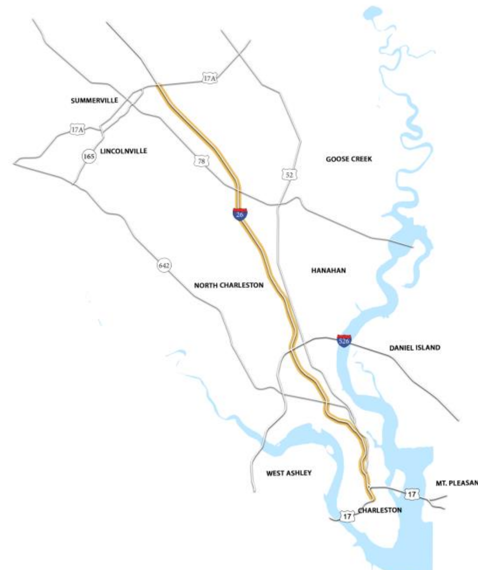
2016

I-26 Fixed Guideway Transit Alternatives Analysis

Executive Summary



Comprehensive Operational Analysis of the Charleston Area Regional Transportation Authority (CARTA) transit system and fixed guideway transit Alternatives Analysis of the I-26 Corridor.

i-26ALT

BCDCOG
BERKELEY-CHARLESTON-DORCHESTER COUNCIL OF GOVERNMENTS
PLANNING, PARTNERSHIP & PROSPERITY

OVERVIEW

i-26ALT was initiated by the Charleston Area Transportation Study (CHATS) to identify a fixed guideway transit alternative for the I-26 Corridor connecting Charleston, North Charleston, and Summerville.

The fifteen month study began in October 2014. The study included a Comprehensive Operational Analysis of the Charleston Area Regional Transportation Authority (CARTA) transit system and a fixed guideway transit Alternatives Analysis of the I-26 Corridor. An extensive public involvement campaign was completed with public meetings, community events and focused "Transit Talks" to solicit input throughout the process. The study process incorporated guidelines and methodologies from the Federal Transit Administration's (FTA) Capital Investment Grant Program to identify a recommended alternative to move forward into the program's Project Development phase.

This Executive Summary provides an overview of the study process and results of the analysis. Detailed study documents can be downloaded from the project website at www.i-26ALT.org or by following the links provided in the listing below.

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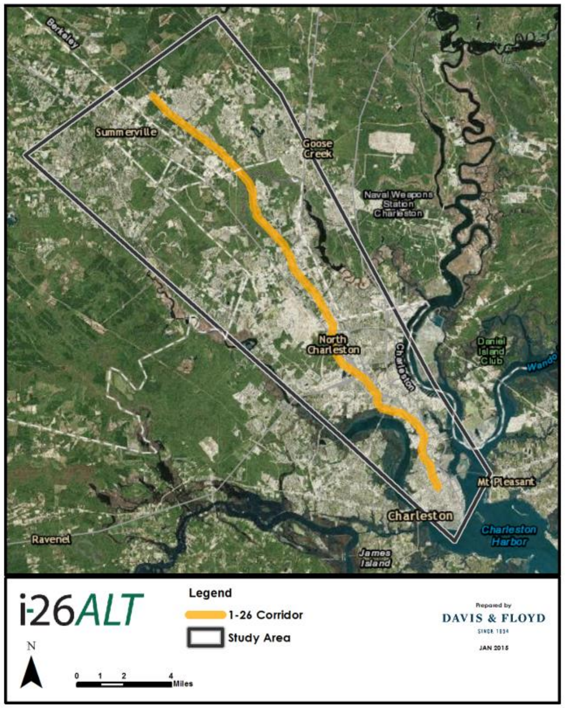
OVERVIEW



"HOW CAN WE MAKE THE EXISTING TRANSIT SYSTEM, CARTA, THE BEST IT CAN BE TODAY WITH EXISTING RESOURCES, AND UNDERSTANDING THAT AS THE REGION CONTINUES TO GROW, LOCAL BUS SERVICE WILL NOT BE ENOUGH, WHAT REGIONAL FIXED GUIDEWAY ALTERNATIVE IS THE BEST OPTION FOR THE I-26 CORRIDOR FROM SUMMERVILLE TO CHARLESTON, WITH THE POTENTIAL TO EXPAND TO OTHER CORRIDORS IN THE FUTURE?"

The i-26*ALT* Study identifies and evaluates transit solutions for the I-26 Corridor connecting Summerville, North Charleston and the Charleston Peninsula. These solutions are intended to improve transit service, enhance regional mobility, manage existing and future transportation demand, support the regional economy, and create livable communities.

Purpose & Goals

The purpose of the I-26 Alternatives Analysis is to **improve transit service** and **enhance regional mobility** along the 22-mile I-26 Corridor connecting Summerville, North Charleston, and Charleston

1. Improve mobility, accessibility, safety, and connectivity of the transit system and region;
2. Promote a cost effective and financially feasible transit alternative;
3. Support local land use objectives;
4. Plan for projected growth in an environmentally sustainable manner;
5. Respond to community needs and support; and
6. Support a diverse regional economy.

Existing Conditions

The Charleston region saw a 22 percent increase in population between 2000 and 2010, and that trend is projected to continue, with a **forecasted 48 percent increase in population and a 55 percent increase in employment over the next 25 years**. The i-26ALT study area encompasses three counties, multiple municipalities, and makes up 40 percent of the region's population and 50 percent of the region's employment. As growth continues along this capacity constrained corridor, alternative transportation modes, such as transit, become a higher priority.

The question is how can we make the existing transit system, CARTA, the best it can be today, and understanding that as the region continues to grow, local bus service will not be enough, what regional fixed guideway alternative is the best option for the I-26 Corridor from Summerville to Charleston with the potential to expand to other corridors in the future. The CARTA Operational Analysis and I-26 Alternatives Analysis provide the first step toward answering this question.

Demographic Characteristics	BCD Region			i-26ALT Study Area *Updated 01/2016		
	2010	2040	% Change	2010	2040	% Change
Population	621,695	920,358	*48%*	276,869	366,361	*32%*
Households	249,569	376,693	*51%*	108,645	150,334	*38%*
Employment	307,809	477,227	*55%*	167,332	223,579	*34%*

CARTA Operational Analysis

The CARTA Operational Analysis (COA) provides an in-depth analysis of the existing transit system to identify strengths as well as opportunities for improvement. Through detailed market, service, and operational analyses, short range and mid-range transit recommendations are presented in an effort to develop the best transit system for the region given current resources as well as an outline of what it will take to grow the service over the next 10 years.

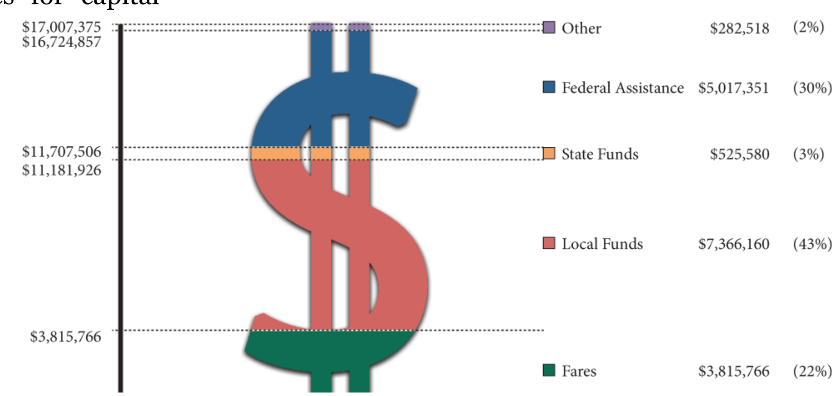
The CARTA transit system carries approximately five million passengers per year. Ridership has stabilized over the past few years, and with growing traffic congestion throughout the service area, CARTA has experienced a decline in on-time performance and reliability on many of its most heavily traveled routes. **CARTA's fleet is approximately 13 years old**, one of the oldest in the nation for a system CARTA's size, which further reduces reliability. Additionally, CARTA needs to modernize with fare payment systems, passenger amenities, and other technologies to improve the performance of the system and the quality of service for passengers.

CARTA has a diverse ridership base of commuters, tourists, students and other customers using the system. Approximately **70 percent of CARTA's customers are "transit dependent"** meaning riders have no other mode available to make work, medical, shopping or other trips. As such, CARTA must work within its means to ensure that safe and reliable service will continue to be provided to its customers. CARTA is currently funded in large part by Charleston County sales tax, which makes up approximately 40 percent of its revenues. Federal funding, local funding partners, and fares make up the remaining revenue sources. Most of the funds currently go toward operations and maintenance of the existing system, with little reserves set aside for investment in future capital, such as vehicles, shelters and technology needs.

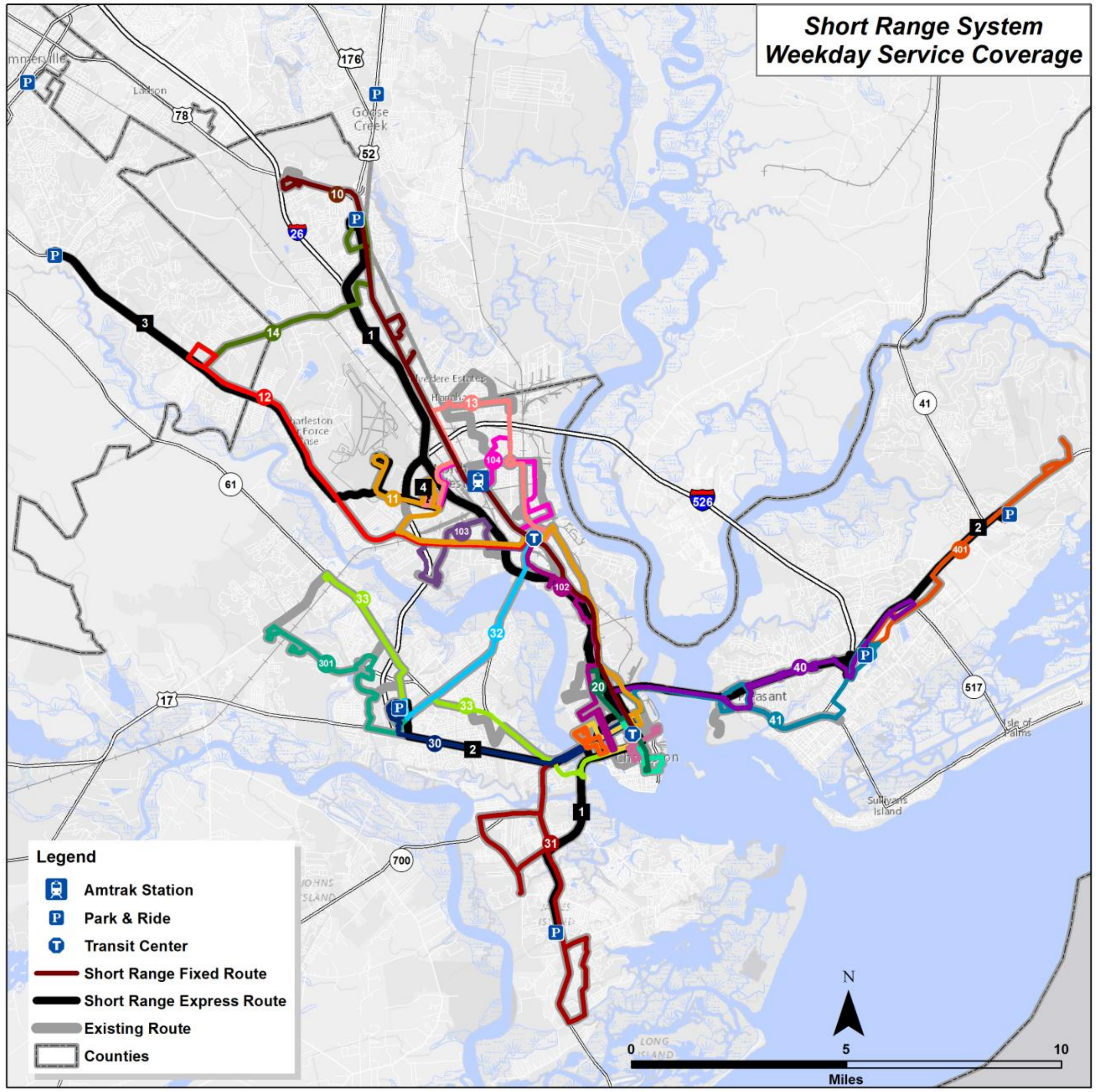
The Short Range Plan is focused on improving the **quality of service** for existing customers, while identifying opportunities to remove inefficiencies and set aside revenues for capital reserves. The Short Range Plan recommendations are intended to:

1) Provide **reliable** and consistent service by realigning service to improve on-time performance, remove inefficiencies, and respond to current travel patterns;
2) **Reinvest** in the system for capital improvements such as new buses, better fareboxes, more shelters, etc.;
3) Get **ready** for the future by building transit corridors for future premium services.

