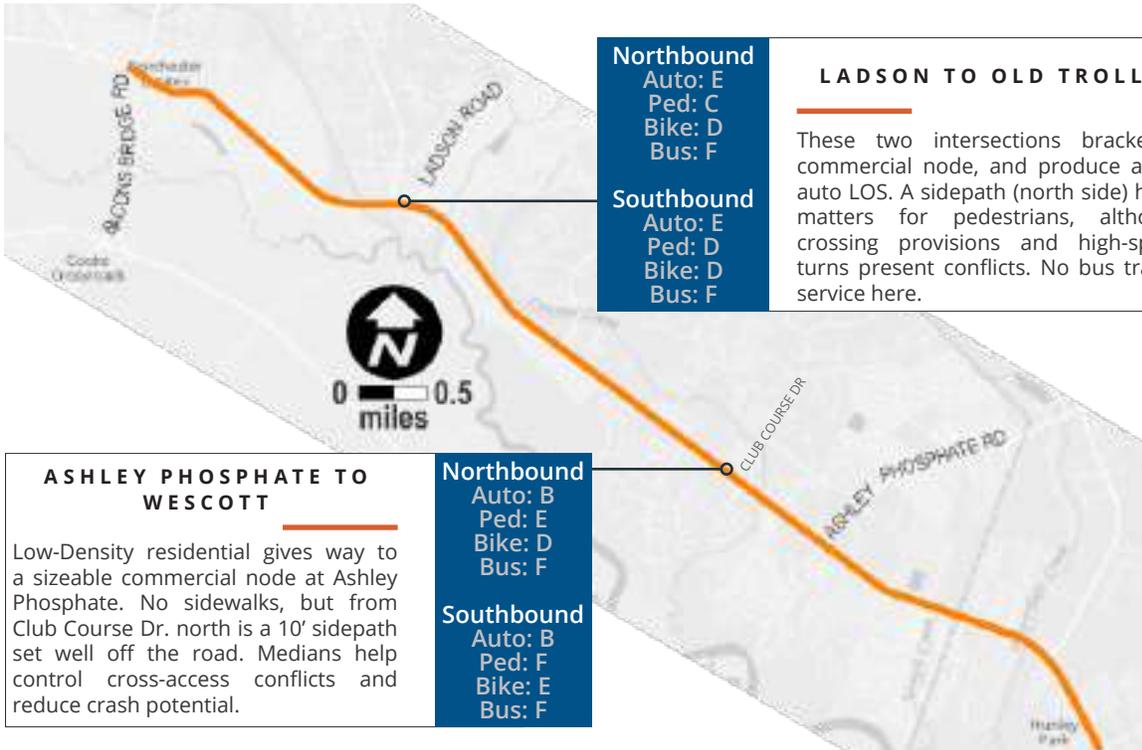
Northbound
Auto: B
Ped: E
Bike: D
Bus: F

BEECH HILL TO DORCHESTER

Construction work will widen the road, assumed to be five lanes. No sidewalk yet exists, but the reconstruction may be addressing this shortcoming. Minor queuing is typical on the west and south legs of the Dorchester intersection in peak periods.

Southbound
Auto: B
Ped: E
Bike: D
Bus: F

02 **CORRIDOR: SC 642 (DORCHESTER ROAD)**



Northbound
Auto: E
Ped: C
Bike: D
Bus: F

LADSON TO OLD TROLLEY

These two intersections bracket a commercial node, and produce a low auto LOS. A sidepath (north side) helps matters for pedestrians, although crossing provisions and high-speed turns present conflicts. No bus transit service here.

Southbound
Auto: E
Ped: D
Bike: D
Bus: F

ASHLEY PHOSPHATE TO WESCOTT

Low-Density residential gives way to a sizeable commercial node at Ashley Phosphate. No sidewalks, but from Club Course Dr. north is a 10' sidepath set well off the road. Medians help control cross-access conflicts and reduce crash potential.

Northbound
Auto: B
Ped: E
Bike: D
Bus: F

Southbound
Auto: B
Ped: F
Bike: E
Bus: F

03 **CORRIDOR: US 78 (5TH STREET)**



DOWNTOWN SUMMERVILLE

Westbound
 Auto: D-F
 Ped: E
 Bike: D
 Bus: F

Eastbound
 Auto: D-F
 Ped: F
 Bike: E
 Bus: F

This small town main street sees congested conditions from mid-day through the PM peak period from Myers to Cedar. Sidewalk is very rare, and there are no bike provisions (although the Sawmill Branch Trail is nearby). Business driveways are sometimes poorly defined; intersections at Auburn Hills and Maple could be improved.

04 **CORRIDOR: RIVERS AVENUE**



Although there is a bike lane on Rivers Avenue, traffic volumes and speeds encourage use of the sidewalk.

COSGROVE TO DURANT

Westbound
 Auto: D
 Ped: C
 Bike: B
 Bus: E

Eastbound
 Auto: D
 Ped: C
 Bike: B
 Bus: E

The highway-directed land uses have many driveways and present the greatest (access management) challenge in the corridor. With bike lanes, sidewalks, and transit on 20 to 30-minute headways, Rivers Avenue is the most "complete" of the corridors. However, design (e.g., railroad), safety, and aesthetic challenges remain to improve viability.

05 **CORRIDOR: US 52 (GOOSE CREEK BOULEVARD)**

OLD MT. HOLLY TO OLD FORT

Some congestion from US 176 to the south occurs now. Access management will play a vital role as the corridor develops further, with several unsignalized crossings set. No bike/ped facilities are present, but the sidepath (and transit service) that stops just south could be extended with acquiring additional right-of-way.

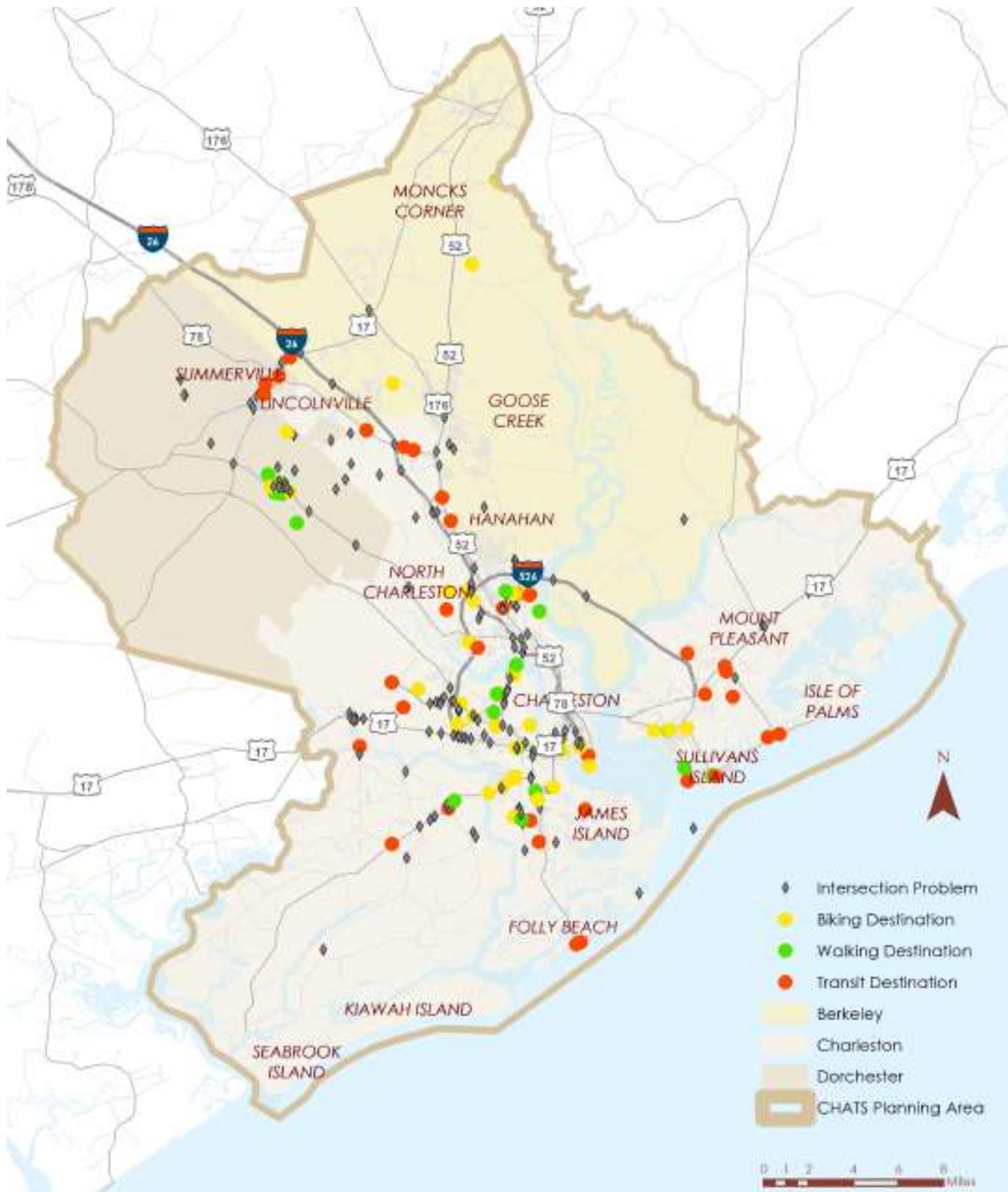
Northbound
 Auto: A
 Ped: F
 Bike: E
 Bus: F

Southbound
 Auto: A
 Ped: F
 Bike: E
 Bus: F



Map 2-4: Survey Point Comments

The comments provided through the interactive web map identified travel destinations and intersection issues. These are illustrated in this map figure. Intersection comments tended to dominate the discussion in this survey.



roadway directions

The Project Team was challenged with coordinating this information, past plans (including the adopted LRTP), and identifying the remaining shortfalls in capacity and performance identified through forecasts of simulated future travel needs. Some, although not all, of the specifics are shown at right (“Roadways: What We Heard”), with more general directions that need to be considered in the development of the recommendations discussed in the following paragraphs.

It’s About Traffic and Congestion, Sort of

While there are many newcomers to the region arriving every day, more participants in outreach efforts have lived in the BCD Region for 10, 15, or 20 years. These people have seen enormous change, and particularly lengthening trips and longer periods of traffic congestion. A number of people voiced a concern about the pace, location, design, or other aspects of a successful economy and wanted policies to reflect the need to better manage new development, or at least make it pay for a larger share of the infrastructure that supports it.

Everyone (and Place) has Their Limit

Although there is still room for roadway capacity improvements, the additional infrastructure is increasingly expensive to plan, design, build, and maintain. Technology, transit, and active modes of travel will have to bear an increasing share of the responsibility to move people and goods in a place that values its historic and natural resources. Twenty-four travel lanes across various corridors connect the northwest edges of the CHATS planning area to the Charleston central business district. Adding more travel lanes may help segments of the corridor, but that capacity still has to “funnel” down to lower-capacity streets.

Feeding the Beast

Perhaps the most significant barrier to overcome is that of creating stable financing adequate to build and maintain a transportation system with a capacity that meets the demand. The Team heard many times that new improvements are overwhelmed or obsolete by the time they are constructed, implying that higher-capacity designs should have been pursued initially.

Roadways: What We Heard

- **Summerville**
Several commenters highlighted issues on downtown streets and major arterials to the west of town (e.g., Orangeburg Road, Dorchester Road).
- **Charleston/North Charleston**
The areas around Montague Avenue, I-526/I-26 interchange, Savannah Highway, Sam Rittenburg Blvd., and other major highways were focal points for many commenters, particularly specific intersections from a capacity standpoint.
- **Mt. Pleasant/Sullivan’s Island**
There were fewer comments here, and focused on fewer areas, such as intersections with the Isle of Palms Connector and SC Hwy 41. There were more biking, walking, and transit destinations on the islands and beaches, but connections to them were noted as being important facilities and services to improve.
- **James Island/Folly Beach/Kiawah**
Maybank Highway, River Road, and Bohicket Road intersections and, to some extent, roadway capacity were noted as areas to improve.
- If there was an **over-arching theme** to many of the comments received at the project symposia and other venues, it is that the capacity of the roadways has been reached and that congestion is rapidly worsening, threatening the economy, freight movements, and emergency response times. Workshop participants noted that managing capacity and elevating complete streets as their top priorities.

walk & bike conditions

Purpose

Integration of concerns identified in the recent WalkBike BCD Plan.

In the CHATS area the places most conducive to walking and biking are those that are older and more established. Densely gridded areas like the downtown and historic areas in Charleston and North Charleston, and smaller town centers such as in Summerville and Mt. Pleasant, are typically easier to walk with short block distances and sidewalks. The city grid, a remnant of colonial planning and indicative of a past without the automobile, dissipates outside of the Charleston Peninsula and town centers, breaking down into sprawling and often disconnected neighborhoods that border creeks, rivers, rail lines, major arterials, and pockets of commercial areas. This pattern of development, mixed with rural, farmland, and preserved natural areas make up the majority of the CHATS planning area, which doesn't provide adequate connectivity for pedestrians and cyclists. Depending on the neighborhood and zip code, almost all errands and trips would require a car or access to transit service. Those that attempt to travel on foot or by bike are often met with streets without the infrastructure needed to allow them to travel safely. The importance of providing this infrastructure is noted and communities like Goose Creek and Mt. Pleasant are making strides to improve this.

Map 2-5: Existing Bicycle and Pedestrian Facilities



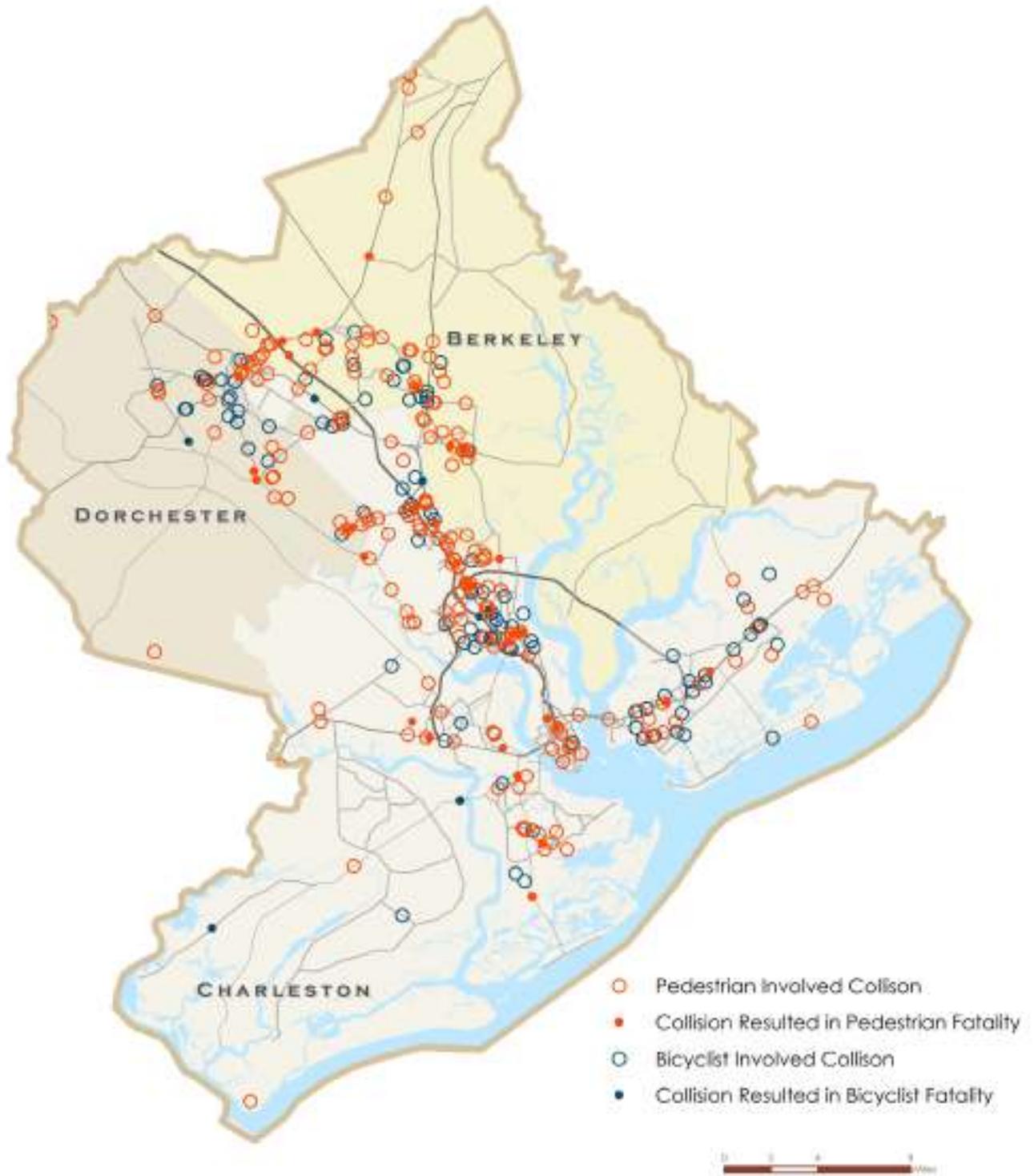
...fatalities are not simply statistics, but represent the deaths of neighbors, workers, family members, and residents in the region.

bicycle and pedestrian crashes 2015-2016

In 2014, South Carolina had the sixth-highest rate of pedestrian fatalities and the ninth highest rate of bicyclist fatalities per capita in the United States. Pedestrian and bicyclist crashes are on the rise in the CHATS planning area. There were more crashes each year in 2012, 2013, and 2014 than in 2010 and 2011. Pedestrian crashes were split between daytime and nighttime hours, while the majority (72%) of bicyclist crashes occurred during the day. Additionally, over three-quarters of the pedestrian and bicyclist fatalities were at night, suggesting night crashes are more severe. Within the CHATS planning area there

were 229 pedestrian crashes and 117 bicycle crashes reported between 2015 and 2016 (Map 2-6). These collisions resulted in 39 fatalities. These fatalities are not simply statistics, but represent the deaths of neighbors, workers, family members, and residents in the region. Their stories are imbedded in the data of this report and emphasize the need to design safer streets and invest in better infrastructure.

