2035 CHATS
Long Range Transportation Plan



BCDCOG

Berkeley-Charleston-Dorchester Council of Governments

CHATS Long Range Transportation Plan Chapters

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Background & History

The Berkeley Charleston Dorchester region in South Carolina is one of the most history-laden areas in the United States. From its settlement, to its role in the Revolutionary and Civil Wars, to the present day, it is a region with a rich past and a bright future.

The Early Days of Charles Town

The Colony of Carolina was given to eight Lords Proprietors by King Charles II of England in 1663. In 1666, Captain Robert Sanford explored and named the Ashley River, and took possession of Carolina. The first colonists set sail in 1669, reaching Carolina in 1670 and founding Charles Town (as the City of Charleston was then called) in honor of King Charles II. The original settlement was on Albemarle Point, across the Ashley River from its current site. The peninsula opposite the settlement was referred to as Oyster Point, and over time the colonists began to recognize the strategic importance of this location. Soon, settlers began to build houses there, and by 1679 the Proprietors selected Oyster Point as the location of the town, rather than the land chosen by the first settlers. As a result, Charles Town was moved to its current location on the peninsula.

From the beginning, the Proprietors had a vision of the town they hoped to build. The plan for the city was modeled after the "checkerboard" plan proposed in London after the fire of 1666. In this way, they hoped to avoid the narrow and winding streets of most European cities, and instead lay out the streets in "broad and … straight lines."[1] People granted lots in the town were required to build homes within two years. The town was bounded on the west by what is today Meeting Street, and on the north and the south by Beaufain and Water Streets, respectively. Land was set aside for a courthouse, a public wharf, a churchyard, and an artillery ground. East Bay Street, running north-south parallel to the Cooper River, was one of the first streets laid out, and parallel to it were Church Street and Meeting Street. Running east-west were Cooper Street (later renamed Broad Street), Dock Street (later Queen Street), and Tradd Street. A wide dirt path ran from south to north and out of town, connecting the plantations with the town. This path was first called the Broadway or Broad Path, and was renamed King Street much later.

In 1682, the Proprietors directed that counties be established to better organize the government. Three counties, each named for one of the proprietors, were established. Berkeley County, containing Charles Town, was in the center, bordered by Craven County to the north and Colleton County to the south. By 1690, Charles Town was the fifth-largest city in North America. Rice was found to grow well in Charles Town, and was fast becoming the crop of choice for exporters.

The following years were difficult ones for Charles Town, as the city weathered hurricanes, attacks during Queen Anne's War and the Yemassee Indian War, as well as invasions from pirates Blackbeard and Stede Bonnet. The failure of the Lords Proprietors to protect colonists from threats prompted the colonists to petition the King to take over the colony, and in 1721 South Carolina became a royal colony.

In the 1730s, a restriction on trade that had previously allowed the Carolinas to export only to Great Britain was removed. In the following years, Charles Town prospered with increased exportation of rice. Slaves from West Africa were imported to fuel the growing rice plantations. Tar, pitch, turpentine, leather, deerskins, corn, peas, beef, and pork were also popular trade commodities. The town grew beyond its original eighty acres and many new buildings were constructed. By 1739, eight wharves extended from Bay Street into the Cooper River, serving 500 ships annually.

The growing town, along with an increase in traffic to serve the docks, resulted in the need to build new roads and extend existing ones. By the end of the decade, the city had thirty-three streets keeping with the original criss-cross pattern.

[1] Fraser, Walter J. Charleston! Charleston! Columbia, SC: University of South Carolina Press, 1989. Page 7.

Since its early days, Charleston has been ahead of its time in urban planning. When the construction of an Exchange was planned in 1767 to house trade, it was sited "to harmoniously relate spaces and uses."[2] As the city grew, expenditures were planned for roads, bridges, and filling in of low-lying areas. The city also began to spread out in the 1760s and 1770s as private developers planned suburbs around the city.

The City of Charleston

During the American Revolution, Charles Town endured capture by the British army in May 1780. The town was returned to Carolinian control October 1782, and in 1783, the name was changed and it was incorporated as the City of Charleston.

In the early 1800s, the expansion of rice and cotton-growing fueled a boom in Charleston. The first industry, a cotton mill, opened in Charleston in 1789. The City built the first bridge over the Ashley River in 1808. The War of 1812 led to a boom in the shipbuilding business. Following the war, trade in rice and cotton once again boomed.

In 1819, cotton prices fell due to overproduction, and by 1830, Charleston had fallen on harder times as other port cities took over, new market towns emerged, and the advent of the steamboat meant that planters no longer had to bring their cotton to Charleston by wagon. The steam locomotive was seen as a solution to the City's economic problems, by helping to connect Charleston to inland markets. The *Best Friend*, put into service on December 25, 1830, was the first steam locomotive to be used in a business venture in the United States. However, leading Charlestonians refused to let the rails go through the town to the wharves, and the railroad did not produce the expected economic boom. However, several other railroad lines were built in the 1830s and 1840s, and increasingly, Charleston's imports and exports traveled by rail instead of by sea, contributing to somewhat of a decline of the port. Public transportation made its debut in Charleston in 1861, with the formation of the Charleston City Railway, which operated a horse-drawn car line in the City.

The first shots of the Civil War were fired by Confederate forces on Fort Sumter, in the Charleston harbor on April 12, 1861. The Civil War raged for the next four years, with Charleston enduring bombardment and fire. When General Lee surrendered in 1865, there was much rebuilding to be done in Charleston. Steamship service to New York resumed, and railroads were repaired to open up the lines of trade once again. In 1878, federal money was appropriated for the modernization of the harbor, including dredging and the construction of jetties.

Improvements were also made to the streets starting in the 1870s. As of that time, Charleston had 53.5 miles of streets, of which about one-third were paved with a variety of materials, including wood and shells. When Mayor Courtenay took office in 1879, he began a program to improve the streets by paving them in blocks of granite. The South Carolina Rail Road was reorganized in 1881 and became the South Carolina Railway Company. The railroad was at long last extended to the docks, and a waterfront terminal was built.

Electric streetcar service was introduced in Charleston in 1897 and was run by the Charleston Consolidated Railway Gas & Electric Company. In 1899, the first gasoline-powered automobile made its appearance in Charleston. Shipped from Boston, it was taken for a few trips along the Battery before the police banned it as a public nuisance. In 1903, Mayor Rhett established the Board of Public Works to establish a systematic approach to planning and maintenance. This organization was abolished in 1912 by Mayor Grace, who appointed his own Committee on the Streets. In 1913, a state law permitted the city to assess property owners half the cost of street improvements that abutted their property. As a result, vast improvements were made in paving, sidewalks, curbs, and drains. Asphalt was used to pave the major thoroughfares, which improved driving conditions for automobiles, which were appearing in greater numbers.

[2] Fraser, Walter J. Charleston! Charleston! Columbia, SC: University of South Carolina Press, 1989. Page 119.

When World War I broke out, Charleston became the headquarters of the Sixth Military District, resulting in an economic boom for the city. Civilians worked at the Navy Yard, in the clothing factory, and on construction projects including the Army Port Terminal. The prosperous city reached a population of almost 100,000 by 1920, at which time there were 3,462 automobiles registered in Charleston.

A statewide initiative to pave farm-to-market roads began in the 1920s, resulting in a vast expansion of the secondary highway system in South Carolina. Complementing the statewide program, Thomas Stoney, who was elected mayor in 1923, continued the street-paving program begun in the City by Mayor Grace, paving more than 35 miles of road with asphalt. The Ashley River Bridge was also completed under his administration in 1926. The Cooper River Bridge, at 2.7 miles the fifth-longest in the world at the time, was completed in 1929. To pay for the $6 million cost of construction, a toll of 50 cents was charged, which lasted until 1946. The bridge was later renamed the Grace Memorial Bridge, for its champion supporter, John P. Grace. During the same week in 1929 that the Cooper River Bridge opened, the original privately-owned Charleston Airport was also officially opened.

In 1931, the Preservation Society and Mayor Stoney pushed a measure that set aside 23 blocks of the downtown area as "Old and Historic Charleston." This zoning ordinance became a model for historic districts across the country. In 1938, the use of streetcars was discontinued in Charleston. The streetcars became viewed as obsolete as buses became more popular.

The economy lagged, however, until the onset of World War II, which brought much-needed money into Charleston. The Navy enlarged its facilities, and the first Ports Authority in the nation was established to examine port commerce. In 1941, the state Highway Department took over responsibility for maintaining major arterials in the city, and funding continued to be provided by the federal government for paving projects. In 1942, the Charleston Municipal Airport was given to the U.S. Army and became Charleston Army Base, though commercial flying continued to operate. The population of the area boomed during the war, reaching 225,000 by 1944.

In 1960, Charleston was finally linked to the west by a major corridor when I-26 opened as part of the Interstate Highway system. The flow of traffic in the area was further improved by the opening of a new bridge over the Ashley River in 1961 and a second Cooper River Bridge in 1966. The State Ports Authority also continued to expand and improve the Port of Charleston, and in 1962 a lighthouse, the most powerful in the Western hemisphere at the time, was completed on Sullivan's Island.

The Charleston Naval Base on the north side of town expanded throughout the 1960s due to the influence of Congressman Mendel Rivers. The area attracted associated industries, and grew into a military-industrial complex that spurred the local economy. The growth of the Naval Base and the Port resulted in significant growth in the region through the 1960s. In 1972, the city of North Charleston was incorporated. Port activity increased and by 1971, Charleston became the top container ship port on the east coast.

The 1970s also saw a boom in tourism in Charleston. The forts had been refurbished, and old homes were being restored by the Historic Charleston Foundation. The Foundation also worked to restore and beautify commercial areas. By the mid-1970s, the city had 162 miles of streets, 160 of which were paved. The oceanside areas thrived, including Sullivan's Island, the Isle of Palms, Seabrook Island, and Kiawah Island. The Town of Mount Pleasant doubled in population in the 1970s and again in the 1980s, and Dorchester County nearly doubled in population in the 1970s also. In 1979, the Charleston Municipal Airport was placed under control of the newly-formed Charleston County Aviation Authority, and continued to operate under joint use by the U.S. Air Force.

Transportation in the Charleston region continued to improve in the 1980s and 1990s. Several new regional roadways, including I-526, the James Island Connector, and the Isle of Palms Connector, opened during this period. In addition, the Charleston Visitor Reception and Transportation Center, housed in a restored 1856 railroad freight station on Meeting Street, opened its doors in 1991.

The bus system was operated by the South Carolina Electric & Gas Company until 1995, when it was taken over by the City of Charleston. The Charleston Area Regional Transportation Authority (CARTA) was formed to run the transit system, and took over operations in 1999. Services provided by CARTA are integral to regional transportation system and will only expand the mobility and productivity of the region.

In 2005, the Arthur J. Ravenel Bridge, replacing the two bridges spanning the Cooper River (Grace and Pearman Bridges), was opened to traffic. The diamond-tower design have been named the John P. Grace Tower and the Silas N. Pearman Tower to remember the men and the bridges that served Charleston, which now serve as an iconic symbol representing the region. For years, there had been a need to replace the Cooper River Bridges, but this effort would not have been possible without partnerships to design and build the new bridge and especially the fund innovative partnerships to fund the project. This spirit of collaboration will allow our region to flourish into the next century, setting the standard for the delivering a vision and addressing the region's transportation needs.

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Introduction & Vision

Why Update the Long Range Transportation Plan?

The Charleston Area Transportation Study Metropolitan Planning Organization's (CHATS MPO) current Long-Range Transportation Plan (LRTP) was last updated in 2005. Federal metropolitan planning guidance requires that long-range transportation plans be updated every five years. The 2035 LRTP for the CHATS MPO will incorporate "lessons learned" from past planning, while focusing on proactive strategies for the future. A successful LRTP update will complement both economic development initiatives and community investment without compromising quality of life. With this goal in mind, this study addresses federal and state planning requirements while building upon the community vision for the future transportation system, providing mobility options that enhance quality of life for all users. The vision, goals, and objectives of the 2035 LRTP were developed based on input shared at numerous public input meetings, online surveying, CHATS meetings, and through the work of a Study Team comprised of representatives from each jurisdiction within the CHATS Study Area. Finally, all necessary federal regulatory requirements and planning initiatives, in addition to state, and local transportation and land use plans have been considered in compiling this regional transportation vision, policy, and prioritization guidebook.

The LRTP seeks to address regional needs through continuous coordination with representatives of numerous stakeholders, including:

- CHATS MPO
- Cities of Charleston, Hanahan, North Charleston, Goose Creek, Isle of Palms, and Folly Beach
- Towns of Mount Pleasant, Moncks Corner, Sullivan's Island, Summerville, Lincolnville, James Island, Kiawah Island, Rockville, and Seabrook Island
- Berkeley, Dorchester, and Charleston Counties
- Various local, regional, state, and federal agencies, including the local transit authorities (CARTA and TriCounty Link), SCDOT, FTA, and FHWA

Since 1980, the BCD Region has experienced a population growth of more than 50 percent. The region has added new businesses, expanded shopping opportunities, and developed more venues to attract visitors — but not without cost. While these increases have provided a great benefit for the communities, they also have increased vehicular traffic and increased demand on the transit systems, adding to congestion, and creating new traffic pressure points throughout the region. As this rate of growth continues, accommodating additional travel demand will become increasingly important. The LRTP will identify methods to maintain the mobility and accessibility of goods and people while balancing the quality of life of its citizenry.

Federal Policies and Guidelines Applicable to the 2035 Long Range Transportation Plan

The 2035 LRTP is predominately regulated through Federal Legislation including the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Uses (SAFETEA-LU), which established the requirements for regional long range transportation plans and the Clean Air Act Amendments of 1990 (CAAA), which established minimum standards for attainment of clean air goals. These federal regulations necessitate a comprehensive assessment of all modes comprising the transportation system by addressing the mobility of both goods and people. SAFETEA-LU mandates eight planning factors that must be addressed when devising regional plans per Metropolitan Planning Organizations (MPO); thus, these factors provide the underlying framework for the 2035 LRTP and are as follows[1]:

1. Promote the economic vitality of the metropolitan or urbanized area by encouraging global competitiveness, productivity, and efficiency.
2. Enhance the safety of the transportation system for motorized and non-motorized users by incorporating measures to prevent reoccurring and non-reoccurring incidents.
3. Enhance the security of the transportation system for all users by integrating plans for emergency response, community resilience, and prevention of illegal criminal activity.
4. Increase the mobility and accessibility for people as well as freight.
5. Protect and enhance the environment, promote conservation of energy, improve the quality of life, and ensure coordination among transportation improvements and state and local future land use plans.
6. Promote the integration and interconnectivity of the multimodal components of the transportation system for people and freight.
7. Promote efficiency in operation and management of the transportation system.
8. Emphasis on the preservation of the existing transportation system

The standards for attainment of National Ambient Air Quality Standards (NAAQS) per the Clean Air Act include provisions for emissions from motor vehicles. Despite emission standards for vehicles and point sources, attainment of air quality standards becomes

[1] Source: *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Uses (SAFETEA-LU)*; Title 23-Highways, §134(h). Federal Highway Administration (FHWA)

increasingly difficult as reliance on the automobile for travel persists. Without multimodal transportation options juxtaposed to smart growth and interconnected development patterns, air quality will continue to decline.

In June of 2009, the United States Departments of Transportation (DOT), Housing and Urban Development (HUD), and the Environmental Protection Agency (EPA) have formed the *Partnership for Sustainable Communities*[2]. Through this partnership, these agencies will strive to coordinate housing and transportation goals, address environmental concerns, and promote social equity. To accomplish these goals, a *Livability Initiative* was established, which provides the underlying framework to guide decisions for all communities. The Livability Initiative strives to promote economic vitality and the social well-being of all individuals by enabling and sustaining a multimodal or diversified transportation network that is safe, reliable, easily accessible, and integrated within existing and proposed land uses. This transportation system will contribute to economic, social, and environmental benefits for surrounding communities by providing additional transportation choices and increased accessibility to employment opportunities. The ultimate goal of this initiative is to incorporate multimodal transportation opportunities into existing communities while maintaining and enhancing existing cultural attributes. This initiative consists of six *Livability Principles,* which are as follows:

1. Provide more transportation choices to reduce household transportation costs as well as automobile and foreign oil dependency, improve air quality, decrease greenhouse gas emissions, and promote public health.
2. Promote equitable, affordable housing through increased accessibility to housing choices for all individuals that are energy-efficient and served by a multimodal transportation system to encourage mobility and reduce transportation costs.
3. Enhance economic competitiveness by improving workers' accessibility to jobs, educational facilities, and services, as well as businesses' accessibility to markets.
4. Support existing communities and preserve the rural landscape by allocating funding toward revitalization through transit-oriented and mixed-use developments as well as infill development.
5. Improve intergovernmental cooperation to improve transportation planning and investment practices.
6. Value and enhance the unique cultural attributes of all communities by promoting walkable and safe streetscapes.

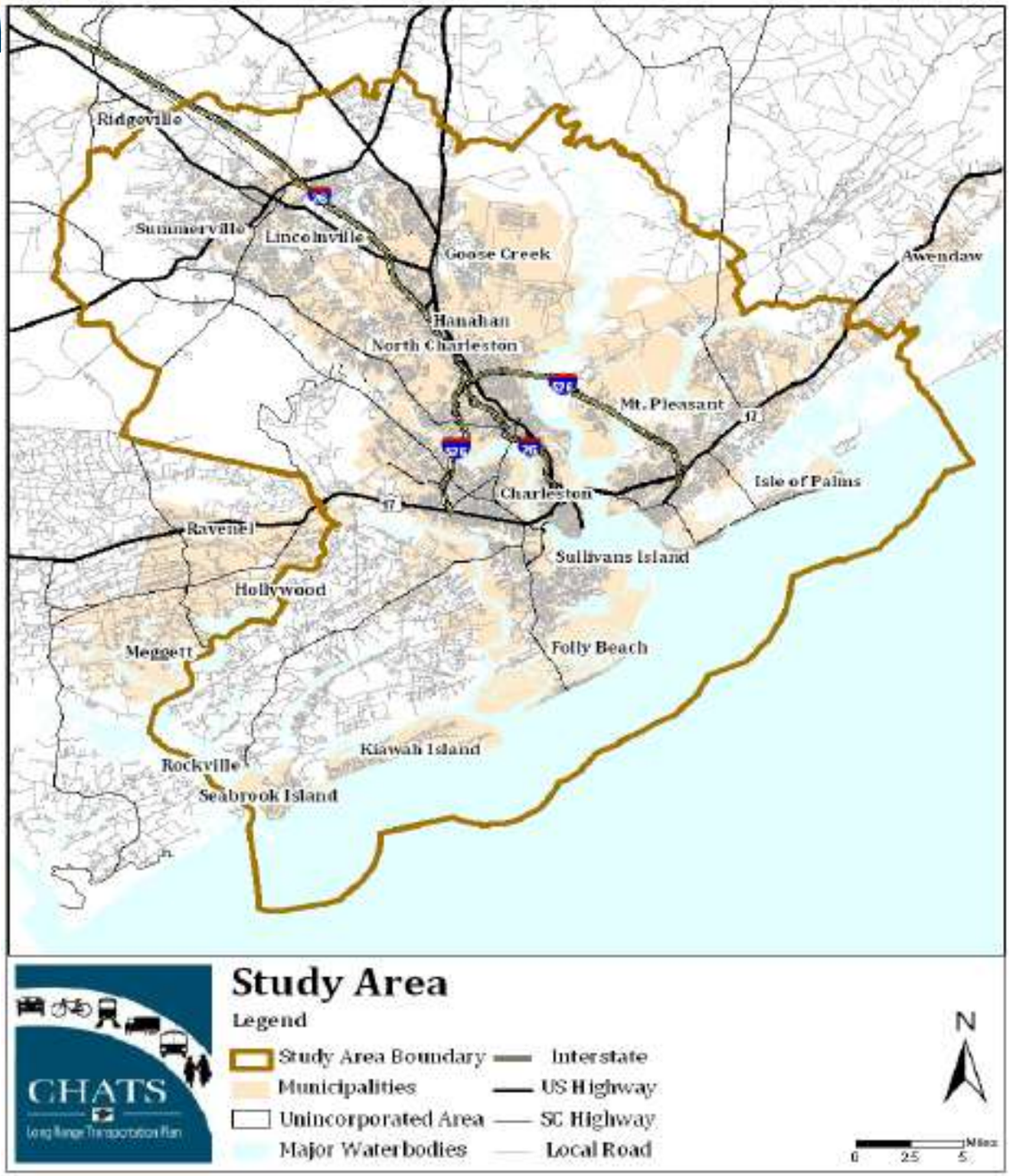
[2]*Leveraging the Partnership: DOT, HUD, and EPA Programs for Sustainable Communities*, April 2010, United States Department of Transportation (DOT), United States Department of Housing and Urban Development (HUD), the Environmental Protection Agency (EPA)

These Livability Principles provide the 2035 LRTP with the underlying framework for sustainable transportation planning. However, in order to incorporate these Livability Principles into the 2035 LRTP, a comprehensive cost-benefit analysis of all desired transportation improvements is essential. For instance, transportation planners should analyze the savings associated with a reduction in travel time through measures to ameliorate congestion, in fuel costs and vehicular maintenance associated with multimodal opportunities, in greenhouse gas emissions, as well as the potential decline in traffic accidents against the future costs associated with roadway expansion, sprawling development trends, and maintenance of this infrastructure. Cost-benefit analyses can provide insight into the expected return on investment (ROI) of proposed improvements. An analysis of the return on investment will indicate the expected value and, in turn, financial effectiveness associated with transportation improvements. For instance, a return on investment can be the expected tax revenues associated with a project, enhanced quality of life due to improved air quality, mobility, and/or accessibility associated with additional multimodal transportation opportunities, or strengthened economic vitality due to increased mobility and accessibility of individuals, services, and goods. Widely used performance measures to calculate the return on investment include: life-cycle costs and benefits, benefit/cost ratio, per capita vehicle miles of travel (VMT), volume/capacity analysis of roadways, and transit ridership. However, these measures are ineffective in assessing the benefits associated with multimodal transportation services; thus, innovative strategies to measure these benefits are necessary. For instance, accessibility to transit can be measured by the amount of individuals within a specified distance of a transit stop or the number of jobs that are accessible by a transit route. Moreover, the distribution of incomes within the aforementioned radius can reflect the equity of services. The per capita cost of each mile traveled by transit represents the affordability and financial efficiency of the service[3] and potential regional travel demand benefits.

Innovative Transportation Planning

The *CHATS Long-Range Transportation Plan* identifies specific and general transportation system improvement recommendations and strategies to accommodate future transportation demands while promoting safety and efficiency. This plan supports a multimodal transportation system that addresses the economic, social, and environmental needs of the BCD Region by assessing not only automobile accessibility, but also freight, bicyclist, pedestrian, and transit components of the system. The LRTP recognizes that integrated transportation and land use planning and interconnectivity of the transportation system are essential in enabling increased accessibility and mobility for BCD residents. Additionally, the LRTP coordinates with existing and proposed multimodal transportation efforts by incorporating such initiatives as: the *Bikeway and Pedestrian Master Plan* (adopted in 1995), the *Tri-County Greenway Plan* (adopted in 1997), *East Coast Greenway Master Plan* (adopted in 2007), and other various highway corridor plans. The success of this LRTP also depends greatly on its ability to *actually be implemented*. Simply put, this plan must be practical. With this in mind, the *CHATS Long-Range Transportation Plan* includes discussion on strategies, methods, and sources of funding for implementation.

[3] *Transportation Planning Performance Measures-Final Report*: *SPR 357*, October 2005, Lane Council of Governments, Oregon Department of Transportation (ODOT), Federal Highway Administration (FHWA)



represents the anticipated twenty year horizon for urban growth for the CHATS area. This also is an area in which CHATS MPO can reasonably expect to be able to affect in the future. The study area is shown in **Figure 2.1**.

Census and Demographics

The Berkeley-Charleston-Dorchester region is a growing area. Total population has increased more than 50% from 1980 to 2009, and is expected to expand at a rate of nearly 25% from 2010 to 2035. While this rate of growth can result in numerous opportunities for a region, it also can create challenges such as increased traffic congestion, pollution, and loss of open space.

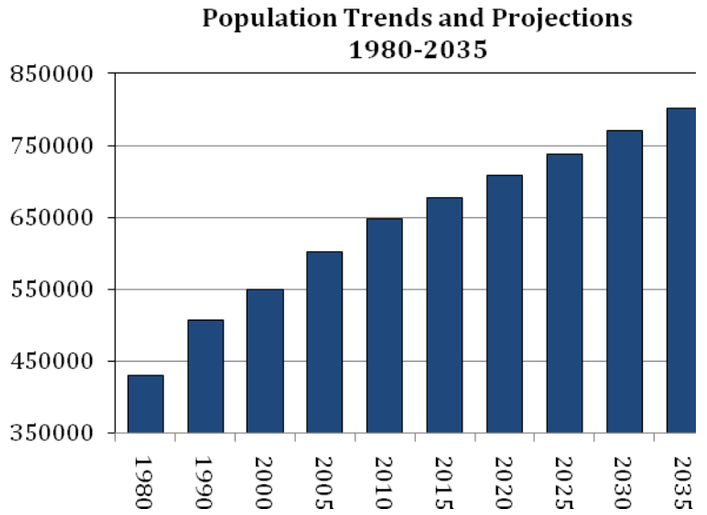


Figure 2.2

Source: South Carolina Office of Research and Statistics; Health and Demographics Division

Traveling Trends

Today, people drive more often, make longer trips, and own more vehicles than ever before. According to national trends, in 1969, households made an average of 3.83 trips per day, in

1995 that number rose to 6.36 trips per day, an increase of 2 ½ trips per household or 66%[4]. This is despite the fact that the national average household size has decreased from 3.16 to 2.63 persons since 1969. In 2003, the average daily household vehicle trips for the BCD Region were 7.62 trips and the average household size was 2.53 persons[5]. 21% of trips generated in the BCD Region were from home to work, nearly 50% of trips generated were from home to non-work destinations, and nearly 30% of trips generated were to and from locations other than home.

As evidenced by **Figure 2.3**, average commute times in the Berkeley-Charleston-Dorchester region display only marginal fluctuations from 1990 to 2008. Slight decreases during this time period can be attributed to the construction of major freeway facilities as well as roadway expansions and improvements such as the construction of Ashley Phosphate Road and the Arthur Ravenel Jr. Bridge, which was funded through the 27 in 7 South Carolina Department of Transportation (SCDOT) bonding package. The 27 in 7 bonding package enabled SCDOT, in conjunction with regional planning organizations, to finance 27 years of roadway and bridge projects throughout South Carolina in a period of seven years from 1999 – 2006. Despite slight decreases in commute times for Charleston and Dorchester Counties, current commute times in the region remain comparable in length to those of Atlanta, GA (26.0 minutes in 1990, 31.2 minutes in 2000, 26.8 minutes in 2008) and Raleigh, NC (20.2 minutes in 1990, 24.9 minutes in 2000, 21.5 minutes in 2008). Long commute times increase pollution and decrease productivity resulting in a lost work time or personal time.

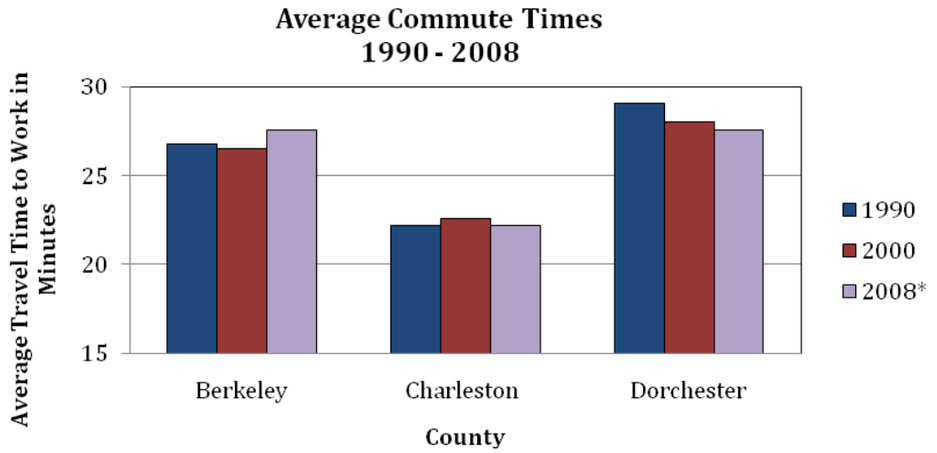


Figure 2.3

Source: U.S. Census Bureau, 2008 American Community Survey
*Data was derived from 2008 estimates per the American Community Survey

Between 1990 and 2008, the Berkeley-Charleston-Dorchester area experienced an increase of 25% in the number of individuals commuting to work as well as an increase of 41% in the number of individuals driving alone to work. The use of alternative modes, such as carpooling and transit, has experienced a decline during this same period. Similarly, the number of individuals commuting outside of their county of residence to employers has steadily increased. The percentage of individuals working from home increased slightly from 2000 to 2008; however, due to increases in the commuting labor force and those driving alone, this increase had little effect in reducing travel demand on roadways. Increases in the number of vehicles on roadways contribute to increased congestion and gas consumption as well as social costs, water quality degradation via runoff, and air quality degradation. **Figure 2.4** displays the percentages of various modes of travel used by the BCD labor force to commute to work. As evidenced by the graph, the BCD labor force is predominately dependent on the use of automobiles for travel to work. For instance, in 2008, over 90% of the individuals who commute to work travel via private automobile and less than five percent of the individuals that commute to work utilize alternative methods of transportation, such as: bicycle or pedestrian travel, transit, and other means. Historically, increasing travel demands on roadways was typically resolved through infrastructural improvements, including road widening, the construction of new interchanges, etc. However, predominant dependence on the automobile will continue if measures to enable and encourage a multimodal transportation system coordinated with land use planning are not implemented.

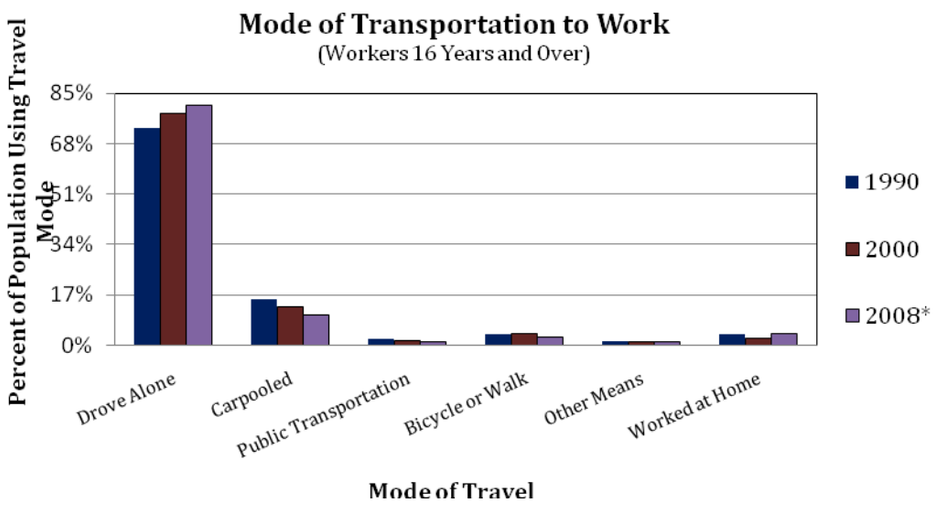


Figure 2.4

Source: U.S. Census Bureau, 2008 American Community Survey,
2006-2008 American Community Survey
*Data was derived from 2008 estimates per the American Community Survey

[4] Source: *1995 Nationwide Personal Transportation Survey*, Office of Policy Information, United States Department of Transportation (USDOT), Federal Highway Administration (FHWA)
[5] Source: 2003 *BCDCOG Household Travel Behavior Survey Report.* Kimley-Horn and Associates,Inc. and NuStats.

Figure 2.5 displays the increase in the commuting labor force from 1990 – 2008. Although an increasing commuting labor force is a function of an increasing population and the spatial distribution of employment opportunities, it is also an indication of travel demands and the multimodal transportation improvements necessary to efficiently serve the needs of the BCD labor force.

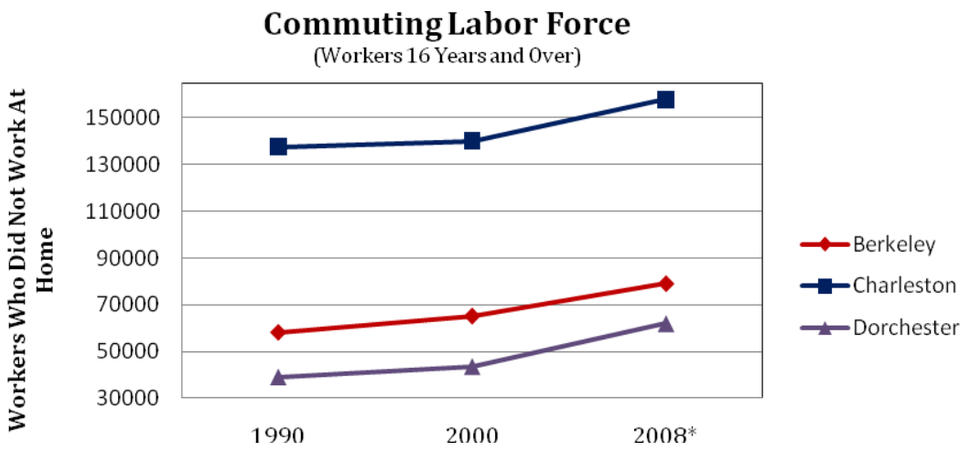


Figure 2.5

Source: U.S. Census Bureau, 2008 American Community Survey,
*Data was derived from 2008 estimates per the American Community Survey

Figure 2.6 displays the amount of BCD workers that are commuting from outside of their county of residence to the workplace. While Charleston County has maintained a steady increase in the amount of individuals commuting outside of their county of residence for work between 1990 – 2008, both Berkeley and Dorchester Counties endured significant increases in the amount of individuals commuting outside of their county of residence for work, particularly between 2000 – 2008. If these trends continue, increases in travel demand on roadways will contribute to increased congestion, further illustrating the challenges facing the region. . Many metropolitan areas have been able to reduce long travel times and congestion by making multiple travel options available to the public. A multimodal transportation system can effectively meet the transportation needs of a regional population by providing increased accessibility and mobility to residents through a variety of transportation options.

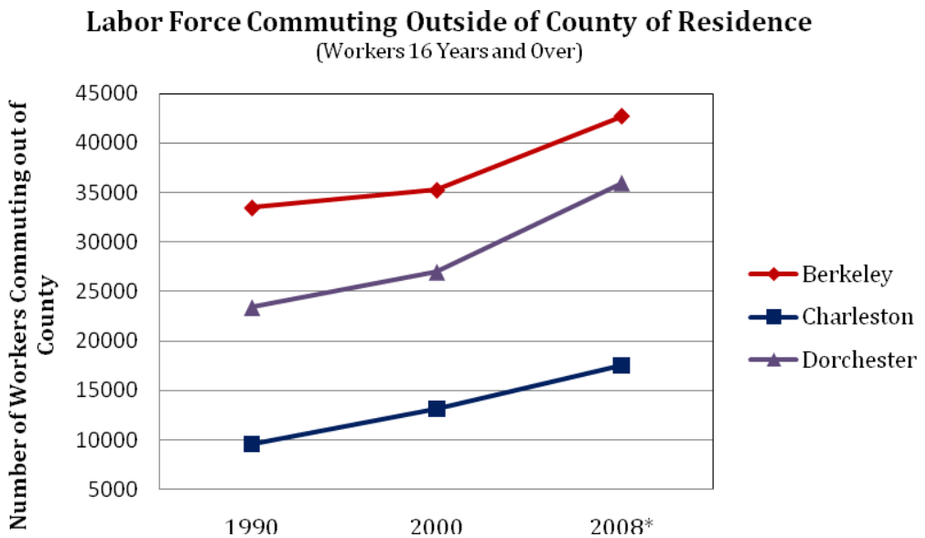


Figure 2.6

Source: U.S. Census Bureau, 2006-2008 American Community Survey
*Data was derived from 3-year estimates per the American Community Survey

Figure 2.7 displays the distribution of the BCD labor force for the year 2000. Nearly 50% of the labor force of both Berkeley and Dorchester Counties commute to Charleston County for work. In fact, according to 2000 statistics, nearly 70% of the BCD labor force is employed in Charleston County and nearly 30% of these workers commute from Berkeley or Dorchester Counties. With a large concentration of economic base and supportive industries located within the Charleston – North Charleston Metropolitan Statistical Area (MSA, such as those associated with tourism, educational and health services, aeronautics, professional, scientific, or managerial occupations, accommodation and food services, and the transport of goods, these employment trends will persist; thus, a comprehensive approach, including multimodal transportation opportunities is essential for continued economic vitality, global competitiveness, and resilience by ensuring an efficient means of travel for goods, services, and personnel.

Resilience in the transportation system is essential. Resilience is defined as responsiveness to abrupt changes such as accidents, natural disasters, global turmoil, increases in energy costs, and climate change. For instance, a multimodal transportation network provides a cost-effective means of transportation as petroleum costs become financially inefficient. Furthermore, a variety of modes and route options would enable mobility when disasters, extreme weather events, or accidents render some thoroughfares inaccessible.

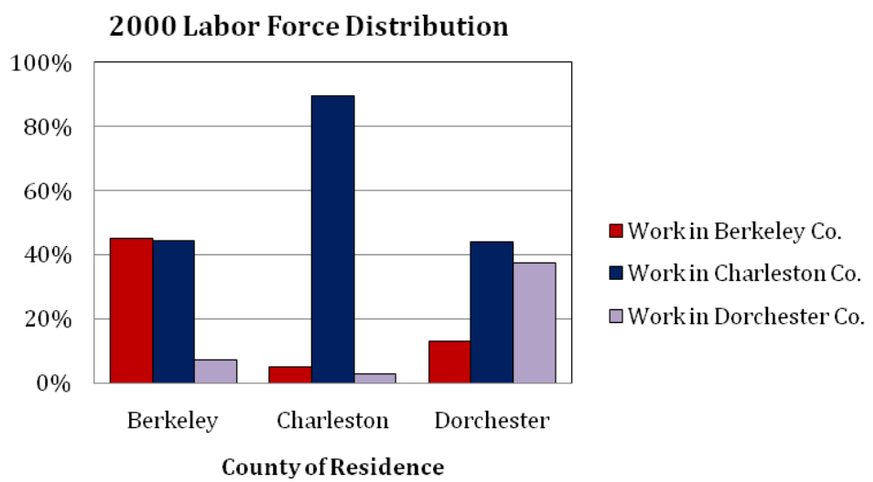


Figure 2.7

Source: South Carolina Office of Research and Statistics; Health and Demographics Division;
County Worker Flow

Public Involvement

Transportation planning has become a more inclusive process that builds on strong citizen involvement. Citizens are the very ones that face the daily challenges associated with travel. To ensure that the CHATS Long-Range Transportation Plan considered these important issues and kept the region's best interest in mind, a *LRTP Study Team*, comprised of representatives from each municipality and jurisdiction within the BCD Region, was consulted and involved early in the planning process to make policy recommendations and decisions representative of their citizens interests. In order to make sure that the community was adequately represented, citizens and planners from a broad range of backgrounds were invited to participate in the process.

The first task of the *LRTP Study Team* was to generate a list of regional characteristics that have attracted them to and kept them in the area. A reoccurring theme was an appreciation of coastal water features in the community. Other characteristics include the historical context, convenience, attractiveness, and overall atmosphere of the region. The committee members agreed that they wanted to retain each of these characteristics while promoting a plan that would protect the integrity of the transportation system.

The public involvement process was not limited to members of the *LRTP Study Team*. An online survey was conducted and community input meetings were held as a means to encourage public participation in the 2035 LRTP planning process. CHATS meetings and BCDCOG Board meetings are open to public comment as well. Enhanced multimodal transportation capability was a reoccurring theme amongst the public. Nearly 430 individuals responded to the online survey of twelve questions. Each question had an average response rate of 84%. The first question of the survey asked respondents how they would allocate $100 towards transportation improvements. The improvements that were allocated the most money indicate those that are most important to respondents. The subsequent table displays the average amount of money allocated to each improvement.

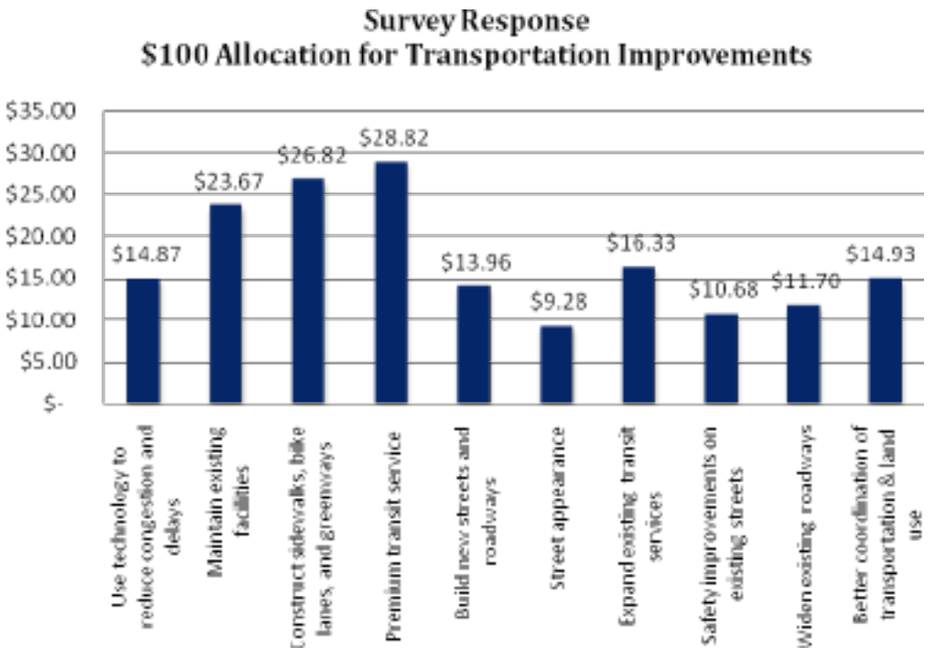


Figure 2.8

As indicated by **Figure 2.8**, it is most important to respondents that a premium transit service serve the BCD Region. The construction of sidewalks, maintenance of existing facilities, expansion of current transit services, and improved land use-transportation coordination were very important to respondents as well. Areas of lesser concern involve improved streetscapes, improved safety of existing roadways, and the widening of roadways. An additional survey question asked respondents to rate the quality of the various elements of the transportation system. 75% of respondents rated current on-road bicycle facilities, greenways, bike routes, and public bike racks as poor, 60% of respondents rated sidewalks, greenways, and pedestrian signals as poor, and 55% of respondents rated public transit as poor. Improvements in these facilities will provide additional multimodal transportation opportunities and, in turn, contribute to economic, social, and environmental benefits.

Seven community input meetings were held in various locations throughout the region from November December of 2009 to allow members of the community to express their transportation concerns and list priorities. After a brief presentation, workshop participants discussed transportation issues and projects. Frequently mentioned improvements included:

- Improve the transit network and services Improve deteriorating and aging roadway networks;
- Incorporate more bikeways, sidewalks, and greenways;
- Incorporate intermodal transportation capabilities with existing public transportation facilities along Dorchester Road;
- Enable public transit opportunities within Kiawah and Seabrook Islands;
- Improve accessibility to Kiawah and Seabrook Islands;
- Enhance the safety of existing bus shelters, incorporate additional park and ride facilities, and improve the lighting of these facilities;
- Enhance and incorporate freight and passenger rail opportunities to industrial sites
- Promote safe routes to school;
- Improve traffic flow along King and Meeting Streets;
- Add additional traffic calming measures to slow traffic and promote the safety of motorists, pedestrians, and bicyclists;
- Improve connectivity of the existing roadway network;
- Improve the streetscape through beautification and pedestrian capabilities;
- Incorporate passenger rail service from Summerville to Charleston;
- Incorporate light rail service on Johnnie Dodds and Coleman Boulevards, Savannah Highway, as well as the Airport and Coliseum;
- Incorporate a water taxi or ferry service to provide connectivity between Mount pleasant, the Charleston Peninsula, Daniel Island, and John's Island;
- Improve bicycle and pedestrian networks to ensure safety and encourage usage;
- Improve interchanges along I-26 and I-526 to reduce vehicular accidents;
- Improve accessibility from John's Island to Goose Creek, Hanahan, and the Summerville Area as well as to Mount Pleasant.;;
- Coordinate traffic lights along College Park Road to improve traffic flow;
- Improve signage and lighting on John's Island to enhance visibility;
- Improve John's Island roadways;
- Incorporate bikeways along Ashley Phosphate Road;
- Improve traffic congestion and delays in such areas as: the intersections of 526 and 17, Sam Rittenburg Boulevard and Ashley River Road, Main Road and 17 as well as along North Rhett Avenue; Maybank Highway, Highway 52 from the I-26 interchange to Highway 176, Glenn McConnell Parkway, Folly Road, US Highway 17, and Dorchester Road;
- Reduce air pollution and oil consumption;

- Revitalize existing corridors through infill development; and
- Discourage further disjointed and inefficient conventional suburban development trends

Vision and Objectives

In light of the key characteristics that retain the BCD Region as a special place, the community envisions a future region that provides accessibility and mobility for people and goods by developing and maintaining an adequate, safe, and balanced transportation system. During the development of the previous LRTP, an extensive process was created to identify explicit goals and policies related to transportation. This effort helped guide the overall development of the new LRTP and is referenced in the *CHATS 2005-2030 Transportation Plan*. This 2010 LRTP update attempts to balance both the vision and objectives expressed by community members *and* comments received at the public meetings. This effort has resulted in the following goals of the Study (in no particular order):

- **Develop a compatible plan** — consider future land use and adjacent jurisdiction plans;
- **Create a plan** — accommodate community growth and related travel demand increases;
- **Improve roadway safety;**
- **Recognize specific mobility needs** — consider regional tourism and economic development (business and industry);
- **Recognize access and limited mobility** — address disabled persons and other similar needs;
- **Create a system of interconnected streets** — improve mobility and distribute traffic efficiently based on purpose and function;
- **Provide for convenient, efficient connections** — connect various surface and air transportation modes and facilities;
- **Enhance the efficiency of the existing transportation system** — implement low cost improvements and incorporate innovative techniques (such as congestion management strategies);
- **Enhance the quality of life** — minimize adverse impacts and/or positively affect the natural and social environments;
- **Support "mixed-use" development** — encourage bicyclists and pedestrians by promoting context-sensitive roadway design;
- **Promote a pedestrian-friendly environment** — fill in gaps and improve interconnection within the sidewalk system;
- Support additional bike lanes and trails to parks and community activity centers;
- Evaluate the need for passenger/commuter rail service between regional activity centers;
- Create interconnected bicycle and pedestrian networks;
- **Provide and plan for future transit service expansions** — include park-and-ride facilities and readily available transit service information, and transit ready development patterns;
- **Protect and reserve rights-of-way** — encourage local jurisdictions within the BCD Region to plan for ROW needs as future development occurs; and
- **Build consensus and locate funding sources** — determine acceptable local sources and implement innovative techniques to supplement federal and state revenues

A Transportation Planning Guide

The vision of a safe, multi-modal, and interconnected transportation system for the BCD Region can become a reality. This plan is intended to serve as a tool and guide for the future success in the implementation of the Region's transportation system (2035 is the planning horizon for the transportation plan). The *CHATS Long-Range Transportation Plan* includes the following chapters:

1. Background and History
2. Introduction and Vision
3. Transportation System Operation and Maintenance
4. Planning for Growth - Future Conditions
5. Pedestrian and Bicycle Facilities
6. Transit Services
7. Freight Mobility
8. Safety
9. Security Planning
10. Environmental Screening
11. Financial Plan
12. Implementation Plan

Transportation System – Existing Conditions & System Operations

Introduction

The Berkeley-Charleston-Dorchester region is composed of numerous cities, towns, and crossroad communities, as well as unincorporated rural areas. Municipalities (cities and towns) within the CHATS MPO area include Charleston, North Charleston, Mount Pleasant, Goose Creek, Summerville, Hanahan, Moncks Corner, Isle of Palms, Folly Beach, Sullivan's Island, Seabrook Island, Kiawah Island, James Island, Lincolnville, and Rockville. Outside of the municipalities, the land use ranges from residential subdivisions to agricultural and forest lands.

The Charleston region offers many options to its residents in terms of residential locations and employment opportunities. From the historic downtown to the newer residential subdivisions, small rural communities, and beachfront towns, there are options for every lifestyle. Historic downtown Charleston, the natural amenities, and the beaches also make the region a popular tourist destination. However, the growth in employment, housing, and tourism has resulted in increased traffic congestion that continues to worsen in major corridors.

The purpose of evaluating today's transportation system is to understand what improvements are needed now and what improvements will be needed in the future. Community profile data described in this chapter include the following:

- Regional Access
- Principal Arterials
- Minor Arterials
- Transportation Corridors and Activity Centers
- Corridor Operations
- Traffic Safety and Crash History

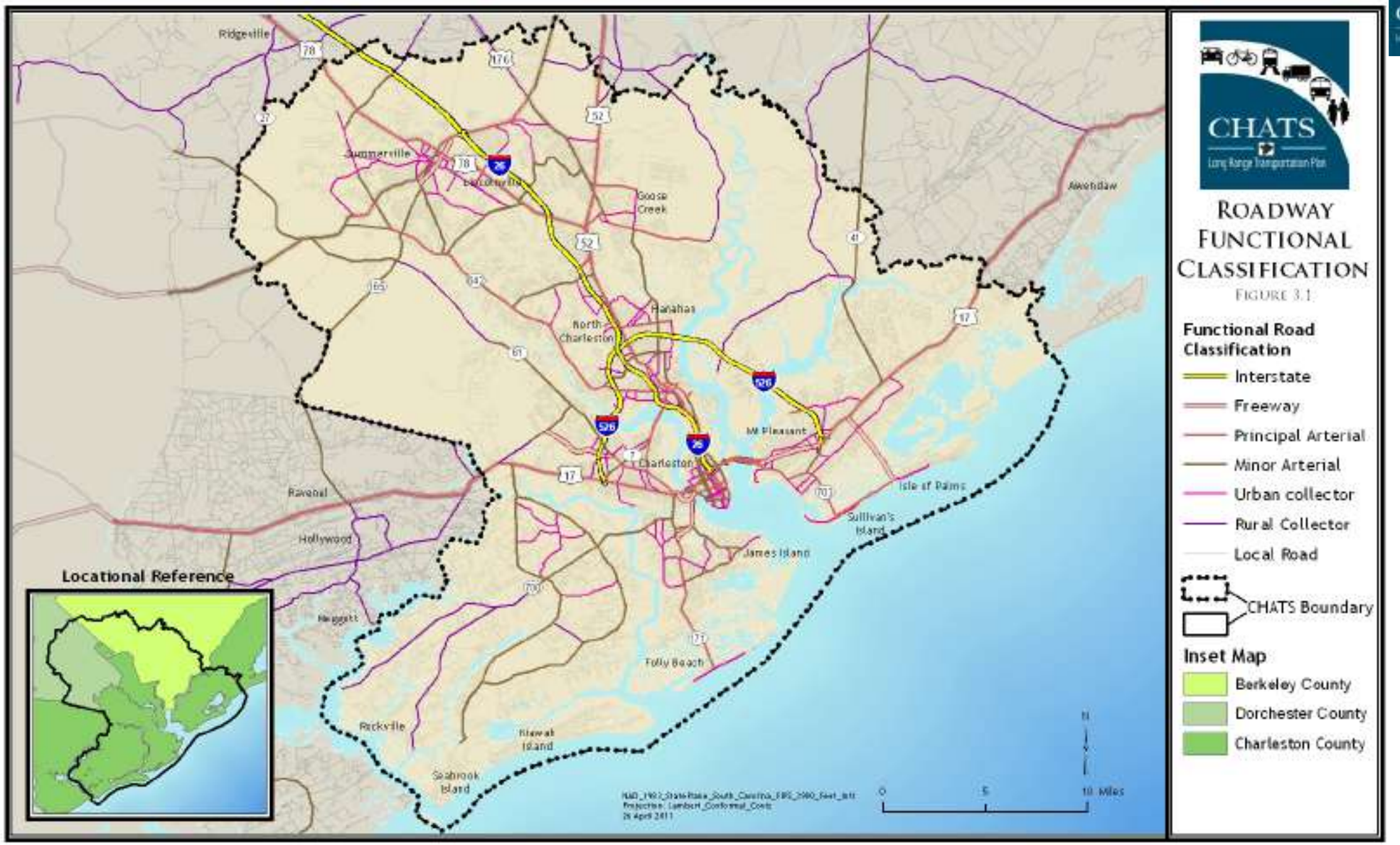
Regional Access

Regional access in the BCD region is provided by two important interstate highways and three major US Routes as shown in **Figure 3.1**. These are:

- I-26 and I-526
- US 17, US 52, and US 78

I-26 is the one of the major interstate corridors in South Carolina. With connections from Johnson City, TN, Asheville, NC, and Columbia, SC, the corridor runs northwest/southeast through the state, terminating in Charleston, SC. At the western edge of the study area, I-26 is a four-lane rural freeway. At the exit for US 17 Alternate, it becomes a six-lane freeway, which expands to eight lanes between Ashley Phosphate Road and I-526. This cross-section continues until the eastern terminus of the interstate at US 17 in Charleston. Currently, seventeen interchanges are available on I-26 in the CHATS study area at the following locations (listed from west to east):

1. Jedburg Road
2. US 17 Alternate
3. College Park Road
4. US 78
5. US 52 /US 78 /Rivers Avenue
6. Ashley Phosphate Road/Northside Drive
7. Aviation Avenue
8. Remount Road
9. I-526 (Mark Clark Expressway)
10. Montague Avenue
11. SC 642/Dorchester Road
12. SC 7/Cosgrove Avenue
13. Spruill Avenue
14. N. Meeting Street
15. Rutledge Avenue
16. Morrison Drive/E. Bay Street
17. US 17/King Street/Meeting Street


Ridgeville
Summerville
Goose Creek
Hanahan
North Charleston
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Folly Beach
Ravenel
Hollywood
Rockville
Seabrook Island
Kiawah Island
Awendaw
Locational Reference
0
5
10 Miles
ROADWAY FUNCTIONAL CLASSIFICATION
FIGURE 3.1
Functional Road Classification
Interstate
Freeway
Principal Arterial
Minor Arterial
Urban collector
Rural Collector
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County

I-526 is a half-loop, four-lane facility that begins at US 17 west of the Ashley River and ends at US 17 in Mount Pleasant, providing connectivity to Daniel Island and North Charleston. This portion of the highway includes fourteen interchanges (including the termini) at the following locations (from west to east):

1. US 17 (Savannah Highway)/Sam Rittenberg Boulevard
2. Paul Cantrell Boulevard
3. Leeds Avenue
4. SC 642 (Dorchester Road)
5. Montague Avenue
6. International Boulevard
7. I-26
8. US 52/US 78 (Rivers Avenue)
9. North Rhett Avenue
10. Virginia Avenue
11. Clements Ferry Road
12. Daniel Island/Seven Farms Road
13. Long Point Road
14. US 17 (Johnnie Dodds Boulevard)/Business I-526 (Chuck Dawley Boulevard)

US 17 is a major US route that runs east/west across the region. It connects the Charleston peninsula with the mainland on both the east and the west. The newly constructed, eight-lane Arthur Ravenel Jr. Bridge provides increased mobility and accessibility to and from US 17, the Charleston Peninsula, and I-26. US 52 and US 78 are also multilane major arterials that serve short as well as long distance travel.

Proportion of Service Graph from the Highway Capacity Manual, Transportation Research Board – Figure 1-5. Figure portrays the intended relationship of functionally classified

Principal Arterials

Principal arterials in the BCD region include the network of streets that serve medium and long distance travel and connect minor arterials and collector streets to freeways and other higher type roadway facilities. Roadway improvements and maintenance on principal arterials are primarily funded through the South Carolina Department of Transportation (SCDOT). Typical cross-sections for these corridors vary from two lanes to as many as six lanes on sections of US 17 and US 52/78 (Rivers Avenue). Posted speed limits on principal arterials tend to range from 35 to 55 mph. **Figure 3.1** illustrate principal arterials in the Charleston-North Charleston Urbanized Area as shown on the functional classification map.

Minor Arterials

Minor arterials primarily serve to connect short distance collector streets and principal arterials. In the BCD region, minor arterials are primarily two-lane undivided roads with little or no paved shoulder and posted speed limits ranging from 35 mph to 55 mph. **Figure 3.1** shows minor arterials in the Charleston-North Charleston Urbanized Area.

A profile of each major highway, principal arterial, and minor arterial within the CHATS MPO area is presented in **Appendix A**. Included for each corridor is a photograph, information on traffic volumes, and relevant roadway characteristics.

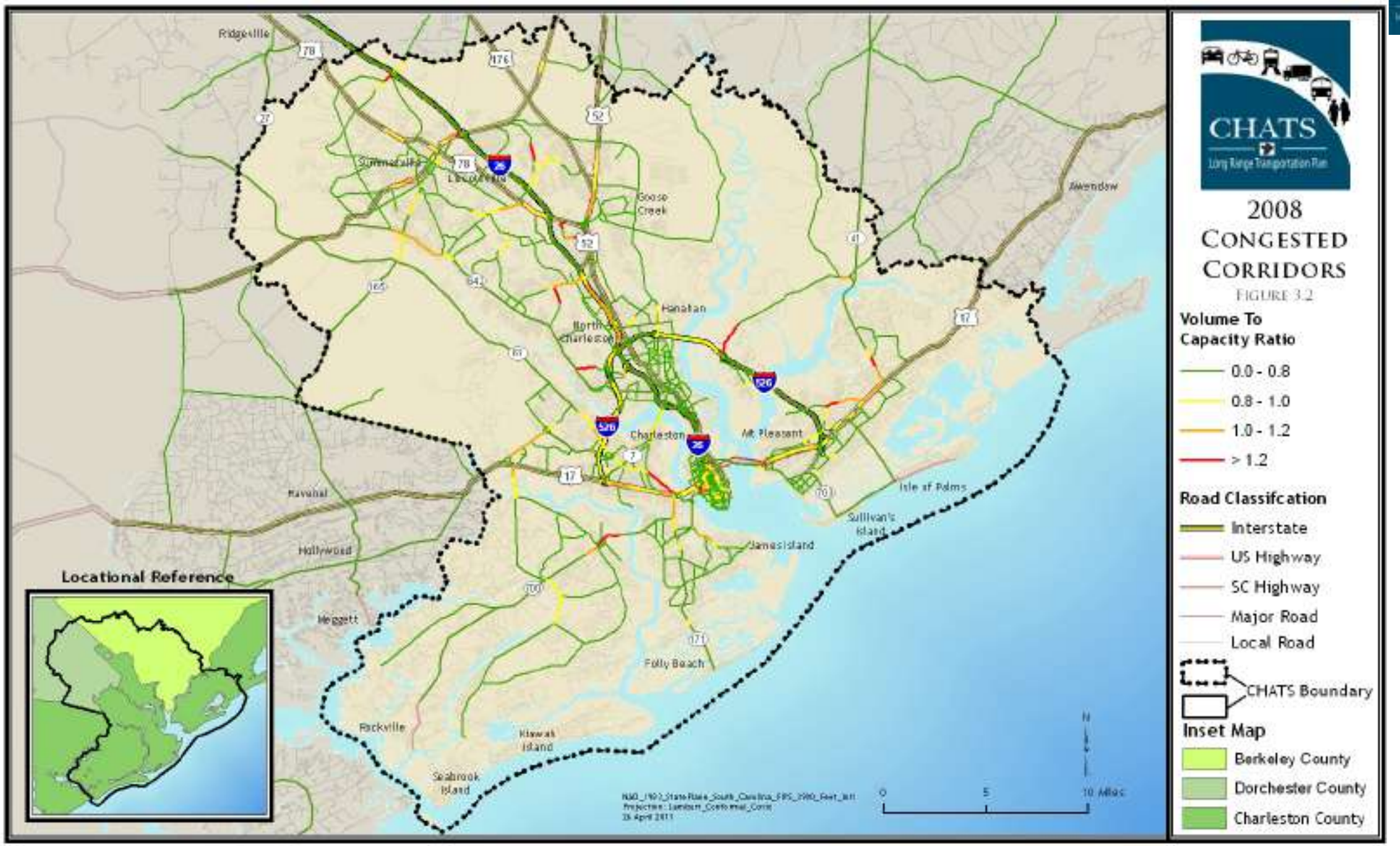
Corridor Operations

Corridor Traffic Volumes

Figure 3.2 illustrate 2009 average daily traffic (ADT) volumes on study roadways in the BCD region. Corridors that displayed noticeably high vehicular ADT's included sections of the following:

- I-26 (west of I-526) — 133,100
- I-526 (south of I-26) — 78,000
- US 52/US 78/Rivers Avenue (south of US 52/78 split) – 65,100
- US 17 (over Cooper River) — 75,500
- Ashley Phosphate Road (at I-26) – 55,600
- SC 61/St. Andrews Blvd. (north of US 17) — 42,000
- SC 7 (over Ashley River) – 43,000
- US 17/Savannah Hwy. (west of Ashley River)—40,100
- SC 642/Dorchester Road (south of Ashley Phosphate Road) – 37,500

Corridors listed include key arterials within the study area as well as key interstate corridors that provide links to destinations outside the study area. Congested corridors are highlighted in **Figure 3.2**.


Ridgeville
78
176
52
Summerville
Goose Creek
Hanahan
North Charleston
Charleston
Mt. Pleasant
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Meggett
Folly Beach
Rockville
Kiawah Island
Seabrook Island
Awendaw
Locational Reference
2008
CONGESTED
CORRIDORS
FIGURE 3.2
Volume To
Capacity Ratio
0.0 - 0.8
0.8 - 1.0
1.0 - 1.2
> 1.2
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
0
5
10 Miles

Corridor Volume/Capacity Ratios

The level of congestion on a roadway can be indicated by the volume/capacity ratio (V/C). V/C represents a comparison of the actual volume of traffic carried by a roadway to the theoretical capacity of the roadway. A V/C less than 0.8 generally indicates a roadway that is operating acceptably. As the V/C approaches 1.0, the roadway becomes increasingly congested. It may operate acceptably for much of the day, but is likely to be congested during peak periods. A V/C greater than 1.0 indicates a roadway that is carrying more traffic than for which it was designed. Roadways with high V/C are generally very congested, especially in the peak periods, and may operate in stop-and-go conditions. Roadways in the BCD region that currently experience high V/C ratios are illustrated in **Figure 3.2.**

Growth in the Berkeley-Charleston-Dorchester region, along with insufficient mobility options and travel demand management increases has resulted in peak hour traffic congestion on many major area roadways. A lack of road connectivity due to design and geography contributes to this deficiency, creating morning and afternoon peak travel periods that have sections of commuter travel corridors frequently congested and, in some cases reducing travel speed to a crawl.

Principal arterials in the study area that are the most heavily congested include sections of I-26, I-526, US 17, Rivers Avenue, Ashley Phosphate Road, SC 61, SC 7, and Dorchester Road. These roadways experience heavy traffic and long delays during peak hours. US 17 has V/C ratios ranging from acceptable to well overcapacity throughout much of the Charleston region, from I-526 in West Ashley through Mount Pleasant.

I-26 and I-526 are two of the major traffic-carrying roads in the region, and currently both of these roads are operating near capacity, with V/C ratios generally between 0.8 and 1.0.

Several other regional roadways also show varying levels of congestion, with V/C ratios ranging from 0.8 to 2. Some of the notable roadways include Micheaux Parkway, Cross County Rd., and US 17A in the Town of Summerville. In the West Ashley area, Ashley River Road and St. Andrews Boulevard, along with US 17 as mentioned previously, are congested facilities.

In North Charleston, Rivers Avenue is one of the primary commercial facilities in addition to carrying regional through traffic. This combination of demands has led to severe congestion in some areas. Dorchester Road is a regional roadway, which parallels I-26 from North Charleston to Summerville. As these areas have developed, the load on Dorchester Road has increased and there are few parallel options to carry the traffic. The Ashley River parallels Dorchester Road to the west. To the east, Dorchester Road is accessible by two major facilities, Ladson Road and Ashley Phosphate Road, both of which are also congested facilities. As this region continues to grow, connectivity will increasingly become an issue that needs to be dealt with.

On James Island, the congested roadways include Harbor View Road and Folly Road. Folly Road is the major north-south road on the Island and provides access to Folly Beach. Harbor View Road is one of the major roads connecting to the James Island Expressway, and simply can't handle the high volume of traffic from the Expressway during peak travel hours.

Maybank Highway is the primary access road to Johns Island and accordingly, to Seabrook and Kiawah Islands. As these areas have developed, the traffic load on Maybank Highway has increased as well. Currently, sections of Maybank Highway are very congested.

Traffic safety and crash history

Statistics provided by the SCDOT show that during 2009, the intersection with the highest crash frequency in Berkeley, Charleston, and Dorchester counties was Old Trolley Road/Bacons Bridge Road with 38 crashes.

A listing of the top thirty intersections in the CHATS region ranked by crash frequency is shown in **Table 3.1**. These locations are also identified in **Figure 3.3**. The summary of crash data shown in this table represents reported crashes at the specified locations for the calendar year 2009. There are multiple contributing factors to high crash frequency, including intersection design, access considerations, and traffic congestion. Many of the locations identified with high crash frequency were also locations where congestion often exists. A direct relationship exists between traffic congestion and crash frequency, hence the ongoing efforts to provide adequate funding for transportation projects that minimize traffic congestion. Driveway access in close proximity to intersections can also contribute to crash frequency by increasing the conflict points near the intersection.

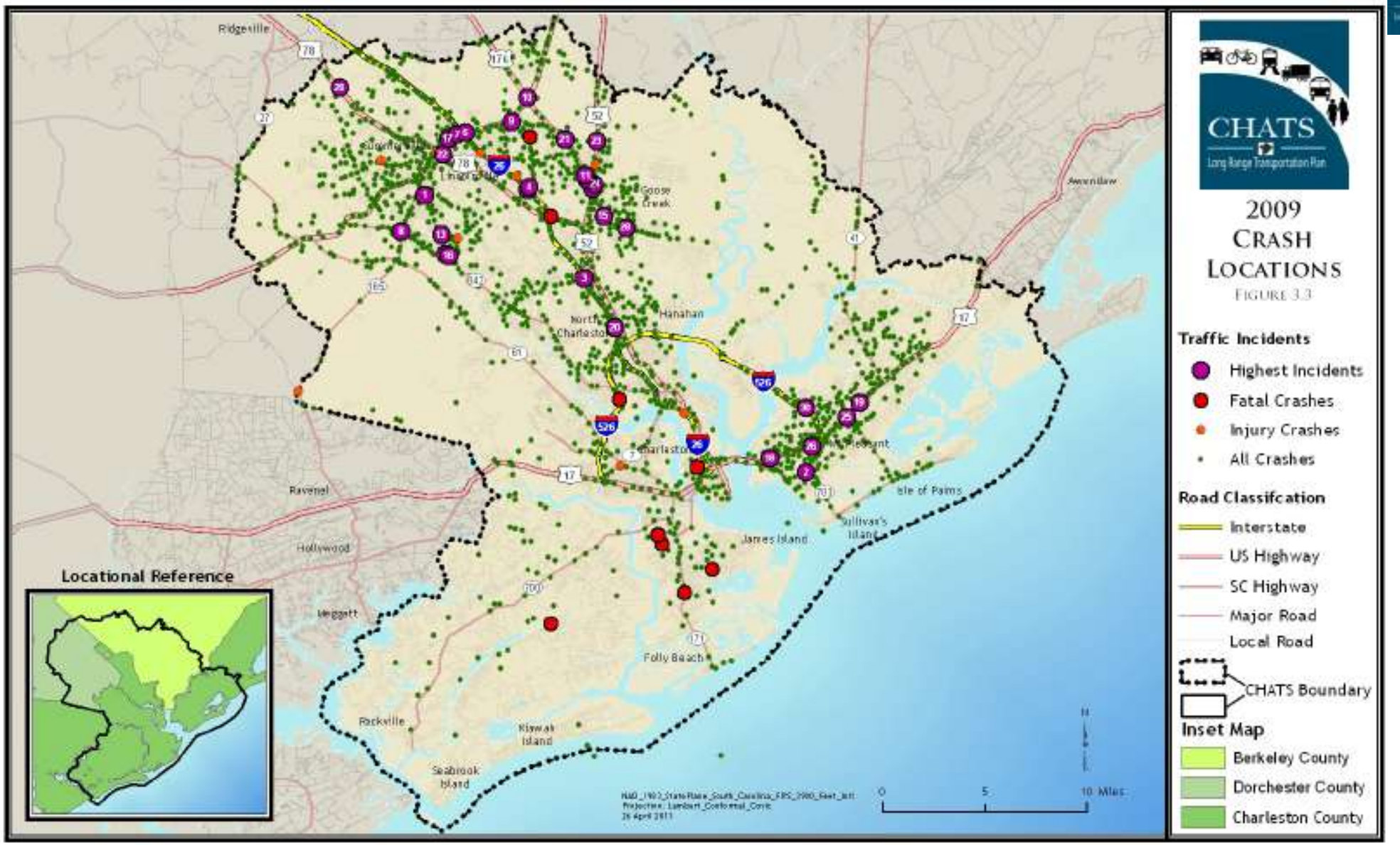

2009
CRASH
LOCATIONS
FIGURE 3.3
Traffic Incidents
Highest Incidents
Fatal Crashes
Injury Crashes
All Crashes
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Ridgeville
Goose Creek
Hanahan
North Charleston
Charleston
Ravenel
Hollywood
Meggett
Folly Beach
Isle of Palms
James Island
Sullivan's Island
Awendaw
Rockville
Kiawah Island
Seabrook Island
0
5
10 Miles

Table 3.1
Intersections Ranked by Crash Frequency (2009)

Rank	Intersections	Total Collisions	Total Fatalities	Total Injuries
	Trolley Rd-Bacons Bridge Rd	38	0	7
2	Ben Sawyer Blvd-Chuck Dawley Blvd	32	0	7
3	I-26-Ashley Phosphate Rd	32	0	6
4	College Park Rd-Treeland Dr	32	0	14
5	I-26-College Park Rd	30	0	6
6	Main St-Farmington Rd	26	0	6
7	Main St-Holiday Dr	24	0	9
8	Dorchester Rd-Bacons Bridge Rd	24	0	5
9	Main St-Myers Rd	24	0	25
10	Main St-St. James Ave	21	0	12
11	St. James Ave-Central Ave	20	0	16
12	Goose Creek Blvd-Red Bank Rd	20	0	3
13	Trolley Rd-Midland Pkwy	20	0	5
14	Trolley Rd-Miles Jamison Rd	20	1	11
15	Red Bank Rd-Howe Hall Rd	19	0	6
16	Dorchester Rd-Ladson Rd	18	0	5
17	Main St-Berlin G Myers Pkwy	18	0	3
18	US 17- Houston Northcutt Blvd	18	0	4
19	US 17-Long Point Rd	17	0	11
20	I-26-Remount Rd	17	0	2
21	St. James Ave-Old Mount Holly Rd	16	0	12
22	Berlin G Myers Pkwy-5th North St	16	0	13
23	Goose Creek Blvd-Montague Plantation Rd	15	2	8
24	Goose Creek Blvd-Thomason Blvd	14	0	9
25	US 17-Isle of Palms Connector	14	0	1
26	US 17-Bowman Rd	13	0	5
27	St. James Ave-Brandywine Blvd	13	0	5
28	Red Bank Rd-Fanwood Rd	13	0	5
29	US 78-Old Orangeburg Rd	11	1	3
30	Belle Hall Pkwy-Long Point Rd	11	0	3

When looking at high frequency crash locations, it is also important to consider the severity of the crashes. Collisions at some locations tend to occur at higher speeds and thus cause more injuries than crashes at other locations. **Table 3.2** indicates the twenty most frequent locations for accidents with injuries.