The Mid-Range Plan identifies service enhancements that pivot around high capacity corridors and a premium transit line along the I-26 Corridor. Although no funding source has been identified, the Mid-Range Plan presents a needs-based assessment to grow the system over the next five to 10 years.



THE SHORT RANGE PLAN RESULTS IN AN EIGHT PERCENT REDUCTION IN SERVICE HOURS. THESE REDUCTIONS ARE INTENDED TO REMOVE INEFFICIENCIES FROM THE CURRENT SYSTEM AND TO DEVELOP A CAPITAL RESERVE FUND FOR FUTURE SYSTEM INVESTMENT IN VEHICLES, PASSENGER AMENITIES, AND TECHNOLOGY.



Alternatives Analysis

The I-26 Fixed Guideway Alternatives Analysis includes a three-tiered screening process to identify the best transit mode and alignment for a fixed guideway transit alternative that meets the project purpose and goals.

- Pre-Screen – Fatal Flaw Analysis
- Screen One – Initial Screening
- Screen Two – Detailed Screening

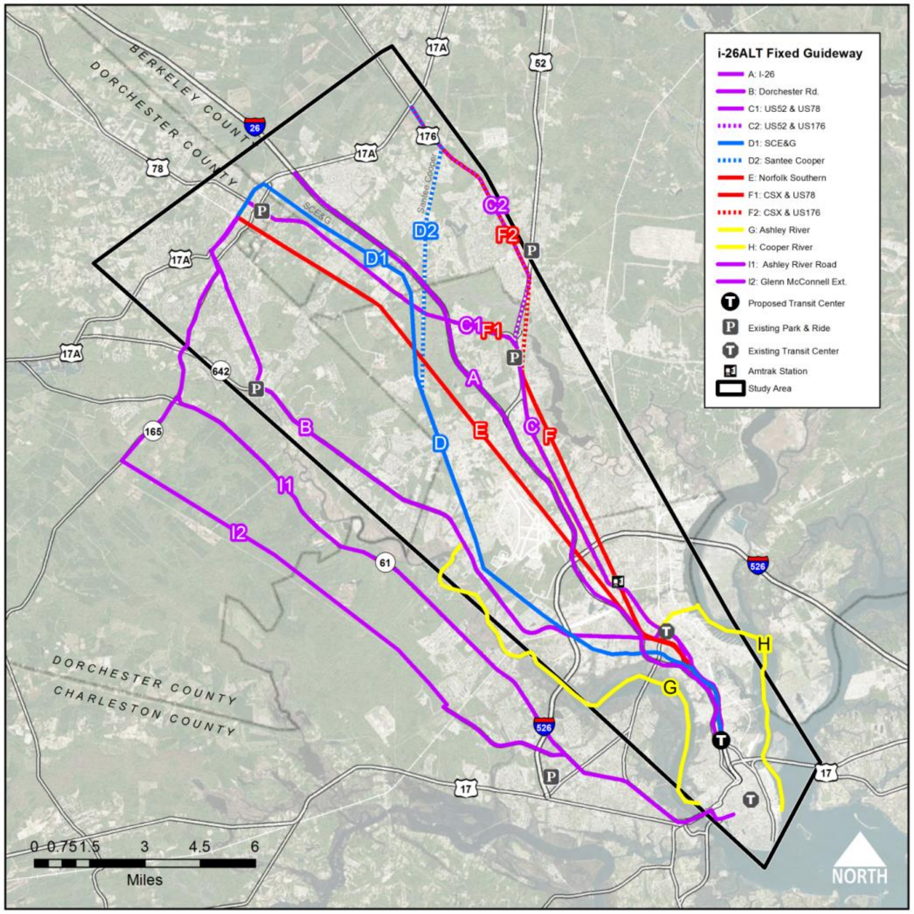
The pre-screen analysis identifies the universe of potential transit modes and an array of potential alignments including roadways, rail corridors, utility alignments, waterways, and other alignments to eliminate those that do not meet the following criteria:

1) Has the alternative been eliminated previously for reasons that are still valid?
2) Is a mode or alignment (including alignment segments) ill-suited to address the purpose and need and project goals?
3) Does the mode or alignment have a fatal flaw considering the market and environment in which it would operate or the amount of funding likely to be available?

The Screen One – Initial Screening consisted of a qualitative and quantitative assessment of twenty alternatives that comprised of various transit modes and alignments carried forward and included Bus Rapid Transit (BRT), Light Rail Transit (LRT) , Hybrid Rail, and Commuter Rail, as well as alignments along roadways, rail lines and utility corridors. A peer system review and land use analysis were also conducted to develop measures for this analysis.

The Screen Two – Detailed Screening of BRT and LRT alternatives were assessed using FTA's project justification criteria based on ridership forecasts developed with the FTA's STOPS model, and planning level capital and operating costs.

Pre-Screen Alignments



Alternatives Analysis

Pre-Screen Analysis:

Has the alternative been eliminated previously for reasons that are still valid?

Is a mode or alignment (including alignment segments) ill-suited to address the purpose and need and project goals?

Does the mode or alignment have a fatal flaw considering the market and environment in which it would operate or the amount of funding likely to be available?

Conventional Bus

... also called local bus, trolley, demand response, express bus, or commuter bus.

Defined: Roadway vehicles powered by diesel, gasoline, battery, or alternative fuel engines operating on streets and roadways in fixed-route or other regular service.

Example: CARTA - Charleston, SC

Heavy Rail

... also called metro, subway, rapid transit, or rapid rail.

Defined: Rail service operating on electric railway with the capacity for heavy traffic with rapid acceleration passenger cars in a separate right-of-way.

Examples: Washington, DC
Atlanta, GA
New York, NY

People Mover

Defined: Electric transit vehicles operating on a guideway without a crew.

Examples: Miami, FL
Jacksonville, FL

Bus Rapid Transit

... also called BRT.

Defined: System of buses that operate like a conventional rail in reserved guideways or mixed traffic.

Examples: Orlando, FL
Las Vegas, NV
Los Angeles, CA

High Speed Rail

Defined: Rail service that operates on rail lines designed to operate at high speeds up to 150 miles per hour, powered by diesel-electric locomotives or electricity from overhead wires.

Examples: Europe
US: Amtrak (limited speed on Acela Express)

Personal Rapid Transit

... also called PRT.

Defined: Small, lightweight, driverless electric vehicles running on a special guideway, with on-demand, nonstop service.

Examples: Morgantown, WV
Heathrow Airport, UK
Madsar City, UAE

Light Rail Transit

... also called streetcar, tramway, or trolley.

Defined: Short passenger rail cars on fixed rails in right-of-way that is separated from other traffic or mixed with traffic, driven electrically from an overhead electric line by an operator on board the vehicle.

Examples: CATS - Charlotte, NC
Norfolk, VA
Phoenix, AZ

Magnetic Levitation

... also called Maglev.

Defined: Trains that hover above tracks or guideways that are levitated and propelled by magnetic force, eliminating friction to allow for high speeds of 300 miles per hour.

Examples: China
Japan

Aerial Tramway

Defined: Electric system passenger vehicles running on a special guideway, with on-demand, nonstop service.

Examples: Portland, OR

Commuter Rail

... also called streetcar, tramway, or trolley.

Defined: Urban passenger train service consisting of local short distance travel between a central city and adjacent suburbs using electric or diesel locomotive hauled or self-propelled railroad passenger cars.

Examples: STAR - Nashville, TN
Miami, FL
Chicago, IL

Monorail

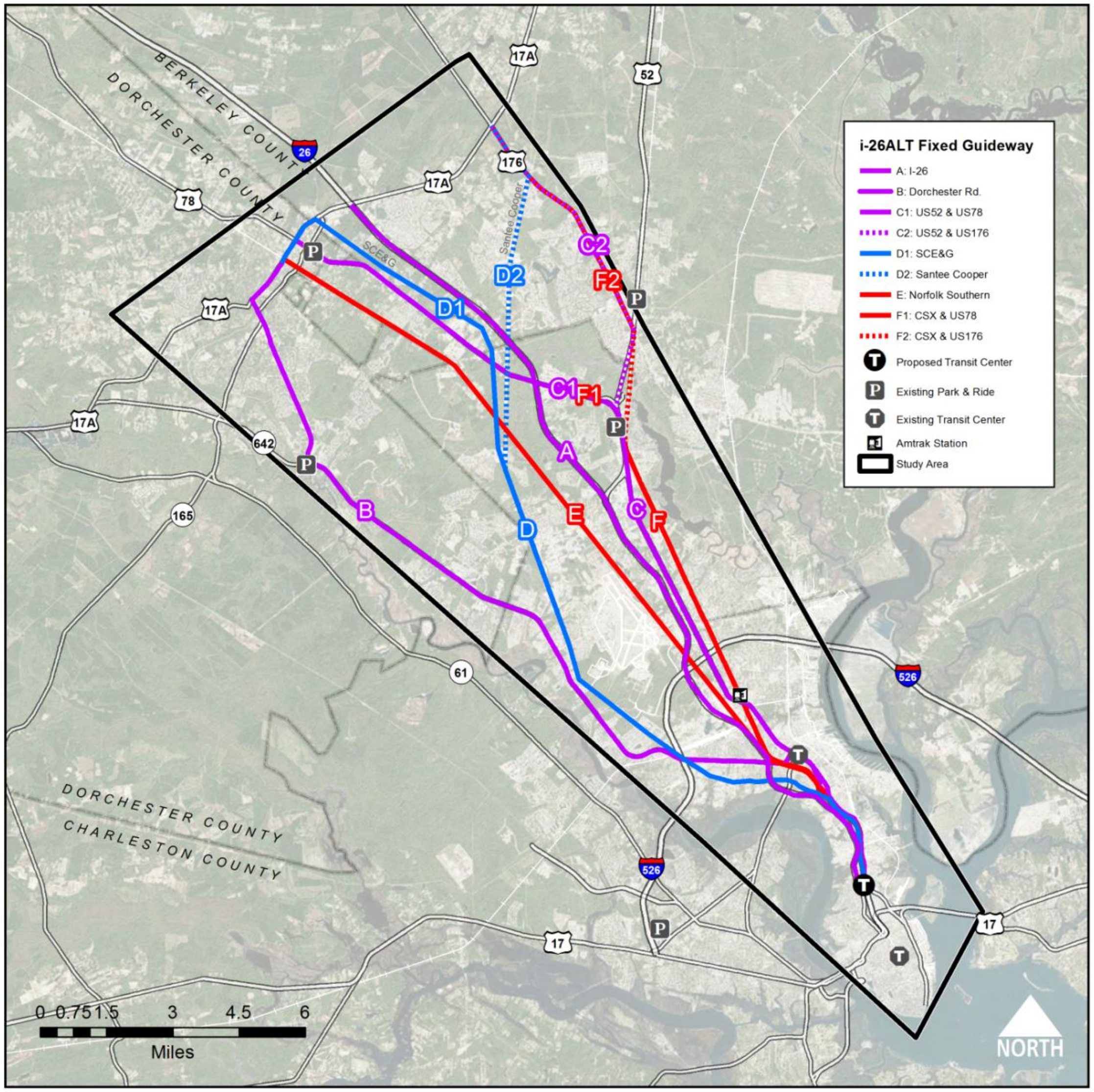
Defined: Electric guided transit vehicles operating suspending from or straddling on a guideway formed by a single beam, rail, or tube.