Map 2-6: Regional Pedestrian and Bicycle Crashes, 2015 & 2016



barriers and challenges

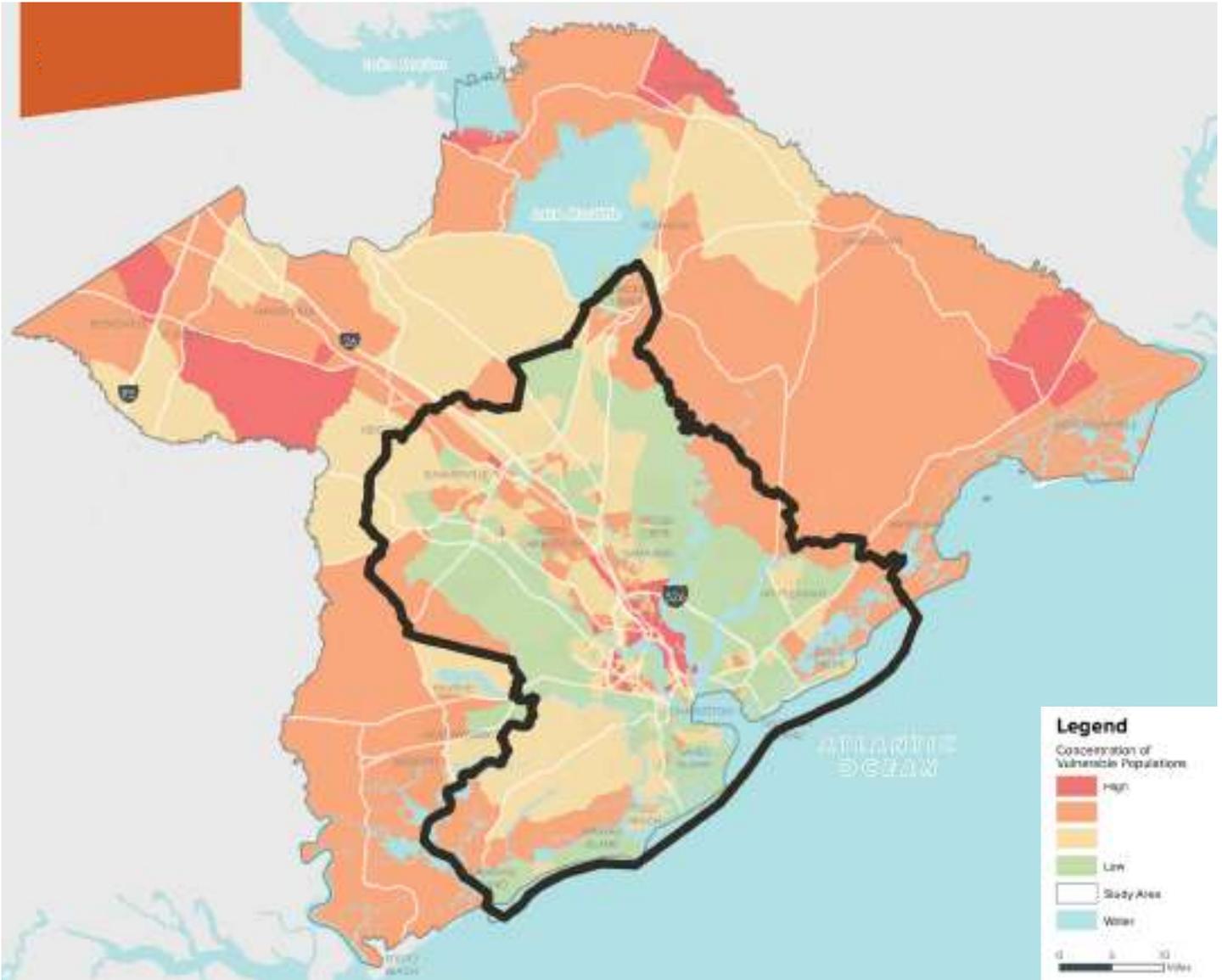
There are currently over 94 miles of shared-use paths, and over 60 miles of on-road bikeways, in the CHATS planning area. Unfortunately, they do not always connect the different municipalities and communities to each other, or to all major destinations.

Major arterials such as Interstate 26 and US 78 limit bicyclist and pedestrian mobility and pose serious safety concerns. Growth and development patterns around these corridors have historically failed to support active transportation and transit users. Bridges without dedicated active transportation facilities like the Ashley River Bridge and SC Highway 7 are barriers to connectivity. Highway 17 (Savannah Highway) bisects small towns such as the Town of Ravenel, and this five-lane roadway that supports high-speed traffic creates lengthy and dangerous crossings for pedestrians and challenging merge conditions for cyclists.

The analysis also revealed the areas with higher concentrations of low-income communities that are more likely to suffer health and access disparities. These are the communities where commuters may be walking or biking in unsafe conditions daily if they don't have access to a vehicle or public transportation. Six socioeconomic criteria identify these areas as follows: seniors, children, non-white populations, low-income households, vehicle access, and linguistic isolation.

The communities with the most vulnerable populations were found to be concentrated along the edges of Dorchester and Berkeley counties and in the downtown areas of North Charleston and Charleston. The urban downtown areas were found to have the highest concentration of households without a vehicle, making transportation access and improvements vital to sustaining the quality of life in these communities. Vulnerable populations in the Neck and Upper Peninsula areas are served by transit.

Figure 2-8: Regional Equity Analysis



demand and stress

The results of demand analysis suggests that pedestrian and bicyclist activity is expected to be the highest in central Charleston County, southeast Dorchester County, and southern Berkeley County. This conclusion is based on factors known to influence walking and biking behavior, including where people live, work, play, learn, and access transit in the CHATS planning area.

Level of Travel Stress analysis was based on the factors that would affect the perceived safety and comfort experienced by cyclists traversing the region. The results provide useful depictions of the quality of infrastructure serving bicyclists in the CHATS planning area. Streets with shared-lane markings (sharrows) were scored the same as shared streets since bicyclists have to share the road with vehicles in both situations. Residential streets with two lanes and lower speeds offer more comfortable, low-stress

environments. Shared-use paths and trails also offer low-stress environments for bicyclists and are given a low stress score since these facilities are separated from vehicular traffic.

Under these parameters, around 70% of the roads in the region are low stress for cyclists. The remaining 30% are high stress and make up the main corridors and thoroughfares in the region, connecting to urban cores as well as employment, educational, and retail centers. For cyclists, the most direct routes are typically the least comfortable or safe.

Figure 2-9: Regional Pedestrian and Bicycle Demand

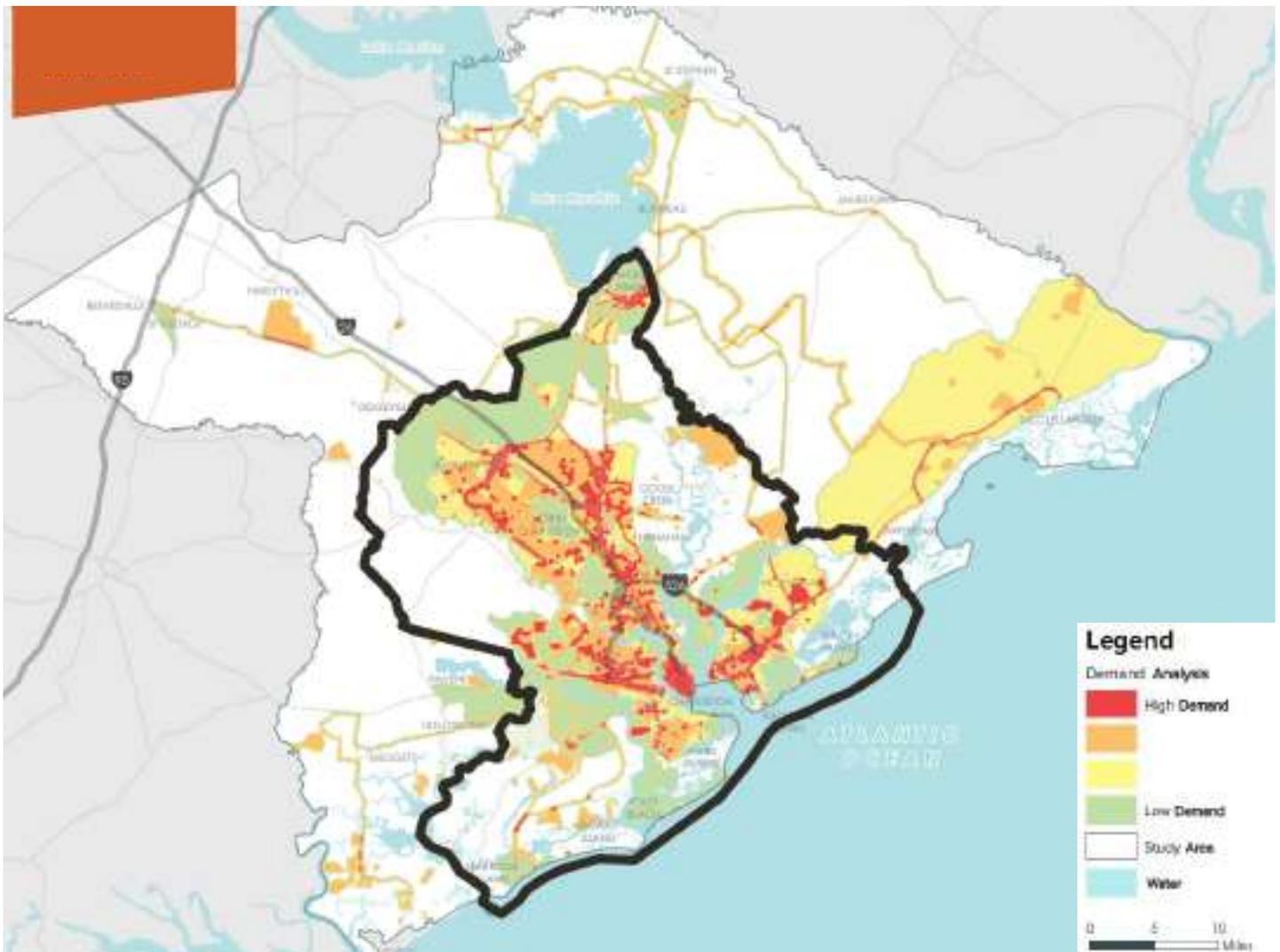
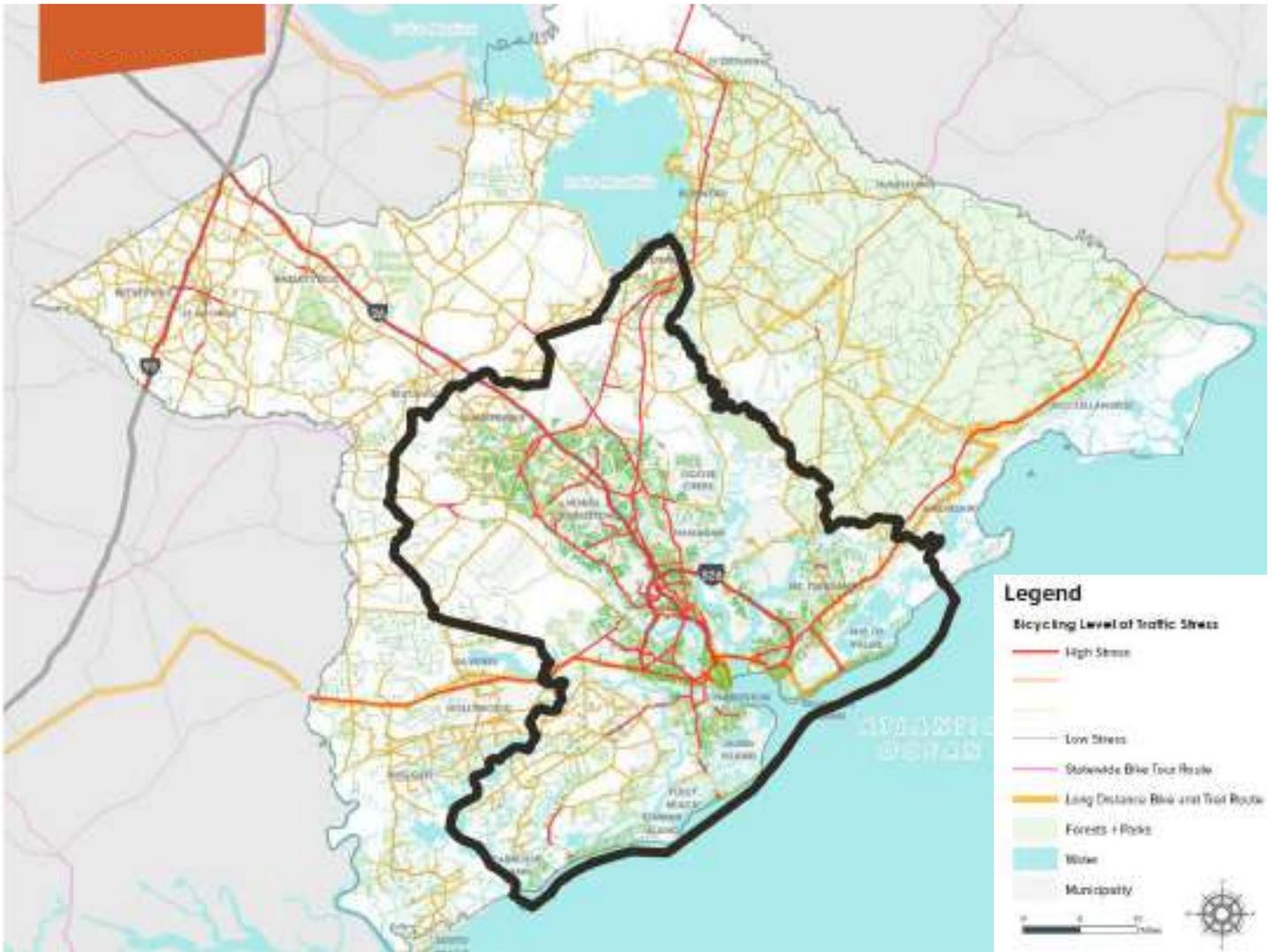


Figure 2-10: Bicycle Level of Traffic Stress



sharing the ride

In under three years, the City of Charleston has seen the implementation of two bike share programs on the Peninsula. Affordabike, a locally owned and operated bicycle shop, jumped ahead of the City's plans after another company was chosen. From August 2016 to October 2017, Affordabike operated ten bike share stations using a cell phone app for users to locate, rent, and return bikes.

At the end of May 2017, HolySpokes was launched as the city's official bike share program. The program is run by another local company, The Gotcha Group, funded by the Medical University of South Carolina and backed by Social Bikes, a nationwide bike share company running in several major cities. They have

30 hubs in operation. The City is currently collecting the data from HolySpokes for future analysis, having so far logged nearly 49,000 trips, and the bike share company is working closely with the Department of Transportation as they consider expanding.