In addition to the notably high crash and injury frequencies, three of the top 30 intersections experienced crashes that involved a fatality. These include:

- Goose Creek Boulevard / Montague Plantation Road
- Old Trolley Road / Miles Jamison Road
- US 78 / Old Orangeburg Road

Table 3.2
Intersections Ranked by Injury Frequency (2009)

Rank	Intersections	Total Collisions	Total Fatalities	Total Injuries
1	Main St-Myers Rd	24	0	25
2	St. James Ave-Central Ave	20	0	16
3	College Park Rd-Treeland Dr	32	0	14
4	Berlin G Myers Pkwy-5th North St	16	0	13
5	Main St-St. James Ave	21	0	12
6	St. James Ave-Old Mount Holly Rd	16	0	12
7	Trolley Rd-Miles Jamison Rd	20	1	11
8	US 17-Long Point Rd	17	0	11
9	Main St-Holiday Dr	24	0	9
10	Goose Creek Blvd-Thomason Blvd	14	0	9

Although the fatalities at these intersections represent a small portion of all crashes and injuries reported at each location, the fact that they occurred warrants special attention to determine if countermeasures can be deployed to prevent future fatalities.

Potential Safety Enhancements

A preliminary review of the accident history has been performed for five intersections where accidents are most frequent or where fatalities occurred. Accident reports indicating crash types and other conditions were not available at the time of this study. However, a field investigation was performed to confirm existing conditions, design features and to observe driver behavior. The following comments are offered for consideration when additional accident studies are performed. These comments relate to potential accident causation as well as remedies. Field observations provided insight to potential patterns and revealed conditions that could be enhanced through geometric changes or enhancements to traffic control.

Old Trolley Road / Bacons Bridge Road

The intersection of Old Trolley Road and Bacon Bridge Road is an intersection that experiences a high volume of traffic. It accommodates significant peak hour travel as well as land access within close proximity to the intersection in a skewed configuration. The intersection is signalized with free-flow directional lanes from Old Trolley Rd. onto Bacons Bridge Rd. During 2009, a total of 38 crashes occurred. Field observations identified the following conditions that may contribute to the crash frequency at this location:

- High peak-hour traffic volumes
- Travel demand management strategies
- Driveway access in close proximity to the intersection
-

Possible enhancements to this intersection may include:

- Improved turn-lane capacity
- Enhanced signal timing and phasing
- Consolidated driveway access for commercial properties
- Peak hour transit service

Ben Sawyer Boulevard. / Chuck Dawley Boulevard

This intersection is a signalized intersection with high traffic volumes and free-flow right turn lanes. A number of driveways are located within close proximity to the intersection causing conflict with turning traffic. The main issue the lack of merge lane from Chuck Dawley Blvd. onto Coleman Blvd. The Town of Mount Pleasant has proposed improvement to this intersection as portion of the Coleman Boulevard-Ben Sawyer Boulevard Revitalization Plan (2005).

Possible enhancements to this intersection may include:

- Installation of a merge lane or realignment of the right turn lane
- Driveway relocation/consolidation as redevelopment occurs
- Installation of vehicular roundabout
- A more pedestrian-friendly intersection configuration

Interstate 26 / Ashley Phosphate Road

The intersection of I-26 and Ashley Phosphate Road is a complex intersection that is an interstate interchange in addition to a confluence of a US Highway, side streets, and driveways. The multiple turning movements and impressively high traffic volumes create a hazardous scenario. Pedestrian activity is factor as well. The intersection is a well-known congestion point during the peak periods. Finally, the interstate entry ramp creates a dangerous conflict with through traffic. Field observations identified the following conditions that may contribute to the crash frequency at this location:

- High peak-hour traffic volumes
- Aggressive driver behavior
- Driveway and side street access within close proximity to the intersection
- Interstate access ramps

Possible enhancements to this intersection may include:

- Prohibit turns m0vements
- Street network connectivity
- Operational improvements, such ramp metering
- Travel demand strategies and Peak hour transit service

College Park Road / Treeland Drive / I-26 Interchange

The intersection of College Park Road and Treeland Drive had 32 reported accidents during 2009. Treeland Drive is a frontage road along I-26, which is in close proximity to the interstate interchange. There were 30 additional crashes at the I-26 / College Park Road interchange. This entire area experience high traffic volumes during peak hours, frequently experiencing queuing on the interstate off ramp.

Possible enhancements to this intersection may include:

- Prohibit turns m0vements
- Street network connectivity
- Operational improvements, such reducing posted speed limits and high-visibility signal back plates
- Travel demand strategies and Peak hour transit service

Existing Transit Network

The purpose of the CHATS LRTP is to create a balanced transportation system that accommodates personal vehicles, freight vehicles, transit services, pedestrians, and bicycles. One of the goals of the plan is to incorporate transit services to maximize the capacity of the existing system. This goal can be accomplished by providing a more attractive and convenient transit system. Improvements to the transit system will have residual effects on many of the other goals, including creating a safe transportation system, encouraging context-sensitive design elements, promoting economic development, promoting pedestrian-friendly environments, and minimizing environmental impacts. The following section discusses existing transit services briefly. Chapter 6 includes more information on transit planning, setting stage for more detailed policy and program recommendations in Chapter 12.

Transit Services

Transit services in the CHATS study area are provided by the Charleston Area Regional Transportation Authority (CARTA) and TriCounty Link. CARTA is the primary provider in the urbanized area, offering extensive service focused on the urban core of the Charleston-North Charleston region. Its services include a system of fixed routes, demand-response, and express routes. As the designated public provider in the rural areas of the region, TriCounty Link, officially called the Berkeley-Charleston-Dorchester Rural Transportation Management Association (BCD-RTMA), offers services that interconnect with CARTA. TriCounty Link provides different types of services, including fixed routes, express routes, and Medicaid-supported service in Berkeley, Charleston, and Dorchester counties. In addition to CARTA and TriCounty Link, several private transportation, human service transportation, and taxicab companies provide local transportation services. Intercity transit service is provided by Greyhound and Amtrak connecting to region to point inland.

Multi-Modal Networks

Transportation planning has evolved into a holistic approach that recognizes the travel demand benefits of a robust multi-modal network. Once focused solely on roadway solutions, planners and local officials concentrated roadway capacity solutions to commuter traffic and travel patterns. Livable community initiatives promulgate balancing travel between modes by incorporating pedestrians and cyclists for utilitarian and employment trips. The increasing demand for bicycle and pedestrian facilities as expressed by the public has culminated in an enhanced focus on these modes during the transportation planning process. This focus includes the background information that follows as well as the multi-modal recommendations in Chapter 12.

Pedestrian Facilities

Pedestrian can be defined both as “undistinguished, ordinary” and “going on foot.” Considering both definitions, travel by foot should be ordinary and commonplace. Downtown Charleston, Downtown Summerville, and the Old Village of Mount Pleasant primarily exhibit an interconnected network of sidewalks in relatively good condition. Traveling further from these urban centers, sidewalks appear only on main corridors or in some neighborhoods, and are less frequent and well-connected. Approaching the rural fringe, few, if any, sidewalks exist.

Recent efforts have been made by the South Carolina Department of Transportation to incorporate pedestrian facilities into standard roadway design. The South Carolina Department of Transportation’s Highway Design Manual (May 2003) states the following concerning sidewalk construction:

> Generally, sidewalks are an integral part of city streets. For suburban residential areas, the construction of sidewalks is often deferred. However, sidewalks in rural and suburban areas are still often justified at points of community development such as schools, local businesses, shopping centers, and industrial plants that result in pedestrian concentrations along the highway. If pedestrian activity is anticipated, include sidewalks as part of the construction.

In addition to sidewalks, the Berkeley-Charleston-Dorchester (BCD) region includes greenways and trails. Greenways Incorporated defines greenways as “corridors of land recognized for their ability to connect people and places together; greenway trails can be paved or unpaved, and can be designated to accommodate a variety of trail users, including: bicyclists, walkers, hikers, joggers, skaters, horseback riders, and those confined to wheelchairs.” Greenways have been shown to enhance residential property value in the neighborhoods served.

Bicycle Facilities

The Highway Design Manual produced by SCDOT in 2003 also emphasizes the importance of constructing bicycle facilities on new roadways and offers several fiscally conservative methods of improving conditions for bicycle riders. An Engineering Directive Memorandum issued by SCDOT in 2003 affirms this focus on bicycle facilities and provides guidelines for the selection and design of bicycle facilities for new roadway projects.

Destinations within a 5-mile radius (trip duration of 30 minutes) are achievable for many citizens. Although the Berkeley Charleston Dorchester region has few designated bicycle facilities and routes at this time (with the exception of greenways), the combination of interconnected streets and mixed land uses makes it possible to bicycle for short trips using quiet streets in neighborhoods in several urban areas in the region.

For the advanced or more experienced cyclist, existing rural roads with (comparatively) lower traffic volumes provide an opportunity for cyclists to enjoy longer uninterrupted trips, albeit sharing the road with vehicular traffic. Although there are only two designated bicycle touring routes in the BCD region (the Walter Ezell Route and the Coastal Route), experienced cyclists routinely use the rural road network for bicycling. The existing greenways/multi-use paths and bikeways are illustrated in **Figure 5.1**.

The roadways and areas where current bicycle facilities exist in the study area were physically examined and analyzed by bicycle and in some cases by automobile, to determine their current suitability for bicycling for the CHATS and Charleston County Bikeway and Pedestrian Master Plan. This examination and inventory included a determination of the bicycle facility type, the roadway type, and their location in the study area. Information from the Plan was then augmented with updated information to reflect improvements made since the Plan was drafted in 1995 and to detail the type of facility present at each location.

System Operations & Maintenance

Operation and maintenance of our transportation infrastructure and transportation system is essential to the development of the region. Even before providing new transportation facilities, the region must ensure that it is operating and maintaining the existing system as efficiently as possible. Local governments and SCDOT devote considerable funding to the operations and maintenance of their existing transportation system. **Table 3.3** below displays the funds needed by SCDOT to provide for O&M needs for both the existing system. These figures do not include any expenses projected for maintenance of new facilities that would result from the various projects proposed in this plan.

SCDOT Maintenance Costs Per Lane Mile

DIST	CTY	County	Primary	Secondary
6	8	Berkeley	$5,177	$1,635
6	10	Charleston	$2,450	$3,400
6	18	Dorchester	$5,393	$1,810

The most expensive non-capital highway activity is roadway maintenance and operations. Maintenance costs include routine and regular expenditures required to keep highways in usable conditions (such as patching repairs, bridge painting, and other maintenance-of-condition costs) and traffic service costs (such as snow and ice removal, pavement marking, signs, and litter removal). Expenditures for maintenance and traffic services are not eligible for federal aid. Maintenance expenditures are estimated to increase throughout the region over the next 25 years. Identified maintenance needs by the SCDOT lead the Department to spend about $100 million annually on state-wide highway maintenance. SCDOT anticipates an annual decrease in O&M spending if new funding mechanisms are not developed. Local governments also develop budgets to address operations and maintenance needs.

Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) have many benefits when implemented in concert with an overall transportation management strategy. ITS solutions use communications and computer technology to manage traffic flow in an effort to reduce crashes, mitigate environmental impacts such as fuel consumption and emissions, and reduce congestion from normal and unexpected delays. Successful systems include a variety of solutions that provide surveillance capabilities, remote control of signal systems components, seamless sharing of traveler information with the public, and allow emergency vehicles to have priority to proceed safely through signalized intersections. Intelligent Transportation Systems include the following:

- Signalization
- Progressive-Controlled Signal System
- Dynamic Message Signs (DMS)
- Closed Circuit Television Traffic Monitoring
- Traffic Management Center
- Emergency and Transit Vehicle Preemption
- Automated Vehicle Location Systems

Signalization

The volume of traffic attracted to some side streets or site driveways is more than can be accommodated as an unsignalized intersection. Delays for minor street movements and left-turn movements on the main street may create or contribute to undue delays on the major roadway and numerous safety issues. The installation of a traffic signal at appropriately spaced locations can mitigate these types of issues without adversely affecting the operation of the major roadway. Approximate construction cost is $50,000 to $60,000 per signal. However, the surrounding context of the intersection may warrant an enhanced signal such as mast arm, which increases the cost.

Progressive-Controlled Signal System

A progressive-controlled signal system coordinates the traffic signals along a corridor to allow vehicles to move through multiple signals without stopping. Traffic signals are spaced appropriately and synchronized so when a vehicle is released from one intersection the signal at the next intersection will be green by the time the vehicle reaches it. Likewise, adaptive signal control involves continuously collecting automated intersection traffic volumes and using the volumes to alter signal timing and phasing to best accommodate actual—real-time—traffic volumes. Adaptive signal control can increase isolated intersection capacity as well as improve overall corridor mobility by up to 20%during off-peak periods and 10%during peak periods. Approximate construction cost is $250,000 per system and $10,000 per intersection.

Dynamic Message Signs (DMS)

Dynamic Message Signs alert vehicles of congestion or incidents. DMS units give general alerts, such as "congestion ahead" or specific details on the location of the incident or predicted travel times so motorists can mentally prepare. Often, drivers are more patient if they can anticipate how long the delay will be or how far the congestion spreads. Perhaps most importantly, DMS informs drivers who can choose alternate travel routes during heavy congestion, thereby reducing the volume on the freeway, the likelihood of additional incidents, and the average travel time for the system as a whole.

Closed Circuit Television Traffic Monitoring

Closed Circuit Television (CCTV) cameras are primarily used on interstate facilities and major arterials to provide visual traffic volume and flow information to traffic management or monitoring centers. These centers use this information to deploy incident response patrols/equipment and to provide roadway travel delay information to motorists. By having visual roadway information, traffic management centers are able to identify incidents quickly and respond appropriately and efficiently, helping to reduce the effect of incidents on a single location or on multiple roadways. Approximate construction cost is $20,000 per location.

Emergency Vehicle and Transit Vehicle Preemption

This strategy involves an oncoming emergency or transit vehicle changing the indication of a traffic signal to green to favor the direction of desired travel. Preemption improves emergency vehicle response time, reduces vehicular lane and roadway blockages, and improves the safety of the responders by stopping conflicting movements. In most cases, transit vehicles would receive "tier II" signal preemption that will extend the green time for an approaching vehicle verses the signal override for emergency vehicles. Approximate construction cost is $5,000 to $7,000 per intersection plus $2,000 per equipped vehicle.

Access Management Solutions

While acknowledging some access management strategies are better suited to one corridor type than another, access management strategies can improve safety and efficiency of system operations. Median divided roadways are a basic access management strategy that has been adopted as the recommended cross section for facilities constructed in the CHATS planning area.

Operations & Maintenance of Transit

Operations and maintenance of the transit systems is a key element in enhancing transportation options for people in the urbanized area. The Charleston Area Regional Transit Authority (CARTA) operates in the CHATS area. Operations and maintenance needs have been included for this agency.

For the fiscal year 2007, operating costs for CARTA totaled approximately $18 million. Local funds cover the largest share, including the transportation sales tax form Charleston County, with federal funding for maintenance and capital acquisition providing the remainder. Passenger fares cover approximately one-quarter. Advertising revenue also contributes a small portion of their revenues. Operating cost are commensurate with the level of service provided, however fleet replacement must be considered. Buses have a 12 year useful life and cost approximately $425, 000 each.

Further Strategies

The regional mobility strategies outlined in the CMP offer methods to minimize the impact on the transportation network by focusing on reducing traffic congestion and enhancing transportation alternatives to the single occupant vehicle (transit, bicycling, and walking). The multimodal section identifies specific tools to improve roadways, transit, bicycle, and pedestrian facilities.

Funding strategies to maintain facilities should be considered in the development of a project. The acceptance of privately constructed roadways into the public system should be scrutinized via construction specifications and guidelines for reasonable street patterns. For example, is it in the public's interest to maintain a 2,500 foot long cul-de-sac road that serves a handful of homes?

A well-connected network of streets will help mitigate maintenance costs. Dispersion of traffic across network reduces congestion on heavily used corridors, especially at major choke points and intersections. These streets will also improve safety in the transportation network, allowing people to access attractions on smaller-scaled, walkable, transit-friendly roadways. A well-designed transit system that is fully integrated with other modes such as bicycling, walking, and ridesharing can minimize the number of road facilities needed.

Land use development patterns can influence the operations and maintenance of the transportation system. By developing sites with a mix of land uses, the travel demand on the transportation system can be minimized. Transit Oriented Development (TOD) provides excellent examples of combining land use and transportation strategies to minimize impacts on operations and management of the system. This type of nodal development maximizes access by transit and non-motorized transportation. Nodal development allows transit to be a viable option by increasing the mix of residential and commercial facilities. It reduces the need for automobile use and parking. By reducing the distance required for trips, it encourages walking and cycling, and allows some households to reduce their car ownership, which together can result in large reductions in vehicle travel.

Operations and maintenance should be a significant consideration in planning and programming projects. The construction or acquisition cost is only a small portion of the lifecycle cost of an asset. As new projects are developed, operating and maintaining that facility should be a factor in the cost-benefit evaluation.

Planning for Growth-Future Conditions

Introduction

Increases in population and employment are signs of a successful community, one where people and businesses want to be located. Along with these successes, however, come the associated increases in traffic and congestion as the community's transportation system struggle to keep up with the additional travel demand. The population in the Berkeley-Charleston-Dorchester region is expected to increase approximately 29% between 2008 and 2035 from 647,194 to 835,534. Employment in the study area is expected to increase 29% in the same time frame, from 303,488 to 392,736. The same socioeconomic and land use assumptions were used for all future conditions.

If no improvements were made to the transportation facilities in the study area between 2008 and 2035, the daily vehicle-miles of travel (VMT) are expected to increase by approximately 30% and vehicle-hours of travel (VHT) are expected to increase by approximately 40%, while system delay will increase by 100%. This indicates that the roadways are becoming increasingly congested. In order to address this congestion, numerous roadway, transit improvements, and system management strategies were evaluated. Coupled with the evaluation of different land use scenarios and fiscal constraints, a optimal solution will be sought to provide the best mobility solution for the region.

This chapter will examine two future land use-transportation scenarios. The first is the Existing + Committed scenario, which includes the existing transportation facilities and transit services, in addition to all transportation projects that are underway or already have funds appropriated to them. The second scenario is called the Financially-Constrained Plan. This includes all committed projects, in addition to projects selected to receive funding from citizen's input forums or by CHATS member jurisdictions, proposed through the long range planning process. These 'visionary' projects are ranked based on greatest return on investment in terms of congestion relief, increased mobility, implementation of livability principles, economic development benefits, safety benefits, and that minimize environmental impacts (see Chapter 10). Finally, higher-ranked projects are identified with projected transportation revenue to the region, resulting in a "Financially-Constrained" land use-transportation scenario.

Existing & Committed Conditions

The first step in determining the projects that should be included in the Long Range Transportation Plan is to examine the Existing + Committed (E+C) Condition. The E+C transportation network includes all projects that are currently under construction or already have funding allocated to them, in addition to existing facilities. Projects that are included in the E+C condition are shown in Figures 4.1 and 4.1a. Several of the E+C projects address deficiencies that were present in the Existing conditions described in Chapter 3. The additional capacity on Interstate 26 that is currently under construction will address the deficiency that currently exists at that location. Additional lane capacity on Dorchester Road and US 17 Alternative address the lack of capacity on those facilities.

Despite the committed improvements, there are many facilities in the Berkeley-Charleston-Dorchester region that are expected to be congested in 2035 if additional improvements are not made. Several roads in the Johns Island, Mount Pleasant, and West Ashley areas will be significantly over capacity by 2035. In addition, traffic demand in the Goose Creek, and Summerville, areas are also expected to grow significantly by 2035, leading to capacity deficiencies particularity in the peak travel hours. Although several improvements are already committed in Mount Pleasant, deficiencies are expected to exist there as well. The level of congestion on a roadway can be indicated by the volume/capacity ratio (V/C) and delay (free-flow travel speed/congested travel speed). V/C represents a comparison of the actual volume of traffic carried by a roadway to the theoretical capacity of the roadway. Figures 4.3 show the roadways with high V/C ratios in the 2035 E+C condition.

Future Land Use

The CHATS LRTP looks at potential growth in the region through the utilization of what is commonly known as an urban land use allocation model. This approach takes advantage of the local land use planning initiatives by incorporating them into the long-range transportation planning process**.**

Over time, residential and employment densities have decreased as the amount of developed land in the CHATS study area has increased. Between 1970 and 1994, the developed part of the BCD region (essentially the CHATS study area) increased by 256% while the region's population increased by 41 percent, according to a Clemson University study. Since this time, population growth, while dipping slightly after the close of the Charleston Navy Base, has continued to increase substantially, particularly in the outer edges of the urbanized area (such as in Goose Creek, Summerville, areas of Mount Pleasant west of Interstate 526, the northwest corner of West Ashley, and on Daniel Island).

While this has taken place, the majority of municipalities in the US have begun to realize that the allocation of land uses throughout a community or region has a significant determination regarding the viability of various transportation options. The traditional suburban model of growth has encouraged expansion of an auto-centric transportation model, at the expense of other potential options. In recent years, the realization that compact, neo-traditional development is a viable

alternative to the suburban form of development that took place between the late 1940s and today has led to the construction of a number of "new urbanist" communities in the region. These include I'On in Mount Pleasant and Daniel Island. In addition, this change in community development pattern has provided the impetus for the revitalization of a number of existing walkable communities in the CHATS Region. Some of these include downtown Summerville, the Park Circle area of North Charleston, and the Avondale area of the City of Charleston. Keeping this in mind, and understanding that many of the multi-modal transportation improvements are based on having a better mix of land uses along the region's spine and primary corridor areas, additional density and a better mix of land uses should be encouraged wherever possible in much of the built-up sections of the CHATS region to maximize the existing transportation infrastructure.

Connecting Land Use and Transportation

Residential Growth

Over the next 25 years, the CHATS study area is expected to add nearly 74,000 households. Most of the growth, according to the comprehensive plans of the three component counties, is anticipated to take place in or near existing municipalities, with the exception of the proposed East Edisto development in Charleston and Dorchester counties. Within Charleston County, the largest portion growth is projected to occur within the Urban Growth Boundary (UGB) delineated in the 2008 Comprehensive Plan Update, primarily in areas already proposed for development. A large portion of the area within the UGB are former industrial and port facilities near the Downtown Charleston area, a portion of which is slated for redevelopment, including the Magnolia Development in the "Neck Area" between downtown Charleston and Interstate 526, the Park Circle and Olde North Charleston neighborhoods in North Charleston, and within the former Charleston Navy Yard. The redevelopment of these areas, along with the continued development taking place along the Interstate 26/US 52-78/Norfolk Southern Rail corridor, including the development of Ingleside Plantation and continued industrial development (including the expansion of Boeing's facility at the Charleston International Airport) or along the US 17 corridor between West Ashley and Mount Pleasant is expected to bring residential growth that might support additional transportation options.

Many of the future neighborhoods are, or have the potential to be, in close proximity to transit facilities, community parks and facilities, and educational facilities. Several comprehensive plans of communities in the region frame this future development in the form of hubs or priority investment areas, based on the location of existing facilities or as loci for future development. These hubs or investment areas, strung along the primary corridors of the region, would ideally be, based on the future density of development within the hub areas, adaptable for a variety of transportation options. With this goal in mind, a number of the communities have adopted language in their comprehensive plans that encourage future development to take place along transit corridors, to integrate a variety of transportation options, and to encourage future development of a mixed-use land use pattern. This will help to aid communities in providing viable residential, employment, entertainment, shopping, and transportation options for residents of the region. Additional residential development is expected to occur in the Awendaw area along US 17, as development continues to move northward from Mount Pleasant, in areas of West Ashley north of Bees Ferry Road (Long Savannah, Grand Oaks, and other developments), and in the area of Ingleside Plantation .

Within Berkeley County, the largest area where growth is expected to occur is at the northern and western edges of Goose Creek in the Carnes Crossroads and Cane Bay area. Already, new schools and retail centers are being constructed to meet the anticipated demand, and Roper St. Francis is seeking permission to construct a 50-bed hospital in this area. This area is also in close proximity to the Jedburg Road area, where a great deal of employment growth is projected to take place in the coming years. Additional development is also expected to occur on Daniel Island and along the north side of the Wando River, and in the area between Goose Creek and Moncks Corner between US 52 and US 17A.

Within Dorchester County, it is anticipated that the greatest extent of residential growth will take place within the East Edisto area, defined as areas east of US 17A, south of SC 61, and bisected by SC 165 that is currently the site for silvicultural activities. Between 2008 and 2035, it is anticipated that several thousand homes will be constructed within the various villages that will be a part of East Edisto, with most of this development taking place after 2015. Additional development is expected to take place in the Wescott Plantation area, along Old Trolley Road in the Oakbrook area, and contiguous to the incorporated portions of Summerville, particularly in the Knightsville area.

Employment Growth

Between 2008 and 2035, employment growth is expected to continue throughout the BCD region closely tied into the residential growth in the region. Based on the model assumptions, over 89,000 jobs are expected to be created in the region between now and 2035. It is assumed that a large portion of future employment will be focused into several key fields, including tourism, medical care, and aviation tied into the expansion of Boeing's facility in North Charleston to serve as the manufacturing center for the 787 Dreamliner. While this employment growth is expected to be dispersed across the region, there are several areas that will serve as loci for future employment growth.

Within the City of Charleston, a nexus of employment growth is expected to be located in the vicinity of the MUSC campus. Elsewhere in Charleston County, employment centers are expected to emerge on the northern end of Mount Pleasant along US 17, in the vicinity of the Charleston International Airport, and to the west of Ravenel along US 17.

While the largest amount of employment growth is expected to take place within Charleston County, the other counties in the CHATS Study Area are also expected to see significant employment growth. The largest portion of this growth is anticipated for Berkeley County in the Jedburg Road area, where the large Jedburg Commerce Park and several additional industrial and office parks currently in the early stages of development will continue to expand and be integrated into activities at the Port of Charleston. Additional development is expected to occur as part of continued expansion of the Naval Weapons Station (part of Joint Base Charleston) to the southeast of Goose Creek, in the Daniel Island and Clements Ferry areas at the southern end of the county and between Goose Creek and Moncks Corner

Level of Service A

In Dorchester County, the largest area of employment growth expected between now and 2035 is in the area to the southwest of Summerville, where a large industrial park adjacent to the East Edisto development is expected to serve as an employment draw to the region, with additional development along the Berlin Myers Parkway and within the Ladson area. Overall, it is estimated that the largest percentage increase in growth in the regions will take place in Berkeley County, where the total number of jobs will increase by 43% between 2008 and 2035 (vs. 25% for Charleston County and 36%for Dorchester County.)

Level of Service C

Transportation Corridors and Activity Centers

There is an inherent relationship between activity centers and the transportation that links them to other centers and destinations. Equally important is the mobility choices that are provided within the center. Often neighborhoods and activity centers are dependent upon a small number of transportation corridors to provide essential links between home, school, employment, shopping, social, and recreational destinations. The extent to which these origins and destinations are blended into multi-purpose activity centers will have dramatic effects on a person's ability to choose a mode for their trip. In many cases, the range of trip alternatives (walk, bike, drive, or transit) can influence the overall perception of a community.

Level of Service F

The degree to which the corridors within and between activity centers are considered successful transportation is in large part dependent upon the intended function of the street. A unique challenge for the future will be to balance the mobility needs of an area with other priorities. Often automobile mobility has been given priority without regard for other considerations regarding the function of the street, including the corridor's relationship to land use, urban design and the promotion of alternate modes. One of the unique challenges in creating a successful transportation system for the Berkeley-Charleston-Dorchester region is blending connectivity and access functions with the preservation of natural features as well as the character of individual communities. Each community may have different needs and priorities. While recognizing these differences, it is important not to lose focus of the practical concept of overall regional connectivity. This concept is particularly relevant as it relates to people's desires to make safe and efficient trips not only by driving, but also by walking, bicycling, or using transit.

A review of local land use and area plans reveals a number of activity centers. While the definition and criteria used to describe these activity centers differs for each plan, most can be characterized into one of three categories: Regional, Community, and Neighborhood Activity Centers. The characteristics for each are listed below:

Regional Activity Centers

- Large-scale, transit supportive center of employee-intensive land uses;
- Core areas contain large-scale and high intensity urban land uses that are supported by and serve communities within the region;
- Accessed by interstates/freeways, principal arterials, and public transportation (preferably regional transit);
- Served by municipal water and sewer;
- Higher residential densities; and
- Balance between residential/non-residential land use ;

Community Activity Centers

- Include a combination of retail, personal services, civic, educational, and social uses that serve the needs of surrounding neighborhoods;
- Core areas contain medium-scale development that is focused on serving the day-to-day needs and activities of the core area occupants as well as the greater needs of the surrounding neighborhoods;
- Accessed by principal arterials and public transportation;
- Served by municipal water and sewer;
- Medium density residential areas; and
- Residential/non-residential land use mix is approximately 60/40

Neighborhood Activity Centers

- Largely residential with a mixed-use core that serves as a focal point for the neighborhood and provides retail and service needs;
- Mixture of low and medium density residential areas;
- Accessed by principal and minor arterials with integrated collector street access; and
- Transit service is provided or desired

Vision Plan Conditions

The Vision Plan can be considered a "wish list" of projects. It includes all candidate projects being considered for implementation, comprised of projects that collected through public input, input from member jurisdictions, CHATS Study Team, as well as additional projects to address remaining deficiencies. The term Vision is applied because no financial resources have been allocated to the projects. Project comprising the Vision Plan form the pool of projects that will be prioritized for federal funding, thus generating the financially-constrained project list. Projects included in the Vision Plan condition are shown in Figure 4.2. Later in this chapter a full description of candidate transportation improvements (see "Transportation Recommendations," page 4-11) are described in more detail.

Financially Constrained Plan Conditions

This scenario includes committed projects (as in the Existing + Committed condition), in addition to projects prioritized from the Vision Plan; collected through public input, input from member jurisdictions, and CHATS Study Team, as well as additional projects to address remaining deficiencies. The term "Financially-Constrained" is applied because these projects are prioritized with an allocation of projected revenue to CHATS or other State and local funding source. Projects included in the Financially-Constrained Plan condition are shown in Figure 11.1**.** Later in this chapter a full description of recommended transportation improvements are described in detail.

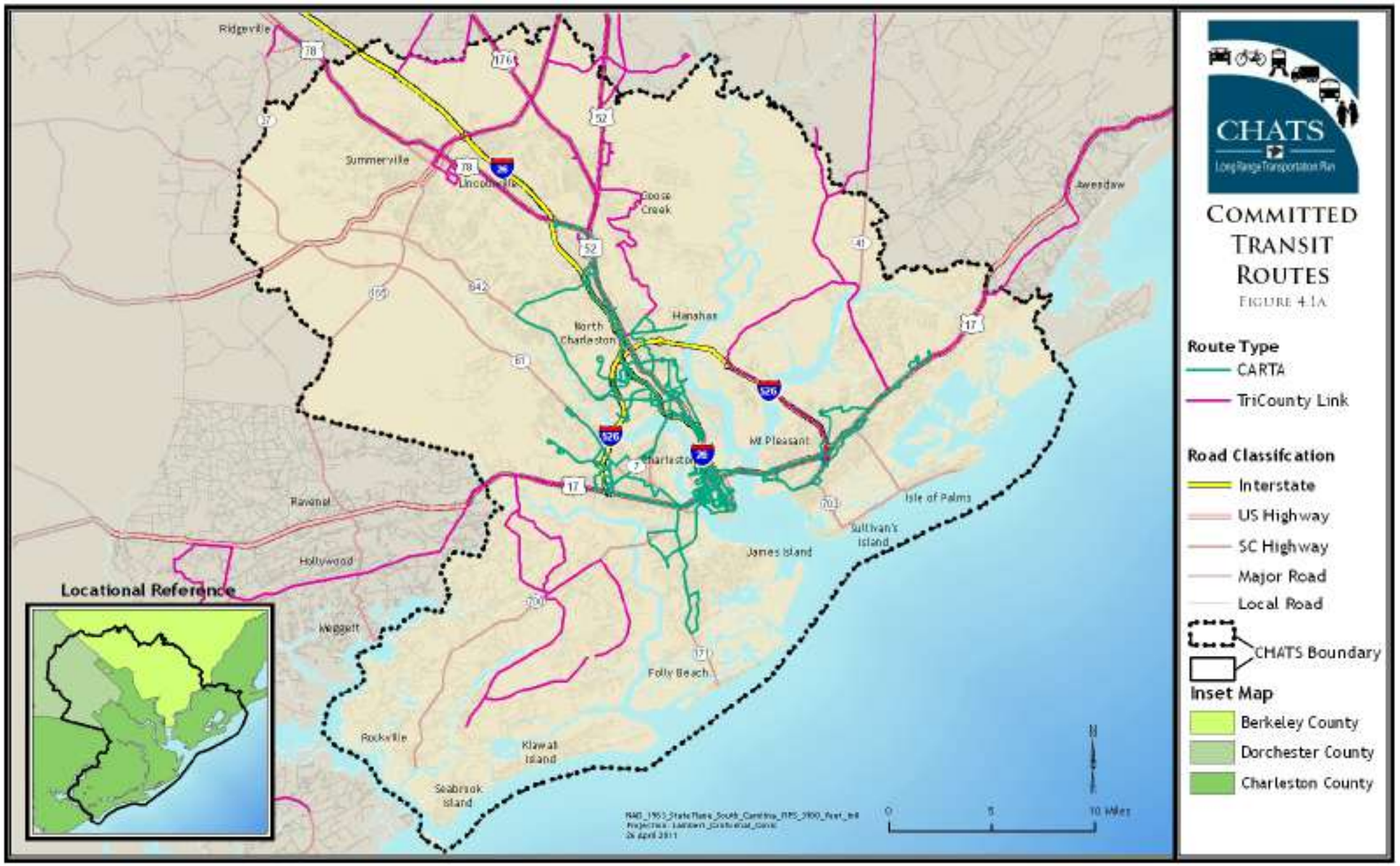
Several of the Dorchester County transportation sales tax projects are located in the Summerville area, and these projects make a significant impact on congestion in that area. In the E+C condition, there were several roadways that were significantly over capacity, and the implementation of these projects provides significant congestion relief.

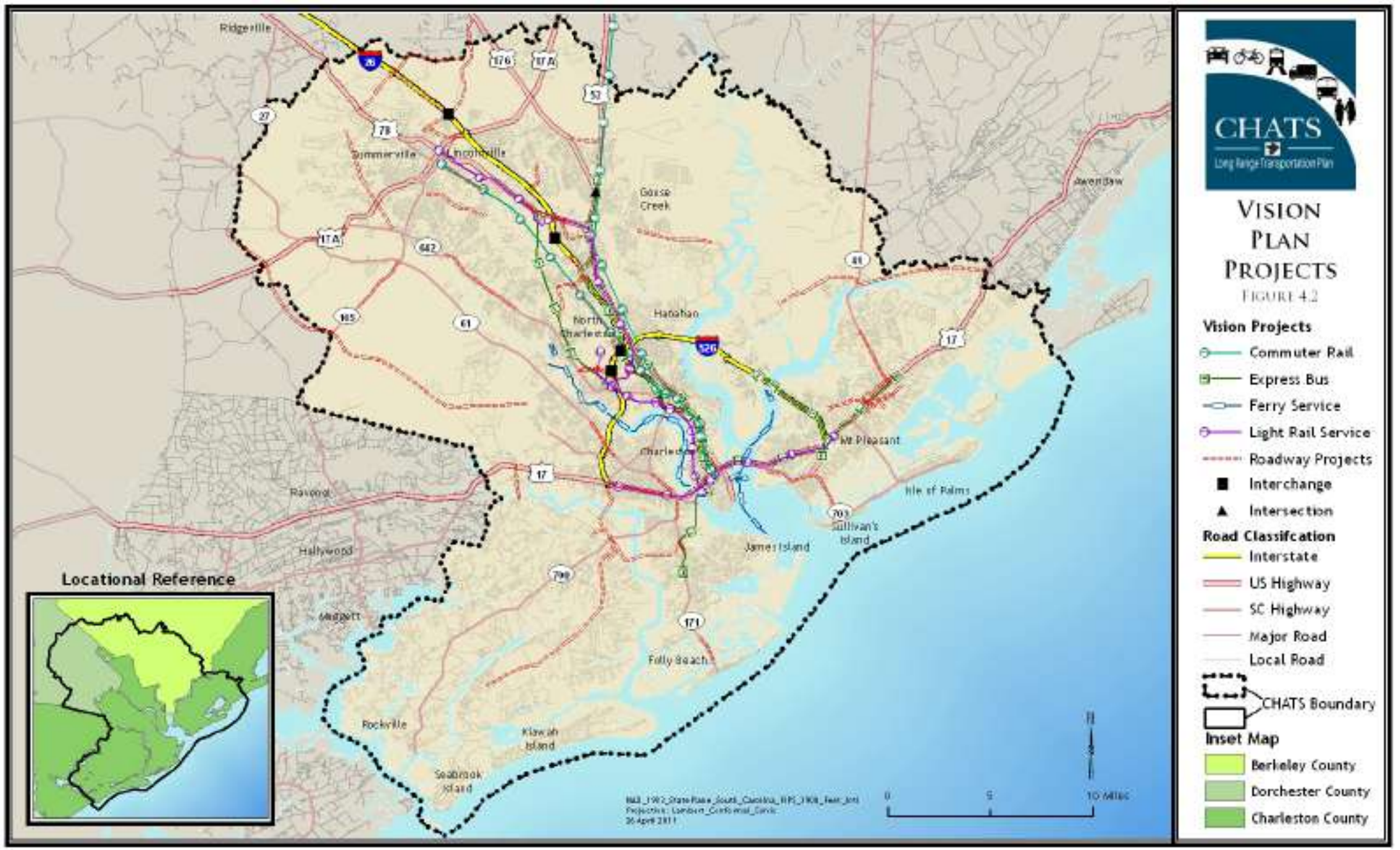
The SC 61/Glenn McConnell Parkway Extension will provide significant additional capacity parallel to Ashley River Road, and will relieve traffic congestion along that facility and on the western side of the region in general.

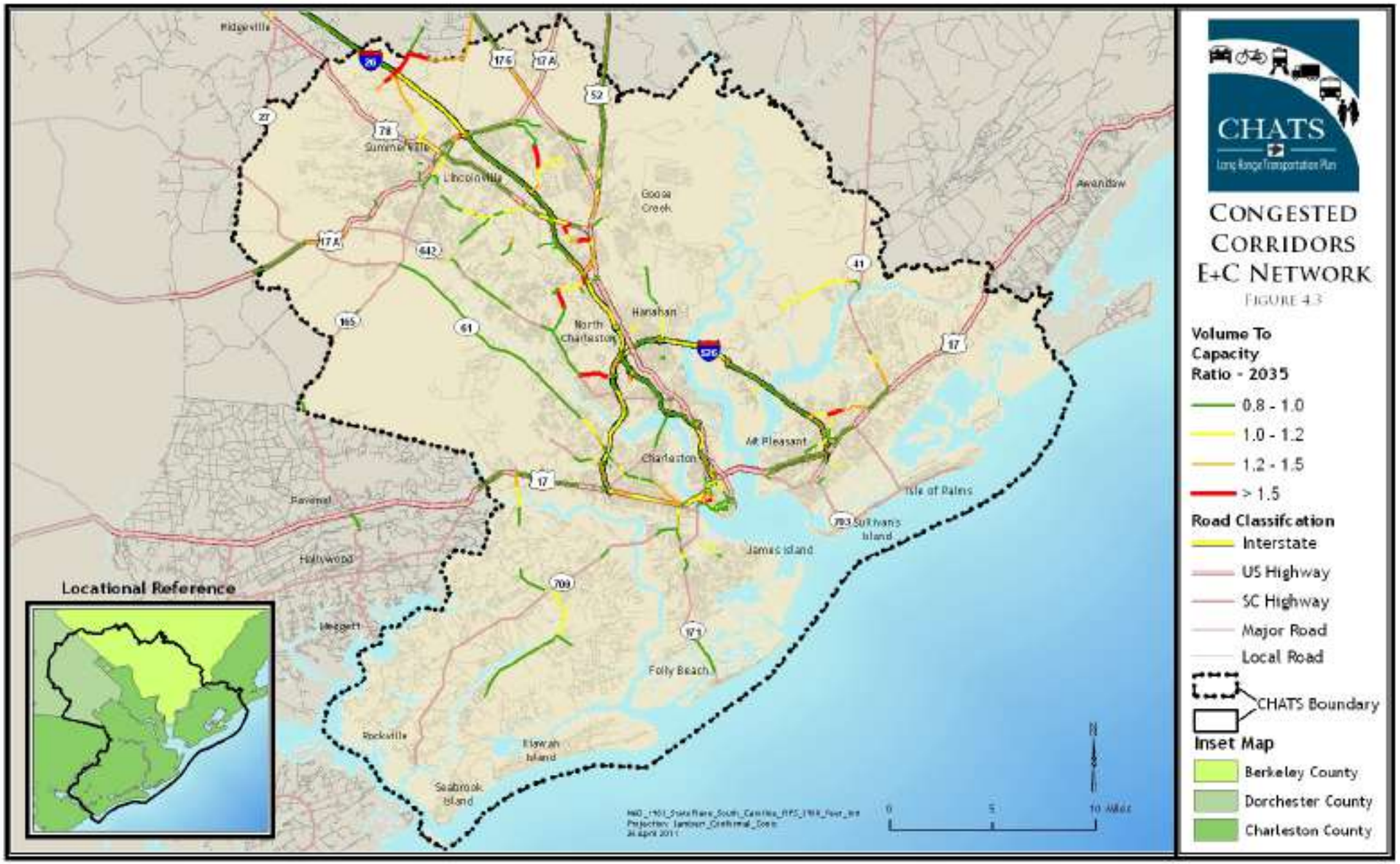
Movement of traffic on James Island and Johns Island will be improved in the Financially-Constrained Plan. This is due to several roadway improvements, including capacity improvement along Maybank Highway and improvement to Harborview Road, as well as other projects than increase the capacity of the system.

In several communities, roadway capacity improvements on major facilities thoroughfares will help to relieve congestion. However, it will be difficult for the roadway facilities to keep up with the rate of growth in the CHATS Study Area, and it is likely that congestion will still be an issue on some facilities. It is this cyclical nature of roadway capacity improvements that has led to a shift in transportation planning ideology. Integrating land use decision-making with transportation priorities has resulted greater return on transportation investment, greater mobility for users, and greater access for all types of users of the system. A number of transit projects were evaluated in the Vision Plan condition to capitalize the existing transportation infrastructure, implementing the principles of people trips and not car trips. This focus reflects the input received from the citizen input forums. Figure 4.3 shows the congested facilities for roadways in the E+C Plan condition.


CHATS
Committed Roadway Projects
Figure 4.1
Type of Improvement
Capacity Improve
New Alignment
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
US HWY 17A
College Park Rd
US HWY 78
Henry Brown Blvd
Berlin G Myers Pkwy
Northside Rd
Dorchester Rd
Palmetto Commerce Pkwy Ext
Railroad Ave Ext
Bacons Bridge Rd
I-26
Clements Ferry Rd
W Bridge Connector Rd
Port Access Rd
US HWY 17
Long Savannah Connector
Johnnie Dodds Blvd
Sweetgrass Basket Pkwy
Bees Ferry Rd
Bowman Rd
Maybank Hwy
Harbor View Rd
0
5
10 Miles

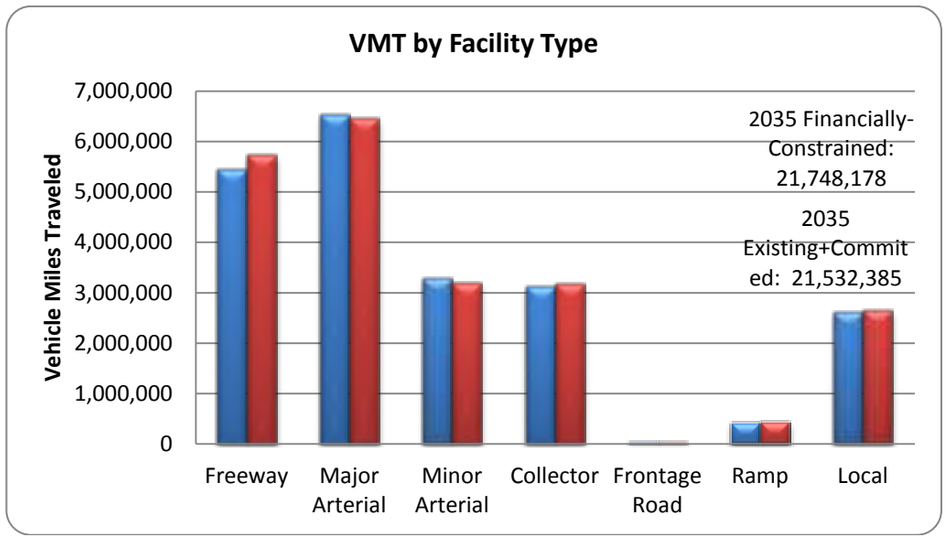

Ridgeville
Summerville
Lincolnville
Goose Creek
Hanahan
North Charleston
Mt Pleasant
Charleston
Ravenel
Hollywood
Meggett
Rockville
Seabrook Island
Kiawah Island
Folly Beach
James Island
Sullivan's Island
Isle of Palms
Awendaw
Locational Reference
CHATS
Long Range Transportation Plan
COMMITTED TRANSIT ROUTES
FIGURE 4.1A
Route Type
CARTA
TriCounty Link
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
0
5
10 Miles


CHATS
Long Range Transportation Plan
VISION PLAN PROJECTS
FIGURE 4.2
Vision Projects
Commuter Rail
Express Bus
Ferry Service
Light Rail Service
Roadway Projects
Interchange
Intersection
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Ridgeville
Summerville
Goose Creek
Hanahan
North Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Meggett
Folly Beach
Rockville
Kiawah Island
Seabrook Island
Awendaw
0
5
10 Miles


CHATS
Long Range Transportation Plan
CONGESTED CORRIDORS E+C NETWORK
FIGURE 4.3
Volume To Capacity Ratio - 2035
0.8 - 1.0
1.0 - 1.2
1.2 - 1.5
> 1.5
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Ridgeville
Summerville
Lincolnville
Goose Creek
Hanahan
North Charleston
Mt Pleasant
Charleston
Isle of Palms
Sullivans Island
James Island
Folly Beach
Ravenel
Hollywood
Meggett
Rockville
Edisto Island
Seabrook Island
Awendaw
0
5
10 Miles

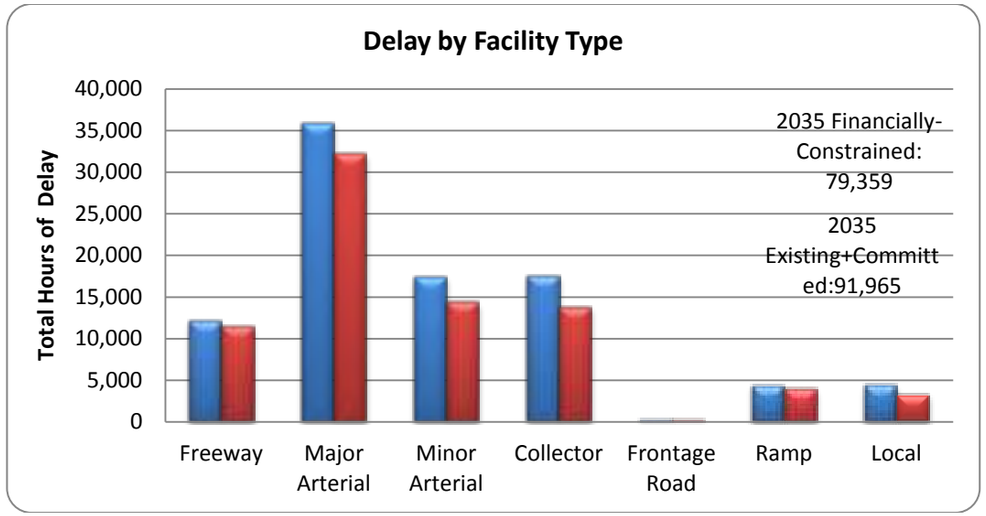
Scenario Comparison

As expected, the total vehicle-miles of travel (VMT) on the regional network do not differ significantly between the E+C and Financially-Constrained Plan conditions. Total VMT slightly increases, as there are more facilities available to drivers with a less-congested condition. However, there is a shift in the VMT between the two conditions. In the Financial Plan condition, more of the VMT occurs on freeways and collectors. This occurs because of additional capacity (widening, new facilities) that has been added on these facility types in the Financial Plan. This additional capacity results in a shift in traffic from lower-class facilities to freeways and collectors, as shown in the chart below.



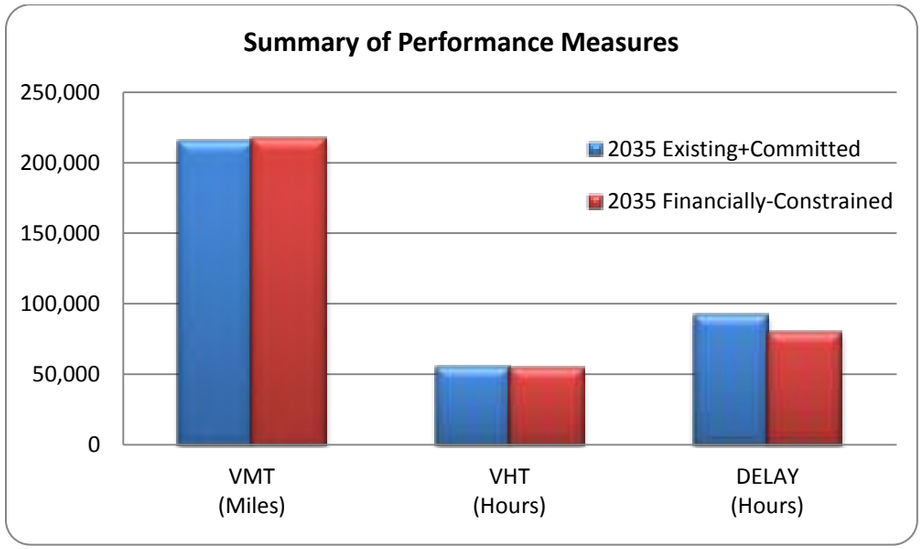
The significant differences between the two conditions come when comparing the system delay. Delay is determined by assigning traffic to the network both in the congested condition and also in a non-congested, free-flow condition. The difference in total travel time between these two conditions constitutes the total delay. Comparing the 2035 E+C condition to the Financially-Constrained Plan condition, there is a projected reduction in delay of approximately 14%, or 12,606 hours as presented in the following chart. The projected population of the region is 835,534 in 2035, so the reduction in delay translates into about one minute fewer that each person in the region will spend sitting in traffic in the morning and afternoon peak hours each day.

The most significant decreases in delay between these two scenarios occur on collector and local roads. There are very few capacity increases on freeways in the region in the Financial Plan[1], compared to the



E+C condition, so the difference in delay on freeways is relatively minor. Most of the capacity increases occur on major/minor arterials, and collector roads, which results in significant delay savings for those facility types. Collector streets in particular play a crucial role in maintaining connectivity of the transportation network throughout the region. A good system of collector streets can reduce the need for additional widening of arterials by accommodating short-distance trips, so it is important to examine the collector street system on a local level.

[1] Values will be updated if the Study Team or Policy Committee modifies the Financially-Constrained Plan.



Land Use and Transportation

Over the next 25 years, the CHATS study area is expected to add over 161,000 residents. Most of the growth, according to the CHATS land use forecasting methodology based on the comprehensive land use plans of the CHATS member jurisdictions is expected to take place within or near existing municipal boundaries and within or adjacent to the traditional developed areas. Within Charleston County, the growth is expected to occur within the Urban Growth Boundary (UGB) delineated in the 2008 Comprehensive Plan Update. Several sections of the UGB are former industrial facilities near the Downtown Charleston area that are slated for redevelopment, including the Magnolia Development in the "Neck Area" between downtown Charleston and Interstate 526, the Park Circle and Olde North Charleston neighborhoods in North Charleston, and within the former Charleston Navy Yard. The redevelopment of these areas, along with the continued development taking place along the Interstate 26/US 78/ Norfolk Southern Rail corridor, including the development of Ingleside Plantation and continued industrial development (including the expansion of Boeing's facility at the Charleston International Airport)or along the US 17 corridor between West Ashley and Mount Pleasant.

Many of these neighborhoods are, or have the potential to be, in close proximity to transit facilities, community parks, and educational facilities. Both the North Charleston and Mount Pleasant Comprehensive Plans frame this future development in the form of hubs. These hubs, strung along the primary corridors of the region, would be easily adaptable to a mixture of transportation options. With this goal in mind, a number of the communities have adopted language in their comprehensive plans that encourage future development to take place along transit corridors, to integrate a variety of transportation options, and to be development with a mixture of uses, This will help to aid communities in providing viable residential, work, and transportation options not just for drivers, but for all residents across the lifecycle.

A notable exception to this pattern would be the development proposed for the East Edisto area in western Dorchester and Charleston counties, currently home to a variety of silvicultural activities. Between now and 2035, up to 15,000 new homes are expected to be constructed in this area, mostly in Dorchester County sections of East Edisto. In addition, a significant amount of industrial and retail development is proposed for areas of East Edisto along existing major highway corridors (US 17 and US 17A).

Project Descriptions for Recommended Transportation Improvement Projects

As we evaluate the regional transportation system over the next 25 years, it is evident that there will be a greater need for a variety of transportation options in the region. With limitations to new construction including natural and man-made barriers, it will become even more important to protect the integrity of the existing system, and to provide a range of transportation options for residents. This could take several forms, including the expansion of existing roadways, transit improvements, the construction of new roadway alignments, or the creation of new transit options that better utilize existing corridors or waterways.

This document provides a list of proposed improvements specific to key transportation opportunities throughout the region. The list includes projects identified on the previous long-range transportation plan, Charleston County, Berkeley County, and Dorchester County sale tax referendums, and those identified by the general public, by members of the CHATS Study Team, and from members of the CHATS Policy Committee.

Within the Long Range Transportation Plan, there are a number of recommendations for improvements to existing roadway corridors and the creation of new roadway alignments in the CHATS study area. It should be noted that the recommendations emphasize the protection and enhancement of existing roadway corridors through the inclusion of plantable medians, the implementation of complete streets design principles that encourage the utilization of a variety of transportation modes, including walking and biking, and better access management design. In addition, along most of the corridors in the region, improvements that will encourage transit accessibility and mobility are implemented. That is, if an arterial warrants widening or other capacity improvements, a median may be proposed to improve safety, control access, to enhance the corridor aesthetics, improve transit mobility and safety, and improve pedestrian and bicycle safety and accessibility.

The following provides a list of recommended improvements as presented in the Vision Plan resulting from the ranking and prioritization methodology shown in Chapter 10 and 11. Included for each recommended

transportation improvement is information on the projects purpose and need statement. However, the list does not represent the entire universe of improvements recommended in the region. Additional improvements (i.e., collector street connections, intersection laneage, interchange upgrades and operational and spot safety) may be recommended in subsequent chapters or within existing municipal transportation plans and in the Statewide Transportation Improvement Program.

Bacons Bridge Road/Delmar Highway (SC 165)

Purpose and Need Statement: The primary purpose for this project would be to provide for additional capacity along Bacons Bridge Road/Delmar Highway between SC 61 (Ashley River Road) and the Ashley Ridge High School area. A secondary purpose for this project would be to provide for additional safety along the Bacons Bridge corridor, including multi-modal options between the proposed Ashley Ridge community and Ashley Ridge High School, located on SR 165.

Need: As growth related to the proposed East Edisto development takes place, traffic demand in this section of Dorchester County could increase substantially, particularly between Ashley River Road and Ashley Ridge High School adjacent to the proposed Ashley Ridge new town that would be part of East Edisto. In 2009, there were 12 accidents along this corridor, with injuries occurring in three of the accidents. It is important to improve visibility at the intersections in order to provide for the safety of drivers.

Berlin Myers Parkway

The proposed extension of Berlin Myers Parkway from Maple Street to US 17A would connect the proposed Sheep Island Parkway and areas to north and east of Summerville to US 17A and the existing section of the Parkway in the Town of Summerville.

Purpose and Need Statement: The primary purpose of this roadway is to provide system connectivity and system capacity to accommodate travel demand in the Summerville area based the forecasted growth in the number of employment centers located jurisdiction. A secondary purpose for this project would be to improve bicycle and pedestrian accessibility through the northern section of Summerville.

Need: Because of the large amount of proposed investment in this corridor, it is imperative to have a network of roads that would serve this area, including the proposed parkway. The construction of the Berlin Myers Extension will help to limit traffic pressure on US 78 and US 17A in the Summerville area. By 2035, both roadways will be operating with an LOS of F, with traffic along US 78 at over 115% of capacity and traffic along US 17A at over 170% of capacity. At the present time, pedestrian and bicycle connections between the existing neighborhoods along the proposed alignment and the employment centers at either end of the proposed roadway do not exist. The provision of pedestrian and bicycle facilities in this area as part of a roadway project would improve accessibility for non-driving residents to the commercial center along US 17A and the industrial parks near Maple St and US 78.

Commuter Rail Service

Two fixed guideway transit routes have been proposed for inclusion in the regional long range transportation plan. The first corridor extends from the Jedburg Road area to downtown Charleston along the existing Norfolk Southern rail line. There would be between four and seven stops along this corridor. The trains would operate primarily during the morning and afternoon rush hours with limited service during the midday and evening hours. Some minor acquisitions of right of way and improvements to the existing rail line may be required.

The second fixed guideway transit route would extend from Goose Creek area to Downtown Charleston along the existing CSX rail line, extended to Moncks Corner as travel demand dictates. There would be between five and seven stops along this corridor. This route would be similar in scheduling, trains, and right of way and improvement needs to the Norfolk Southern line. . This route could be extended at a future date to the Moncks Corner area to serve the residents of this growing community.

Purpose and Need Statement: The primary purpose for commuter rail within the CHATS study area would serve to improve overall capacity along the congested transportation network adjacent to the rail corridors, particularly during peak travel hours.

As described in earlier items in this section, many of the primary roadway corridors connecting Summerville, Goose Creek and the northern sections of North Charleston to the Neck area and the Charleston peninsula are currently operating at a LOS of F or will be by 2035. Because there is limited right of way available for additional roadway improvements within the Neck Area and along the Interstate 26 corridor, the Charleston region has begun to take a serious look at reviving passenger rail travel along this corridor through a variety of means.

Bus Rapid Transit

Bus Rapid Transit (BRT) is similar to Light Rail in that it provides (relatively) high speed, high frequency service from dedicated stops along a fixed route. The biggest differences between the two are in the type of vehicle used and in the ability to utilize and enhance existing roadway facilities as part of a BRT system instead of requiring new rail lines. There are several options for transit providers in designing a BRT system that balance cost constraints with the ability to provide high-speed service. For the CHATS Study area, five BRT routes were studied. The routes are as follows:

1) Goose Creek to Downtown Charleston, via I-26
2) Rivers Avenue to Downtown Charleston via the Neck area
3) Folly Road from the southern section of James Island to Downtown Charleston via the James Island Connector
4) US 17 from the Oakland Town Center in Mount Pleasant to the MUSC campus
5) From Moncks Corner to Downtown Charleston via the existing Santee Cooper power line easement. This route would also serve the proposed North Charleston Intermodal Transit Center.

The first four routes would utilize existing roadway corridors and would require limited additional resources or significant implementation issues. The fifth route would be on a newly built alignment that would cross through the Charleston Air Force Base.

Purpose and Need Statement: The primary purpose for Bus Rapid Transit service in the Charleston region would serve to improve capacity along the congested transportation network adjacent to the transit corridor, particularly during peak travel hours. A secondary purpose of bus rapid transit would serve to provide transportation infrastructure to support community growth described in the City of Charleston and City of North Charleston's Comprehensive Plans and the BCDCOG's *Our Region, Our Plan*.

Need: As described in earlier items in this section, many of the primary roadway corridors connecting Summerville, Goose Creek and the northern sections of North Charleston to the Neck area and the Charleston Peninsula are currently failing, as is the US 17 corridor on either side of the Charleston Peninsula and along Folly Road on James Island. There is limited right of way available for additional roadway improvements along these corridors, and in many cases, additional capacity improvements are not locally desired. As a result, the Charleston region has begun to take a serious look at providing alternative means of moving residents through these corridors via a series of alternatives. Along the Ashley and Cooper Rivers, a number of large-scale redevelopment projects have been approved that would provide for additional residential, employment, and commercial options within the Neck area and in northern areas of the Charleston Peninsula. Many of the proposed developments, such as the Navy Yard, Magnolia, and the Promenade developments have been proposed to be constructed using elements of New Urbanism, which emphasizes mixed uses, traditional form communities that would better tie into transit than the suburban style development that has taken place in much of the region. With the presence of a dedicated light rail system, development near the transit can take place as a series of nodes along the light rail corridors, allowing for the intensity of development within the corridors to make bus rapid transit a potentially feasible alternative for the region. Additionally, the provision of light rail would serve to provide a motivation for the redevelopment of the US 17 and Folly Road corridors in a more nodal form, rather than reinforcing the strip development that is present along the existing corridor areas.

New Bus Routes

As the region continues to growth, local fixed route bus service is needed to accommodate travel needs through the region. Over the last decade, Summerville, Goose Creek, and Daniel Island has become residential and employment hubs for the Region. New services are needed that correspond with commuter traffic flows throughout the urbanized area and the location of employment centers. Additional needs for new bus service are routes that directly connect regional population centers, such as West Ashley and North Charleston. A specific request received from citizen input was transit service to and from Daniel Island that would better integrate this area into the City and the region. Bus access to Daniel Island could be provided through Mount Pleasant, with an express bus connecting Daniel Island to the K-Mart plaza along Johnnie Dodds Boulevard, or express bus service that would connect Daniel Island to Downtown Charleston and to the Airport area along Interstate 526.

Purpose and Need Statement: The primary purpose of this project would provide a system linkage between employment and residential hubs within the CHATS urbanized area. These areas, including Daniel Island, necessitate local bus service (potentially express bus service based on demand) as demonstrated by congested roadway corridors, supportive land uses, and service area analyses.

Need: In the last decade, Summerville, Goose Creek, and Daniel Island has become residential and employment hubs for the Region. New services are needed that correspond with commuter traffic flows throughout the urbanized area and the location of employment centers. In the case of Daniel Island, it has grown from an uninhabited area along the Cooper and Wando Rivers to a mixed-use community that is part of the City of Charleston with over 5,000 residents. In addition, Daniel Island and the Clements Ferry corridor are home to numerous businesses, and to two of the region's large sports facilities (the Family Circle Cup tennis complex and Blackbaud Stadium). At present, the only direct access from most of the Charleston area to Daniel Island is via Interstate 526, precluding bicycle or pedestrian travel to the island. Because of the population and employment growth in the Charleston-North Charleston Urbanized Area, transit services are needed to provide access for residents to employment centers and provide cost effective strategies to address traffic congestion in the Region.

Cross County Road

Cross County Road provides a connection between Ashley Phosphate and Dorchester Roads. In addition, the corridor is home to a large number of industrial and warehouse facilities.

Purpose and Need Statement: The primary purpose of this project would be to provide additional roadway capacity to serve the future needs of this corridor.

Need: By 2035, this road is expected to accommodate nearly 25,000 vehicles per day, including a large amount of truck traffic.

Clements Ferry Road

Clements Ferry Road is a growing corridor north of the Wando River between SC 41 and Interstate 526. Along its route are several growing subdivisions and a number of warehouse and industrial facilities that rely heavily on this roadway for freight access.

Purpose and Need Statement: The primary purpose of this project is to address capacity concerns along Clements Ferry Road. The secondary purpose of this project would be to provide transportation infrastructure to support community growth as specified in the City of Charleston's Comprehensive Plan.

Need: At present, sections of the roadway to the west of SC 41 are operating at a LOS of F. This will continue into 2035, where the road is projected to operate at over 120% of capacity. Clements Ferry Road serves a number of office and industrial facilities north of the Wando River. Improvements to this corridor should address mobility and accessibility concerns related to businesses in the area.

Dorchester Road Connector
With the growth of businesses near the Charleston International Airport, there has been an increasing demand on existing roadways in this area.

Purpose and Need Statement: The primary purpose of the Dorchester Road Connector would be to improve connectivity and network capacity between Summerville, proposed office and industrial facilities at the southwestern edge of the Charleston International Airport, existing residential communities, and the proposed North Charleston Intermodal Station.

Need: At present, there is limited access to areas to the southwest of the Charleston International Airport. There is only one through east-west road between the Charleston Air Force Base and Interstate 526 (Micheaux Parkway) and no north-south road with a direct connection from Dorchester Road to the proposed North Charleston Intermodal Station. In addition, the residents living in the airport area are limited to using Dorchester Road and Micheaux Parkway to access Charleston International Airport, the Boeing facilities, and other employers in the airport area.

Folly Road
Folly Road serves as the primary north-south roadway across the center of James Island, while connecting the Folly Beach community to the remainder of the Charleston region. There is a large amount of commercial strip development along Folly Road.

Purpose and Need Statement: The primary purpose of this project is to increase capacity on Folly Road through James Island.

Need: Through James Island, there are several areas where congestion is an issue along Folly Road. South of the James Island Connector, the roadway is currently operating at a LOS of F. In addition, the causeway connecting James Island to Folly Beach is projected to operate at a LOS of F by 2035.

Gregorie Ferry Connector
This project involves the new alignment of approximately 2,600 feet of new alignment two-lane curb/gutter roadway. The facility will provide system connectivity linking SC Highway 41 to US Highway 17 and George Browder Road. Approximately 1,250 ft. of the roadway is to be constructed by the developer of Gregorie Ferry Landing.

Purpose and Need Statement: The purpose of the Gregorie Ferry Connector would be to add network connectivity along US Highway 17. It would also serve as an intersection improvement project to correct a roadway deficiency at the intersection of US Highway 17 and Porchers Bluff Road.

Need: At present, SC Highway 41 over 18,000 vehicles per day use the existing two lane roadway, or over 125% of its capacity. The addition of this minor arterial will provide network connectivity to accommodate significant travel demand as development occurs on US Highway 17 corridor. Due to the increased growth in the area and the need to improve facilities to provide safer geometry in the area of SC highway 41, US Highway 17, and Porchers Bluff Road.

Glenn McConnell Parkway Extension – Phase I
This proposed facility will be a major arterial on new location, extending Glenn McConnell Parkway from Bees Ferry Road in the City of Charleston to US Highway 17 Alternative.