Examples: Las Vegas, NV
Seattle, WA
Orlando (Disney), FL

Ferry Boat

Defined: Vessels carrying passengers and vehicles over a body of water.

Examples: Fort Lauderdale, FL
Seattle, WA
New York, NY



Screen One Alignments

Bus Rapid Transit

- System of buses that operate like a conventional rail in reserved guideways or mixed traffic.

Light Rail Transit

- Short passenger rail cars on fixed rails in right-of-way that is separated from other traffic or mixed with traffic, powered electrically from an overhead electric line.

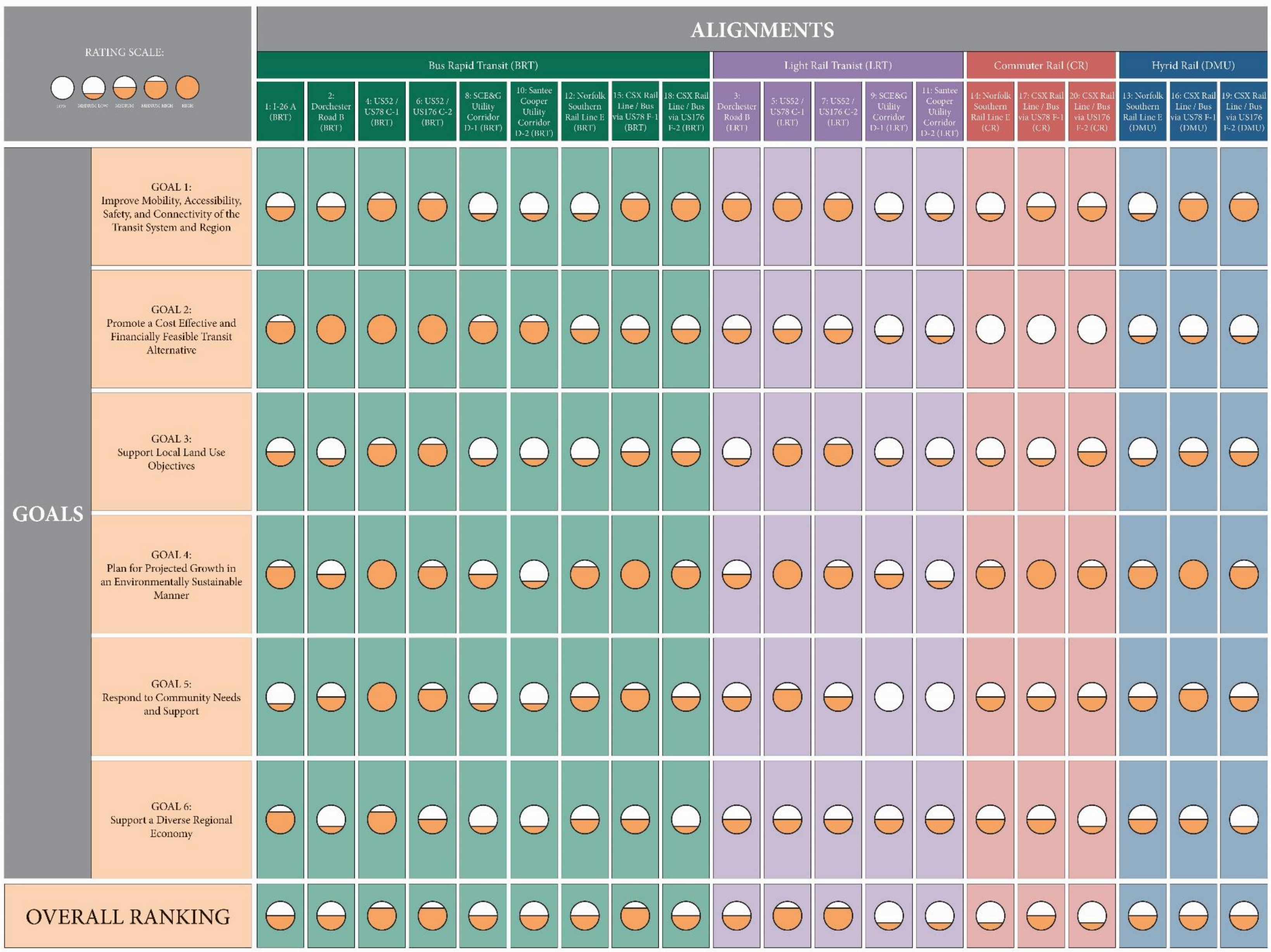
Hybrid Rail

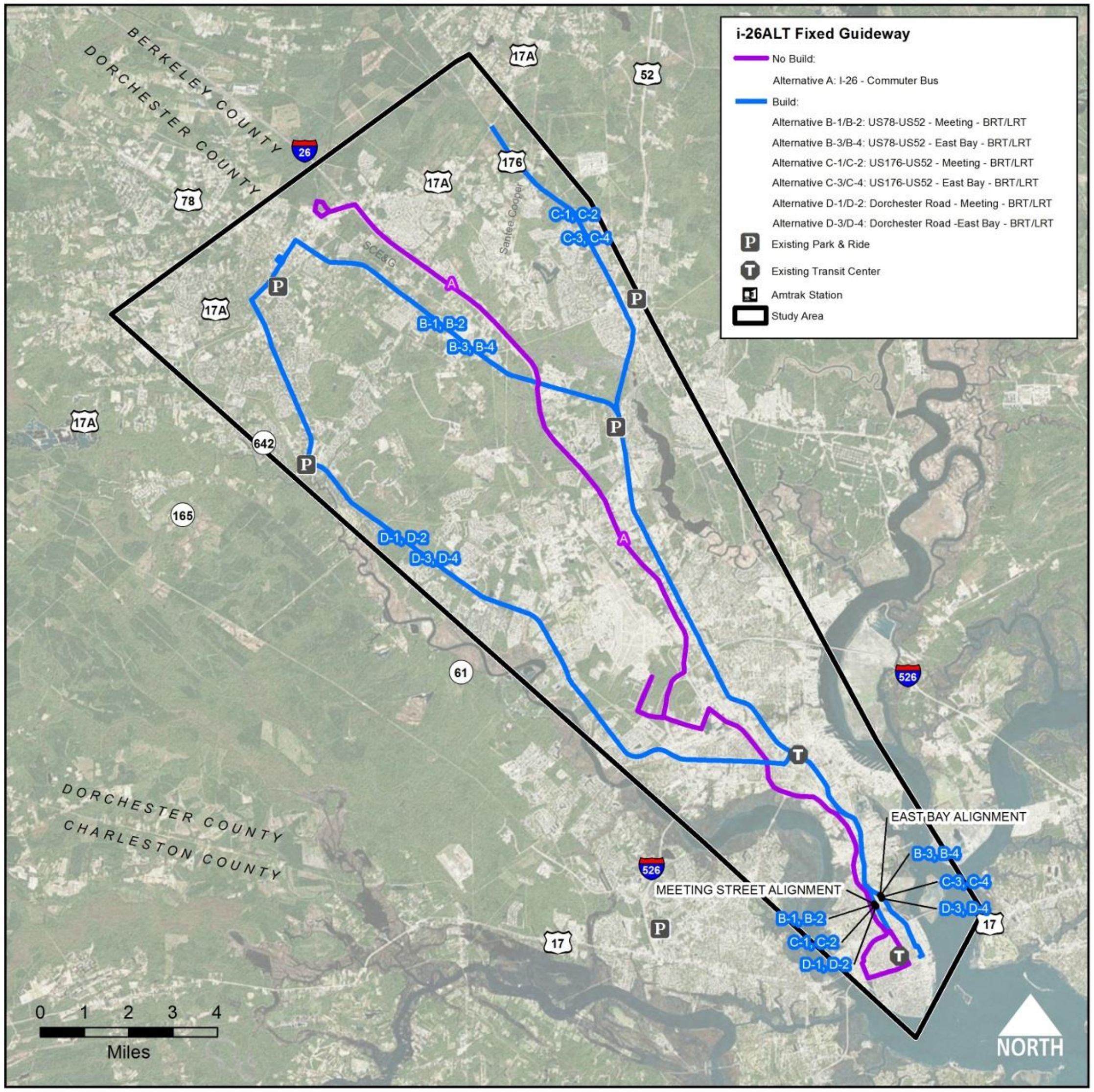
- Urban passenger train service operated as light rail or commuter rail service using electric or diesel self-propelled passenger cars. (EMU/DMU)

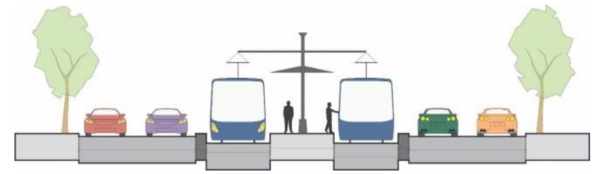
Commuter Rail

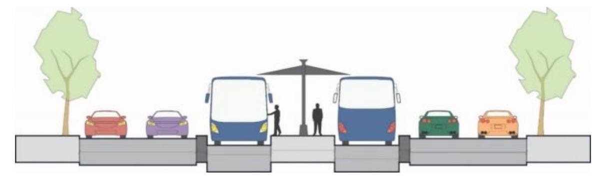
- Urban passenger train service consisting of local, short distance travel between a central city and adjacent suburbs using electric or diesel locomotive hauled passenger cars.

Screen One Rankings









- Alternative A: No Build I-26 Commuter Bus
- Alternative B-1: US 78/US 52/Meeting– BRT
- Alternative B-2: US 78/US 52/Meeting – LRT
- Alternative B-3: US 78/US 52/East Bay – BRT
- Alternative B-4: US 78/US 52/East Bay – LRT
- Alternative C-1: US 176/US 52/Meeting – BRT
- Alternative C-2: US 176/US 52/Meeting – LRT
- Alternative C-3: US 176/US 52/East Bay – BRT
- Alternative C-4: US 176/US 52/East Bay – LRT
- Alternative D-1: Dorchester Rd/US 52/Meeting – BRT
- Alternative D-2: Dorchester Rd/US 52/Meeting – LRT
- Alternative D-3: Dorchester Rd/US 52/East Bay – BRT
- Alternative D-4: Dorchester Rd /US 52/East Bay – LRT

Screen Two Alignments

Travel Demand Forecasting

The project team prepared ridership forecasts using the Simplified Trips-On-Project Software (STOPS), a transit ridership model developed by the Federal Transit Administration to support planning of fixed guideway transit projects. STOPS was calibrated using market data obtained from a 2014-2015 survey of CARTA riders that shows the location of key transit markets and the characteristics of transit riders. STOPS also utilizes highway network information and socioeconomic forecasts from the BCDCOG travel forecasting model to provide an understanding of how existing travel conditions are likely to evolve into the future.