Recently, Bird dockless electric scooters have begun popping up in major cities across the US. While the company has successfully infiltrated other southern cities, Charleston, and subsequently Mount Pleasant, quickly pushed back on scooters due local bans against unregulated vehicles. As of this writing, HolySpokes is the only non-vehicular ride share in the region.



Clockwise from top left: Holy Spokes Inaugural Ride (City of Charleston Twitter); Heat map of one Saturday's rides on HolySpokes bikes (Post and Courier, Stephanie Barna); HolySpokes Social Bicycles app screenshot (Charleston City Paper); Police officers picking up Bird scooters in Mount Pleasant (Post and Courier, Wade Spees/Staff, Thad Moore)

bicycle & pedestrian directions

The BCDCOG was completing its regional bicycle and pedestrian plan simultaneously with the development of the CHATS Long-Range Transportation Plan. The two projects were thus able to coordinate heavily; the recommendations in the LRTP emulate those in the regional bicycle and pedestrian plan. The following are the premier lessons from the active mode planning; see also the more specific comments highlighted at right (“Active Modes: What We Heard”).

We’re Doing this for Our Health

Accessibility to walk and bike facilities helps encourage more of that activity, which in turn is strongly linked to physical and mental health. Walking helps control weight, and therefore a host of related health conditions including cancer rates, diabetes, and hypertension. The disparity of incomes and infrastructure have social equity implications, since some vulnerable populations don’t have access to a private car and therefore depend on walking to destinations or to transit for their livelihoods.

Safety is Paramount

Places that see seasonal and permanent influxes of residents, older populations, and tourists typically see higher incidences of crashes, including those involving pedestrian and bicycle travelers. The CHATS planning area is experiencing several of these trends, the result being that the area has one of the highest incidences of pedestrian and bicyclist crashes in the country.

Infrastructure Needs

Maintenance on long-established sidewalks and the need for new on- and off-road walking and biking paths are evident and were popular topics at public gatherings. Although crossing safety treatments are commonplace throughout the region, in many cases major corridors lack crossing provisions or alternative facilities of any kind.

Active Modes: What We Heard

- **Regional Thinking:** Commenters identified the need for completing regional connectivity links in the bicycle system, including existing greenways.
- **Addressing Safety:** The public was provided a list of safety recommendations to prioritize. Of that list they prioritized additional greenways and trails, decreasing the speed limit on certain roads, and making intersection crossings safer were within the top 5 for BOTH walking and bicycling. These priorities correlate with findings from the public workshops that separated facilities (greenways, multi-use paths) are highly preferred over on-road facilities.
- **Reaching Destinations:** The primary aim of citizens in the CHATS planning area is to safely reach their favorite or most-frequent destinations. These include school, work, medical appointments, parks and trails, downtown, major urban centers, and retail stores.
- **A Smart Investment:** Over 90 percent of online survey respondents agreed that tax dollars should include pedestrian and bicycle amenities and when asked how they would spend \$100 on transportation improvements, they allocated almost \$70 to trails, on-street bike lanes, and sidewalks.
- **Need for Improvement:** A respective 80 and 70 percent of survey respondents disagreed that “biking (or walking) in the CHATS planning area is a safe, practical, and convenient way to get from one place to another.”

public transit conditions

Public transportation in the CHATS planning area is operated by two fixed-route bus services and human service providers within the three counties. The following summary includes findings from outreach to transit operators as well as a technical review of past performance data and current operating services.

Fixed services are provided by two agencies: the Charleston Area Regional Transportation Authority (CARTA) and the Berkeley-Charleston-Dorchester Rural Transportation Management Association (RTMA, d.b.a. TriCounty Link). CARTA primarily serves the urban core of the planning area with fixed route, commuter bus, and paratransit services, while TriCounty Link (TCL) primarily serves the rural areas with deviated fixed route and commuter services. Map 2-7 illustrates the CARTA and TCL route networks within the CHATS planning area.

Map 2-7: Service Area Map



Purpose

Brief review of primary transit services and performance.

- CARTA Bus Routes
- TriCounty Link Routes
- Overlap of routes

CARTA services

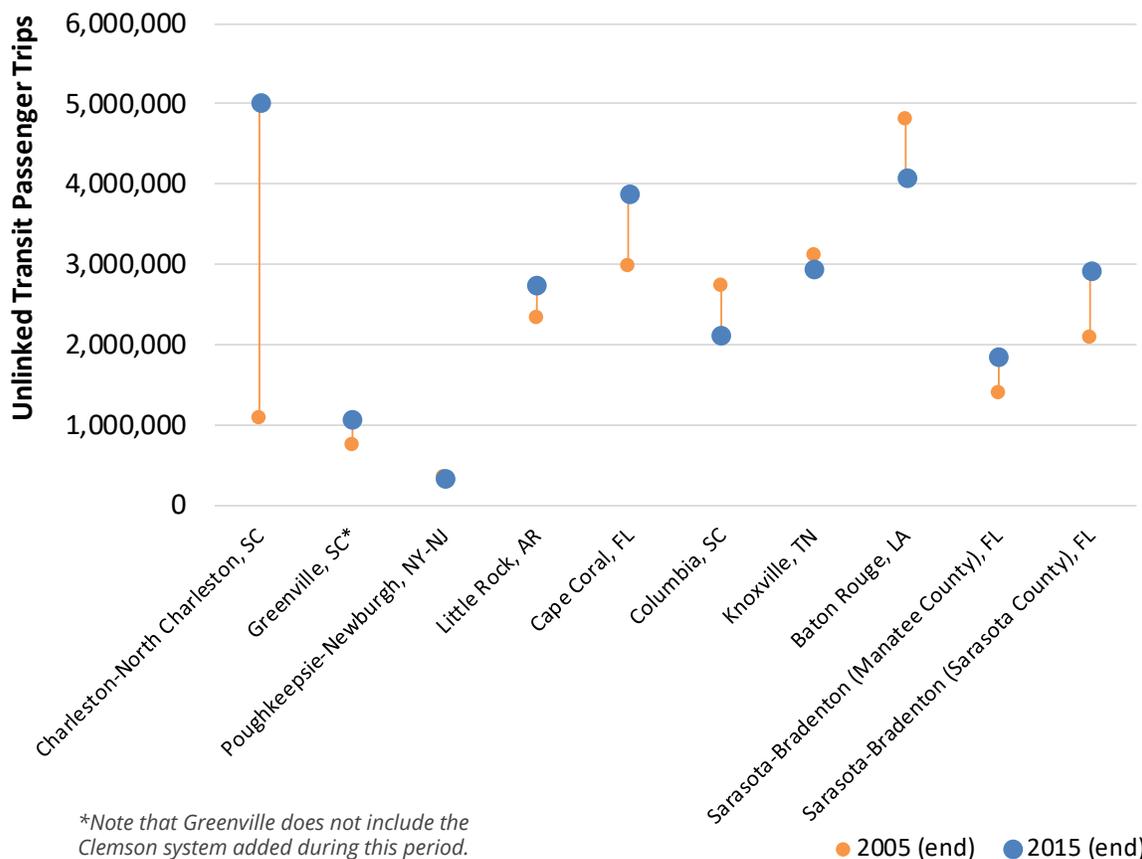
CARTA currently operates 21 fixed bus routes, which include 18 local routes and three Downtown Area Shuttle (DASH) routes. It also operates four commuter express routes serving seven park-and-ride facilities and the airport. CARTA's Tel-a-Ride (ADA paratransit) provides demand response service to qualifying individuals within 3/4-mile of a fixed-route alignment. CARTA operates 365 days a year, with local routes generally running from approximately 5:15 a.m. to 8:30 p.m. at frequencies ranging from 15 to 105 minutes. CARTA's express routes generally operate within the same span of service as the local routes; however, no mid-day service is provided and routes depart every 30 minutes except for Route 4, which departs every hour during midday.

According to the most recently available data reported to the National Transit Database (NTD), CARTA provided over five million passenger trips in 2015 across its three service modes. Local bus and commuter bus ridership accounted for over 4.9 million trips in 2015, and demand response accounted for approximately 79,000 trips. Total

system-wide ridership increased 15% between 2011 and 2015. General service supply metrics including revenue hours, miles, and peak buses also increased since 2011, as did the operating budget and fare revenues earned, reflecting an overall growth of the system during this period. CARTA's total operating budget in 2015 was approximately \$19 million and the agency earned approximately \$3.6 million in fare revenues during the same year.

When compared to other fixed-route transit operators serving areas of similar urbanized population sizes (although each system context is different), CHATS has staged a remarkable period of growth over the past decade. Figure 2-11 shows the 2005, 2010, and 2015 ridership data in terms of unlinked passenger trips (includes transfer trips) for each year. Some systems have declined over this period (Columbia, SC) or rebounded (Knoxville, TN). The CARTA system has staged the most dramatic growth, quintupling ridership over the ten-year period. This may be due in part to the half-cent local transportation sales tax in Charleston County, of which 18% goes toward transit.

Figure 2-11: Transit Ridership, 2005 and 2015.



TriCounty Link services

The TriCounty Link system is comprised of nine deviated fixed routes and nine commuter routes. The deviated fixed routes follow a published schedule and operate as a “flag-stop” service, picking up customers between the scheduled stops along the fixed routes. Each route also offers a route deviation option that allows the driver to go off the route up to ¾-mile to pick up customers that cannot meet the bus at designated stop locations. This is primarily a pre-scheduled curbside service, which allows TCL to meet Americans with Disabilities Act (ADA) requirements, although the deviation option is useful in the lower-density context of the large service area that TriCounty Link covers. TriCounty Link’s commuter express routes operate between a network of park-and-ride lots and other key points throughout the service area and interface with CARTA services at coordinated transfer locations. TriCounty Link has a transfer agreement with CARTA, allowing passengers to pay one fare each way when transferring between agencies.

BCDCOG began oversight of TCL in 2012 and implemented more rigorous reporting procedures than had previously been in place. As such, ridership and operating statistics prior to TCL’s first annual report to NTD in 2013 are unreliable. According to 2015 NTD data, TCL has shown an overall decrease in ridership since 2013 subsequent to the discontinuation of Medicaid service in 2012. However, TCL posted a slight gain in ridership in 2015 over 2014 figures for both its deviated fixed route and commuter bus services. Other service statistics including operating expenses, fare revenue, and revenue miles and hours reflect a similar pattern.

trends affecting public transportation

As is the case in most southeastern metropolitan areas, the CHATS planning area is expanding in population but that population is growing in a less dense pattern. Several indicators related to this development trend foretell challenges to traditional, fixed-route bus operations as a regional service, and may make a case for dedicated high capacity transit (Figure 2-12). The counties have population densities that do not readily support traditional fixed-route services consistently throughout, with the City of Charleston having a density nearly four times as great as the rural part of the counties. However, retail destinations, employment centers, and relatively dense areas outside of the city can and in some cases provide support for transit lines in the CHATS planning area.

Although both the CHATS population and the number of passenger trips carried by CARTA have increased in recent years, the relative number of people in the planning area using transit has declined (Figure 2-13). The Regional Transit Framework Plan provides an in depth analysis of existing and future growth and travel patterns, and identifies a toolbox of transit solutions to address the diverse transit environment in the region. Parking remains relatively inexpensive in the urban core and, although challenging to find during weekdays, is still sufficiently convenient to discourage shifting from private automobile modes of travel.

“There is poor connectivity to many areas throughout City and region, which eliminates it as an option for many potential choice riders.” - Focus Group Participant (7.26.17)

Figure 2-12: Population Density and Commute Times

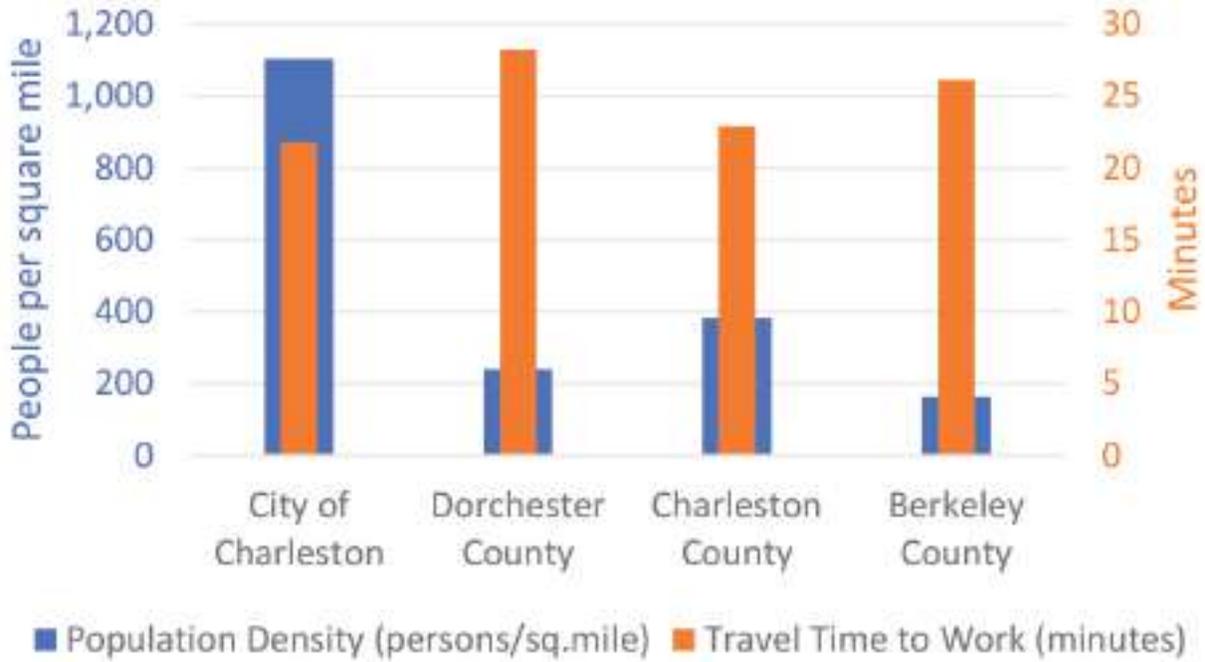
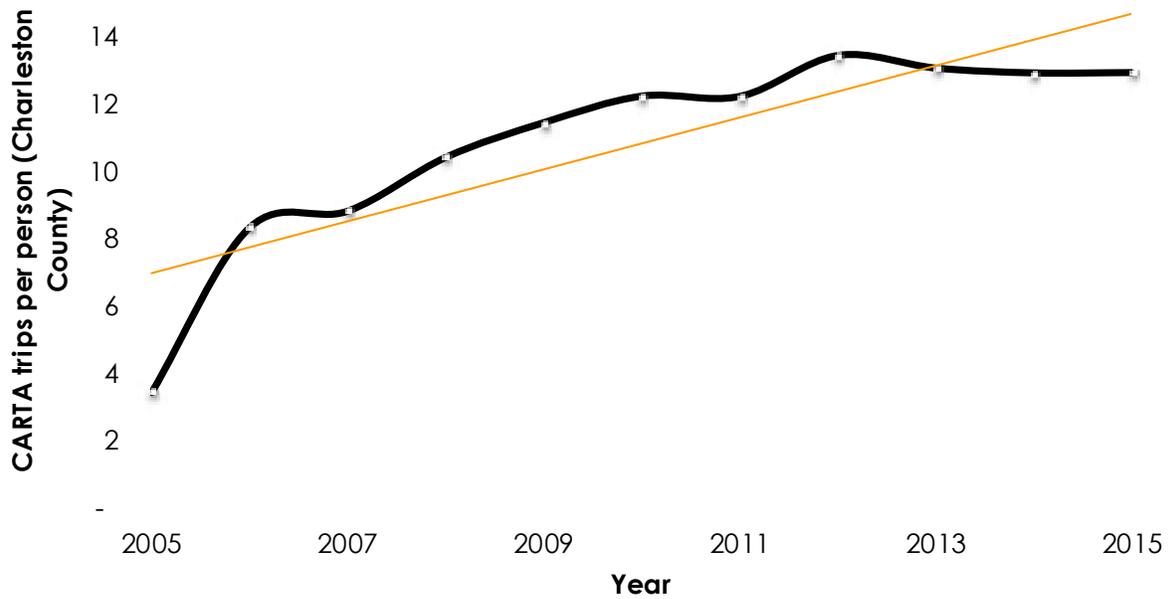


Figure 2-13: CARTA Passenger Trips and Charleston County Population (1990-2015)



Lowcountry Go Commuter Services Program

The Lowcountry Go Commuter Services Program implements a set of select Transportation Demand Management (TDM) strategies in an effort to shift commuter demands to alternative transportation options. This program has the potential to impact system-wide commute patterns and traffic congestion.