Purpose and Need Statement: The primary purpose of the proposed roadway would serve to provide an alternative to the congested Interstate 26 corridor for residents of Summerville, a principal city in the region according to the US Census Bureau, and the surrounding areas. A secondary purpose of the Parkway would be to protect the scenic nature of the Ashley River area between Interstate 526 and Bacons Bridge Road by diverting traffic from the existing SC 61 to the Glenn McConnell Parkway. A secondary purpose of the Glenn McConnell Parkway would serve to provide a safer evacuation route for residents of the region.

Need: Sections of the existing SC 61 between Interstate 526 and Paul Cantrell Boulevard are operating at a LOS of F. In addition, sections of Dorchester Road and Interstate 26 on the north side of the Ashley River are also operating above their existing capacity. The parkway would also serve as the main corridor into the Charleston area for sections of the proposed East Edisto development located in Dorchester County. By 2035, the Parkway is expected to carry between 18,000 and 21,000 vehicles a day. At present, Ashley River Road (SC 61) passes through several miles of plantation lands and scenic lowland areas adjacent to the Ashley River, a state scenic river. Because of this, the current roadway is unable to be widened to accommodate additional traffic demand created in recent years. The new alignment would allow SC 61 to better serve as a relief valve to Interstate 26, while protecting the scenic nature of the Ashley River Road corridor.

Glenn McConnell Parkway Extension – Phase II
Purpose and Need Statement: The purpose of the Glenn McConnell Parkway-Phase II would be to add network connectivity on the western side of the Town of Summerville to Old Orangeburg Rd. It would also serve as an evacuation route for residents of the region.

Need: At present, SC 61 serves as a designated evacuation route for the region. Because of the capacity constrains and the numerous live oaks located in close proximity to the corridor, in a large-scale storm event, the existing roadway could be blocked by falling tree limbs, limiting the ability of residents evacuate the region in an expedient manner. The new alignment would be located further inland where less vegetation is present, allowing more residents to utilize a SC 61 to evacuate safely.

International Boulevard
International Boulevard connects Interstate 526 with the Charleston International Airport and serves as a commuter route to the residential area to the north.

Purpose and Need Statement: The primary purpose of improvements along this corridor would be to improve capacity between Interstate 526 and the commuting pattern to points north, including the Charleston International Airport.

Need: International Boulevard between Interstate 526 and Micheaux Parkway is projected to operate at a LOS of F by 2035, with a projected 58,000 vehicles per day expected by 2035.

Interstate 26 Widening (Port Access Road to I-526)

Purpose and Need Statement: The Primary purpose of this project would be to provide additional traffic capacity through the Neck area of North Charleston. The secondary purpose of this project is to improve transportation infrastructure to support the creation of new facilities at the Port of Charleston. Operational strategies, such as HOV lanes and transit services shall be evaluated in the project development phase.

Need: With the continued growth of the Charleston region and the continued development of the Port of Charleston, the need to provide for accessibility for port facility traffic is important for the region. By 2035, approximately 100,000 vehicles per day, including approximately 12,000 trucks per day are projected to travel along the corridor. With the proposed construction of additional port facilities on the former Navy Yard in North Charleston, additional truck traffic will be attracted to Interstate 26 and Interstate 526 between the Port and existing and future warehouse and industrial facilities located along the Interstate 26 corridor in Jedburg Road area and in other areas of the region.

Interstate 26 Interchange with Interstate 526

Purpose and Need Statement: The primary purpose of this project is to improve existing roadway deficiencies at the intersection of Interstate 526 and Interstate 26. Operational strategies, such as HOV lanes and transit services shall be evaluated in the project development phase.

Need: One of the main bottlenecks of the existing regional transportation network is the Interstate 26 interchange with Interstate 526. The existing freight traffic through this corridor creates a great deal of congestion on both roadways, particularly during peak traffic periods. Coupled with the substandard geometries of the exit ramps at this intersection, there are frequent accidents and traffic backups in the vicinity of the interchange, with 72 accidents taking place in 2009, including 14 injuries.

Jedburg Road

Jedburg Road is a key corridor connecting the northern end of Summerville to Interstate 26 and points to the north and east in Berkeley County.

Purpose and Need Statement: The primary purpose of this project would be to provide additional capacity along the Jedburg Road corridor. A secondary purpose of this project would be to provide transportation infrastructure to promote growth and development in the Jedburg Commerce Park and the adjacent industrial, office, and warehouse facilities currently underway in the Sheep Island/Jedburg Road area.

Need: With continued development of the numerous employment centers in the Jedburg Road area, by 2035, it is estimated that between 30,000 and 60,000 vehicles per day will utilize Jedburg Road. Between US 78 at the western end of Summerville and Wildgame Road, north of Interstate 26, development in the area is characterized by a number of existing or approved and proposed industrial and warehouse facilities. The Jedburg Commerce Park is a large industrial/ warehouse facility housing numerous businesses, most notably the regional distribution facilities for Piggly Wiggly. In addition, the Rockefeller Free Trade Zone and numerous other existing and proposed industrial facilities that would total over 5 million square feet in gross lease area are located in this area. Improvements to Jedburg Road would provide for greater access for employees and truck traffic accessing this district.

Light Rail Transit Service

Another option that may be beneficial for the CHATS study area as the region grows is light rail. Light rail lines provide more frequent service than commuter rail with a shorter space between stops (approximately 1 mile apart in suburban areas and ½ miles within urbanized areas, in comparison to the 2 to 5 miles between commuter rail stops). Because of the type of trains that are typically used and the frequency of stops that are required, any light rail line would be required to construct a new line, either within existing right of way areas or within areas where light rail can be easily put into place. Additionally, new station facilities, including terminals or waiting areas and parking facilities would be required along the routes.

There are four light rail lines that are proposed for the CHATS study area. Three of the lines would run roughly parallel to the Interstate 26 corridor, with the fourth line located adjacent to US 17 across the City of Charleston and the Town of Mount Pleasant. The routes are as follows:

1) Summerville to Downtown Charleston, following a similar route to the Summerville Commuter Rail Line
2) Rivers Avenue from Hanahan to Downtown Charleston, following a similar route to the Goose Creek Commuter Rail Line. This could be extended to Goose Creek depending on demand.
3) Charleston International Airport to Downtown Charleston. This route would also serve the proposed North Charleston Intermodal Center.
4) Mount Pleasant Town Center area to Citadel Mall area along US 17.

Purpose and Need Statement: The primary purpose for light rail service in the Charleston region would serve to improve capacity along the congested transportation network adjacent to the rail corridors, particularly during peak travel hours. A secondary purpose of light rail service would serve to provide transportation infrastructure to support community growth in the City of Charleston and City of North Charleston's Comprehensive Plans.

Need: As described in earlier items in this section, many of the primary roadway corridors connecting Summerville, Goose Creek and the northern sections of North Charleston to the Neck area and the Charleston Peninsula are currently operating at a LOS of F, as are sections of the US 17 corridor in both Mount Pleasant and West Ashley. There is limited right of way available for additional roadway

improvements within both corridors. As a result, the Charleston region has begun to take a serious look at improving mobility along these corridors through a variety of means. Along the Ashley and Cooper Rivers, a number of large-scale redevelopment projects have been approved that would provide for new residential, employment, retail, and service options within the Neck area encompassing parts of North Charleston and Charleston. Many of the proposed developments, such as the Navy Yard, Magnolia, and the Promenade developments are intended to be constructed using elements of New Urbanism, which emphasizes traditional form communities comprising of mixed uses. Communities built in this way (similar to early 20th century streetcar suburbs and urban neighborhoods) encourage the utilization of transit substantially more than the suburban style development that has taken place in much of the CHATS study area and the US since the early 1950's. With the presence of a dedicated light rail system, development near the rail areas can take place as a series of nodes along the light rail corridors, allowing for the higher intensity of development within the corridors to make light rail a potentially feasible alternative. Additionally, the provision of light rail would serve to provide a motivation for the redevelopment of the US 17 corridor in a more nodal form, as described in the Mount Pleasant Comprehensive Plan, rather than reinforcing the existing strip development currently present.

Long Point Road
Long Pond Road extends from US 17 to its terminus at the Wando Welch Terminal in Mount Pleasant, serving as a major collector facilities with access to Interstate 526 for residents of the town.

Purpose and Need Statement: The primary purpose of this project is to provide additional capacity to provide relief to the US 17 corridor between Interstate 526 and the Isle of Palms Connector.

Need: While roadwork in recent years has been done to improve this corridor, existing conditions along Long Point Road, particularly near the Boone Hall Plantation, demonstrate the issues that are present in this area. At present, Long Point Road is operating at a LOS of F. By 2035, the road is projected to be operating at 155% of the existing capacity.

Main Road
Main Road is the one of the two primary north-south roadways through Johns Island, connecting the western end of Johns Island and Wadmalaw Island to the mainland and US 17.

Purpose and Need Statement: The primary purpose of improvements along the Main Road corridor would be to provide additional roadway accessibility and capacity to western sections of Johns Island.

Need: Main Road is the only roadway that directly connects Johns Island to mainland areas of the Charleston region. By 2035, sections of the roadway between River Road and US 17 are projected to be operating at a LOS of F or at over 130% of the existing roadway capacity. Sections of the roadway between the CSX rail line and US 17 are currently operating at a LOS of F.

Mark Clark Expressway Extension
The Mark Clark Expressway (Interstate 526) extension would provide a direct connection between the current terminus of the Expressway at Savannah Highway and the James Island Connector via Johns Island and through a section of James Island.

Purpose and Need Statement: The primary purpose of the Mark Clark Expressway Project is to increase the capacity of the regional transportation system, improve safety and enhance mobility to and from the West Ashley, Johns Island and James Island areas of Charleston.

Need: At present, both Savannah Highway (US 17) and St. Andrews Boulevard (SC 61) are operating at a LOS of F. By 2035, Savannah Highway would be carrying 127% of capacity while St. Andrews Blvd would be carrying an estimated 140% of capacity. Projected 2035 traffic estimates are expected to range between 15,000 and 24,000 vehicles a day (vpd) along this new facility. Based on the travel model results, the proposed section of Mark Clark between Maybank Road and US 17 is expected to carry a higher level of traffic (i.e., 24,000 vpd) than the section between Maybank Road and the James Island Connector.

Micheaux Parkway
Micheaux Parkway connects Dorchester Road with the Charleston International Airport, and is used as a commuter corridor for travelers from Summerville and western sections of North Charleston.

Purpose and Need Statement: The primary purpose of the project would be to provide for additional capacity between Dorchester Road and International Boulevard.

Need: With the continued residential and industrial growth along the Dorchester Road corridor and near Charleston International Airport, including the recent construction of the Boeing plant, additional demand is expected along this corridor, with an estimated 20,000 vehicles per day expected to use this road by 2035. The road is currently operating at a LOS of F or 120% of capacity. By 2035, this is projected to increase to over 160%.

Miles Jamison Road
Miles Jamison Road functions as a urban collector road between Old Trolley and Ladson Roads in the Ladson area and in the Town of Summerville.

Purpose and Need Statement: The primary purpose of this project is to provide a operational improvement on the Miles Jamison Road corridor. A secondary purpose of the project would be to improve multi-modal accessibility within the Summerville area, as proposed in the Dorchester County Comprehensive Plan.

Need: Traffic demand is expected to increase along Miles Jamison Road as residential and commercial development continues in the Summerville area. By 2035, this road is projected to carry approximately 20,000 vehicles a day and be operating at a LOS of F. At the present time, there are no bicycle or pedestrian facilities along this corridor, limiting accessibility for non auto users to nearby shops and employers.

Montague Avenue
Montague Avenue is the primary connection from Interstate 26 to Center Pointe and the North Charleston Coliseum complex.

Purpose and Need Statement: The primary purpose of the project is to provide additional roadway capacity along Montague Avenue between Interstate 26 and International Boulevard in North Charleston.

Need: In recent years, the construction of the Center Pointe development, the growth of the Charleston International Airport, and the continued expansion of the North Charleston Coliseum complex has increased traffic demand along Montague Avenue, the main access point to this area for traffic coming from downtown Charleston. At present, sections of this corridor are operating at a LOS of F. By 2035, over 43,000 vehicles per day are expected along this corridor.

Mount Pleasant Roadway System
The Mount Pleasant Roadway System would create a series of roadways that would provide for a transportation network between Porchers Bluff Road and Six Mile Road. These roadways would connect to a future extension of Sweetgrass Basket Parkway, to Rifle Range Road, and to US 17. A secondary purpose of this project would be to provide system linkages to an infill area of Mount Pleasant. This system of projects has the potential to be implemented through multiple individual improvements.

Purpose and Need Statement: The primary purpose of this roadway would be to improve capacity along the US 17 corridor by creating a network of roadways.

Need: At present, the section of US 17 between Long Point Road and SC 41 is operating at a LOS of F. The creation of a network of roadways, including the roadways that would be part of this network are anticipated provide relief to this area, as discussed in the Mount Pleasant Transportation Study. At present, there are few linkages between Rifle Range Road and US 17. Travelers are required to drive along either of the primary roadways to gain access to this area. The provision of a network of roadways will help to improve access through this section of Mount Pleasant.

Old Mount Holly Road
Old Mount Holly Road functions as an urban collector, connecting US 52 to St. James Avenue (US 176). However, with the implementation of the Henry Brown Boulevard extension project, this facility becomes part of an arterial system for the Goose Creek area.

Purpose and Need Statement: The primary purpose of this project is to provide a system linkage through the Goose Creek area, connecting with the Henry Brown Boulevard extension at the northern end of the city. A secondary purpose of the project would be to provide additional bicycle and pedestrian faculties for residents of the Goose Creek area and for the CHATS study area, as proposed in the Goose Creek Comprehensive Plan.

Need: At the present time, much of the traffic from the Goose Creek area towards Charleston moves through the center of Goose Creek along St. James Boulevard to US 52 and into Charleston County. With the completion of the proposed Henry Brown Boulevard extension, a significant percentage of traffic would utilize Old Mount Holly Road to connect to the Henry Brown Boulevard Extension at US 52 and to areas of North Charleston, Hanahan, and lower Goose Creek, including to the Naval Weapons Station. As an integral part of this system, Old Mount Holly Road is projected to carry approximately 18,000 to 20,000 vehicles a day by 2035. At the present time, there are no bicycle or pedestrian faculties that connect the northern edge of Goose Creek to the US 52 corridor and to the Marguerite Brown Municipal Center, home to City Hall and a variety of municipal facilities. Bicycle and pedestrian facilities along the proposed roadway would allow for improved access to the Marguerite Brown Governmental Center and other offices and businesses in the northern section of Goose Creek.

Old Orangeburg Road
New residential development continues to put pressure on Old Orangeburg Road between Dorchester and Mallard Roads in the Summerville area. This 2-lane minor arterial provides service between Dorchester Road and I-26 via Mallard Road and Jedburg Road.

Purpose and Need Statement: The primary purpose of this project would be to provide for additional transportation capacity along the Old Orangeburg Road corridor. A secondary purpose for this corridor would be to provide for multi-modal options along this corridor.

Need: With the large amount of residential and commercial growth within the southwestern section of the Summerville area in recent years, the need for a relief valve for US 17A in Summerville has become acute. In addition, with the future development of several industrial parks in the vicinity of Exit 199, including the expansion of the Jedburg Industrial Park and the Mead Westvaco site near the proposed Sheep Island Parkway, additional demand will be placed on the existing two lane roadway. This will be especially true if there is direct access from this roadway to the proposed Glenn McConnell Parkway, providing greater accessibility for residents of areas north of Summerville to the Charleston Peninsula. If this happens, the use of Orangeburg Road as a connector to the Parkway from Summerville would raise demand to the point where the roadway would be operating at a LOS of F by 2035. At present, there are no sidewalks or bicycle facilities along much of this corridor. With the increased development that has taken place in the Knightsville area, particularly in the vicinity of Central Avenue and Old Orangeburg Road, the need to provide safe multi-modal connections is of great importance for residents and businesses along this corridor. In particular, there are no direct sidewalk connections to Knightsville Elementary School, located near the intersection of Old Orangeburg Rd. and Central Ave, and to the shopping centers located along the Old Orangeburg Road corridor, particularly near the above stated intersection. By providing additional connections to schools and retail centers, it is anticipated that localized auto trips along Old Orangeburg Road will be lessened as pedestrian and bicycle use increases.

Park West Boulevard
Park West Boulevard provides a connection between SC Highway 41 and US Highway 17. It serves as a minor arterial that connects numerous neighborhoods in the Town of Mount Pleasant, positioning itself as a vital connector in the local street network

Purpose and Need Statement: The primary purpose of this project would be to provide additional roadway capacity to accommodate current and future travel demands along this corridor. This corridor also accommodates a multitude of bicycle and pedestrian trips that will need to be designed for using the Complete Street principles.

Need: The corridor is capacity constrained under current conditions. The presence of school facilities exacerbates the peak hour congestion issues.

Red Bank Road
Red Bank Road is a primary access roadway to the Charleston Naval Weapons Station from Interstate 26 and the Goose Creek areas. The section between Henry Brown Boulevard and Bushy Park Rd is on the property of the Charleston Naval Weapons Station but is maintained by the South Carolina Department of Transportation.

Purpose and Need Statement: The primary purpose of this project would be to provide better accessibility to the Naval Weapons Station and the Bushy Park Industrial Park for residents of Goose Creek and other freight movements throughout the region.

Need: With the continued growth of the Naval Weapons Station and associated businesses, there is an increasing demand along this corridor, particularity the turning movement at the gate. With the growth of the Naval Weapons Station as part of Joint Base Charleston (JBC), the Naval Weapons Station has recommended that Red Bank Road have additional capacity as part of the 2008 Joint Land Use Study for JBC.

SC Highway 41
The section of SC Hwy. 41 between US 17 and the Wando River has seen a great deal of development pressure in recent years as growth in the Town of Mount Pleasant has expanded into this area.

Purpose and Need Statement: The primary purpose of this project is to provide congestion relief for vehicle travel to and from the subdivisions located along SC 41 in Mount Pleasant. The secondary purpose of the roadway improvement is to enhance the safety of the region by improving the SC 41 evacuation route for residents east of the Cooper River.

Need: At present, over 18,000 vehicles per day use the existing two lane roadway, or over 125% of capacity, earning SC Hwy 41 a LOS grade of F mainly at peak commute hours. By 2035, this is expected to increase to over 28,000 trips per day and severely over capacity. The project should be divided into three sections to define the project purpose, from US 17 to Joe Rouse Road, Joe Rouse Road to Dunes West Boulevard, and the remaining section from Dunes West Boulevard to the Wando River bridge. This minor arterial will experience significant traffic demand as development occurs on each end of the corridor. Due to the increased growth in the area and the need to provide improved facilities for evacuation, an integrated, context-sensitive solution will be required. Specifically, the second section presented above should be three-lane cross-section based on community input and an improved two-lane section for the third section identified.

Sea Island Parkway
The Sea Island Parkway would provide a connection between Maybank Highway and the growing Kiawah and Seabrook Island areas via Betsy Kerrison Parkway on Johns Island.

Purpose and Need Statement: The primary purpose for this roadway would be to provide congestion relief and network capacity along River Road and Bohicket Road on Johns Island that would also protect the scenic nature of the two roadways.

Need: Both Bohicket Road and River Road are scenic roadways that pass through tree-lined areas of Johns Island with live oaks in close proximity to the right of way in these areas. With increasing numbers of seasonal residents residing on the two islands (and the likelihood that a significant number of these homes would convert to year-round use), improving accessibility and safety to the mainland areas is of importance to residents of these areas. By 2035, Bohicket Road between Maybank Highway and Edenvale Road is projected to be operating at a LOS of F.

Sheep Island Parkway and Sheep Island Parkway Interchange with Interstate 26
Along with Jedburg Road, the proposed Sheep Island Parkway would serve as a connector road between the Cane Bay and Carnes Crossroads areas and Interstate 26 and Summerville.

Purpose and Need Statement: The primary purpose of this project would be to provide greater mobility between the growth areas of Summerville, the approved and proposed industrial and employment centers in the vicinity of Interstate 26, and the Cane Bay area.

Need: Due to continued growth in this area, it is estimated that by 2035, nearly 25,000 vehicles per day will be travelling along the Sheep Island Road corridor, with a substantial amount of this traffic consisting of truck traffic from the numerous industrial parks proposed in this area. As part of this project, a full interchange is proposed for the intersection of Interstate 26 and the proposed Sheep Island Parkway.

South Aviation Avenue
A key corridor that would provide relief to Interstate 26 is S. Aviation Avenue, which currently provides a loop around the airport, connecting the Charleston Air Force Base to Interstate 26 and the southern section of the airport.

Purpose and Need Statement: The primary purpose of this project would be to improve mobility and accessibility to the Charleston International Airport and the Charleston Air Force Base (part of Joint Base Charleston) b by providing an alternative route for vehicle traffic moving through the area.

Need: At present, Ashley Phosphate Road, Interstate 26, and International Boulevard are operating at a LOS of F, with Interstate 26 projected to carry over 180,000 vehicles per day by 2035. Additionally, by 2035, Interstate 526 between Interstate 26 and International Boulevard is projected to operate at a LOS of F. With the opening of the Boeing manufacturing plant adjacent to the Charleston International Airport and the opening of the Palmetto Commerce Parkway north of Ashley Phosphate Road, the need to improve connectivity along this corridor is imperative. By providing for direct access to Aviation Avenue from Ashley Phosphate Road, truck traffic accessing both Boeing and the Charleston Air Force Base will be more likely to use this route, lessening impacts to sections of Interstate 26 that currently is being used by over 110,000 vehicles per day and to the interchange at Interstates 26 and 526 that is currently operating at a LOS of F.

Streetscaping Projects

Another goal of the LRTP is to improve transportation options through the downtown areas of the various communities within the CHATS study area. One means of doing so is through streetscape projects that act to prioritize bicycle and pedestrian travel through downtown areas. As part of the LRTP there were two streetscape projects that were assessed:

1) Coleman Boulevard and Ben Sawyer Boulevard in Mount Pleasant
2) Lincolnville Road and Lincoln Avenue in Lincolnville.

Each of these projects would provide beautification for downtown areas as well as new sidewalk and bicycle facilities within these areas. Combined with facade improvements and infill mixed-use construction, it is anticipated that these downtown areas would benefit from these improvements. Projects of this type are consistent with the Complete Streets funding category as presented in Chapter 11.

Purpose and Need Statement: The primary purpose of the streetscaping projects is to address safety concerns along these corridors.

Need: Both Lincolnville Road and Coleman Road have existing, yet different safety concerns that the streetscaping projects would help address.

Lincolnville Road connects a largely rural community (Lincolnville) to the largely suburban areas that surround it, including Ladson and Summerville. Much of the stretch of Lincolnville Road is unlit and there are no sidewalks or bicycle facilities present, requiring residents to walk either on the pavement or along the minimal shoulder area that is currently in place.

Coleman Boulevard passes through a heavily travelled section of Mount Pleasant, connecting Downtown Charleston with downtown Mount Pleasant and Sullivan's Island. Because of the high traffic and design that has traditionally favored mid to high-speed auto travel, there are frequent accidents (110 in 2009, resulting in 32 injuries and 1 death) along this corridor.

Sweetgrass Basket Parkway

The Sweatgrass Basket Parkway Extension would be located between Porchers Bluff Road and Six Mile Road, connecting to the existing Sweetgrass Basket Parkway at Six Mile Road.

Purpose and Need Statement: The primary purpose of this roadway would be to improve capacity along the US 17 corridor by creating a network of roadways. The Sweatgrass Basket Parkway Extension would be part of this network. A secondary purpose of this project would be to improve bicycle and pedestrian connectivity through this section of Mount Pleasant and to the region.

Need: At present, the section of US 17 between Long Point Road and SC 41 is operating at a LOS of F. The creation of a series of roadways, including an extension to Sweetgrass Basket Parkway/ Hungryneck Boulevard would provide relief to this area, as discussed in the Mount Pleasant Transportation Study. At present, pedestrian and bicycle connectivity through this corridor is limited, with only the most experienced or needy walkers and riders utilizing the US 17 corridor. Additionally, according to the Mount Pleasant Transportation Study and previous planning efforts at the regional level, this section of Sweetgrass Basket Parkway would serve as part of the East Coast Greenway, a series of bicycle trails and corridors extending from Maine to Florida.

US 17A (North Main St.)

US 17A (North Main Street) in Summerville is the primary access for residents of Summerville to Interstate 26 and towards Goose Creek and Moncks Corner. This section of North Main St. also passes by several large shopping centers, including Azalea Square and North Main Market.

Purpose and Need Statement: The primary purpose of this project would be to provide operational improvements on US 17A between Interstate 26 and the Berlin Myers Parkway in the Town of Summerville. A parallel corridor may be required to achieve the desired congestion relief.

Need: Because of the continued growth in the Summerville and Goose Creek areas and the expansion of retail options along US 17A (North Main Street) near Exit 199 on Interstate 26, increased demand will be placed on existing roadways, with over 66,000 vehicles per day expected in the vicinity of Exit 199 by 2035.

US 52 and US 176 Intersection

The intersection of US 52 (Goose Creek Boulevard) and US 176 (St. James Boulevard/Red Bank Road) is the gateway to the Goose Creek area. US 52 is the primary roadway from the Goose Creek and Moncks Corner area to the greater Charleston Region, while US 176 and Red Bank Road serve as the primary access

corridor to the Charleston Naval Weapons Station for the Goose Creek, Summerville, and Moncks Corner areas.

Purpose and Need Statement: The primary purpose of this project is to improve capacity along the US 52 corridor, particularly in the vicinity of US 176. To address safety concerns at the intersection of US 52 and US 176.

Need: Because of the heavy congestion at this intersection (nearly 100,000 vehicles per day by 2035), the need for additional traffic mitigation is necessary. Additionally, the intersection of US 176 and US 52 and the section of US 52 from US 78 to US 176 are operating at a LOS of F. The intersection of US 52 and US 176 is one of the most dangerous intersections in the BCD region. In 2009, there were 108 accidents within a ¼-mile radius of this intersection, including 38 injuries. Improvements at this intersection would serve to provide a safer means of access through this corridor.

US 17A West of Summerville

The section of US 17A west of Summerville between SC 642 and SC 61 serves as a primary evacuation route for people living in West Ashley and areas west of the Ashley River in Dorchester County. At present over 10,000 vehicles including over 1,400 trucks per day are using this corridor. The secondary purpose of the project would serve to provide transportation infrastructure to support community development.

Purpose and Need Statement: The primary purpose of the project would serve to increase capacity along US 17A west of the Ashley River

Need: By 2035, because of the growth of the Summerville area and the proposed East Edisto development, US 17A will be operating at a LOS of F or approximately 150 % of the capacity at the current LOS. Over 31,000 vehicles per day are anticipated to use this section of US 17A by 2035. With the proposed redevelopment of existing forestlands in the Clubhouse area by Mead Westvaco as part of East Edisto, the need for improved roadways to serve the proposed office and residential communities is a priority for the region. Even without the proposed development, the roadway will be deficient by 2035 due to projected regional growth and traffic moving between Walterboro and Summerville.

Waterborne Transit

With its large harbor and location at the confluence of the Ashley and Cooper Rivers, Charleston is in a position to implement a variety of waterborne transit routes within the BCD study area. These routes would run primarily during peak commuting hours and provide an alternative for travelers into the downtown Charleston area while limiting additional demands on constrained roadways and parking facilities in the downtown area. The following routes proposed to assess their accommodation of travel demand:

1) Daniel Island to Downtown Charleston
2) Fort Johnson (James Island) to Downtown Charleston
3) Patriots Point in Mount Pleasant to Downtown Charleston
4) North Charleston to Downtown Charleston

For each of the routes, capital costs would include new boats that have a smaller capacity (approximately 50 passengers, as compared to the 150 passengers that the existing fleet holds) and are faster (top speeds of 25-30 knots, compared to the 10 knots per hour of the existing fleet) than existing boats used for tourist activities such as harbor tours and to provide access to Fort Sumter. These boats, if operated by private concerns, could potentially be used for these activities during off-peak times, either from the existing tour boat access points or from the localized access points where ferry service would commence.

Purpose and Need Statement: The primary purpose for waterborne transit service in the Charleston region would serve to improve capacity along the congested transportation network adjacent to the transit corridor, particularly during peak travel hours.

Need: As described in earlier items in this section, many of the primary roadway corridors connecting Summerville, Goose Creek and the northern sections of North Charleston to the Neck area and the Charleston Peninsula are currently operating at a LOS of F. This is also the case along the US 17 corridor on either side of the Charleston Peninsula, on sections of Folly Road on James Island, and where the James Island Connector merges into the Charleston street network near MUSC. There is limited right of way available for additional roadway improvements along these corridors and, in many cases, additional capacity improvements are not locally desired. As a result, the Charleston region has begun to take a serious look at providing alternative means of moving residents through these corridors via a series of alternatives. Because of the proximity of employment centers in the Charleston Peninsula area to the Ashley and Cooper Rivers and the numerous potential access points in neighborhood areas, waterborne transportation is being explored as an alternative for the region.

Access Management

As development continues to occur along major highways and prominent corridors, protecting the through capacity of these corridors will be increasingly important. A number of roadways in the BCD region are reaching or already have reached the practical limits of widening and major improvement. Other corridors can be enhanced with capacity improvements, but the cost of doing so is prohibitive or controversial.

Development already located along roadways is unlikely to willingly remove points of access without a comprehensive corridor plan. Meanwhile, new development will continue to locate along roadways and seek direct driveway access. The increasing number of driveways and intersections will create more points of conflict; create additional traffic congestion and safety concerns that effectively reduce the through capacity of many of the most important travel corridors. Implementing access management policies and constructing measures has the potential to create a balance between the need for access to the transportation system and the desire to protect the mobility of major corridors.

Corridor and Intersection Mitigation Measures

With minor improvements or direct changes to driver behavior, more efficient use can be made of the existing transportation system. Minor improvements may include the construction of additional turn lanes, installation of updated or advanced signal equipment, installation of intelligent transportation systems, and identification of alternative travel patterns. Nodal type development with a mixture of land uses will serves a mitigation measure.

- **Adaptive signal control**—involves continuously collecting (automated) intersection traffic volumes and using the volumes to alter signal timing and phasing to best accommodate real-time traffic volumes. Adaptive signal control can increase isolated intersection capacity as well as improve overall corridor mobility by up to twenty percent during off-peak periods and ten percent during peak periods.

  Approximate construction cost: $250,000 per system and $10,000 per intersection in addition to 25% of capital costs in training, etc.

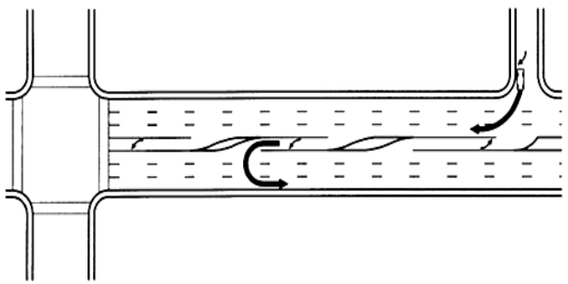
- **CCTV traffic monitoring—**Closed Circuit Television (CCTV) cameras are primarily used on interstate facilities and major arterials to provide visual traffic volume and flow information to traffic management or monitoring centers. These centers use this information to deploy incident response patrols/equipment and to provide roadway travel (delay) information to motorists. By having visual roadway information, traffic management centers are able to identify incidents quickly and respond appropriately and efficiently, helping to reduce the effect of incidents on a single location or on multiple roadways.

  Approximate construction cost: $20,000 per location

- **Non-traversable median—** these features are raised or depressed cross section elements that physically separate opposing traffic flows. Inclusion in a new cross section or retrofit of an existing cross section should be considered for some multi-lane arterials (general) and for multi-lane roadways with high pedestrian volumes, high collision rates, or in locations where aesthetics are a priority. As these treatments are considered, sufficient spacing and locations for U- and left-turn bays must are identified.

  - *Advantages*—increased safety and capacity by separating opposing vehicle flows, providing space for pedestrians to find refuge, and restricting turning movements to locations with appropriate turn lanes
  - *Disadvantages*—potential for increased emergency vehicle response time (indirect routes to some destinations), inconvenience, increased travel distance for some movements and potential opposition from the general public and affected property owners.

  Approximate construction cost: variable



- **Median U-turn treatment—**these treatments involve prohibiting or preventing minor street left turns at signalized intersections. Instead, these turns are made by first making a right-turn and then making a U-turn at a nearby median opening. These treatments can increase safety and efficiency of roadway corridors with high volumes of through traffic, but should not be used where there is not sufficient space available for the provision of U-turn movements. The location of U-turn bays must consider weaving distance, but also not contribute to excessive travel distance.

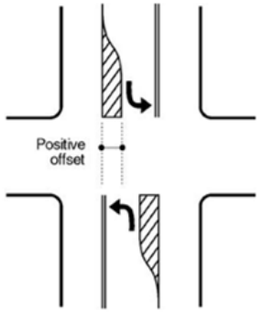
- *Advantages*—reduced delay for major intersection movements, potential for better two-way traffic progression (major and minor street), fewer stops for through traffic, and fewer points of conflict (for pedestrians and vehicles) at intersections.
- *Disadvantages*—increased delay for some turning movements, increased travel distance, increased travel time for minor street left turns, and driver confusion.

Approximate construction cost: $50,000 - $60,000 per median opening

- **One-way frontage roads and side street connectivity—** many older major roadway corridors have two-way service roads along both sides of the street. A local example is Johnnie Dodds Boulevard Mount Pleasant Converting these service roads to one-way with slip ramps has the potential to improve their safety and efficiency—decreasing the number of intersection conflict points from 96 (two-way) to 36 (one-way) at minor road intersections and also reducing confusion at intersections. Street connectivity involves establishing a network of streets that forms a grid pattern, providing multiple routes and connections to get to origin and destination points. A minor street network that makes connections between parcels can serve shorter trips and increase the capacity of the major thoroughfare. FHWA includes this type of project in its list of valid project purpose statements for the NEPA project scoping process.

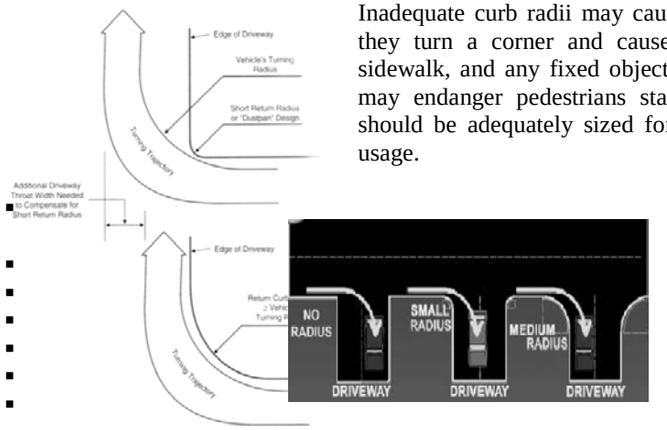
Approximate construction cost: $1,000,000 per mile

- **Offset left turn treatment—** exclusive left turn lanes at intersections are generally configured to the right of one another, which causes opposing left turning vehicles to block one another's forward visibility. An offset left turn treatment involves shifting the left turn lanes to the left, adjacent to the innermost lane of oncoming through traffic. In cases where permissive left turn phasing is used, this treatment can improve efficiency by reducing crossing and exposure time and distance for left-turning vehicles. In addition, the positive off-set improves sight distance and may improve gap recognition. Where there is sufficient median width, this treatment can be easily retrofit. Where there is not sufficient right-of-way width, the construction of this treatment can be difficult and costly.



Approximate construction cost: variable

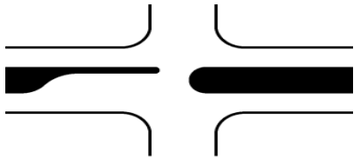
- **Intersection and driveway curb radii**—locations with inadequate curb radii have the potential to necessitate that turning vehicles use opposing travel lanes to complete their turning movement. Inadequate curb radii may cause vehicles to "mount the curb" as they turn a corner and cause damage to the curb and gutter, sidewalk, and any fixed objects located on the corner. This also may endanger pedestrians standing on the corner. Curb radii should be adequately sized for area context and likely vehicular usage.



- **Emergency vehicle/Transit vehicle preemption—**this involves an oncoming emergency or other suitably equipped vehicle changing the indication—to green—of a traffic signal to favor the direction of desired travel. Preemption improves emergency vehicle response time, reduces vehicular lane and roadway blockages, and improves the safety of the responders by stopping conflicting movements.

Approximate construction cost: $5,000-$7,000 per intersection plus $2,000 per equipped vehicle

- **Left-turn storage bays**—where possible, exclusive left-turn lanes/bays should be constructed to provide adequate storage space for turning vehicles, exclusive of through traffic. The provision of these bays reduces vehicle delay related to waiting turning vehicles and will decrease the frequency of rear-end and other collisions attributable to lane blockages.

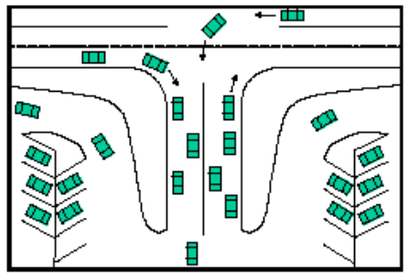


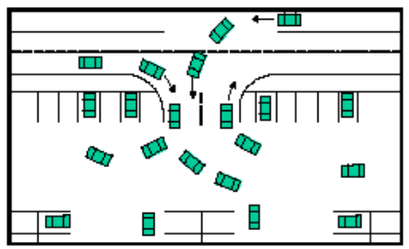
In some cases turn bays/lanes can be constructed within an existing median, in other cases, additional right-of-way is required and construction may be more costly.

- **Minor street approach improvements**—at signalized intersections, minor street vehicular volumes and associated delays may require that a disproportionate amount of green time be allocated to the minor street, contributing to higher than desired main street delay. Often, with laneage

improvements to the minor street approaches, such as an additional left-turn lane or right-turn lane, signal timing can be re-allocated and optimized.

Site Access Mitigation Measures



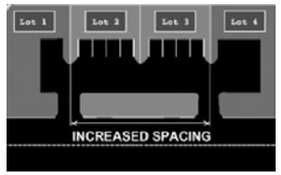


Site driveways and intersections should be configured to minimize negative effects on the adjacent public street network. This can be accomplished through good site design and by limiting the number of new points of access along a roadway.

- **Driveway throat length**—is the distance from the edge of the public street to the first internal site intersection. An adequate separation should be provided (minimum 200 feet) to prevent internal site operations from affecting an adjacent public street. (Approximate construction cost: varies and is usually the responsibility of private development)

- **Number of driveways**—in many cases, new development occurs adjacent to an existing site or adjacent to another new development. In these cases, driveway permit applicants should be encouraged to seek cross access easements/agreements (from an existing adjacent property) or coordinate with an adjacent proposed development to create interconnected internal circulation systems and shared-use external driveways. (Approximate construction cost: varies and is usually the responsibility of private development)

- **Driveway placement/relocation—**driveways located in close proximity to intersections create and contribute to operational and safety issues. These include intersections and driveway blockages, increased points of conflict, frequent/unexpected stops in the through travel lanes, and driver confusion (as to where vehicles are turning). Driveways in close proximity to intersections should be relocated or closed, as appropriate.



- **Signalization**—the volume of traffic attracted to some site driveways is more than can be accommodated acceptably under an unsignalized condition. Delays for minor street movements as well as left-turn movements on the main street may create or contribute to undue delays on the major roadway and numerous safety issues. The installation of a traffic signal at appropriate locations can mitigate these types of issues without adversely affecting the operation of the major roadway.

Types of Corridors and Potential Solutions

A number of different roadway cross sections are represented throughout the region. In some cases traffic flows along these roadways are minimally impeded. However, in some corridors, spot and/or corridor-wide improvements are needed. The following indicates types of roadway cross section; land use and development character; local examples of the roadway; and possible access management measures that can be implemented to mitigate corridor or intersection operational issues.

Five lanes (predominantly retail land uses)

Local Examples

- Savannah Highway (US 17)
- Coleman Boulevard

Access Management Measures

- Adaptive signal control
- Median U-turn treatment
- Non-traversable median treatment
- Offset left turn treatment
- Intersection and driveway curb radii
- Left-turn storage bays
- Minor street approach improvements (left-turn lane and right-turn lane)
- Emergency vehicle / Transit vehicle preemption
- Driveway throat length
- Consolidate driveways
- Driveway placement/relocation

Four-lane Divided with Landscaped Median

Local Examples

- Dorchester Road
- Palmetto Commerce Parkway

Access Management Solutions

- Adaptive signal control
- Median U-turn treatment

- Offset left turn treatment
- Intersection and driveway curb radii

- Left-turn storage bays
- Minor street approach improvements (left-turn lane and right-turn lane)
- Emergency vehicle / Transit vehicle preemption
- Driveway throat length
- Consolidate driveways
- Driveway placement/relocation
- Signalization (driveways)

Four-lane undivided

Local Examples

- Lockwood Drive
- US 52
- Morrison/East Bay

Access Management Measures

- Adaptive signal control
- Median U-turn treatment
- Non-traversable median treatment
- Offset left turn treatment
- Intersection and driveway curb radii
- Left-turn storage bays
- Minor street approach improvements (left-turn and right-turn lane)
- Emergency vehicle / Transit vehicle preemption
- Driveway throat length
- Consolidate driveways
- Driveway placement/relocation
- Signalization (driveways)

Inviting and varied building facades that address the street and appropriate building heights with regard to street width are important in the Context Realm

Four-lane with Service roads and Partially Controlled Access

Local Examples

- Johnnie Dodds Boulevard (US 17)

Access Management Measures

- Adaptive signal control
- CCTV traffic monitoring
- Non-traversable median treatment
- One way frontage road system
- Emergency vehicle / Transit vehicle preemption

Complete Streets

Introduction

"Complete Streets" is a policy to transform transportation corridors from vehicle-dominated thoroughfares into community-oriented streets that safely and conveniently accommodate all modes of travel not just motorists. In recent years, a number of regional communities have adopted recommendations to implement a complete streets program as a part of their Comprehensive Plan and a policy in the CHATS LRTP, discussed herein. By doing so, opportunities for pedestrian and bicycle travel will be enhanced, access to and facilities along transit corridors will be improved with minimal impact to highway travel.

The complete streets policy was adopted by CHATS in response to increased public awareness of the needs of all travelers in public rights of way. Outreach meetings with citizens of this region were well-attended and served as an opportunity for many participants – a majority – to voice their concern about the apparent single-focus transportation vision in this region. The diversity of users and the natural beauty of the area are not presently complemented with our roadway corridors. The proposal includes the following elements:

- Safer and more convenient walkways, sidewalks and crosswalks (see Chapter7)
- Safer and more convenient bikeways (see Chapter 13)
- Intelligent transportation systems using high-technology (see Chapter 4)
- Access management to improve public safety (see Chapter 4)
- Water shuttle or ferry boat system serving transportation needs (see Chapter 8)
- Safe transportation corridors for all system users (Chapter 7 and 9)

Each of these elements is described below, followed by a detailed description of four basic zones or realms in a corridor, which are: **context realm, pedestrian realm, travelway realm and intersection realm**. Later in this section, a series of typical illustrations are presented showing plan and cross-section views of different types of streets.

Interrelationship of Context and Arterial Design. Source: CD+A

A number of corridors in this region are not safe for walking or bicycling – and should be considered a viable option for congestion relief or a land use-transportation planning solution to travel demand. So complete streets is intended to better serve pedestrians, bicyclists, freight operators, and transit customers with safe and convenient facilities. Aesthetics are an important element of complete streets to create environments where people want to be. Furthermore, the installation of Intelligent Transportation Systems (ITS) along major corridors with high-technology equipment will result in usable advance information available to motorists. Saving time by using an alternate route because a motorist heard about a bottleneck on the television, radio, or internet is appreciated. Also, major investments in multilane roadways have eroded over time, due in part to a willingness to grant too many driveways that are too close together and without adequate safeguards to protect motorist safety. Movements toward implementing access management strategies are embraced for higher-speed multilane corridors particularly those with demonstrated crash histories. Lastly, most participants in our public outreach process indicated that the primary reason why they moved to this region and or what keeps them here is water. Intrinsically this is understood, but the framers of this plan considered strategies that would allow citizens closer and more public forms of access to the harbor and rivers of this region – access that would also provide a form of mobility. Preliminary studies for a water shuttle or ferry boat system in this region have been completed by the United States Department of Interior National Park Service and have been recommended by a number of communities as a transportation option in their Comprehensive Plans.

This plan embraces a vision of a privately operated system operating between publicly-owned docks with adequate provisions for parking and connections with all forms of the regional transportation system including pathways, bikeways, bus service and activity centers.

Context Realm

The context realm is defined by buildings that frame the major roadway. Guidance for the context realm focuses on four areas of consideration.

Buildings tall enough to frame a corridor and give pedestrians a comfortable sense of enclosure measure at least 25% of the roadway right-of-way

Building Form and Massing

High-quality street design should be supplemented with buildings located close to the street that frame the public space enjoyed by pedestrians. In more urban areas, these buildings should be located directly behind the sidewalk and even encroach into the pedestrian realm in some areas with stairs, stoops, or awnings to provide visual interest and access to the public space. Suburban environments that must incorporate setbacks for adjacent buildings should limit this distance to 20 feet or less and avoid off-street parking between buildings and the pedestrian realm. Larger setbacks in these suburban areas will diminish the sense of enclosure afforded to the pedestrian and move access to the buildings farther away from the street. In both environments, building heights should measure at least 25% of the corridor width. That is, a 100-foot wide roadway right-of-way should be framed by buildings that are at least 25 feet high on both sides with facades that are at most 20 feet from the edge of right-of-way.

Architectural Elements

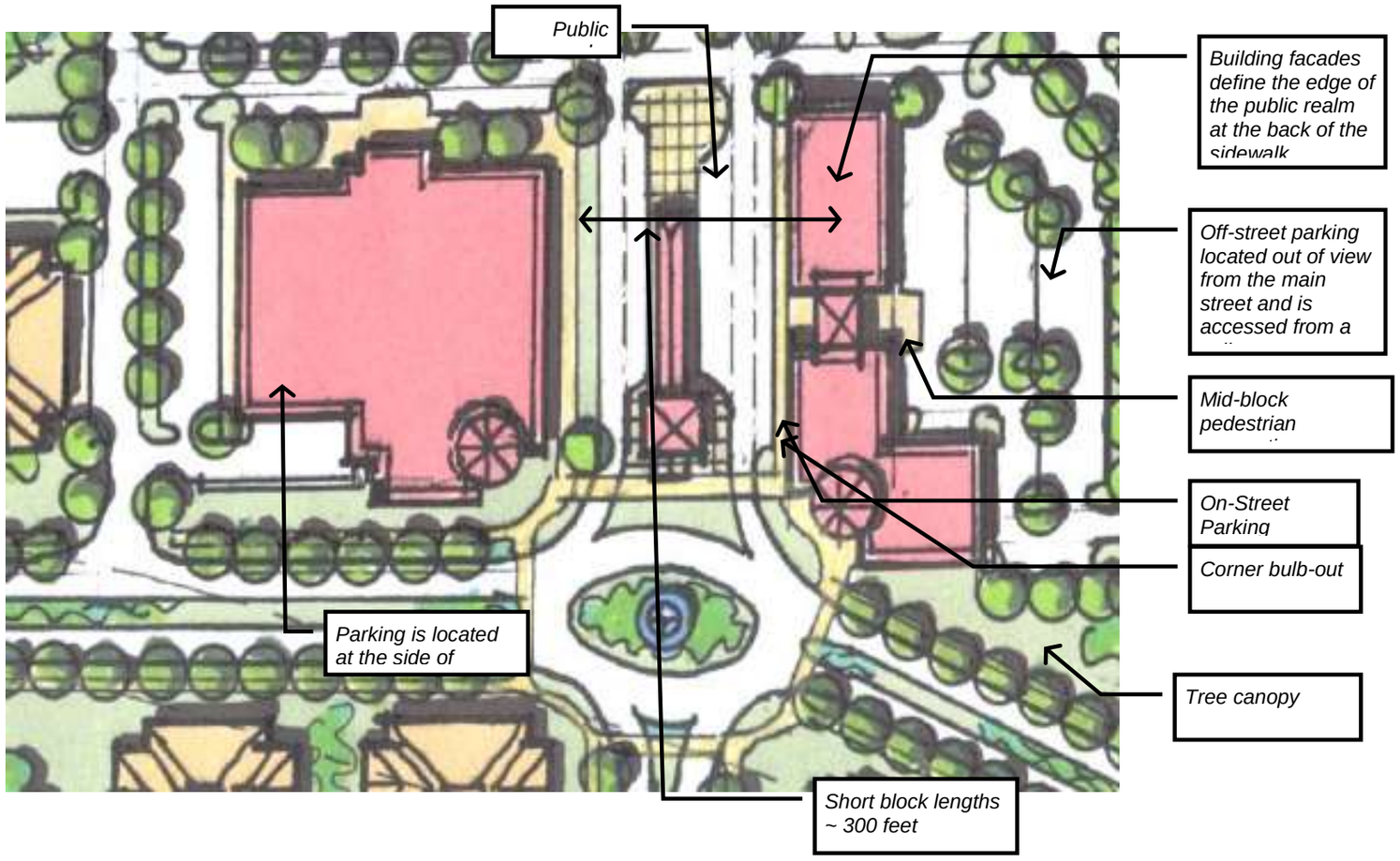
Careful placement and design of buildings adjacent to the major roadway offer opportunities for meaningful interaction between transportation and land use. These opportunities are greatly enhanced when land uses located along the pedestrian realm are conducive to walking; such as restaurants, small shops and boutiques, residential units and offices located in close proximity. Building scale and design details incorporated into individual buildings serve to foster a comfortable, engaging environment focused on the pedestrian. Common building design treatments generally favored in a pedestrian environment include awnings, porches, balconies, stairs, stoops, windows, appropriate lighting, promenades, and opaque windows.

Transit Integration

Areas that are targeted for high-quality transit service must be supported through land use and zoning policies that support transit-oriented development and reflect the benefits of increased access to alternative modes of travel. Examples include appropriate densities and intensities for supporting transit use, parking ratios that reflect reduced reliance on the automobile, and setback and design guidelines that result in pedestrian supportive urban design. In addition, potential transit service identified for transportation corridors within the community should take into consideration the land use, density/intensity, and urban design characteristics of the surrounding environment before selecting proposed technologies or finalizing service plans. A number of communities in the study area have implemented elements into their comprehensive plans that promote the utilization of a variety of transit options as ways to enhance local and regional mobility.

Site Design

The complete street is truly integrated into the surrounding environment when the interface between the site and the street is complementary to the pedestrian environment created along the entire corridor. Access to the site should be controlled through a comprehensive access management program to minimize excessive driveways that create undesirable conflicts for traveling pedestrians. Building orientation, further defined by landscape and architectural elements incorporated into the site should reinforce the public space protected between the buildings. Public paths through sites should be provided to shorten blocks longer than 600 feet.



Pedestrian Realm

Awnings encroach over the throughway zone, protecting pedestrians from sun and rain

The pedestrian realm extends between the outside edge of sidewalk and the face-of-curb located along the street. Safety and mobility for pedestrians within this 'public' realm is predicated upon the presence of continuous sidewalks along both sides of the street built to a sufficient width for accommodating different space needs within different environments; such as suburban verses downtown settings. The quality of the pedestrian realm is also greatly enhanced by the presence of high-quality buffers between pedestrians and moving traffic, safe and convenient opportunities to cross the street, and consideration for shade and lighting needs. Each is discussed below.

The pedestrian realm may consist of up to four distinct functional zones – frontage zone, throughway zone, furnishing zone, and edge zone. The frontage zone is located near the back of the sidewalk and varies in width to accommodate potential window shoppers, stairs, stoops, planters, marquees, outdoor displays, awnings, or café tables. The throughway zone provides clear space for pedestrians to move between destinations and varies between 6 and 16 feet wide based on the anticipated demand for unimpeded walking area. The furnishing zone provides a key buffering between pedestrians and moving traffic. It generally measures at least 8 feet wide to accommodate street trees, planting strips, street furniture, utility poles, sign poles, signal and electrical cabinets, phone booths, fire hydrants, bicycle racks, or retail kiosks targeted for the pedestrian realm. The edge zone is incorporated into the pedestrian realm concurrent with the presence of on-street parking to allow sufficient room for opening car doors.

Outdoor displays in the frontage zone next to the building leave adequate clear space for pedestrians to walk in the throughway zone

Awnings encroach over the throughway zone, protecting pedestrians from sun and rain

Incorporation of one or more of these function zones is generally based upon the context of the surrounding built environment. For example, a more urban, downtown environment will include all four zones in the pedestrian realm and could measure up to 24 feet wide. An equally important link to the pedestrian network that is located in a more suburban setting may omit one or more of the function zones listed above; with an overall minimum width of 11 feet.

Recommended design elements for promoting a healthy pedestrian realm generally focus on one of four areas of concentration, which are: pedestrian mobility, quality buffers, vertical elements and public open space. Together, these 'best practices' can be implemented in both urban and suburban environments, to varying degrees, for promoting healthy pedestrian environments.

Pedestrian Mobility

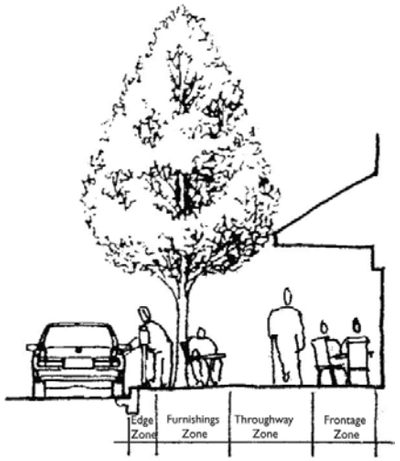
Recessed Entries add usable space of the Pedestrian Realm (Coronado, CA, CD+A)

The presence of a comprehensive, continuous pedestrian network serves as the foundation for fostering a walkable community that supports active transportation and mode choice. Sidewalks generally provide clear zones of 6 to 8 feet wide to accommodate pedestrian travel. In more urban environments, amenities in the frontage zone and furniture zone will greatly increase the overall width of the corridor as compared to more suburban settings. Mid-block pedestrian crosswalks should be incorporated into the urban fabric, as needed, to ensure that convenient crossing opportunities are provided approximately

every 300 feet for maximizing efficiency and safety within the pedestrian system. As a general rule, mid-block crossings should be considered on two-lane streets with a block length greater than 500 feet when the posted speed limit for the travel lanes does not exceed 40 miles per hour.

Quality Buffers

Lateral separation between pedestrians and moving traffic greatly enhances the character of the pedestrian realm. The amount of separation incorporated into the pedestrian realm may vary between corridors based on the context of the surrounding built environment or on streets with different travel speed and/or traffic volume characteristics. In downtown areas, on-street parking, either parallel or angled, provides sufficient distance (8 to 18 feet) for separating pedestrian and vehicle traffic. Likewise, landscape planting areas (typically 8 feet wide) incorporated into either urban or suburban environments provide adequate lateral separation for pedestrians. In urban areas, street trees may be placed in tree wells within an overall hardscaping surface instead of using suburban-style grass areas.



Sidewalk Pedestrian Zones Source: CD+A

Vertical Elements

A seat wall creates informal outdoor public space

Vertical elements traditionally incorporated into the pedestrian realm include street trees, pedestrian-scale street lighting, and utilities. Street trees provide necessary shade to pedestrians and soften the character of the surrounding built environment. They should be spaced between 15 and 30 feet apart, be adapted to the local environment, and fit the scale and character of the surrounding area. Pedestrian-scale street lighting incorporated into the pedestrian realm should use metal halide fixtures mounted between 12 and 20 feet high. Utilities should not interfere with pedestrian circulation or block entrances to buildings, curb cuts, or interfere with sight distance triangles. In some cases, undergrounding utilities avoids conflicts and clutter caused by utility poles and overhead wires. Relocation of overhead utilities to tall poles on just one side of the roadway is a cost-effective aesthetic alternative to burial of utilities in a duct bank under the road.

The Public Realm

The pedestrian realm serves a dual purpose within the built environment – acting as both a transportation corridor and a public open space accessible to the entire community. Therefore, specific design elements incorporated into the pedestrian environment should reinforce this area as a public space; including opportunities for visitors to enjoy the unique character of the corridor in both formal and informal seating areas. Public art and/or specialized surfaces and materials introduced into the pedestrian realm are appreciated by slower moving pedestrians. In more urban areas, street furniture and/or outdoor cafes provide opportunities for 'people watching' that foster community ownership in the pedestrian realm. Furthermore, building encroachments in downtown areas, such as stairs and stoops, provide for interesting points of access to the pedestrian realm. Lastly, awnings and canopy trees provide shade, which is helpful in the temperate climate of this region.

Street trees need at least eight feet of ground exposed to air and water to thrive

Travelway Realm

The travelway realm is defined by the edge of pavement or curb line in more urban areas, that traditionally accommodates the travel or parking lanes needed to provide mobility for bicycles, transit, and automobiles sharing the transportation corridor. This area also separates the two pedestrian realms defined within the complete street and may provide carefully-designed crossing opportunities between intersections. Recommended design elements incorporated into the travelway realm serve to achieve greater balance between travel modes sharing the corridor and favor design solutions that promote human scale for the street and minimize pedestrian crossing distance. Guidance for the travelway realm focuses on two areas of consideration: modes of travel and medians.

Multimodal Corridors

Balance between travel modes within the same transportation corridor fosters an environment of choice for mobility that could lead to reduced congestion on major roadways and a healthier citizenry. On a complete street, safe and convenient access to the transportation network for bicycles, transit, and automobiles is afforded within the travelway realm. Travel lanes for automobiles and transit vehicles should measure between 10 and 12 feet wide, depending on the target speed, to manage travel speeds and reinforce the intended character of the street. Parking lanes incorporated into the travelway realm should not exceed 8 feet in width (including the gutter pan) and may be protected by bulb outs evenly spaced throughout the corridor. Bus stops located along the corridor should be well-designed to include shelters, and benches that comfort patrons while waiting for transit service. On-street bicycle lanes (typically 4 to 8 feet wide) should be considered when vehicle speeds range from 30 to 40 miles per hour. Wide outside lanes may be preferred on streets with slower speeds. To avoid situations where citizens with only basic skills may be attracted to a corridor, designated bicycle routes on parallel corridors may be the best option when speeds on the major street exceed 40 mph. According to state law, bicyclists are considered vehicles and as such are permitted on all corridors except freeways and access-controlled highways.

A multimodal travelway creates managed conflict so modes of travel co-exist safely

Median Treatments

Medians are often incorporated into the travelway realm to provide dedicated left turn lanes, opportunities for landscaping, and pedestrian refuge at crossings. They generally vary between 6 and 18 feet wide depending on their intended application and the limitations set forth by the context of the surrounding built environment. Medians also reinforce other access management solutions provided within the travelway to reduce the number of conflict points and maintain the human scale intended for the complete street. In addition to center medians, other access management solutions incorporated into the travelway realm should limit the number of individual driveways along the corridor and avoid the use of right turn deceleration lanes. Together, these improvements will reduce the overall pedestrian crossing distance for the travelway and maximize the safety for pedestrians traveling inside the pedestrian realm.

Intersection Realm

The intersection realm lends careful consideration for the concerns of multiple travel modes that could meet at major intersections within the transportation system. Recommendations for improving the multimodal environment in and around these major intersections focus on two areas of concentration – operations and geometric design.

Operations

In terms of operations, traffic signals or roundabouts are the two most appropriate applications for traffic control devices that could also maintain the pedestrian scale of the street reinforced in the context, pedestrian, and travelway realms. The merits of a traffic signal verses a roundabout for intersection control should be determined on a case-by-case basis; considering issues such as desired speed of traffic, availability of right-of-way, anticipated traffic patterns, and the context of the built environment surrounding the intersection.

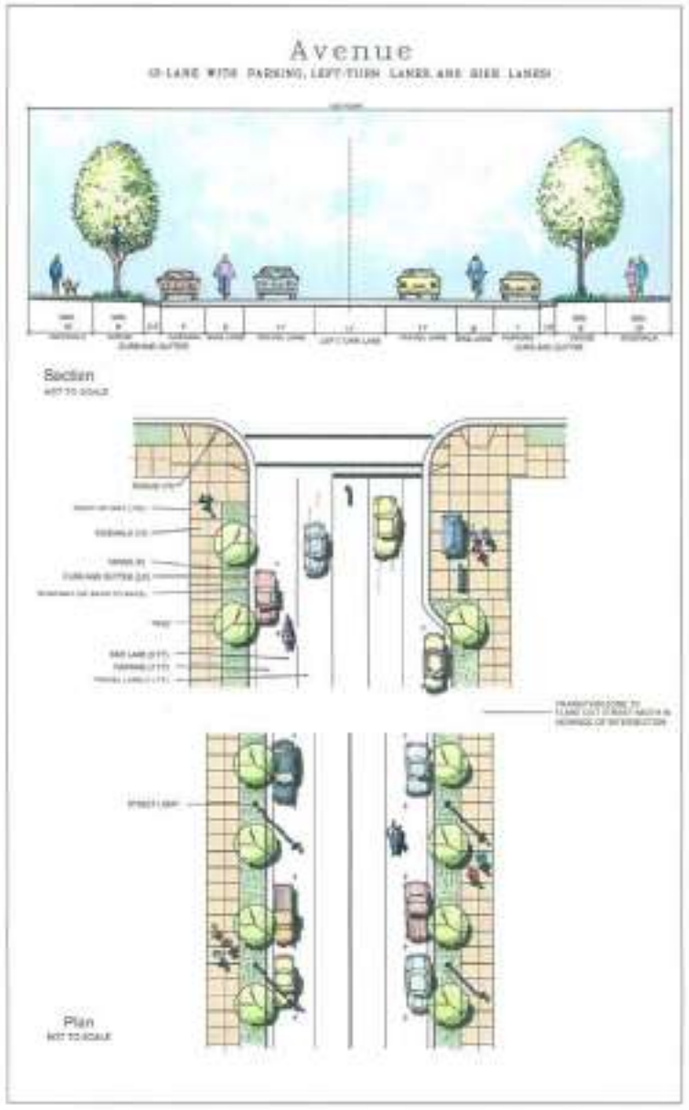
Geometric Design

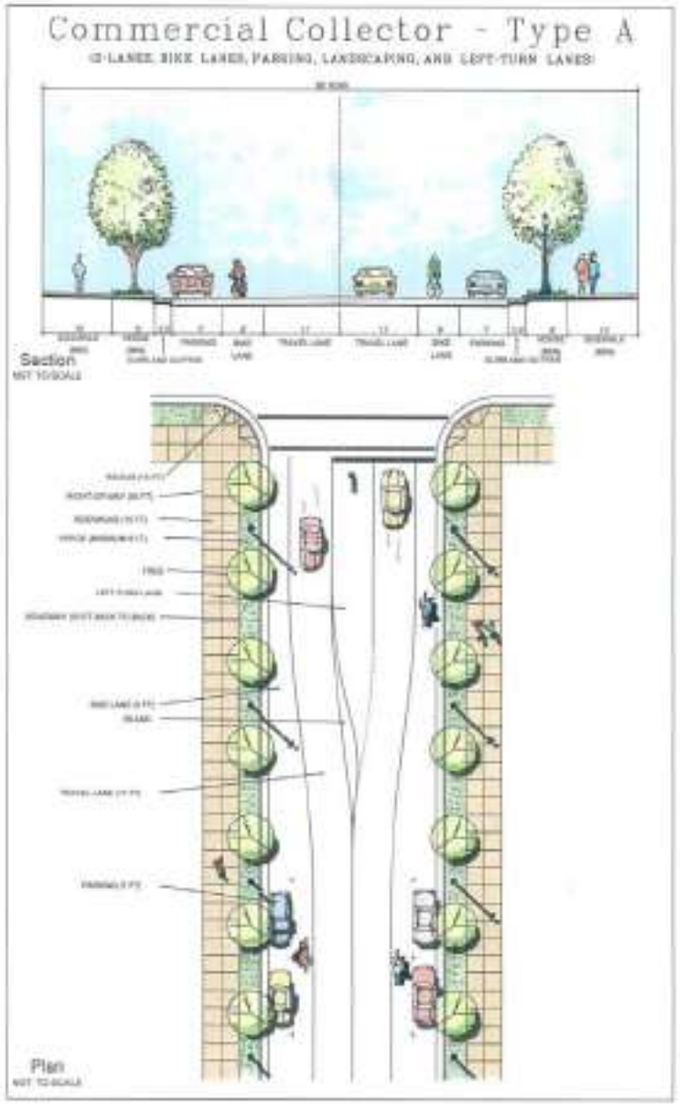
Geometric considerations for the intersection should reinforce the operational characteristics of the traffic signal or roundabout. At traffic signals, this includes the introduction of curb extensions, or bulb-outs, to shorten pedestrian crossing distance and protect on-street parking near the intersection. Curb return radii designed for signalized intersections should be 15 to 25 feet to control turning speed around corners. At roundabouts, special consideration should be given to entry and exit speeds, pedestrian refuge in the splitter islands, and assigning predictability to the intersection for pedestrians, bicycles, and vehicles. Both intersection treatments may consider special pavement markings to distinguish pedestrian areas or bicycle lanes; although these surfaces need to be stable, firm, and slip resistant. Additional consideration should be given to maintaining adequate sight triangles in the intersection, addressing the treatment of bicycle lanes through the intersection, and compliance with federal requirements per the American with Disabilities Act for crosswalk and curb ramp design.

Small curb return radii and curb bulb-outs at intersections shorten the time and distance that pedestrians are exposed to traffic in intersection and mid-block

Illustrations on the following pages show alternative types of streets. These cross-sections and plan view illustrations capture a range of rights-of-way from 55 feet to 120 feet in width. Widths for basic design elements such as sidewalks and verge (landscaping strips) are wider than what is typically provided in the

region. Therefore, careful evaluation of these recommendations by implementing agencies is anticipated. Furthermore, the width of travel lanes is shown narrower than the standard 12 feet now provided by South Carolina Department of Transportation. This too must be evaluated, although research conducted elsewhere in the United States shows little or no difference in crash history between 11 and 12-foot lanes. The illustrations also show several examples with 10-foot wide lanes, however only on residential collector streets where target speeds are 25 mph.