Service plans were prepared for each short list alternative including station locations, BRT or LRT timetables, and adjustments to existing competing or complementary bus services. These service plans were processed by STOPS and used to generate estimates of future year ridership for each route and station included in each alternative.

This project utilized STOPS version 1.52—the most recent version available at the time of the project. FTA is currently in the final stages of developing STOPS version 2.00 and BCDCOG should consider updating this analysis when the next version becomes available. One new capability in STOPS version 2.00 will be the ability to include special transit generators such as downtown visitors which are under-represented in the current implementation of STOPS. Although these trips are not likely to use the BRT or LRT lines, the special generator capability will allow the STOPS representation of current transit ridership to more closely align with observed ridership patterns in Charleston.

It is likely that any follow-up analysis will occur after the formal adoption of new BCDCOG population and employment forecasts, and the next round of analysis should be updated to represent the most recent set of adopted socioeconomic projections.

Screen Two – Project Justification Criteria

Cost Effectiveness	• Cost per Trip • Must be Under $10 for Medium Rating
Mobility Improvements	• Total Number of Trips on the Project • 5M or Higher for Medium Rating
Congestion Relief	• Number of New Weekday Transit Trips • 2,500 for Medium Rating
Environmental Benefits	• Dollar Value based on change in Vehicle Miles Traveled for Air Quality Emissions, Energy Use, Greenhouse Gas Emissions, and Safety
Land Use	• Population and Employment from Census Data within ½ Mile of Stations • Legally Binding Affordability Restricted Housing within ½ Mile of Stations
Economic Development	• Transit Supportive Plans and Policies

CRITERIA	BRT: Alt B-1: US78/ Meeting	Alt B-3: US78/ East Bay	Alt C-1: US176/ Meeting	Alt C-3: US176/ East Bay	Alt D-1: Dorchester/ Meeting	Alt D-3: Dorchester/ East Bay
COST EFFECTIVENESS: Cost Per Trip *Preliminary FTA Rating (\$9.99 or Lower for Medium Rating)*	\$9.12	\$9.64	\$12.41	\$12.44	\$12.04	\$11.74
MOBILITY IMPROVEMENTS: Trips on Project *Preliminary FTA Rating (5,000,000 or Higher for Medium Rating)*	2,831,044	2,899,104	2,179,638	2,279,199	2,176,893	2,376,303
CONGESTION RELIEF: New Transit Trips *Preliminary FTA Rating (2,500 or Higher for Medium Rating)*	3,973	3,818	1,968	1,840	4,010	3,970
ENVIRONMENTAL BENEFITS: Cost/Benefit Ratio *Preliminary FTA Rating (0% or Higher for Medium Rating)*	0.9%	0.2%	-3.3%	-3.8%	-1.6%	-2.0%
LAND USE: Employment and Population Density *Preliminary FTA Rating (Employment: 70,000+ for Medium Rating, Population Density: 5,760+ for Medium Rating)*	Emp: 28,058 Pop: 2,257	Emp: 33,336 Pop: 1,986	Emp: 23,521 Pop: 2,462	Emp: 28,799 Pop: 2,146	Emp: 18,730 Pop: 2,515	Emp: 24,008 Pop: 2,199
ECONOMIC DEVELOPMENT						
OVERALL RATING						

Screen Two BRT Alternative Ratings

CRITERIA	LRT: Alt B-2: US78/ Meeting	LRT: Alt B-4: US78/ East Bay	LRT: Alt C-2: US176/ Meeting	LRT: Alt C-4: US176/ East Bay	LRT: Alt D-2: Dorchester/ Meeting	LRT: Alt D-4: Dorchester/ East Bay
COST EFFECTIVENESS: Cost Per Trip *Preliminary FTA Rating ($9.99 or Lower for Medium Rating)*	$36.31	$38.03	$51.79	$51.75	$44.51	$45.93
MOBILITY IMPROVEMENTS: Trips on Project *Preliminary FTA Rating (5,000,000 or Higher for Medium Rating)*	3,645,735	3,721,309	2,673,395	2,821,796	3,026,986	3,082,330
CONGESTION RELIEF: New Transit Trips *Preliminary FTA Rating (2,500 or Higher for Medium Rating)*	6,617	6,412	3,663	3,586	6,255	6,120
ENVIRONMENTAL BENEFITS: Cost/Benefit Ratio *Preliminary FTA Rating (0% or Higher for Medium Rating)*	-0.4%	-0.6%	-1.6%	-1.7%	-1.4%	-1.5%
LAND USE: Employment and Population Density *Preliminary FTA Rating (Employment: 70,000+ for Medium Rating, Population Density: 5,760+ for Medium Rating)*	Emp: 28,058 Pop: 2,257	Emp: 33,336 Pop: 1,986	Emp: 23,521 Pop: 2,462	Emp: 28,799 Pop: 2,146	Emp: 18,730 Pop: 2,515	Emp: 24,008 Pop: 2,199
ECONOMIC DEVELOPMENT						
OVERALL RATING						

Screen Two LRT Alternative Ratings

Public Involvement

The I-26 Fixed Guideway Alternatives Analysis outreach process was designed to provide opportunities for interested parties to receive information, discuss issues, and participate in the decision-making process during the study, particularly at key milestones. The outreach focused on engaged participation by a variety of stakeholders and the public with the goal of selecting a preferred alternative for transit improvements along the study corridor. It also supported the ongoing advocacy and outreach activities set forth by the Charleston Area Transportation Study (CHATS) and the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) to promote coordinated regional transportation planning. A Public Involvement Plan (PIP) was created to guide the project's engagement efforts and defines strategies for communicating with agencies, stakeholders, and the public about the I-26 Regional Fixed Guideway Transit Alternatives Analysis (i-26ALT) project.

Public engagement efforts undertaken in the Alternatives Analysis process were focused on ***identifying*** the various audiences/stakeholders vested and impacted by the study; ***educating*** these groups on the purpose and need for the project; ***informing*** them of findings resulting from the analysis; and actively and meaningfully ***engaging*** them in the decision making process.

IDENTIFY

EDUCATE

INFORM

ENGAGE

338 Attendees to 12 Public Meetings
75 Attendees to 3 Focused Transit Talks

6,601 Unique Visitors, 19,911 Page Views and 192 Active Participants on Mindmixer

1,756 Corridor Employee Surveys Completed and Validated

190 Followers and 235 Tweets
Most Active Month: April with 7,183 Impressions

114 Fans and 1,965 Unique People Reached

"For that, we are going to need a comprehensive regional transportation and public transit plan. And the good news is that that process is starting to come together. By working with our citizens and regional partners, we've already seen real progress on several major fronts, from the re-think of Folly Road, to the widening of Clements Ferry, to the **I-26 Alt study,** which recently recommended a bus rapid transit system from Summerville to Charleston. This kind of close collaboration between and among citizens and jurisdictions is going to be key to solving our traffic problems in the years ahead -- and we as a city are committed to doing our part to make it work."

– John J Tecklenburg, Mayor City of Charleston

State of the City Address, January 2016

ULI Sponsored Transit Talk – One of three Transit Talks focused on Land Use, Environment & Community, and Business

Recommendation

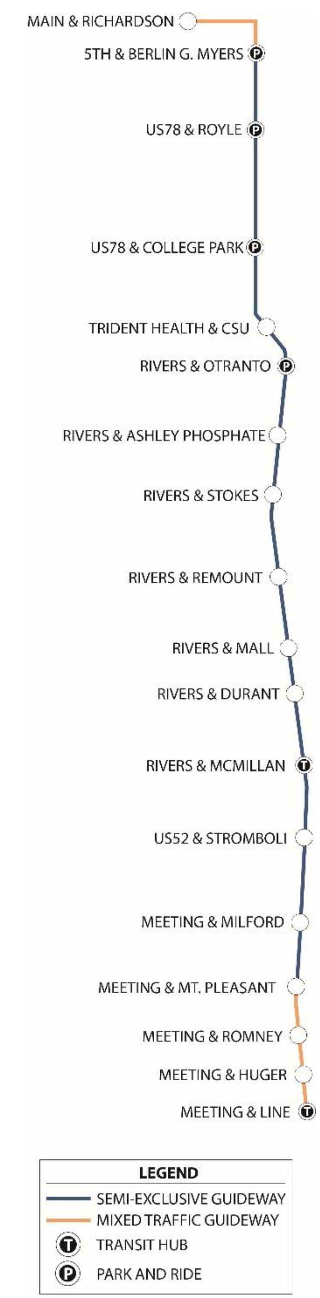
As a result of a 15-month study with the purpose to identify a fixed guideway transit alternative that will improve transit service and enhance regional mobility along the 22-mile I-26 Corridor connecting Summerville, North Charleston, and Charleston, the alternative recommended to move forward into further project development is Alternative B-1: Bus Rapid Transit (BRT) along the US 78/US 52 (Rivers Avenue) alignment to a terminus at Line Street.

Based on a three-tiered screening process of transit modes and potential alignments, as well as a public outreach program that included stakeholders and community members, Alternative B-1 ranked highest across all of the alternatives under consideration in terms of meeting the purpose and goals of the project.

- Total Annual Trips: 2 million trips per year
  - 3,772 "New" daily transit trips
  - Total systemwide annual trips: 6.5 million
- Planning Level Operating Costs: $5.9M/Year
  - Weekday Service: 4:00 AM – 1:00 AM; 10-minute peak, 20-minute non-peak, 30-minute early/late
  - Saturday: 6:00 AM – 1:00 AM, 20-minute service
  - Sunday: 7:00 AM – 11:00 PM , 30-minute service
- Planning Level Construction Costs: $360 Million
  - $15.5 M/Mile
  - 23.1 Mile Corridor
  - 18 Stations
  - 16 Vehicles

Estimated Weekday Boardings by Station

Station	Station Type	Forecasted Ridership	
		Alt. B1 (2015)	Alt. B1 (2035)
Main St - Richardson Ave	Urban Center	551	550
E 5th St N - Berlin Pkwy	Park & Ride	806	869
US 78 - Royle Rd	Park & Ride	426	437
US 78 - College Park Rd	Park & Ride	370	409
US 78 - I 26 (Trident Health)	Activity Center	156	187
Rivers Ave - Ontario Blvd	Park & Ride	556	640
Rivers Ave - Ashley Phosphate Rd	Activity Center	257	283
Rivers Ave - Stokes Ave	Activity Center	193	196
Rivers Ave - Remount Rd	Airport	521	574
Rivers Ave - Mall Dr	Activity Center	392	441
Rivers Ave - Durant Ave	Intermodal Center	241	277
Rivers Ave - McMillan Ave	Transit Hub	630	740
US52 - Stromboli Ave	Neighborhood	176	193
Meeting St - Milford St	Neighborhood	122	192
Meeting St - Mt Pleasant St	Transit Hub	231	258
Meeting St - Romney St	Neighborhood	99	109
Meeting St - Huger St	Activity Center	191	214
Meeting St - Line St	Transit Hub	957	1,126
Total		6,874	7,696



Recommendation

The i-26*ALT* project was developed to identify a transit alternative that could compete for federal funds under the Federal Transit Administration's Capital Investment Grant Program, which includes a multi-phased, competitive process that project sponsors must follow to be considered for funding. The Comprehensive Operational Analysis was developed to support key requirements under the local financial commitment ratings criteria for the existing transit system. The Alternatives Analysis focuses on the project justification criteria. The following are the key milestones for the next-steps:

- **2016:** Finalize and adopt COA and Alternative Analysis
  - CHATS/BCDCOG to select Preferred Alternative to move forward
  - CARTA to adopt COA recommendations and implement Short-Range Plan
- **2017 to 2018**: Project Development
- **2019 to 2021:** Engineering Phase (Note: Projects under $300M, and requesting less than $100M in CIG funds have 3-years to complete both project development and engineering phases –which would be 2017 to 2019)
- **2022 to 2025**: Construction and implementation

FTA'S Capital Investment Grant Program Three Phase Process for New Starts Projects

Project Development

Complete **NEPA** process

Select **Locally Preferred Alternative (LPA)**

Adopt LPA in Fiscally Constrained **Long Range Transportation Plan**

Obtain **Medium Project Rating** under Project Justification Evaluation

Obtain commitment of **30% of matching funds**

Complete **30% design and engineering**

Two-Year Timeframe

Engineering

Commitment of **50% of matching funds**

Significant progress with engineering

Recommendation for Construction Grant Agreement

Three -Year Timeframe

Construction

New Starts project costs are greater than $300M with a federal share greater than $100M. Small Starts projects follow a two-phased process: Project Development and Construction. Project Development and Engineering must be complete within three years. Small Starts projects cost less than $300M with $100M or less in Federal Funds.