The Lowcountry Go Commuter Services Program, founded in 2018, has accomplished a tremendous amount in a short timeframe. Managed by the Berkeley-Charleston-Dorchester Council of Governments in partnership with the South Carolina Department of Transportation, the Federal Highway Administration, and employers and stakeholders in the Tri-County Region, this pilot program is focused on reducing traffic congestion and improving quality of life.

The Lowcountry Go Commuter Program is a strategic approach to managing transportation resources. Because the program serves as a centralized system for transportation options and coordinates requests for transportation services, the BCDCOG staff is positioned to provide residents, commuters, and employers with a menu of transportation services and coordination options. The Lowcountry Go Program directs BCDCOG and consultant resources to implement the recommended Transportation Demand Management strategies for employees and employers through education, promotion and marketing projects and programs that focus on the following:

- Moving people instead of moving vehicles;
- Identifying the travel needs of individual consumers;
- Assisting with the entire trip, even if the trip involves more than one mode of travel;
- Promoting vanpool, carpool, and rideshare matching initiatives;
- Emphasizing opportunities to expand traditional business practices to include programs such as flex time, telecommuting, compressed work week, and staggered work hours; and
- Promoting transit-oriented developments.

Employee TDM Strategies. The selected TDM strategies recommended to reduce traffic congestion include commuter-based TDM programs focused on the travel of employees to and from work. Implementation of these strategies includes promoting, marketing and educating employees on the benefits of carpools, vanpools, rideshare matching, and guaranteed ride home programs.

Employer TDM Strategies. The recommended employer-based TDM programs are focused on coordination of the hours and operations of employees in the workplace. Implementation of these strategies includes the promotion of projects and programs to incentivize work flextime, staggered shifts, compressed work weeks, telecommuting, transit passes, and other financial incentives to encourage off-peak employee travel.

Outreach. This commuter services program relies heavily on engagement and input from community stakeholders, regional large employers, and their respective employees to recognize commuter needs and to establish a baseline of commuter behavior and program awareness in the Tri-County Region. Outreach is achieved through contact through the BCDCOG mobility manager and other agency contacts; the www.LowCountryGo.com website; Facebook, Instagram, and other social media.



transit directions

Several key themes emerged from public input from symposia meetings, surveys, and focus groups.

Address Land Use and Development.

Without strong leadership in land development location, density, and design practices, transit will be impractical in many corridors. These practices will need to extend to parking management and pricing strategies in downtown “core” areas to encourage alternative modes of travel, and linking existing and emerging nodes of higher-density development with transit.

Major Corridors are Ready for Premium Transit Service.

The major northern corridors, US 78, US 52, and Dorchester Road, offer potential for a premium transit service such as bus rapid transit (BRT). Detailed planning and preliminary designs, as well as likely right-of-way purchases, need to proceed quickly before development makes some options infeasible. This premium service should also strongly consider waterborne transportation services. A Regional Transit Framework Plan (2018) has been developed and addresses these issues.

Winning Hearts and Minds.

People repeatedly spoke of the need to overcome transit stigmas, and improve the image of public transportation to show that transit can be for everyone.

One Size Doesn't Fit All.

Park & Rides, BRT, ferry service, expanded fixed route, and improvements to the existing services are important to provide mobility options when it comes to transit, especially in an area where the natural and built environment across multiple jurisdictions creates impediments to effective transit service.

Transit: What We Heard

- Bus Rapid Transit (BRT) or Passenger Rail Service for the North (I-26) Corridor; US 17 Corridor is also a strong candidate for high-quality transit service
- More/Better service for the beaches
- Existing services often carry a poor image with choice riders, and are not competitive with auto travel currently in outlying communities
- Waterborne services, including access to port areas and medical facilities
- Increased development of park-and-ride lots and services, which aligns to the recent Park and Ride Study conducted by the BCDCOG
- Need to eliminate stigma associated with transit services
- Better information for, and marketing of, the current system and services is important



Purpose

Provide relevant direction and peer examples for improving freight transportation.

freight conditions

The location of the South Carolina Strategic Freight Network, major freight generators, and average annual daily truck traffic volumes (2012 data) are shown in Map 2-8. The intermodal freight generator data was developed from a data layer originally sourced from the Federal Highway Administration / US DOT and augmented for this project to include more major, manufacturing attractors (destinations) for freight shipments. The freight generator/ attractor data indicates port, air, truck, and rail terminals including Norfolk Southern and CSX railyards. Note that port facilities are distributed to reflect different operations at Wando terminal as well as two pier locations at the north and south

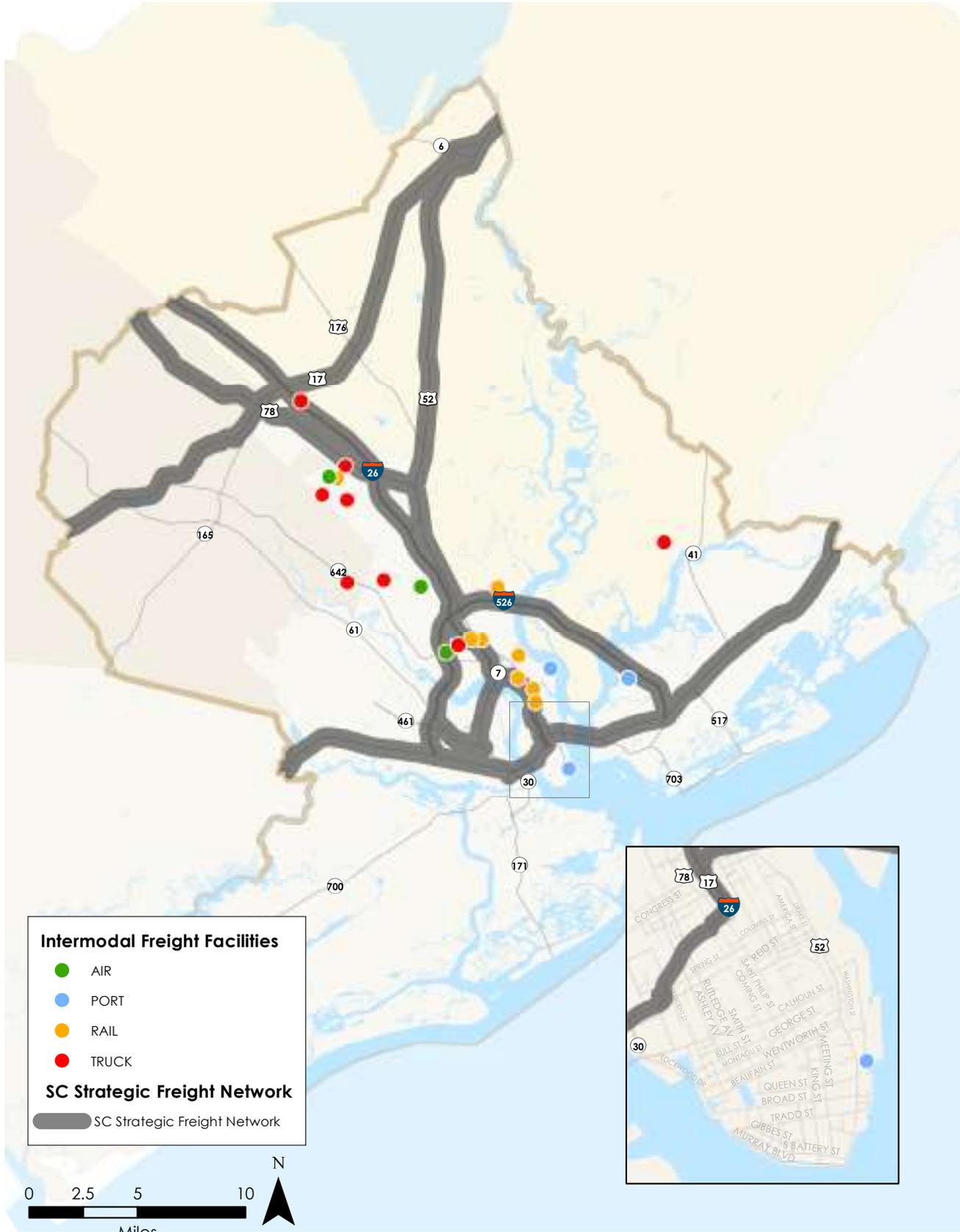
ends of the Charleston peninsula. Charleston International Airport (call: CHS) is emblematic of the increases in freight movements into and out of the region. In 2003, air freight (typically smaller volume, high-value shipments) amounted to just over 5,400 tons of total enplanement/deplanement tonnage. By 2017 (the most recent full year of data) that volume had increased by 630% to nearly 40 tons annually. (Charleston International Airport, 2018).

Map 2-8: Average Annual Daily Truck Traffic (AADTT)



Average Annual Daily Truck Traffic (AADTT) for 2012 is captured in the Freight Analysis Framework version 4 (FAF4) Data.

Map 2-9: Freight Generators



Freight generators include the Charleston International Airport; manufacturing facilities like Volvo, Boeing, and Bosch; and rail and seaport terminals.

While most of the freight volumes in Map 2-8 correspond with a freight network road segment (shown in gray “underneath” the volume linework in the map), there are some roadways such as SC 642 (Dorchester Road), SC 171 (Folly Road), SC 165, and Redbank Road that are not included. The clustering of major and minor freight generators and attractors as well as support facilities around the I-26 corridor, places a lot of emphasis in that area. Similarly, intermodal transfers and ground freight movements occurring very close to the densely populated and restricted “Neck” area of Charleston continue to present conflicts for different types of travel.

Roadway network speeds within the study area that vary from day to day impact just-in-time delivery systems that many major manufacturing facilities rely on to keep production facilities running smoothly and continuously. Figures 2-14 and 2-15 illustrate both the average speeds on the Interstates in the Tri-County Region as well as the variability of speeds on just one major route (US Highway 17) for a two-year average of all weekdays from October 2016 through September 2018.

Figure 2-14: US 17 Speed Variability

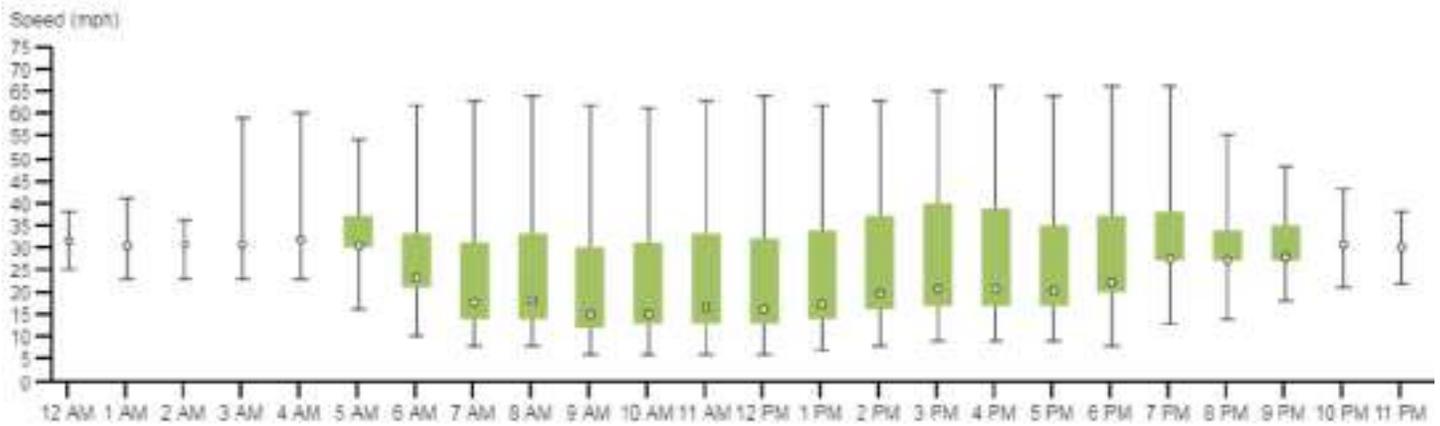
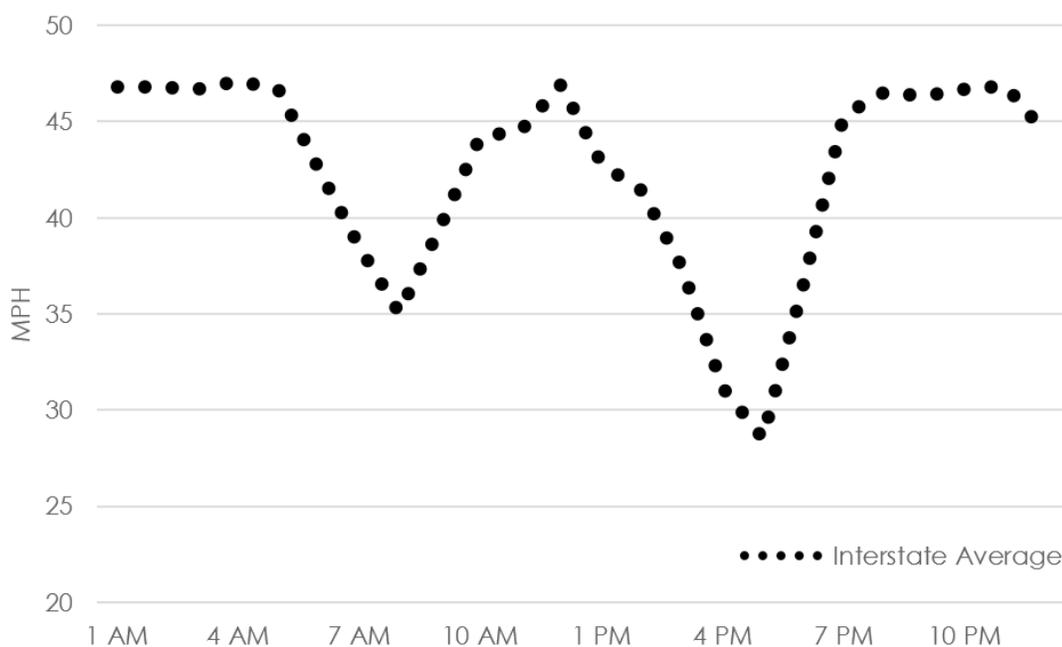


Figure 2-15: Daily Changes in Interstate Travel Speeds



Variability in speeds on US Highway 17 specifically and daily changes in average weekday travel speeds on Interstate segments within Berkeley, Charleston, and Dorchester counties are a source of concern for manufacturers, delivery companies, and industries dependent on consistent access.

peer review

The following pages summarize a review of eight freight studies completed in the past five years, emphasizing practices that can be used to help shape the freight section of the CHATS Long-Range Transportation Plan as well as guide future policy and freight-focused planning efforts in the CHATS planning area.

The MPO freight plans and practices reviewed share some of the common elements listed above, notably the development of a plan and process that is updated and informed by an advisory committee to the MPO. Some variations dealing with land use, performance measure practices, equity, and land use/design and mitigation from freight infrastructure were noted.

A noteworthy practice is having a “deconstructed” freight plan that lives on the MPO website and in a chapter of their respective LRTP, and is supported by detailed prior studies. Not just smaller MPOs take this path, some of the larger MPOs like NJTPA and SANDAG employ this approach.

Land use and economic development are common themes as well, although only Tampa, Florida spent considerable time detailing mitigating freight-related design and community issues. A final note concerns the use of purchased freight data, which allowed some MPOs to better detail commodity flows.