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(2-LANES, BIKE LANES, PARKING, LANDSCAPING, AND LEFT-TURN LANES)
Section
NOT TO SCALE
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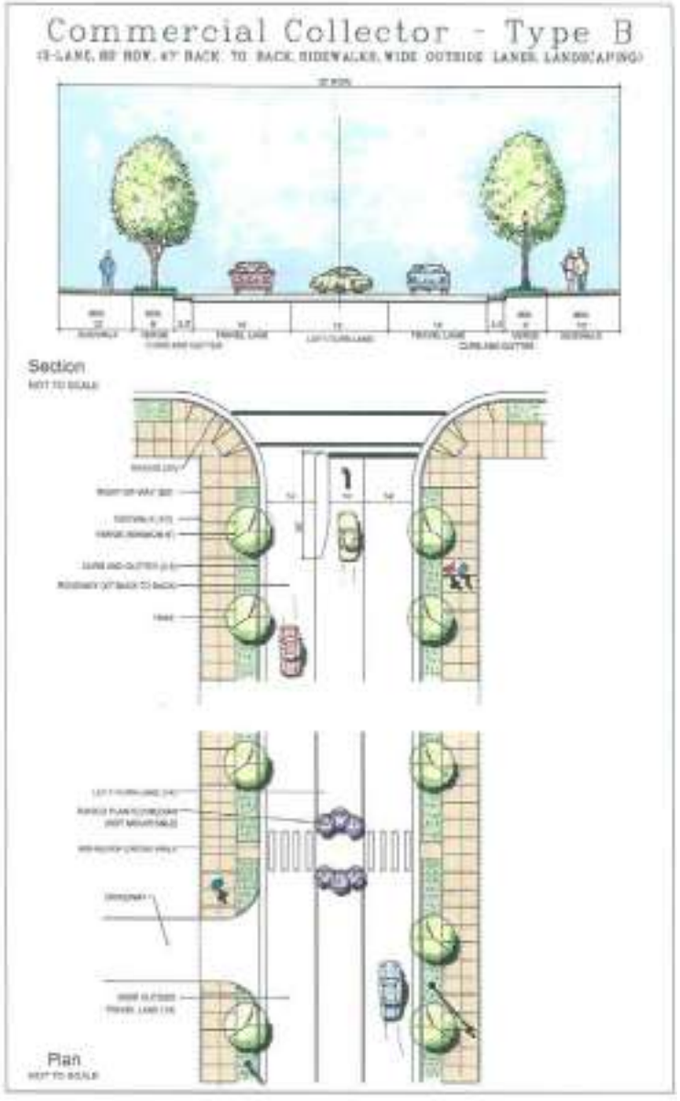
Commercial Collector - Type B
(2-LANE, 80' ROW, 47' BACK TO BACK, SIDEWALKS, WIDE OUTSIDE LANES, LANDSCAPING)
Section
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Plan
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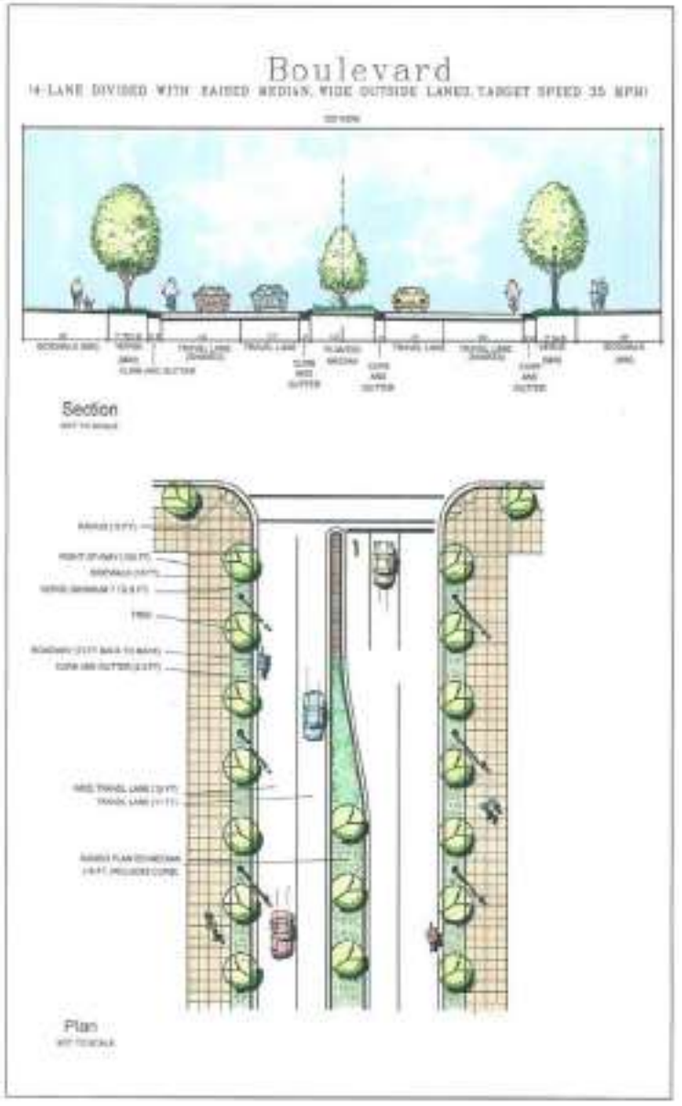
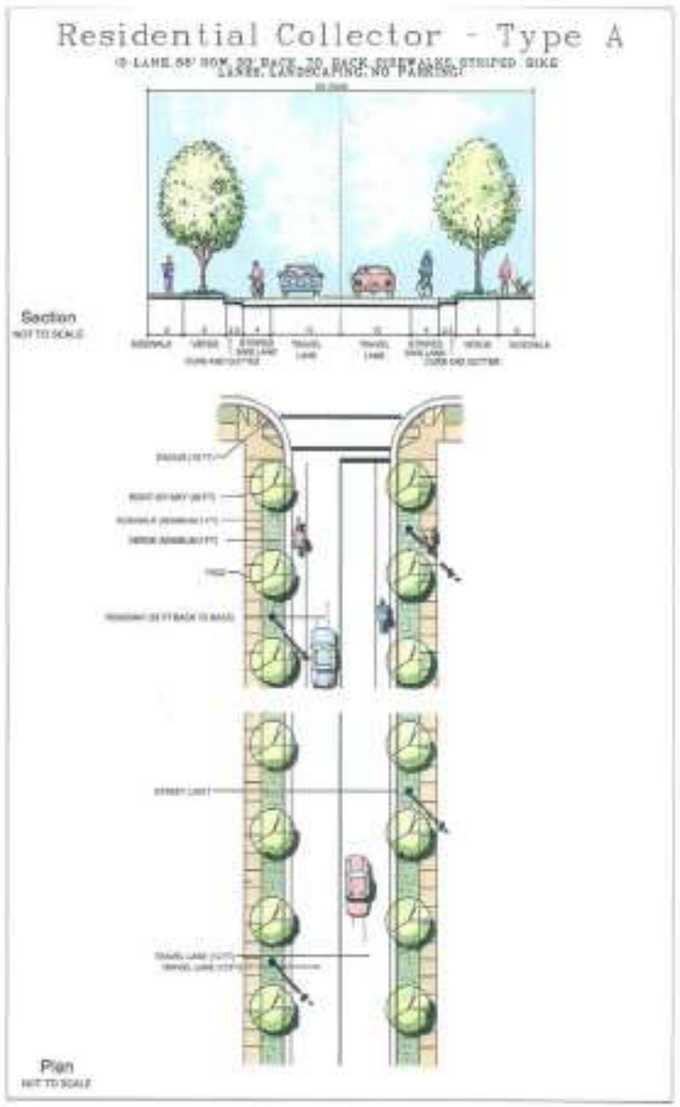

Boulevard
(4-LANE DIVIDED WITH RAISED MEDIAN, WIDE OUTSIDE LANES, TARGET SPEED 35 MPH)
Section
Plan


Residential Collector - Type A
Section
NOT TO SCALE
Plan
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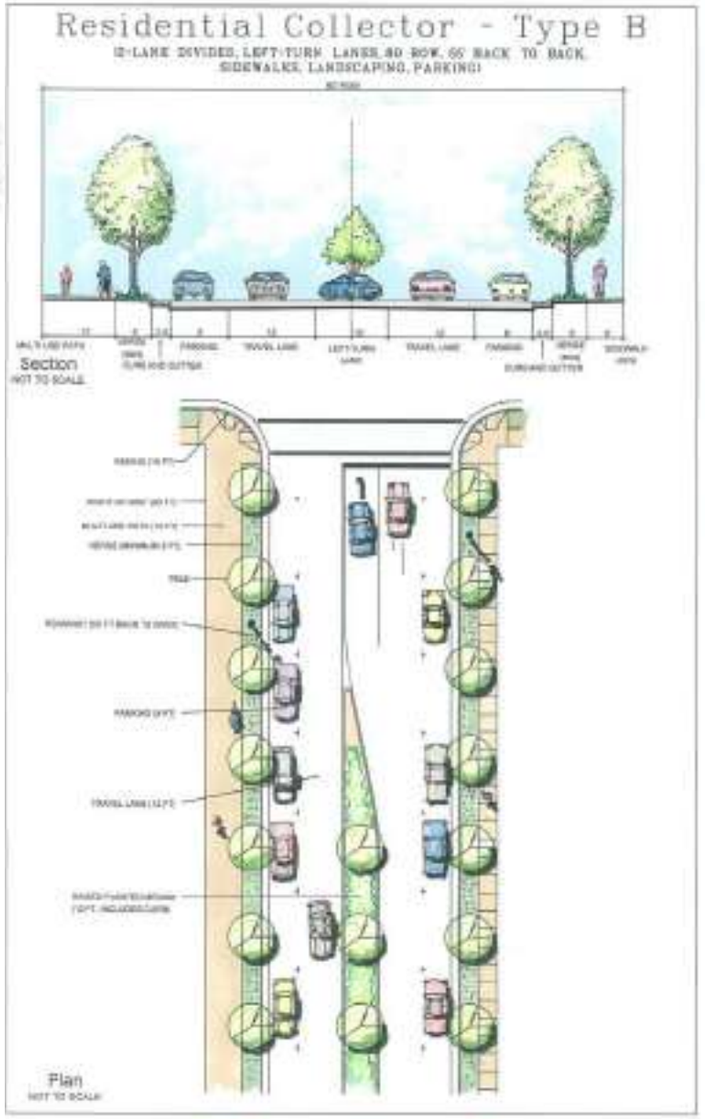
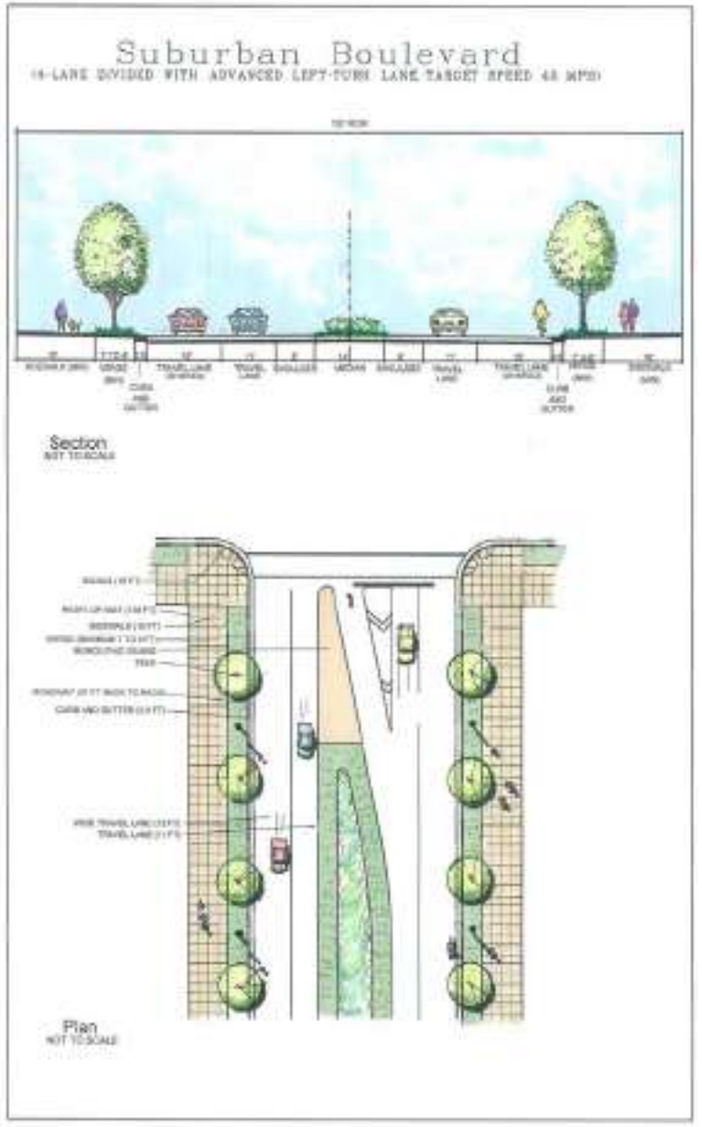

Residential Collector - Type B
(2-LANE DIVIDED, LEFT-TURN LANES, 80 ROW, 65' BACK TO BACK,
SIDEWALKS, LANDSCAPING, PARKING)
Section
NOT TO SCALE
Plan
NOT TO SCALE


Suburban Boulevard
Section
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Plan
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Bicycle & Pedestrian Element

Introduction

Transportation plans no longer focus solely on roadway solutions. In the quest for an improved quality of life, we now strive to enhance the livability of our communities. One common theme of any livable community is how well it accommodates pedestrians and cyclists.

Walking and bicycling have numerous benefits, including:

- **Personal Benefits** — Cardiovascular fitness, health, and transportation cost savings;
- **Societal Benefits** — Reduced vehicle miles of travel, improved public health through a cleaner environment and healthier citizens, and improved mobility for those that are disabled or without access to private automobiles; and
- **Environmental Benefits** — Reduced air and noise pollution and improved water quality from fewer parking lots/spaces/structures

The gap between the tremendous potential for bicycling and walking in the CHATS study area and the current conditions and proposed transportation projects is raised in almost every discussion about bicycling and walking in the region. In each of the public meetings held as part of the update of this plan, residents expressed a strong desire for improvements to the conditions and opportunities for bicycling and walking. Citizens want to be able to walk safely within their community to run errands, shop, visit friends, and neighbors, and get to work. They want to be able to bicycle to their downtown communities and throughout the region, and firmly believe there is significant potential to enhance the experience of tourists visiting the region. Similarly, public agency staff and local officials recognize the need to improve safety and opportunities for bicycling and walking throughout the region. In addition, bicycle and pedestrian facilities can benefit other roadway users. For example, paved shoulders provide a refuge for motorists with disabled vehicles and help to slow travel lane pavement deterioration.

Existing Conditions

Walking

Pedestrian can be defined both as “undistinguished, ordinary” and “going on foot.” Considering both definitions, travel by foot should be ordinary and commonplace. Downtown Charleston, Downtown Summerville, and the Old Village of Mount Pleasant primarily exhibit an interconnected network of sidewalks in relatively good condition. Traveling further from these urban centers, sidewalks appear only on main corridors or in some neighborhoods, and are less frequent and well-connected. Approaching the rural fringe, few, if any, sidewalks exist.

Recent efforts have been made by the South Carolina Department of Transportation to incorporate pedestrian facilities into standard roadway design. The South Carolina Department of Transportation’s Highway Design Manual (May 2003) states the following concerning sidewalk construction:

> Generally, sidewalks are an integral part of city streets. For suburban residential areas, the construction of sidewalks is often deferred. However, sidewalks in rural and suburban areas are still often justified at points of community development such as schools, local businesses, shopping centers, and industrial plants that result in pedestrian concentrations along the highway. If pedestrian activity is anticipated, include sidewalks as part of the construction.

In addition to sidewalks, the Berkeley Charleston Dorchester (BCD) area includes greenways and trails. Greenways Incorporated defines greenways as “corridors of land recognized for their ability to connect people and places together; greenway trails can be paved or unpaved, and can be designated to accommodate a variety of trail users, including: bicyclists, walkers, hikers, joggers, skaters, horseback riders, and those confined to wheelchairs.” Greenways have been shown to enhance residential property value in the neighborhoods served.

In 2005, the BCDCOG was awarded a grant from the S.C. Forestry Commission to complete a study to determine the appropriate regional routing of the 2,500 mile East Coast Greenway that will extend from Maine to Key West Florida (www.greenway.org). Within the BCD region, a 95 mile long trail has been proposed, extending through Charleston County, mostly in close proximity to US 17. The Greenway will link neighborhoods, communities, local, state, and national parks (including the Francis Marion National Forest, the Santee Coastal Reserve, and the Cape Romain National Wildlife Refuge), local, state, and national bicycle routes and trails (including the Palmetto Trail), schools, health care centers, and shopping nodes for local users. This important stretch of the East Coast Greenway provides an opportunity to explain and highlight Coastal South Carolina as well as the significance of the area in the nation’s history to the visitors using the East Coast Greenway

This greenway routing makes connections with existing greenways and trails along its proposed route while encouraging the development of new dedicated right-of-way facilities for bicycles and

pedestrians along the corridor. The selected routing was approved by all of the counties and municipalities along the route but may be changed as more areas are developed.

Figure 5.1; illustrate existing and proposed bicycle and multi-use facilities in the BCD region.

Bicycling

The Highway Design Manual produced by SCDOT in 2003 also emphasizes the importance of constructing bicycle facilities on new roadways and offers several fiscally conservative methods of improving conditions for bicycle riders. An Engineering Directive Memorandum issued by SCDOT in 2003 affirms this focus on bicycle facilities and provides guidelines for the selection and design of bicycle facilities for new roadway projects.

Grade school youth can pedal for a substantial amount of time and distance at 10 mph on a bike. Destinations within a 5-mile radius (trip duration of 30 minutes) are achievable for many citizens. Although the Berkeley Charleston Dorchester region has few designated bicycle facilities and routes at this time (with the exception of greenways), the combination of interconnected streets and mixed land uses makes it possible to bicycle for short trips using quiet streets in neighborhoods in several urban areas in the region.

For the advanced or more experienced recreational cyclist, existing rural roads with (comparatively) lower traffic volumes provide an opportunity for cyclists to enjoy longer uninterrupted scenic trips, albeit sharing the road with vehicular traffic. Although there are only two designated bicycle touring routes in the BCD region (the Walter Ezell Route and the Coastal Route), experienced cyclists routinely use the rural road network for bicycling. The existing greenways/multi-use paths and bikeways are illustrated in **Figure 5.1.**

Bicycle & Pedestrian Environment

The study area has many contrasts for the bicycling and walking public. The region has both good and bad examples of accommodating bicyclists and walkers, sometimes within a few blocks of each other.

Downtown Charleston is one of the most walkable communities in the nation, featuring a human scale-built environment, pedestrian-friendly street patterns, and a mix of interesting residential, retail, and business locations generating traffic on foot. The historic Old Village area of Mount Pleasant has many of the same characteristics.

Within a few miles of downtown Charleston, the beach communities of Kiawah Island, Sullivan's Island, Folly Beach, the Isle of Palms, and Seabrook Island offer residents and visitors alike the opportunity to ride their bicycles conveniently and safely throughout the community. In these areas, rails, bike lanes, and relatively quiet residential streets invite people to take to two wheels for all kinds of trips.

I'On, in the Mount Pleasant area, provides residents with a setting featuring connected streets, sidewalks, and paths that offer variety for walking, jogging, and pedaling through the neighborhood. By design, public space abounds — from quiet trails and parks to the vibrant shops at I'On Square. I'On received the 2001 Platinum Award for Best Smart Growth Community in the Nation from the National Association of Homebuilders for its innovative design practices. The Goose Creek hiker-biker trail system and the Summerville multi-use trail system are other good examples of integrating bicyclists and pedestrians into the fabric of the community.

Other features of the study area suggest a great potential for improving conditions for bicycling and walking, such as:

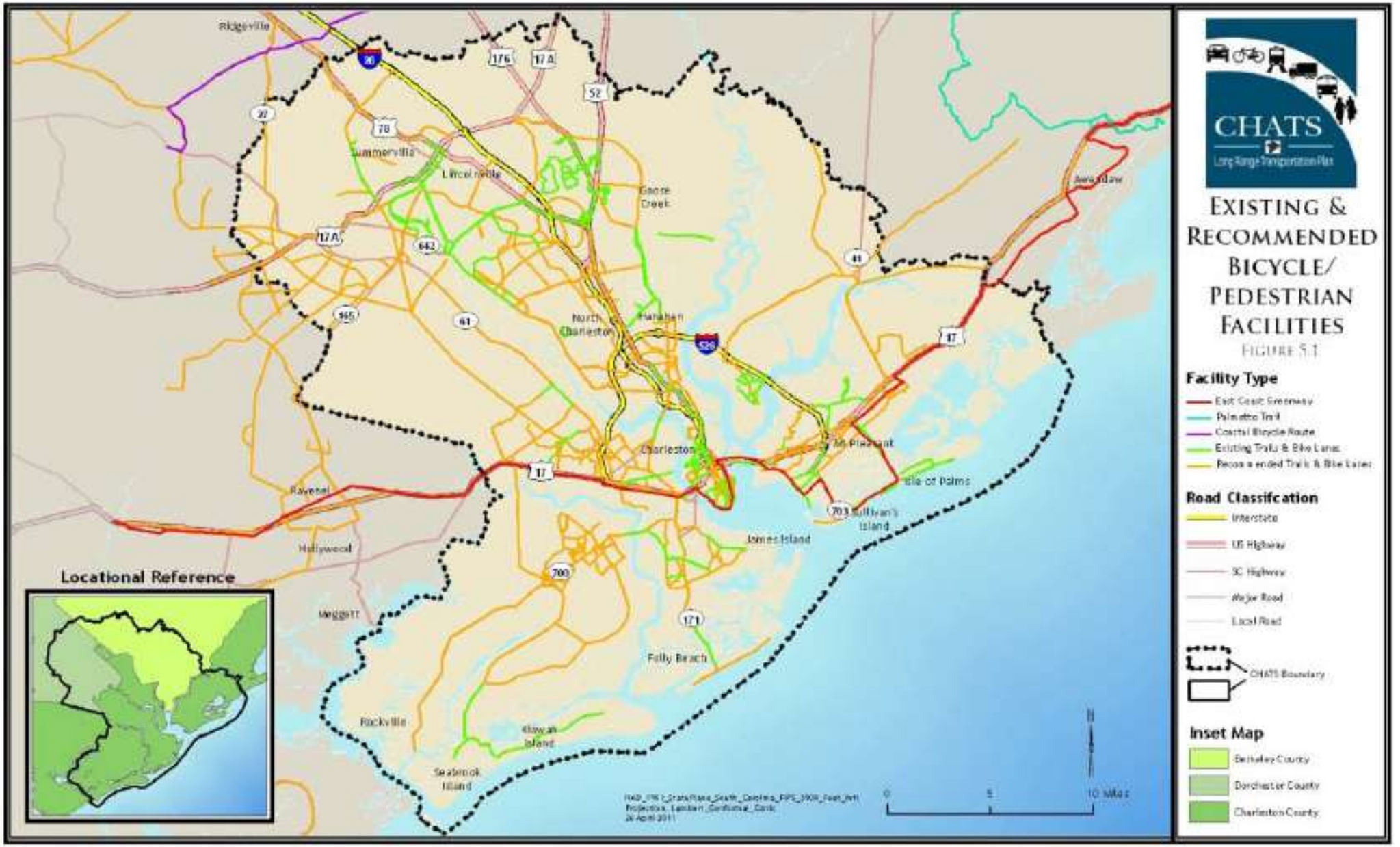
- Climate for year-round bicycling and walking
- Flat terrain
- Numerous self-contained communities (e.g., Mount Pleasant, James Island, West Ashley)
- Mixed-use land areas (e.g., North Charleston, Summerville)
- Short distances between destinations in these communities

Despite these many positive attributes, the reality is that bicycling and walking are not considered viable options for most trips by many people in the area. There are more examples of areas that are unsafe for potential bicyclists and pedestrians than there are positive examples in the BCD area.

While the potential for foot and bicycle travel within the communities in the study area is great, the same cannot be said for the long distance or inter-community travel. Deterrents to inter-community travel include:

- Lack of safe water crossings of the Ashley, Stono, Wapoo, and Wando Rivers;
- Design of arterials discourages all but the most determined bicyclists;
- Gaps in safe facilities make longer distance travel difficult;
- Distances between the suburban growth centers, such as Summerville, and the traditional employment centers in North Charleston and Charleston are too great for the majority of people to consider bicycling and
- Increasing suburbanization that will make these factors worse

The reality of bicycling and walking in the study area is that "you can't get there from here." There are few safe places to ride or walk. There are few opportunities, for example, to travel east or west from North Charleston into neighboring communities. Although significant improvements have been made in recent years (such as the construction of Wonders Way as part of the Arthur Ravenel Bridge), Downtown Charleston, while offering many bicycle and pedestrian facilities within its boundaries, is almost completely sealed off from bicycle and pedestrian access from elsewhere in the region. Existing bicycle and pedestrian facilities entering and exiting this area have sometimes been poorly designed or have developed a reputation for not being safe. This lack of quality bicycle and pedestrian facilities also has a negative effect on the physically-challenged. Those individuals that



EXISTING & RECOMMENDED BICYCLE/ PEDESTRIAN FACILITIES

FIGURE 5.1

require ADA compliant facilities to safely travel would benefit greatly from an interconnected pedestrian network.

Much of the existing bicycling and walking in the BCD area falls into two quite distinct categories.

1. **Utilitarian, non-discretionary travel.** A significant portion of the population in the study area does not have access to a car. Children, students, and many elderly are not able to drive. In addition, some households cannot afford an automobile. According to the 2000 Census, an average of 9.7% of all households in the Berkeley-Charleston-Dorchester region do not have a vehicle available. This number is highest in Charleston County, where 11.9% of all households have no vehicle available. For these households, bicycling and walking may be the only option they have for most of the trips they must make every day, regardless of the conditions they experience.
2. **Recreational, discretionary travel.** Bicycle clubs, such as the Coastal Cyclists, organize numerous rides throughout the year and have an active membership. There are many bicycling, walking, and running events that use the highway system on a regular basis. Joggers, bicyclists, and fitness walkers can be seen in almost every neighborhood. The beach communities have high levels of bicycling and walking.

The Four Es of Bicycle & Pedestrian Planning

Four important components contribute to the success of a non-vehicular transportation system:

- **Engineering** — Before there can be facilities for walking and riding bicycles, a network of pathways must be planned and designed. Good design and route choices are essential parts of a successful pathway network.

- **Education** — Once pathway systems are developed and in-place, new and experienced cyclists need to be made aware of where these systems are and what destinations can be accessed. Motorists, pedestrians, and cyclists need to understand the "rules of the road" to keep themselves safe while operating not only on, but also adjacent to these facilities.

- **Encouragement** — The most nebulous of the four components, people need to be encouraged to walk and bicycle. The more desirable the BCD area becomes for pedestrians and cyclists (by providing safe access to more destinations in the region) the more successful these modes will become. Setting a regional goal to be widely recognized as bicycle-friendly is a worthy idea.

- **Enforcement** — It is critical to make sure that laws pertaining to the interaction between motorists and pedestrians/cyclists are heeded by all to ensure safety.

Previous Planning Efforts

The Berkeley Charleston Dorchester (BCD) region, with its subtropical climate and unique historic coastal setting, has the opportunity to be a national player in the incorporation of bicycle and pedestrian facilities into the fabric of its transportation network. The BCD region has had the vision of a bicycle network incorporated into its transportation system for a number of years, starting with the development of the 1976 Long Range Bikeway Plan. Unfortunately, only small portions of that plan were implemented. This limited plan implementation can be traced to the historical trend, nationwide and in the BCD region, where transportation planning and design has been focused on the needs of the motorist. Standards were developed and limits imposed based on the capabilities of the automobile. The needs and limitations of the non-motorized traveler were secondary considerations that were either overlooked or eliminated in roadway design.

However, perceptions about bicycle and pedestrian facilities and their necessity in the fabric of our communities have changed. In addition, SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users)has encouraged the incorporation of bicycle and pedestrian facilities into the transportation network and has raised the level of understanding relative to the consideration of bicycling and walking as a viable and necessary means of transportation.

In September 1995, the CHATS and Charleston County Bikeway and Pedestrian Master Plan was prepared for the Charleston County Park and Recreation Commission by a consultant team headed by HOH Associates, Inc. This plan identified existing conditions, as well as recommendations for improvements to the bicycle and pedestrian networks.

Integral in the development of the 1995 plan, because of the number of communities and associated agencies in the study area, was the active involvement of the residents, local government staff, and elected officials from all relevant jurisdictions. During the planning process, the project team developed a wide range of activities in order to provide maximum opportunity for their involvement. Additionally, a Bicycle and Pedestrian Technical Advisory Committee was formed at the outset of the planning process. This committee was designed to be instrumental in the comprehensive planning effort, as it ensured coordination with the jurisdictions represented, improving community support of the plan, and making it more responsive to local needs. The committee, made up of agency and community representatives, participated in major team planning work sessions, helped identify key planning issues, detailed potential planning opportunities, addressed implementation challenges raised during the planning process, reviewed and commented on major draft level products, and helped guide the final plan through the approval process of the respective members' city council or commission.

The master plan process was developed in response to the Berkeley Charleston Dorchester region's diversity and varied needs, and included the following components:

- An inventory and review of existing conditions, regulations, and policies;
- The establishment of visions, goals, and policies relative to the Charleston region and community expectations;

- The development of engineering, education, enforcement, and encouragement programs and policies in response to the region's visions and goals;
- The development of a Regional Bicycle Route Master Plan;
- The development of bicycle and pedestrian facility engineering design guidelines; and
- The establishment of the Master Plan implementation strategy

As a part of the development of the 1995 plan, the following primary policies were adopted by the CHATS Policy Committee and the Charleston County Transportation Committee. Other area jurisdictions and agencies have been encouraged to adopt or endorse these policies as appropriate. These recommendations were also incorporated into the 1998, the 2005 CHATS Long Range Transportation Plan, and now herein.

1. All new and improved non-controlled access highways in the CHATS study area will provide a minimum level of safe accommodation for bicyclists and pedestrians.
2. On key routes identified in the CHATS plan, streets and highways shall be retrofitted to better accommodate bicyclists and pedestrians.
3. All new and improved bridges in the CHATS study area will provide safe bicycle and pedestrian access.
4. Improvements to area transit services must ensure safe and convenient access for bicyclists and pedestrians.
5. All existing rail and utility corridors will be reviewed for their potential to incorporate multi-use trails. The CHATS Policy Committee recommends that area jurisdictions shall act immediately to protect and preserve abandoned railroad corridors that have the potential to become part of a regional trail network.
6. The design, designation, and signing of bicycle and pedestrian facilities in the CHATS study area will conform to current standards and guidelines developed at the national level.
7. The CHATS Policy Committee recommends that area jurisdictions shall encourage bicycle- and pedestrian-friendly retail, commercial, and residential developments.
8. The CHATS Policy Committee recommends that area jurisdictions adopt policies and procedures to encourage the installation of secure bicycle parking facilities throughout the study area.
9. The CHATS Policy Committee will support efforts so that area residents and visitors will have the opportunity to receive training and information to enable bicyclists, pedestrians, and motorists to more safely coexist on area roads.
10. The CHATS Policy Committee will recommend to State and local jurisdictions that enforcement of laws regarding dangerous and illegal behavior by motorists, bicyclists, and pedestrians be improved.

Current Planning Efforts

A set of resolutions approved by the South Carolina Department of Transportation Commission conceives the following vision for the future:

> Now, therefore, be it resolved that the South Carolina Department of Transportation Commission in meeting duly assembled this 14th day of January 2003, affirms that bicycling and walking accommodations should be a routine part of the department's planning, design, construction and operating activities, and will be included in the everyday operations of our transportation system; and "Therefore, be it further resolved, that the South Carolina Department of Transportation Commission requires South Carolina counties and municipalities to make bicycling and pedestrian improvements an integral part of their transportation planning and programming where State or Federal Highway funding is utilized.

Regional Bike and Pedestrian Action Plan

In 2005, the BCDCOG completed a regional ***Bike and Pedestrian Action Plan*** funded by the Robert Wood Johnson Foundation. With the assistance of healthcare providers, the school districts and other partners, the Berkeley-Charleston-Dorchester Regional Bicycle and Pedestrian Action Plan is based on three principles:

(1) Children should be able to safely walk and bike to school if they and their parents so choose.
(2) Roadways should equally accommodate pedestrians, bicyclists, and motorists.
(3) Bicycling and walking should become a routine part of daily activity in the BCD region.

With these principles as a guide, an Action Plan was developed to improve walking and bicycling conditions in the region and to encourage residents to walk and bike on a daily basis. The Action Plan consists of three elements:

(1) Safe Routes to School (SRTS) Programs

The goal of a SRTS program is to create a safer environment for children who already walk and bike to school, and to encourage more children to become physically active by walking or bicycling to school. SRTS programs also benefit the community by reducing traffic congestion around schools, improving air quality, and reducing school transportation costs.

(2) Complete Streets

A *Complete Street* is a street that is safe and convenient for all users, including pedestrians, bicyclists, and motorists. Complete Streets policies should be routinely implemented at state and local levels to insure that pedestrian and bicycle facilities are included in all transportation projects.

This approach is far less expensive than costly retrofits on streets that were only designed to accommodate motor vehicles. Accommodating pedestrians and bicyclists is particularly important in the Charleston region as substantial activity occurs in economically disadvantaged communities where residents rely on non-motorized transportation. Recommendations for the implementation of Complete Streets policies are included in numerous municipal Comprehensive Plans within the BCD region.

(3) Community Intervention

To foster environments where walking and bicycling are a routine part of daily activity, a variety of community interventions are needed in the BCD region. Physical interventions such as sidewalks, trails, and roadway improvements are needed to improve bicycle and pedestrian access. Social interventions are needed to encourage people to walk or bicycle for health, fitness, and transportation.

Recommendations are detailed in the Implementation section of this document and include allocating more funding to improve bike and pedestrian facilities, encouraging local governments to adopt Complete Streets policies and designating a district pedestrian and bicycle coordinator within SCDOT.

In addition to the initiatives in the Bike and Pedestrian Action Plan, the BCDCOG staff has coordinated with the League of American Bicyclists to support the Bicycle Friendly Community (B**FC)** Program. According to the League, The BFC program provides incentives, hands-on assistance, and award recognition for communities that actively support bicycling. Applications for inclusion as a BFC are based on the following criteria:

1) Engineering
2) Education
3) Encouragement
4) Evaluation & Planning
5) Enforcement

The fulfillment of these goals of increased funding of and attention to bicycle and pedestrian projects at a local and statewide level sets a precedent for the BCD region. Berkeley, Charleston, and Dorchester Counties and their constituent municipalities can build on current successes and ensure that as they experience growth, pedestrian and bicyclist issues will be given appropriate consideration.

Since the adoption of the CHATS and Charleston County Bikeway and Pedestrian Master Plan in 1995, communities in the BCD region have demonstrated an increasing commitment to pedestrian and bicycle improvements. This dedication to providing a complete range of transportation options is integral to the success of an overall transportation plan.

Seven public involvement workshops were conducted as a part of the development of the 2010 CHATS Long-Range Transportation Plan update. As a part of these workshops, a survey was distributed to attendees (this survey was also distributed through a range of other venues as well). The results of this survey indicate that residents of the BCD area are dissatisfied with the quality of bicycle and pedestrian facilities currently available to them. Survey respondents rated the quality of the bicycle and pedestrian systems in the BCD area as poor. The public survey respondents indicated that of every $100 spent on transportation improvements, they would spend $27 on bicycle and pedestrian facilities. However, based on a 5-year spending projection of state and federal funds, only $1.00 of every $100 in transportation improvements is dedicated to bicycle and pedestrian projects.

In addition, bicycle and pedestrian issues were addressed at meetings of the CHATS Study Team, meetings of the Transportation Planning Advisory Group (TPAG), and meetings of the CHATS Policy Committee. A policy survey also was distributed to counties and municipalities in the BCD region to address policies in their jurisdictions that could affect the development of bicycle and pedestrian facilities. The results of this survey can be found in **Table 5.1**.

The results of this policy review indicate several things. Many of the larger municipalities have guidelines to help shape the development of bicycle and pedestrian facilities in their areas, and have recommended additional guidelines in their updated comprehensive plans. In contrast, Berkeley, Charleston, and Dorchester Counties have fewer requirements for these facilities, however these communities have also recommended more stringent provisions for bicycle and pedestrian facilities. Most of the municipalities surveyed stated that they have plans to build sidewalks and/or bikeways in specific locations using public funds, indicating support for improving the bicycle and pedestrian network at a local level.

In addition to these efforts, a separate study was conducted by Kimley-Horn and Associates for the development of the East Coast Greenway through the BCD region. The East Coast Greenway will ultimately extend from Calais, Maine to Key West, Florida. Nationwide, much of the East Coast Greenway will be comprised of existing local trails (greenways, bikeways, rail trails, canal towpaths, park pathways, waterfront esplanades, etc.) Users will include walkers, cyclists, skaters, wheelchairs, strollers, and in snowy areas of the country, even skiers in northern communities. As of January 2011, less than 20 % of the Greenway is completed, with an additional 20 % currently under development. It is hoped that at completion of the Greenway, at least 80% of the system will be located along traffic separated trails with the remaining 20% on low traffic rural roads and city streets. Trail segments are planned to retain local character, function as community facilities, and boost local economies with new tourism dollars spent in the local communities. The East Coast Greenway will complement existing bicycle and pedestrian planning efforts in the Berkeley Charleston Dorchester region by promoting bike- and pedestrian oriented transportation projects and access within and adjacent to the Greenway corridor. The recommended East Coast Greenway route in the Berkeley Charleston Dorchester region is shown in **Figure 5.1**.

The Citadel, Clemson University, and South Carolina State University conducted a study entitled “South Carolina East Coast Greenway Transportation Safety, Route Location, and Facility Needs Study.” This study examined route conditions and planning issues that would affect the development

of a preferred East Coast Greenway alignment. This information was compiled into a Bicycle Compatibility Index Level of Service procedure and a preferred route was developed based on this information. The route proposed in that document is virtually identical to the alignment documented in the Kimley-Horn study, with a few minor changes.

Identified Needs

Bicycle

Types of Cyclists
In order to develop an appropriate bicycle element, the following "ABCs" of cyclists need to be understood.

Advanced Cyclists — These are usually experienced cyclists who have the ability to safely ride under more typical thoroughfare conditions of higher traffic volume and speed. This group of cyclists generally prefers shared roadways as opposed to striped bike lanes and paths. Although surveys show this group represents only about 20 percent of all cyclists, they also show that these cyclists ride about 80 percent of the bicycle miles traveled yearly. With monthly street sweeping of gutter debris, advanced cyclists typically accept striped bike lanes.

Basic Cyclists — These cyclists are casual or new adult and teenage riders less secure in their ability to ride in traffic without special accommodations. They typically prefer bike paths and bike lanes on collector or arterial streets with less exposure to fast-moving and heavy traffic. Surveys of the cycling public indicate that 80 percent of cyclists can be categorized as basic cyclists.

Child Cyclists — This group, which is a subset of the basic cyclists, includes children (aged 12 and under) on bicycles who have a more limited field of vision as they ride. This group generally keeps to neighborhood streets, sidewalks, and greenways. When children venture out onto busier roadways, they typically stay on sidewalks or bicycle facilities that keep them safely away from traffic. Given the comfort level of these cyclists, it is recommended that areas in the BCD region lacking bike lanes allow children and other cyclists who are uncomfortable riding in traffic to ride on sidewalks with the requirement that they yield to pedestrians.

In addition, within the BCD region a significant subsection of bicyclists are what can be classified as *Cyclists of Necessity*. While amongst the most present of cyclist groups on a number of regional streets, cyclists of necessity share many of the traits that characterize basic cyclists. This group utilizes bicycles heavily for commuting and shopping, yet like basic cyclists, these bicyclists prefer to utilize sidewalks and trails. Typically found in low-income communities, many members of this group have minimal awareness of safety regulations and possess minimal bicycle safety accessories (helmets, lights, etc).

Cyclists, not unlike drivers, generally become more experienced over time and miles of riding. As cyclists ride and gain more experience operating in traffic, they eventually graduate from the classification of a basic cyclist to an advanced cyclist more capable of operating under typical roadway conditions.

Facilities
As with the definitions for the types of cyclists, it also is important to understand the differences between the types of facilities.

Shared Lane — This type of facility is often referred to as a "wide outside lane," a "shared lane," or a "wide curb lane." These facilities provide extra width in the outermost travel lane on either single- or multi-lane roadways to accommodate cyclists. Typically, shared lane facilities have an outer lane width of 14 feet on multi-lane roadways and 15 feet on two-lane roadways. It is important to note that the lane width that is measured on this facility type does not include the width of the gutter adjacent to the travel lane. This facility is most appropriate on travel routes with moderate traffic volumes and is suitable for cyclists who are comfortable riding with the flow of regular traffic. These routes can be ridden by basic cyclists, but are most often preferred by advanced cyclists.

Sharrows – In 2009, the federal Manual on Uniform Traffic Control Devices (MUTCD) was amended to include the use of "Sharrow" Shared Lane road markings. MUTCD 9C.07's recommended placement of Shared Lane Marking centers "at least 4 feet from the face of the curb, or from the edge of the pavement where there is no curb" applies to "a street without on-street parking
that has an outside travel lane that is less than 14 feet wide" According to the MUTCD, the Shared Lane Marking "may be used to assist bicyclists with lateral positioning in a shared lane with on-street parallel parking in order to reduce the chance of a

Striped bike lane photo by SCDOT

bicyclist's impacting the open door of a parked vehicle, assist bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and a bicycle to travel side by side within the same traffic lane, alert road users of the lateral location bicyclists are likely to occupy within the traveled way, and encourage safe passing of bicyclists by motorists, and reduce the incidence of wrong-way bicycling."
The Shared Lane Marking should not be placed on roadways that have a speed limit above 35 mph or on shoulders or in designated bicycle lanes.

Striped Lanes — This type of facility consists of an exclusive-use area adjacent to the outermost travel lane. The area delineated for cyclists is a minimum of 4-feet-wide and is marked by a solid white line on the left side and frequent signs and stenciled pavement markings indicating either "Bike Only" or another such message so as to deter vehicles other than bicycles from using the lane for travel. In situations where a striped lane encounters on-street parking, extra width is required, most often a minimum of one additional foot (5-foot total lane width). As with the shared lane facility, delineated bike lane minimum widths do not include any curb-and-gutter that may exist, as these areas may be unsuitable for bicycle travel. Striped bike lanes are one of the facilities of choice for basic and child cyclists because they offer a measure of security (separation from vehicles) not found in all other facilities.

Multi-use path parallel to a roadway

Multi-Use Paths (one side of street) — This type of facility is typically a minimum 10-foot-wide asphalt path that runs parallel to the street and is shared by pedestrians, cyclists, and in-line skaters. These paths are set back from the curb by a planted verge area that is a minimum width of 5 feet. It is generally unacceptable to construct this type of facility where there are frequent curb cuts and intersections because the chance for conflicts between cyclists and vehicles is dramatically increased. This facility type is generally suitable for all levels of cyclists, but is most often preferred by basic and child cyclists.

Off-road multi-use paths can increase the value of neighboring real estate and protect existing corridors from development. Trails and other greenway corridors promote parkland development, wetland preservation, and environmental protection.

Signed Routes — This type of route is created in cases where no room or need exists to create additional space for cyclists. Often, signed routes lead cyclists through the "quieter" streets of a city, using neighborhood streets where traffic speeds and volumes are low. This type of route is good for cyclists of any level, provided it is planned on streets that have low traffic volumes and speed. Signed routes are helpful in wayfinding to link neighborhoods with networks of greenways and bike lanes.

The residents of the BCD area possess a wide range of skill levels and facility preferences. Differences in riding ability and trip purposes were considered when identifying the most suitable bikeway system. The recommended bicycle facilities map, as seen in **Figure 5.1**, represent a system of interconnected facilities, which, when implemented, will provide the basic necessities for all skill levels. These recommended projects are a critical part of the annual transportation planning process, and should be used as a guide for future capital projects.

The goal is to develop an interconnected system of trails and bikeways that would allow users to safely travel between major destination points in the BCD area. However, facility types were not specified, since this is best determined on a project-by-project basis. Several of these bikeways and trails follow the alignment for the proposed East Coast Greenway, which will hopefully contribute to the success of this route by making it more accessible to bikers, pedestrians, and the disabled.

U-shaped bike rack

One bicycle accommodation not included in the map is the provision for bicycle parking. Many potential bicyclists fear their vehicles will get stolen if they are parked on bike racks. However, most bicycle thefts occur at the residences when bikes are left unattended. Bicycle theft can never be eliminated; however, some common sense measures can be taken to avoid or limit the chance of theft. First, the placement of bicycle parking should always be in a visible, weather-protected, and well-lighted location. Secondly, bicycles should be locked using the wheel and frame for security. U-shaped bicycle racks are recommended.

Consideration should be given to providing bicycle parking at key destination points throughout the region. Some potential areas include, but are not limited to, malls, theaters, parks, central business districts, and schools. The cost for such amenities ranges from a few hundred to several thousand dollars, depending on the type and quality of material.

Pedestrian

The pedestrian plan was developed based on the premise of providing safe travel without being required to walk in a vehicle lane, a ditch, or an unpaved shoulder. Rather than proposing specific corridors for improvement, the plan developed a set of walkability criteria. These criteria assigned labels to areas or roads in the BCD region based on a standard set of characteristics. This information does not take in to account safety of street crossing or ADA accommodations. These attributes are as follows:

Not Walkable Areas

- Interstate corridors
- Neighborhoods with average ½-acre lots or larger

- Industrial parks
- Rural areas

Not Walkable Roads

- Roads lacking sidewalks or a multi-use path
- Installation of a sidewalk would not be practical or would not enable safe pedestrian travel

Potentially Walkable Areas

- Neighborhoods without continuous sidewalks or multi-use paths
- Higher-traffic areas where safety would be improved with a dedicated pedestrian path

Potentially Walkable Roads

- Roads currently lacking pedestrian facilities
- Roads with worn paths or other indicators of existing pedestrian traffic
- Roads where installation of a sidewalk would enable pedestrians to safely travel the corridor

Walkable Areas

- Sidewalks or multi-use paths are present
- Neighborhoods with low traffic volumes and speeds

Walkable Roads

- Roads that currently have sidewalks or multi-use paths or are low-traffic volume/speed

Not Applicable Areas

- Military bases
- Ports
- Airports

Recommendations

Recommendations designed to enhance the walkability and bicycle-friendliness of the CHATS region are organized by policies, programs, retrofit projects, new construction and then funding and priorities.

Standards

The South Carolina Department of Transportation has established standards for pedestrian and bicycle facilities that are presented in the 2003 Highway Design Manual as well as the 2003 Engineering Directive. As appropriate, considerations should be given to enhancements of the standards, as described in Chapter 4 “Complete Streets.”

Policies

A survey of local governmental agencies in the region was conducted in November 2010 and is summarized in **Table 5.1**. It shows a varying degree of implementation of pedestrian and bicycle-friendly policies. Implementing agencies may use **Table 5.1** as they consider policy updates.

Three general steps can be taken to provide an improved pedestrian and bicycle environment:

1. Integrating land use and transportation to create communities and neighborhoods that are designed for walking and cycling
2. Adopting pedestrian- and bicycle-friendly development standards, policies, and guidelines
3. Having a proactive attitude toward change

Respondents to the public survey said they would like to dedicate $24 of every $100 spent on transportation improvements to bicycle and pedestrian facilities. In contrast, based on a 5-year spending projection of state and federal funds, only $0.50 of every $100 in transportation improvements is spent on bicycle and pedestrian projects. The discrepancy in actual funding versus desired funding levels by the public indicates a shift could occur in the way the BCD region spends its money.

The responsibility for making the policy changes and improvements needed to change this will be shared by numerous and different agencies and jurisdictions, including SCDOT, the CHATS Policy Committee, Berkeley, Charleston, and Dorchester Counties, and all municipalities.

The primary strategies and actions recommended are as follows:

- Currently, sidewalk implementation is required either on one or both sides of the street in most counties and cities in the CHATS study area for residential land development. It is recommended that these policies be implemented in those counties and cities that do not already have them. A strong commitment to sidewalk implementation should be an integral part of the development review process.
- Promote bicycling and walking as legitimate, popular, and mainstream activities that all sections of society and all ages can enjoy.
- Support employer programs to promote bicycling and walking as modes of commuting, including relevant safety information.
- Use driver education classes and curricula, driver testing and licensing information, and public awareness campaigns to inform motorists about passing bicyclists with care, using the horn appropriately, and yielding to bicyclists at intersections. Supply information to drivers on how to share the road with bicyclists and pedestrians in ways that are not intimidating. Additionally, provide enforcement and publicity of cases where motorists are abusive and threatening to
- bicyclists or pedestrians.

[1] Note: Shaded boxes above indicate the agency answered yes, or a *qualified* yes.

General Comments:
[A] Dorchester County Transportation Master Plan contains bikeway recommendations; [B] City of Folly Beach Planning Commission may require sidewalks and pedestrian easements for interparcel connectivity; [C] City of Goose Creek Zoning Ordinance includes a downtown redevelopment area; [D] City of Hanahan - The City applies yearly for grants to add bikeways/sidewalks for older developments. New developments are required to install sidewalks; [E] Town of Mt. Pleasant - Commercial Village Ordinance is in effect with a goal of creating pedestrian friendly commercial development. Sidewalk ordinance is required with one or both sides determined by density and allows for paths and trails in some instances; [F] Sullivan's Island - In process of rewriting zoning ordinance

Table 5.1 – Bicycle and Pedestrian Policy Review	Berkeley County	Charleston County	Dorchester County	City of Charleston	City of Folly Beach	City of Goose	City of Hanahan
General Issues							
Our Comprehensive Plan supports improvements to bicycle and pedestrian mobility.							
Our Comprehensive Plan expresses support for greenways and/or trails.							
Our annual budget includes funding for sidewalk improvements.							
Our annual budget includes funding for trails.							
Our annual budget includes funding for on-road bikeways.							
We have completed an ADA Transition Plan, which identifies locations needing curb ramps							
Land Development Issues							
Our zoning ordinance identifies areas where mixed uses are:	Permitted	Permitted	Permitted	Required &	Permitted	Permitted	Permitted
Our zoning ordinance permits residential and commercial densities that encourage a compact, pedestrian friendly design.							
We have a transit oriented development ordinance.							
We have a Traditional Neighborhood Development ordinance.							
Our residential land development ordinance addresses street design.							
Our residential land development ordinance requires sidewalks on both sides							
Our residential land development ordinance requires sidewalks on one side of							
Our commercial land development ordinance requires sidewalks if property is							
Our commercial land development ordinance requires sidewalks on both sides							
Our commercial land development ordinance requires sidewalks on one side							
Our commercial land development ordinance discourages homes with garages							
Our commercial lot development standards require on-site connections.							
Our commercial lot development standards require pedestrian and/or bicycle connections to adjacent developments and residential areas.							
Our parking ordinance allows for side lot and rear lot parking in lieu of front							
Our parking ordinance includes a requirement to install bike racks.							
Our parking ordinance requires that parking garages include bike racks.							
Our parking ordinance requires connections between sidewalks along the street							
Our street design standards include sidewalks.							
Our street design standards require a minimum -- feet of sidewalk width and --							
Sidewalk Width		4		5		4	
Verge Width		5		Varies	2	3	
Our street design standards include bike lanes.							
Our street design standards allow traffic calming.							
We have plans to build sidewalks using public funds in the following locations:				All Areas of the City			Murray Blvd.
We have plans to provide bikeways using public funds in the following locations:				All Areas of the City			
General Comments:			[A]		[B]	[C]	[D]

[1] Note: Shaded boxes above indicate the agency answered yes, or a *qualified* yes.

General Comments: [A**]** Dorchester County Transportation Master Plan contains bikeway recommendations; [B] City of Folly Beach Planning Commission may require sidewalks and pedestrian easements for interparcel connectivity; [C] City of Goose Creek Zoning Ordinance includes a downtown redevelopment area; [D] City of Hanahan - The City applies yearly for grants to add bikeways/sidewalks for older developments. New developments are required to install sidewalks; [E] Town of Mt. Pleasant - Commercial Village Ordinance is in effect with a goal of creating pedestrian friendly commercial development. Sidewalk ordinance is required with one or both sides determined by density and allows for paths and trails in some instances; [F] Sullivan's Island - In process of rewriting zoning ordinance

	Isle of Palms	Town of Kiawah Island	Town of Lincolnville	Town of Mt. Pleasant	City of North Charleston	Town of Seabrook	Town of Sullivan's Island	Town of Summerville
General Issues								
Our Comprehensive Plan								
Our Comprehensive Plan								
Our annual budget								
Our annual budget								
Our annual budget								
We have completed an ADA Transition Plan, which identifies locations needing curb ramps.								
Land Development Issues								
Our zoning ordinance	Permit	Not Allowed	Permitted	Permitted	Permitted	Permitted		Permitted
Our zoning ordinance permits residential and								
We have a transit								
We have a Traditional								
Our residential land								
Our residential land								
Our residential land								
Our commercial land								
Our commercial land								
Our commercial land								
Our commercial land								
Our commercial lot								
Our commercial lot development standards								
Our parking ordinance								
Our parking ordinance								
Our parking ordinance								
Our parking ordinance								
Our street design								
Our street design								
Sidewalk Width			3(5 Commercial)	5				4
Verge Width			5		5			5
Our street design								
Our street design								
We have plans to build sidewalks using public	Ocean Blvd.,		Lincoln Ave., Broad St.	Rifle Range Rd., Long Point Rd.	Midland Park Rd., James Bell Dr.			
We have plans to provide	Breach	Kiawah Island						Sawmill Branch, 3rd
General Comments:				[E]			[F]	

- Teach parents and young children the correct use of crosswalks and safe crossing strategies. Teach bicyclists of all ages to ride with traffic, and teach older child cyclists and adults to ride on the street rather than the sidewalk. Ensure that every elementary school child receives comprehensive bicycling and walking instruction by the age of eleven.
- Enforce pedestrian right-of-way laws. Explain to motorists the need to watch out for pedestrians crossing the road and to yield to pedestrians when entering a major highway from a side road. Teach motorists to yield to bicyclists and pedestrians when turning and entering driveways. Increase motorist awareness of the presence of bicyclists on streets and pedestrians on sidewalks.
- Enforce traffic laws that will reduce illegal behavior by both bicyclists and motorists. Provide programs that will better acquaint both motor vehicle and bicycle operators with their rights and responsibilities when operating on the highway system.
- A policy to improve bicycle route signage and directional signage will show connections between the routes. Comprehensive and frequent bicycle signage also can promote bicycling by making the extensive bicycle route system more easily discernible and generally known. With this in mind, it is recommended that bicycle signage be implemented area wide to provide a comprehensive, understandable system.

Programs Encouragement

Many existing and potential bicyclists and pedestrians in the BCD region say they would ride or walk more often if conditions were better and if there was more encouragement given to the activity. There is an important link between these two "ifs." Communities with the highest levels of bicycle activity in the United States, such as Madison, Wisconsin, Seattle, Washington, and Davis, California, have not only developed an impressive infrastructure for bicycles with bike lanes, trails, and other facilities, but they also have actively promoted bicycling in their communities. Similarly, cities such as Copenhagen, Denmark; New York, New York; Washington, DC; and San Francisco, California have developed an extensive sidewalk network that provides interconnectivity and encourages people to walk.

There are four key messages that residents and visitors in Berkeley, Charleston, and Dorchester Counties must hear before they are likely to change their travel habits:

- Bicycling and walking are legitimate and realistic means of travel;
- Transportation is much more than getting to and from work;
- Bicycling and walking can be done safely; and
- Bicycling and walking are a great value

There also are four key groups of people who need to be involved in encouraging bicycling and walking in the region:

- Government agencies and politicians;
- Employers;
- Retailers; and
- Bicycle user and pedestrian advocacy groups

A series of policies and programs could be adopted to promote bicycling and walking in the BCD area, including:

- Encouraging bicycle and pedestrian commuting;
- Bike to work/walk to work events;
- Employee Commute Options (ECO) programs;
- Maps and other information;
- Encouraging shopping by bicycle or on foot;
- Encouraging bicycling or walking to school and church; and
- Encouraging recreational bicycling, walking, and running

Improving the safety of bicyclists and pedestrians will require a comprehensive program that can be condensed into a number of key actions:

- Literature for college students and tourists visiting the BCD region;
- Increase the level of commuting and utilitarian bicycling and walking;
- Create a conveniently-spaced network of bicycle- and pedestrian-facilities throughout the BCD region;
- Provide better information about the bicycle and pedestrian system;
- Install bicycle-friendly curb inlets and drainage grates;
- Remove debris from the edge of the street;
- Adopt a child helmet law;

The integration of bicycle and pedestrian facilities into the transportation planning and design process is crucial. A part-time bicycle and pedestrian coordinator and periodic training will help achieve the full integration of bicycles into our everyday lives. Initially a part-time coordinator on the BCDCOG staff could write grant applications for new funding and promote policy changes within each of the city and county government agencies. This part-time regional planner position should evolve into full-time bicycle and pedestrian coordinators working for the largest cities and counties. At that time, the COG may consider retaining a regional planner to serve the smaller jurisdictions.

Safety

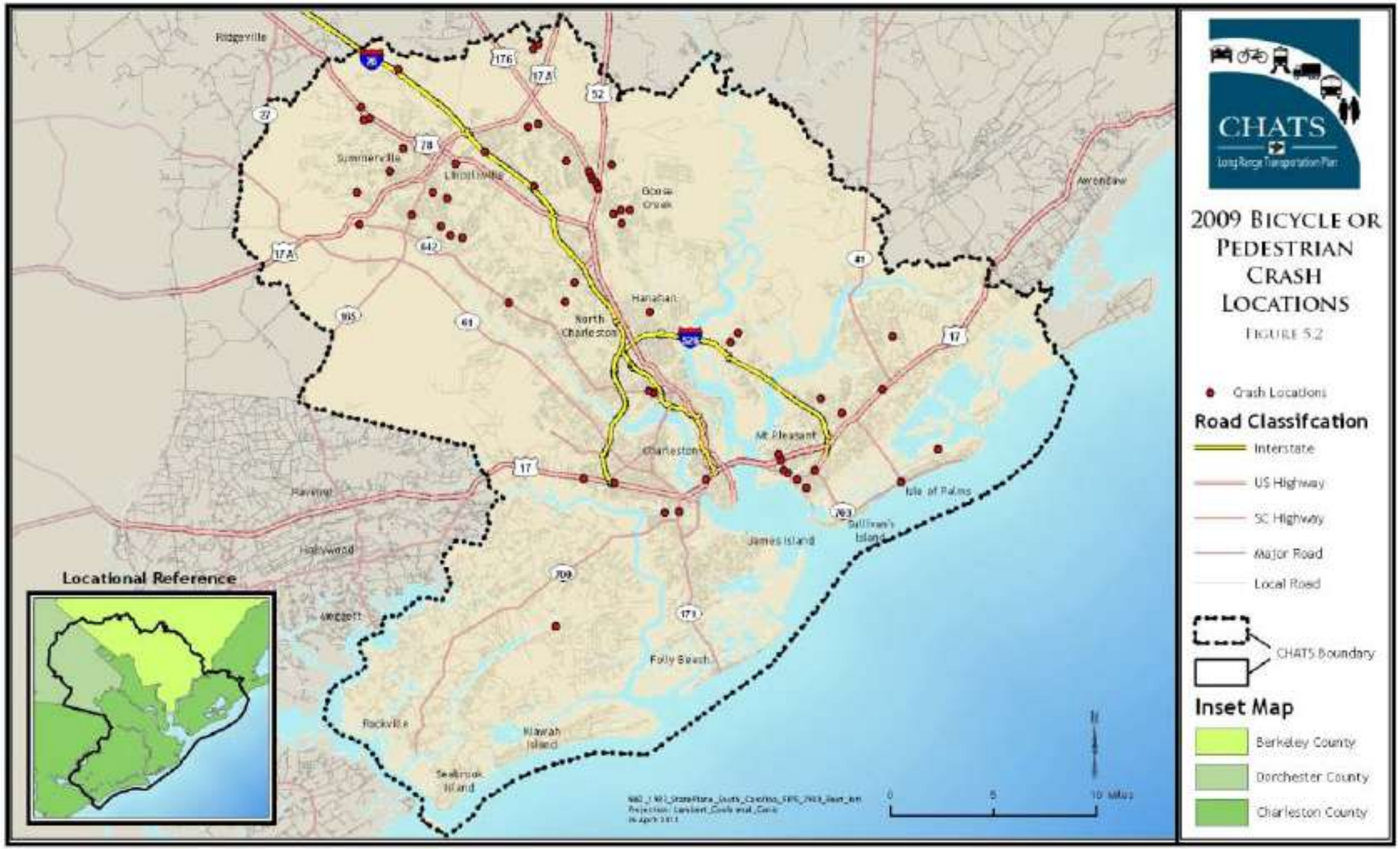
Identifying safety issues was a critical element of the plan. Crash data involving a pedestrian or bicyclist were obtained from SCDOT for the period January 1, 2003 through December 31, 2009, the last year data is available for both pedestrian and bicycle accidents. A summary of the data is shown in **Table 5.2**. The annual trends for each county indicate that Charleston County has consistently had the more crashes. This would be expected because of the density of the county compared to

Berkeley and Dorchester Counties and due to Charleston County possessing the majority of the large roadways located in the region.

Table 5.2 – Annual Crash Trends by County

	2003	2004	2005	2006	2007	2008	2009
Berkeley	32	39	35	43	40	58	49
Charleston	236	249	220	284	277	276	240
Dorchester	34	32	41	24	44	37	34

Crashes involving pedestrians and bicyclists are still somewhat of a random occurrence, so when more than one crash involving a pedestrian or bicyclist occurs at one location or if multiple accidents occur along a corridor, it may suggest a need for countermeasures that are specific to that area. In recent years, SCDOT has noticed that while the locations of these accidents are random, the causes of many of these accidents are similar in nature. With this realization in mind, SCDOT has undertaken a safety program on its roadways that looks to lower both accidents and fatalities along state roadways. These measures include larger, more visible signage in the vicinity of frequent accident areas, better placement of traffic control signage in the intersection areas, and the utilization of traffic control features to limit accidents and fatalities. **Figure 5.2** shows the location of all pedestrian/bicycle crashes with injuries or fatalities in 2009. A follow-up study of multiple accident areas and corridors where accidents frequently occur should be undertaken, beginning with updated crash data, a review of the officer's crash reports, a site investigation, consideration of alternative countermeasures, and a search for funding to implement the countermeasures, design and then implementation.


CHATS
Long Range Transportation Plan
2009 Bicycle or Pedestrian Crash Locations
Figure 5.2
Crash Locations
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Ridgeville
Summerville
Goose Creek
Hanahan
North Charleston
Mt. Pleasant
Charleston
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Meggett
Folly Beach
Rockville
Kiawah Island
Seabrook Island
Awendaw
0
5
10 Miles

Bicycle Safety

For instance, there are different levels of bicycle riders using area bicycle facilities for different needs, each having different handling abilities. The need for bicycle education is apparent in numerous sections of the BCD Region. On several occasions, bicyclists were observed riding on the wrong side of the road in areas such as Downtown Charleston, West Ashley, and North Charleston, and on major corridors such as Meeting St. and Montague Ave., a contributing factor in accidents and fatalities involving a bicycle. In fact, 30 percent of car/bike accidents nationwide occur because the bicyclist is riding on the wrong side of the road. In addition, many riders, particularly the "cyclists of necessity" do not wear a helmet while riding, despite the use of a helmet considerably lowering of the risk of the head injuries that are the major cause of bicycle fatalities. It is thus recommended that local schools, civic groups, and family activity centers become more involved and organize some type of bicycle safety program.

The best way to get started is to build on the success of other local programs. Such a program exists in the region at the Medical University of South Carolina and is now in their second decade of activity. The "SC Low Country Think First" program is intended to keep kids safe through grass roots education and prevention. Their mission statement reads "To prevent brain, spinal cord and other traumatic injuries through the education of individuals, community leaders and the creators of public policy." The program operates in collaboration with other injury prevention programs in the area, especially the Trident Area "SAFE KIDS" program located at MUSC.

The program is an award-winning public education effort. The S.C. Low Country Think First Program covers Charleston, Dorchester, and Berkeley counties primarily. The program covers all ages. The primary emphasis is on two educational programs geared toward teenagers and young adults, and children in grades K-3. These programs are the "Think First for Teens and "Think First for Kids

The "Think First for Teens" program concentrates on teaching young people about their own personal vulnerability and risk taking. Each year an estimated 500,000 persons sustain permanent brain and spinal cord injuries in the United States. The most frequent causes of these injuries are motor vehicle crashes, falls, and sports and recreation especially diving and violence. Teens and young adults are a high risk for these devastating injuries, many of which are preventable." By utilizing speakers who have sustained brain and spinal cord injuries, the message that we promote is the following: You can have a fun-filled, exciting life, without hurting yourself, if you "THINK FIRST" and use your mind to protect your body."

The "Think First for Kids" safety and prevention program is comprised of six safety modules, including vehicular, bicycle, water, sports and recreational, and violence avoidance. It was launched in 1996 and is the first program of its kind designed specifically for children ages six to eight. Through the use of classroom curriculums, comics, videos and posters featuring *Street Smart*, the safety super hero, we try to instill and reinforce safe behavioral patterns during these formative years.

Enforcement

Many bicyclists across all user groups are unaware that legally, bicycles are considered vehicles, and that bicyclists are expected to obey traffic laws as they would when driving an automobile. Bicyclists have a reputation for not obeying traffic laws. In a number of cities, including Charleston, the law specifically prohibits cycling on sidewalks. Cyclists are frequently seen running red lights and stop signs, riding against traffic, and riding for long periods within the median of multi-lane roadways. This behavior puts the bicyclists at risk and increases conflicts with pedestrians and motorists. Likewise, pedestrians have a tendency to cross streets at inappropriate locations; for instance, between parked cars or mid-block. For these reasons, stronger local ordinances, control measures, and enforcement efforts should be implemented. The following bicycle and pedestrian ordinances and enforcement initiatives are recommended for the planning area:

- Work with local police to increase enforcement on the following offenses:
  - Running stoplights and stop signs;
  - Riding the wrong way down the street;
  - Riding in the median of multi-lane roadways; and
  - Riding at night without lights
- Increase police patrols preferably with police on bicycles within the planning area including off-street trail system and parks.
- Ride bicycles in the same direction as traffic.
- Require safety helmets to be worn by all bicyclists riding on a public facility.

With these goals in mind, in 2008, the South Carolina legislature passed H3006, the Bicycle Safety Bill. In addition to a number of the recommendations presented above, the new law requires that vehicles maintain a safe operating distance between motorists and cyclists and provides penalties for violations of this, as well as for harassment of bicyclists by drivers. However, there is still no mandatory helmet law for any rider group in the state.

Retrofit

Within the approximately 800 square miles of the CHATS study area, most existing roadways are not pedestrian or bicycle friendly; hence there is a considerable backlog of retrofit work. While this task may appear daunting to municipalities, realistically every paved street has a lifespan that will

eventually necessitate some degree of comprehensive repair work. Different options are referred to as resurfacing, milling and paving, and full reconstruction and each has a respective cost and expected extension of lifespan for the pavement. The point is that as streets are scheduled for pavement maintenance, a policy should be in place that would consider changing the finished street such that pedestrians and bicyclists are accommodated, often with just a bucket of paint when restriping a street.

Restriping Improvements — Restriping is a low-cost alternative that can modify an existing roadway cross-section for use by bicyclists without widening. The stripe provides bicyclists the comfort of being delineated from the motorist travel lane, and also visually alerts the motorist to the potential presence of bicyclists on the roadway. Restriping projects can be completed in conjunction with resurfacing or other road improvement projects.

Interconnectivity between existing neighborhoods- In addition, in many developed areas where it may be impossible to provide road connections between neighborhoods, a sensible alternative may be to provide pedestrian or bicycle interconnections. By doing so, communities can create a shorter alternative for these user groups, as well as encourage a better sense of community between adjacent neighborhood areas.

New Construction

As new streets are constructed and existing streets are extended or interconnected, the "Complete Streets" concept described in Chapter 4 and incorporated within the comprehensive plan of numerous municipalities in the BCD region should be used to incorporate full accommodation of non-automotive travel, including for bicyclists and pedestrians. The incremental cost to accommodate bicyclists and pedestrians is much less than the cost to retrofit. Such a policy should be negotiated with the South Carolina Department of Transportation at a regional level once the long-range transportation plan has been adopted. The cost should be borne by developers who build local streets to serve their developments. It would be expected that the cost would be passed on to the ultimate users (buyers and renters). If any county or municipality requires developers to pay for and build collector streets then the incremental cost to accommodate pedestrians and bicyclists should be funded by the developers. There is strong demand nationwide for residential and mixed-use communities with sidewalks and bikeways as they are now considered a top amenity.

Greenway Construction — Explore the use of property contiguous to sewer, fiber optics, TV cable, phone line, or natural gas right-of-ways (ROW) for multi-use easements. This should help to alleviate the cost associated with ROW acquisition and renegotiations.

Implementation Considerations

Implementation of policies, programs, and projects requires public support, political will, and staff diligence. The public outreach sessions held throughout the region in conjunction with this long-range transportation plan show strong public support for "complete streets" that safely and conveniently accommodate pedestrians and bicyclists.

Funding for retrofit projects is scarce and very competitive. The federal Transportation Enhancements Program is extremely popular in this region and across the nation. Funds are set aside for statewide competition every two years. This region has been successful using Enhancement Funds to build hiker-biker trails in Goose Creek, multi-use trails in Summerville, trails and sidewalks in Mount Pleasant, and many other projects.

Streets funded with state and federal transportation monies are a steady source to build a network, however these projects are typically scattered throughout the region and rarely form an immediate network serving a specific area. Nevertheless, most of these streets form critical links in the transportation system and would be very expensive to retrofit for sidewalks and bikeways compared with the incremental cost of accommodation as other transportation improvements are constructed.

Funding for new construction occurs as development occurs, if developers are required to provide infrastructure. This "pay as you go" system is effective in that streets are built as new development occurs. However, these public streets are often used by general traffic that did not pay for them so a degree of fairness is introduced if a public-private partnership is formed with a mixture of funds from both the developer and the public sector.

In conclusion, a multi-pronged approach is necessary that includes:

<u>Short-term</u>

- BCDCOG funding for a part-time bicycle-pedestrian coordinator for three years
- Ongoing use of federal Transportation Enhancement funds to construct facilities identified in this Pedestrian and Bicycle Plan
- Development of project scoring system to use technical criteria to rank candidate projects for prioritization by decision-makers.
- Policy changes to implement demonstration projects
- Policy changes to adopt pedestrian and bicycle-friendly ordinances and policies in each jurisdiction

<u>Mid-term</u>

- County and large city funding for their own pedestrian-bicycle coordinators
- Consideration of using "flexible" state and federal surface transportation program funds to construct pedestrian and bicycle projects

Project Selection Criteria for On-Street Facilities and Multi-Use Paths

Following are criteria to consider in developing a prioritization scoring procedure for pedestrian and bicycle projects.

- Provide connectivity between important activity centers within each jurisdiction and within the region
- Provide service to existing areas of the greatest population and employment density, as well as areas of expected growth
- Provide service to residents making bicycle and pedestrian trips outside their home jurisdiction
- Serve the primary connectivity needs between jurisdictions within the region and neighboring jurisdictions outside the region
- Provide key crossings of the major highway, rivers, and/or railroad barriers that make regional bicycle and pedestrian connectivity difficult or impossible
- Include many of the roadways and other corridors with the greatest potential to serve pedestrian trips
- Project consistency with adopted state, regional or local plans
- Project addresses social equity or environmental justice issues
- Cooperation/joint application with multi-jurisdictional sponsorship of project
- Degree of public participation in the development of the project and/or support of non-governmental groups
- Quality of the management/maintenance program to provide for the upkeep of the project
- Overall benefit to the community/MPO

Transit Element

Introduction

Transit is an integral component of the transportation network for many residents of the BCD region. A significant number of local citizens rely on transit to access jobs, medical care, needed services, and all other aspects of daily life. As the region's population continues to grow, convenient and reliable transit service will become an even greater necessity. The purpose of this element of the Long Range Transportation Plan is to identify transit strategies that will enhance mobility options, ease congestion, and mitigate transportation costs for all residents of the region, including those who have no other transportation options as well as those who have other mobility choices.