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i-26ALT

I-26 Fixed Guideway Alternatives Analysis

CHAPTER I: Existing Conditions

Draft Report – February 2016

DAVIS & FLOYD FOR INFORMATION SINCE 1954 DAVISFLOYD.COM PROFESSIONAL ENGINEERING

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1 Introduction

The I-26 Fixed Guideway Alternative Analysis (i-26*ALT*) identifies and evaluates transit solutions for the I-26 corridor connecting Summerville, North Charleston and the Charleston Peninsula. These solutions are intended to improve transit service and enhance regional mobility, manage existing and future transportation demand, support the regional economy, and create livable communities. Information gathered in this report is meant to inform the alternatives analysis process as fixed guideway alternatives and alignments are screened to develop a community supported Locally Preferred Alternative (LPA) that can move forward into the Project Development/NEPA phase of the FTA's Capital Investment Grant program.

This Existing Conditions Report provides a macro-level overview of the Study Area and its delineated boundaries, as well as a summary of relevant infrastructure including transportation, rail, utility and transit facilities, to guide the development of conceptual fixed guideway alternatives and alignments to be considered in future analysis. This is followed by a more detailed or micro-level review of the Study Area through individual Sub Area analyses.

Existing conditions were recorded through a mix of field visits, review of maps, available Geographic Information Systems (GIS) data, relevant system data provided by local agencies, and a comprehensive review of local plans and studies conducted in the corridor. Due to the large extent of the i-26*ALT* Study Area, data collection is further organized by sub areas. Sub areas were determined by aggregating census block groups into manageable sections primarily along the travel shed of the interstate. Areas were delineated based on a combination of physical boundaries (major roads, water features, etc.) and naturally clustered land use and development patterns.

2 Study Area

The i-26*ALT* Study Area includes the areas and communities surrounding the 22-mile segment of I-26 connecting Summerville, North Charleston and Charleston, South Carolina.

2.1 General Description

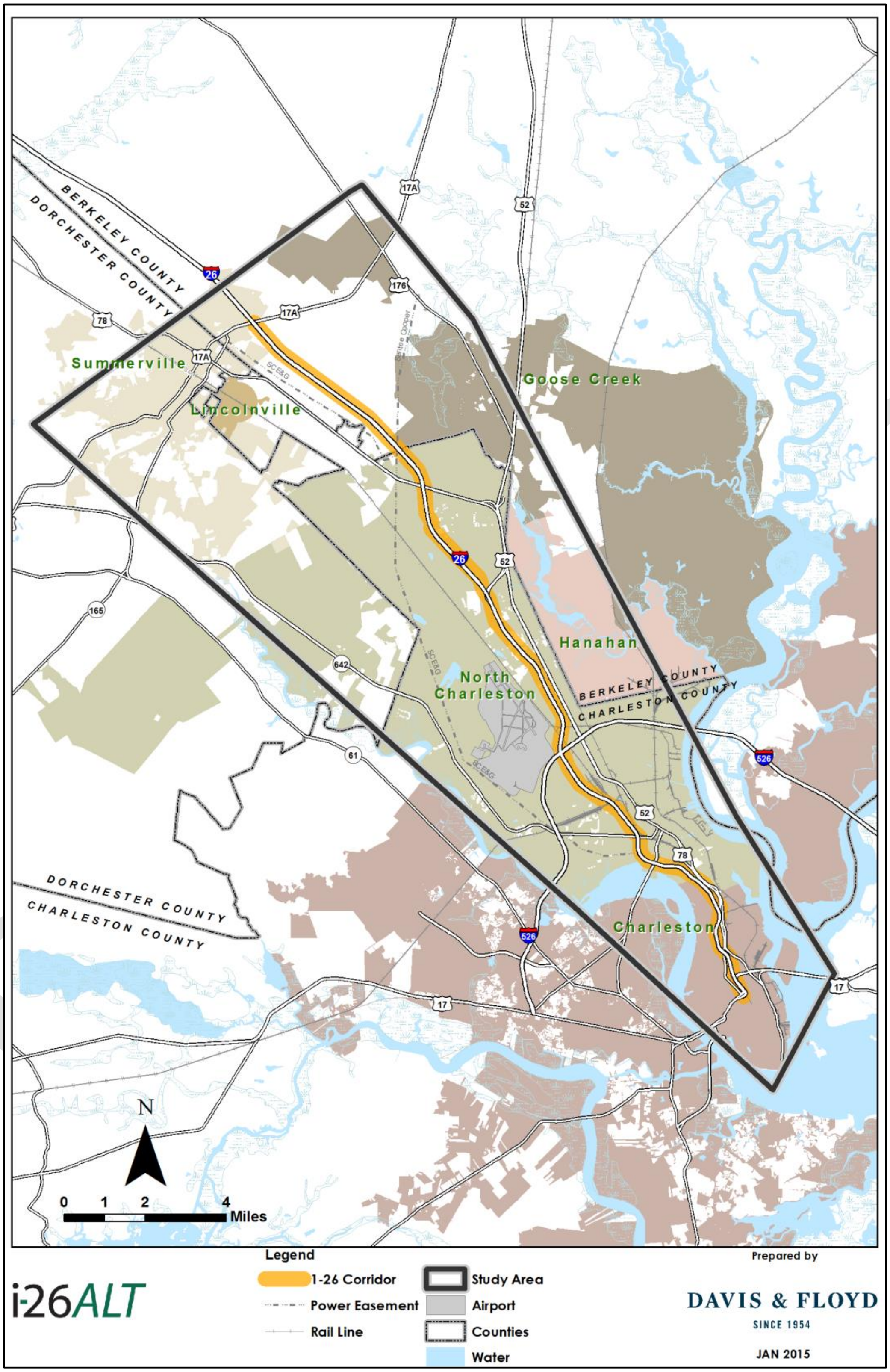
The northwestern boundary of the Study Area includes the Town of Summerville and US 17A. The Study Area is bounded to the southwest primarily by Dorchester Road and the Ashley River; to the north and east by US 176, the City of Hanahan, and the Cooper River; and to the southeast by the Charleston Peninsula. The following section provides a map of the Study Area. Maps were generated from GIS data collected primarily from US Census Tiger files, local municipalities, and the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG). Aerial Orthoimagery (high resolution aerial images) and US Topo Quadrangle maps obtained from the US Geological Survey (USGS) are also included in the land use and natural resources sections.

2.1.1 Corridor Map

The I-26 Corridor travels through two counties - five miles through Berkeley County and 17 miles through Charleston County. The i-26*ALT* Study Area, however, includes the three counties of the tri-county region, Berkeley County, Charleston County, and Dorchester County, since potential alignments include parallel facilities that pass through some or all of these jurisdictions. There are also a number of local municipalities represented within the Study Area.

Figure 2-1 provides a map of the I-26 Corridor and the local jurisdictions located in the Study Area. The municipalities of Summerville and Lincolnville are located in the northwestern sector of the Study Area, and Goose Creek is located in the northeast. A large portion of the Study Area is located in the jurisdictional boundary of the City of North Charleston. The City of Hanahan is located on the eastern edge of the Corridor, while the southern end of the Study Area falls under the jurisdiction of the City of Charleston.

Figure 2 - 1: i-26*ALT* Study Area and Local Municipalities



2.2 Area Demographics, Land Development Patterns and Existing Zoning

The following section provides an overview of the Study Area demographics, current land use, and existing zoning. Focus is placed on area population and employment data and densities since studies show that of the factors that affect the demand for transit, the most significant is the number of individuals who live and work within easy access, usually walking distance, to transit service. Transit routes located in areas with high population and/or employment areas result in a larger sector of the population having more direct access to transit. Densities also serve as indicators as to the type and frequency of transit service that might be appropriate for an area. Current zoning data for the Study Area was developed from land, zoning and parcel data provided by local jurisdictions. An inventory of current land use for the Study Area was recorded from aerial images and in-field observations.

2.2.1 Study Corridor Demographics

The i-26*ALT* Study Area accounts for roughly 45 percent of existing (2010) population and 54 percent of existing employment (2010) in the tri-county region. Table 2-1 provides a summary of population, household, and employment for the Study Area. Estimates for base year 2010 and horizon year 2035 were obtained from the Charleston Area Transportation Study (CHATS) Regional Transportation Model at the Traffic Analysis Zone (TAZ) level. Using GIS software, a selection of TAZs whose centroid were located inside the Study Area were used to estimate population, household and employment figures.

Population, household and employment growth inside the Study Area from 2010 to 2035 is estimated to increase approximately 22 percent, 24 percent, and 21 percent respectively.

Table 2 - 1: Study Area Population, Household and Employment Statistics

Demographic Characteristics	Region			Study Area			Study Area as % of Region	
	2010	2035	% Change	2010	2035	% Change	2010	2035
Population	621,695	783,516	26%	276,869	338,593	22%	45%	43%
Households	249,569	316,894	27%	108,645	135,143	24%	44%	43%
Employment	307,809	391,053	27%	167,332	203,260	21%	54%	52%

Sources: CHATS Regional Transportation Model (2010 TAZ, 2035 TAZ)

Research provides guidance on typical minimum densities needed to support transit service modes and frequency of service. While these thresholds provide some guidance, they are not exact and are presented under conditional scenarios and constraints. Density guidelines have been developed by a number of sources, including local community planning, in an effort to guide design and land use policies to promote or increase an area's transit ridership potential. Density levels are expressed as floor area ratios, households, residential units, population, employees, jobs, activities (a combination of employment and residents), and commercial use in attempt to put transit supportive densities into context.

The Transit Cooperative Research Program (TCRP) Transit Capacity and Quality of Service Manual (Report 165) provides minimum density values to define transit supportive areas or areas that are capable of supporting hourly fixed route transit service. It is suggested that a typical minimum density of 4 jobs per gross acre or 3 households per gross acre is supportive of hourly daytime transit service. Using these minimum density thresholds as well as a composite of thresholds presented in other studies and plans, the following density level and supported transit service table (Table 2-2) was developed to provide insight into the transit supportive densities that exist in the Study Area.