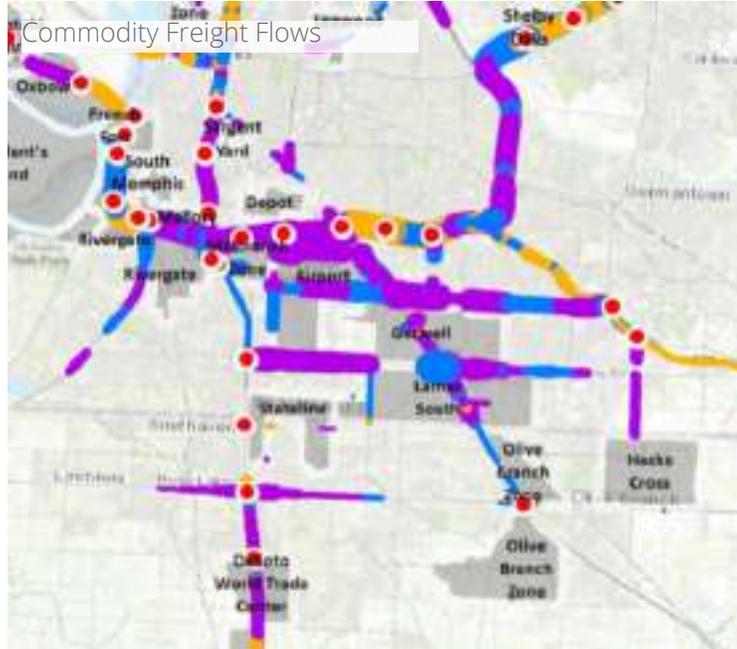
01	MEMPHIS
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Greater Memphis Regional Freight Plan (2017 Draft)

Five Class I Railroads, Waterborne Freight, Freight Zones, Technology, Financing, and Demand Management

With 238 million square feet of industrial space and the busiest intermodal hub in the U.S., the Memphis MPO justifiably views freight transportation as central to its mission.

The Plan identifies key bottlenecks, but emphasizes both technology and demand management (shifting from truck to rail modes) as ways of improving freight flows. Funding for “big ticket” capital improvements as well as shorter-term targets like truck parking and local corridors are considered in the Plan as well. Surveys indicated that pavement repair, truck rest areas, and access to roadway information as most important to shipping representatives. The Plan includes descriptions of regional commodity flows, commodity types, and key assets (distribution, rest stops).



02	MIAMI
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Miami-Dade County Freight Plan (2014)

Broadly Multi-modal, Focus on Site-Level (e.g., Port, Railyard, Terminal) Priorities

Every major mode of travel is found in Miami, and addressed in the freight plan: air cargo, truck traffic, rail, and waterborne shipping - as well as competition for space with cruise ships.

The impact of the Port Miami Tunnel - over 3,000 trucks a day removed from downtown streets - prefaces a discussion of major capital investments. The prioritized projects utilized the same methodology as the Southeast Florida Freight Plan: truck volumes, facility type, time frame, intermodal connectivity. Most priorities are on-site improvements such as cranes, taxiways (airport), and railyard/trackage construction. Roadway improvements, however, earn some of the biggest priority scores, including adding managed lanes and interchange design modifications. Technology, as well as bottleneck/Hot Spot concept designs, are included in this Plan.



03	TAMPA BAY
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Tampa Bay Regional Strategic Freight Plan

On-Line Documentation; State DOT District Office in Lead; Best in Class for Community Design Integration

With Florida DOT's District Seven Office in the lead, this plan is highly accessible and not as technical as many of its peers.

Notable is the distributed approach to the content in the Plan, as well as a substantial guidance on integrating truck design practices (e.g., large turning radii) with various, prototypical community types and their impacts on transportation system users.

As with other plans reviewed, Tampa Bay describes the economic benefits of freight to its region, commodity movements, and priority locations in the transportation system for improvement. An interactive map allows the user to browse priority locations and see specific improvements, although many locations are missing some information.



04	SAVANNAH
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CORE MPO Freight Transportation Plan (2015)

Extensive Conditions Reporting; Performance Measure Detail; Environmental Justice/Equity

As with other MPO-sanctioned freight plans, Savannah paints a picture of existing conditions (very extensive, in this Plan) and identifies bottleneck locations. The report goes into substantial detail on performance measures at national, state, and MPO levels as well, providing strong reconciliation between LRTP and freight plan objectives/measures. Technology, land use considerations, and physical infrastructure improvements are cited as ways of improving performance.

Atypical is the section on Environmental Justice, or how the demographics of race and income differ across the planning area and may be impacted by freight. The Plan goes further, identifying remediation efforts to offset health and quality-of-life impacts from freight movements and infrastructure.

Hampton Roads Regional Freight Study (2017)

Clear and Thorough Summary; Interpretation of Graphs are Greatly Aided by "Quick Facts"

One of the premier deep-water ports and located in one of the largest metro areas, the potential for infrastructure needs - and conflicts - is high in Hampton Roads.

One of the elements that would be expected to be identified more readily in other plans - at-grade rail/road crossings - is identified early in the Hampton Roads Plan. Other areas of impact not seen as much in other plans include issues pertaining to truck parking, constraints on operations (hours, routing), and impacts on smaller companies from the requirement to have electronic logs.

Heavy increases in rail transport of freight in recent years have not lessened the perennial concern about the fragility and congestion of water crossings in the region. The Plan employs better use of data, such as identifying costs incurred to the trucking industry from congestion, than some of its counterparts in other areas. This data is employed in the LRTP project priority process by giving points to projects that improve truck freight routes, but there is not a separate scoring system for projects in the freight plan or process.



Alamo Area MPO Freight Planning

No Stand-Alone Freight Plan specific to the Region; Enhanced LRTP Documentation and Mapping

The San Antonio freight situation is not as large a part of the regional economy or transportation concern as other MPOs reviewed here. The MPO has responded accordingly by developing a more detailed freight element in their long-range transportation plan and process.

Like Tampa Bay, the MPO has launched an interactive map although it contains information only on the existing freight system and not future improvements. Also similar is the absence of a MPO freight planning document - this region relies on the state freight plan and enhances its LRTP with additional freight-related data and recommendations. Workshops were held with freight representatives as well as first responders and school system employees to gain information on bottleneck locations, safety concerns, and physical barriers to access.

Nevertheless, the amount of information available overall is considerably less and less detailed than in other planning products. The approach here is an entry-level foray into freight planning.



07 CHICAGO

CMAP MPO Freight Planning

Detailed, Near-Stand-Alone Freight Element in LRTP; Strong Rail Transport Focus; Less “Filler” Content

Having six of the seven Class I railroads means Chicago is strong on collaboration, like convening freight conferences.

Like some other MPOs reviewed, CMAP has opted to include a detailed freight component in their LRTP instead of a stand-alone freight plan. This approach eliminates some duplicity of information, especially in the areas of congestion reporting, demographics, and land use. The freight chapter (12) of the LRTP is therefore more succinct, but it doesn't sacrifice much content compared to stand-alone freight planning documents: reports that detail manufacturing linkages and, especially the freight economic “cluster” provide a lot of content to the LRTP freight chapter.

The CMAP website is also well worth exploring, providing consistent formatting and a lot of information integrated seamlessly into a comprehensive planning process.

08 SEATTLE

City of Seattle Freight Master Plan (2016)

City, not MPO, Master Plan; Good Balance of Context; More Community-Oriented, Including Retail/Delivery

The City of Seattle developed a clean, clear, and concise plan that identifies the importance of freight and implementation strategies to improve its performance.

The City's Freight Master Plan (FMP) is targeted to the informed layperson and decision-maker, and strives to be graphically appealing and informative. Strong public engagement (25 stakeholder interviews) helped frame key issues for the community (like noise and safety), not just freight performance issues like other plans.

An emphasis on local, retail-driven element yields detailed strategies, like evaluating street trees and their maintenance on truck routes and “no idle” zones. The Plan does not shirk specific infrastructure recommendations, describing and mapping 68 projects.



freight directions

On August 8, 2017 a focus group was conducted with eight representatives of freight transport and emergency response providers. Based on this meeting, congestion/crash assessments, and a review of freight planning processes of eight peer MPOs, several directions for the CHATS Long-Range Transportation Plan shall be pursued by the BCDCOG and its public / private partners (see also text box at right, "What We Heard").

Moving Freight is Hard Now, and Getting Harder. Freight providers noted that land development approvals are over-burdening an already-congested roadway network, citing Clements Ferry Road, Ashley Phosphate Road, and I-26 as examples. This congestion is hampering freight movement, and costing consumers and companies money both in terms of shipping delays and attracting/retaining truck drivers.

It Will Take a Strong State/Local Partnership to Make Freight Better. The fast growth of new residents and businesses and already-constrained roadway network make improvements obsolete before they are completed. Additional resources are necessary to resolve current congestion problems, and new policies relating growth to roadway capacity to avoid even more serious issues in the future.

Managing Demand Better. Expanding the Port's operating hours and days (e.g., Saturday) would help shippers avoid some of the worst peak traffic conditions. Allowing some travel on shoulders under certain conditions offers some current or potential future relief, as does the new intermodal terminal, app-driven scheduling services for moving individual boxes, and HOV/HOT lane technology.

"Every carrier will tell you the same thing: that money is being lost due to traffic congestion. The growth in the region leaves us 10 years behind in terms of the infrastructure needs."

-Freight Focus Group Participant (8.7.2017)

Freight: What We Heard

From Freight Focus Group:

- Current congestion levels are costing people and companies a lot of money
- It's becoming harder to find drivers willing to deal with the congestion levels in the region
- Some solutions, including expanding the Port's operating hours into the evening and major capacity expansions of congested roadways, are going to be very costly to implement

From Freight Peer Review:

- Develop a comprehensive Regional Freight Plan or detailed Freight Element in the LRTP
- Technology is central to future success
- Align high-priority freight projects with LRTP
- Freight = Economic Competitiveness
- Include freight-related land uses in discussion
- Emphasize bottleneck locations
- Port MPOs have Freight Advisory Committees
- An open, accessible freight plan is rare, but advantageous
- Spend resources collecting good data



policies: now & needed

Any place that is growing rapidly and has a lot of its growth in greenfield (as opposed to redevelopment) areas will benefit from strong growth management and economic development policies that account for resource preservation, conservation, and improvements. In a survey sent to government representatives of the communities in Berkeley, Dorchester, and Charleston, respondents were asked about existing transportation related policies and requirements. The final question asked respondents to identify the transportation-related policy areas that would be most beneficial to improve in their communities (Figure 2-16).

Purpose

Identification of policies and directions for improving the transportation system.

Figure 2-16: Transportation Policy Priorities



Participants were given the following instructions to rank policy priorities for their respective municipalities: *"Please order the following transportation-related policy initiatives in order of their importance to be improved or, if not currently in place, then added in the future. Please rank ALL of them regardless of whether or not your community has the policy."*

Map 2-10: Participants in Existing Policy Survey



All three of the counties had at least one representative submit a survey; all jurisdiction names displayed in dark red text also had at least one representative submit a survey. Areas that had more than one submission by a representative have a number in parentheses next to their name to indicate the total number of submissions.

Figure 2-17: Existing Policy Survey Policy Responses



Respondents were asked if their municipality had specific streetscape or transportation related policies. The ratio of affirmative responses to negative are depicted in blue and gray, respectively, above.

past plans

At the regional, county, and municipal levels of government, there are multiple plans and studies in place guiding development and planning, and proposing projects in the CHATS area. This section reviews the plans most relevant to the transportation network and planning of the study area.

One type of plan found in even the smaller municipalities is the Comprehensive Plan. State law mandates that any local government that exercises zoning and planning authority must produce a Comprehensive Plan. The comprehensive planning process gives the local government, planners, and citizens a chance to plan the future of their community and take stock of its current state. By law, the plan must cover nine elements by their existing conditions, needs and goals, and strategies to reach the goals and time

frames to complete them. The transportation element listed in much of these plans were examined for relevancy.

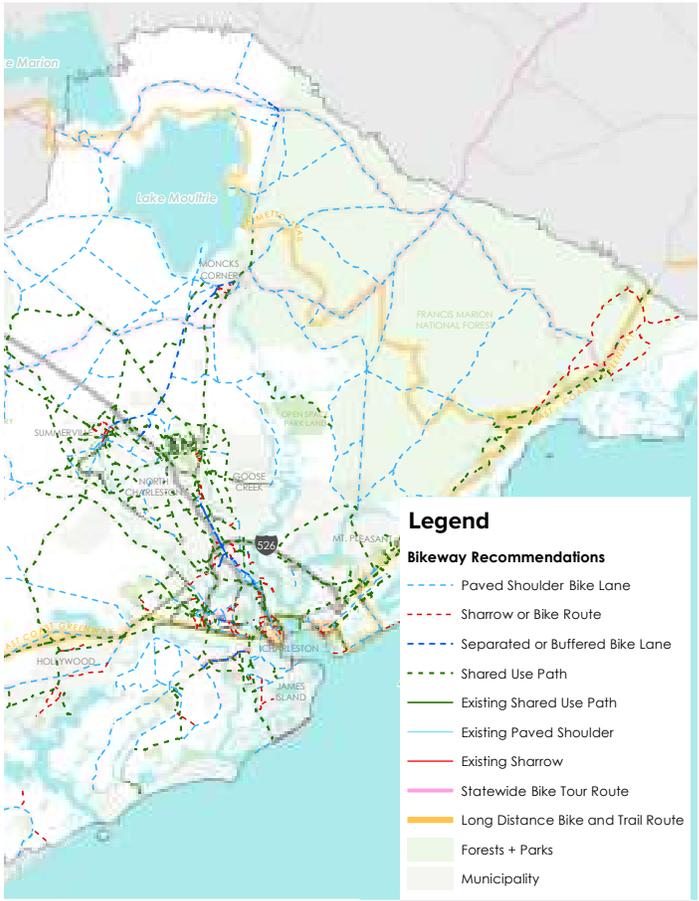
Other plans examined in this section include small area studies and plans, corridor studies, complete street studies, greenway plans, bicycle and pedestrian plans, and transportation plans. While a number of these plans center on small towns in the region, they provide a look into the priorities and goals for each community, and shed a light on projects and policies these communities are looking into for the future. The plans examined have guided this project directly or indirectly, affecting the implementation for policies and prioritization of projects.

01	BCD REGION
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Walk Bike BCD (2017)

The *WalkBike BCD Plan* is the guiding document for development of a connected network of walking and biking routes within the Berkeley-Charleston-Dorchester region. Investing in walking and biking promotes regional goals of improved health, safety, economic development, and quality of life. Among the key recommendations of WalkBike BCD are identifying potential locations to create expanded connectivity between neighborhoods and communities for walkers and bikers, providing a long-term vision for investment and collaboration for increased accessibility and safety, providing programs and policies that enable residents and visitors of the tri-county region to incorporate active transportation into their daily lives, and adopting agency design guidelines that provide the foundation for high-quality pedestrian and bicycle facilities.

The goals and recommendations outlined in the *WalkBike BCD Plan* will be integrated into the LRTP. The bike and pedestrian network established by WalkBike BCD should be included in the LRTP. A collaborative approach to funding and implementation will ensure the strategic growth of the bike and pedestrian network across the BCD region.

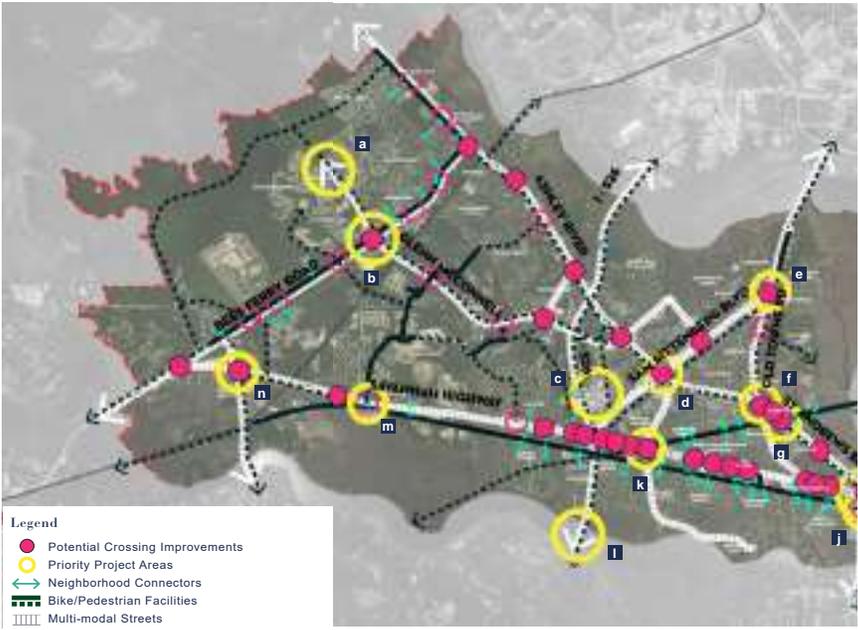


03	CHARLESTON (CITY)
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Plan West Ashley (2017)

Plan West Ashley will serve as the overarching planning document for shaping future development in the West Ashley area that enhances the quality of life and protect the area’s historic, cultural, and natural environment. The Plan sets policies and identifies specific public and private actions aimed at accomplishing the five key goals established by the plan which include upgraded community design and land use, connected transportation, resilient infrastructure and sustainability, affordable housing, and focused economic development.