Transit is reliant upon a complete transportation system to operate effectively. Appropriate roads and highways must be suitable for bus traffic, sidewalks, and other pedestrian features that provide adequate access to transit stops. Thus, transit cannot be considered in isolation. The strategies that will be developed as part of the long-range transit vision will be supportive of improvements to the total transportation system.

Existing transit services in the BCD region are summarized below. Following this summary is a synopsis of previous and current transit planning efforts in the region, an overall assessment of transit needs, and a discussion of the future outlook for public transportation.

Existing Transit Services

Transit services are provided by two agencies in the BCD region: the Charleston Area Regional Transportation Authority (CARTA) and TriCounty Link (also known as the Berkeley-Charleston-Dorchester Regional Transportation Management Association (RTMA)). Since 2004, with the addition of transportation sales tax revenues and private sector funding partnerships, transit services have expanded and ridership has increased drastically. CARTA provides fixed-route and paratransit (demand-response) services in the urban core of Charleston, North Charleston, and the immediately surrounding areas. TriCounty Link provides deviated fixed-route and demand-response services to residents of the outlying rural areas. In addition to the two public transit operators, a number of local human service agencies provide transportation services geared specifically to their clients. Many private transportation and taxicab companies offer personalized transportation services as well. Intercity transit services are available through Greyhound and Amtrak. Coordination efforts have been facilitated to enable efficiency and connectivity of transit providers as well as various modes of travel, as presented in the BCDCOG Human Service Transportation Coordination Plan.

CARTA

As the urban public transit provider, CARTA serves as the primary means of transportation for many local residents. CARTA's services include a network of fixed routes, commuter express routes, complementary paratransit service (Tel-A-Ride), and the Downtown Area Shuttle trolleys (DASH). CARTA caters to the diverse transportation needs of the citizens of the CHATS area, such as those of commuters, students, cyclists, the elderly or disabled, and visitors to the area. Providing transit services to nearly 650,000 residents, CARTA has one of the largest service areas of Southeastern transit providers. Additionally, CARTA has experienced annual ridership in excess of four million trips provided. .

CARTA was established in 1997, when the agency assumed responsibility for transit services that were formerly operated by South Carolina Electric and Gas (SCE&G). As part of the transition agreement, SCE&G provided funds sufficient to support transit operations for approximately 7 years. At the end of the 7-year period, a new local funding source must be identified to support operations and provide matching monies for federal grants.

Funding:

In the past, CARTA has lacked the funding necessary to sufficiently serve the transit needs of Charleston-North Charleston-Summerville Metropolitan Area citizens. In November 2004, nearly 60% of Charleston County voters approved a ½-cent increase in the county sales tax in which proceeds are dedicated to roadway and bridge improvements, green space acquisition, and transit operations. This appropriation has enabled CARTA the financial security necessary to maintain and enhance existing services. Additionally, a federal apportionment of nearly five million dollars per the *American Recovery and Reinvestment Act* in 2009 and an annual apportionment from Federal Transit Administration (FTA) Section 5307 program have given CARTA the financial capacity to improve and sustain services. In fact, the allocation of federal funding through the *American Recovery and Reinvestment Act* (ARRA) has permitted CARTA to replace eleven percent of its aging bus fleet, improve the Leeds Avenue Maintenance Facility, and install 25 additional bus shelters throughout its service area. A comprehensive approach to service delivery that includes funding resources, strategic partnerships, targeted marketing, and service adjustments has enabled CARTA to boast record ridership for the second consecutive year. In 2009, Charleston County Half-Cent Sales Tax revenue accounted for nearly 40% of CARTA's administrative and operating revenues exceeding federal appropriations, which accounted for nearly 30%, passes and farebox

revenues accounted for nearly 20%, partnerships with local agencies and SCDOT grant monies accounted for the remaining 10%.

Partnerships with the College of Charleston, City of Charleston, the Medical University of South Carolina, Roper Hospital, the Citadel, Charleston County School District, and Trident Technical College have also contributed to sustained increases in ridership. CARTA has participated in many ongoing marketing efforts and initiatives to educate citizens of its services and the many benefits of transit.

CARTA is developing a vehicle replacement plan, in which the establishment of a Capital Replacement Investment Fund will be recommended. This will allow the 20% local match requirement to federally fund vehicle replacements be held in reserve to avoid the fiscal strain associated with vehicle replacement. Despite ARRA funding to replace its fleet, the replacement of additional buses will be necessary over the next five years and will require substantial funding. For instance, the cost to replace one bus with all of the required components (fare tower, security camera, etc.) exceeds $400,000 in 2010 dollars. Because vehicle replacement consists of a significant portion of CARTA's budget, the Vehicle Replacement Program was developed to stagger vehicle purchases over the five-year planning horizon. Similar to the Capital Replacement Investment Fund, CARTA intends to initiate an operating reserve fund, where three months of operating expenses will be held in reserve to provide financial security in the case of a sudden decline in revenues.

Services:

CARTA currently operates twenty-five routes with six park and ride facilities. With increased residential and commercial development, expansion of services and facilities is needed to sufficiently meet the transportation needs of traveling public. Conversely, future growth of the region and land use planning must coordinate with transit service planning. Services are provided Monday through Saturday and as late as 11:00pm on certain routes. DASH services and certain fixed-route services are available on Sundays. CARTA Express Service caters to peak hour commuters and has displayed increasing ridership since its inception in 2007. Currently, CARTA maintains two express routes: North Charleston to James Island and West Ashley Mount Pleasant. Monthly ridership of Express Services exceeds 30,000 riders who opt to utilize transit over their personal automobile. This represents a new trend in CARTA, with over 70 percent of Express Service passenger households possessing more than one vehicle. Sustaining ridership trends and efficiency of Express services is fundamental to ensure a sustainable transportation system. In fact, the expansion of Express services has been proposed for the Dorchester Road corridor to Downtown Charleston to accommodate the increased travel demand associated with regional commuting patterns. This new route will service employment node in North Charleston and the recently completed park and ride facility at the North Charleston Regional Intermodal Transportation Center. Furthermore, the success of these services will provide the basis for the designation of fixed guideway transit corridors. CARTA Express Service was implemented through the *New CARTA Plan*, which was adopted in 2005. Additionally, all CARTA buses are equipped with bike racks to provide that intermodal connection for cyclists. Furthermore, CARTA is focusing on customer service, as indicated in the *CARTA Transit Action Plan FY 11-12*, to equip the new bus shelters planned for construction throughout the CHATS Area with automatic vehicle location (AVL) software to inform passengers with *real-time* arrival information.

Figure 6.1 illustrates the fixed routes that serve the CHATS planning area. In totality, CARTA ridership has steadily increased since 2005. More specifically, it has increased by nearly 200 percent. However, increases in ridership create new pressures on CARTA to expand services as certain routes reach capacity. CARTA must continuously strive to maintain the existing level of service but also devise efficient and innovative methods to accommodate future growth. For example, DASH service has experienced a significant increase in ridership (over 78,000 passengers per month) by partnering with the City of Charleston, the Charleston Visitors' Bureau, and the State Ports Authority. This partnership allowed the DASH service to operate fare-free starting in late 2010. It is this type of partnership and creative marketing that will allow CARTA to expand and reach new markets. The graph below, **Figure 6.2**, displays CARTA's ridership trends from 2006 to 2010.

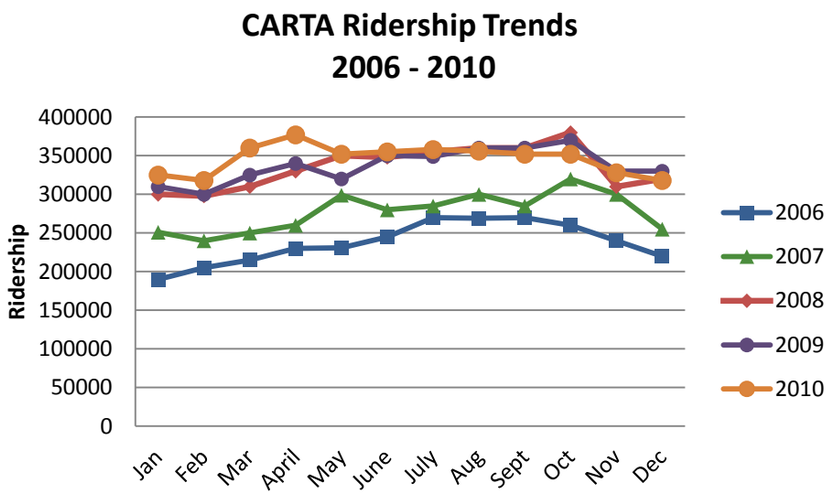
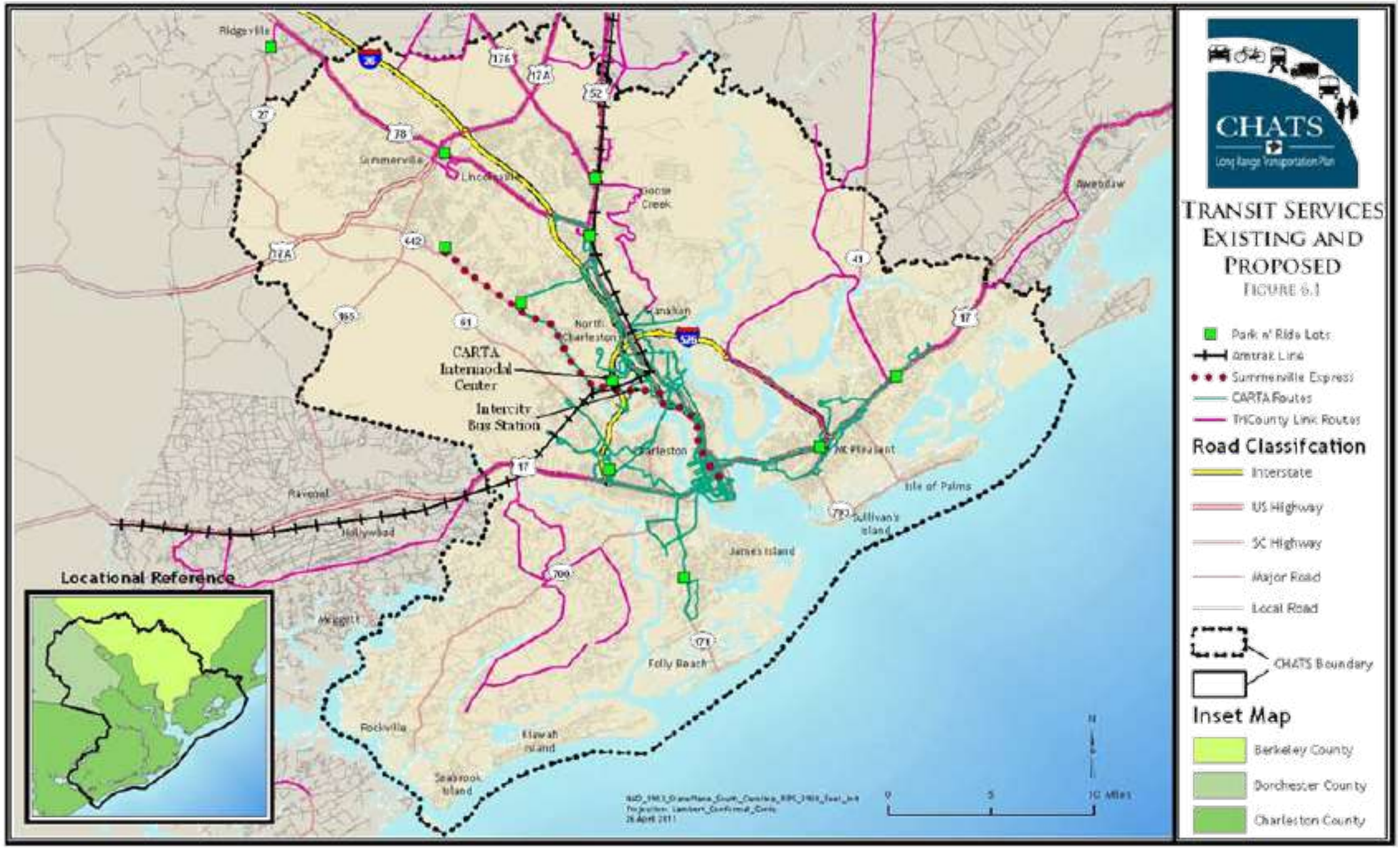


Figure 6.2: CARTA Ridership Trends 2006-2010
Source: CARTA

One of the ways in which CARTA intends to accommodate future transportation needs is by advancing the development of the North Charleston Regional Intermodal Transportation Center near the intersection of Dorchester Road and Montague Avenue. This 30-acre site was purchased through funding from FTA Section 5309, *New Capital Investments*. This intermodal transportation center will accommodate CARTA and TriCounty Link transit services, Greyhound, Amtrak, taxi, and, prospectively, fixed-guideway transit services. Due to its proximity to Interstate 526 and the Charleston International Airport, this site is ideal for intermodal exchange. As of 2010, the installation of utilities and lighting, landscaping, and the construction of a park and ride lot consisting of 225 parking bays has been completed. The park and ride facility will not be utilized by transit patrons until the Dorchester Road Express Route is instituted. Aside from services associated with transit, this multistory building will house a variety of commercial uses including retail, restaurant, and office opportunities. Funding for this project will result from federal programs as well as public-private partnerships.


CHATS
Long Range Transportation Plan
TRANSIT SERVICES EXISTING AND PROPOSED
FIGURE 6.1
Park n' Ride Lots
Amtrak Line
Summerville Express
CARTA Routes
TriCounty Link Routes
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
CARTA Intermodal Center
Intercity Bus Station
Locational Reference
Ridgeville
Summerville
Goose Creek
Awendaw
North Charleston
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Meggett
Folly Beach
Rockville
Kiawah Island
Seabrook Island
0
5
10 Miles

TriCounty Link

TriCounty Link legally the Berkeley-Charleston-Dorchester Regional Transportation Management Association (RTMA) prior to September 2007, provides rural transit service throughout the BCD region, serving both the general public through scheduled routes and demand-response services, as well as agencies and employers through contract operations for their clients. Established in 1996, TriCounty Link focuses on transporting customers who reside in rural areas to employment opportunities and services. Through coordinated transfer points with CARTA, customers can travel into the urbanized area, providing these citizens with a more economical method of travel. Because of the rural service area, TriCounty Link is characterized by longer trip lengths and more specialized services than are typically provided in an urban setting.

Services:

TriCounty Link currently provides nine deviated fixed routes, four *Commuter Solutions* routes, and ten contract routes throughout the region as well as Medicaid services in Dorchester and Berkeley Counties. . TriCounty Link maintains eight park and ride locations that provide free parking. Each TriCounty Link bus is equipped with bike racks to cater to the transportation needs of cyclists. A transfer agreement with CARTA allows patrons to transfer in between transit providers at no additional charge. In fact, in 2008, the institution of three additional commuter routes providing a terminus at the CARTA bus stop at the Otranto Super K-Mart enable commuters from Ridgeville, Summerville, Goose Creek, and Moncks Corner to connect with CARTA services. The Mount Pleasant K-Mart Park and Ride provides transfer opportunities as well. Additionally, TriCounty Link provides free Link-to-Lunch services in Moncks Corner through a partnership with Santee Cooper. TriCounty Link continuously strives to maximize efficiency of its services while providing rural residents with easy accessibility throughout the BCD region. In late 2009, a Commuter Solution route was extended to residents of Bonneau, St. Stephen, and Pineville.

In 2009, TriCounty Link's ridership consisted of nearly 170,000 individuals, a number that is only expected to increase in the future. The expansion of services to Wadmalaw and Kiawah Islands as well as the existing services on Edisto Island is anticipated for the future. Lastly, as of July 2010, TriCounty Link, through a partnership with Santee Cooper, was able to equip four commuter buses with wireless internet capabilities; TriCounty Link plans to equip additional buses with such capabilities in the future. The routes equipped with these services consist of the Moncks Corner-Summerville and North Charleston-Moncks Corner Commuter Solutions routes. The intent of this installation is to boost ridership and revenues as well as change the image of public transit. TriCounty Link is the first public transit provider in the state to provide wireless internet capabilities. TriCounty Link's strides in accommodating the transportation needs of rural BCD residents enabled it to boast an increase in ridership exceeding 40 percent from June 2009 to July 2010, with the most significant increases occurring in the Commuter Solutions routes. However, ridership on Dorchester County routes has declined during this time period; TriCounty Link is investigating more efficient and effective methods of providing public transit to this area. South Carolina Department of Transportation (SCDOT) designated TriCounty Link as the *best rural public transportation provider of 2010* and the *best transit provider of 2008*. Finally, TriCounty Link plans to expand service through public-private or public-public partnerships as opportunities arise or as funding allocations allow. The graph below, **Figure 6.3**, displays TriCounty Link's ridership trends from 2003 to 2010.

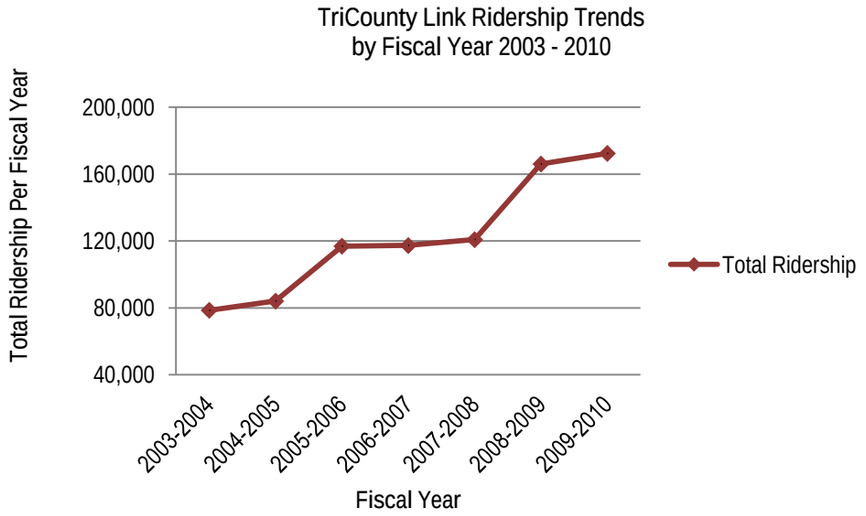


***Figure 6.3** TriCounty Link Ridership Trends 2003-2010*
Source: TriCounty Link

Funding:

The low-density character of the rural areas of the BCD region presents fiscal challenges for rural transit providers. To assist in these expenses, TriCounty Link obtains funding through a number of federal programs through the Federal Transit Administration via such programs as Section 5309 - *Transit Capital Investment,* 5311-*Formula Grants for Other Than Urbanized Areas,* 5316 - *Job Access and Reverse Commute*, 5317 - *New Freedom Program*, and indirectly through Section 5310 - *Transportation for Elderly Person and Persons with Disabilities*. . Additionally, through Title XIX of the *Social Security Act*, funding is distributed to transit providers for the transportation of Medicaid recipients to non-emergency medical services. Medicaid funding for Berkeley and Dorchester Counties comprised nearly 26% of TriCounty Link's administrative and operating revenues during the 2010 fiscal year. Additionally, with over one million dollars appropriated per the *American Reinvestment and Recovery Act (ARRA) of 2009*, TriCounty Link is able to update its aging facility and purchase 14 14-passenger buses and two 32-passenger buses. To obtain local revenues, TriCounty Link maintains contractual agreements with local businesses. An example is

the ongoing partnership with Santee Cooper that has enabled TriCounty Link to enhance and maintain services in Berkeley County. TriCounty Link plans to establish similar partnerships in Dorchester County to expand services. TriCounty Link also obtains revenues from fares and advertising income. Additionally, Charleston County has allocated half-cent sales tax revenue toward TriCounty Link operations. This appropriation has enabled the extension of services to residents of Mt. Pleasant, Awendaw, McClellanville, and Johns Island.

Source: www.ridetricountylink.com

Figure 6.1 illustrates TriCounty Link routes serving the CHATS study area.

TriCounty Link has achieved a sustained increase in ridership since 2003, as illustrated in Figure 6.3; TriCounty Link Ridership Trends 2003-2010. In fact, TriCounty Link has experienced an increase in ridership of nearly 120% since 2003. These gains result from increased coordination with local human service agencies as well as the enhancement of existing services in Charleston County through the appropriation of half-cent sales tax funding, federal funding, and the establishment of partnerships.

Other Transit Providers

TriCounty Link contracts with a number of agencies in Berkeley and Dorchester Counties to provide transportation services for their clients; however, in Charleston County, many of the human service agencies work through the broker system established to deliver Title XIX (Medicaid) transportation for eligible clients in Charleston County for transportation to health care facilities. A number of other agencies also provide transportation specifically for their clients, using agency-operated vehicles. This type of service is generally funded by agency programs, and is not open to the general public.

In addition, a significant number of private transportation companies, including taxicab companies, operate in the BCD region. These companies provide specialized services for individuals and groups.

Intercity Transit Services

Intercity bus services in the BCD region are provided by Greyhound and by I 95 Coach, while intercity rail services are operated by Amtrak. Greyhound's regional bus terminal is located on Dorchester Road in North Charleston, and provides service to points north, south, and west. Another Greyhound terminal is located in Summerville. I-95 Coach provides daily express bus service from locations in North Charleston (Wal-Mart on Rivers Ave) and Summerville (McDonalds at US 17A and Interstate 26) to a location in New York's City, NY. The region's Amtrak station is located in North Charleston, and is served by Amtrak's *Palmetto* and *Silver Meteor* lines.

Transit Planning Efforts

Previous Long Range Transportation Plan

The previous CHATS Long Range Transportation Plan included a transit element that was completed in 2005. The transit element contained three major components:

1. *The Planning Framework*, which included information on transit needs, based on socioeconomic analysis, an operational analysis, and market research
2. *The Strategic Plan*, which described issues and opportunities regarding overall transit policy
3. *The Long Range Transit Plan*, which detailed proposed service improvements

At the time of this previous effort, limited funding was available to public transit providers thus, services and ridership were in decline. The previous plan supported the goals of the *New CARTA Plan* by including options for expanding existing regional transit services and facilities, enabling an integration of various modes of travel, developing innovative funding strategies, and enabling coordination among the rural and urban transit providers, The *New CARTA Plan*, adopted in 2005 in response to funding and service reductions in 2004, devised methodologies to restore and improve existing services by instituting: CARTA Express Service, CARTA At Night, additional fixed routes, and the designation of paratransit zones. The expansion of services purported in the *2005 New CARTA Plan* and coordination efforts between TriCounty Link and CARTA have been implemented; however, further coordination among transit providers as well as integration among varying modes of travel is necessary to further a sustainable and economically efficient transportation system. Lastly, the plan referred regional coordination of transit service and land use planning decisions to coordinate and develop transit services in the CHATS region. To advance this objective, the BCDCOG will undertake a feasibility study in 2011 to identify the opportunities and barriers.

Commuter Rail Service

Commuter rail is a service that operates on existing freight rail lines, catering to intraregional commuters traveling to and from work during the peak commuter hour. Historically, these transit services provided a means of transportation for residents of the suburbs into the central business district. In fact, the first regularly scheduled passenger service in the United States operated between Charleston and Augusta (1833). More recently, as cities continue to expand, the use of commuter rail has been implemented across the country to avoid the mitigate highway congestion. In 1990, BCDCOG conducted a study of potential commuter rail corridors in the Charleston Urban Area. Two primary corridors were evaluated, both radiating from downtown Charleston:

- Charleston – Summerville
- Charleston – Goose Creek – Moncks Corner

This study included only very preliminary analyses, and recommended that investigations that are more detailed be conducted. The analysis concluded that commuter rail service was not warranted at the time of the study; however, with sustained residential and commercial development contributing to increased travel demands on our roadways, a commuter rail service could be viable in the Charleston – Summerville corridor as well as the Charleston – Goose Creek corridor. The 1990 Study concluded that the following actions be taken: a detailed feasibility analysis of these corridors, preservation of the right-of-way as well as locations suitable for train stations, and advance the use of the Charleston Visitors' and Transportation Center as a rail terminus.

In the spring of 2006, a preliminary feasibility study of commuter rail in the CHATS Area was completed as recommended in the 2030 Long Range Transportation Plan, public interest, and increasing travel demand in these corridors. This study specifically analyzed the corridor stretching from the peninsula to the Town of Summerville along existing Norfolk Southern rail lines. According to land-use data collected for study, the population in areas along the corridor is predicted to increase by approximately 45,000 by 2025, concluding that a commuter rail service could potentially be successful in the Charleston/Summerville corridor in the future. The 2006 study initiated the planning framework that continues to guide policy decisions to date.

The 2006 Feasibility Study outlined nine recommendations for implementation of Commuter Rail in the CHATS Area; as of June 2010, three of these recommendations have been completed and the remaining recommendations are in progress. The recommendations that have been successfully completed are as follows;

- Implement and ensure effective marketing of the CARTA Express Service as success of this transit service will provide the impetus for commuter rail.
- Strengthen partnerships with stakeholders in the region who have an interest in rail and other forms of transit. The CHATS Commuter Rail Committee and the I-26 Corridor Committee have been created as a cooperative means to coordinate these efforts with land use planning.
- Establish a regional Rail Transit Advisory Committee that collaborates on coordinating land use and commuter rail planning and facilitate transit-oriented developments. The CHATS Commuter Rail Committee and the I-26 Corridor Committee have been created to facilitate regional coordinated land use and commuter rail planning efforts.

The recommendations that are currently in progress are as follows:

- Thorough land use data collection and forecasting for the commuter rail corridor. This research is compiled by the BCDCOG pursuant to the 2035 Long Range Transportation Plan.
- Perform mode split modeling and ridership estimates. The estimation tool and base year have been completed.
- Initiate coordination with rail operations who own the rail alignments within the corridor to establish track-sharing agreements.
- Perform a capacity analysis of rail lines and existing roadway infrastructure.
- Further capital investment analysis. This is a component of the Phase II Commuter Rail Feasibility Study, which was initiated in 2008.
- Expand service potential to Goose Creek and Moncks Corner per the CSX rail line. This is a component of the Phase II Commuter Rail Feasibility Study

Additionally, the proposed North Charleston Regional Intermodal Transportation Center is consistent with these plans. This facility will provide a park-n-ride facility, along with a transfer point for intermodal connections, where the routes will converge. CARTA and TriCounty Link will provide feeder transit services to places of employment that are not immediately accessible by the commuter rail line. Additional potential terminal locations proposed in the 2006 study include the former South Carolina Railroad Terminal, now currently the Charleston Visitors' and Transportation Center, located just south of Mary Street on the Charleston Peninsula. This terminal will provide immediate access to the commercial corridors of King and Meeting Streets as well as several economic generators including the College of Charleston, the Medical University of South Carolina, and Charleston School of Law via CARTA's DASH services. The potential Summerville Terminal, located between Main Street and Berlin Myers Parkway or potentially north of downtown, is easily accessible given its proximity to downtown and arterials. Infill development and revitalization of Upper King, Noisette and the Navy Yard, as well as the Neck Area, contribute to increased commercial and residential development, compliment commuter rail plans, reinforcing the need and feasibility of this transit service.

A second corridor was evaluated in phase II of the Commuter Rail Feasibility Study that investigates the potential for commuter rail along the Highway 52 corridor stretching to Moncks Corner and Goose Creek along existing CSX rail lines. Like the Phase I study, analysis of population and employment trends, growth and development patterns, the availability of right-of-way, travel patterns

and demand, as well as roadway capacity is necessary to assess the suitability of commuter rail along this corridor. Additionally, this study will investigate the suitability of proposed stations, including parking availability, amenities offered, and cost of construction. An inventory of grade crossings and the condition of rail lines, an evaluation of necessary line improvements, as well as a capacity analysis of the rail lines has been completed. As of July 2010, an analysis of the capital investment necessary to facilitate this initiative is in progress. Further analysis of the suitability and cost of proposed passenger_stations, rolling stock estimation, funding opportunities, as well as modal split modeling and ridership estimates remains to be completed.

Lastly, the BCDCOG completed the Application to the State Transportation Infrastructure Bank (SIB) in October 2008 for funding for commuter rail. Although the application was determined to be eligible for funding under the SIB guidelines, no funding has yet been appropriated.

Current Transit Planning Efforts

CARTA Transit Action Plan FY 2011-2015

CARTA prepares a transit action plan every five years. The transit action plan is an annually updated business plan that involves an assessment of current services and infrastructure, designation and prioritization of near-term action items that reflect current strengths, weaknesses, and opportunities, as well as the development of the program of projects. As the goals outlined in the former transit action plan, the *New CARTA Plan*, have been attained, it is time to devise a new plan that recognizes the current transit needs and opportunities in the region. The proposed *CARTA Transit Action Plan; Fiscal Year 2011-2015* is primarily focused on maintaining existing service; the uncertainty associated with the current economic climate limits CARTA's ability to commence large-scale expansions without new sources of funding. In fact, CARTA intends no net increase or decrease in services. However, maintaining the existing level of service can present a fiscal challenge without locally generated funding. The projected administrative, operational, and debt service costs associated with maintaining the existing level of service for the next five years exceeds $100 million. CARTA intends to generate local funding through four goals: maximizing efficiency of resources, increasing local revenues, building community support, and planning for future investments. Additionally, CARTA outlined 20 prioritized objectives to facilitate the four aforementioned goals. *High priority* indicates the objectives that are necessary to maintain the existing level of service as well as promote fiscal efficiency and sustainability. *Medium priority* indicates the objectives that will contribute to the facilitation of near-term enhancements; near-term enhancements are defined as those that require little investment but generate a high level of return. *Low priority* indicates the longer-term objectives that require a great deal of investment and necessitate higher risk premiums. Prioritized objectives of the CARTA Transit Action Plan are enumerated below:

CARTA Transit Action Plan; FY 2011-2015

	Objective	Prioritization
1	Maintain the existing level of service	High
	Maximize Efficiency	
2	Build Upon Most Successful Services	Low
3	Discontinue Underperforming Services	High
4	Install Automatic Vehicle Location System	Medium
5	Reassess Service on Peninsula	Medium
6	Establish Operating Reserve Fund	Medium
7	Replacement Program	
	Plan For Future Development	
8	Advance Implementation of Intermodal Center	High
9	Continue to Build Capital Replacement Fund	High
10	Create an "Enhanced Bus" Service on Rivers Avenue	Low
11	Prepare for New Service Opportunities	Medium
12	Continue Planning for Future Major Investments	High
	Increase Revenue	
13	Seek Increased Advertising Revenues	High
14	Consider Concessions at SuperStop	Medium
15	Build Partnerships with Local Hotels and Attractions	Medium
16	Local Dedicated Funding	
	Build Support	
17	Provide Additional Transit Amenities	Medium
18	Enhance System's Online Presence	High
19	Develop a Focus on Sustainability	Medium
20	Increase Community Involvement	Medium

Source: CARTA Transit Action Plan FY 11-15

Additionally, CARTA intends to extend services to areas that are currently underserved; these areas include the following:

- Dorchester Road; Implementation of the Express Service route to attract commuters from the Summerville Area.

- Daniel Island; The anticipated classification as an urbanized area per the 2010 Census would necessitate its inclusion into CARTA's service area.
- Mount Pleasant; Services remain limited despite sustained growth.
- Other areas that continuously petition for CARTA services such as Folly Beach.

Transit service is an effective strategy in addressing traffic congestion, air quality deterioration, and achieving growth management goals promulgated in comprehensive land use plans. The LRTP seeks to synthesis these goals into a regional vision that address the mobility needs of the region while maintaining quality of life and equitable service for all users. One initiative being explored by CARTA is to build on the success of high performing services by increase the level of service to existing customer and attract new ones by implementing an *enhanced bus* service. This concept would complement Route 10 on Rivers Avenue, which accounts for 25% of total system ridership, servicing nearly 35 passengers an hour. This route is not only significant fiscally but also to the many passengers that rely on its services; thus, CARTA intends to enhance services through the following: increase frequency of bus service, incorporate stylized buses that provide additional passenger comfort, coordinate traffic signals, improve amenities, implement unique branding and marketing of new *enhanced services*, and enhance pedestrian access to bus stops. Building on the success of an *enhanced bus* services on route ten will provide the underlying support for a fixed guideway transit service, such as commuter rail or bus rapid transit (BRT).

CARTA intends to make incremental progress in support of major transportation improvements including bus rapid transit (BRT) or commuter rail through continued enhancement of existing services and implementation of the Dorchester Road Express Route. CARTA is also involved, as a stakeholder, in the evaluation of the feasibility of commuter rail in the CHATS Area.

High Speed Rail in South Carolina

Federal Policy Framework

The American Reauthorization and Reinvestment Act (ARRA) of 2009 presented a renewed interest in high-speed rail in pursuit of advancing the interconnected, livable communities initiative. Through this bill, $8 billion was allocated to states through the 2012 fiscal year for the improvement and advancement of intercity high-speed rail services with $1.3 billion of these funds allocated specifically to Amtrak. Aimed at near-term economic recovery, this act established the basis for longer-term improvements that promote economic viability and competiveness. Subsequently, the Passenger Rail Investment and Improvement Act of 2008 aimed specifically at improving existing intercity rail services and designating corridors through inter-state coordination. In April of 2009, the Federal Railroad Administration (FRA), a branch of the United States Department of Transportation (DOT) that is committed to advancing a national intercity rail network, completed the High Speed Rail Strategic Plan, which delineated the goals, challenges, and benefits of implementing intercity high-speed rail. With previous legislation and planning efforts providing the policy framework, FRA developed the High-Speed Intercity Passenger Rail (HSIPR) program in June 2009, which strives to facilitate intercity rail by providing funding for infrastructural and capital improvements as well as multimodal connections. Furthermore, the FY 2010 DOT Appropriations Act allocated $2.5 billion to the HSIPR program for service development programs, individual projects, planning projects, and multi-state coordination with a 20% local match requirement.

A coalition has been formed among transportation leaders of Southeastern states, including Alabama, Tennessee, Virginia, North Carolina, Georgia, Florida, and South Carolina to facilitate a high speed, interconnected, intercity rail service. Two federally designated high-speed rail corridors within South Carolina are as follows: 1) Raleigh, NC – Spartanburg/Greenville, SC – Atlanta, GA 2) Raleigh, NC – Columbia, SC -Savannah, GA. Neither route passes through the BCD area. The South Carolina Department of Transportation is participating in these efforts and continues to study intercity passenger rail connections within South Carolina. As of May 2010, CHATS supports the designation of an East Corridor under HSIPR to serve the CHATS Area. The East Corridor would provide daily intercity rail services between leading tourism destinations, Myrtle Beach and Charleston. Additionally, the North Charleston Amtrak station accounts for over 30% of all boardings and alightings in the state. The proposed North Charleston Regional Intermodal Center will provide the new terminus for Amtrak as the existing station becomes functionally obsolete; thus, the advancement of the intermodal center is essential not only in facilitating high speed rail in the CHATS Area but also in maintaining and increasing Charleston-bound rail passengers and intercity connections to the region.

Water Shuttle Service

A water shuttle or ferry has historically been part of the surface transportation system in this coastal region. Road and place names throughout the region still commemorate old ferry locations – including Clements Ferry, Bees Ferry, Givhans Ferry, Mathis Ferry, Murray's Ferry, Nelson Ferry, and Parkers Ferry. Over time, the construction of bridges and other means of transportation have meant most ferries are no longer in operation.

However, an interest has grown in recent years in reviving water shuttle service, particularly in the Charleston Harbor. A water shuttle in the Charleston Harbor would not only provide an alternative, cost-effective form of transportation to the increasingly congested bridges in the area, but also could be an attractive means of travel for tourists and visitors. This would allow them to enjoy a scenic ride between points of interest, without having to get in their cars. Furthermore, it would enhance the existing mass transit system as well as pedestrian and cyclist facilities, with potential connections on both sides, including the DASH service in downtown Charleston.

Currently, two water shuttle providers offer sightseeing services within the Charleston Harbor, including a shuttle service to Fort Sumter from both Patriots Point Marina and the Charleston Maritime Center as well as a fixed route service in between the Charleston Maritime Center and Patriots Point Marina. The subsequent map, **Figure 6.4**, displays existing water shuttle services and potential landing sites for an expansion of these services. These landing sites provide access to various locations throughout Charleston's urbanized core as well as James Island, Daniel Island and Mt. Pleasant. These potential landing sites involve the following: the Union Pier Passenger Terminal, Shem Creek Marina, Remley's Point Marina, Daniel Island Marina, Ripley Light Marina, and the Charleston City Marina. Nine of these 15 landing sites provide an immediate nexus to transit services or bicycle facilities enabling access to additional destinations. Five, not including Fort Sumter, are within one mile of these multimodal opportunities. For the implementation of water shuttle services and efficient use of landing sites, multimodal transportation planning should be coordinated with plans for water shuttle services. Four water-borne ferry routes have been included in as candidate projects and were evaluated in the CHATS Travel Demand Forecasting Model. The results can be found in environmental screening chapter of this document. *Figure **6.4**: Charleston Harbor Water Shuttle and Potential Landing Points*

Recommendations:

- Work with the current private operator and the National Park Service to develop a detailed implementation plan for the initial phase of the expansion of existing Charleston Harbor water shuttle services to enable transit services and become a component of the regional transportation system.
- Identify a lead agency for the water shuttle operation.
- Work to reduce and/or eliminate docking fees for boats, to make the service more financially feasible.
- Coordinate bus service – including stops, transfer points, and schedules – with water shuttle service, to maximize the accessibility for both residents and visitors.
- Identify "park and ride" locations for water shuttle passengers at all key departure points.
- Investigate funding opportunities for needed facilities and improvements. A potential source may be the Federal Highway Administration's Ferry Boat Discretionary Program. Authorized under ISTEA and TEA-21, this program provides funding for ferryboats and ferryboat terminals where there is significant public benefit and/or ownership. The National Park Service has also indicated they may have some funding available, at least for planning purposes.

Trident Smart Ride Program & Mobility Management

The Trident Smart Ride Program of the BCD Council of Governments provides information, resources, and tools to help residents, employees, and students make good choices about how to get around the region. The program is a low-cost strategy that returns large benefits in congestion management, maintenance of our air quality, affordable housing, and the overall livability of the region. A major focus of the program is to work with employers in the region to reduce commuting cost to their employee, educate the workforce on their travel options, and minimize transportation cost and availability as a barrier for workforce development. Through the Trident Rideshare Program, services offered encompass a coordinated menu of tools, education, information, partnership development, and activities that promote a multimodal transportation system.

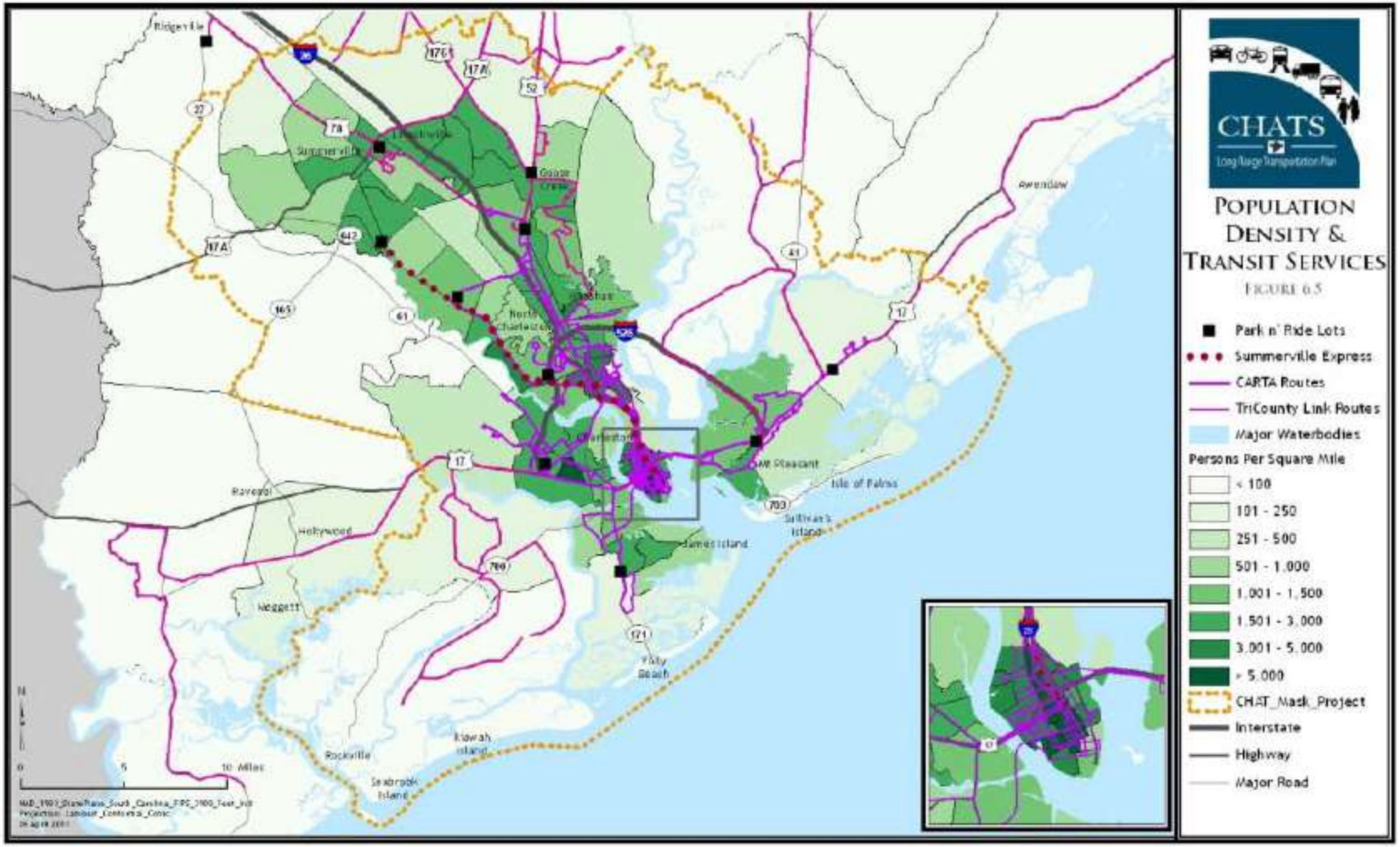
Trident Rideshare **www.tridentrideshare.com** is a free, web-based, rideshare matching software that commuters can use to find individuals that may be interested in carpooling, sharing taxicabs, or taking bicycle commute trip together. Ridesharing can present a cost effective, alternative to driving alone. In this manner, the BCDCOG has expanded the definition of transit. To remain relevant to regional travel demands and need of commuters, the program deploys a broad range of travel options to commuters that the traditional transit vehicle cannot serve. Semi-public options, such as vanpool have been added to the transit repertoire in a BCDCOG-led effort to 'think outside the bus,' offering flexible services to meet the needs of employees and employers. This range of options helps extend the reach of transit services and offer a dynamic, scalable spectrum of options for the traveling public.

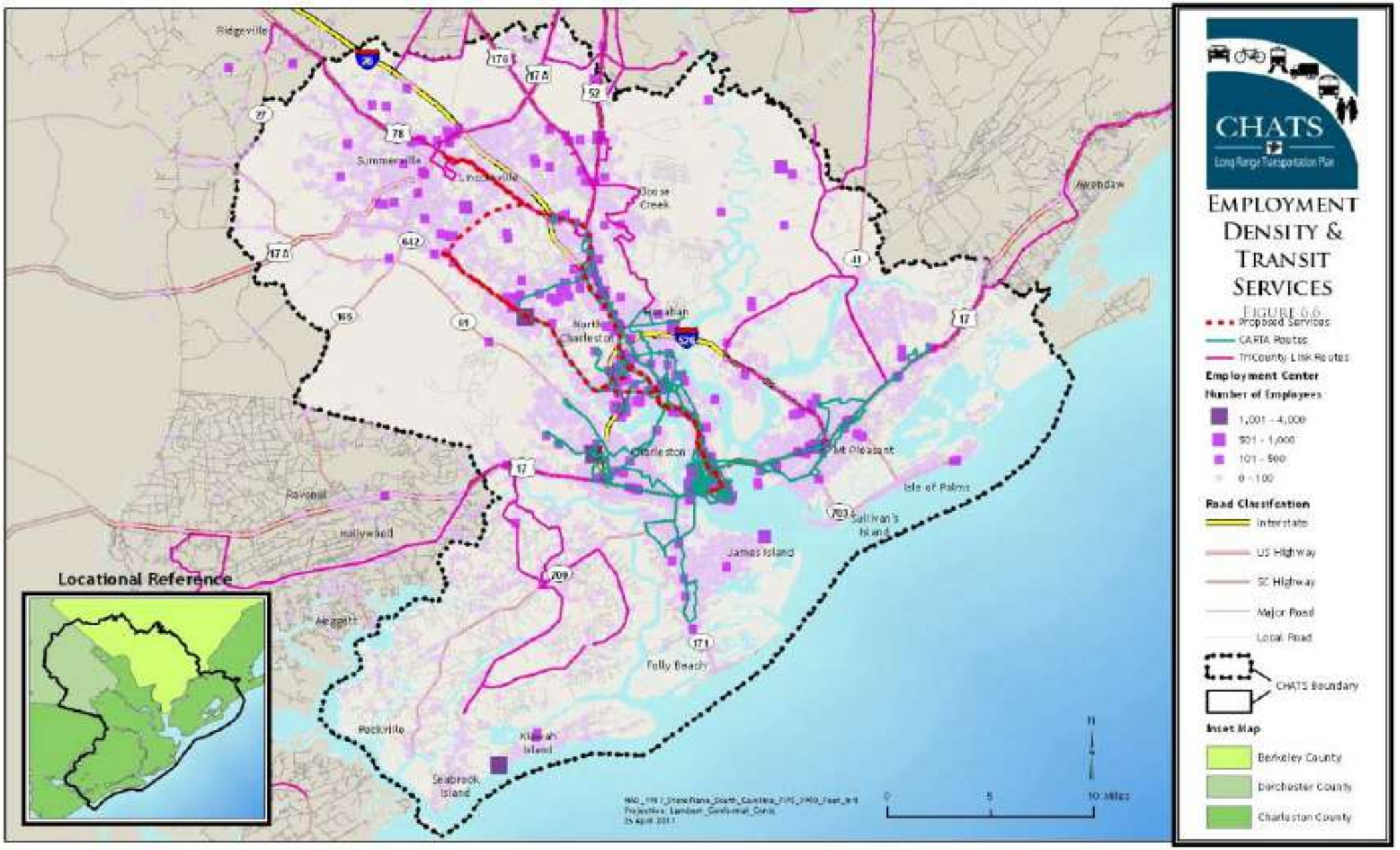
Transit Environment

The success of transit is determined by a variety of factors, including the demographic characteristics of the areas that are served. **Figures 6.5** and **6.6** illustrate the population density per the 2000 Census and 2008 employment density, respectively, of the study area as it relates to transit routes. The transit routes shown on these two figures include both existing and proposed CARTA and TriCounty Link services. As evidenced by Figure 6.1, the interconnected regional transit system provides many rural communities in Berkeley and Charleston counties access into the urbanized area. However, areas, such as Daniel Island, are expected to contain the densities necessary for urban classification anticipated the 2010 Census data, an expansion of transit services and facilities is necessary to meet the transportation needs of this community. Additionally, due to sustained growth since 2000, many areas, especially those extending from the CHATS area, will show higher population densities in the 2010 Census and additional route options may be necessary to adequately serve these residents. Despite the successes of both CARTA and TriCounty Link, Dorchester County residents have limited access to services when, according to 2000 Census data, over 40 percent of employed residents work in Charleston County, a trend that is most likely to persist. Furthermore, additional route options to and within the islands and within Mt. Pleasant would strengthen the regional transit network, providing residents with additional access to employment centers within the urbanized core. Additionally, increased route options to the islands provided on a seasonal basis could promote the tourism industry within these locales.

Figure 6.6 displays the spatial distribution of employers and transit services. As evidenced by the map, existing transit services provide access to many employment centers by offering services along major arterials, throughout the CHATS area, and within cluster economies that extend to rural locales. In fact, CARTA scored the highest in the State in a study, which reviewed the effectiveness of a transit system in linking people to employment performed by the Brookings Institute. However, limited transit services to the islands, such as Kiawah and within James Island, prohibit access to significant employment centers including the economic cluster of Kiawah Island, which contains over 1,000 employees and the newly established industrial corridor in North Charleston. For those individuals that do not reside in close proximity to these employment centers, more transit connectivity with existing transit services within these locales and neighboring towns may present a more economical and sustainable source of transportation.

The primary role of transit is to create complete transportation system for a region, connecting residential and employment areas and offering the most cost effective use of public funding for transportation. . The importance of coordinated land use and transportation planning is evidenced by Figures 6.5 and 6.6. In pursuing any future fixed guideway transit modes, it will be required that transit supportive density be planned for proposed transit corridors.


CHATS
Long Range Transportation Plan
POPULATION DENSITY & TRANSIT SERVICES
FIGURE 6.5
Park n' Ride Lots
Summerville Express
CARTA Routes
TriCounty Link Routes
Major Waterbodies
Persons Per Square Mile
< 100
101 - 250
251 - 500
501 - 1,000
1,001 - 1,500
1,501 - 3,000
3,001 - 5,000
> 5,000
CHAT_Mask_Project
Interstate
Highway
Major Road
Ridgeville
Summerville
Goose Creek
North Charleston
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Meggett
Folly Beach
Rockville
Kiawah Island
Seabrook Island
Awendaw
0 5 10 Miles


CHATS
Long Range Transportation Plan
EMPLOYMENT DENSITY & TRANSIT SERVICES
FIGURE 6.6
Proposed Services
CARTA Routes
TriCounty Link Routes
Employment Center
Number of Employees
1,001 - 4,000
501 - 1,000
101 - 500
0 - 100
Road Classification
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Ridgeville
Summerville
Lincolnville
Goose Creek
North Charleston
Hanahan
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Folly Beach
Ravenel
Hollywood
Meggett
Rockville
Kiawah Island
Seabrook Island
Awendaw
0
5
10 Miles

Identified Needs

Vision for Transit

The overall vision for transit remains similar to the vision described in the previous long range plan. The primary goal is to enable transit to be a viable transportation option for citizens throughout the region. With CARTA and TriCounty Link's implementation of various commuter routes, more choice riders are utilizing services. Commuter routes and park and ride locations cater to the needs of peak-hour commuters; local and fixed route opportunities continue to meet the transportation needs of the transit dependent. To address future mobility needs and promote a sustainable transportation system, transit must continue to serve the needs of the transit-dependent population, while continuing to offer a competitive alternative to the automobile for "choice" customers.

Perceptions of Transit

Historically, the overall perception of transit in the region is that it is designed strictly for people who do not have other transportation options and it is not customer-friendly or reliable. In a survey conducted prior to 2005, respondents indicated that overall transit services were "poor" and that they would be more likely utilize transit if more routes, shorter headways, park-and-ride lots, and more information were available. Since 2005, CARTA and TriCounty Link have successfully enhanced services and incorporated commuter amenities to better accommodate the variety of transportation demands of the BCD region, steadily increasing ridership, and change the perception of transit. In fact, a CARTA on-board bus survey conducted in the spring of 2009 revealed that a variety of individuals were utilizing transit, illustrating that service enhancements successfully meeting the diverse transportation needs of the BCD region.

Furthermore, both CARTA and TriCounty Link have detailed websites that provide information regarding fares, route schedules, park and ride locations, and transfer opportunities. CARTA and TriCounty Link have extended their marking reach by participating in such initiatives as, "Dump the Pump Day", which involved support from many BCD municipalities and transit authorities provided many incentives to passengers, such as free travel and prize drawings, to raise support of the many benefits of utilizing public transit. TriCounty Link's mascot, Linky, has been instrumental in garnering public support; in less than a year since his introduction, he has participated in numerous public events including: the Martin Luther King Day Parade, Earth Day Celebration, Black Expo, Flowertown Festival, National Transportation Week, and Buist Academy's Field Day. Additionally, TriCounty Link has partnered with Charleston County Department of Education to teach John's Island elementary and middle school students how to utilize public transit services within their area. In the summer of 2010, TriCounty Link equipped their buses with wireless internet capabilities, further enhancing the perception of transit by providing an appealing alternative to the automobile.

Issues to be Addressed

Through initial public outreach, as well as through discussions with CARTA and the CHATS Study Team a number of transit-related issues were identified as being important to the future of transit in the region. These issues were categorized as follows:

- Institutional issues
- Service issues
- Funding issues

Institutional Issues

- Although positive enhancements have improved the perception of transit, continued efforts are necessary to obtain further community support.
- Despite added transfer opportunities and coordination of route schedules, the physical and institutional boundaries between transit providers need to be continuously addressed as the region grows and services expand.

Service Issues

- Services should be developed that are attractive to choice riders, while still serving the needs of the transit-dependent riders.
- The relationship between parking, driving, and transit should be examined.
- Rail corridors should be preserved for future rail service.
- Explore the potential for streetcar service within the peninsula.
- Implement transit supportive land use and include the needs of transit users in site design
- Identify corridors to implement fixed guideway transit services and align comprehensive land use plan to transit supportive land use patterns
- The role of the Downtown Charleston Visitor Center as a transit hub should be examined.
- Improved signage and transit amenities (e.g., bus shelters) are needed.
- Technology and Intelligent Transportation Systems (ITS) strategies should be incorporated into transit services.
- Transit security should be addressed.

Funding Issues

- Although Charleston County voters have approved a sales tax referendum that would create a dedicated source of transit revenue, transit funding issues for service outside of Charleston County need to be addressed.
- The positive economic development impact due to transit needs to be actively publicized in the local community.
- Although sales tax revenue and federal funding help fund transit operations , rail or another major investment in the future would likely require public-private partnerships, additional funding, or a separate referendum to raise additional revenue,

Future Outlook

Strategies to Enhance Transit

Transit is an important component of the transportation network in the CHATS area. Residents, employees, and visitors benefit greatly from transit services, and an opportunity exists to increase the role of transit in the region. Over the coming years, the primary goal for transit will be to enhance services to increase attractiveness and more fully integrate services into the multimodal transportation framework of the region.

Recommended strategies related to public transportation are described below in the following categories:

1. 1. Existing service enhancements
2. 2. Facilities, equipment, and amenities
3. 3. New modes and technologies
4. 4. Institutional and funding strategies

The first three categories discuss planning, operational, and capital aspects of transit improvements in the region, and the fourth category addresses policy strategies that should be implemented to address the needs that have been identified.

Existing Service Enhancements

A. Continue to enhance commuter service from outlying areas — Charleston serves as a regional tourism, employment, and medical hub. Transit opportunities available to communities on the fringe of the urban area and downtown Charleston have increased significantly over the past five years. Fixed route services are available to rural communities throughout the BCD region. Two bus stops permit transfer opportunities between TriCounty Link and CARTA, enabling rural residents increased access and mobility to the urbanized sections of the CHATS Area. However, enhancement of regional transit services through additional transfer and rural route opportunities is necessary to sustain the increasing demand of transit services as the region grows. Vanpools, which can be developed through Trident Ride Share, may be another way to provide connections to areas that do not have the population base to support fixed-route services.

B. Continue to expand service oriented to special generators — the fare-free DASH trolleys in downtown Charleston have been popular with tourists and residents alike. Since 2005, CARTA has extended shuttle services to the College of Charleston, the Medical University of South Carolina, Trident Technical College, and Charleston School of Law. Furthermore, CARTA provides services to shopping centers, a variety of tourist attractions, the Charleston International Airport, and the Port of Charleston Passenger Terminal. Additionally, TriCounty Link provides services specifically tailored to key employment sites, such as Santee Cooper in Moncks Corner, and Link to Lunch services. TriCounty Link plans to extend contractual agreements with local businesses within Berkeley and Dorchester Counties. Maintaining services to these markets and building relationships with employers is critical in ensuring economic vitality. These connections, in conjunction with transfer opportunities between transit providers, have enabled many residents accessibility to key economic centers.

C. Expand community-based services in low-density areas — the study area continues to develop rapidly; however, because much of the development continues to be low-density in nature, Transit providers will continue to encounter fiscal difficulties in providing fixed-route transit services. In these outlying areas, CARTA and TriCounty Link should examine opportunities for expanded demand-response options or "hybrid" service models such as point-deviation or route-deviation services. These community-based services could provide additional connectivity among residential areas and nearby commercial, employment, and service centers. In addition, such services could also connect to existing or future fixed routes. Furthermore, increased coordination between land use and transportation planning is fundamental in ensuring development patterns, which will support transit feasibility. Isolated and fragmented development patterns present fiscal obstacles for transit. In a number of cases, vanpools, carpools, and other innovative transit services can serve these areas.

D. Implement Intelligent Transportation Systems (ITS) enhancements at major transit stops and investigate the potential of designated rights-of-way for fixed guideway service — Intelligent transportation systems strategies, such as signal preemption to allow buses to quickly proceed through traffic signals as well as passenger information technologies that inform customers when the next bus will be arriving, are cost-effective ways to increase the efficiency and attractiveness of the transit system. As stated in the *CARTA Transit Action Plan, FY 11-15,* CARTA intends to incorporate automatic vehicle location (AVL) software in the 25 shelters that are planned for construction. Furthermore, the designation of right-of-way for bus rapid transit services would enable increased efficiency and contribute to lower headways in heavily congested areas. Strategies to assist buses in traveling through congested corridors help transit to gain a competitive edge on private automobiles and providing real-time travel information to customers makes transit more accessible to passengers who may not be regular transit users. These and other ITS enhancements should be evaluated for specific applications in the region.

Facilities, Equipment, and Amenities

A. Complete the North Charleston Regional Intermodal Center —. Pursuant to the establishment of a dedicated funding source, such as public-private partnerships, plans for constructing this facility should proceed. This facility will serve as a vital hub linking local, regional, and intercity transit services. . Furthermore, funding for the implementation of the Summerville CARTA Express Route on Dorchester Road should be secured, as it will serve the site. Additionally, the completion of the North Charleston Regional Intermodal Center and the success of the express route may provide the impetus for a fixed guideway service.

B. Examine the role of the Transit Oriented Development (TOD) as a transit hub to support nodal land use plans — Recent development proposals have discussed transit oriented design that can serve hubs for transit service. As CARTA expands its services, an opportunity exists to require site plans to be transit supportive. A nodal system throughout the region, with passenger information services and other amenities, would be beneficial to the entire system. Potential

solutions for establishing a Transit node, perhaps as part of Ingleside Plantation, East Edisto, and Goose Creek Downtown District should be examined.

C. *Provide transit amenities throughout the region* — Transit amenities, including bus shelters, enhanced signage, and traveler information systems can enhance the attractiveness, comfort, and safety of the transit system. CARTA and TriCounty Link should work with local governments and the business community to provide these types of amenities at critical locations in the region. Due to the acquisition of ARRA funding, CARTA is preparing to construct 25 additional bus shelters at high-demand locations.

E. *Further coordination opportunities between CARTA and TriCounty Link* — although transfer opportunities are provided between TriCounty Link and CARTA, continued coordination is necessary to ensure a connected regional transit network as services expand and the region grows. A feasibility study to explore the potential for consolidating the two systems will be undertaken in 2012 to further this strategy.

F. *Stronger coordination of land use and transportation planning* — it is critical that local planning officials coordinate their land use planning and transportation planning to ensure the feasibility as well as availability of transit services. Coordinated land use-transportation project, like Our Region, Our Plan are underway to define these relationships.

New Modes and Technologies

A. *Develop dedicated park-and-ride facilities* — The CARTA Plan includes a series of park-and-ride lots to serve express routes. CARTA will soon be working to identify specific locations for these facilities. These parking facilities would be located primarily on the fringes of the service area, and would enable commuters to leave their vehicles at a safe location and use transit for the remainder of their trip. These facilities should be developed using shared-use agreements with owners of existing parking lots as a first step. If demand warrants, CARTA could construct dedicated facilities for transit patrons.

B. *Study the potential implementation of fixed guideway service* — The Region has expressed an interest in investigating the feasibility of such a mode to connect major generators and attractions in the region. Due to increasing development on major corridors, there may be an opportunity to use high-capacity transit to provide important transportation links. Because a fixed guideway service requires the acquisition or dedication of new rights-of-way as well as the construction of new guideway, coordinated and concerted efforts among varying stakeholders as well as state and federal officials, similar to the efforts of the Neck Area Master Plan, are necessary to facilitate land use that will support the locally preferred service. In the Neck Area Master Plan, studies will involve an analysis of trends, market demands, and the capacity of the existing transportation system serving the core area of the region. This study provides the framework for maximizing existing transportation infrastructure while recognizing the transportation needs of existing neighborhoods as well as those generated by proposed developments. Similarly, planning for these types of service light rail should be coordinated with existing and future redevelopment plans, as well as the examination of the future role of the Visitors' Reception and Transportation Center. This type of transit project has the potential to serve as a catalyst for further (and more intensive) downtown redevelopment, and would be an attraction in itself.

C. *Continue discussions and preserve rail corridor capacity for potential commuter rail service* — as studies have illustrated, commuter rail can be an economically viable transportation option for commuters. As the region continues to grow, it is important that rail corridor capacity be preserved for future service. Without available rail capacity in place, it will be much more difficult to implement additional commuter rail services once the necessary levels and types of development have been attained.

D. *Examine critical corridors for Bus Rapid Transit (BRT) opportunities* —Although some areas of the region may not yet have the population or development patterns necessary to support commuter rail, bus rapid transit should be explored as an alternative implementation of a higher-capacity transit service. Due to the success of CARTA's Route 10 services on Rivers Avenue, CARTA, as delineated in the *CARTA Action Plan FY 2011-2015*, is planning to incorporate *Enhanced* Services, which embody elements of bus rapid transit. This is the first step in implementing bus rapid transit services in the CHATS Area The feasibility of bus rapid transit services should be explored as an interim strategy to provide a high level of transit service without the expense of exclusive right of way.

E. *Explore potential water shuttle connections* — Public water shuttle services have been studied in the region, but currently, water shuttles are primarily used for sightseeing purposes. However, as the region continues to grow, opportunities may exist to provide water shuttle services as part of the public transit framework, potentially connecting points in downtown Charleston to Mt. Pleasant, Daniel Island, James Island, North Charleston, and other emerging areas. This concept should continue to be monitored in future years. If ferry service is to be provided, it is critical to have a supporting bus transit service in place to connect ferry terminals to regional destinations.

Institutional and Funding Strategies

A. *Maintain a comprehensive marketing program* — for transit to truly become a mode of choice in the region, convenient services must be available, and the public must know that such services are available. According to the *CARTA Transit Action Plan FY 11-15*, CARTA intends to take advantage of federal funding opportunities for the incorporation of green technologies to enhance its public perception. CARTA recognizes the marketability of green technologies and plans to create a "sustainability" marketing plan. Furthermore, TriCounty Link and CARTA have been involved in the "Dump the Pump" initiative as well as various additional community functions and marketing strategies to engage and educate the public of the many benefits of transit. Both TriCounty Link and CARTA emphasize the potential savings that would accrue upon utilizing transit over the private automobile. However, despite these efforts, it is appropriate that both CARTA and TriCounty Link maintain comprehensive marketing campaigns. Such campaigns should be targeted to existing as well as potential customers and focus on potential "niche" markets including downtown employees, college students, commuters, and visitors. It is recommended that creative marketing strategies be explored, like trading advertising space, partnerships, and coordinating with the BCDCOG Mobility Management Program.

B. *Actively participate in promoting transit-supportive land use* — CARTA should work closely with local jurisdictions to make sure that transit service is considered in future development projects. Potential exists for large-scale development and redevelopment in

the region, and the proposal review process should include an assessment of provisions to support transit use, such as passenger waiting facilities (i.e., shelters), pedestrian access to transit, adequate street design for transit vehicles, and in larger developments, dedicated transit facilities.

C. *Pursue local funding outside of Charleston County* — Although the proceeds from a dedicated sales tax has been identified as a local funding source in Charleston County, no significant sources of local funds have been identified to support transit service outside of Charleston County. Although the level of transit service outside of Charleston County may not require a dedicated tax, the regional transit providers should continue to work with local jurisdictions to identify potential sources of funding to support current and expanded transit operations.

D. *Enhance security as needed* — Recent years, the importance of transit security has increased dramatically. CARTA and TriCounty Link should take necessary steps to make sure that its operations are safe for residents, employees, and visitors that rely on transit.

Projected Revenues

Transit systems rely on a combination of federal, state, and local funding sources, along with farebox revenues and other miscellaneous sources, to cover operating and capital expenses. A brief description of primary transit funding sources is given below.

Table 6.1: Fiscal Projections for Transit Services
2010- 2035

	2010-2015 (Short Range)	2016 – 2025 (Medium-Range)	2026 – 2035 (Long-Range)
Total Revenue Available	$146 Million	$304.7 Million	$451 Million
Existing Service: Operating Expense	$143.7 Million	$299 Million	$442.7 Million
Existing Service: Capital Expense (Vehicle Replacement and Enhancements)	$14.5 Million	$19.9 Million	$29 Million
Amount Available for New Projects (Planning, Operating, and Capital)	-12.2 Million	-14.2 Million	-20.7 Million

Federal Sources

- *Federal Transit Administration (FTA) Section 5303 Grant* — This annual grant is a formula-based program that funds transit planning activities in metropolitan areas. As the Metropolitan Planning Organization for the region, CHATS is the recipient of these monies. These funds can be used for projects that fit within the "cooperative, continuous, and comprehensive" framework for metropolitan planning. The federal share for these activities is 80%, with a 20% local match requirement.
- *FTA Section 5307 Grant* — This grant is provided to urbanized areas throughout the country on a formula basis, and is used primarily for capital and planning projects. These funds are used to reimburse 80% of eligible costs, with a local match requirement of 20%. However, FTA's definition of "capital" includes maintenance costs; thus, all maintenance costs are eligible expenses for reimbursement under this program. Because maintenance activities are usually included under a transit system's "operations" budget, this funding source is actually used to meet capital, operating, and planning needs. All capital expenses are eligible for Section 5307 assistance, as are technical assistance (planning) project costs. As the designated recipient, CARTA receives these funds directly from FTA.

- *FTA Section 5309 Grant* — This grant is provided to fund capital projects, including fleet replacements and construction of new facilities. Operating assistance is not an eligible use of these monies. For larger systems, Section 5309 funds are available to fund large-scale capital investments such as light rail, commuter rail, and bus rapid transit. These grants are provided to specific systems for specific projects through Congressional "earmarks." Assistance for bus-related projects is typically provided with a 20% local match requirement, but due to intense project competition, major investments (i.e., "New Starts") require a larger local match to be favorably considered for funding. Because these funds are not guaranteed for all systems, potential revenues are not included in the baseline projection of transit revenues in the BCD region.
- FTA Section 5310 Grant — This grant provides private non-profit and public agencies with financial assistance for the necessitation of safe, efficient, and coordinated transportation services for elderly and disabled individuals that would otherwise be unavailable. Agencies that are eligible for funding through Section 5310 must be certified by the state to coordinate services for the elderly and disabled and verify that no non-profit entities are readily available to provide the aforementioned transportation services. The minimum local match requirement for 5310 funding is 11.47% of the project cost. *South Carolina Department of Transportation (SCDOT) administers the state-managed portions of FTA 5310 funding and appropriates a share to* Berkeley Citizens, Inc., a non-profit human service organization that provides support, various services, and training to elderly and disabled individuals. Furthermore, Berkeley Citizens, Inc. contracts with TriCounty Link to provide transportation services to their clients.
- FTA Section 5311 Grant — This grant is used to support capital, operating, and administrative needs of transit systems serving non-urbanized (less than 50,000 population) areas. These funds are distributed to states on a formula basis, and states then redistribute funds to eligible providers. TriCounty Link receives a portion of South Carolina's allocation of Section 5311 monies. The maximum federal share for capital projects funded

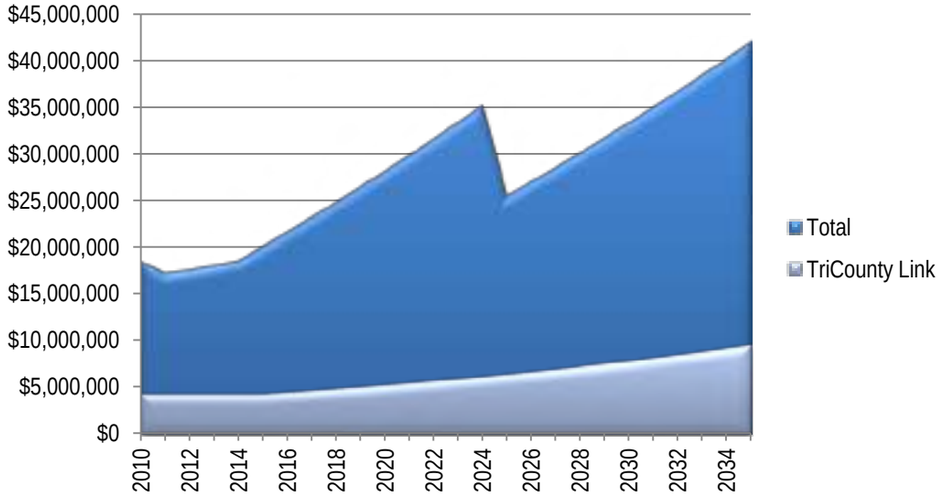
under this program is 80% (with a 20% local match), while operating assistance projects can be funded up to a maximum of 50% federal participation (with a 50% local match).