Table 2 - 2: Transit Supported Service Levels and Density Thresholds

Supported Transit Service	Household Density (Households/Acre)	Jobs Density (Jobs/Acre)
Minimal Transit	1-2	1-3
Hourly Local Bus (1 bus/60 mins.)	3-6	4-25
Frequent Local Bus (1 bus/10-30 mins.)	6-12	25-75
High Capacity Service (BRT or Light Rail)	12+	75+

Source: TCRP Report 165, Urban Land Institute (2003)

Figures 2-2 and 2-3 provide household densities along the Study Area for the years 2010 and 2035. Areas that meet the Transit Capacity and Quality of Service Manual minimum density level (3-6 households/acre) are found primarily within the Study Area and are served by the current CARTA bus system or are within a half-mile radius of routes. Areas with higher density levels of 9 or more households per acre that are supportive of frequent bus service or high capacity transit service are located on the Charleston Peninsula. For the year 2035, areas meeting the minimum transit supportive density increase as indicated in Figure 2-3. Distinct areas of household density growth can be found in North Charleston, Goose Creek and Summerville along the I-26 Corridor. Increases in household density in the Charleston Peninsula for the year 2035 occur in areas that currently have high household densities.

The Study Area's transit supportive job/employment densities for the years 2010 and 2035 are provided in Figures 2-4 and 2-5. Using the Transit Capacity and Quality of Service Manual minimum transit supportive job density threshold of 4 jobs per gross acre, the 2010 job density map indicates areas that are supportive of hourly daytime transit service or better. Areas with higher job densities are located in the more urban core or central business district in Downtown Charleston and also around select employment nodes in North Charleston. Transit supportive job density levels projected for the year 2035 reflect increased density levels in areas of North Charleston south of the I-26 and US 78 intersection, in the Charleston Neck Area, and along Dorchester Road. Employment densities in Downtown Charleston reflect increases in select areas of already high density levels.

While both employment and population densities have a strong relationship to transit ridership and demand, recent research suggests that the magnitude of the relationship between employment densities and transit ridership is greater than that between residential densities and transit ridership. Regional demographics for other identified transit dependent groups can be found in detail in the CARTA Comprehensive Operation Analysis (COA) Existing Conditions Report. The populations identified in the COA include the region's youth, elderly, no vehicle households, low income households, disabled population, and minority population.

Figure 2 - 2: Household Density (2010 TAZ Data)

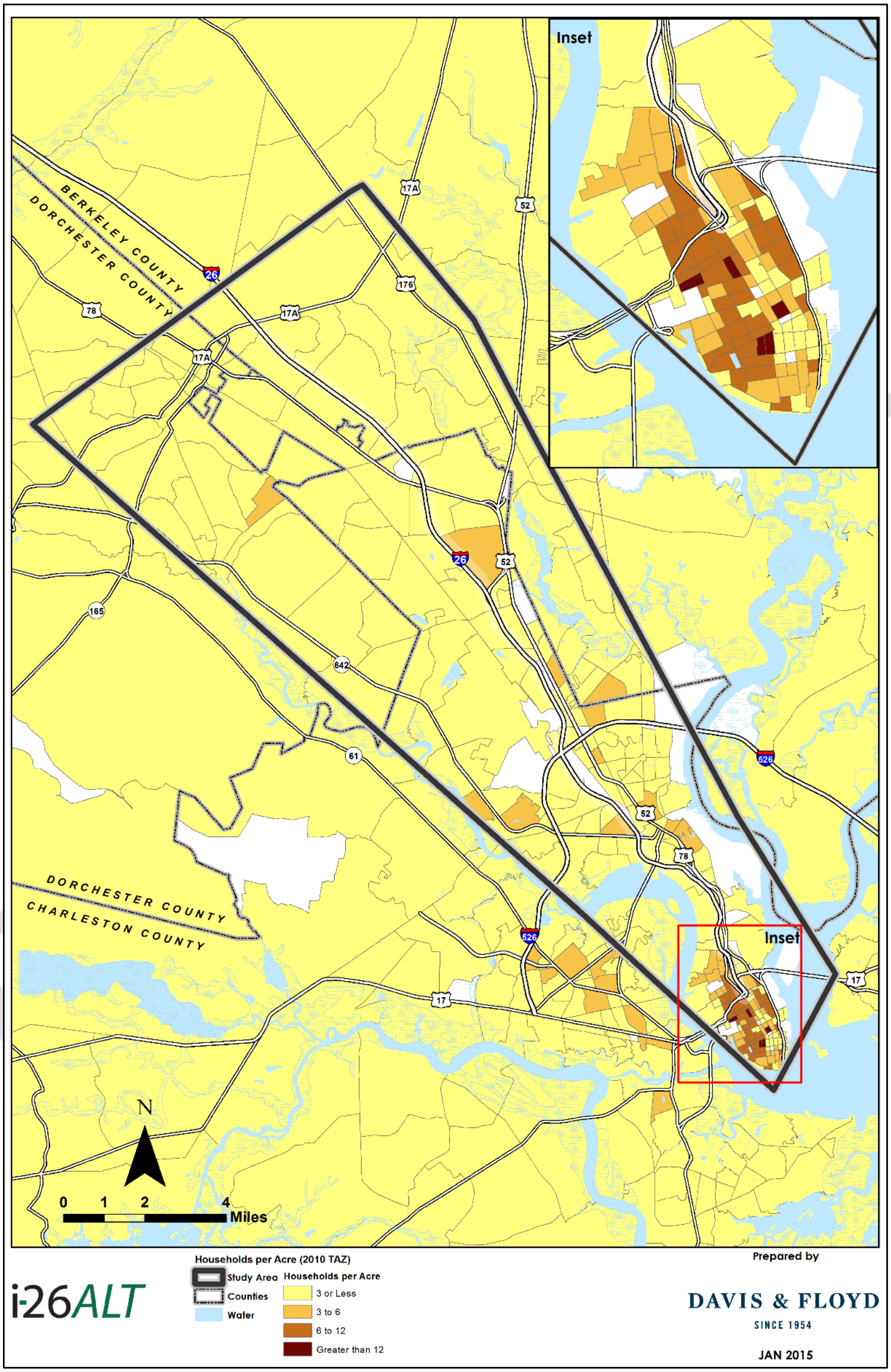


Figure 2 - 3: Household Density (2035 TAZ Data)

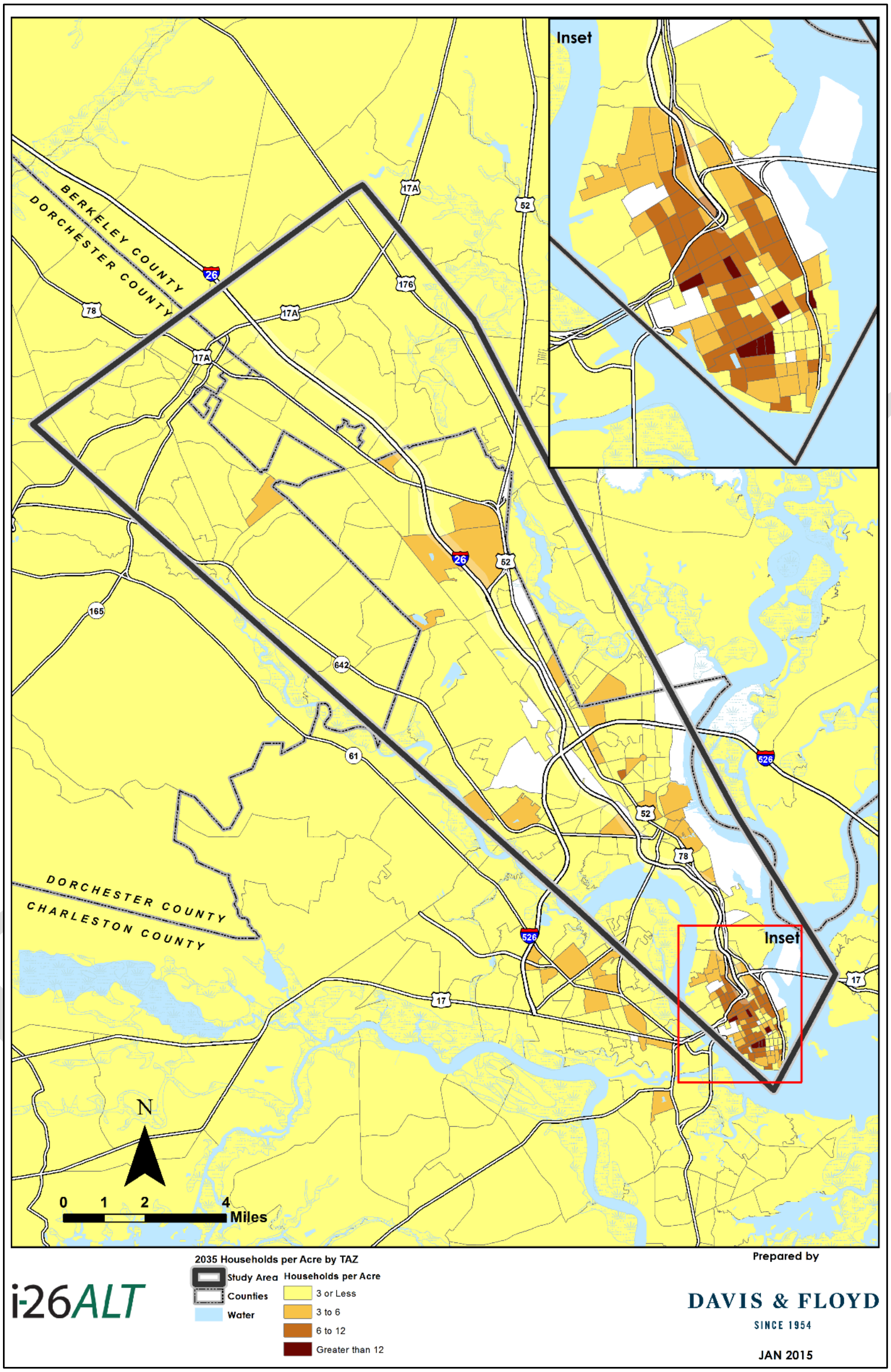


Figure 2 - 4: Job Density (2010 TAZ Data)