Plan West Ashley recommends a holistic approach to transportation planning in order to create a West Ashley that is more connected, not only within the West Ashley neighborhoods but also with the greater Charleston area. Plan West Ashley establishes methods to provide connections through meaningful transportation options and lane-use development that supports mobility, walkability, livability, and sustainability. With the growing population and expanded residential development, traffic congestion is a primary concern for the West Ashley area. Key transportation goals include providing greater vehicular capacity and safety improvements in targeted locations, providing better pedestrian and bike safety, expanding greenways and bike lanes, investing in public transit enhancements and expansion, and creating more efficient connections across the Ashley River.



Many of the desired goals for the West Ashley area are reflective of the overall vision for the greater area.

I-26 Fixed Guideway Transit Alternatives Analysis (2016)

The I-26 Alt plan is a comprehensive operations analysis of the Charleston Area Regional Transportation Authority (ARTA) transit system and proposes fixed guideway transit alternatives for the 22-mile long I-26 Corridor that connects Summerville to Charleston. It was initiated by CHATS to identify and evaluate solutions to improve transit service, enhance regional mobility, manage existing and future transportation demand, support the regional economy and create livable, walkable communities by responding to their transportation needs as the area experiences exponential growth.

The plan features a thorough analysis of potential transit modes and potential alignments and measured alternatives through a pre-screening process and two rounds of detailed screening including both qualitative and quantitative assessments. In pre-screening, all modes and alignments were examined and alternatives were ruled out based on suitability, validity of concerns, and physical and financial probability of success. In the initial screening, alternatives were measured through peer review and land-use analysis along with quantitative and qualitative assessment. For the last round of screening, BRT and LRT alternatives were measured with the Federal Transit Authorities Capital Infrastructure Grants project justification criteria based on ridership forecasts, planning level capital, and operating costs. At the end of the report, the recommended project is a BRT line along the US 78/US 52, or Rivers Avenue, alignment, ending at Line Street, with 18 stations along the stretch.

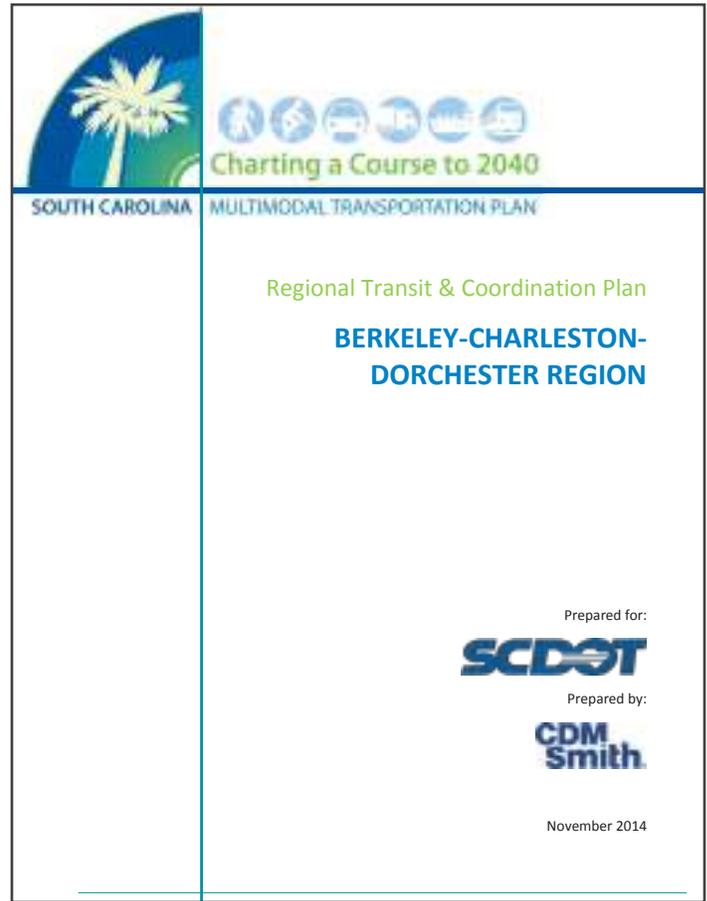


Folly Road Corridor Study (2016)

The 2016 Folly Road Corridor Study identifies potential opportunities and outlines recommendations to transform the Folly Road corridor into a thriving, multi-modal corridor. This major thoroughfare leading onto James Island, connects West Ashley area to the north with the City of Folly Beach to the south. Today, Folly Road suffers from excessive traffic, inadequate infrastructure, minimal landscaping, disconnected bike lanes and sidewalks, and aging strip malls that line the corridor. Following the five guideposts of safe, connected, green, valuable, and synced, the Folly Road Corridor Study provides a framework to design a “complete street” that would balance all modes of travel including walking, biking, and public transit with a strong emphasis on streetscape. By transitioning the area away from an auto-centered design to a more holistic approach, the Folly Road corridor can help re-invigorate business and better establish a sense of community and personality for the gateway to Folly Beach. This Complete Streets study would set the standard for new development and could serve as the precedent for creating more sustainable and aesthetically-pleasing roadways for the area.

South Carolina Multi-modal Transportation Plan (2014)

The South Carolina Department of Transportation updated the Multi-modal Transportation Plan (MTP) with state and federal departments and other key stakeholders from its predecessor passed in 2008. The MTP lays out the goals and objectives, current conditions, future deficiencies, estimated funding, and the latest federal requirements of the transportation infrastructure for the state of South Carolina. Included in the plan are fully integrated modal plans for the Interstates, Strategic Corridors, Public Transit and Human Health Service Coordination, Freight, and Rail systems for the state. Additionally, the plan breaks down by regions defined by metro areas and includes a Regional Transit & Coordination Plan for the Berkeley-Charleston-Dorchester Region. The state recognizes the need to develop and improve the reliability of the multi-modal options for residents and visitors in this region, increase the conditions and safety of the systems in place, support the economic and community vitality of the area, promote equity and access for the communities, and to sustain the natural and cultural resources and environment of the region.



OurRegion, OurPlan (2012)

OurRegion, OurPlan (OROP) is the 2040 vision plan for the BCD region that aims to provide a blueprint for shaping the growth of the community through a framework of centers, corridors, and green areas, as well as specific planning principles. The plan arose from the concern over fast regional growth sprawling out into the rural areas, effecting mobility, affordability, and the quality and quantity of natural environment. The Plan focuses on these principles and unique character or place, historic preservation, landscaping, variety of place, the public realm, transportation options, walkable streets, low-impact parking, human scale, and economic development.

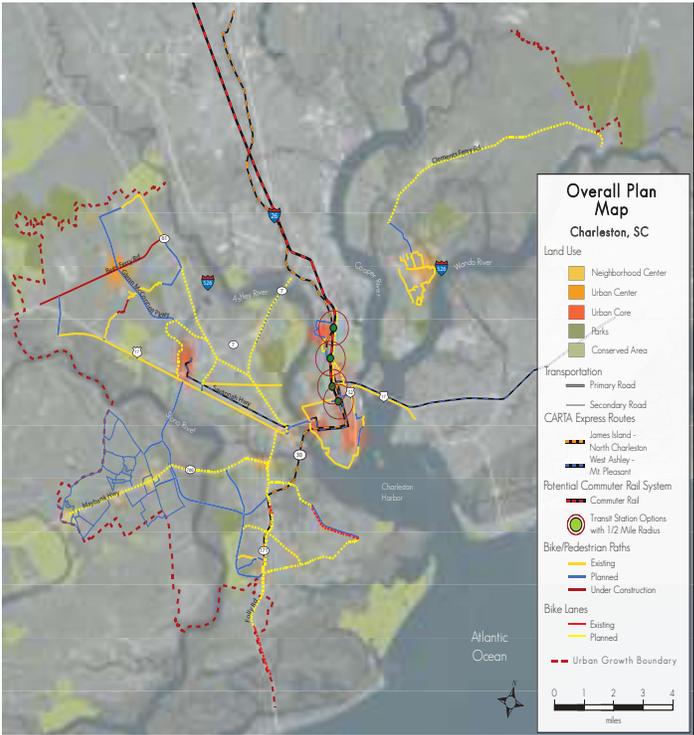
The plan developed four goals for Mobility and Transportation Infrastructure: 1) to promote alternate modes of travel, 2) to develop an integrated transportation system that maximizes use of existing transportation infrastructure, 3) to reduce reliance on carbon-based fuels, and 4) to ensure that transportation facilities are context-sensitive with the natural and built environment. To accomplish these goals, the plan lays out specific objectives, the sort of policy needed to enforce these initiatives, and the indicators of successful implementation.

Century V City Plan

2010 Comprehensive Plan Update

The Century V City Plan serves as the principle guiding document for all development and redevelopment within the City of Charleston for the next 10 to 15 years. This plan outlines all future goals related to natural and cultural resources, economic development, public safety and services, land use and preservation, transportation options, and planning coordination. Some of these core goals include establishing land use regulations that encourage compact development; providing a wide range of housing, workplace, and transit options; and ensuring the equal distribution of municipal services to new and existing customers. Building upon the visions of the 2000 Century V Plan update, the 2010 Comprehensive Plan is divided into seven sections: Population & Housing, Economic Development, Cultural Resources, Natural Resources, Land Use, Mobility, and Community Services.

While all sections covered in the Century V Plan are relevant, the Century V Mobility goals and recommendations will serve as a foundation for establishing the basis for all City of Charleston transportation decisions. The primary mobility goal is to offer as many mobility choices as possible from more interconnected and improved routes to expanded multi-modal options including walking, biking, public transit, and water transportation. There is a strong focus on “walkability” and improving streetscapes by adopting new street design standards with an emphasis on complete streets.



more plans, and ties to this study

Plan Name	Location	Date Adopted	Recommendations		
			Projects	Policy	Other
Moncks Corner Comp Plan	Moncks Corner (Town)	May 2018		X	
Town of Kiawah Island 2015 Comprehensive Plan	Kiawah Island (Town)	December 2015			X
City of Folly Beach Comprehensive Plan 2015	Folly Beach ("City")	December 2015	X		X
James Island Connector Bicycle Safety Analysis	Charleston (City)	October 2015	X		
Amended Comprehensive Plan	Isle of Palms (City)	May 2015			X
Town of Seabrook Island Comprehensive Plan	Seabrook Island (Town)	March 2015			X
City of North Charleston Comprehensive Plan Update	North Charleston (City)	January 2015	X	X	
Peninsula Mobility Report	Charleston (City)	November 2014			X
Sam Rittenberg Corridor Report	Charleston (City)	October 2014	X		X
Citadel Mall Report	Charleston (City)	October 2014	X		X
The Upper Peninsula Planning Study	Charleston (City)	September 2014		X	
Town of Sullivan's Island Comprehensive Plan	Sullivan's Island (Town)	May 2013		X	
Johns Island Community Greenway Plan	Charleston (City)	October 2010	X		
Calhoun Street East/Cooper River Waterfront Plan	Charleston (City)	February 2010	X		X
Berkeley County Comp Plan	Berkeley County	January 2010		X	
Comprehensive Plan Ten Year Update	Rockville (Town)	August 2009			
Charleston County Comp Plan	Charleston County	November 2008		X	
Dorchester County Comp Plan	Dorchester County	January 2008	X	X	
Johns Island Community Plan	Charleston (City)	November 2007	X		
Town of Summerville Comprehensive Transportation Plan	Summerville (Town)	July 2007	X		
Town of Mount Pleasant Transportation Plan Update	Mount Pleasant (Town)	December 2006	X	X	
Imagine Goose Creek, Comprehensive Plan	Goose Creek (City)	July 2005		X	

Relevance to 2040 LRTP

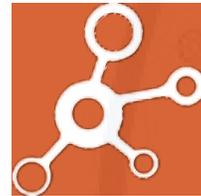
<p>The plan highlights a commitment to encourage the implementation of a multi-modal transit that improves existing connections, public transit, and active transportation. The plan notes the importance to coordinate with WalkBike BCD and the CHATS 2040 LRTP.</p>
<p>While all roads within the Island's gate are privately owned, the Town manages two access roads and a roundabout completed in 2005. K.I. Pkwy improvements, a bike path and a trestle bridge were done in 2009. It maintains standards for curbside parking, emergency access and routes.</p>
<p>The community recognizes the need to update and maintain several key access bridges, and notes the planned improvements for the Folly Road at Camp Road and Folly Road at River Point Row intersections.</p>
<p>The study found the best solution to open the full length of the connector to cyclists, but restricting certain on- and off-bound ramps and providing alternate access points in combination with coordinated safety improvements.</p>
<p>The community is accessed by two main roads, SC 703 and SC 517, and there are only 35 miles of roadway on the island. The goals for the Isle are to improve the transportation infrastructure and provide clarified parking infrastructure, signage, and restrictions.</p>
<p>Plan recognizes the importance of transportation, infrastructure, and connectivity, and moves for the Town to continue supporting the efforts to improve roads or replace existing roads in the region.</p>
<p>The plan states the goals for the city as continued coordination for transportation and land use planning, provide safe routes for walking and cycling, create an efficient road network, reduce traffic congestions, and development a multi-modal system.</p>
<p>The report makes recommendations for the next 2-10 years, including bringing back the trolley system, adding tourist center, placing parking decks in key locations to access other transportation modes, and making a number of pedestrian and bicycle improvements.</p>
<p>The study proposes a separated cycle track, fitting into the existing bike network in the area, and redesigning intersections for safe bike crossings, as well as widening sidewalks and adding trees. Such changes would support redevelopment of retail areas along the corridor.</p>
<p>The Citadel Mall sits where Sam Rittenberg Blvd and I-526 meet Highway 17, three high volume roadways in West Ashley, making it a major destination in the city and a central location to important roadways.</p>
<p>The report recommends complete streets in the redeveloped Upper Peninsula, with sidewalks, cycle tracks, on street parking, and pedestrian islands. The level of mixed use redevelopment proposed will support a multi-modal, walkable future for this area.</p>
<p>Sullivan's Island is serviced by the CARTA call ahead program, is part of the East Coast Greenway, has worked with SCDOT to replace the Ben Sawyer Memorial Bridge. It lists improvements to access, active transportation, and public transit through collaboration with other entities.</p>
<p>The Community Greenway Plan proposes a network of pedestrian connectivity along roads, through communities, and connects existing trails and destinations.</p>
<p>The plan proposes pedestrian oriented streets with bicycle accommodations and offers redesigns for many of the intersections in the area to support these goals.</p>
<p>The Berkeley plan looks to the CHATS MPO 2030 Plan and BCDCOG Plans to list projects that are noted as necessary across jurisdiction lines and underlines their importance to the region.</p>
<p>Rockville, as a rural town, has no public transportation, and the plan states that any strategies would need to respect the resources and heritage of the region.</p>
<p>The report highlights the importance of the various planning and transportation agencies, including SCDOT, BCDCOG, CARTA, CHATS, FHWA, and FTA, working to make the same recommendations across planning documents to update policies and propose projects that meet shared goals.</p>
<p>The plan maps out existing and proposed CHATS, TIP, and Sales Tax projects in the area and encourages their completion through policy changes and collaboration among entities.</p>
<p>The plan notes recommendations for Maybank Highway such as the potential I-526 Interchange, building a parallel roadway to preserve tree canopy, and configure the land use in 'town' and 'country' nodes.</p>
<p>The plan lists the existing issues, planned projects, and recommended bicycle infrastructure implementation and intersection and operational improvements.</p>
<p>Through a series of analysis including needs assessments for transit and vehicular mobility, the plan lists needed and not needed projects, and lists the funding possibilities for the recommended projects identified.</p>
<p>The plan lists the infrastructure and transportation issues and goals for providing planned infrastructure improvements to support future growth in the region.</p>

finding direction

The complexity of the large and diverse CHATS MPO area demands a variety of recommendations for improvement. Themes that are repeated from analysis, public engagement, the Advisory Committee, and adopted plans/policies help provide a consistent framework for shaping these recommendations. The following is a summary of the key directions discussed in the preceding sections on freight, public transportation, auto/roadway, active modes, and cross-cutting policy matters, setting the stage for future recommendations.

Direction 1: Improve Connections in the Roadway Network

As the outlying areas of the CHATS planning area expand and attract new residential and commercial growth, more frequent connections - for all modes of travel - become increasingly important. A single road, regardless of its capacity or design, can accommodate trips entering and leaving from many points - only a network can distribute traffic effectively.