- FTA Section 5316 Grant — This grant is used to support the capital, planning, and operating expenses necessary to provide for the transportation of low income individuals to and from jobs and work-related activities. As many jobs are located in suburban areas, this grant assists in providing additional mobility to those individuals that dwell in rural or urban areas. South Carolina Department of Transportation (SCDOT) administers the state-managed portions of FTA 5316 funding. TriCounty Link and CHATS receive an annual appropriation of this funding. The Federal share for capital expenses may not exceed 80% (with a 20% local match); however, federal shares can be as high as 90% if funding is used to provide bicycle access to mass transit facilities or to purchase equipment required by the Clean Air Act Amendments of 1990 (CAAA) or the Americans With Disabilities Act of 1990 (ADA). The federal share for operating, administrative, and management costs may not exceed 50% (with a 50% local match).
- FTA Section 5317 — This grant is used to support the capital and operating expenses for additional public transit opportunities for individuals with disabilities than what is required in the Americans With Disabilities Act of 1990 (ADA). South Carolina Department of Transportation (SCDOT) administers the state-managed portions of FTA 5317 funding. TriCounty Link receives an annual appropriation of this funding. The Federal share for capital expenses may not exceed 80% (with a 20% local match) and the federal share for operating, administrative, and management costs may not exceed 50% (with a 50% local match).
- American Recovery and Reinvestment Act (ARRA) of 2009 — As a response to economic recession, the ARRA provided funding for infrastructural and capital improvements for transit authorities to necessitate sustainable transportation systems and generate jobs. The ARRA allocated over eight billion dollars to FTA sections 5307, 5311, and 5309 grant programs for capital improvements. Additionally, ARRA enabled both CARTA and TriCounty Link to upgrade aging facilities and purchase new buses.

State Sources

- State Mass Transit Fund (SMTF) — These monies are administered by the South Carolina Department of Transportation (SCDOT) and are distributed to transit agencies across the state based on formula allocations. These funds are provided by a set-aside of 1/8 of 16 cents per gallon from the state's fuel tax receipts. This grant is intended primarily to serve as matching money for other (i.e. federal) grants. The amount of SMTF money available to transit systems has remained relatively stable in recent years. SCDOT has recommended the allocation of nearly one million dollars in SMTF funds for CARTA and TriCounty Link for the 2010 – 2011 fiscal year.

Figure 6.7
Transit Revenue Projections



Local Sources

- Sales Tax Revenue — In November 2004, voters in Charleston County passed a referendum establishing a dedicated ½-cent sales tax for transportation projects. A portion (18%) of the receipts is earmarked to maintaining and expanding transit services in the county. No other major source of local funds has been identified.

  The establishment of a local funding source is critical because federal monies cannot be utilized without a local match, and federal monies are not eligible to pay for many operations costs, such as fuel and salaries. These expenses must be paid with non-federal funds.

Farebox Revenue/Other Sources

- *Farebox Revenue* — Passenger fares and receipts from pass sales are an important part of the overall revenue stream, but like all other transit systems in the country, fares alone cannot pay for the total costs of operating the CARTA and TriCounty Link systems.

- *Other Sources* — In addition to farebox revenue, transit systems often benefit from other revenue streams, such as contracts with various agencies for transportation service, advertising revenue, and other sources. A significant portion of TriCounty Link's costs are covered through service contracts (which can be used for local matching funds), and CARTA as well as TriCounty Link obtain revenues from on-board advertising opportunities.

Based on these funding sources, **Figure 6.7** illustrates projected annual transit revenues over the long-term planning horizon. A high degree of uncertainty exists in forecasting the amount of funding that may be available in future years. Therefore, the projections shown are conservative, assuming only a slight increase over time in the federal and state revenues that are available. **Figure 6.8** further illustrates the future funding uncertainty as the Charleston County Transportation Sales Tax Ordinance has a sunset clause that in 2025.

Projections for local funds are based on the receipt of a portion of the revenues (beginning in 2006) resulting from Charleston County's ½-cent sales tax for transportation projects. Receipts from the sales tax should be available to CARTA in late 2005, but some of the initial receipts will be used for debt service. It should be noted that the long-term chart does not include projected revenues for TriCounty Link, since a substantial portion of TriCounty Link's service is provided to customers living outside the urbanized area boundary.

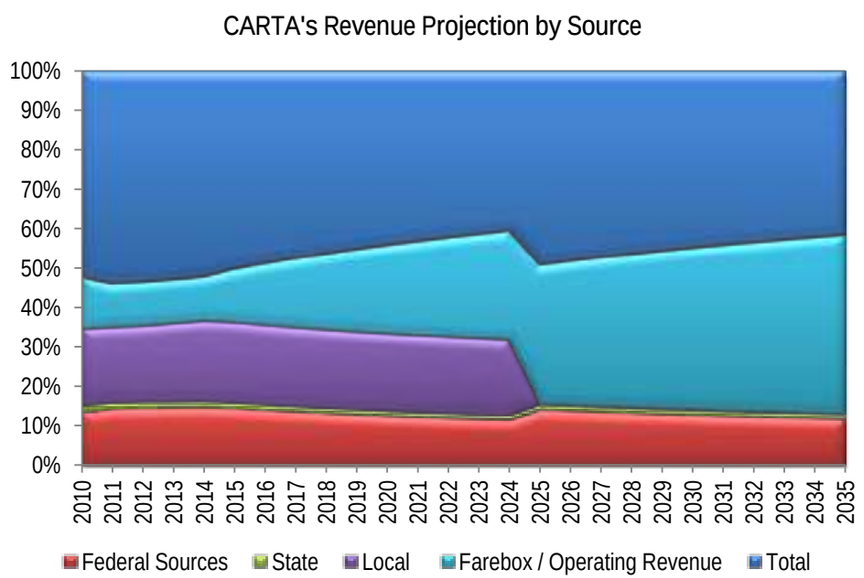


Figure 6.8

Table 6.1 displays total revenues in short-, medium-, and long-range terms of the planning period. As noted above, these projections are intended to be conservative, and are based on existing sources only. "Unfunded needs" for transit will require additional funding sources that have not yet been identified.

Fiscally Constrained Program

Based on the projected revenues described above, a fiscally-constrained program was developed for the short-range, medium-range, and long-range elements of the planning period using 2010 fiscal year performance for both CARTA and TriCounty Link. Operating costs for CARTA were estimated based on the implementation of the "*CARTA Transit Action Plan FY 11-15* which describes strategies for service maintenance and improvement. The estimated average annual operating costs for full implementation of the "*CARTA Transit Action Plan FY 11-15* is nearly $20 million in 2010 dollars. Capital costs are estimated based on prioritization of vehicle replacement as enumerated in the CARTA Action Plan FY 11-15, the status of the fleet as of 2010, and the *useful life* of each vehicle type as defined by the Federal Transit Administration (FTA). The useful life determination indicates the amount of time in which a vehicle should be retired to ensure an adequate return on federal investment. Vehicles are expected to remain in service for their useful life and the Federal Government maintains a financial interest until that time. Projected vehicle replacement costs for CARTA's DASH service were not included in this assessment; as such, information is contingent upon the Peninsula Transit Study, which will delineate the future of this service. The funds remaining after these expenditures are available to address the planning, operating, and capital strategies described earlier in this section.

Note that due to projected cost escalations, the amount of funding available for new projects decreases gradually in future years, and in the long-term, additional revenues will be needed to sustain existing operations (with no funds available for new projects). The primary reason for this deficit is that costs are projected to increase, but the local sales tax that will provide the primary source of operating funds is capped with regard to the total receipts that can be collected. These amounts are illustrated in **Table 6.1.**

Freight Mobility Assessment

Overview

Efficient, safe, and secure freight transportation will help ensure the region's future economic stability. This regional freight mobility assessment addresses highway, rail, port, and water transport, as well as the intermodal connections between different modes. As one of the major ports on the East Coast, the Port of Charleston and the BCD region serves as a major intermodal link between other sections of South Carolina, the southeastern US, and the world.

As an economic gateway, the Port of Charleston is one of the largest employers in the region as well as in the state. More importantly, the regional jobs and impacts associated with freight flowing throught the port go far beyond employment at port facilities; they include those employed by trucking firms, warehouses, railroads, and other intermodal facilities, as well as services associated with these businesses. Review of County Business Patterns[1] data indicates that as of 2008, nearly 9,000 people are employed in the transportation and warehousing sector, the majority of which are employed in port related activities[2]. This represents three percent 3% of the total 303,488 estimated jobs in the Berkeley-Charleston-Dorchester County region. The transportation and warehousing sector job estimates are summarized below by major sub-sector[3]:

Table 7.1
Transportation and Warehousing Employment
Charleston Area Transportation Study

Sector	Estimated Employment
Road	4,200
Water	2,000
Air	400
Warehousing	1,200
Rail	100
Other	1,100
Total	9,000

Source: County Business Patterns, U.S. Census Bureau, 2008

An even greater number of employees and their families depend directly on these transportation facilities for the arrival and distribution of goods, specifically those in Charleston's manufacturing/processing, warehousing, and retail sectors. Along with regional tourism, the freight transportation sector is a major driving force for the Charleston economy, with the impacts of the existing port facilities; the SC State Ports Authority affects an estimated 260,800 jobs in South Carolina, as of 2008[4].

The following pages assess freight mobility in the Berkeley-Charleston-Dorchester (BCD) region. Study Team members reviewed existing data and conducted an internet-based survey of commercial transportation users (shippers) and providers (carriers) in the BCD region. This survey allowed for those direct users of the system to provide a firsthand account of facility access, location characteristics, and traffic flow issues for the freight community in the region.

The overall purpose of the freight mobility assessment was to identify transport infrastructure issues that affect shipping decisions and logistics for the BCD region. Objectives included collecting relevant, available data and surveying freight users, freight providers, and government officials to understand:

1. **Specific problems** that may lead to project-specific recommendations
2. **Broad issues** that relate to overall system limitations that may lead to policy recommendations
3. **Patterns and trends** related to future transport needs for freight goods and services that may lead to strategic long-term recommendations

Freight Transportation Components and Framework

Three key types of freight transportation were evaluated in this study — trucking, port, and rail. Air transport also was considered, but it was not evaluated to be a key type because it relies on trucking to move freight to and from the airport. The volume of airport-related trucking is relatively small compared to those associated with the port, intermodal rail, and other types of freight movement.

Port-related freight comprises the largest share of movements. Combined, however, the numerous firms (typically small) that provide local delivery and distribution comprise an even greater share of the overall freight volume. The following overview summarizes port, intermodal rail, and trucking freight movements for the BCD region.

[1] Charleston-North Charleston MSA, 2001; http://censtats.census.gov/cgi-bin/msanaic/msasect.pl
[2] Sector 48 of the North American Industry Classification System (NAICS)
[3] Due to disclosure requirements, exact employment by various sectors is often not available. Estimates based on analysis of industry codes for each mode and related support services.
[4] South Carolina States Port Authority Economic Impact Study. October, 2008

Port of Charleston

The South Carolina State Ports Authority (SPA) served 1,539 ships and barges in fiscal year 2010 (July 1, 2009-June 30, 2010) at its seaport terminals in Charleston andGeorgetown, In the Port of Charleston, the SPA handled 1.2 million 20-foot by 8 foot by 8 foot equivalent units (TEUs). (*Note: ocean shipping containers come in 20-, 40- and 45-foot lengths.*) In the 5 years between 2004 and 2010, total TEU and container traffic declined by 25.7 and 24.8 percent, respectively, as shown in **Table 7.2**. This decline, began in 2007 as the end of the housing bubble, combined with the continued expansion and modernization of the Port of Savannah has led to an increasing utilization of the Savannah port by freight providers In addition, breakbulk cargo[5] totaling 585,013 tons in 2010 were handled from Charleston port facilities. This amount has also declined from previous years.

Table 7.2
Port of Charleston – Container Movements
Charleston Area Transportation Study

Fiscal Year	TEUs	Containers	TEU/Container
2004	1,724,586	986,697	1.75
2005	1,970,875	1,134,328	1.74
2006	1,978,806	1,130,082	1.75
2007	1,883,651	1,076,110	1.75
2008	1,694,504	972,791	1.74
2009	1,367,977	782,220	1.75
2010	1,280,000 (Est)	741,208	1.75 (est)
Volume Growth			
Total	-25.7%	-24.8%	
Avg. Annual	-4.3%	-4.1%	

Source: South Carolina State Ports Authority

Current Locations — The Port of Charleston currently operates at four primary locations within the study area: Wando Welch, North Charleston, Columbus Street/Union Pier, and the Veterans Terminal, located at the former Naval Base, as shown in **Figure 7.1**. The Wando Welch Terminal is located on the Wando River in Mount Pleasant; the North Charleston Terminal and the Veterans Terminal are located on the Cooper River in North Charleston; and the Columbus Street and Union Pier Terminals are located on the peninsula in downtown Charleston. Freight is moved to and from these locations primarily by truck and rail. Major import commodities include consumer goods and machinery, while major exports include agricultural and paper products, as listed in **Table 7.3**.

[5] General cargo packaged or handled as separate units

Table 7.3
Port of Charleston – Top 10 Commodity Movements
Charleston Area Transportation Study

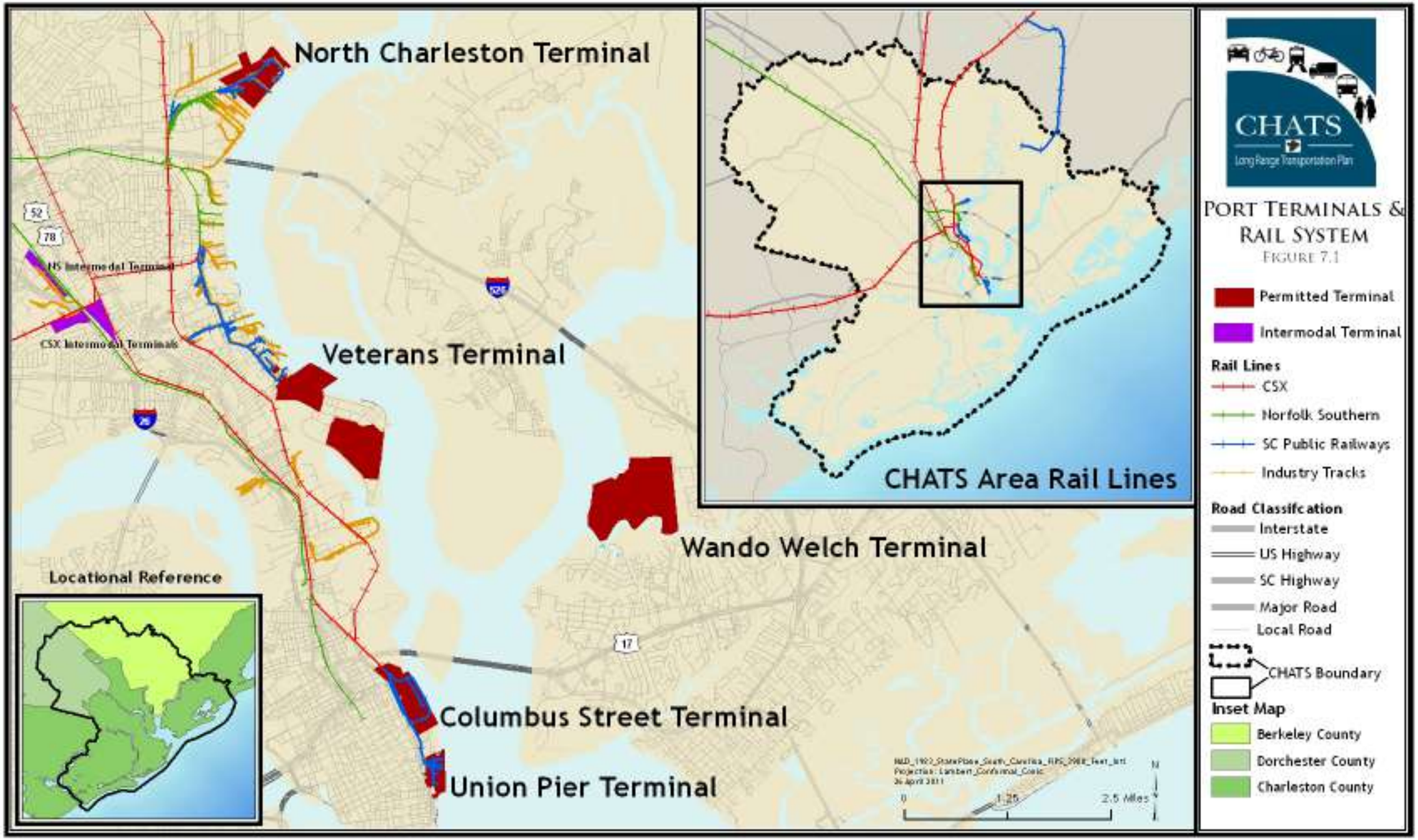
Top Imports	Top Exports
Furniture	Paper Products
Auto Parts	Wood Pulp
Sheets, Towels, and Blankets	Auto Parts
Fabrics, including. Raw Cotton	Logs & Lumber
Truck Tires	Fabrics, including Raw Cotton
General cargo	Misc. Cargo
Apparal	Synthetic Resins
Paper	Mixed Metal Scrap
Household Goods	Chemicals
Yarns	Poultry

Source: South Carolina State Ports Authority

To accommodate future water transport demand, the SPA is pursuing a number of major projects. These include, a Charleston Harbor deepening project that will allow Charleston to serve as a port for Panamax and SuperPanamax ships that will utilize the Panama Canal expansion expected to be completed in 2014. These ships are larger, with a deeper draft than ships currently utlizing local port facilities. ;In addition,the costruction of the first phase of a new three-berth, 250-acre marine terminal at the former Charleston Naval Base is expected to be completed by 2017..

Navy Base Terminal — Currently, the Veterans Terminal operates on a 110-acre site located within the site of the former Charleston Navy Base. The terminal is located 1.5 miles from I-26 with four piers, rail access, open (paved and earth/gravel) storage areas, and 90,000 square feet of warehouse space. Planned as a non-container facility, the Veterans Terminal handles breakbulk and project cargo. Targeted breakbulk includes metals (steel, zinc, copper, and aluminum), lumber, heavy equipment, and cargo moved using "super-sacks".[6] Project cargo includes numerous pieces that come in a variety of shapes and sizes that will be used in a single project, which emphasize volume (i.e., cubic measurements) instead of tonnage.[7] An Environmental Impact Study (EIS) was approved in 2007 for the utilization of another section of the former Naval Base for a three berth container terminal on approximately 250 acres. The proposed termnal would be connected to Interstate 26 via a newly constructed 1.2 mile roadway connecting Interstate 26 in the vicinity of Exit 217 to the port terminal. The proposed port will also have rail access via a combination of existing and proposed railway lines. The location of these lines is the subject of current discussions between the City of North Charleston and State agencies. The first phase of the proposed terminal is expected to be completed in 2018, with the full buildout of the terminal expeced to be completed in 2025. It is estimated that a minimum of $400 million will be spent on the new port facilities.

[6] Large bundles of breakbulk cargo
[7] 'Bring on the Breakbulk', *Port Charleston*, March/April, 2004


North Charleston Terminal
Veterans Terminal
Wando Welch Terminal
Columbus Street Terminal
Union Pier Terminal
HS Intermodal Terminal
CSX Intermodal Terminals
Locational Reference
CHATS Area Rail Lines
CHATS
Long Range Transportation Plan
PORT TERMINALS & RAIL SYSTEM
FIGURE 7.1
Permitted Terminal
Intermodal Terminal
Rail Lines
CSX
Norfolk Southern
SC Public Railways
Industry Tracks
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
0
1.25
2.5 Miles

Freight Movements — To understand the magnitude of port-related movements relative to those of other sources, we reviewed a study completed in 2002 entitled *Container Movements and Traffic Mitigation Measures*[8] (prepared by Wilbur Smith Associates). The study provides terminal vehicle counts and traffic counts on I-26 and I-526 in late 2001-2002. Conducted over three days, the report provides the best compilation of total port-related trucking movements for this area. It also compares these movements to total interstate traffic, which helps compare port traffic to other regional trucking movements. In addition, as part of the update to the LRTP, additional information was obtained from the South Carolina Ports Authority regarding port related truck movements in March, 2011.

As of early 2011, only the Wando Welch and North Charleston terminals are being utilized for container service. In sync with the recent decline of the Port of Charleston as a shipping location, there has also been a decline in container trucks utilizing the Charleston port facilities, with a 21.2 % decline between 2002 and 2011. This is due to a variety of factors, including SCPA no longer operating the Columbus Street terminal as a container port.

A comparison of the gate movements and the traffic counts based on a 2002 study and factoring in the subsequent decline in Port traffic estimates that trucks compose between 2.8% (I-526 at Leeds Ave.) and 6.4% (I-526 at Cooper River) of the total average annual daily traffic (AADT). The port-related share of the AADT ranges from 1.3% (I-26 at Azalea Ave.) to 5.7% (I-526 at Cooper River). These traffic counts and AADT are summarized in **Table 7.4**. As indictated by values, port-related truck traffic is not a significant portion of the overall traffic volume on the roadways. Further, it can be concluded that the movement of freight in the CHATS study area havs a multiute of origin and destinations related to each sector of the economy from grocery stores to agricultural goods and may not interact with the port facilities at any point in the journey of that good.

Table 7.4
Interstate Traffic Counts

	I-526 at Cooper River		I-526 at Leeds Ave.		I-26 at Ashley Phosphate Rd.		I-26 at Azalea Ave.	
AADT (Yr. 2008)	72,100		72,100		146,100		82,600	
Truck 12-Hour								
Port-Related	4,110	5.7%	1,081	1.5%	3,506	2.4%	1,053	1.275%
Non-Port	487	0.675%	919	1.275%	1,862	1.275%	2643	2.4%
Total	4,597	6.375%	2000	2.775%	5368	3.675%	3,696	3.675%

Basis for data: *Container Movements & Traffic Mitigation Measures, Port of Charleston*; Wilbur Smith Associates, 2002, Updated in 2022

[8] Wilbur Smith Associates, March 2002

Railroads and Intermodal Yards

High quality rail access to the Port of Charleston is key to the continued success of the port facility., The BCD region is served primarily by two privately-owned Class I railroads and a publicly-owned short-line railroad. Combined, these three railroads serve the rail needs of shippers, trucking firms, and the port. The locations of these railroads and other private tracks are shown in **Figure 7.1**.

Privately Owned — The two privately-owned Class I railroads operating within South Carolina — Norfolk Southern (NS) and CSXT Corporation — both operate tracks through Charleston that provide access to rail points throughout the Southeastern US, including Atlanta, Savannah, Charlotte and other areas. Additionally, both companies have major intermodal yards located along I-26, south of the I-526 interchange. In addition, one of the goals of the proposed Navy Yard project is the creation of a near-dock intermodal yard in the vicinity of port areas..In 2010, it is estimated that the port will process approximately 1.3 million TEUs. It also is estimated that approximately 10% of this volume will be shipped from the region by rail, with CSXT processing 86,000 TEUs and NS processing 44,000 TEUs. It is estimated that containerized rail freight would consist of 23% of all freight derived from the proposed Navy Yard terminal. This freight would be evenly split by the two rail companies, based on the 2007 Navy Yard facility EIS.

According to the 2008 South Carolina State Rail Plan, the existing regional intermodal facilities are near their capacity and would be unable to absorb projected growth in container usage. In addition, there is not enough land available for expansion at the existing intermodal rail facilities in the regions. According to the recommendations of the State Rail Plan, the development of a near-dock intermodal facility, either at the Cooper Yard site or elsewhere within the former Charleston Navy Base should be a focus for the freight transportation community in the coming years.

Publicly Owned — South Carolina Public Railways, a publicly owned and operated agency, operates a short-line railroad with three important spurs that connect to CSXT and NS lines. One of these connects to the Columbus Street/Union Pier Port Terminal. The second spur connects the Cosgrove Yard at the North Charleston Port Terminal and the third connects the Nucor Steel and BP plants in Berkeley County.

Truck Yards and Warehouses

Within the BCD region, there are a number of local and national trucking firms that serve the CHATS study area. Based on data obtained as part of the 2004 CHATS update, an estimated 40% of locally owned trucks primarily serve the BCD region, moving freight between the port, intermodal terminals, and/or

truck yards and warehouses; 10% move freight to and from the Midlands (Columbia) and Upstate (Greenville) regions of the state; and 50% transport freight throughout the southeast region. While these movements reflect those of several large trucking firms that were interviewed at the time of the 2004 CHATS update, dozens of smaller companies also operate to and from the port. It can be reasonably assumed that these percentages have not changed substantially in the ensuing years.

Existing primary warehouse/truck yard locations include:

- Montague Avenue/Dorchester Road/Azalea Drive location south of I-526 and west of I-26
- Ashley Phosphate Road area west of I-26, including Palmetto Commerce Parkway
- Rosemont area between exits 217 and 219 on I-26
- Jedburg Road area near Exit 194 on Interstate 26

In addition, other warehouses are scattered along US 52, Rhett Avenue, Clements Ferry Road, and Long Point Road.. To understand freight flow and access routes, **Figure 7.2** illustrates the major freight transport components within the region. These components include:

- Major roads
- Port terminals
- Rail lines
- Intermodal yards
- Truck yards
- Warehouses
- Industrial parks

From the Wando Welch terminal, trucks generally use I-526 to I-26 to travel north or deposit/pickup loads at the warehouses or intermodal facilities. Truckers access the North Charleston terminal from I-526 via Virginia Avenue and Rhett Avenue. From the Columbus Street/Union Pier terminal, truckers access I-26 via East Bay Street and Meeting Street. The proposed Navy Yard facility would be accessed via I-26 to a newly constructed roadway located in the vicinity of a reconstructed Exit 217.

From the truck yards, a large portion of the trucks travel north along I-26. In addition, many trucks serve the two rail intermodal yards. Minor movements also occur along US 17 to the southwest and northeast. Some of the truck yards are located close to warehouse storage facilities, which provide storage for freight delivered both locally and nationally.

South Carolina Strategic Corridor Plan

As part of the South Carolina State Intermodal Transportation Plan, the South Carolina Strategic Corridor Plan identified several roadway corridors throughout the state that would provide a continuous corridor network for persons and freight moving throughout South Carolina. In addition to the interstate highways, there are four identified Strategic Corridors that connect the CHATS study area with the remainder of South Carolina. These are:

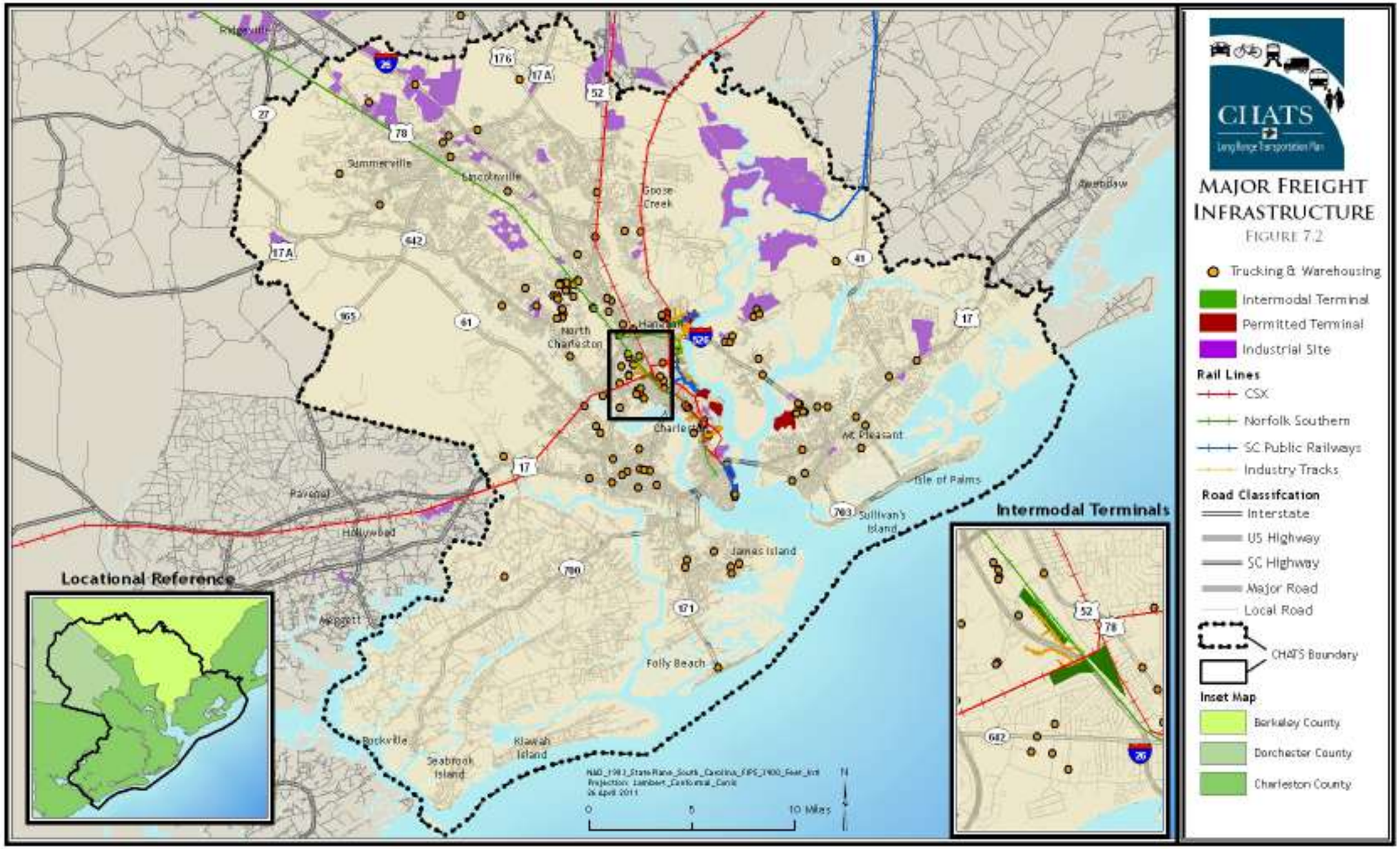
1) Atlantic Coast Corridor (US 17)
2) Pee Dee Corridor (US 52)
3) Mountains to the Sea Corridor (US 178 to US 78)
4) Best Friend of Charleston (US 78)

In addition, there are several area roadways that serve to connect corridors or provide access to coastal areas. These are

1) US 17 Alternate between US 78 and US 52
2) SC 41 and SC 402 between US 17 and US 52
3) SC 171 between US 17 and Folly Beach
4) SC 700 between US 17 and Rockville

Shippers/Receivers

Thousands of local firms ship and receive freight within the BCD region. These firms range in size from large fuel refineries to small bakeries, with a wide range of routes, schedules, and challenges. This study effort attempted to contact the shippers serving the region. While a number of the firms were receptive, none of the firms chose to be specifically identified.


MAJOR FREIGHT INFRASTRUCTURE
FIGURE 7.2
Trucking & Warehousing
Intermodal Terminal
Permitted Terminal
Industrial Site
Rail Lines
CSX
Norfolk Southern
SC Public Railways
Industry Tracks
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Intermodal Terminals
Summerville
Lincolnville
Goose Creek
North Charleston
Hanahan
Charleston
Mt. Pleasant
Isle of Palms
Sullivan's Island
James Island
Folly Beach
Ravenel
Hollywood
Meggett
Rockville
Seabrook Island
Kiawah Island
0 5 10 Miles

Freight Survey

Approximately 35 firms participated in the survey. This effort was not intended to collect a large amount of data or to quantitatively analyze information collected. Rather, the survey provided a broad instrument to address relevant freight issues. The shippers and carriers surveyed were able to specify transportation-related problems and concerns in the BCD region and identify possible solutions.

> "I-26 traffic growth poses the greatest long-term transportation issue facing regional movements to/from the port"
> – *South Carolina Public Ports*

Survey —The survey included three main sections for both shippers and carriers. The first section was directed at all respondents and requested background information on firm location, size, vehicle fleet, hours of operation, and peak periods. The second section questioned shippers about their inbound and outbound operations in regards to products, markets, transport decisions, volume, service factors, etc. This data made it possible to address issues of trucking, rail, and water separately. The third section addressed carrier and logistic firm operations in regards to fleet size, services provided, commodities handled, geographic coverage, routes used or desired, challenges, and vehicle restrictions.

Contacts — Commercial transportation users and providers face a variety of objectives, constraints, and issues. For this reason, both freight carriers and shippers were anonymously surveyed. Surveyed shippers included large firms with significant freight transportation movements. Such firms either transport the freight directly using privately owned trucks or contract-out service through trucking carriers. Organizations contacted included the Port, railroads, and trucking/warehouse distribution facilities (please refer to Table 7.6).

Problems and Needs

In general, survey respondents considered the condition of the current freight transportation infrastructure in the BCD region to be good. A unifying concern, however, was the need for increased highway capacity (with nearly half of the respondents indicating this as an issue) and the presence and quality of connector roads and ramps that would improve access from existing freight facilities to the region's primary tranport corridors. In addition, several issues, observations, and recommendations resulted from discussions with shippers, truckers, the Port, and the railroads, including the following:

- *Ashley Phosphate Road* — Trucking firms seek alternative routes due to the major congestion at the Ashley Phosphate Road exit on I-26. One alternate route used is taking Cross Country Road south to Dorchester Road (SC-642), southeast to Michaux Parkway, east to International Boulevard, and east to I-526. This circuitous route uses a 4-lane divided highway (SC-642) and other roadways through the International Commerce Park (Michaux Parkway and International Boulevard) to avoid the congestion on Ashley Phosphate Road.

  With the Ashley Phosphate Road and interchange improvements completed, traffic has improved notably. However, as an access road/interchange to the nearby malls, non-truck traffic will remain heavy. For this reason alternative trucking routes, such as the Cross Country/Michaux Parkway/ International Boulevard remain an important alternative, which could be hampered by future development in the International Commerce Park.

  In addition, the completion of the Palmetto Commerce Parkway provides an alternative for truck traffic moving coming to and from the west into this corridor by allowing truck traffic to utilize the College Park Road exit (Exit 203) to Ladson Road to the Parkway, limiting additional impact to the Ashley Phosphate area.

- *Dorchester Road (SC-642)* — Respondents suggested extending the southbound left-hand turn lane at Michaux Parkway., as well as widening the road from Interstate526 to US 17A. The proposed widening of Dorchester Road west of Old Trolley Road will help to alleviate this issues.

- *US 78/US 52 from Interstate 26 to Goose Creek*.—The growth of the Goose Creek area and the presence of the Naval Weapons Station has provided additional pressure on US 78 between I-26 and US 52. Respondents indicated a need to improve access and capacity from US 78 to US 52 going toward Goose Creek and the Naval Weapons Station

- *I-526* — Respondents identified the need for additional police patrol of reckless drivers who cut in front of trucks and other vehicles
- *I-526 at North Rhett Avenue.* Respondents indicated a need for a revised ramp plan and additional lanes on I-526 between I-26 and Rhett Ave.
- *I-26 Truck Restriction Area* — Some truckers support the restriction of trucks to the right two lanes on I-26 to facilitate passing and alleviate congestion.
- *I-526 at US-17 Interchange* — Congestion issues require further study of possible traffic signal improvements and/or road widening/reconfiguration.
- *US 17*—respondents indicated that this roadway is highly congested throughout its route. It is anticipated that improvements along Johnnie Dodds Boulevard in Mount Pleasant will assist in alleviating some of these congestion issues.

- *Interstate 26 at Interstate 526*-- Numerous respondents identified a variety of issues with this interchange, In particular, the westbound merge from I-526 to I-26 was cited as a significant issue area.
- *Access to CSX Railyard*- Respondents noted that a light and turn lane from Rivers Ave to the CSX facility were promised at the time of the 2002 North Charleston/South Carolina agreement regarding future rail access to the Navy Yard area.
- *Northern Crosstown Connector*--At least one respondent indicated a need for a northern Interstate grade crosstown connector running from I-26 north of College Park Road (Exit 203) east into the North Charleston/Hanahan area.
- *Jedburg Distribution Facility* — Respondents indicated that stop signs are ineffective; a stop light is needed to control automobiles and to enable trucks to safely enter highway.
- *I-26 widening to I-95*-— Respondents also indicated a need for additional highway capacity from the Jedburg facility to Interstate 95 in order to handle the anticipated demand for warehousing in the BCD region in future years.
- *US 52 and US 176 intersection in Goose Creek* – Respondents indicated the need for additional right turn lanes from southbound US 176 to southbound US 52.
- *Remount Road, Aviation Avenue, and Rivers Avenue (US-78/52)* — Heavy traffic congestion makes these roads dangerous. Several warehouses and retail outlets ensure continued truck use. A concern is that these roadways could be better marked to allow users to locate them.
- *Accident response along Interstate 26 and Interstate 526*—Respondents noted that along the local interstates the response to and clean up of accidents is slow due to the heavy traffic along these roads. Several respondents also noted the need for better traffic enforcement along these roadways.
- *Downtown Charleston* — Poorly synchronized signals in downtown Charleston inhibit traffic flow and exacerbate congestion issues. In addition, a need for enforcement to protect the existing loading zones and the creation of new loading zones was identified.
- *Rail Track Consolidation* — The South Carolina Rail Commission is interested in consolidating privately owned track south of the intermodal facilities to improve general service, rationalize operations, and possibly provide more intermodal access.
- *FAX/E-mail/Text Notification* — Truckers would like to see additional notification for closures and accidents along area roadways. This can be done via a number of methods, including via Fax, E-mail, or by Text Message.
- *Naval Base Redevelopment* — State funds are needed to fulfill the commitment to provide direct access from the proposed new port terminal on the former Naval Base site to I-26 and to avoid truck traffic on local streets.
- *Electric signage*- Respondents indicated the need for additional utilization of electronic signs to provide information to truckers and other motorists along Interstate 26, Interstate 526, and other area roadways.

Recommended Improvements

The problems and needs identified by freight users and transport providers can be divided into several categories based on location. These locations include the I-26, I-526, Ashley Phosphate Road, Jedburg Road, Clements Ferry Road/SC-41, Downtown Charleston, and North Charleston (south end) areas. In addition, the problems and needs are categorized by type (such as short- and long-term facilities and policy/programs) and summarized in **Table 7.7**.

Interstate I-26 and I-526

The critical freight transportation issue identified by the Port and the trucking firms was the long-term need to provide additional capacity for movements out of Charleston — namely, north of the I-26/I-526 junction. While trucking needs will continue to grow, transport providers considered the growth of automobile traffic to be the major influence on future northbound conditions. Possible solutions discussed included the widening of I-26 and the establishment of an alternative route. Transportation providers are in favor of the ongoing widening of a section of I-26 north of I-526, but expressed general concerns that a much longer segment of I-26 needs to be widened., potentially to Interstate 95 based on the anticipated impact of the Jedburg Commerce Park and adjacent proposed warehouse and transportation facilities . In addition, numerous freight providers indicated a need to rebuild the Interstate 26-Interstate 526 intersection to better handle freight transportation needs.

Other long-term needs include the improvement of the I-526/US 17 interchange to relieve traffic congestion and improve flow. Regarding policy and programs, some trucking firms voiced support of the truck lane restrictions (to the two right-hand lanes) to improve overall traffic flow. Also, several firms voiced concern with impatient drivers who continually swerve in front of trucks on I-526 when exiting this facility. Recommendations included signage and increased police patrolling along these corridors.

Palmetto Commerce Parkway

At the center of the region, this primarily north-south facility parallels I-26 from Ashley Phosphate Road to Ladson Road serves a number of commercial, and industrial, areas. Exit 209 on I-26 is a significant cause of traffic congestion and this new facility (currently under construction) will improve traffic conditions. Nonetheless, the support of alternative trucking routes may help relieve overall traffic conditions in the area. One such route currently used from Ashley Phosphate Road to I-526 is Cross Country Road/Dorchester Road/Michaux Parkway/International Boulevard. This route could become a more viable alternative route with a few modest improvements and could remain viable with careful planning. Improvements include lengthening the southbound left-hand turn lane on Dorchester Road at Michaux Parkway. Planning includes ensuring that access to new commercial development along Michaux Parkway and International Boulevard is restricted and signalized. The recent realignment of Michaux Parkway at International Boulevard at the entrance to the Boeing plant will assist in this as well.

Clements Ferry Road/SC-41

The rapidly increasing commercial and residential development along these important arterials northeast of I-526 will require care to mitigate current congestion and safety issues as well as dampen traffic impacts of new development. Short-term improvements include the installation of traffic signals at key locations to enable side road traffic to safely enter travel lanes. The widening of

Clements Ferry Road via the Berkeley County Salex Tax program will assist in mitigating the existing congestion issues.. A new 2 to 3 mile access road from the Nucor/BP industrial area that avoids residential neighborhoods would be welcome by both the major industries and local citizens. Policy recommendations include appropriate planning that limits access to these important arterials.

Downtown Charleston

This area is constrained by narrow streets and dense development. Major improvements would be difficult to implement. Minor improvements, such as improved synchronization of traffic signals and identification of additional loading zones, would be welcomed by trucking companies.

North Charleston

Just north of Charleston, in the neck of the Charleston Peninsula, the industrial area accommodates several trucking and warehouse operations as well as train tracks. The rail intermodal facilities are located a few miles to the north. In addition, the new port terminal at the former Naval Base (NBT) has recently begun operations and will grow significantly in the future. Several interrelated issues are key for this area, including:

1. Constraints of intermodal rail yard capacity
2. The construction of the proposed roadway between Interstate 26 and the Navy Yard, including the redesign of the existing Exit 218.
3. Consolidation of variously owned rail tracks under the South Carolina Public Railways Authority
4. The resoulution of the ongoing dispute between the City of North Charleston and the South Carolina Department of Commerce regarding rail access to the proposed Navy Yard terminal.

These three issues should be jointly evaluated to determine what common solutions might produce the best results for the transport users, providers, and surrounding residents.

North of Summerville

Another facility improvement identified in the interviews involves the the reconstruction of Exit 194 at the Jedburg Distribution Facility and adjacent proposed freight facilities to the north of Summerville to better handle the increased truck movements that are occuring and will continue to increase there. In addition, the construction of a new interchange at Interstate 26 and Sheep Island Road, coupled with the construction of the proposed Sheep Island Parkway will help to provide an alternative for traffic entering and exiting the warehouse and freight facilties in the area, as welll as provide additional access to the Summerville area.

Policy Concerns

Lastly, several policy programs were mentioned during the interviews that are worthy of further consideration, including:

- The FAX Notification Program, has proved to be useful in other local truck-related traffic matters, such as during the Arthur Ravenel Bridge construction. Issues to consider included system coordination and methods to distribute information (i.e., fax, email, text message).
- States surrounding South Carolina have different truck weight restrictions. South Carolina's weight restrictions are the lowest in comparison to neighboring states. The truckers have no preference regarding the actual weight allowed, but would request that neighboring states coordinate to determine a common weight restriction.
- Poorly inspected tire pressures on intermodal chassis result in many interstate blow-outs. This creates a dangerous environment for truckers and other motorists. Currently, the chassis are typically owned by the shipping lines, but truck drivers are expected to check tires regularly. The tire quality is reportedly low and the truckers' time is often too short to conduct proper inspections. This results in unnecessary blow-outs. Further study is recommended to determine a viable solution for all concerned parties. A key recommendation offered by more than one trucker was to significantly raise the minimum tire requirements.

Conclusion

Currently, the BCD region's freight transportation system is relatively good in comparison to similar metropolitan areas around the country. However, the success of the port combined with the continued growth of other industries expose infrastructure constraints that will continue to worsen. The need for improvements to I-26 and I-526 (lane additions and/or development of alternative routes connecting north of Summerville) continues to be stressed by freight transport users. Capacity improvements to as well as consolidation/rationalization of rail and intermodal facilities will provide effective alternatives to truck transport and improve overall I-26 capacity. Lastly, the commercial and residential growth in various regional locations (Ashley Phosphate Road, Clements Ferry Road, SC-41, Jedburg Road, etc.) underscores the need to properly identify transportation impacts of new commercial and residential construction.

Table 7.7
Recommended Improvements
Charleston Area Transportation Study

Facility Improvements		Policy & Programs
Short-Term	Long-Term	
Interstates I-26 and I-526		
	Add Lanes to I-26	Restrict Truck Lane Use on I-26
	Need Alternate Route from Charleston	Monitor Car Traffic on I-26 and I-526
	Improve I-526/US 17 Interchange	Improve Clean-Up of accident scenes along I-26 and I-526
	Improve I-26 interchange at I-526	
	Improve I-526 interchange at North Rhett Boulevard	
Ashley Phosphate Road Area		
Lengthen Southbound Left-Hand	Develop Alternate Routes	Limit/Control Access to Michaux Pkwy
Turn Lane on Dorchester Road to Michaux Parkway	Construction of new Michaux Parkway alignment	
Clements Ferry Road/US-41		
Install Traffic Lights	Widen other area Roads Build Access Rd to Nucor/BP	Limit/Control Future Access
Widen Clemens Ferry Road from I-526 to Jack Primus Road		
Downtown Charleston		
Synchronize Traffic Lights Identify Additional Loading Zones		Enforce the use of existing loading zones
North Charleston		
Reconcile Rail Plan	Expand Intermodal Yard Capacity	
	Provide I-26 Access to NBT	
	Consolidate Rail Tracks	
Summerville Area		
	Construction of I-26 interchange at Sheep Island Road	
	Construction of Sheep Island Parkway	
	Improve I-26 interchange at Jedburg Road	
	Complete Glenn McConnell Parkway extension	
Other		
		Expand FAX/e-mail/text Notification Program
		Coordinate Heavy Vehicle Restriction
		Implement Intermodal Chassis Inspection

Safety Planning

Background

Safety means the ability to satisfy a trip purpose via any mode of travel without incurring personal harm or damage to property. Safety must be considered as a key goal in the development of metropolitan transportation plans and programs. Great efforts have been made to increase safety in the BCD region and throughout the state. Traffic safety laws have been passed or reinforced to address traveler behaviors. The Seatbelt Law, DUI Law, and driver education programs all are steps that have been made to improve safety on South Carolina's roadways. Other strategies have involved new roadway designs and the implementation of various Intelligent Transportation System (ITS) technologies. Rumble strips have helped reduced roadway departures, and roadway cameras have helped authorities respond and manage major incidents. Some National, State, and regional statistics are given below to frame the challenges at hand regarding safety problems for varying modes of transportation. Although there have been improvements and the rates of fatalities and injuries have declined on the national level over the years, there are still needed improvements. Design standards, projects, and initiatives to enable motorists, patrons of transit, trucking companies, bicyclists, and pedestrians to safely share the roadways are crucial.

Federal Mandate

With the passage of SAFETEA-LU in 2005, all states were required to prepare a Strategic Highway Safety Plan (SHSP). Also, SAFETEA-LU requires that "metropolitan transportation plans should include a safety element that incorporates or summarizes the priorities, goals, countermeasures, or projects for the MPO contained in the Strategic Highway Safety Plan required under 23 U. S. C. 148."

In the CHATS area, efforts have been made to strengthen emergency response and services through coordination. Discussions on safety planning were incorporated into the evacuation planning conducted in the CHATS region. A communication system, response plan, and evacuation plan improved the coordination and communication between emergency response agencies. Key participants in these meetings have been response personnel representing South Carolina Department of Transportation (SCDOT) Incident Management Program and personnel representing the governmental entities of the region. Coordination included the urban transit provider, CARTA, to provide vehicles for evacuation. Additional issues discussed in these meetings include best practices in communication, response time, accident investigation, and efficient removal of stalled or crashed vehicles from the travel way. One important issue is acquiring communication equipment that uses a common frequency. Accomplishments from these meetings will greatly increase the safety and security of motorized and non-motorized uses of the highway system.

The consideration of the goals, performance measures, and planning factors identified in the SC SHSP, regarding the safety of motorized and non-motorized users of the transportation system, are reflected in all aspects of the metropolitan planning process, including the development of the LRTP and the Transportation Improvement Program (TIP). Safety has been factored into the development of the TIP, all short range planning studies, strategic planning studies, and all transportation needs studies.

Safety planning for all users of the transportation system is a priority for CHATS. CARTA has embarked on a transit facilities plan that evaluates bus stops for safe access and furniture needs. Coupled with the Complete Streets initiative, pedestrians, bicyclists, and transit customers will have safe access to the transportation system.

All municipalities within the CHATS area are exploring measures to address safety and the MPO is presently coordinating with these municipalities to include their efforts into the transportation planning process.

Traffic collisions are responsible for billions of dollars in economic loss, yet worse, are the injuries and fatalities associated with these incidents. **Table 8.1** presents national statistics on traffic crashes for 2002, 2005, and 2008.

Table 8.1
Annual Traffic Related Accidents: 2002, 2005 and 2008

	2002	2005	2008
Total Fatalities	42,815	43,443	37,261
Total Injuries	2,926,000	2,699,000	2,346,000
Crashes that Resulted in Property damage:	4,348,000	4,304,000	4,146,000
Non-motorists			
Pedestrians killed	4,808	4,749	4,378
Pedestrians injured	71,000	70,000	69,000
Bicyclists killed	662	622	716
Bicyclists injured	48,000	46,000	52,000

2000 Economic cost of traffic crashes **(2000)- $230.6 billion**

Source: National Highway Traffic Safety Administration (NHTSA) National Statistics

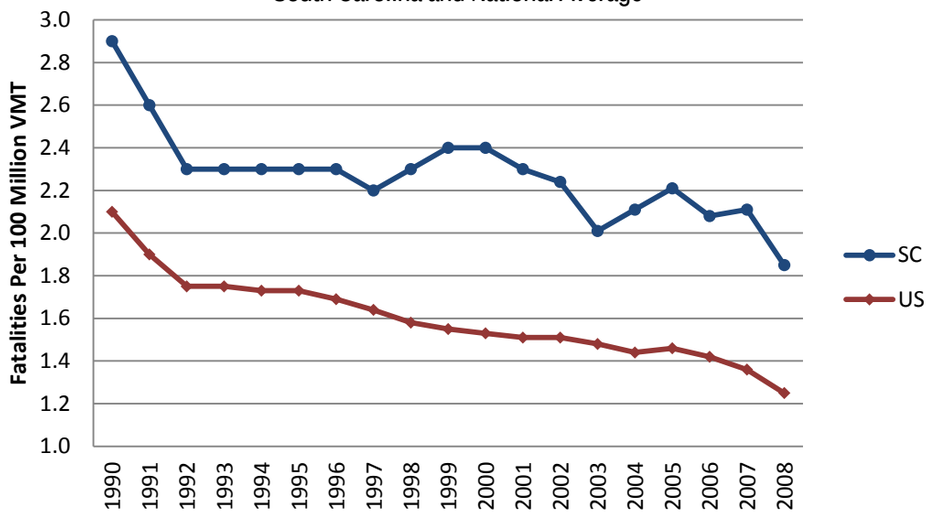
As evidenced by the table, traffic related fatalities and injuries as well as property damage resulting from vehicular accidents has decreased since 2002. However, bicycle related injuries and fatalities have increased over this same timeframe. Pedestrian fatalities and injuries have remained relatively constant.

Statewide Traffic Incidents

South Carolina ranked well above the national average for fatal accidents, as shown in the subsequent graph, which displays the South Carolina millage death rate or traffic fatalities per 100 million vehicle miles traveled (VMT) compared to national averages. In fact, according to 2008 statistics, there is a fatal accident every 9.5 hours in the State of South Carolina (2005 data). Secondary roads accounted for 72 percent of the traffic fatalities. A major objective of the SHSP targets safety improvements on secondary roadways. In 2007, this target on safety was institutionalizing by in a 2007 legislative action that added safety as a weighted criteria for ranking transportation projects statewide. Additionally, South Carolina is ranked number four in the nation for the rate of pedestrian fatalities per 100,000 people[1]. South Carolina is preceded by Florida, Delaware, and Louisiana, respectively, in this listing.

Source: South Carolina Budget and Control Board, Federal Highway Administration

Figure 8.1
Millage Death Rate
South Carolina and National Average



MPO Regional Crash Statistics

According to 2008 traffic fatalities data obtained from the South Carolina Department of Public Safety, of the 46 counties in South Carolina, both Berkeley and Charleston Counties are ranked within the top ten counties for total traffic fatalities. These top ten counties account for nearly half of the total traffic fatalities in South Carolina. Charleston County was ranked third, preceded by Greenville and Lexington Counties. Berkeley County was ranked number eight, closely following Richland and Florence Counties. Nearly 60% of these fatal traffic accidents occurred on primary arterials. Furthermore, according to 2007 traffic collision data, Charleston County had the most traffic collisions with,11,872; a number that was just slightly more than the number two and three counties, Greenville (11,425) and Richland (10,905). In fact, Charleston County has been the number one ranking county for traffic collisions since 1999. Additionally, Charleston County had the most injury collisions and persons injured, with 3,228 and 4,687, respectively, in 2008. The high number of collisions in Charleston County is largely a result of the large population and larger amounts of travel compared to other SC counties. Berkeley County and Dorchester County ranked 10th and 13th in the State, respectively. According to statistics from the South Carolina Department of Public Safety, the majority of accidents in the BCD region occurred on secondary roadways. A major objective of the SHSP targets safety improvements on secondary roadways. This target on safety was institutionalized in a 2007 legislative action that added safety as a weighted criteria for ranking transportation projects statewide.

Table 8.2
2008 Motor Vehicle Traffic Collisions by County

COUNTY	Collision Type				Persons	
	Fatal	Injury	PDO*	Total	Killed	Injured
Berkeley	37	992	2,408	3,437	41	1,536
Charleston	55	3,228	8,589	11,872	59	4,687
Dorchester	23	700	1,922	2,645	25	1,040

Source: 2008 Traffic Collision Fact Book, South Carolina Department of Public Safety

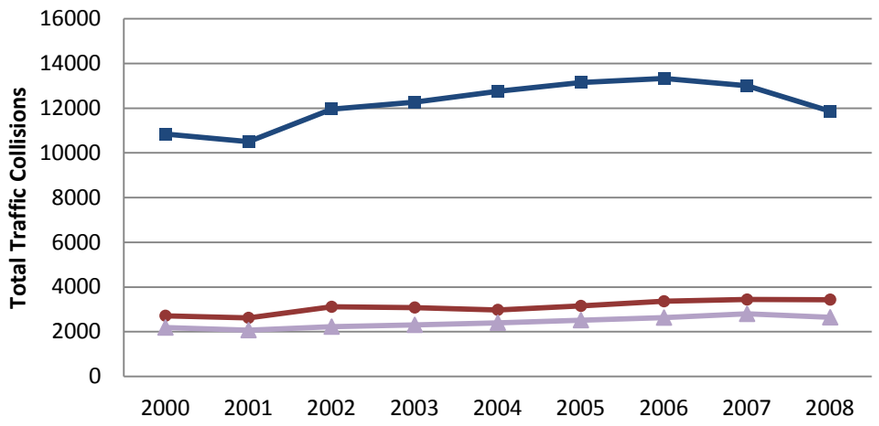
*Property Damage Only

Figure 8.2 displays the total amount of traffic collisions for the BCD region from 2000 to 2007. After increasing at a decreasing rate since 2005, the total number of traffic collisions in Charleston County displayed a slight decline in 2008. Furthermore, Berkeley County has displayed only marginal fluctuations in total traffic accidents and Dorchester County has remained relatively constant during this same timeframe. These trends have occurred despite annual increases in daily vehicle miles traveled (VMT). In fact, from 2002 to 2007, total traffic collisions in the BCD region have increased by 10% whereas daily vehicle miles traveled have increased by 14%. Despite slight improvements in transportation safety, the percentage of traffic accidents involving pedestrians or bicyclists from 2000 to 2006 has remained moderately unvarying.

Figure 8.3 displays the distribution of traffic related fatalities in the BCD region for 2008. Over 45% of fatalities involved the influence of alcohol, with a blood-alcohol level exceeding the legal limit. Furthermore, over 60%of total fatalities resulted from single-vehicle accidents. Nearly 40% of total fatalities involved cargo trucks. Lastly, nearly 20%of total fatalities resulted from vehicle and pedestrian or bicyclist collisions.

Existing Conditions

Figure 8.2
Total Traffic Collisions
BCD Region



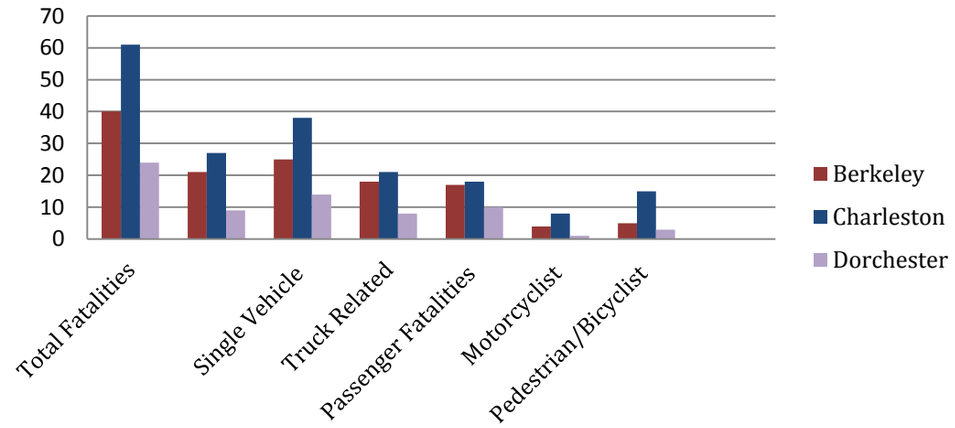
High Crash Locations

The MPO compiled information from the SC Department of Public Safety to identify high crash locations on major roadways in the Region. Although data were not analyzed by MPO staff in order to determine the specific causes of crashes at particular locations, the following observations were made:

- Most of the high crash locations listed were located at isolated spots or intersections rather than on longer segments of roadways; and
- More high crash locations occurred on uncontrolled access roadways than on controlled access roadways such as interstates, particularly secondary roads.

From a policy and programming perspective, the MPO seeks to address high crash locations by funding safety-conscious design principles into roadway improvement projects that are planned in order to promote safe transportation facilities for all modes of travel. Based on the observations above, perhaps one of the single most important elements that can be addressed to improve safety is access management. Access management consists primarily of limiting the number driveways and conflict points on the roadway system and serves to both reduce the number of crashes as well as reduce congestion.

Figure 8.3
2008 Traffic Fatalities
BCD Region



More information on high crash locations and maps can be found in Chapter 3 of this document.

Safety in Transit Operations

Local transit agencies have always placed an emphasis on providing a safe, secure, and reliable service for its passengers and employees. These efforts are continuing and are an integral part of providing transit service. While transit must be concerned about safety as it relates to the provision of service, transit itself can be a valuable resource to a community in providing rescue or evacuation services. Local transit providers participate as part of the larger community emergency preparedness efforts. Basic goals of transit agencies in regards to safety and security include:

- Being prepared for and well-protected against attacks;

- Being able to respond rapidly and effectively to natural and human-caused threats and disasters;
- Being able to appropriately support the needs of emergency management and public safety agencies; and,
- Being able to quickly and efficiently be restored to full capability

Safety Planning Progress

Many steps have been taken to improve safety in the transportation system in the CHATS Region. In February 2007, the state adopted a Strategic Highway Safety Plan with the mission to develop, implement, and manage an integrated multi-stakeholder process to improve highway safety.

Safety Planning Issues

- Some of the challenges involved in planning for safety include creating an innovative region-wide and/or state-wide system for collecting, analyzing, and sharing important information like crash data and integrating safety conscious planning into long range planning and short-term programs. Some other issues surrounding incorporating safety in the LRTP are as follows:
- Recognizing regional safety needs and local isolated problems;
- Building stakeholder partnerships;
- Continuing multi-agency coordination and communication;
- Disseminating important real-time incident information to motorists;
- Implementing design factors in new infrastructure that enhances the safety and extends the life of structures, minimizing construction zone periods;
- Improving interconnectivity of the transportation system, across and between modes, for people and goods;
- Implement Complete Streets concepts;
- Address safety issues at railroad crossings;
- Improving the accessibility and safety of transit stops and transfer points;
- Continuing efforts to promote truck safety such as restricted lanes, speed limits, and proper loading to prevent turnovers;
- Implementing ITS technologies on transit and emergency vehicles; and
- Finding financial resources to fund safety improvements

The State of South Carolina SHSP details five emphasis areas that will be focused on to obtain its mission. The CHATS MPO is a partner in this endeavor and will work cooperatively to achieve the mission.

1. Serious Crash Types
2. High Risk Drivers
3. Special Vehicles
4. Vulnerable User
5. Management Information

Safety Conscious Planning

Regional- growth strategies, major network strategies, etc.;

- City/County- community plans, zoning and subdivision regulations, transportation plans, etc.;
- Small area plans- sector/neighborhood plans, area transportation strategies, corridor and access management strategies, pedestrian and bicycle facilities development, etc.; and
- Site- site plan review, site impact studies, etc.

Safety conscious planning is needed in land use planning decisions and processes to influence policies that shape the direction of land uses to the specifics of urban form, mix, and density of use. Safety conscious planning is also an integral part of transportation planning for all modes of travel in order to shape the amount of travel as well as the mix of transportation modes.

The following strategies have been identified to address safety issues in the CHATS planning area. These strategies will be implemented, as appropriate, in the land use planning phase, LRTP policies and project selection, TIP project selection, or project design, construction, and operation.

Strategies

- Vehicle and pedestrian crash data analysis (CHATS)
- Bicycle LOS study, with safety as core element (CHATS)
- Project review by the CHATS Facility Design Committee (CHATS)
- Implement Complete Streets criteria (CHATS)
- Implement SHSP Educational Programs (SCDOT)
- Continue Safe Routes to School Program (CHATS)
- Roadway Incident Management (SCDOT)
- Improve Intersection Safety (SCDOT)
- Improve Work Zone Safety (SCDOT)
- Freight Movement Planning (CHATS / SCDOT / Truckers Assoc.)
- Improve Driver Behavior (SCDOT / SC Dept of Public Safety)
- Legislation (SC Government)
- Roadway/Intersection Lighting (SCDOT)
- Shoulder Rumble Strips and Striping (SCDOT)
- All Weather Pavement Markings (SCDOT)
- Longitudinal and Median Barriers (SCDOT)
- Speed appropriate Road-Side CHATS / SCDOT)
- Guardrail placement and End Treatment Upgrades (SCDOT)
- Highway signage (e.g. chevrons for problem curves, etc.) (SCDOT)
- Raised pavement markers (RPMs) (SCDOT)
- Roadway Design (FHWA / SCDOT / CHATS)
- Achieve Safety through Design and Technology (SCDOT / CHATS)
- Enforcement (SC Dept. of Public Safety)
- Work Zone Safety programs (SCDOT)

- Educate Young drivers and Elderly Drivers (SC DMV)
- DUI and Aggressive Driving Prevention (SC Dept. of Public Safety)
- ITS and Emergency Response (SCDOT / Municipalities)
- Safe Access to Transit Facilities (Transit Providers / Municipalities)
- Pedestrian Facilities (SCDOT / CHATS / Municipalities)

LRTP and TIP Project Selection

The project selection criteria for the Long Range Transportation Plan include safety as a prioritization factor. The MPO requires that all parties pursuing projects funded with federal funds show how the project meets the goals and objectives of this plan, including Safety.

Interagency Consultation

The primary objective of the safety goal is to work with state and local agencies and transportation providers to identify needs and facilitate improvements. Building partnerships with stakeholders is important in the following areas:

- Developing and implementing short-term strategies that enhance the safety for all users of the transportation system;
- Creating policies and design practices that are consistent with an efficient and safe multimodal transportation network;
- Developing an information system for compiling, accessing, and analyzing crash data; and
- Establishing a long-term vision that enhances the safety of all citizens.
- The development of the SHSP Plan included a number partners and interagency coordination. These partners came together to draft this plan.

Hazard Mitigation

Natural and man-made hazards are a constant concern in the BCD Region as they pose a threat the health and safety of the population, economic vitality, and environmental quality. Currently, 19 roadways within the BCD region are designated as evacuation routes by the South Carolina Department of Transportation. This network of routes, consisting of interstates as well as US and state Highways, directs motorists to the midlands of South Carolina. The roadways that are designated as evacuation routes per SC DOT are as follows:

Table 8.3
Designated Evacuation Routes in the BCD Region

Interstates	SC 165
I-26	SC 171
I-526	SC 61
US Highways	SC 517
US 17	SC 6
US 52	SC 642
US 78	SC 402
US 178	SC 45
US 176	SC 41
South Carolina Highways	SC 700
SC 174	Bohicket Road (SC 20)
SC 64	SC 703

Source: SCDOT

As these routes can become congested, lane reversals extending from I-26 near the onramps of I-526 from Mount Pleasant and West Ashley through the intersection of I-77 near Columbia are instituted in order to increase mobility.

Having an efficient plan of evacuation is essential in promoting regional resilience. Highly resilient communities anticipate disturbances, reduce vulnerabilities, respond effectively to disturbances, and recover rapidly with minimized downtime to community, government, and business services. In 2007, Charleston became a partner in the Community and Regional Resilience Initiative (CARRI) to collaboratively devise the strategies necessary to enhance community resilience. A CARRI Charleston Advisory group was devised in 2008 and consists of local government officials and representatives from CARTA and TriCounty Link, local police departments, SC DOT, non-profit and faith-based organizations, as well as the business sector, which collectively play a vital role in the community, identified transportation, and mobility as a priority area for improvement in regional resilience.

This prioritization was based on the ability for individuals' to meet basic human needs and a community's ability to maintain cultural and social capital, as well as recover its economic capacity after a natural or man-made disaster. The Advisory Group identified the following deficiencies in the current transportation system that hinders community resilience:

- The tri-county has 761 bridges and overpasses, approximately 100 of which are considered substandard. These would almost certainly be destabilized, with some rendered unusable under certain disaster scenarios – particularly seismic events. Furthermore, although there is high potential for severe seismic events in the area (the threat of a major earthquake is statistically the same as for a hurricane), we do not have good data on the safety of existing or proposed roads with respect to seismic events
- Dependence on major high-volume arteries such as I-26, I-526, US 17, and Alt. US 17, as well as other critical connectors like US 52, US 78, SC 61, and US 176 retards mobility and resilience if these routes are compromised as many jobs are concentrated in Charleston County.
- The Charleston International Airport, located in North Charleston accommodates both commercial airlines and the Charleston Air Force Base—a major employer in the region. Additionally, the airport area is a major manufacturing center in the region housing companies such as Boeing. The airport, which serves more than 1.4 million passengers annually, is located directly over the most geographically disturbed area in the earthquake fault zone. (The Charleston area is the site of an active seismic zone. The Woodstock Fault runs through a 25 mile x 15 mile oval known as Middleton Place-Summerville Seismic Zone, which includes the airport.)

Furthermore, the Advisory Group identified the following measures to address regional transportation congestion and system vulnerabilities relative to disaster response and recovery (specifically for hurricane, earthquake, and pandemic scenarios):

- Identify and consider critical connector roads that link outlying population centers to high-density areas
- Assess adequacy of designated evacuation routes
- Identify particularly vulnerable bridges and overpasses
- Identify post-event alternative transportation options for post-event response and recovery including use of the port and navigable waters (such as the Cooper river) to ensure mobility of people, goods, and services during response and recovery, and
- Consider potential transportation effects of other types of scenarios/disasters besides hurricanes (ex, chemical spills).
- Both light and heavy rail have been discussed as options for future mass transit in the Tri-County areas. Given infrastructure that already exists, Heavy rail would allow use of existing infrastructure and give more transportation options.
- Adoption of policies which support a diversification of transportation modes coordinated with land use planning
- Encourage ridership of mass transit and enhance existing mass transit services.

The Berkeley-Dorchester Hazard Mitigation Plan (BDHMP), updated in 2010, delineates the planning process for the implementation of projects and programs that will avoid or reduce vulnerabilities and make the communities of Berkeley and Dorchester counties more resilient to the impacts of potential hazard events. The Disaster Mitigation Act of 2000 requires that local jurisdictions and states devise a FEMA-approved hazard mitigation plan to receive funding through the Hazard Mitigation Grant Program, which is implemented under Section 404 of the Stafford Act. This amendment shifts emergency management programs away from the response and recovery role and encourages a mitigation protocol where potential hazards are identified and prepared for in order to ameliorate harm to individuals and property. Through the development of the BDHMP, participating jurisdictions created Mitigation Action Plans, where transportation improvements were a reoccurring theme for prioritization of the incorporation of hazard mitigation measures. Similarly, the Charleston Regional Hazard Mitigation Plan, updated in 2008, identifies vulnerabilities and outlines goals to minimizing losses associated with hazards. Resilience of the transportation system was a reoccurring theme for improvement.