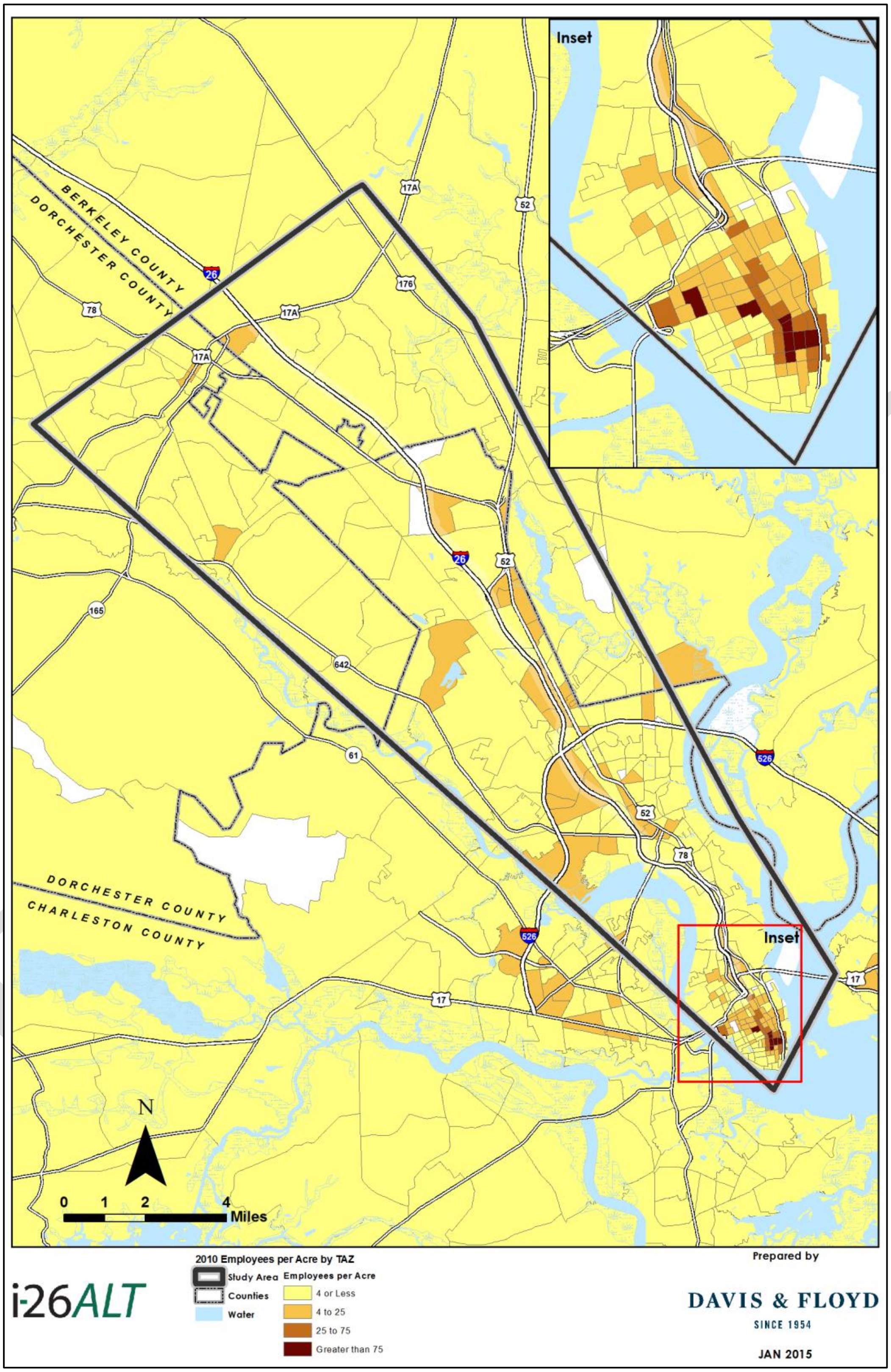
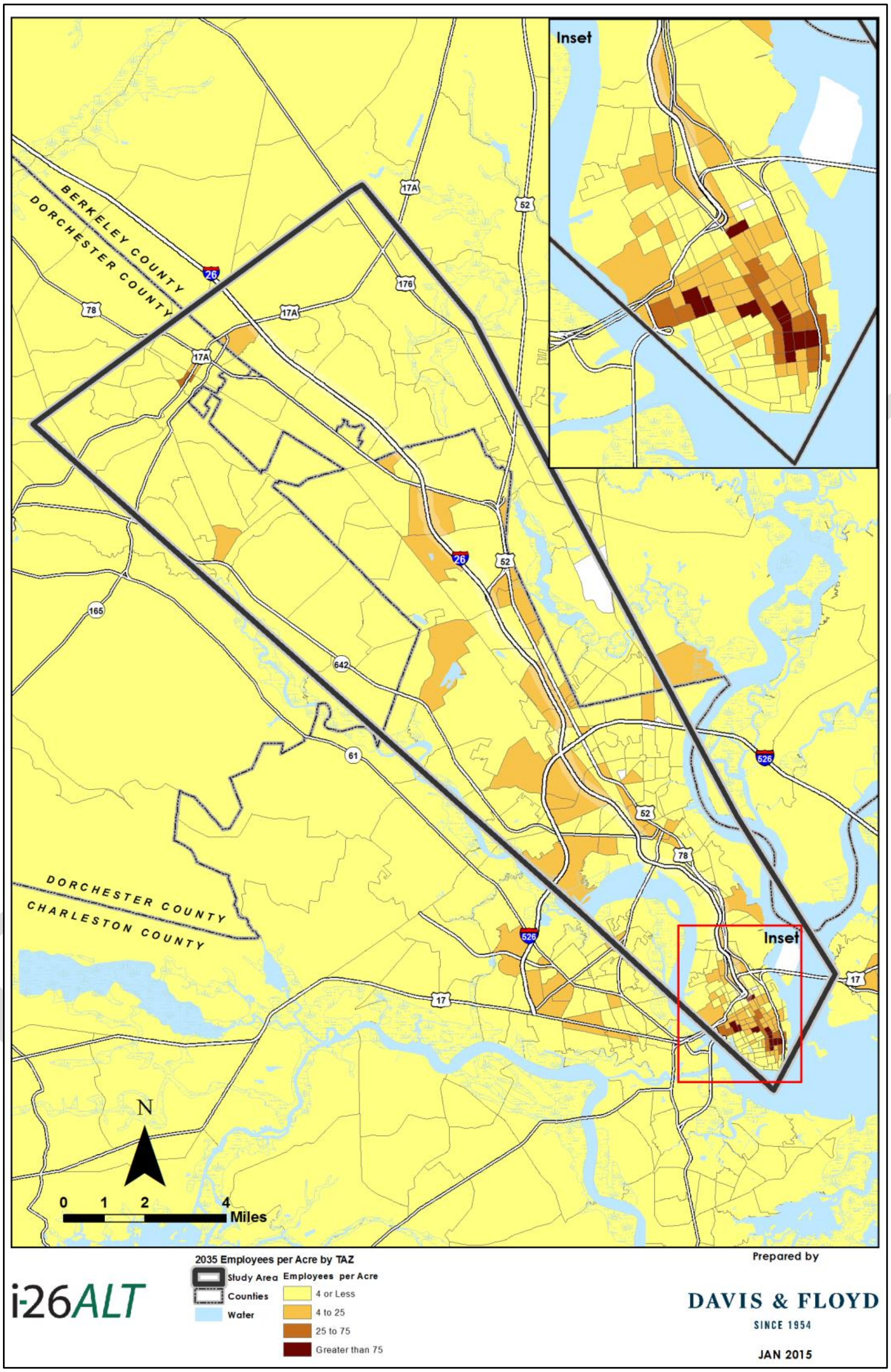


Figure 2 - 5: Job Density (2035 TAZ Data)



2.2.2 Current Land Use and Existing Zoning

Utilizing aerial imagery (Figure 2-6), general observations were made regarding current land development patterns within the Study Area. Existing zoning data for the Study Area was developed from land use, zoning and parcel data provided by local jurisdictions. Due to varying classifications and definitions used by the various jurisdictions, zoning data was broadly re-defined and re-classified to develop categories that can be generalized throughout the entire Study Area. Table 2-3 provides an overview of the re-classified designations applied to the Study Area, and Figure 2-7 provides a map of the generalized classifications.

Table 2 - 3: Study Area Re-defined Zoning Classifications and General Descriptions

Corridor Zoning Classification	Composite Zoning	Description
Commercial	Commercial, Institutional, Office, Business District, Commercial Redevelopment	Uses that offer employment, retail and service opportunities
Light Industrial	Light Industrial	Low-impact or high-tech manufacturing, distribution or warehousing use
Heavy Industrial	Heavy Industrial	Heavy manufacturing, utilities, and any other higher-impact uses
Low Density Residential	Single Family Residential	
Medium Density Residential	Low to Medium Density Residential	
High Density Residential	Multi-Family, Townhome, Duplex	Housing for one or more families including duplexes, condominiums, and apartments
MU/PUD/PDD	Mixed Use, Planned Unit Development, Planned Development District	Similar designations that promote a mix of residential, commercial, retail and office uses; or special zoning areas.
Mobile	Mobile/Manufactured Housing	Any movable dwelling
Rural/Conservation /HOA	Parks and Recreation Conservation Agricultural Public Facilities	Public, private and/or protected ownership including park and recreational spaces, areas preserved in a natural state without development, land owned by homeowners associations, wetlands, floodplains, stream buffers, underdeveloped and unused lands
Vacant	Vacant	Open land with no designated land use or zoning, or areas deemed vacant

General Study Area zoning patterns include:

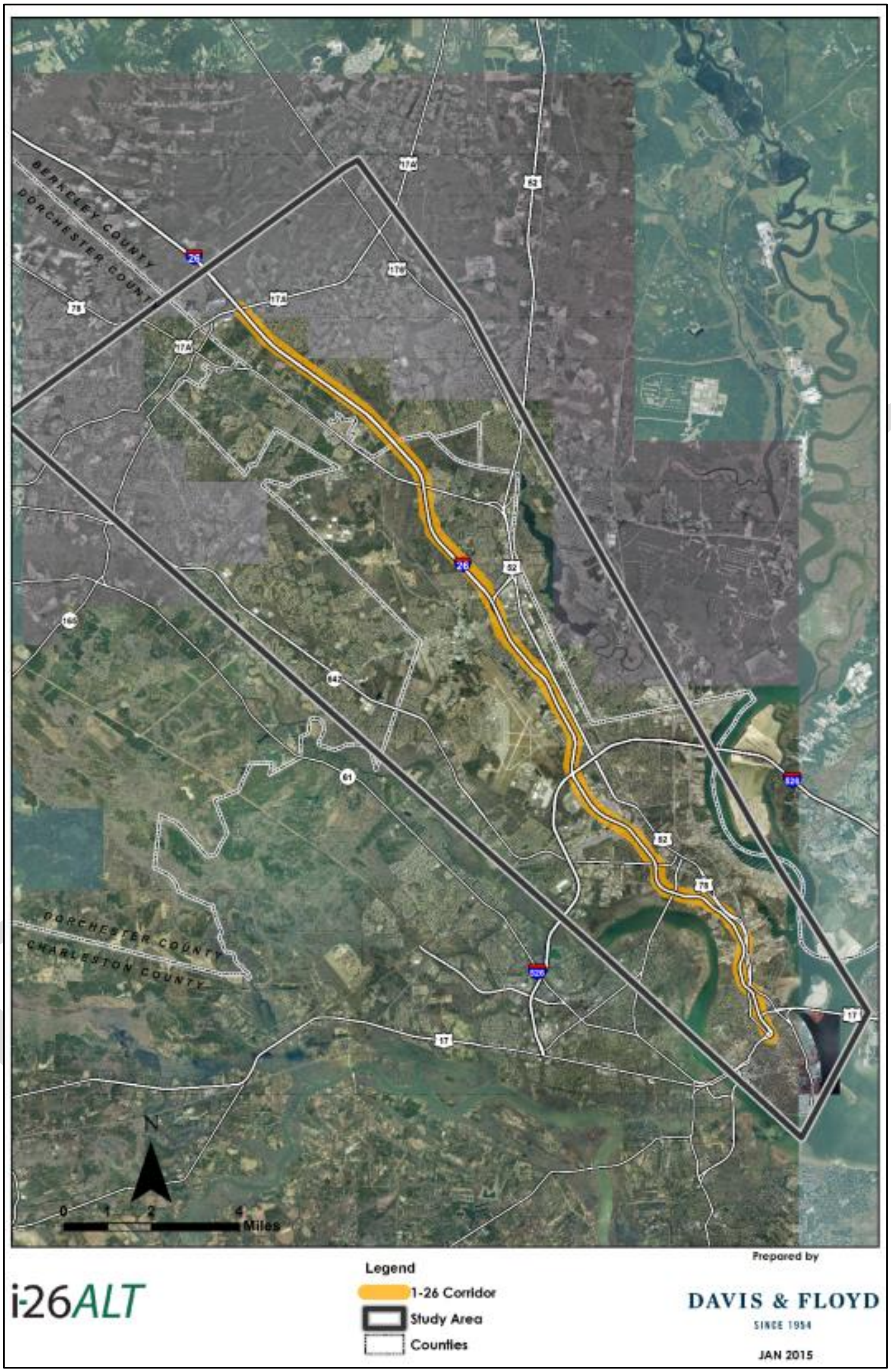
- Light Industrial uses are concentrated in North Charleston, such as the Charleston International Airport, Joint Base Charleston and sites along Palmetto Commerce Parkway.
- Heavy Industrial uses are found mainly within I-526 along the Neck Area and Peninsula and include the region’s port facilities.