Direction 2: Increase Opportunities for Bicycle and Pedestrian Modes of Travel

Businesses, residents, and travelers are increasingly expecting to see more and better - especially off-road - bicycle and pedestrian networks. Currently, the CHATS planning area has sparse and fragmented pedestrian and bicycle accommodations, particularly outside of the core urban areas. Additional measures related to safe crossings are critical, emphasizing less-affluent communities where pedestrian crashes are more prevalent.



Direction 3: Enhance the Public Transportation System to Better Serve Existing Riders and Attract Choice Riders

Perhaps the most-cited theme was the need for more frequent public transportation as well as premium modes of travel, notably bus rapid transit and water-borne modes. The north/northwest corridors, downtown Charleston, town centers, and beaches were the most-often cited destinations for transit.



Direction 4: Draft and Adopt Policies that Directly Address the Goals of the LRTP

The rapid expansion into outlying areas will increase traffic pressure on smaller, secondary roads and the major arterials that they feed. Aligning transportation provision with decisions about the location, magnitude, and design of new private (and public) developments will be the single, most-important action to be taken by local governments and their private partners over the long haul. Policy recommendations can be found in the Implementation and Funding Chapter of this report.





Direction 5: Technology is an Increasing Share of the Answer

The superior ability of “smart” cities to be competitive in the upcoming decades is well-documented, and transportation is at the forefront of those decisions. Better signal progression integrated with routing logistics can improve both emergency response and transit - even freight - movements. Automated vehicle technology will further expand the utility of smart transportation infrastructure, extending into local delivery services, parking, and ridesharing across modes of travel.



Direction 6: Detailed Planning

None of the other recommendations - or even the long-range transportation plan in its entirety - creates a single-point solution for all the issues and challenges facing the dynamic CHATS planning area. Additional studies focusing on detailed corridor design, small area studies, and more frequent updates of land use and transportation plans will be necessary to keep pace with growth, and to provide citizens repeated opportunities to engage with professional staff and decision-makers about how best to meet those challenges.



Direction 7: Capacity = Capital

Ultimately, new roadway and transit capacity; bicycle and pedestrian infrastructure; expanded transit service and premium technologies; and designing new plans and programs all require an infusion of money. The LRTP identifies both costs and traditional revenue sources accessible to planners of today, but the size of the current, much less future, traffic concerns will necessitate the continued development of bond, tax, corporate contributions, and other financing sources to plan, design, build, and maintain/operate new services and expanded infrastructure.



Direction 8: Freight Mobility

Incorporating freight considerations into the periodic long-range transportation plan is important in a region that is a primary freight gateway, an activity that generates billions of dollars in economic benefits, thousands of jobs – and a lot of truck traffic. Every long-range transportation plan should have a project priority factor for freight from this plan onward. Additionally, reinvigorating the freight planning group and making it into a formal advisory committee with voting membership on the CHATS study (technical) and policy committees in lieu of the current practice of having a state port representative on the former and SC Trucking Association representative on the latter is preferred. Technology will play an increasingly important role for freight going forward, but it is a moving target that needs more frequent attention than plan updates afford.



Direction 9: Protecting Community Integrity

The CHATS planning area began as a place with great accessibility (initially by water and later by road and air), beautiful natural surroundings, and an attention to public design that has made it one of the most enviable places to live, work, and visit in the country. Protecting and building on that legacy now includes addressing threats posed by climate change, too-quick design values, and a tide of growth that is capable of drowning much that is good in the region. Transportation policies and decisions need to: contemplate these resources; support appropriate pace, quantity, and styles of development; and be driven by the community and its values. Increasing engagement with segments of the public and strengthening development and preservation policies are perhaps the most critical actions to ensure that a transportation system can be successful in meeting mobility, economic, and community goals.

environmental screening

The LRTP process is an integrated approach of planning for mobility to ease current and future transportation issues. During the process an array of factors are considered to ensure feasible recommendations. Often times the most feasible projects may impact the natural and social environments. An environmental screening early in the process help decipher impacts and the severity. Some projects may be eliminated during the process due to the substantial impacts that are anticipated. Others will continue through the process and mitigation measures can be developed to minimize the impacts.

The CHATS study area has a large amount of water features including lakes, rivers and wetlands. Easing congestion issues by constructing new roadways is a difficult task within the area due to the large number of notable water features. Multi-modal projects such as greenways, sidewalks and on-road bicycle facilities can have less impact on the physical environment and attribute to better air quality for the area. When a project is needed and impacts can not be avoided, a mitigation plan should be deployed to rectify any and all impacts.

The project ranking (as described in Chapter 6) includes criteria for consideration of environmental features. This preliminary exercise identifies major environmental impacts that may reduce a project's feasibility. Detailed environmental assessments will be completed in the future as the projects develop. All assessments and strategies should be coordinated with appropriate agencies over the resource(s) studied.

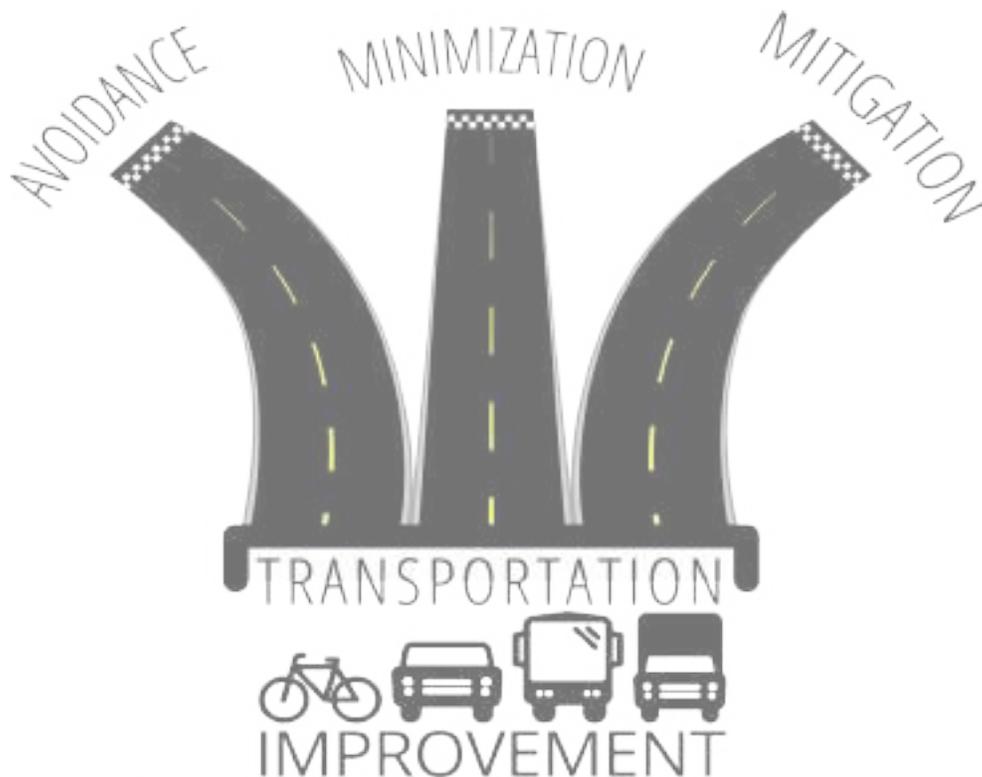


Environmental Features

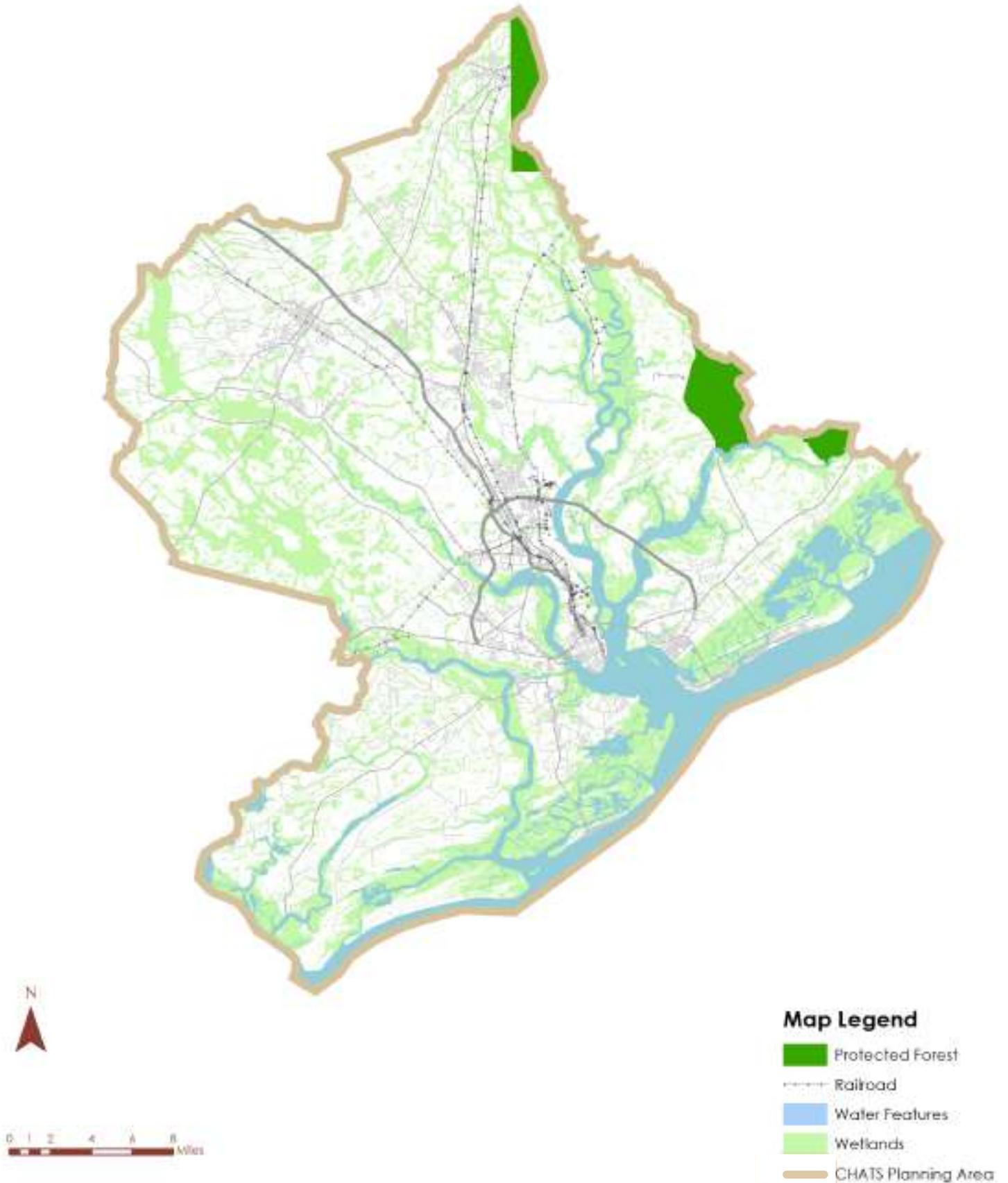
As the CHATS area continues to grow and develop, pressures not only on vulnerable communities, but also on sensitive environmental areas, are likely to increase. One inevitable consequence of the development of new infrastructure is the disturbance of natural environmental systems. In order to preserve the natural heritage of the area, and indeed the region as a whole, careful consideration of impacts to natural features should be considered throughout the planning process.

Natural amenities, such as clean water, clean air, and open spaces, are not only fundamental to a high quality-of-life, but must also be maintained to satisfy State and Federal regulations. The CHATS area has a large number of important natural water features which provide sources of drinking water, habitat for wildlife, and play an important role in the hydrologic cycle. Notable water features include Santee River, Lake Marion, Lake Moultrie and Edisto River among others. While lakes, creeks, and streams represent important natural constraints to development, these features are, in many cases, surrounded by wetland, riverine, and scrub environments, which are also vitally important for maintaining water quality. These environments are also home to many protected species. Providing important water filtration, these areas are also home to unique biotic communities and reduce the threat of flooding during storm events. Special care must be taken in developing around these features. Map 2-11 indicates the location of notable water features for the area.

Community facilities such as churches, park and recreational areas and schools are considered during an environmental analysis. These features build the social environment that are utilized by populations in and near the areas being studied. A large impact on the social environment could significantly impact residents and visitors to the area. Major impacts to the social environment could reduce the feasibility for a project. Map 2-12 identifies community facilities in the area.

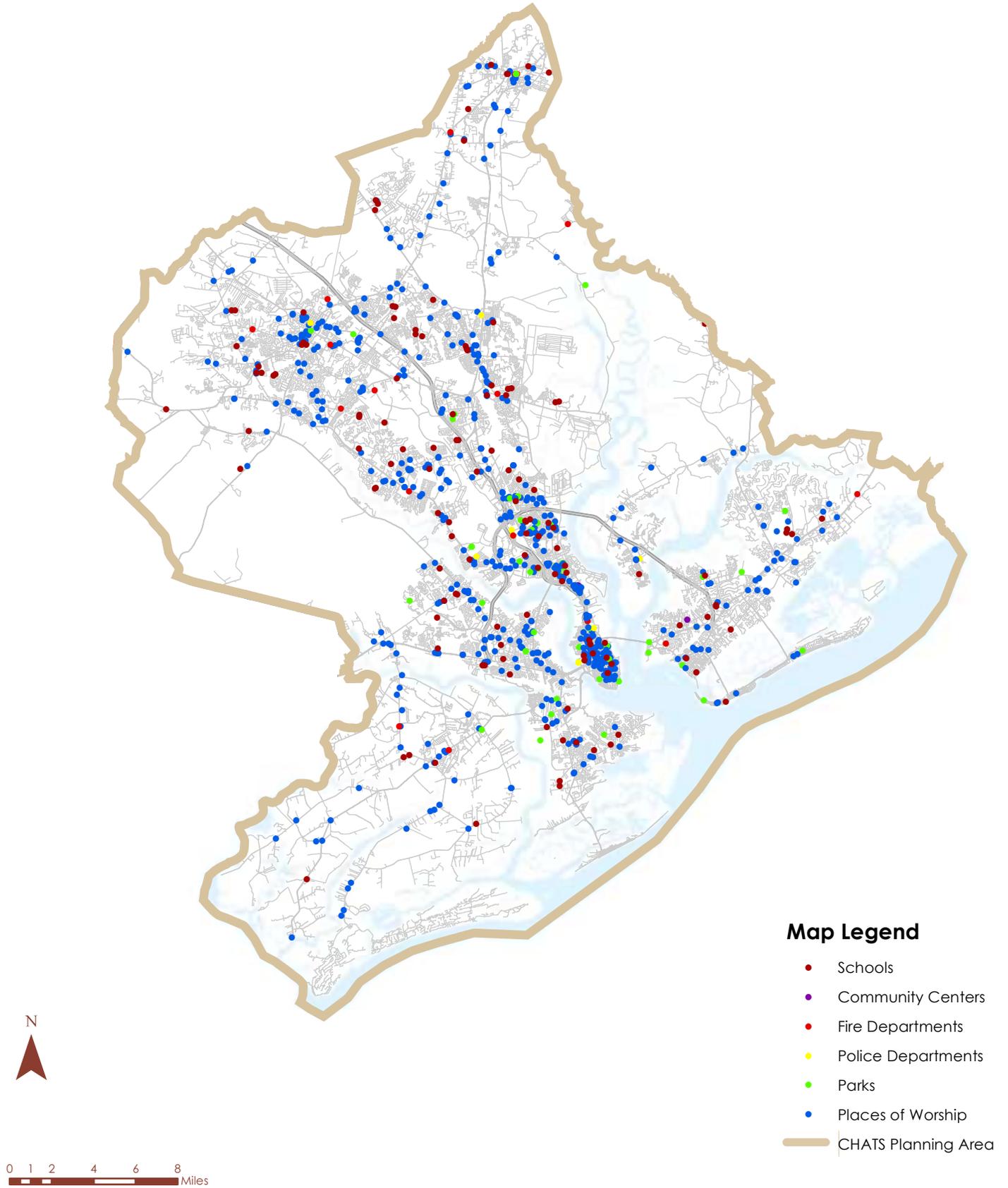


Map 2-11: Natural Features



This map indicates the location of protected forests, wetlands, and water features. Environmental impacts of transportation projects should take the location of these features into account.

Map 2-12: Community Facilities



This map indicates the location of important cultural resources such as churches, schools, and parks.