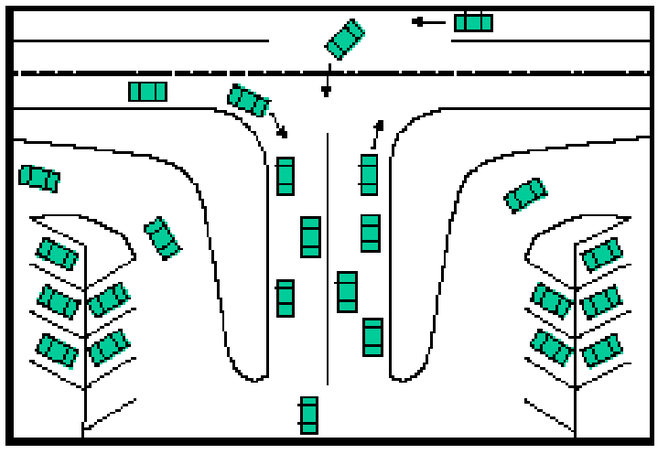
Hazardous Materials

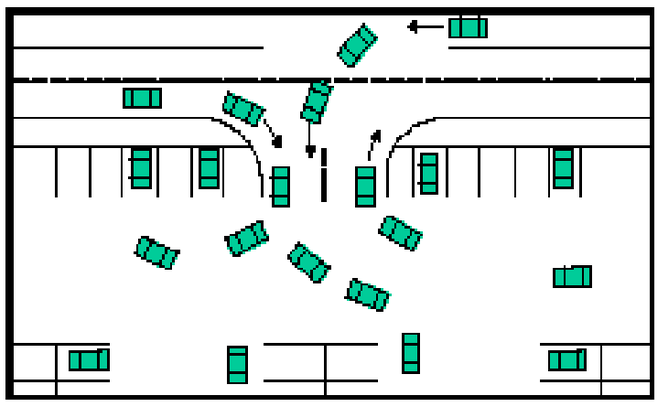
Hazardous material releases or spills mainly occur along transportation routes, per ships, trains, or trucks, or at hazardous storage locations. Interstates 26, 95 and 526 are the most frequently used routes to transport materials to and from points within the BCD region's industrial and urban areas and are the most vulnerable to hazardous material releases due to the high travel demand of these roadways. The Port of Charleston and many railway corridors are also vulnerable to hazardous material releases due to their vital economic contributions. Emergency medical services personnel of Charleston, Berkeley, and Dorchester Counties are trained in hazardous material operations.

Incident Management

Statistics convey that traffic incidents cause nearly 25 percent of total delay on roadways because of a reduction in capacity. For instance, a lane blockage on a three-lane arterial can reduce total capacity by nearly 50%. Furthermore, if a lane blockage occurs when a roadway is already meeting its capacity, for instance, during peak-hour travel demand, congestion will not be ameliorated after the incident is cleared but after travel demand into the roadway decreases. One additional minute of lane blockage yields four additional minutes of congestion as traffic accumulates into the roadway. Additionally, lane blockages can lead to secondary incidents such as crashes and stalled vehicles due to running out of gas. The Federal Highway Administration (FHWA) has developed a Traffic Incident Management (TIM) program to assist state and local transportation agencies in reducing the time it takes to restore capacity following a traffic incident. TIM is a planned and coordinated process to detect, respond to, and remove traffic incidents and restore capacity as safely and quickly as possible. Quick and coordinated clearance increases safety for travelers and incident responders. Promoting more aggressive and widespread traffic incident management is an important strategy to improve system resilience as well as promote the safety of motorists.

SCDOT Incident Response, formerly known as SHEP, is available to serve motorists of select areas of the BCD region by providing minor repair services to disabled vehicles, traffic control and incident management during emergencies, as well as first aid to individuals injured in traffic accidents until the arrival of emergency medical services.





Access Management

As development continues to occur along major highways and prominent corridors, protecting the through capacity of these corridors will be increasingly important. Some major highways in cities and towns are reaching or already have reached the practical limits of widening and major improvement. Other corridors can be widened, but the cost of doing so is prohibitive or controversial.

Development already located along roadways is unlikely to willingly remove points of access. Meanwhile, new development will continue to locate along highways and seek direct driveway access. The increasing number of driveways and intersections will create more points of conflict, create additional points of congestion, and effectively reduce the through capacity of many of the most important travel corridors. Implementing access management policies and constructing measures has the potential to create a balance between the need for access to the transportation system and the desire to promote the safety of the many users of the transportation system as well as maintain mobility of major corridors. .

With minor improvements or direct changes to driver behavior, more efficient use can be made of the existing transportation system. Minor improvements may include the construction of additional turn lanes, installation of updated or advanced signal equipment, installation of intelligent transportation systems (ITS), and identification of alternative travel patterns**.** Other measures to control traffic flow include: median U-turn treatment, traffic monitoring, Non-traversable medians, adaptive signal control, one-one-way frontage roads, offset left turn treatment, left-turn storage bays, minor street approach improvements, intersection and driveway curb radii, emergency vehicle preemption, minor street approach improvements, number of driveways, driveway throat length, and driveway placement and relocation.

Real-Time Traveler Information Program

511, a nationally designated telephone number, provides current information about travel conditions, allowing travelers to make better choices including time of travel, mode of transportation, and route. 511 was designated in 2000 by the Federal Communications Commission (FCC) for the dispersal of travel information available to states & local jurisdictions across the country. However, the FCC ruling leaves nearly all implementation issues & schedules to state & local agencies & telecommunications carriers. There are no Federal requirements or mandates to implement 511. Currently, no 511 services are provided in South Carolina. CARTA intends to equip 25 bus shelters that are planned for construction throughout the Charleston Metropolitan Area with real time traveler, bus location software to keep awaiting passengers informed of arrival times.

Security Planning

Background

SAFETEA-LU added planning for security as a integrated long range plan element, highlighting the increased emphasis placed on transportation system security. All projects listed in this plan have been reviewed to determine their potential to improve the security of the transportation system.

Though the MPO is not involved in specific security or emergency planning activities, CHATS communicates with the SCDOT, SC Department of Public Safety, the local emergency management and law enforcement agencies, and local engineering officials. Emergency personnel have been consulted to comment on transportation plans and projects with the intention of developing a transportation system that is as secure as possible.

Existing Conditions

Intelligent Transportation Systems

Intelligent Transportation System (ITS) cameras allow officials to monitor activity along Interstates within the region. Law enforcement and/or emergency personnel can be dispatched if an emergency is spotted. Dynamic Message Boards located along interstates and major highways throughout the region are capable of displaying emergency information such as weather warnings, hazardous spill information, Amber alerts, or evacuation orders.

A permanent real-time Traffic Management Center has been constructed at the SCDOT District 6 office in North Charleston. The center is staffed throughout the day to monitor traffic flow and incidents that disrupt traffic progression. Using the cameras installed along I-26 and I-526, staff can dispatch emergency response personnel more quickly, minimizing congestion and delays. As the cameras and signal systems are networked across the region, signal timing plans can be adjusted from the Traffic Management Center to respond to conditions in real -time. A Signal System Master Plan is under development using CHATS funding.

The SCDOT Incident Response vehicles provide incident response services along area interstates and routine surveillance of bridges and overpasses, keeping a look out for suspicious activity or disabled vehicles. The incident response truck operators are able to contact law enforcement or emergency personnel if needed.

Public Transit

Since the recent national focus on security, efforts to enhance security have reached a new level of importance. The Federal Transit Administration (FTA) has undertaken a series of major steps to help local transit providers prepare against a variety of threats. Under the FTA Section 5307 program, one percent of the funding allocation must be spent on security enhancements, allowing an integration of security measures into transit operations. This continual emphasis on security, from capital procurement to hiring and training of employees, to the management of the agency, to the provision of service, is intertwined into daily activities. The security function is supported by emergency response plans, both to support resolution of those incidents that occur on transit property and those events that affect the surrounding community serviced by the agency.

Local transit providers have made great strides to strengthen security and emergency preparedness. Local transit providers are a critical transportation link everyday and during an incident. CARTA has prepared a security risk assessment and is taking steps to implement the findings by developing security and emergency response plans, training drivers and supervisors, and coordinating with local emergency management services. Security is being considered proactively in all plans or projects being developed rather than added as an afterthought.

Basic goals of transit agencies in regards to safety and security include:

- Being prepared for and well-protected against attacks;
- Being able to respond rapidly and effectively to natural and human-caused threats and disasters;
- Being able to appropriately support the needs of emergency management and public safety agencies; and
- Being able to quickly and efficiently be restored to full capability

While local transit agencies have embraced the need to update safety and security throughout their systems, there are relatively few funds to help pay for these programs. Capital expenses can slowly be absorbed through the regular improvement plans. As older vehicles are replaced, the fleet can be upgraded to include new security features, such as equipping vehicles with GPS locating devices, further enhancing the safety and security of the system. However, it would take years to turn over the entire fleet without some additional financial assistance.

Freight Movement

Trucking

The Transportation Security Administration (TSA) administers the Hazmat Threat Assessment Program, which obtains background and security checks on drivers of commercial vehicles transporting hazardous materials. In addition, the Federal Motor Carrier Safety Administration (FMCSA) has initiated several programs aimed at protecting against terrorists using commercial trucks as weapons or targets. Their top priority is dealing with trucks that carry hazardous materials.

Rail

The TSA has developed a series of voluntary freight rail security action items that should be considered when security plans are developed. The action items address system security, access control, and en-route security.

Air and Port Traffic

The TSA has new air cargo regulations in place that includes canine teams, site and onboard inspections, and physical screening of cargo as well as security and background checks of pilots, employees, and cargo carriers. The TSA is also responsible for air passenger security.

Bridges and Coastal Security

The U.S. Army Corps of Engineers and the US Coast Guard are responsible for monitoring bridges and coastal waterways along the coast of South Carolina. These agencies ensure that these facilities are operating in a secure manner.

Security Planning Progress

The Strategic Highway Safety Plan in South Carolina establishes a framework for a systematic, statewide, multi-agency effort to improve the management of highway incidents- crashes, disabled and abandoned vehicles, debris in the roadway, work zones, adverse weather, and other events and emergencies that impact the transportation system.

The Department of Homeland Security administers the Targeted Infrastructure Protection Program, which in 2005 allocated $365 million to rail, port, and inter-city bus security, and highway watch and buffer zone protection programs. The program remains active today through its strategic implementation plan, annual performance reviews of the USDOT as federal agency, and integration into other funding sources within the USDOT.

Interagency Consultation

The MPO has sought input from coordinating agencies and their comments have been incorporated into this chapter. The MPO will continue to engage emergency and law enforcement personnel in transportation planning activities. In addition, emergency management agencies have coordinated on critical link facilities, such I-26, in the event of an earthquake event. CHATS staff has recently collaborated with the County Local Emergency Planning Committees (LEPCs), who were established to monitor hazardous materials sites and transporters under the USDOT Pipeline and Hazardous Material Safety Administration (PHMSA).

LRTP and TIP Project Selection

Projects benefiting the security goals of the LRTP will be given consideration for inclusion in the Plan. CHATS requires that all parties pursuing projects funded with federal funds show how the project meets the goals and objectives of this plan, including Security.

Environmental Screening

Introduction

Transportation projects have the potential to create significant impacts to the natural and man-made environment and often disrupt communities as much as they improve mobility. Only through early awareness and responsible planning can these impacts be minimized or even avoided. For this reason, the CHATS long range transportation planning process includes an environmental screening systems level planning phase. The use of a screening process allows the project team to evaluate projects using available and collected data sets. In this manner, options can be evaluated quickly and recommendations can be formulated which best accomplish the transportation goals while minimizing impacts.

In some cases, this process has been proven to effectively eliminate those projects, which are determined to have unacceptable impacts or are likely to encounter permitting difficulties due to potential impacts. In these cases projects may actually be eliminated from consideration. Because individual projects can significantly affect other projects, these issues must be resolved as early as possible to avoid inefficient use of time and resources. The result is a transportation plan that is respectful of the environment and cost-effective in its implementation.

The vast majority of impacts associated with projects in this plan are associated with roadway projects. This is mainly due to the large amounts of land required to build roadway projects and the resulting traffic that can become not only a conduit for traffic but also a barrier to community. Sidewalks and bicycle facilities are much more limited in the magnitude of their impacts, due to smaller cross-sections and greater flexibility to avoid problem areas. Furthermore, pedestrian and bicycle facilities are most often built in conjunction with roadway facilities and have only marginal impacts, if any, beyond those of the roadway itself.

> *"No one has the right to use America's rivers and America's waterways that belong to all the people, as a sewer. The banks of a river may belong to one man or one industry or one state, but the waters which flow between the banks should belong to all the people."*
>
> — ***President Lyndon B. Johnson****, upon signing the Clean Water Act of 1965*

The vast majority of transit projects in the long-range transportation plan (LRTP) are associated with bus route service expansions on existing rights of way, which typically involve no new construction and have minimal impacts on either the natural or the manufactured environment. In general, transit impacts tend to be positive because increased service tends to reduce vehicle miles traveled (VMT), lower air emissions, and improve accessibility in disadvantaged neighborhoods.

The following discussion of the plan's environmental screening process is divided into two parts. The first focuses on overall screening of the natural and cultural environment. It also addresses specific issues related to environmental justice.

The Ashley River is one of many sensitive waterways within the CHATS planning area.

The second section attempts to identify potential environmental and social impacts associated with the proposed transportation improvements. To assist with this effort, the project team developed a series of maps that inventory known environmental features. These maps include wetlands, endangered species, protected land, archeological sites, and historic sites as well as many other features. When overlaid with the proposed transportation projects, these prove to be useful tools in assessing the relative impacts to the environment.

This information also has been translated into an environmental screening model, which provides an overview of potential project impacts when compared with quantitative performance measures. Both of these tools are discussed in later sections of this chapter. It is important to point out that this environmental screening is merely a cursory review of available data and is not intended as a replacement for a more thorough project by project evaluation. As project plans are further refined, more precise environmental assessments may be necessary. For some of the projects recommended in the LRTP, NEPA studies are underway or completed.

Environmental Features

The Charleston area continues to urbanize. As growth occurs, impacts to the environment are inevitable. With the development of new infrastructure it will be important to manage and minimize these impacts. Some natural amenities, however, such as clean water and open spaces must be maintained to satisfy not only residents' desires for a high quality of life, but also state and federal

environmental policies. Figure 10.1depicts important environmental features within the Charleston area. Figure 10.1 clearly shows the magnitude of wetlands throughout the planning area as well as state and federal protected lands. Two large areas of protected land are the Medway Plantation just north of Goose Creek and Francis Marion National Forest, northeast of Mount Pleasant.

In addition, most of the wetlands identified in Figure 10.1 are jurisdictional with 401 Certification, which represent sites where the state has authority to protect water quality under the Clean Water Act (CWA). Figure 10.2 identifies the location of cultural features, including historic sites and features registered on the National Registry of Historic Places. Figure 5.3 presents the community facilities that need to be served by transportation facilities, but also need to be protected from in the externalities of transportation facilities. Collectively, the maps represent wetlands, protected lands, bodies of water, historic sites, parks, schools, churches, hospitals, fish advisory streams, and other significant features.

As with most urban coastal communities, the CHATS area has a number of pristine environmental features that continue to attract newcomers and visitors alike. While these amenities make positive contributions to the area's identity, a careful review of these maps reveals how challenging it can be to construct new transportation facilities in areas where they are most needed. Responsible planning dictates that these features be considered during the planning process, as well as an integrated approach to coordinating land use-development and transportation planning.

Environmental Justice

Environmental justice is a law intended to prevent the use of federal funds for projects, programs, or other activities that generate disproportionate or discriminatory adverse impacts on minority or low-income populations. This effort is consistent with Title IV of the 1964 Civil Rights Act, and is promoted by the U.S. Department of Transportation (USDOT) as an integral part of the transportation planning process, from individual project planning and design to the long range visioning process. The environmental justice assessment incorporated in this update was based on three basic principles, derived from guidance issued by the USDOT:

- The planning process should avoid, minimize, or mitigate environmental impacts (including economic, social, and human health impacts) that affect minority and low-income populations with disproportionate severity.
- Transportation benefits should not be delayed, reduced, or denied to minority and low-income populations.
- Any community potentially affected by outcomes of the transportation planning process should be provided with the opportunity for complete and equitable participation in decision-making.

As part of this transportation plan update, Census 2000 data was used to identify the geographic distribution of low-moderate-income (LMI), and minority populations, so that the positive and negative effects of various transportation investments in the transportation plan could be assessed. Minority populations include Blacks, Hispanics, Asian Americans, American Indian, and Alaskan Natives. LMI is defined as a household in which the total household income does not exceed fifty percent (low income) and eighty percent (moderate income) of the median for the area, as adjusted for household size by the US Department of Housing and Urban Development (HUD). This information is presented on Figures 10.4and 10.5. Figure 10.4 depicts the distribution of LMI populations. This map reveals a significant area along the east side of Charleston that has fifty percent or greater of the population designated as LMI. Figure 10.5 shows the distribution of the minority population and spatial distribution across the study area. CHATS endeavored to develop and carry out a public involvement process that not only reduced obstacles to participation by minority and low-income communities, but also actively sought out meaningful input. For additional information on minority and low income outreach efforts, please refer to *Chapter 2 — Introduction and Vision*.

While it is nearly impossible to construct infrastructure without impacts, it is through careful planning and early consideration that the Plan intends to manage impacts to communities effectively. Rather than an ad hoc approach to environmental justice planning, this transportation plan identified sensitive communities early in the process. Early identification allowed for an assessment of the existing transportation plan and influenced the selection and alignment of future transportation improvements.

It must be stressed that the environmental justice screening conducted for this study is not intended to quantify specific impacts. As described above, it is intended to guide the development of a plan that is equitable in terms of both costs and benefits. In addition, a critical purpose of this screening is the identification of projects in the transportation plans that, due to proximity, have the potential to affect communities of special interest. When individual studies are begun as part of project implementation, more detailed analyses, including field surveys, will be needed to identify and minimize specific community impacts on a project-by-project basis.

Planning Guidelines

During the development of the transportation plan, the project team used the available data to avoid and minimize impacts to known environmental features. The collection and consideration of these data early in the planning process is intended to lessen environmental impacts and reduce potential conflicts during permitting. In addition, when considering new roadway alignments and extensions, planners and engineers should use a guiding set of principles, including those listed below, to ensure that environmental considerations are followed:

- Avoid steep slopes and otherwise unsuitable topography
- Minimize impacts to the built environment
- Stay away from FEMA designated floodplains
- Minimize the number of wetland (National Wetland Inventory) impacts
- Minimize the amount of each wetland impact (e.g., don't cross a wide wetland when a narrower one can be crossed)
- Minimize the number of stream crossings
- Minimize the length of stream crossings
- Minimize impacts to school sites
- Minimize the number and size of impact to historic features and districts
- Minimize the number and size of impact to threatened and endangered species

Candidate Project Assessment Process

A quantitative screening was performed to assess the potential environmental and social impacts of projects included in the CHATS study area. This analysis consisted of overlaying transportation project alignments/locations onto a series of spatial analyses that depict natural features, cultural sites, community facilities, and environmental justice data. The goal is to assess the impact of the transportation project and use this information to quantify the overall costs and benefits of the improvement. Projects will be prioritized based on this analysis to ensure the regional transportation system is providing the highest mobility benefit with at the lowest impact. Subsequent analyses can be performed to select the alignment alternatives with the methodology and tools developed herein. The results of this evaluation are summarized in matrix form and represent a quantitative assessment of potential project issues (see Table 10.1). The matrix evaluation criteria are grouped into four separates areas:

- Constructability & Implementation
- Travel Demand Benefits
- Financial Viability
- Livability Index

Potential project impacts (if any) were quantified for each of the above categories. This determination is based on the results of a spatial overlay analysis performed for each evaluation criteria. For example, impacts are generally considered major if the project affects a greater acreage of sensitive area. The following is a brief description for each of these headings.

- Minimize the number and size of impact to hazardous waste sites
- Minimize the number and size of impact to superfund sites
- Minimize or avoid impacts to neighborhoods
- Avoid unnecessary or disproportionate impacts to minority and LMI communities
- Avoid impacts to parks and designated open spaces
- Minimize gameland impacts
- Minimize the number of new facilities in critical watershed areas
- Be aware of existing development patterns
- Capitalize on street connectivity opportunities such stub streets
- Encourage a multimodal system with the promotion of pedestrian, bicycle, and transit networks

Environment/Natural Features

This section is primarily focused on natural features related to water quality and endangered/threatened species as well as protected land. The characterization of impacts is primarily related to the amount of acres impacted by a project corridor. As the number of acres impacted increases the severity index increases from no impact to major impacts. Specific features in this category include:

- Hydrological
- Wetlands
- Floodplains/riparian buffers
- Endangered/Threatened species
- Federally, State and privately protected land
- Greenbelt projects

The following methodology was employed to rate project impacts in this category. Hydrologic features were buffered using a 100 ft radius distance. Radius distances were assigned based on South Carolina riparian forest buffer widths recommendations, along with other recommendations made by other states and local governments. All features were spatially overlaid in a GIS software package and compiled into one feature, which was later used in the analysis. All values were summed to obtain the final number of features that may be possibly impacted. The combined feature was later clipped to the road alignment to obtain the impacted area. The environmental, cultural, and constructability characteristics of road alignment, or other transportation improvement projects were evaluated based on acres directly impacted by the proposed project. The following equation was used to calculate impact:

$$I_{mpact} = \left(\frac{\sum_{impact} Acres}{\sum_{\Pr oject} Acres} \right) \times (Weight)$$

Cultural and Community Resources

This category indicates the presence of community services, cultural resources, and institutions including schools, hospitals, religious buildings, parks, and historic resources, and archeological sites. The impacts to these types of community resources are often that of proximity or when right-of-way is required from these sites. In the most extreme cases buildings may be directly impacted. These criteria were assessed with the same methodology described in the Environmental/Natural Features section immediately preceding this section.

Environmental Justice

Environmental justice reviews conducted at the systems planning level typically involve the analysis of available demographic data from the US Census Bureau. When reviewing the LRTP, it is important to consider not only specific project impacts but also the distribution of projects and transportation investments throughout the study area. The plan seeks to minimize disproportionate impacts to minority and Low-to-Moderate income (LMI) groups through proactive planning. As previously mentioned, the CHATS transportation planning process sought to minimize impacts to these groups by involving them in the planning process and avoiding or minimizing disproportionate impacts during the project selection.

The following guidelines were used to rate project impacts in this category. Spatial and demographic data from the 2000 Census were used to conduct the environmental justice analysis. Both minority and LMI variables were analyzed at the block group level. Minority populations were defined as the non-white population (i.e. Blacks, Hispanics, Asian Americans, American Indian, and Alaskan natives). LMI is defined as a household in which the total household income does not exceed fifty percent (low income) and eighty percent (moderate income) of the median income for the area, as adjusted for household size by the US Department of Housing and Urban Development (HUD). LMI data were used for the environmental justice analysis to be consistent with other federal agencies such as EPA, HUD, and USDOT.

Minority and LMI were evaluated based on the number of persons directly impacted verses the total number of people impacted by the transportation project using Census blockgroups as the spatial extent. These social features were evaluated in the same manner described in the Environmental/Natural Features section, except that number of acres impacted is replaced with number of persons impacted. It should be noted that impacts should not always be assumed to be a negative attribute. For example, neighborhood with a high percentage of LMI residents can realize mobility benefits from a proposed transportation project. In this manner, the total impact values necessary for the evaluation criteria were established. These values were used to determine the areas that are more or less suitable for transportation projects.

Mobility and Implementation

As projects are considered it is important to understand the relative benefits as well as the difficulties that may be encountered during implementation. For this reason, the relative mobility benefits and constructability difficulties have been included in this evaluation. This is one of the first steps in understanding the expected ratio between costs and benefits. This evaluation is a quantitative assessment of specific benefits and project costs, providing this information empowers planners to select projects for inclusion in the plan that have a realistic chance of being implemented. This information is also used to group projects into respective horizon years and to develop a financially-constrained project list.

CONSTRUCTABILITY

For the purposes of this evaluation project constructability was considered to ascertain the difficulties associated with project permitting, costs, and even traffic control. Projects with challenging constructability issues may be more costly due to impacts on design and delays associated with maintaining traffic flow during construction. Moreover, a project that is difficult to bring to construction may squander public resources not provide the congestion relief it was intended to offer. An example of a project with minor constructability issues would be a bus rapid transit (BRT) route on an existing roadway. Conversely, an example of a major constructability challenge could be a bridge replacement project where sensitive environmental features of the built and natural environment are present and where limited crossing alternatives exist. In this example, an atypical bridge design may be necessary and creative solutions to maintain traffic flow would likely extend the duration of construction having an impact on project cost. This criterion is quantified by scoring projects in an inverse relationship to the number of permits needed to implement the project (Army Corps, Coast Guard, Air Quality determination, permission from railroad operators, publicly owned facilities (publicly owned parks, recreational areas, wildlife and

waterfowl refuges), or SC DHEC), availability of ROW, and intensity of utilities present. The following guidelines were used to rate project impacts in this screening process:

FINANCIAL VIABILITY

This criterion measures the ability to fund the construction of project and maintain the facility for the functional life span of infrastructure. Included in this category is to include life cycle maintenance / operating cost and pavement quality. Cost will be generalized by facility type or vehicles in operation for the functional life span of infrastructure. Pavement quality will be considered in the assessment by the project's impact positive or negative impact on pavement management.

LIVABILITY INDEX

There are a number of elements that comprise this measure. Livability is being defined by these components and this Plan seeks to implement transportation projects that support these objectives. The index consists of public safety, economic development, consistency with land use plans, and consistency with livability principles. Public safety scoring was scored on the project's implementation of a strategy, a named project in SCDOT Highway Safety Plan, or appears on the SCDOT prioritized safety list. Economic development is comprised of a locally provided ranking and a score calculated South Carolina Department of Commerce. Projects that advance the six principles of livability as promulgated by the Federal government and are consistent with an adopted comprehensive land use plan will be assigned a full score for these criteria.

TRAVEL DEMAND BENEFITS

The assessment of mobility benefits is the primary objective in evaluating candidate projects throughout this process. While all of the previous evaluation criteria relate to a project's potential impacts and compatibility with land use plans and livability principals, this category seeks to quantify the relative travel benefits associated with implementing the project. This measure seeks to enumerate the relative travel benefits associated with implementing the project. Travel demand benefit is quantified by the level of daily congestion relief obtained in the current and the horizon year, each comprising 10% of the ranking. The remaining 10% of the travel demand benefit score is comprised of a measure of travel time improvement (system delay). The Candidate Project Evaluation Matrix presents the results of this ranking process. The following table summarizes the CHATS LRTP ranking criteria.

CHATS LRTP Project Ranking Criteria	Rank
Travel Demand Benefits	**40%**
Current Year V/C	15%
Future Year V/C	15%
Freight Mobility	10%
Constructability	**15%**
Environmental Justice	5
Cultural/Facilities Features	5
Environmental Features	5
Financial Viability	**15%**
Ability to Fund Capital Cost in 6-Year TIP	10
Pavement Quality Index	5
Livability Index	**30%**
Public Safety	10
Evacuation Routes	5
Economic Development	10
Consistency with Land Use Plans	Yes/No
Consistency with Livability Principles	5
Consideration of Modal Options	High/Med/Low
Total	**100%**

Environmental Screening as a Planning Tool

The collection and consideration of environmental data during the development of the LRTP serves as a tool to ensure that the plan respects the natural and man-made environment. When considered with best practices, these data resulted in selecting transportation projects and alignments that minimized impacts. Therefore, this analysis was used not only to eliminate any candidate projects with "fatal" flaws, but also to improve those projects that provide true benefits to the transportation network. The information obtained from this planning process identifies projects with the greatest return on public investment and those project that match the vision and goals of the community. Finally, this screening process allows early identification of likely impacts and areas of uncertainty that will need to be investigated more fully as a particular project moves forward through more

detailed planning and design. The remainder of the chapter is devoted to the communication of known environmental features considered during the LRTP planning process (Figures 10.1-10.5 and the Candidate Project Evaluation Matrix (Table 10.1).

Candidate Transportation Project Total Benefit and Impact Rankings

A ranking process was conducted for the purpose of identifying those projects to be considered in the financially constrained plan. Using the environmental, cultural, environmental justice, project constructability impacts, and the travel demand benefits information, a ranking process was developed based on weighted values identified by the CHATS Study Team members. The transportation project ranking process was based on the following steps.

Step 1: Community Vision and Goals were collected and summarized in to priorities. The CHATS Study Team identified weighted values for the evaluation criteria.

Step 2: Collaborated with partner agencies to assign scores to for each criteria - Constructability, Financial Viability, and the Livability Index. (Total potential points 70).

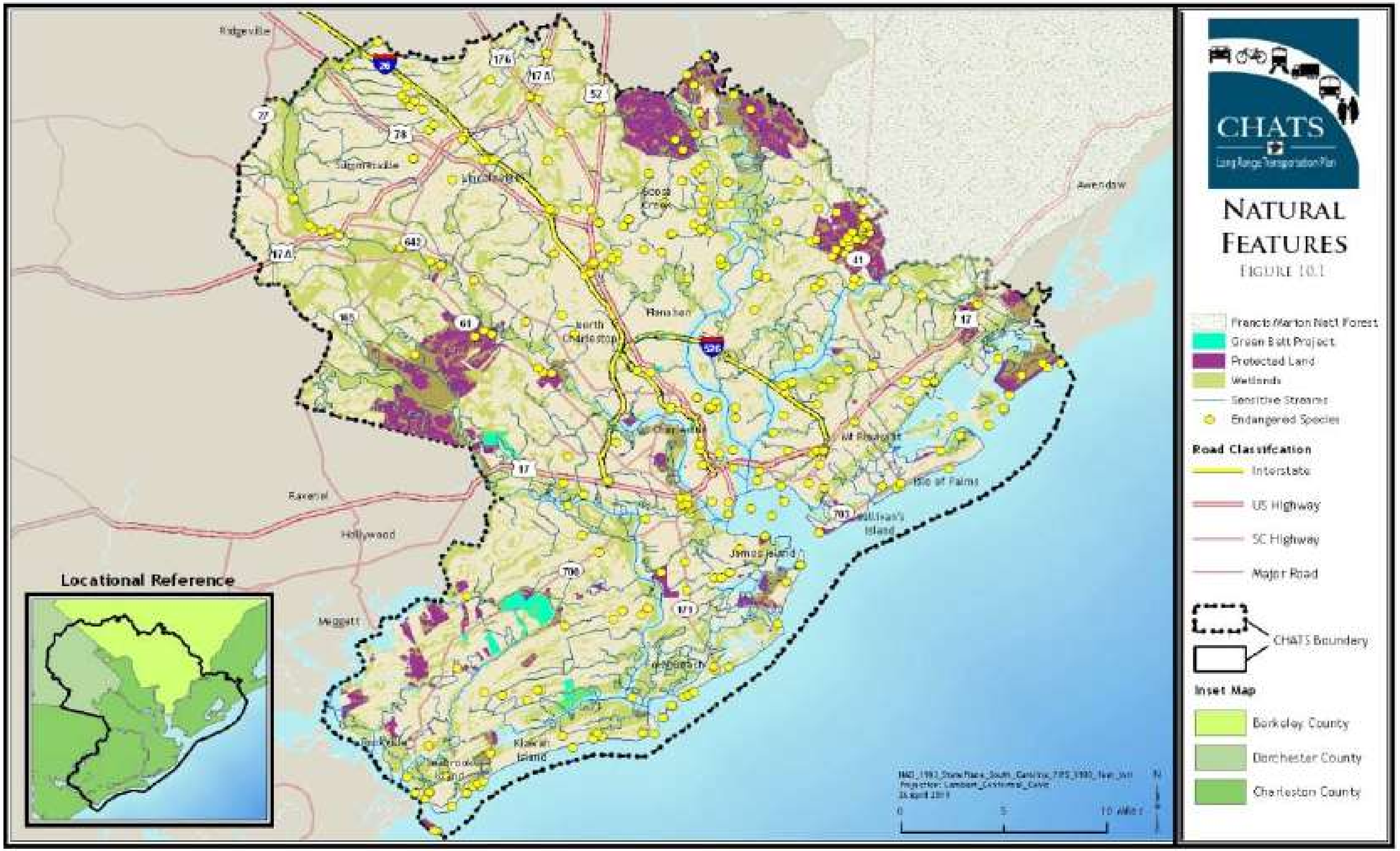
Step 3: Tested each candidate project in the Travel Demand Forecasting Model benefits based on the following criteria:

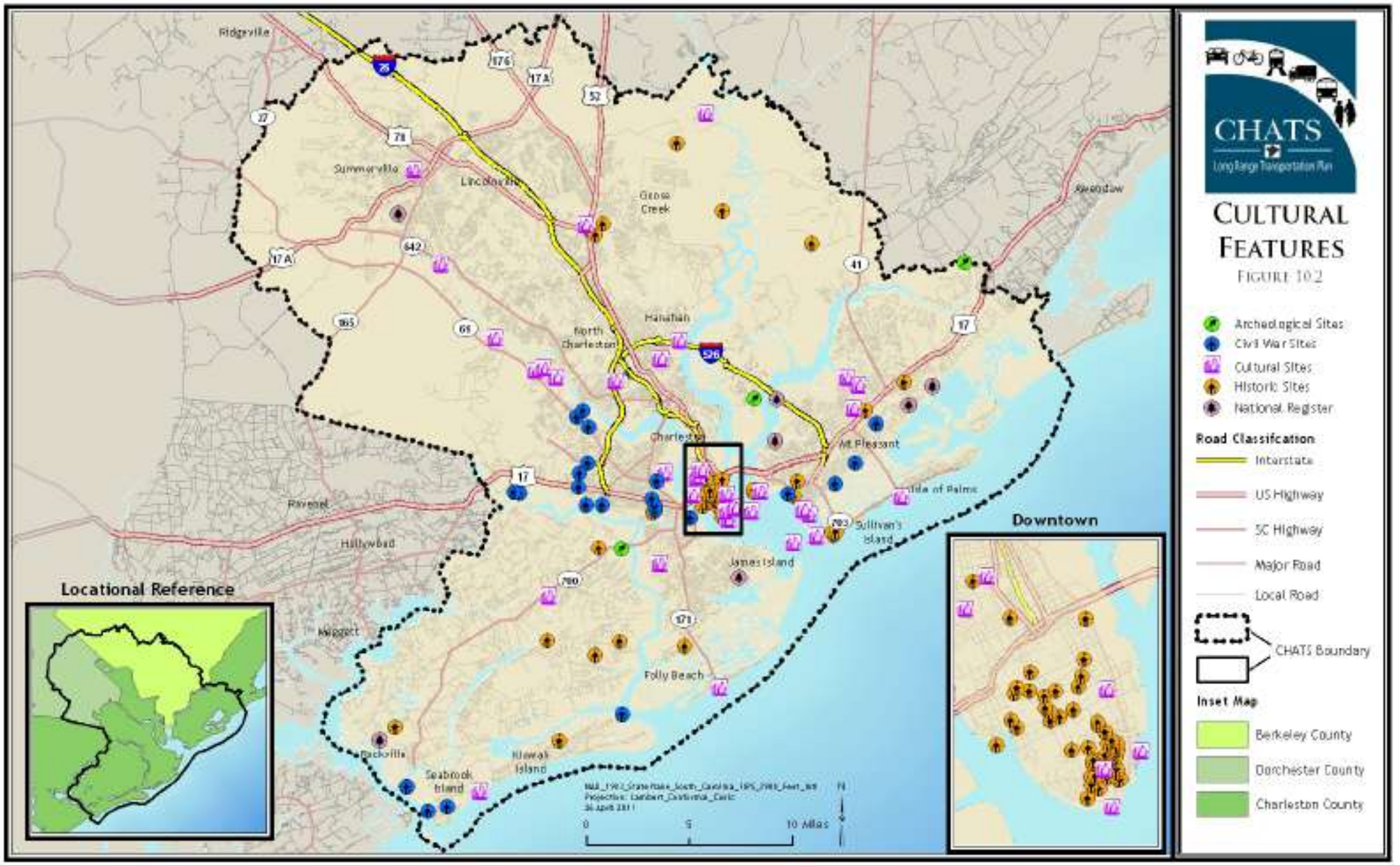
Relief of Existing Congestion (based on 2008 volume-to-capacity ratio (V/C)
Relief of Future Congestion (based on 2035 V/C)
Total 2035 Travel Delay (Vehicle Travel Speed)

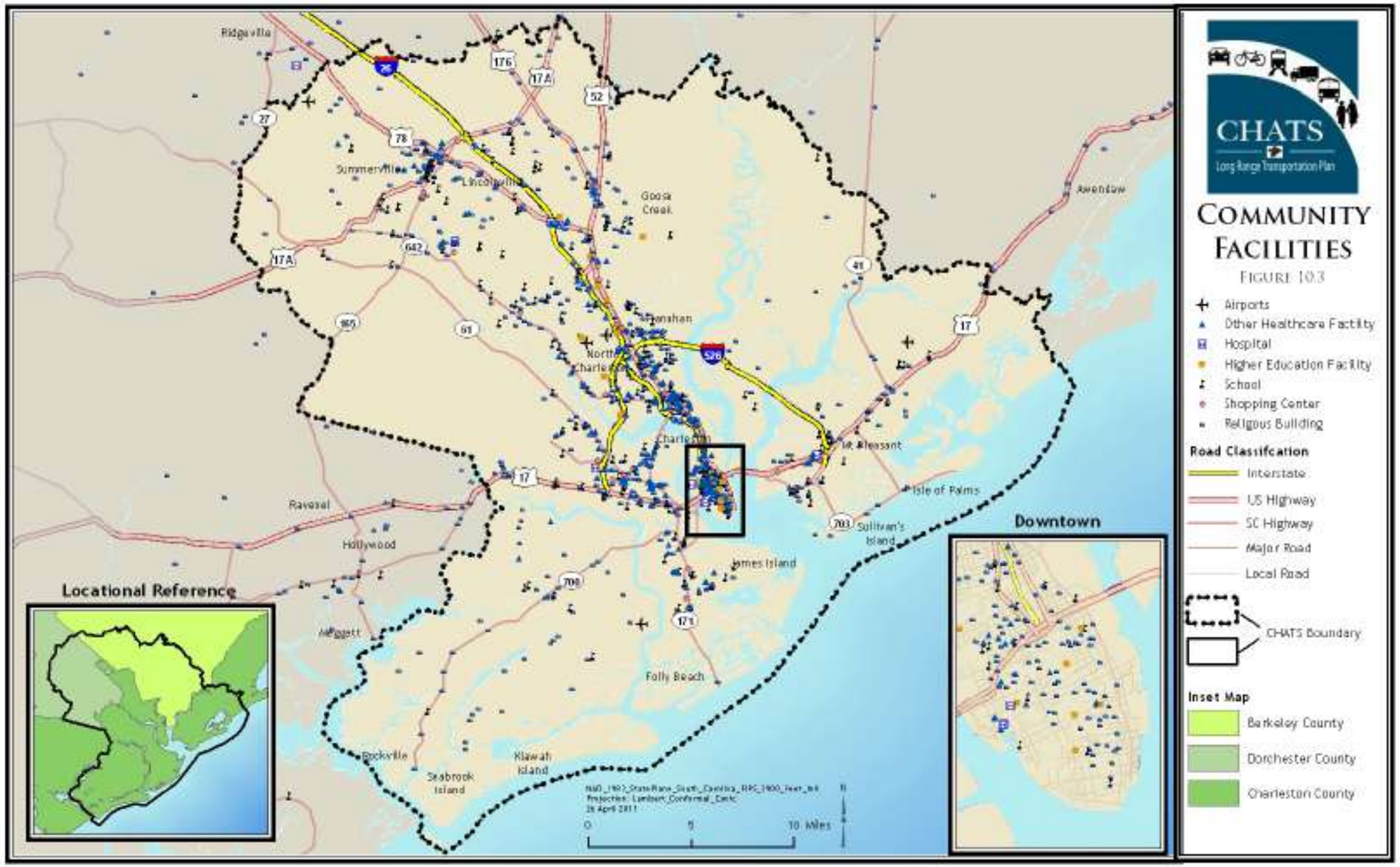
The results of this analysis are shown in Table 10.1 – Candidate Project Total Benefit and Impact Matrix. As presented in the table, a mix of small and large scale projects rose to the top of the rankings. In fact, the top ten ranked projects include:

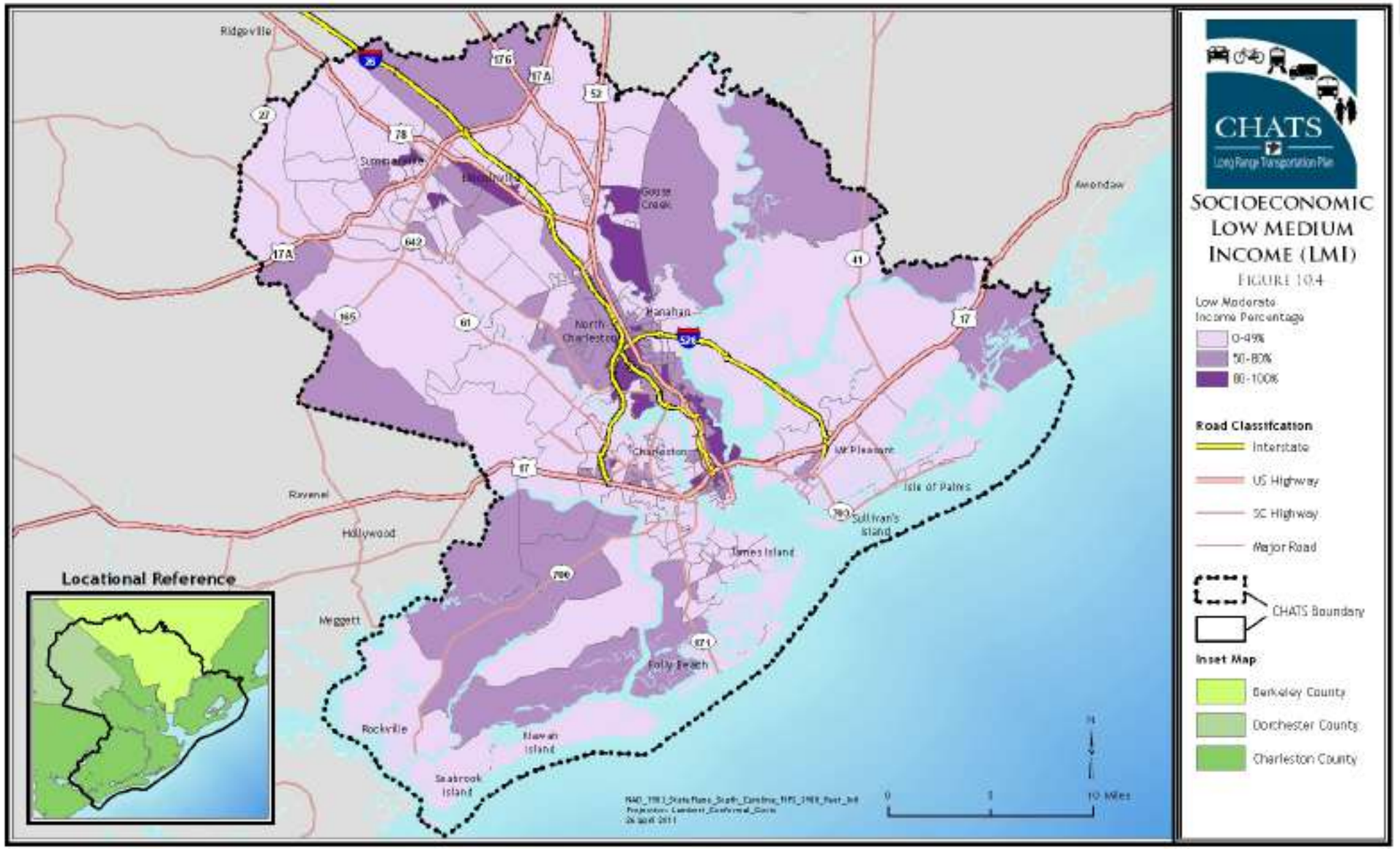
1. US 17 Alternative (North Main Street) (ID # 66)
2. I-526 & I-26 Interchange (ID #21)
3. ITS- Region-wide Signal Systems (ID # 23)
4. US Hwy 52 / US Hwy 176 Intersection Improvements (ID # 44)
5. SC Hwy 41 (ID # 39)
6. Ashley Phosphate Road (ID # 49)
7. Jedburg Road (ID # 24)
8. Savannah Highway (ID # 64)
9. Aviation Connector to Ashley Phosphate (ID # 1)
10. Sheep Island Parkway, Sheep Island Interchange at I-26, I-26 widening, and I-26 Frontage Roads (ID # 42)

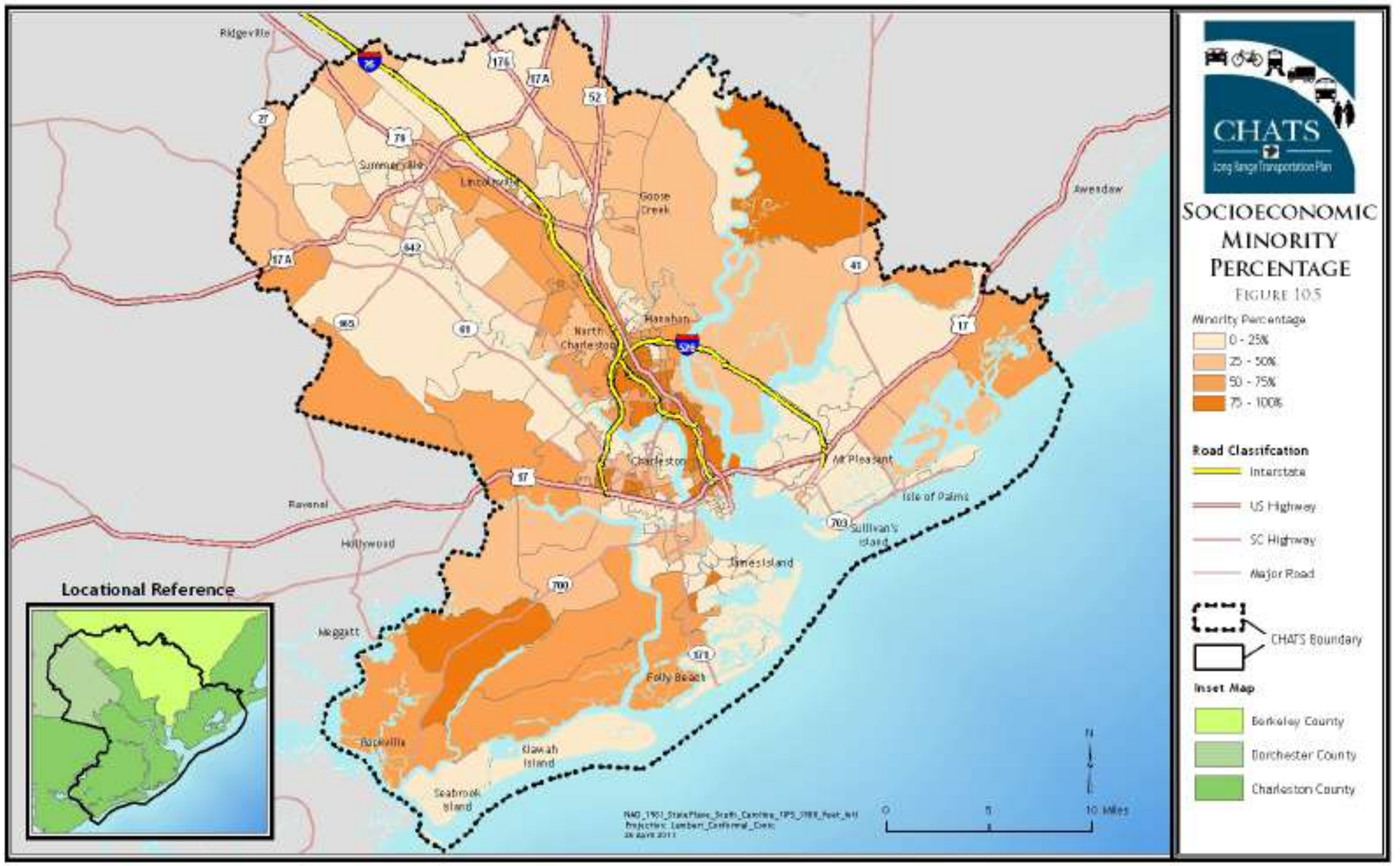
Some large-scale projects like the Mark Clark Expressway and interchange improvements at I-26 and I-526, and I-26 capacity improvements provided significant benefits in traffic demand and congestion relief fell short in the overall project rankings due to their significant environmental and constructability impacts. Others, like ITS Signal Systems, Clements Ferry Road, and Micheaux Parkway improvements provided immediate benefits to relieving existing congestion while having a moderate impact on the environment and cultural issues.


NATURAL FEATURES
FIGURE 10.1
Francis Marion Natl Forest
Green Belt Project
Protected Land
Wetlands
Sensitive Streams
Endangered Species
Road Classification
Interstate
US Highway
SC Highway
Major Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Ridgeville
Summerville
Goose Creek
Hanahan
North Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Kiawah Island
Ravenel
Hollywood
Meggett
Awendaw
0
5
10 Miles


CHATS
Long Range Transportation Plan
CULTURAL FEATURES
FIGURE 10.2
Archeological Sites
Civil War Sites
Cultural Sites
Historic Sites
National Register
Road Classification
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Downtown
Ridgeville
Summerville
Lincolnville
Goose Creek
Hanahan
North Charleston
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Rockville
Seabrook Island
Kiawah Island
Folly Beach
Awendaw
0 5 10 Miles


CHATS
Long Range Transportation Plan
COMMUNITY FACILITIES
FIGURE 10.3
Airports
Other Healthcare Facility
Hospital
Higher Education Facility
School
Shopping Center
Religious Building
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
Locational Reference
Downtown
Ridgeville
Summerville
Lincolnville
Goose Creek
Ashley Phosphate
Awendaw
North Charleston
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Meggett
Folly Beach
Rockville
Seabrook Island
Kiawah Island
0 5 10 Miles


Ridgeville
Summerville
Ladson
Goose Creek
Hanahan
North Charleston
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Meggett
Folly Beach
Rockville
Kiawah Island
Seabrook Island
Awendaw
Locational Reference
SOCIOECONOMIC LOW MEDIUM INCOME (LMI)
FIGURE 10.4
Low Moderate Income Percentage
0-49%
50-80%
80-100%
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County
0
5
10 Miles


Ridgeville
Summerville
Lincolnville
Goose Creek
Awendaw
North Charleston
Hanahan
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Meggett
Folly Beach
Rockville
Kiawah Island
Seabrook Island
Locational Reference
0
5
10 Miles
N
SOCIOECONOMIC MINORITY PERCENTAGE
FIGURE 10.5
Minority Percentage
0 - 25%
25 - 50%
50 - 75%
75 - 100%
Road Classification
Interstate
US Highway
SC Highway
Major Road
CHATS Boundary
Inset Map
Berkeley County
Dorchester County
Charleston County

CHATS LRTP Candidate Project Cost-Benefit Matrix

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
			Constructability	Environmental / Natural Features	Environmental Justice	Cultural Facilities	Relief of Existing Congestion	Relief of Future Congestion	Freight Mobility	Life Cycle Maintenance / Operating Cost	Pavement Quality Index	Public Safety	Evacuation Route	Economic Development	Consistency w/ Land Use Plan	Consistency w/ Livability Principals	Consideration of Modal Options			
1	Aviation Connector to Ashley Phosphate	S. Aviation Ave. to Ashley Phosphate Rd (S-10-75)	2.83	1.6	2.5	4.7	12.0	9	4.0	10	4	4	3	5.00	Yes	0.83	Low	25.0	37.63	62.63
2	Bacon's Bridge Extension/Delmar Highway (SC 165)	SC 61 to Ashley Ridge High School (Approximately 2.3 Miles)	4.02	2.23	5	4.67	0.0	1	1.0	10	3.28	2	3	0.50	Yes	0.83	Low	2.0	35.17	37.17
3	Berlin Myers - North Extension (SC 165)	Maple St. (S 18-131) to Berlin Myers Pkwy (SC 165)	3.45	2.8	3.32	4.33	5.0	2	3.0	10	4	3	0	0.50	Yes	0.83	Low	10.0	32.12	42.12
4	Bus Rapid Transit	Extend BRT to New Wal-Mart Center past SC 41 to MUSC	5.00	5	5	5	5.0	1	1.0	10	2.5	6	5	1.75	Yes	5.00	High	7.0	50.25	57.25
5	Bus Rapid Transit	Folly Rd. (SC 171) to Downtown Charleston	4.79	5	5	5	5.0	1	1.0	10	2.5	4	5	1.00	Yes	5.00	High	7.0	46.67	53.67
6	Bus Rapid Transit	Goose Creek area to Downtown Charleston	4.79	5	5	5	6.0	1	1.0	10	2.5	5	5	1.50	Yes	5.00	High	8.0	48.17	56.17
7	Bus Rapid Transit	Powerline Easement to planned Intermodal Center	3.44	2.28	3.16	5	8.0	1	1.0	4	4	5	3	4.00	Yes	4.17	High	10.0	37.44	47.44

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
8	Bus Rapid Transit	Rivers Ave (US 52) from Otranto (S 10-542) to Downtown	4.21	5	1.83	5	6.0	2	2.0	10	2.5	5	5	3.00	Yes	5.00	High	10.0	47.33	57.33
9	Clements Ferry Road - Phase II (S-8-33)	Jack Primus Rd. (S-8-119) to SC 41	3.85	1.64	5	5	2.0	3	3.0	10	3.39	2	3	3.00	Yes	1.67	Low	8.0	37.95	45.95
10	Coleman Boulevard/Ben Sawyer Boulevard (SC 703)	Main Street Streetscaping from Magrath Darby Rd (S 10-703)/Patriots Point Road to Ben Sawyer Bridge	5.00	5	5	5	1.0	1	0.0	10	3	4	0	0.00	Yes	3.33	High	2.0	40.33	42.33
11	Commuter Rail	Goose Creek area to Downtown Charleston	4.79	5	5	5	5.0	2	2.0	0	5	6	5	2.50	Yes	5.00	High	9.0	42.67	51.67
12	Commuter Rail	Summerville to Downtown Charleston	4.79	5	5	5	5.0	3	3.0	2	5	8	5	2.50	Yes	5.00	High	11.0	46.67	57.67
13	Dorchester Road (SC 642)	Trolley Rd (S-18-199) to Ashley Phosphate (S-10-75)	2.84	3.01	0.03	5	3.0	7	4.0	8	3.61	3	3	3.50	Yes	1.67	High	14.0	33.65	47.65
14	Dorchester Rd. Connector (Local Road)	Micheaux Pkwy (Local Road) to W. Montague Ave. (S 10-162)	2.71	2.5	2.5	5	3.0	6	5.0	8	4	4	3	3.50	No	0.83	Med	14.0	33.67	47.67
15	Expand SHEP service area	I-26 to Exit 199 (US 17 A)	5.00	5	5	5	1.0	1	0.5	10	2.5	8	3	1.00	Yes	0.00	Low	2.5	44.00	46.50
16	Future Dr. Interchange (Local Road)	Future Dr. (Local Road) & I-26	3.23	2.5	2.5	5	4.0	4	4.0	8	4	4	0	3.75	Partial	0.00	Low	12.0	32.67	44.67
17	Glenn McConnell Extension Phase II (SC 61)	US 17A to Old Beech Hill Rd. (S-18-162) at Wright Road	4.26	2.89	4.97	5	1.0	0	0.0	10	4	2	5	1.00	No	0.00	Med	1.0	39.03	40.03
18	Glenn McConnell Extension-Phase I (SC 61)	Bees Ferry Rd. (S-10-57) to US 17A	2.84	0	3.02	5	5.0	5	5.0	10	4	2	5	1.00	Yes	0.00	Med	15.0	33.35	48.35
19	Hungry Neck Blvd (Phase IV) (Local Road)	Six Mile Rd. (S 10-921)to Porchers Bluff Rd.(S 10-51)	3.96	2.51	5	5	4.0	1	1.0	10	4	2	3	0.50	Yes	2.50	Med	6.0	37.34	43.34

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
20	I-26 Widening	Port Access Rd to I-526	2.96	3.15	0.34	5	6.0	4	3.0	6	1.7	8	5	5.00	No	1.67	High	13.0	39.19	52.19
21	I-526 & I-26 Interchange	Interchange Improvement	5.00	5	5	5	15.0	2	1.0	10	2.97	6	5	5.00	Yes	0.83	Med	18.0	49.80	67.80
22	I-526 Interchange Improvements (Exit 16)	International Blvd at I-526	3.07	3.11	0	5	3.0	5	4.0	6	3.74	3	3	5.00	Partial	0.83	Med	12.0	33.35	45.35
23	ITS-Signal Systems	Region wide	5.00	5	5	5	5.0	1	6.0	10	2.5	6	5	4.00	Yes	5.00	Low	12.0	52.50	64.50
24	Jedburg Rd. (S 18-58 and Local Road)	US 78 to Wildgame Rd. (S 8-203)	3.75	2.92	2.92	5	8.0	9	9.0	10	2.71	2	3	4.25	Yes	0.83	Med	26.0	37.30	63.30
25	Light Rail Transit Service	Rivers Ave. (US 52) in Neck Area	3.13	5	2	3	5.0	3	3.0	0	5	5	5	1.00	Partial	4.17	High	11.0	32.67	43.67
26	Light Rail Transit Service	US 17 from Mt. Pleasant to West Ashley	2.75	5	3	3	5.0	2	2.0	0	5	6	4	1.00	Partial	4.17	High	9.0	31.17	40.17
27	Light Rail Transit Service	City of Charleston to Town of Summerville	2.82	2.85	1.78	5	5.0	5	5.0	0	5	6	4	1.25	Partial	4.17	High	15.0	31.71	46.71
28	Light Rail Transit Service	CCAA Airport to Downtown Charleston	3.12	2.9	1.23	5	5.0	2	2.0	0	5	5	4	1.50	Partial	4.17	High	9.0	32.13	41.13

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
29	Lincolnville Rd. /Lincoln Ave. (S-8-881 N)	Streetscaping from Berlin Myers Pkwy (SC 165) to Ladson Rd.(S-10-76)	5.00	5	5	5	0.0	1	0.0	10	4	1	3	0.00	Yes	3.33	Med	1.0	40.83	41.83
30	Roadway System Long Point Rd. (S 10-197) Ext. Primus Dr. (Local Road) Extension Gregorie Ferry Connector Basketmakers Blvd. Jennie Moore School Rd. Charleston Co. School Rd. Johnie E. Brown Rd. *This system of projects has the potential to be implemented through multiple individual improvements	Long Point Rd. (S-10-197) to Lexington Dr. (Local Road) Six Mile Rd. (S-10-921) to Hamlin Rd.(S -10-504) US 17 to SC 41 Long Point Rd. Ext. (S-10-197) to Rifle Range Rd.(S-10-51) Hamlin Rd.(S-10-504) to Porchers Bluff Rd(S -10-51) Jennie Moore School Rd. to Rifle Range Rd. (S-10-51) US 17 to Primus Dr. Extension	3.84	2.04	5	5	4.0	2	1.0	10	4	3	1	0.50	Yes	3.33	Med	7.0	37.21	44.21
31	Long Point Re-Alignment (S-10-97)	Intersection of Long Point Rd.(S-10-97) & US Hwy. 17	3.95	1.65	5	5	4.0	4	3.0	10	3.87	10	0	0.50	Yes	0.83	Low	11.0	41.02	52.02
32	Mark Clark Expressway Extension (I-526)	US 17 to SC 30 Island Connector	2.61	1.65	2.95	5	8.0	15	8.0	4	4	2	5	1.00	Yes	1.67	Low	31.0	28.10	59.10
33	Miles Jamison (S-18-377)	Trolley Rd (S-18-199) to Ladson Rd (S-10-76)	3.95	3.16	3.49	5	2.5	3	3.0	10	3.17	6	0	2.50	Yes	0.83	Low	8.5	38.32	46.82

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
34	Mt. Pleasant Bypass	US 17 North to Clements Ferry Rd.(S-8-33) on new alignment	2.27	0.87	1.53	5	2.0	1	0.0	6	4	2	3	1.25	No	0.00	Med	3.0	24.82	27.82
35	Old Mount Holly (S-8-45)	St. James Ave (US 176) to US 52	3.85	1.24	5	5	2.5	1	1.0	10	3	4	3	0.50	Yes	1.67	Med	4.5	37.07	41.57
36	Old Orangeburg Road (S-18-22)	Dorchester Rd (SC 642) to Mallard Rd (S-18-58)	3.95	3	4.88	5	2.0	3	3.0	8	2.12	5	3	1.00	Yes	0.83	Low	8.0	35.25	43.25
37	Red Bank Road (S-8-29)	N. Rhett Ave. (S-8-136) to Bushy Park Rd.(S-*-503)	3.49	3.09	2.54	5	1.0	4	5.0	10	3.69	6	4	3.00	Yes	2.50	Med	10.0	43.15	53.15
38	S. Aviation Ave. (Local Road)	E. Spartan Blvd. (Local Road) to International Blvd. (Local Road)	1.90	0.37	1.38	5	6.0	12	8.0	10	2.5	2	3	5.00	Yes	1.67	Med	26.0	31.25	57.25
39	SC 41	US 17 to Joe Rouse (S-10-2057)	4.10	2.65	5	5	13.0	5	6.0	10	3.53	4	5	0.50	Yes	0.83	Med	24.0	40.26	64.26
40	SC 41	Dunes West Pkwy to Wando River /County Line	4.06	2.89	5	5	0.0	4	5.0	10	3.41	4	5	0.50	Yes	0.83	Low	9.0	39.97	48.97
41	Sea Island Parkway	Maybank Rd (SC 700) to Betsy Kerrison Blvd.(S-10-20)	2.99	1.94	2.5	5	1.0	9	4.0	2	4	6	5	0.50	Yes	0.00	Med	14.0	29.44	43.44
42	Sheep Island Parkway, I-26 Widening, I-26 Frontage Rds., & Sheep Island Rd. (S-8-275) Interchange @ I-26	N. Maple St. (S-8-131)to US 176, Sheep Island Rd.(S-8-275) to Jedburg Rd.(S-8-58 and Local Road)	3.43	2.28	2.7	5	1.5	15	10.0	4	4	5	3	5.00	Yes	1.67	Low	26.5	35.90	62.40
43	Transit Service	Local Service in CHATS Area, Bus Service from Daniel Island to to Bowman Rd. K-mart Transfer Point	5.00	5	5	5	0.0	1	0.0	10	2.5	6	0	1.00	Yes	5.00	High	1.0	44.50	45.50

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
44	US 52 & US 176 Intersection	Intersection Improvement	4.48	5	5	5	7.5	4	3.0	8	3.048	10	5	3.50	No	2.50	Med	14.5	49.96	64.46
45	Waterborne Transit Service	Daniel Island to Downtown Charleston	4.69	5	5	5	1.0	0	0.0	10	5	4	0	0.50	Yes	5.00	High	1.0	43.25	44.25
46	Waterborne Transit Service	Fort Johnson to Downtown Charleston	4.48	5	5	5	0.0	0	0.0	10	5	4	0	0.50	Yes	5.00	High	0.0	42.42	42.42
47	Waterborne Transit Service	North Charleston to Downtown Charleston	4.69	5	5	5	2.0	0	0.0	10	5	4	0	0.75	Yes	5.00	High	2.0	43.50	45.50
48	Waterborne Transit Service	Patriots Point to Downtown Charleston	4.69	5	5	5	1.0	0	0.0	10	5	4	0	0.50	Yes	5.00	High	1.0	43.25	44.25
49	Ashley Phosphate Road (S-10-75)	Cross County Road (S-10-2028) to Northwoods Blvd. (Local Rd) - capacity improvement	2.72	3.16	1.36	4.7	15.0	12	3.0	10	3.76	3	2	3.75	Yes	0.83	High	30.0	34.23	64.23
50	Ashley River Road (SC 61)	Old Parsonage (S-10-729) to Raoul Wallenberg (S-10-1372) - capacity improvement	3.54	2.79	5	4.7	9.0	2	2.0	10	3.22	2	5	0.00	No	0.83	High	13.0	35.21	48.21
51	College Park Road (S-8-62)	I-26 to Crowfield Blvd (S-8-1093) - capacity improvement	3.89	2.54	5	4.7	2.5	3	3.0	10	3.74	8	1	0.50	No	0.83	Med	8.5	39.65	48.15
52	Cross County Road (S-10-2028)	Ashley Phosphate Rd. (S-10-75)to Hill Park Rd. (Local Rd) - capacity improvement	3.44	3.24	2.5	4.7	10.0	4	4.0	10	3.1	0	2	4.00	No	0.83	Med	18.0	33.71	51.71
53	Deerwood Road (S-10-544 and S-10-1226)	Otranto Rd. (S-10-542) to US 78 (University Ave) - capacity improvement	3.85	3.18	5	4.7	7.0	9	8.0	10	2.72	0	1	0.00	No	0.83	Med	24.0	29.93	53.93
54	Folly Rd. (SC 171)	Sol Legare Rd (S-10-632) to Little Oak - capacity	3.27	2.33	3.53	4.7	2.5	5	5.0	10	2.614	1	5	0.25	No	0.83	Med	12.5	32.76	45.26

		improvement																		
ID	**FACILITY**	**DESCRIPTION**	**CONSTRUCTABILITY & IMPLEMENTATION**				**TRAVEL DEMAND BENEFITS**			**FINANCIAL VIABILITY**		**LIVABILITY INDEX**							**Travel Demand Benefit Rankings (0-30)**	**Project Impact Rankings (0-70)**	**Total Rankings (0-100)**
55	Folly Road (SC 171)	Windemere Rd (S-10-399) to Maybank Hwy (SC 700) - capacity improvement	3.64	3.1	5	3.96	7.5	5	5.0	10	3.039	1	5	0.25	No	0.83	Med	17.5	34.68	52.18
56	Folly Road (SC 171)	James Island Connector (SC 30) to Patterson Ave (S-10-752) - capacity improvement	3.93	2.69	5	4.7	12.0	5	5.0	10	2.568	3	5	0.25	Partial	0.83	Med	22.0	37.37	59.37
57	International Blvd (SC 10-1411)	Micheaux Pkwy (Local Road)to I-526 - capacity improvement	2.75	2.95	0	4.7	2.5	7	7.0	10	2.163	2	1	5.00	No	3.33	High	16.5	34.48	50.98
58	Long Point Road (S-10-197)	Whipple Rd (S-10-72)to Johnny Dodds Blvd(US 17) - capacity improvement	2.38	0.75	4	1.43	12.0	6	6.0	10	3.79	3	1	0.25	No	0.83	Low	24.0	28.39	52.39
59	Main Road (S -10-20)	Savannah Hwy (US 17) to River Road (S-10-54) - capacity improvement	3.19	2.67	2.5	4.66	12.0	7	6.0	10	2.88	3	5	0.25	Yes	0.83	Low	25.0	34.71	59.71
60	Micheaux Parkway (Local Road)	Dorchester Rd (SC 642) to International Blvd (Local Road)- capacity improvement	2.61	3.23	0	4.7	14.0	7	7.0	10	2.5	3	0	5.00	Yes	1.67	High	28.0	32.60	60.60
61	Montague Ave (S-10-62)	International Blvd (Local Road) to I-26 - capacity improvement	2.61	3.24	0	4.7	8.0	5	5.0	10	3.45	3	1	1.50	No	1.67	Med	18.0	31.06	49.06
62	Northside Dr. (S-10-2274)	Ingleside Plantation Rd. (Local Road) to Ashley Phosphate Rd. (S-10-75) - capacity improvement	2.78	3.09	0	4.7	1.0	6	6.0	10	3.45	1	1	2.75	Yes	0.83	Low	13.0	30.16	43.16
63	Otranto Road (S-10-542)	Deerwood Rd.(S-10-544) to Rivers Ave. (US 52)- capacity improvement	3.86	3.24	5	4.7	9.0	6	5.0	10	3.27	0	2	0.00	No	1.67	Med	20.0	32.38	52.38

ID	FACILITY	DESCRIPTION	CONSTRUCTABILITY & IMPLEMENTATION				TRAVEL DEMAND BENEFITS			FINANCIAL VIABILITY		LIVABILITY INDEX						Travel Demand Benefit Rankings (0-30)	Project Impact Rankings (0-70)	Total Rankings (0-100)
64	Savannah Highway (US 17)	Orleans Rd. (S-10-1373) to Wesley Dr. (SC 171)- capacity improvement	3.52	3.16	3.71	4.7	8.0	12	6.0	10	2.291	3	5	1.25	No	1.67	Med	26.0	37.28	63.28
65	St. Andrews Blvd (SC 171 and SC 61)	Ashley River Road (SC 61) to Wesley Dr. (SC 171) - capacity improvement	3.60	3.24	3.94	4.7	15.0	7	5.0	10	1.57	1	5	0.50	No	1.67	Med	27.0	34.12	61.12
66	US 17 Alternate (North Main St)	Berlin Myers Parkway (SC 165) to Interstate 26 - capacity improvement	3.37	3.24	3.87	4.7	15.0	9	4.0	10	3.22	10	3	1.25	No	1.67	Med	28.0	42.11	70.11
67	US 17A	SR 61 to SR 642 - capacity improvement	3.55	2.9	4.22	4.58	1.0	6	5.0	10	2.17	4	5	0.75	No	0.83	Med	12.0	36.95	48.95
68	US 78	Deerwood Rd.(S-10-1226) to Ladson Rd. (S-10-76) - capacity improvement	3.42	2.95	3.54	4.7	2.0	7	6.0	10	3.31	5	5	4.00	Yes	0.83	Med	15.0	41.83	56.83
69	Wildgame Road (S-8-203)	Jedburg Rd (S-18-58 and Local Road) to Sheep Island Rd (S-8-275) - capacity improvement	3.83	3.11	3.76	4.7	0.0	12	9.0	10	2.84	2	0	1.25	No	0.83	Low	21.0	32.24	53.24
70*	Combined Project - Aviation Connector & S. Aviation Ave. (Local Road)	Ashley Phosphate Rd (S-10-75) to International Blvd. (Local Road)	2.02	0.53	1.53	4.96	6.3	11.6	7.8	8	2.70	2	2.5	5.0	Yes	1.6	Med	25.7	30.10	55.81
71	Gregorie Ferry Connector & Frontage Rd (Local Road)	SC Hwy 41 to US Hwy 17	3.63	2.28	4.22	4.70	10.0	4.00	4.00	10	2.53	3.0	3.0	0.50	Yes	0.83	Low	18.0	34.40	52.40

Environmental Mitigation

BACKGROUND

SAFETEA-LU requires that CHATS consult with Federal, State, and Tribal land management, wildlife, and regulatory agencies to develop a general discussion on possible environmental mitigation activities that should be incorporated into transportation projects identified in this plan. Since the transportation planning activities of CHATS are regional in scope, this environmental mitigation discussion does not focus on each individual project within the Long Range Transportation Plan (LRTP) but rather offers a summary of environmentally sensitive areas to be aware of, the analyses conducted by the MPO to identify potential conflicts of planned projects, and mitigation strategies that could be considered in an effort to minimize any negative affect that a project may have on an environmentally sensitive area.

IDENTIFYING SENSITIVE AREAS

There are numerous environmentally sensitive areas found throughout the CHATS planning area. Many areas are too small or too numerous to map at a regional level and can only be clearly identified through a project level analysis. Some areas are yet to be identified and will only become known once a project level analysis is completed, such as caves, sinkholes, and wetlands. When a project is ready to move from the LRTP into the design / engineering phases, the project sponsor should conduct any necessary analysis as required by state and federal regulations to determine the type and location of environmentally sensitive areas within the project study area.

In developing project lists for the LRTP, the MPO conducts top level analysis to determine the potential need for future environmental mitigation. Specifically, CHATS staff looks at proposed project locations throughout the region to determine their proximity to the following natural or socio-cultural resources datasets. That analysis provides early guidance to project sponsors to develop mitigation strategies. Specific features in this category include:

- Hydrological
- Bodies of water
- Floodplains/buffers
- Threatened species
- Parks/US Army Corps of Engineers properties
- Hazardous materials
- Hazardous waste
- Superfund sites
- Schools
- Shopping centers
- Hospitals
- Churches/cemeteries
- Historic resources
- Reinvestment areas

For major construction projects, such as new roadways, or for projects that may have a region-wide environmental impact, a context sensitive solutions process should be considered in which considerable public participation and alternative design solutions are used to lessen the impact of the project. The table below details mitigation activities that could be considered to deal with the primary areas of concern.

ENVIRONMENTAL MITIGATION ACTIVITIES

The CHATS Policy Committee is committed to minimizing and mitigating the negative effects of transportation projects on the natural and built environments in order to preserve the quality of life for our constituents. In doing so, the MPO recognizes that not every project will require the same type and/or level of mitigation. Some projects such as new roadways and roadway widening involve major construction with considerable earth disturbance. Others like intersection improvements, street lighting, and resurfacing projects involve minor construction and minimal, if any earth disturbance. The mitigation efforts used for a project should be dependent upon how severe the impact will be on environmentally sensitive areas. The following three step process should be used to determine the type of mitigation strategy to apply for any given project:

- Identify environmentally sensitive areas throughout the project study area;
- Determine how and to what extent the project will impact these environmentally sensitive areas; and
- Develop appropriate mitigation strategies to lessen the impact these projects have on the environmentally sensitive areas.

To the extent possible, transportation projects should minimize off-site disturbance in sensitive areas and develop strategies to preserve air and water quality, limit tree removal, minimize grading and other earth disturbance, provide erosion and sediment control, and limit noise and vibration. Where feasible, alternative designs or alignments should be developed that would lessen the project's impact on environmentally sensitive areas. The three step mitigation planning process should solicit public input and offer alternative designs or alignments and mitigation strategies for comment by CHATS and its local governments.

The considerations and recommendations made during the planning process are preliminary in nature. Detailed environmental analysis conducted through the National Environmental Policy Act (NEPA) does not apply to long range transportation plans. With exceptions for regional ambient air quality, offsetting environmental impacts during the long-range planning process is not required. While detailed environmental analysis is not required, it is important to consult with environmental resource agencies during the development of a long-range transportation plan. This interagency consultation provides an opportunity to compare transportation plans with environmental resource plans, develop a discussion on potential environmental mitigation activities, areas to provide the mitigation, and activities that may have the greatest potential to restore and maintain the environment.

Detailed environmental analysis of individual transportation projects occurs later in the project development process as the improvement approaches the preliminary engineering stage. At this stage, project features may be narrowed and refined, and the environmental impacts and environmental mitigation strategies can be appropriately ascertained. An environmental review process directs the project-by-project interagency review, study, and identification of environmental concerns. Related requirements that typically apply at this stage involve public hearings, environmental permit-processing, and NEPA studies. Usually, a variety of environmental documentation, permit, and mitigation needs are identified and environmental findings are closely considered and evaluated. Common project environmental mitigation measures (required silt-fence barriers, precautions to control dust, etc.) are managed using Road and Bridge Standards that apply to all construction activities. Special environmental concerns may differ widely by project and location. As environmental studies are conducted and undergo public and interagency review, needed mitigation plans are specified and committed to within the environmental documents on the particular transportation project or activity. Environmental management systems then are used to monitor, and ensure compliance with, the environmental mitigation commitments.

Potential environmental mitigation activities may include: avoiding impacts altogether, minimizing a proposed activity/project size or its involvement, rectifying impacts (restoring temporary impacts), precautionary and/or abatement measures to reduce construction impacts, employing special features or operational management measures to reduce impacts, and/or compensating for environmental impacts by providing suitable, replacement or substitute environmental resources of equivalent or greater value, on or off-site. Where on-site mitigation areas are not reasonable or sufficient, relatively large off-site compensatory natural resource mitigation areas generally may be preferable, if available. These may offer greater mitigation potential with respect to planning, buffer protection, and providing multiple environmental habitat value (example: wetland, plant, and wildlife banks).

Mitigation activities and the mitigation areas will be consistent with legal and regulatory requirements relating to the human and natural environment. These may pertain to neighborhoods and communities, homes and businesses, cultural resources, parks and recreation areas, wetlands and other water sources, forested and other natural areas, agricultural areas, endangered and threatened species, and the ambient air. The following table illustrates some potential mitigation activities and potential mitigation areas for these resources:

Environmental Concern	Applicable Requirement	Potential Mitigation Activities
Wetlands or Water Resources	Clean Water Act at 33 USC 1251-1376; Rivers and Harbors Act at 33 USC 403	Mitigation sequencing requirements involving avoidance, minimization, compensation (could include preservation, creation, restoration, in lieu fees, riparian buffers); design exceptions and variances; environmental compliance monitoring
Forested and other Natural Areas	Agricultural and Forest District Act (Code of VA Sections 15.2-4305; 15.2-4307-4309; 15.2-4313); Open Space Land Act (Section 10.1-1700-1705, 1800-1804)	Avoidance, minimization; Replacement property for open space easements to be of equal fair market value and of equivalent usefulness; design exceptions and variances; environmental compliance monitoring.

Agricultural Areas	Farmland Protection Policy Act of 1981 at 7 USC 4201-4209, Agricultural and Forest District Act (Code of VA Sections 15.2-4305; 15.2-4307-4309; 15.2-4313)	Avoidance, minimization; design exceptions and variances; environmental compliance monitoring

Environmental Concern		Potential Mitigation Activities
Endangered and Threatened Species	Endangered Species Act at 16 USC 1531-1544	Avoidance, minimization; time of year restrictions; construction sequencing; design exceptions and variances; species research; species fact sheets; Memoranda of Agreements for species management; environmental compliance monitoring
Ambient Air Quality	Clean Air Act at 42 USC 7401-7671, and Conformity regulations at 40 CFR 93	Transportation control measures, transportation emission reduction measures; travel demand management; land use and growth management techniques
Neighborhoods, Communities, Homes and Businesses	Property Acquisition Policy Act at 42 USC 4601 et seq.	(appropriate functional and/or aesthetic design features)
Cultural Resources	National Historic Preservation Act at 16 USC 470	Avoidance, minimization; landscaping for historic properties; preservation in place or excavation for archeological sites; Memoranda of Agreement with the SC State Historic Preservation Office (SC SHPO); design exceptions and variances; environmental compliance monitoring
Parks and Recreation Areas	Section 4(f) of the USDOT Act at 49 USC 303	Avoidance, minimization, mitigation; design exceptions and variances; environmental compliance monitoring

FURTHER STRATEGIES

The regional mobility strategies outlined in CMP also focus on reducing traffic congestion and enhancing transportation alternatives to the single occupant vehicle (transit, bicycling, and walking). Implementing these strategies will improve air quality by reducing vehicle use and vehicle congestion. The multimodal transportation strategies section identifies specific tools to improve roadways, transit, bicycle, and pedestrian facilities.

Roundabouts can be used to improve area roadways, providing improved traffic flow and safety with less paved area and less idling than conventional intersections. Properly engineered modern roundabouts can support high volumes of traffic moving through an intersection, provide improved pedestrian movements, and can reduce the number of vehicle and pedestrian accidents. Signalized intersections typically require wider roads than roundabouts, to allow for added lanes to stack

vehicles waiting to complete the turning movement. They can also have less capacity, safety, and more delay than roundabouts.

A better-connected network of neighborhood streets will help relieve traffic congestion in heavily used corridors, especially at major choke points and intersections. These streets will also improve safety in the transportation network, allowing people to access attractions on smaller-scaled, walkable, bikeable, and transit-friendly roadways. A well-designed transit system that is fully integrated with other modes such as bicycling, walking, and ridesharing can minimize the impacts of transportation on the environment by reducing roadway congestion and the need for excess parking. Parking lots cover areas that once absorbed and filtered rainwater. In addition, oil and other pollutants pool in parking lots and are later washed off, exacerbating an area's surface water pollution problems. Ridesharing and travel demand management strategies help reduce travel via single occupant vehicle, and as a result, reduce traffic and traffic congestion and the resulting negative effects on air quality.

Land use and transportation are inextricably linked. Transit Oriented Development (TOD) provides excellent examples of combines land use and transportation strategies to minimize negative environmental impacts. TOD is designed to maximize access by transit and non-motorized transportation, with other features, to encourage transit ridership. TOD does more than simply shift car trips to transit; it also increases accessibility and transportation options through land use clustering and the mix of residential and commercial facilities. It reduces the need for automobile use and parking. By reducing the distance required for car trips, it encourages walking and cycling, and allows some households to reduce their car ownership, which together can result in large reductions in vehicle travel. TOD strategies address how development on a "greenfield" site can be adjusted to incorporate transit strategies early on, and continue to be transit-accessible as the community grows."

Interagency Consultation

The MPO has sought input from coordinating agencies and their comments have been incorporated into this chapter. The most prevalent response from coordinating agencies was that environmental mitigation would be conducted in accordance with the National Environmental Policy Act (NEPA). The US Fish and Wildlife Service stated that this was not the appropriate venue or time to comment on environmental mitigation. That appropriate time would be during a project level analysis when specific impacts could be identified. CHATS will continue to engage the resource management agencies, Military Departments, and regulatory agencies in transportation planning activities.

Financial Plan

Why is a Financial Plan Important?

An underlying principle in the development of the CHATS LRTP is to review the status of transportation funding before finalizing the plan so that the plan is developed with the full knowledge of financial resources. In the past, long-range plans were not required to be financially constrained, yielding wish lists as opposed to realistic blueprints for the future. The current requirement of fiscally-constrained plans requires that the costs of the projects be compared with estimates of anticipated revenues to determine what can be funded in the year of expenditure dollars. A well-developed LRTP considers the amount of funding available before lists are developed so that fiscal constraint is not just a matter of how far down a list of projects the plan can go, but what projects yield the best return for the amount of funds available. The CHATS LRTP has followed a process of fiscal constraint from the beginning, with the early recognition of limited future financial resources.

This chapter outlines the components of the financial element and highlights past, present, and future funding of transportation improvements. All modes are discussed in the financial element to achieve an integrated transportation system that fully assesses the financial need.

Terms that are used frequently in this discussion are defined below.

C-Funds Funds allocated to each county by South Carolina Department of Transportation (SCDOT) for the purpose of transportation improvements; law requires that improvements be tied to transportation and that 25 percent of the funds be spent on the state highway system. Two and sixty-six one-hundredth cents a gallon of the user fee on gasoline must be deposited with the State Treasurer and used in furtherance of a countywide transportation plan adopted by the county transportation committees.

Enhancements Transportation Enhancement (TE) activities offer funding opportunities to help expand transportation choices and enhance the transportation experience through 12 eligible TE activities related to surface transportation, including pedestrian and bicycle infrastructure and safety programs, scenic and historic highway programs, landscaping and scenic beautification, historic preservation, and environmental mitigation. TE projects must relate to surface transportation and must qualify under one or more of the 12 eligible categories.

Federal Transit Administration (FTA) The federal agency that support a variety of locally planned, constructed, and operated public transportation systems throughout the United States Transportation systems typically include buses, subways, light rail, commuter rail, streetcars, monorail, passenger ferry boats, inclined railways, or people movers.

Guideshare Funding available to each of the South Carolina Metropolitan Planning Organizations (MPOs) and Councils of Governments (COGs) for System Upgrade projects. This dollar amount is calculated by taking the MPO's and COG's specific proportion of the state population and applying it to the total available funds for System Upgrade projects. SCDOT is currently revisiting this formula, based on the 2010 Census data.

Metropolitan Transportation Improvement Program (MTIP) A prioritized program of transportation projects prepared by the Metropolitan Planning Organization and state to be implemented in appropriate stages over several years. This program is required as a condition for an MPO to receive federal transit and highway funds.

National Highway System Funds (NHS) Federal funds that are appropriated by Congress for maintaining and improving the National Highway System including interstates. South Carolina has approximately 2,466 NHS miles.

State Infrastructure Bank (SIB) The South Carolina SIB selects and assists in financing major qualified projects by providing loans and other financial assistance for constructing and improving highway and transportation facilities. The I-26 capacity improvement project and the Mark Clark Expressway Extension are receiving SIB assistance.

Statewide Transportation Improvement Program (STIP) A prioritized program of transportation projects prepared by the state to be implemented statewide in appropriate stages over several years. This includes a compilation of all MPO MTIPs

Surface Transportation Program (STP) A federal-aid program for any state-maintained roads not functionally classified as local or as rural minor collector. These funds can be used for any type of transportation improvement.

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) Currently, the most recent federal legislation that authorizes funds for highways, highway safety, and mass transportation. The reauthorization of this program is currently in development.

Principal Funding Sources

Guideshare Funding

The Guideshare is the dedicated funding source for CHATS transportation projects. A set aside from this source is the enhancement funds. Other federal, state, and local funds pass through SCDOT to CHATS on a project basis, but the only constant, reliable funding sources are the Guideshare, Enhancement, and FTA transit funds.

The CHATS Guideshare is $16,953,000 per year, not including the transportation enhancements funds that total approximately $650,000 per year. FTA provides $5,100,000 each year for transit programs, along with $440,000 annually for transit capital or operating cost.

While three other substantial sources of funds for transportation exist, none are exclusively dedicated to CHATS needs. One is the C-funds that come from the SCDOT to each County Transportation Committee. The formula for distribution of the funds that accrue from state user fees (e.g., fuel tax, licenses, or registration fees) has not changed since 1946 and is based 1/3 on population, 1/3 on rural road miles, and 1/3 on physical size of the communities. The funds must be used for transportation purposes, and 25 percent must be used on state highways. Each County Transportation Committee selects the projects and the money is typically used for intersection improvements, small capital projects, and maintenance. The funds received in Fiscal Year 2010-2011 by Berkeley County totaled $2,318,800. The Charleston County total was $2,896,800, and the Dorchester County amount totaled $1,353,200.

Secondly, there is a non-dedicated source of federal funds that are allocated to projects through specific programs (e.g., road maintenance, safety, bridge replacement, and interstate). These are prioritized at the state level by the SCDOT, with limited involvement by the MPOs. It is more difficult to track this amount since funds are allocated for a specific project over several years. A review of the most recent SCDOT 10 Year Highway Construction Projects Summary prepared for each county as well as information available from federal sources suggests that as much as $83 million per year of non-Guideshare funds have been expended in the region. High priority projects such as the I-26 interstate widening, and other bridge projects account for the bulk of these expenditures.

The third category is locally generated transportation funding. Each county has enacted a local option sales tax dedicated to transportation improvements. In November 2004, voters in Charleston County passed a referendum establishing a dedicated ½-cent sales tax for transportation projects. The majority of (83%) of the receipts is earmarked to maintaining and expanding transportation services in the county. Dorchester County's program, enacted in 2006 will generate $125 million for transportation improvement over the life of the program. Berkeley County's program began collecting revenues in 2009, set to expire in 2016, will collect $118.5 million. Finally, Berkeley County, Dorchester County, and the Town of Mount Pleasant charge a transportation impact fee to mitigate the transportation impact of new development.

Recent Expenditures

Over the last decade the Berkeley-Charleston-Dorchester (BCD) area has made a major investment in transportation infrastructure. The bonding program, part of the SCDOT's "27 in 7" bonding initiative, has completed more than $56 million in road projects with a total of $240 million committed. The 14 projects have been completed as planned, namely:

- North Rhett Avenue widening from Remount Road to Red Bank Road
- Trolley Road widening from SC 165 to Traveler's Boulevard
- US 17 Alternate widening from I-26 to US 176
- Virginia Avenue widening from Mark Clark Expressway to Buist Avenue
- Long Point Road widening from the SPA terminal to Whipple Road
- Interchange at I-526 and US 17
- US 78/US 52 interchange improvement
- Maybank Highway Stono River bridge replacement
- Ashley Phosphate Road widening from US 52 to SC 642
- Ladson Road widening from US 78 to SC 642
- US 17 widening (from I-526 to Isle of Palms Connector)

There is a commitment to complete another project, the Berlin Myers Parkway Phase III with additional funds being contributed from Guideshare and Dorchester County Transportation Sales Tax Program.

Future Funds

The legislation reauthorizing SAFETEA-LU is still pending approval, so no concrete estimate of future CHATS Guideshare is available. Furthermore, SCDOT may elect to change the formula by which Guideshare is determined for each MPO, causing additional uncertainty. Therefore, for the purposes of this plan, the estimate of $389.9 million of Guideshare funds from 2012 until 2035 is projected to develop the financially constrained CHATS transportation plan.

All three counties passed local sales tax levies dedicated to transportation improvements. During the course of developing this financial plan, staff coordinated with each county to determine the projects that were likely to be considered for funding with sales tax revenues. This information is reflected in Table 11.1.

Transit Funding

As discussed in Chapter 6 — Transit Element, federal, state, local, and farebox/other sources of revenue are available to fund transit. The Federal Transit Administration (FTA) provides funds through Section 5307, and 5309 grants, with CARTA being the designated recipient of these funds. BCDCOG is the designated recipient of FTA Section 5316 and 5317 grant funds. SCDOT provides state funds through grant applications that are primarily used as matching money for other (i.e., federal) grants. The local funds for transit include the 18 percent of the dedicated 1/2–cent sales tax receipts in Charleston County, operating revenues, advertising revenues, and funding partnerships in the community will be used primarily for local matches and for operational costs.

Details on future transit funds are included in Chapter 6.

Funding for Pedestrian and Bicycle Improvements

Transportation Enhancement Program funds are provided by the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA LU) and allocated by SCDOT

to MPOs. Currently, CHATS receives an estimated $650,000 per year for enhancement improvements for pedestrian and bicycle facilities, streetscaping and other related activities.

Road improvement projects in the past have not always included provisions for pedestrians and bicycles. SCDOT and CHATS have made a commitment that any new project will make such provisions; therefore the cost of many new bicycle and pedestrian projects is accounted for in the roadway costs.

Financial Plan Strategy

The list of candidate projects for CHATS funding begins with a listing of committed projects for which funding commitments have already been established. Subsequently, this listing includes projects that were collected through public input, input from member jurisdictions, and CHATS Study Team, as well as additional projects identified by the travel demand model to address remaining deficiencies in the future year. This pool of projects comprises the Vision Plan Network, being term so because no financial resources have been allocated to the projects. Projects included in the Vision Plan Network form the pool of projects that will be prioritized for federal funding. Projects included in the Vision Plan condition are shown in Figure 4.2

Committed Projects

Ten committed projects are eligible for receiving additional funds, if so required, and thus need to be referenced in the LRTP:

- The CARTA Intermodal Center
- Railroad Avenue Extension from Mabeline Road to Eagle Landing Boulevard (receiving non-Guide Share federal funds)
- US17 North widening from Isle of Palms Connector to a point near Darrell Creek Trail
- Berlin G. Meyers Parkway Extension – Phase III (new 4-lane divided roadway) from SC165 to US 17A
- Harborview Road – a capacity improvement from SC 30 to Mikell Drive
- Bacons Bridge Road – capacity improvements from Trolley Road to a point SC Hwy. 61
- Bees Ferry Road - a capacity improvement from Ashley River Road to US Hwy. 17
- College Park Road - a capacity improvement from Corporate Boulevard to US Hwy. 17 Alt.
- Region wide Congestion Management Program and travel demand modeling
- Debt service on the bonding program through 2022

Candidate Projects

As discussed in Chapter 4 and Chapter 10, projects were evaluated in terms of how they addressed mobility, constructability, environmental justice impacts, cultural/economic impacts, and environmental and natural feature impacts. Each project received an overall score. Table 11.1 reflects the results of the ranking process, resulting in a prioritization of the project's ability to relieve congestion with the minimum impact based on the criteria. Not all projects are indicated because there is not sufficient Guideshare revenue to fund all projects and the implementation of a project precludes the need for another. Projects reflected in Table 11.1 that are not part of the fiscally-constrained plan are part of the Community Vision Plan and remain on the candidate list should additional funding become available.

Ranked List of Candidate Transportation Projects

Rank	Facility	Description	Project ID	Total Rankings (0-100)
1	US 17 Alternate (North Main St)	Berlin Myers Parkway (SC 165) to Interstate 26 - capacity improvement	66	70.11
2	I-526 & I-26 Interchange	Interchange Improvement	21	67.80
3	ITS-Signal Systems	Region wide	23	64.50
4	US 52 & US 176 Intersection	Intersection Improvement	44	64.46
5	SC 41	US 17 to Joe Rouse (S-10-2057)	39	64.26
6	Ashley Phosphate Road (S-10-75)	Cross County Road (S-10-2028) to Northwoods Blvd. (Local Rd) - capacity improvement	49	64.23
7	Jedburg Rd. (S 18-58 and Local Road)	US 78 to Wildgame Rd. (S 8-203)	24	63.30
8	Savannah Highway (US 17)	Orleans Rd. (S-10-1373) to Wesley Dr. (SC 171)- capacity improvement	64	63.28
9	Aviation Connector to Ashley Phosphate	S. Aviation Ave. to Ashley Phosphate Rd (S-10-75)	1	62.63
10	Sheep Island Parkway, I-26 Widening, I-26 Frontage Rds., & Sheep Island Rd. (S-8-275) Interchange @ I-26	N. Maple St. (S-8-131)to US 176, Sheep Island Rd.(S-8-275) to Jedburg Rd.(S-8-58 and Local Road)	42	62.40
11	St. Andrews Blvd (SC 171 and SC 61)	Ashley River Road (SC 61) to Wesley Dr. (SC 171) - capacity improvement	65	61.12
12	Micheaux Parkway (Local Road)	Dorchester Rd (SC 642) to International Blvd (Local Road)- capacity improvement	60	60.60
13	Main Road (S -10-20)	Savannah Hwy (US 17) to River Road (S-10-54) - capacity improvement	59	59.71
14	Folly Road (SC 171)	James Island Connector (SC 30) to Patterson Ave (S-10-752) - capacity improvement	56	59.37
15	Mark Clark Expressway Extension (I-526)	US 17 to SC 30 Island Connector	32	59.10
16	Commuter Rail	Summerville to Downtown Charleston	12	57.67
17	Bus Rapid Transit	Rivers Ave (US 52) from Otranto (S 10-542) to Downtown	8	57.33

Rank	Facility	Description	Project ID	Total Rankings (0-100)
18	Bus Rapid Transit	Extend BRT to New Wal-Mart Center past SC 41 to MUSC	19	57.25
19	S. Aviation Ave. (Local Road)	E. Spartan Blvd. (Local Road) to International Blvd. (Local Road)	38	57.25
20	US 78	Deerwood Rd.(S-10-1226) to Ladson Rd. (S-10-76) - capacity improvement	68	56.83
21	Bus Rapid Transit	Goose Creek area to Downtown Charleston	6	56.17
22	Combined Project - Aviation Connector & S. Aviation Ave. (Local Road)	Ashley Phosphate Rd (S-10-75) to International Blvd. (Local Road)	70*	55.81
23	Deerwood Road (S-10-544 and S-10-1226)	Otranto Rd. (S-10-542) to US 78 (University Ave) - capacity improvement	53	53.93
24	Bus Rapid Transit	Folly Rd. (SC 171) to Downtown Charleston	5	53.67
25	Wildgame Road (S-8-203)	Jedburg Rd (S-18-58 and Local Road) to Sheep Island Rd (S-8-275) - capacity improvement	69	53.24
26	Red Bank Road (S-8-29)	N. Rhett Ave. (S-8-136) to Bushy Park Rd.(S-*-503)	37	53.15
27	Gregorie Ferry Connector & Frontage Rd (Local Road)	SC Hwy 41 to US Hwy 17	71	52.40
28	Long Point Road (S-10-197)	Whipple Rd (S-10-72)to Johnny Dodds Blvd(US 17) - capacity improvement	58	52.39
29	Otranto Road (S-10-542)	Deerwood Rd.(S-10-544) to Rivers Ave. (US 52)- capacity improvement	63	52.38
30	I-26 Widening	Port Access Rd to I-526	41	52.19
31	Folly Road (SC 171)	Windemere Rd (S-10-399) to Maybank Hwy (SC 700) - capacity improvement	55	52.18
32	Long Point Re-Alignment (S-10-97)	Intersection of Long Point Rd.(S-10-97) & US Hwy. 17	31	52.02
33	Cross County Road (S-10-2028)	Ashley Phosphate Rd. (S-10-75)to Hill Park Rd. (Local Rd) - capacity improvement	52	51.71
34	Commuter Rail	Goose Creek area to Downtown Charleston	33	51.67
35	International Blvd (SC 10-1411)	Micheaux Pkwy (Local Road)to I-526 - capacity improvement	57	50.98

Rank	Facility	Description	Project ID	Total Rankings (0-100)
36	Montague Ave (S-10-62)	International Blvd (Local Road) to I-26 - capacity improvement	61	49.06
37	SC 41	Dunes West Pkwy to Wando River /County Line	40	48.97
38	US 17A	SR 61 to SR 642 - capacity improvement	67	48.95
39	Glenn McConnell Extension-Phase I (SC 61)	Bees Ferry Rd. (S-10-57) to US 17A	18	48.35
40	Ashley River Road (SC 61)	Old Parsonage (S-10-729) to Raoul Wallenberg (S-10-1372) - capacity improvement	50	48.21
41	College Park Road (S-8-62)	I-26 to Crowfield Blvd (S-8-1093) - capacity improvement	51	48.15
42	Dorchester Rd. Connector (Local Road)	Micheaux Pkwy (Local Road) to W. Montague Ave. (S 10-162)	14	47.67
43	Dorchester Road (SC 642)	Trolley Rd (S-18-199) to Ashley Phosphate (S-10-75)	11	47.65
44	Bus Rapid Transit	Powerline Easement to planned Intermodal Center	7	47.44
45	Miles Jamison (S-18-377)	Trolley Rd (S-18-199) to Ladson Rd (S-10-76)	20	46.82
46	Light Rail Transit Service	City of Charleston to Town of Summerville	27	46.71
47	Expand SHEP service area	I-26 to Exit 199 (US 17 A)	15	46.50
48	Clements Ferry Road -Phase II (S-8-33)	Jack Primus Rd. (S-8-119) to SC 41	9	45.95
49	Transit Service	Local Service in CHATS Area, Bus Service from Daniel Island to to Bowman Rd. K-mart Transfer Point	43	45.50
49	Waterborne Transit Service	North Charleston to Downtown Charleston	47	45.50
51	I-526 Interchange Improvements (Exit 16)	International Blvd at I-526	22	45.35
52	Folly Rd. (SC 171)	Sol Legare Rd (S-10-632) to Little Oak - capacity improvement	54	45.26
53	Future Dr. Interchange (Local Road)	Future Dr. (Local Road) & I-26	16	44.67
54	Waterborne Transit Service	Patriots Point to Downtown Charleston	48	44.25
54	Waterborne Transit Service	Daniel Island to Downtown Charleston	45	44.25

Rank	Facility	Description	Project ID	Total Rankings (0-100)
56	Roadway System Long Point Rd. (S 10-197) Ext. Primus Dr. (Local Road) Extension Gregorie Ferry Connector Basketmakers Blvd. Jennie Moore School Rd. Charleston Co. School Rd. Johnie E. Brown Rd. *This system of projects has the potential to be implemented through multiple individual improvements	 Long Point Rd. (S-10-197) to Lexington Dr. (Local Road) Six Mile Rd. (S-10-921) to Hamlin Rd.(S -10-504) US 17 to SC 41 Long Point Rd. Ext. (S-10-197) to Rifle Range Rd.(S-10-51) Hamlin Rd.(S-10-504) to Porchers Bluff Rd(S -10-51) Jennie Moore School Rd. to Rifle Range Rd. (S-10-51) US 17 to Primus Dr. Extension	30	44.21
57	Light Rail Transit Service	Rivers Ave. (US 52) in Neck Area	25	43.67
58	Sea Island Parkway	Maybank Rd (SC 700) to Betsy Kerrison Blvd.(S-10-20)	4	43.44
59	Hungry Neck Blvd (Phase IV) (Local Road)	Six Mile Rd. (S 10-921)to Porchers Bluff Rd.(S 10-51)	13	43.34
60	Old Orangeburg Road (S-18-22)	Dorchester Rd (SC 642) to Mallard Rd (S-18-58)	36	43.25
61	Northside Dr. (S-10-2274)	Ingleside Plantation Rd. (Local Road) to Ashley Phosphate Rd. (S-10-75) - capacity improvement	62	43.16
62	Waterborne Transit Service	Fort Johnson to Downtown Charleston	46	42.42
63	Coleman Boulevard/Ben Sawyer Boulevard (SC 703)	Main Street Streetscaping from Magrath Darby Rd (S 10-703)/Patriots Point Road to Ben Sawyer Bridge	10	42.33
64	Berlin Myers - North Extension (SC 165)	Maple St. (S 18-131) to Berlin Myers Pkwy (SC 165)	3	42.12
65	Lincolnville Rd./Lincoln Ave. (S-8-881 N)	Streetscaping from Berlin Myers Pkwy (SC 165) to Ladson Rd.(S-10-76)	29	41.83
66	Old Mount Holly (S-8-45)	St. James Ave (US 176) to US 52	35	41.57
67	Light Rail Transit Service	CCAA Airport to Downtown Charleston	28	41.13
68	Light Rail Transit Service	US 17 from Mt. Pleasant to West Ashley	26	40.17
69	Glenn McConnell Extension Phase II (SC 61)	US 17A to Old Beech Hill Rd. (S-18-162) at Wright Road	17	40.03
70	Bacon's Bridge Extension/Delmar Highway (SC 165)	SC 61 to Ashley Ridge High School (Approximately 2.3 Miles)	2	37.17
71	Mt. Pleasant Bypass	US 17 North to Clements Ferry Rd.(S-8-33) on new alignment	34	27.82

Through the funding allocation process, several projects did not receive funding for various reasons. The results are presented in Table 11.2. The Ashley Phosphate Road (#49) project was eliminated because the travel demand will be accommodated by other projects. Also, Lincoln Boulevard (#29) was removed from consideration because this project is not on the Federal Aid-highway system, thus not eligible for Guideshare funding.

In preparing the Financial Plan, it was noted that the Glenn McConnell Parkway Extension (#18) should receive significant local funding from development agreements. The Sea Island Parkway (#41) is should continue to be studied and should be presented as a comprehensive land use-transportation solution.

Added to the list are six projects proposed for innovative financing. Jedburg Road (#24) and the Sheep Island Parkway et al (#42) are committed projects with local funding, and must be reflected in the LRTP. The remaining projects will be funded through innovative sources, such as the State Infrastructure Bank. These projects include Old Orangeburg Road (#36), Mark Clark Expressway Extension (#32), and I-26 Port Access Road.

Approach

The preparation of the financial plan embraces two key philosophies:

- **Support the "Complete Streets" strategy** by setting aside funds to implement multimodal system users to be selected by the CHATS Policy Committee annually
- **Support initiatives to create locally generated transportation revenue streams** through the sales tax levies, impact fees, public-private partnerships, coordinated land use-transportation solutions, travel demand management strategies, and innovate design

This approach is reflected in an eight-step process:

1. Acknowledge committed projects that have yet to be completed.
2. Consider the total amount of Guideshare funds available for future projects to be $389.9 million. This amount is the $281.9 million of uncommitted Guideshare funds plus the $93.2 million allocated to previously committed projects. These projects have been funded through a combination of Guideshare and sales tax revenues, and are considered an effective way to leverage the federal funding sources.
3. Allocate $25 million to the Complete Streets concept. Input received during public outreach meetings as well as from CHATS Policy Committees members suggested that more of the Guideshare funds should be allocated to the Complete Streets concepts as a comprehensive approach to transportation planning. The $25 million allocated would be available for intersection improvements, access management improvements, as well as additional pedestrian and bicycle improvements and transit projects. The precise projects to be funded will be selected by the CHATS Policy Committee annually, based on consultation and input from member jurisdictions.
4. For the remaining $281.9 million of Guideshare funds, use the prioritized project list to allocate the funds, looking for opportunities to leverage additional funding sources, such as sales tax programs, the private sector, or codification of development requirements. As presented in Table 11.2, most of these projects will be funded from multiple sources.
5. Identify projects for non-Guideshare funds. Committed projects still to be completed include Railroad Avenue Extension, and US Highway 17, and the CARTA Intermodal Center.
6. Consider specific projects as being funded through innovative financing. These include the Glenn McConnell Parkway Extension (#18), Mark Clark Expressway (#32), Old Orangeburg Road capacity improvements (#36), and I-26 Port Access Road. Innovative financing implies non-Guideshare funds will be sought through both public and private sources.
7. All other projects considered become part of a Community Vision Plan that acknowledges the community input in developing this plan, but recognizes that the return on investment is not advantageous for a public infrastructure expenditure. In this manner, an effective transportation system can be established to serve the needs of all users.

Figures 11.1, reflect the Fiscally-Constrained Financial Plan Transportation System.

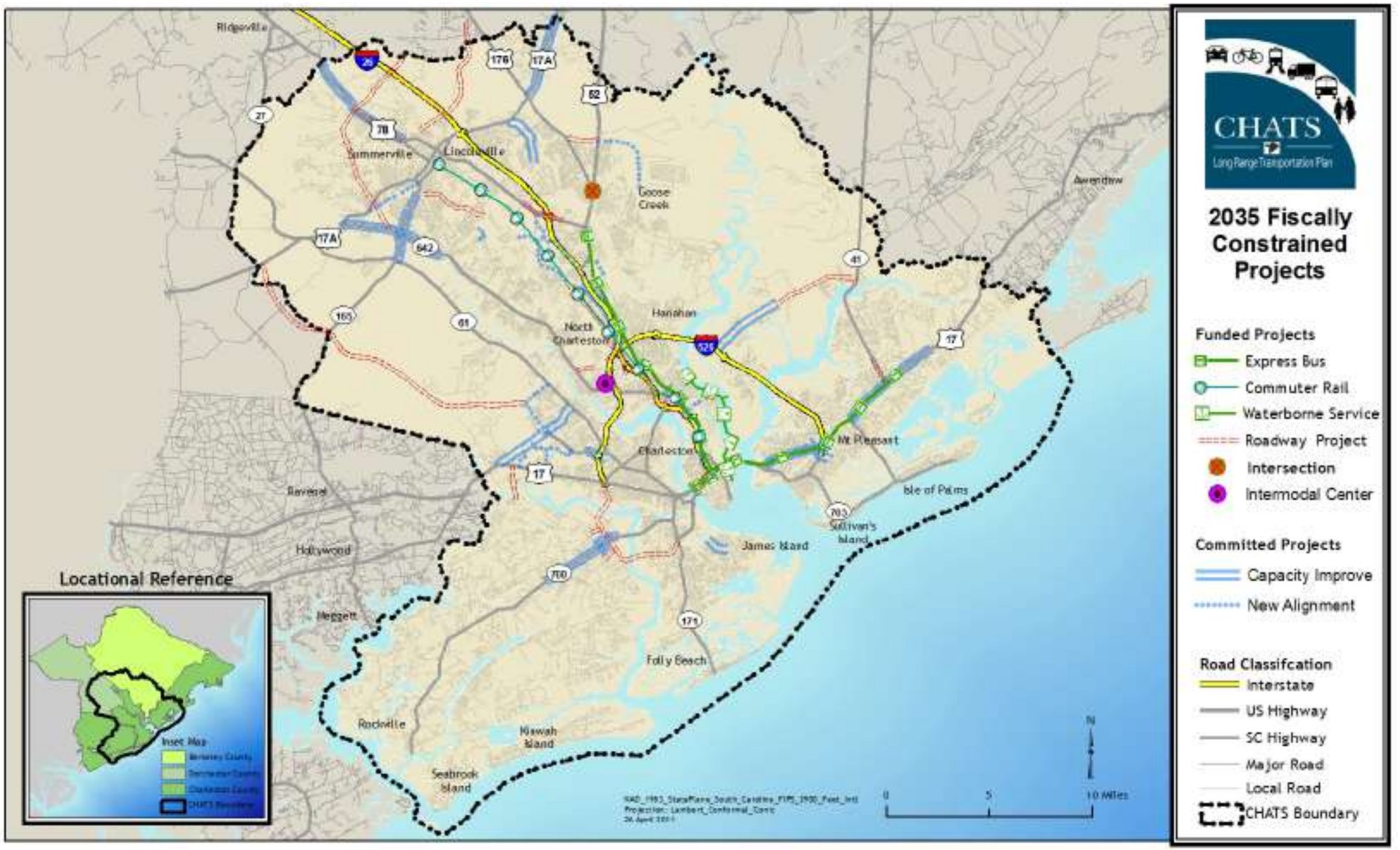

2035 Fiscally Constrained Projects
Funded Projects
Express Bus
Commuter Rail
Waterborne Service
Roadway Project
Intersection
Intermodal Center
Committed Projects
Capacity Improve
New Alignment
Road Classifcation
Interstate
US Highway
SC Highway
Major Road
Local Road
CHATS Boundary
Locational Reference
Inset Map
Ridgeville
Summerville
Lincolnville
Goose Creek
Awendaw
North Charleston
Hanahan
Charleston
Mt Pleasant
Isle of Palms
Sullivan's Island
James Island
Ravenel
Hollywood
Meggett
Folly Beach
Rockville
Kiawah Island
Seabrook Island
0
5
10 Miles
N

Table 11.2 - Fiscally Constrained Transportation Program						
Financial Plan Category		**$Millions**	**Project Cost**	**ID**	**Facility**	**Description**
Guide Share Funds Available	Total Available for Future Projects	$ 400.1				
	Complete Streets		$ 25.0	-	Funding for intersections, access management, pedestrian/bicycle, & transit infrastructure improvements	
	Amount Remaining	**$ 375.1**				
Guide Share Funds Allocation	Previously committed		$ 12.2	23349	Berlin G. Meyers Parkway - Phase III	SC Hwy 165 to US 17 Alt. - new alignment project
			$ 6.0	40959	Harborview Rd.	SC 30 to Mikell Dr. - capacity improvement
			$ 7.5	-	Bacons Bridge Road	Existing 4-lane section to just past SC Hwy 61 - capacity improvement
			$ 13.0	40255	Bees Ferry Rd.	US Hwy 17 to Ashley River Rd.
			$ 2.3	38779	College Park Rd.	US Hwy 17 Alt to Corporate Pkwy
			$ 0.25	41166	Congestion Management / Long Range Plan/ Travel Modeling	Regionwide
			$ 52.00	-	Debt Service	
	Previously Committed Total	**$ 93.2**				
	Amount Remaining	**$ 281.9**				
	Allocated to New LRTP Projects		$ 10.0	23	ITS - Signals	Regionwide - Prioritized in SCDOT/CHATS Signal Master Plan
			$ 40.0	44	US 52/US 176 Intersection Improvements	Intersection of US Hwy 176 & US Hwy 52
			$ 18.0	39	SC 41	US Hwy 17 to Joe Rouse Rd.
			$ 5.0	1	Aviation Connector	S. Aviation to Ashley Phosphate Rd. along Spartan Blvd.
			$ 10.0	42	Sheep Island Pkwy, Interchange @ I-26, & I-26 Widening	N. Maple St. (S-8-131)to US 176, Sheep Island Rd.(S-8-275) to Jedburg Rd.(S-8-58 and Local Road)-Additional funding provided by local sources
			$ 7.0	60	Micheaux Parkway	Dorchester Rd (SC 642) to International Blvd (Local Rd)- capacity improvement
			$ 12.0	59	Main Road	Savannah Hwy (US 17) to River Road (S-10-54)- Capacity Improvement

			$ 40.0	12	Commuter Rail Service	Summerville to Downtown Charleston-On Existing Rail
			$ 25.0	38	S. Aviation Avenue	E. Spartan Blvd. (Local Rd) to International Blvd. (Local Rd)
			$ 25.0	68	US 78	Deerwood Rd.(S-10-1226) to Ladson Rd. (S-10-76) - capacity improvement
			$ 5.0	-	US 78	Jedburg Rd. to W. Richardson Ave.
			$ 5.0	52	Cross County Road (S-10-2028)	Ashley Phosphate Rd. (S-10-75)to Hill Park Rd. (Local Rd) - capacity improvement
			$ 15.0	65	Old Mt. Holly Road	St. James Ave (US 176) to US 52
			$ 4.4	35	Montague Ave (S-10-62)	International Blvd (Local Road) to I-26 - capacity improvement
			$ 20.0	18	Glenn McConnell Parkway Ext.- Phase I	Bees Ferry Rd. (S-10-57) to US Hwy. 17A
			$ 1.0	45/47	Waterborne Transit Service	Daniel Island & N. Charleston to Downtown Charleston
			$ 10.0	33	Miles Jamison Road	Trolley Rd (S-18-199) to Ladson Rd (S-10-76)-Intersection Improvements
			$ 18.0	4	Bus Rapid Transit Capital Acquisition	Along US Hwy 17 & Rivers Avenue
			$ 0.5	15	Incident Management - SHEP	I-26 from Exit 220 to Exit 199
			$ 11.0	9	Clements Ferry Road - Phase II	Jack Primus Rd. (S-8-119) to SC 41
	Guideshare Committed Total	**$ 281.9**				
	Amount Remaining	**$ (0.0)**				

Table 11.2 - Fiscally Constrained Transportation Program (Continued)						
State/Federal Non-Guide Share Funds	Committed Projects		$ 8.0		Railroad Avenue Extension	Mabeline Road to Eagle Landing Boulevard - two lanes on new location
			$ 14.7		Berlin G. Meyers Parkway - Phase III	SC Hwy 165 to US 17 Alt. - new alignment project
			$ 8.0		CARTA Intermodal Center	W. Montague Rd, North Charleston
			$ 164.9		Transit Capital and/or Operations	CHATS Urbanized Area
			$ 79.5		US Highway 17	Capacity Improvement from Isle of Palm Connector to a point near Darrell Creek Trail
			$ 12.5		US 17 Septima Clark Parkway	End of I-26 to Ashley River Bridge
			$ 16.0		CHATS Enhancment Program	Regionwide
			$ 370.8		System Maintenance, Pavement Management, and Safety Program	Regionwide
			$ 534.9		Transit Capital and/or Operations	CHATS Urbanized Area
	Non-Guideshare Committed Total	**$ 674.3**				
Innovative Financing	All or partial funding identified through SIB, sales tax program revenues, or locally generated sources. Explore additional forms of financing		$ 101.0		Glenn McConnell Parkway	Bees Ferry Road to US 17 Alt. - new location multilanes w/ median
			$ 40.0		Old Orangeburg Road	Dorchester Road to Mallard Road – capacity improvement
			$ 489.0		Mark Clark Expressway	US 17 to Folly Road – new location freeway
			$ 25.2		Jedburg Road	US 78 to Wildgame Road - Funding provided by local sources
			$ 94.0		Sheep Island Pkwy, Interchange @ I-26, & I-26 Widening	N. Maple St. (S-8-131)to US 176, Sheep Island Rd.(S-8-275) to Jedburg Rd.(S-8-58 and Local Road)-Funding provided by local sources
			$ 151.5		I-26 Port Access Road	I-26 to new port terminal – new limited access alignment
	Committed Grand Total	**$ 1,857.0**				

Implementation Plan

All long-range plans benefit from a good implementation plan. Taking action on the myriad recommendations for the Charleston Area Transportation Study will be contingent on several factors, not the least of which is the ability to secure funding. To adopt and implement the plan, the BCD Council of Governments and CHATS Policy Committee must work proactively with the following organizations:

- Citizens and businesses
- South Carolina Secretary of Transportation & Commission
- South Carolina Department of Transportation
- United States Department of Transportation
- Private transportation providers
- South Carolina Ports Authority
- Charleston Area Regional Transit Authority and TriCounty Link
- CHATS member jurisdictions
- Private development industry
- Elected leadership in the South Carolina General Assembly
- Neighboring regions in South Carolina

Transportation improvement funds are scarce and competition for them is fierce. Fortunately, citizens of Berkeley, Charleston, and Dorchester counties voted to approve a self-help tax dedicated to improving transportation. These successful voter campaigns should be used to leverage a higher-return-to-source share of state and federal gas taxes and other transportation-related user fees and taxes.

To fully implement the plan, the region will have to identify stable, timely, and equitable methods of funding. Some municipalities are negotiating with developers to shift some responsibility for the "cost of growth" to developers and eventually to home buyers and businesses. It is expected that similar debates will occur in all communities within the region, especially with the uncertainty in federal funding. Evolution toward a creative and effective mix of funding from various sources and stakeholders in the economy and transportation system of this region is a worthy goal. Coupling these funding mechanisms with an integrated land use-transportation planning process will result in an effective investment in transportation infrastructure.

SHORT-TERM ACTIONS

Plan Adoption Process

- Open-house style public input meeting and other presentations
- Plan review by SCDOT and FHWA
- Recommend adoption from the CHATS Study Team
- Adoption by CHATS Policy Committee
- Acceptance of CHATS 2035 LRTP by SCDOT and FHWA

Implement Financial Plan

- Adopt resolution of support for all of the "committed" projects on the E+C list. Support the counties in the implementation of the transportation sales tax programs and impact fee programs.
- Continue to implement the Complete Streets program to use Guideshare funds that include access management projects including landscaped medians, intelligent transportation services, pedestrian and bicycle projects, water shuttle destination point parking and access facilities, and aesthetic improvements including corridor landscaping.
- Program and commence the process to use Guideshare funds to implement technically meritorious projects (see Chapter 11 — Financial Plan) that are not part of any sales tax programs.
- Continue to support non-Guideshare projects still to be completed, including:
  - Railroad Avenue Extension
  - CARTA Intermodal Center and replacement of rolling stock
  - Preservation and maintenance of existing transportation system
- Vigorously pursue innovative public and private sources of funding for the following projects:
- Glen McConnell Parkway Extension
- Mark Clark Expressway
- Old Orangeburg Road Capacity Improvements
- I-26 Port Access Road
- I-26 Capacity Improvements
- Sheep Island Parkway
- Replacement of transit vehicle rolling stock
- Transit services throughout the CHATS Planning Area
- Each jurisdiction adopt and codify the recommended strategies from the regional land use-transportation planning process – *Our Region, Our Plan.*

Setting Priorities

- Pursue flexible use of federal Surface Transportation Program (STP) and various state transportation funds to implement a wider range of transportation projects including bicycle, pedestrian, and intermodal transit facilities.
- Confirm with the CHATS Policy Committee the following principles adopted by the Policy Committee in 2005. Other area jurisdictions and agencies are encouraged to adopt or endorse these policies as appropriate. These recommendations were also incorporated into the *2035 CHATS Long Range Transportation Plan*.

- All new and improved non-controlled access highways in the CHATS study area will provide a

minimum level of safe accommodation for bicyclists and pedestrians.

- On key routes identified in the CHATS plan, streets and highways shall be retrofitted to better accommodate bicyclists and pedestrians.
- All new and improved bridges in the CHATS study area will provide safe bicycle and pedestrian access.
- Improvements to area transit services must provide safe and convenient access for all users.
- All existing rail and utility corridors will be reviewed for their potential to incorporate multi-use trails. The CHATS Policy Committee recommends that area jurisdictions shall act immediately to protect and preserve abandoned railroad corridors that have the potential to become part of a regional trail network or transit corridors.
- The design, designation, and signing of bicycle and pedestrian facilities in the CHATS study area will conform to current standards and guidelines developed at the national level.
- The CHATS Policy Committee recommends that area jurisdictions shall encourage nodal, mixed-use, commercial, and residential developments.
- The CHATS Policy Committee recommends that area jurisdictions adopt policies and procedures to encourage the installation of secure bicycle parking facilities throughout the study area.
- The CHATS Policy Committee will support efforts so that area residents and businesses participate in the BCDCOG Mobility Management Program and implement travel demand management best practices.
- The CHATS Policy Committee will recommend to state and local jurisdictions that enforcement of laws regarding dangerous and illegal behavior by motorists, bicyclists, and pedestrians be improved.
- Facilitate changes to the CHATS transportation project scoring method to align it with the goals and objectives outlined in the CHATS LRTP. Adapt the methods used in this study, as described in Chapter 10 – Environmental Screening, to best fit the needs of the region as projects are prioritized in the future.
- Request inclusion of high-priority projects in the next version of the State Transportation Improvement Program.
- Create a steering committee that will report to the CHATS Policy Committee and be chaired by the Executive Director of BCDCOG to oversee priority-setting of a new program called Complete Streets. Funding levels recommended in this plan for Complete Streets projects, exclusive of other TIP projects, is $25 million over the next 25 years.
- Consider transportation projects listed in the candidate projects to pull forward into the fiscally-constrained plan.
- Pursue innovative financing for the following transportation projects: Sheep Island Parkway, Glenn McConnell Parkway, I-26 capacity improvements, I-26 to Port Access Road, and the Old Orangeburg Road widening, and fixed guideway transit services.
- Continue to evaluate fixed guideway transit options for the region and implementation of transit supportive site design and land use development plans.

Thoroughfare Plan Amendments

- Adoption of a resolution by affected municipalities to amend official comprehensive plans and transportation plans to be consistent with the CHATS LRTP.
- Continue to implement the directive issued in 2003 by the South Carolina Department of Transportation supporting bikeway and sidewalk construction that states:

  'Generally, sidewalks are an integral part of city streets. For suburban residential areas, the construction of sidewalks is often deferred. However, sidewalks in rural and suburban areas are still often justified at points of community development such as schools, local businesses, shopping centers, and industrial plants that result in pedestrian concentrations along the highway. If pedestrian activity is anticipated, include sidewalks as part of the construction.'

Also implement the resolution passed by the State Transportation Commission in January 2003 that states:

"Now, therefore, be it resolved that the South Carolina Department of Transportation Commission in meeting duly assembled this 14th day of January 2003, affirms that bicycling and walking accommodations should be a routine part of the department's planning, design, construction and operating activities, and will be included in the everyday operations of our transportation system"; and "Therefore, be it further resolved, that the South Carolina Department of Transportation Commission requires South Carolina counties and municipalities to make bicycling and pedestrian improvements an integral part of their transportation planning and programming where State or Federal Highway funding is utilized."

- The policy survey conducted for this study shows that many of the larger municipalities have guidelines to help shape the development of bicycle and pedestrian facilities in their areas. In contrast, Berkeley, Charleston, and Dorchester Counties have fewer requirements for these facilities. All cities, towns, and counties in the region should prepare or update their development guidelines to incorporate complete streets concepts with consideration given to the recommendations made in Chapter 4 — Planning for Growth - Future Conditions of this report.
- Municipal officials should consistently remind elected officials of their authority to veto state roadway improvement projects that fail to meet the goals established in this plan, including the requirement to accommodate bicyclists and pedestrians.
- Encourage training as needed for state, regional, and local professionals in the development of appropriate multimodal facilities.
- Use the corridor profiles illustrated in Chapter 4 in developing the project purpose and need statements to implement projects based on their context

Freight Improvements

- The State Ports Authority is pursuing three major projects to accommodate future water-borne freight transport demand:
  - Charleston Harbor deepening project
  - Existing terminals improvement and a passenger terminal
  - New three-berth, 250-acre marine terminal at the former Charleston Naval Base
  - Implement improvement recommend in the freight providers survey
  - Conduct the I-26 and I-526 corridor analysis studies
  - Enhance the freight modeling capacity of the CHATS travel demand model
  - Coordinate intermodal freight movements
- Proactively pursue safety improvement funds to implement countermeasures at high-crash locations listed in Chapter 3
- Proactively implement specific intersection improvement recommended through outreach conducted with freight operators and shippers as part of this Transportation Plan, including the following:
  - Develop a system of truck routes and accessible intermodal facilities–in order to preserve reasonable truck mobility
  - Clements Ferry Road – plan for secondary roads to smooth growing traffic congestion as Cainhoy area develops; install traffic signals at Cainhoy Road / Clements Ferry Road intersection
  - Improve Jedberg Road to emphasize mobility and safety
  - Implement travel demand management strategies to mitigate impacts on neighborhoods
  - Implement driver awareness program to "give trucks a brake" and not cut them off
  - Create legislation to restrict trucks to the two right lanes on I-526 to improve safety and facilitate passing maneuvers
  - Study interchange along I-26 and I-526 to address traffic congestion
  - Study synchronization of traffic signals on truck routes in downtown Charleston, timed to promote safe and reasonable speeds on downtown streets that minimize truck delay
  - Address traffic congestion along the STRANET system
  - Continue developing the 511 system and in-cab notifications and consider using the procedure on other major construction projects affecting truck routes
  - Secure innovative funding to complete the I-26 Port Access Road from the proposed new port terminal on the former Naval Base site to I-26 to eliminate truck traffic on some local streets

Intersection Improvements

- Implement access management policies and construct measures that create a balance between the need for access to the transportation system and the desire to protect the mobility of major corridors. The recommendations (see Chapter 4 - Planning for Growth - Future Conditions) emphasize the protection of existing roadways through the inclusion of plantable medians and better access management design. In other words, if an arterial warrants widening or other capacity improvements, a median may be proposed as a short-term action to improve safety, control access, and enhance the corridor aesthetics.
- More efficient use can be made of the existing transportation system through minor improvements such as the construction of additional turn lanes, installation of updated or advanced signal equipment, installation of intelligent transportation systems, and identification of alternative travel patterns as described in Planning for Growth - Future Conditions.
- Site access mitigation measures should be implemented. Site driveways and intersections should be configured to minimize the negative traffic effects on the adjacent public street network. This can be accomplished through good site design and by limiting the number of new points of access along a roadway, as described in Planning for Growth - Future Conditions.
- Implement Complete Streets projects to improve the safety, comfort, and convenience of pedestrians and bicyclists at intersections where pedestrians and bicyclists are observed or desired.

Transit Service

Voters provided CARTA with funds to continue improving transit service when they approved a referendum for a one-half cent sales tax in Charleston County in November 2004. The following recommendations for action by CARTA are consistent with CARTA plans to wisely use this new voter mandate.

- Enhance existing service according to the CARTA Plan" through the following steps:
  - Continue comprehensive marketing program
  - Enhance commuter service from outlying areas, including Goose Creek and Summerville
  - Establish greater connectivity between CARTA and Tri County Link and consider strategic methods to serve lower density areas that do not generate adequate ridership on conventional fixed-route large bus services
  - Identify companies that may benefit from using transit services, including vanpools as an efficient means to reach new service areas
  - Continue to evaluate the expansion of DASH service in downtown Charleston
  - Continue to serve MUSC with shuttle service tailored to its needs including the bus pass program for students and employees
  - Continue bus pass programs, such as the one with College of Charleston students, faculty, and staff
  - Invest in technology that will allow buses to preempt traffic signals to continue green lights, as well as customer information services via the internet, phones, and at transit stops
  - Build the North Charleston Intermodal Center to create a hub linking local, regional, and intercity transit services
  - Implement the CARTA system wide comprehensive signage program

- Continue implementation and evaluation of CARTA's construction program to place shelters at high-demand bus stops
- Actively participate in promoting transit-supportive land use and site development through speaker forums, and input on comprehensive and other related planning efforts

- Implement new transit modes and technologies
- Develop dedicated park-and-ride lots to support new CARTA express bus routes
- Coordinate with and support the promotion and implementation of the BCDCOG Mobility Management Program including referring clients, and partnering on events that may include the Charleston Green Fair, Earth Day Festival, Dump the Pump Day, and other initiatives.
- Evaluate the transit needs of the Hispanic and disabled community

Follow Up Studies/Plans

- Study the causes and countermeasures of increasing traffic congestion on Interstate Highways 26 and 526 and identify strategies to avoid worsening delays to freight movement.
- Study enhancements to improve the transit hub activities with new private development.
- Monitor successes and areas for improvement with the recently opened CARTA Superstop on Rivers Avenue at Cosgrove Avenue in North Charleston. Develop a prototype for the development of Superstops elsewhere in the CARTA service area. Consider using the Superstops as regional transfer centers between TriCounty Link and CARTA routes.
- Study the potential implementation of streetcar service on the Charleston peninsula.
- Update the Water Ferry study to develop a public-private partnership plan to jumpstart water shuttle (or ferry) service between publicly-owned docks with adequate parking facilities. The service should have a sufficient element of transportation-related function (compared with tourist-oriented service) to justify public capital expenditures to improve docks, road and path access to docks, and vehicle parking. The following actions are recommended for BCDCOG:
  - Work with National Park Service to update the plan for an initial phase of a Charleston Harbor water shuttle service
  - Identify a lead agency for the water shuttle operation
  - Work to reduce and/or eliminate docking fees for boats used in a water shuttle operation
  - Coordinate connecting bus service to serve the water shuttle docks
  - Identify park-and-ride lots for water shuttle riders at all departure points
  - Investigate funding opportunities for needed facilities and improvements. A potential source may be the Federal Highway Administration's Ferry Boat Discretionary program.
- Examine the feasibility of bus rapid transit (BRT) in critical corridors or the locally preferred alternative for that corridor.
- As updates to city, town, and county comprehensive plans are initiated, the goals and objectives of this CHATS LRTP should be reflected including the Complete Streets program.
- Complete a bike restriping design plan for the regional bike/pedestrian route.
- Corridor studies for each of the congested corridors shown in Chapter 3, should be prioritized, funded, and conducted to consider what combination of roadway improvements and complete street improvements should be recommended. This should be followed by corridor studies for any corridors not already studied that appear on Chapter 4 reflecting congested corridors projected after completion of all the "committed" transportation improvement projects.

When considering new roadway alignments and extensions, planners and engineers should use a guiding set of principles, including those listed below, to make sure that environmental considerations are followed:

- Avoid steep slopes and otherwise unsuitable topography
- Minimize impacts to the built environment
- Stay away from FEMA designated floodplains
- Minimize the number of wetland (National Wetland Inventory) impacts
- Minimize the amount of each wetland impact (e.g., don't cross a wide wetland when a narrower one can be crossed)
- Minimize the number of stream crossings
- Minimize the length of stream crossings
- Minimize impacts to school sites
- Minimize the number and size of impact to historic features and districts
- Minimize the number and size of impact to threatened and endangered species
- Minimize the number and size of impact to hazardous waste sites
- Minimize the number and size of impact to superfund sites
- Minimize or avoid impacts to neighborhoods
- Avoid unnecessary or disproportionate impacts to minority and low-income communities
- Avoid impacts to parks and designated open spaces
- Minimize gameland impacts
- Minimize the number of new facilities in critical watershed areas
- Be aware of existing development patterns

Capitalize on street connectivity opportunities such stub streets

Encourage a multimodal system with the promotion of pedestrian, bicycle, and transit networks

Study countermeasures to current deterrents to inter-community bicycle and pedestrian travel such as:

- Lack of safe water crossings of the Ashley, Stono, Wappo, and Wando Rivers.
- Design of arterials discourage all but the most determined bicyclists
- Gaps in safe facilities make longer distance travel difficult
- Distances between the suburban growth centers, such as Summerville, and the traditional employment centers in North Charleston and Charleston are too great for the majority of people to consider bicycling
- Increasing suburbanization that will make these factors worse
- Identify funding source and promote the creation of an ADA Transition Plan for each city, town, and county in the region that identifies existing deficiencies, estimates retrofit costs, schedules improvements, and programs sufficient annual funding to erase the backlog of

deficient locations. The Transition Plan should focus on public facilities for the disabled community, including intersections and curb ramps.

MID-TERM ACTIONS

Corridor Preservation

Preserve rail corridor capacity for potential future commuter rail service in these corridors and consider adding rail/trail bike and pedestrian facilities along the rail corridors:

- Charleston – Summerville – St. George
- Charleston – Goose Creek – Moncks Corner

East Coast Greenway

The East Coast Greenway Plan was completed in 2005 although the routing may changed by the cities, towns, or counties as development opportunities arise. To promote the routing for residents and tourists, East Coast Greenway additional wayfinding signage should be placed along the route and brochures placed at visitor centers.

Programs and Policies:

Education: New and experienced bicyclists need to be made aware of where suitable routes are and what destinations can be accessed. Motorists, pedestrians, and cyclists need to understand the "rules of the road" to keep themselves safe while operating not only on but also adjacent to these facilities. Consider various means of educating the public in these regards.

Encouragement: People need to be encouraged to walk and bicycle. The more desirable the region becomes for pedestrians and cyclists (by providing more destinations oriented for them), the more successful these modes will become. Set a goal regionally and locally to be widely recognized as bicycle-friendly.

Enforcement Issues: Educate law enforcement and the public on the new **H3006 Bicycle Law** Revisions passed by the SC Legislature includes changes that include the following**:** A driver of a motor vehicle must at all times maintain a safe operating distance between the motor vehicle and a bicycle; is unlawful to harass, taunt, or maliciously throw an object at or in the direction of any person riding a bicycle; a bicyclist may, but is not required to, ride on the shoulder of the roadway in order to comply with the requirements of this subsection; whenever a bicycle lane has been provided adjacent to a roadway, operators of: motor vehicles may not block the bicycle lane to oncoming bicycle traffic and shall yield to a bicyclist in the bicycle lane before entering or crossing the lane; and bicycles are required to ride in the bicycle lane except when necessary to pass another person riding a bicycle or to avoid an obstruction in the bicycle lane. However, bicyclists may ride on the roadway when there is only an adjacent recreational bicycle path available instead of a bicycle lane.

Parking: Consideration should be given to providing bicycle parking at key destination points throughout the region. Some potential areas include, but are not limited to, malls, theaters, parks, central business districts, and schools. The cost for such amenities ranges from a few hundred to several thousand dollars, depending on the type and quality of material. A program to partially subsidize the cost could be considered.

Smart Ride Program (Mobility Management Program): Continued support of the BCDCOG's Mobility Management Program, which provides education and assistance throughout the region on how individuals, companies, and agencies can reduce the use of single car vehicles with alternative modes of transportation including biking and walking. The program also promotes policies and initiatives that support the implementation of school pools, flextime, compressed work time, and telecommuting; all of these programs can result in cost savings, improve air quality and reduction of employee stress.

Trident Ride Share: Continued support of the BCDCOG's Trident Rideshare Program, which allows for online or BCDCOG staff assistance at tridentrideshare.com in locating someone to share a bike ride, walk, transit, taxi, or car to work or events.

Safe Routes to School Programs/Grants: Support ongoing coordination with SCDOT, school districts and area partners on promoting Safe Routes to School Programs, grants, policies, and infrastructure improvements, which would include Walking School Buses, Walking clubs, and putting in bike racks at schools and other public buildings.

Bike Friendly Community Program: Continue to support and provide BCDCOG staff assistance on advancing the League of American Bicyclists' Bike Friendly Community program to area towns and cities.

Complete Streets: Provide ongoing assistance to small towns, cities, and advocates on complete street ordinances and policies including accessibility for the disabled as required by the American for Disabilities Act.

Through the BCDCOG's Mobility Management Program, promote the use of biking, walking, and using transit to employers and individuals including the use of parking spaces for preferred parking for bike racks, showers for bicycling employees and information on the tax benefits to employers.

- Currently, sidewalk implementation is required either on one or both sides of the street in most counties and cities in the CHATS study area for residential land development. It is recommended that these policies be implemented in those counties and cities that do not already have them. A strong commitment to sidewalk implementation should be an integral part of the development review process.
- Promote bicycling and walking as legitimate, popular, and mainstream activities that all sections of society and all ages can enjoy through key area events.

- Use driver education classes and curricula, driver testing and licensing information, and public awareness campaigns to inform motorists about passing bicyclists with care, using the horn appropriately, and yielding to bicyclists at intersections. Supply information to drivers on how to share the road with bicyclists and pedestrians in ways that are not intimidating. Additionally, provide enforcement and publicity of cases where motorists are abusive and threatening to bicyclists or pedestrians.
- Coordinate with wellness worksite initiatives to encourage more employees to commute by alternative modes of transportation.
- A policy to improve bicycle route signage and directional signage will show connections between the routes. Comprehensive and frequent bicycle signage also can promote bicycling by making the extensive bicycle route

Implementation of policies, programs, and projects requires public support, political will, and staff diligence. The public outreach sessions show strong public support for "complete streets" that safely and conveniently accommodate pedestrians and bicyclists. Funding for retrofit projects is scarce and very competitive. The Federal Transportation Enhancements Program is extremely popular in this region and across the nation. Funds are set aside for statewide competition every two years. This region has been successful using Enhancement funds to build hiker-biker trails in Goose Creek, multi-use trails in Summerville, trails and sidewalks in Mount Pleasant, and many other projects.

Streets funded with state, county, and federal transportation monies are a steady source to build a network, however these projects are typically scattered throughout the region and rarely form an immediate network serving a specific area. Nevertheless, most of these streets form critical links in the transportation system and would be very expensive to retrofit for sidewalks and bikeways compared with the incremental cost of accommodation as other transportation improvements are constructed.

Funding for new construction occurs as development occurs, if developers are required to provide infrastructure. This "pay as you go" system is effective because streets are built as new development occurs. However, these public streets are often used by general traffic that did not pay for them so a degree of fairness is introduced if a public-private partnership is formed with a mixture of funds from both the developer and the public sector.

A multi-pronged approach is necessary that includes the following:

Short-Term

- Ongoing use of Federal Transportation Enhancement funds to construct facilities identified in the Pedestrian and Bicycle Plan
- Update of project scoring system to use technical criteria to rank candidate projects for prioritization by decision-makers
- Policy changes to implement demonstration projects
- Policy changes to adopt pedestrian and bicycle-friendly ordinances and policies in each jurisdiction

Mid-Term

- County and large city funding for their own pedestrian-bicycle coordinators
- Consideration of using "flexible" state and federal surface transportation program funds to construct pedestrian and bicycle projects

Project Selection Criteria for Streets and Trails

Following are criteria to consider in developing a prioritization scoring procedure for pedestrian and bicycle projects:

- Provide connectivity between important activity centers within each jurisdiction and within the region including schools and shopping areas
- Provide service to existing areas of the greatest population and employment density, as well as areas of expected growth
- Provide service to residents making bicycle and pedestrian trips outside their home jurisdiction
- Serve the primary connectivity needs between jurisdictions within the region and neighboring jurisdictions outside the region
- Provide key crossings of the major highway, rivers, and/or railroad barriers that make regional bicycle and pedestrian connectivity difficult or impossible
- Include many of the roadways and other corridors with the greatest potential to serve pedestrian trips

Complete Streets / Transit Ready Communities

Chapter 10 shows points or areas of interest in the BCD region. These facilities should be linked via a pedestrian-friendly and bicycle-friendly system of facilities. This minimize vehicle miles travel and ensure our air quality standards are maintained. As the region's demographic composition changes, our standards for quality placemaking will evolve and this plan will create a safe, equitable, and effective transportation system to all its users.