Environmental Justice

The term “Environmental Justice” (EJ) refers to the concept that minorities and low-income populations should not suffer unduly as a result of programs, policies, and activities of any Federal agency. It is a concept that began as a movement by African American communities fighting back against local and state government approved plans to allow toxic materials to be stored or dumped near their homes. As a Federal mandate, evaluating environmental justice is an important component of any transportation plan. The Federal Highway Administration (FHWA) identifies three important guiding principles of environmental justice, which shape the treatment of minority and low-income communities in the transportation planning process. These are:

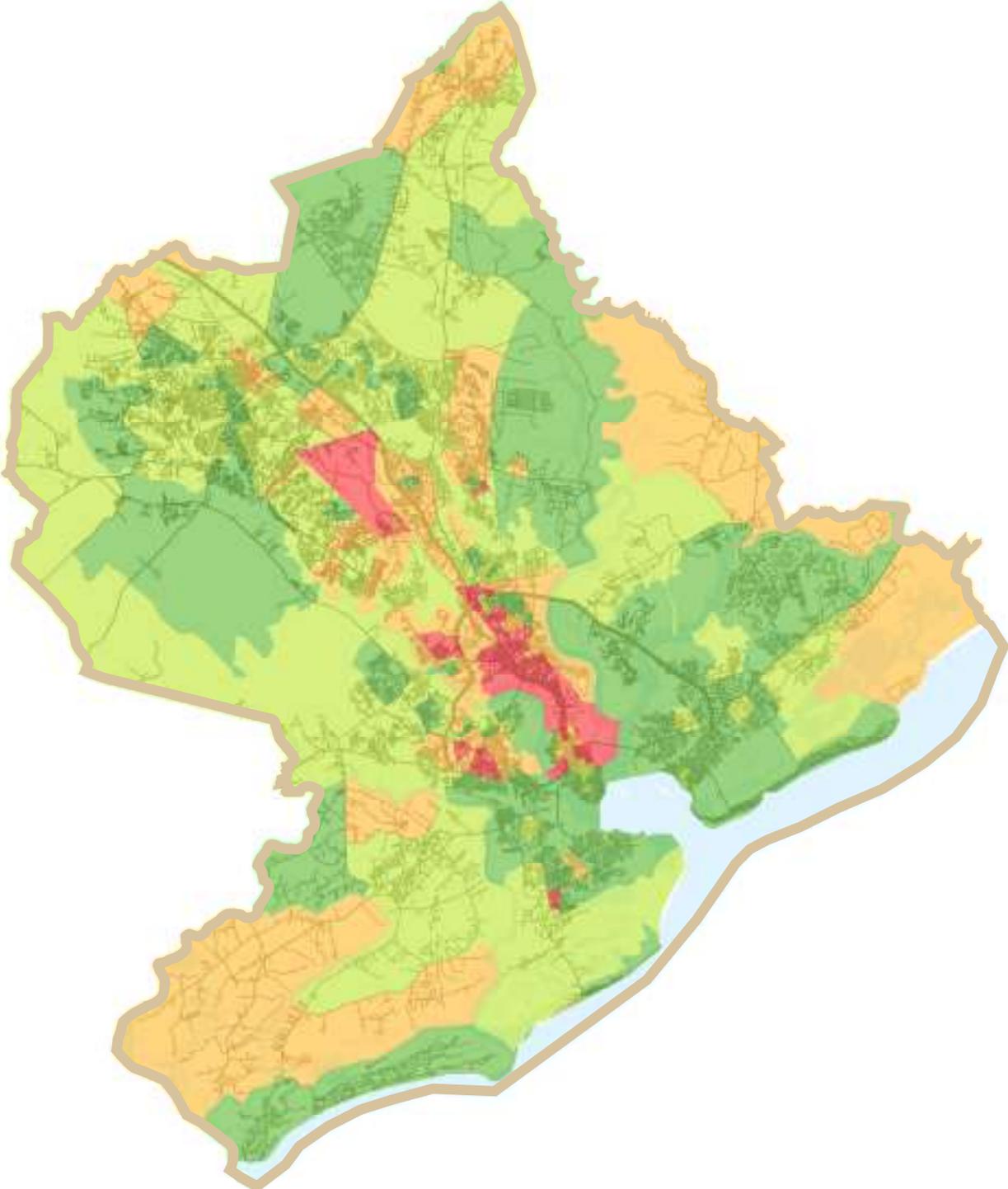
- to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations,
- to ensure the full and fair participation by all potentially affected communities in the transportation decision making process, and
- to prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

As part of the update to this 2040 Long-Range Transportation Plan, 2014 American Community Survey Five-Year Estimates data was used to identify the location and geographical distribution of significant EJ populations, which are commonly identified as either low-income, minority, or predominantly Hispanic. Maps 2-13 and 2-14 present the distribution of minority populations and low-income populations, respectively, within the CHATS planning area. As mentioned, areas with substantial portions of the population living below the poverty line are also likely to represent areas with large minority communities. As these communities are particularly vulnerable to the negative effects of transportation projects, care must be taken in planning transportation projects in these areas.

An understanding of the location of disadvantaged and/or minority populations as well as environmentally sensitive areas is critical to planning transportation projects in a way that avoids or minimizes impacts to the most vulnerable people and ecologies. The collection of this data early in the development of new infrastructure projects will support good decision-making during this process. CHATS is committed to minimizing and mitigating negative effects of transportation projects.



Map 2-13: Minority Population Concentrations



Map Legend

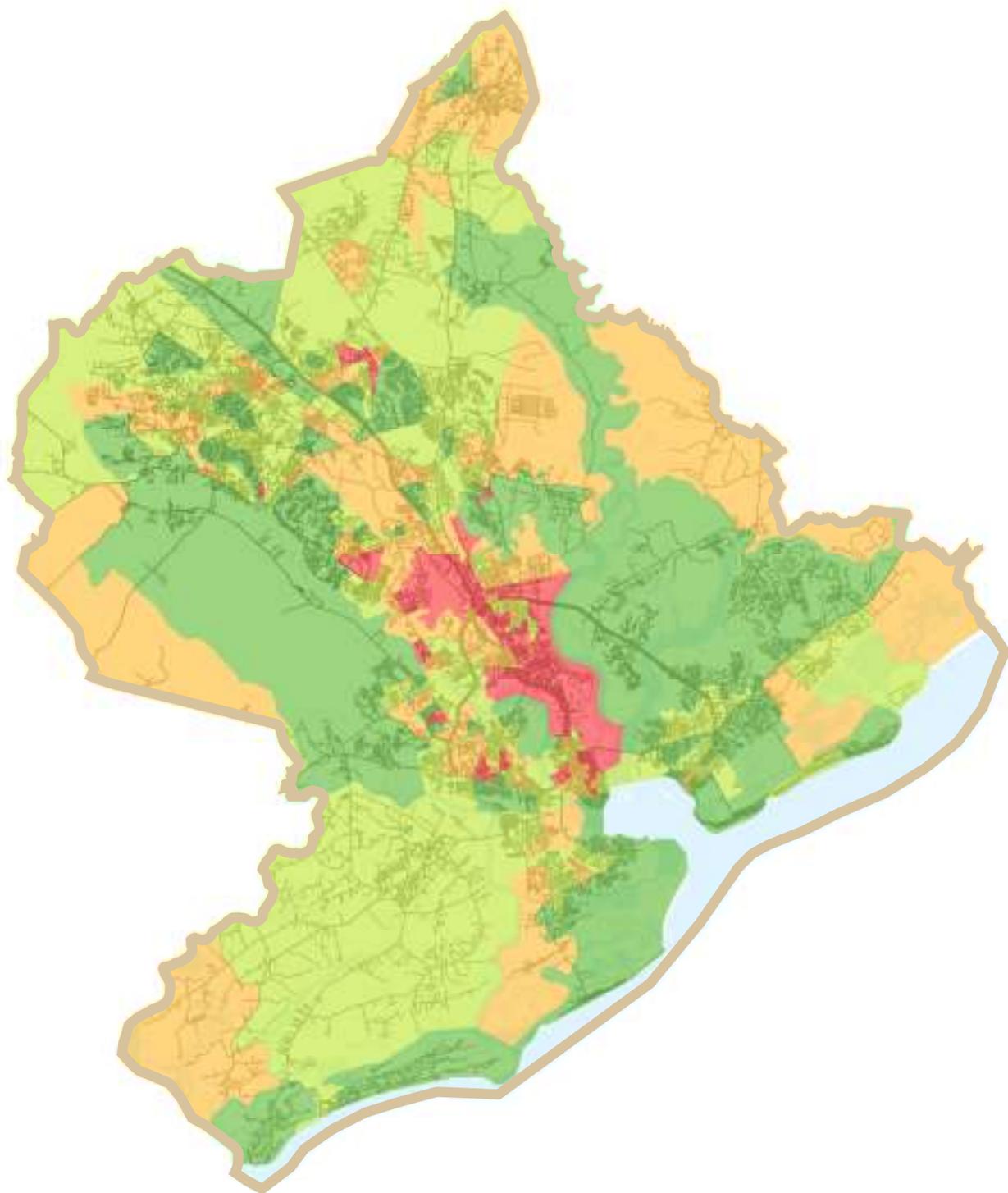
- Lower Minority Population
- 2
- 3
- Higher Minority Population
- CHATS Planning Area



0 1 2 4 6 8 Miles

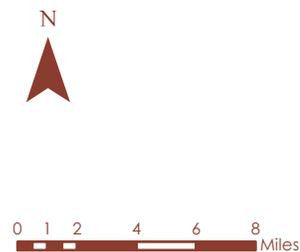
This map indicates the areas where minority populations are most concentrated.

Map 2-14: Low-Income Populations



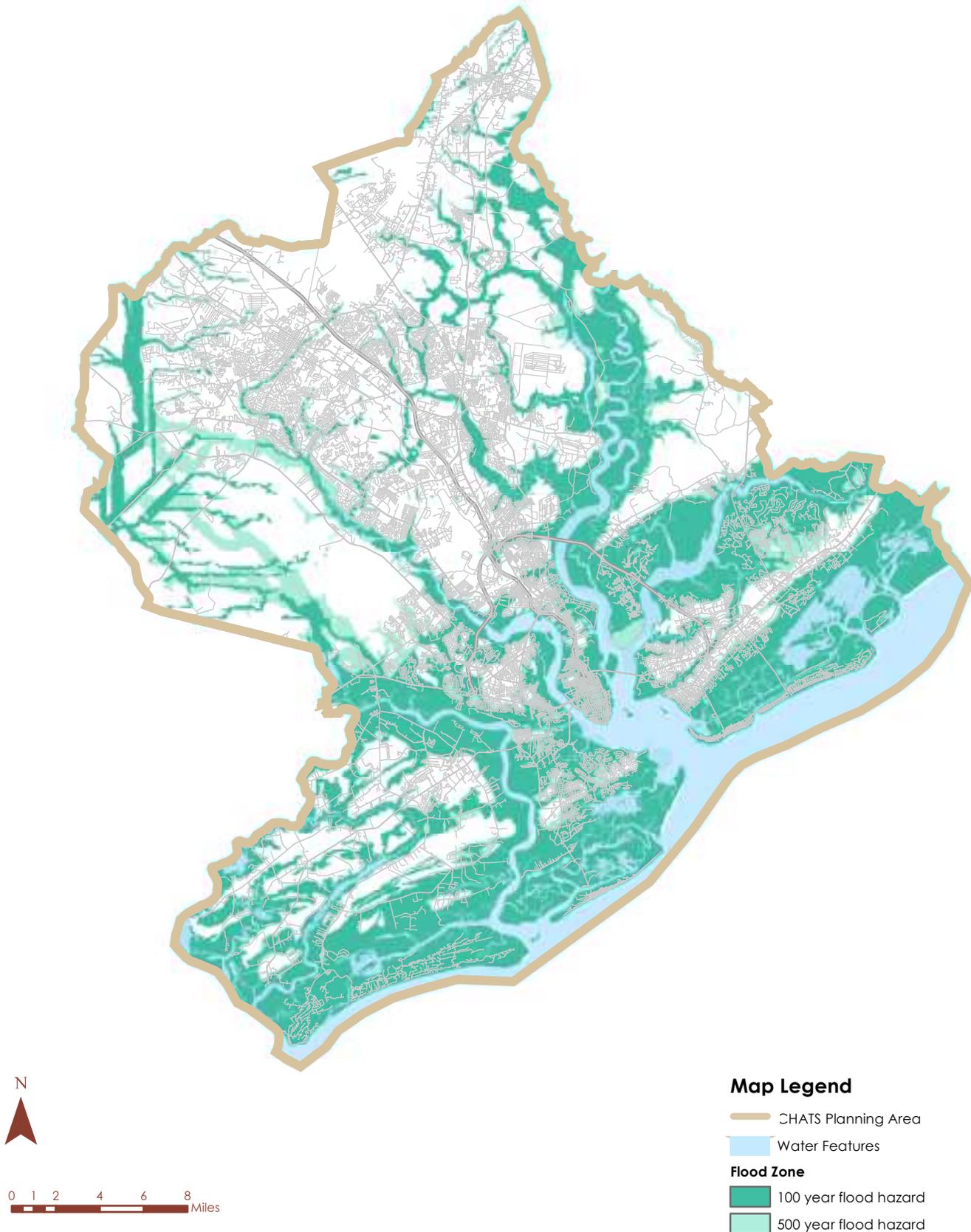
Map Legend

- Fewer Low-Income Household
- 2
- 3
- More Low-Income Household
- CHATS Planning Area



This map indicates the areas where there are higher densities of low-income populations. The spatial patterns of this group closely follow that of minority populations.

Map 2-15: Flood Zones



This map displays areas where flooding may be most prevalent, and may create greater limitations for development and infrastructure provision.

Planning Integration

It is important to have guidelines in determining the feasibility of new infrastructure projects, and to also help decision-makers in understanding the constraints to development. The following are a few guidelines that can be deployed during the planning process to minimize impacts:

- Avoid steep slopes and other unsuitable geography
- Minimize impacts to wetlands, floodplains, and riverine and scrub environments
- Avoid stream crossings and, if unavoidable, prioritize shorter crossing lengths
- Reduce impacts to schools, the built environment, cohesive neighborhoods, and historic sites and features
- Minimize impacts to threatened or endangered species
- Mitigate impacts to superfund/hazardous waste sites
- Minimize impacts to areas with high percentages of low-income or minority residents

- Avoid parks, designated open spaces, and game lands
- Promote connectivity by continuing stub out streets
- Encourage bicycle and pedestrian transportation by considering pedestrian, bicycle, and transit in all roadway projects, where applicable

Project prioritization proposed in this report takes into account the environmental impact. Avoiding or minimizing impact to sensitive ecological areas are a part of the criteria used in project selection and prioritization. More information on this can be found in the Appendix.



Resiliency

The concept of resilient cities has achieved considerable attention worldwide and nationally. The 100 Resilient Cities organization defines urban resilience as: *"...the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience."* A transportation plan has an important part to play integrating these objectives into an interconnected framework of actions that includes policies, infrastructure, and programmatic efforts across a broad array of public and private institutions. The CHATS MPO communities also recognized the importance of resilience during the planning process, with a focus group dedicated to first responders and related resilience experts (August 7, 2017) emphasizing the need to provide redundant and alternative transportation services; interconnected roadways; and better communication between government jurisdictions as important considerations in the updated long-range transportation plan. The vulnerability of the area to flooding, storm surge, and earthquakes were cited as an important and ongoing concern, one that is exacerbated by a lack of transportation network redundancy in key locations (e.g., river crossings). Finally, an overall emphasis on better aligning private development with infrastructure capacity was noted in survey responses, public meetings, and focus groups / interviews.

In the CHATS long-range transportation plan, resilience was specifically incorporated in two areas: the policy guidebook as well as the actual scoring / ranking of candidate transportation projects. In the former case, stormwater management design, access management, and multi-modal design elements were described. Projects were scored on a number of factors, one of which was devoted to resiliency factors, such as impacts to evacuation route(s), street connectivity, proximity of emergency shelters, and other emergency service infrastructure like traffic control centers and hospitals. Projects that improved the reliability and / or capacity of infrastructure that provided access to one of these locations received a higher score. Individual cities within the CHATS planning area should be encouraged to participate in the 100 Resilient Cities and STAR Communities (with a focus on the sustainable aspects of resiliency) organizations. Additional information for 100 Resilient Cities (<http://100resilientcities.org/>) and STAR Communities (www.starcommunities.org/) is readily available – the CHATS MPO or BCDCOG could provide both guidance and financial support or other incentives to their member jurisdictions to succeed with these two programs.