- Conservation/Rural/HOA uses are found in the northern areas of the Study Area and along the Goose Creek Reservoir in the City of Hanahan.
- Major commercial corridors are found along Dorchester Road, US 78/US 52/Rivers Avenue, Ladson Road, Ashley Phosphate Road, Old Trolley Road and along US 17A in Summerville.
- Commercial nodes are located at the intersection of US 17A and US 78 (Summerville), Dorchester Road and Ladson Road (Summerville/North Charleston), I-26 and US 78 (North Charleston), US 52 and US 78 (North Charleston), Dorchester Road and Ashley Phosphate Road (North Charleston), I-26 and I-526 (North Charleston), Cosgrove Avenue and I-26, and the Downtown Charleston commercial area.
- Low Density Residential uses are concentrated along corridors in North Charleston, Charleston Neck Area, and Charleston Peninsula. Low Density Residential uses are less linear in the northern parts of the Study Area.
- High Density Residential uses are concentrated on the Charleston Peninsula.
- Medium Density Residential uses are concentrated on the Charleston Peninsula and also in North Charleston.

It is important to note that zoning designations are generalized based on zoning data from multiple municipalities, in which definitions may vary. Additionally, land classifications from Berkeley County were derived from existing land use maps. Thus, land development presented in this section is generalized based on field observations and combined land use classifications, which may not accurately represent the current zoning assigned to a parcel.

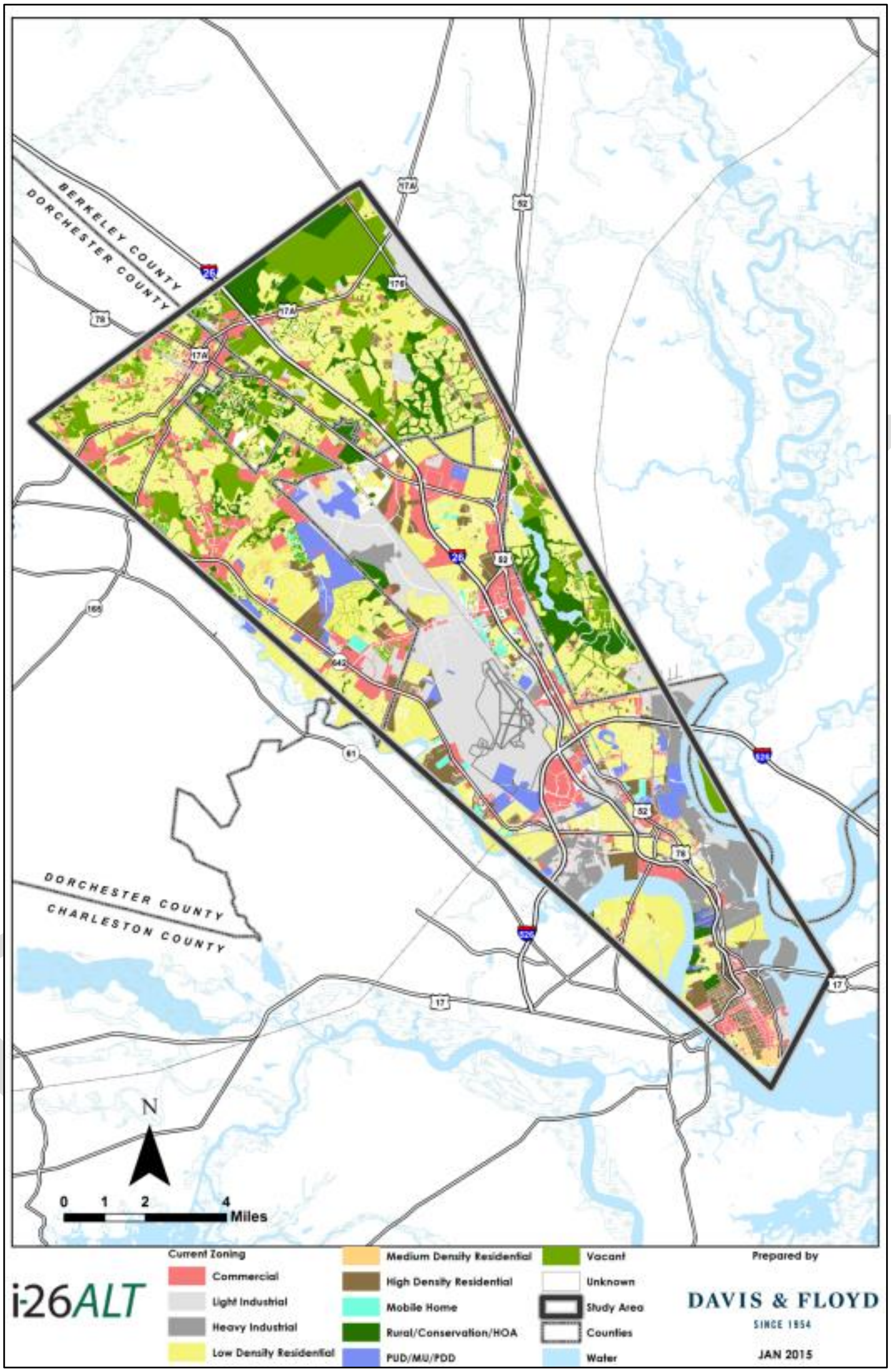
The Corridor's major activity centers are presented in Figure 2-8. The activities identified reflect uses that are normally major trip generators and include educational institutions, shopping, medical facilities, community centers, parks, and civic centers. Activity centers are highly concentrated in North Charleston within the I-526 loop and in Downtown Charleston. Activity centers are also found along major arterials north of I-526 especially along US 52/US 78/Rivers Avenue, Dorchester Road, US 176 and along US 17A and US 165 in Summerville.

Figure 2 - 6: I-26 Study Area – Orthoimagery



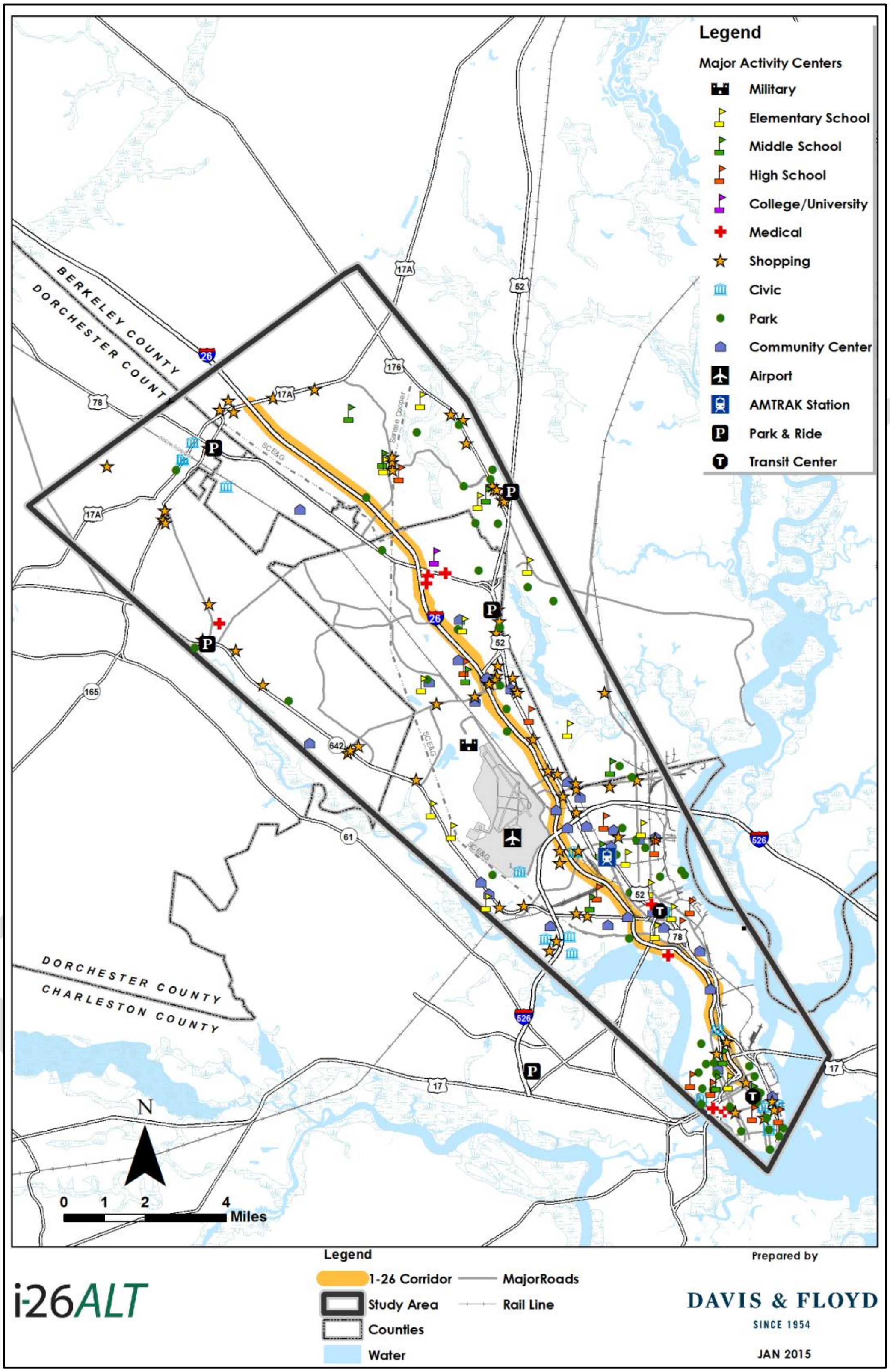
Source: USGS

Figure 2 - 7: Existing Land Zoning



(Note: Zoning is generalized based on GIS data for parcels, zoning, and existing land use)

Figure 2 - 8: Major Activity Centers within Study Area



2.3 Transportation Network Infrastructure

The following section provides an inventory of transportation infrastructure found within the i-26*ALT* Study Area. Transportation network data includes infrastructure such as existing major roadways, network bridges and culverts, traffic congestion and count data, and system crash data. Major roadway facilities are broken down by corridors facilitating both north-south and east-west movements. Descriptions include the facility's location, classification and how it serves the regional system.

2.3.1 Existing Roadways

The major north-south roadway corridors within the Study Area include US 17, Alternate US 17, SC 7 (Cosgrove Avenue), SC 165 (Berlin G. Myers Parkway/Bacons Bridge Road), Orangeburg Road, College Park Road, Old Trolley Road, Palmetto Commerce Parkway, Patriot Boulevard, Cross County Road, North Rhett Avenue/Henry E. Brown Jr. Boulevard, Virginia Avenue, Spruill Avenue, Meeting Street, King Street, Rutledge Avenue, Ashley Avenue, and Lockwood Drive/Boulevard. Figures 2-9 and 2-10 provide maps that identify major roadways.

- US 17 is a principal arterial that connects the Charleston peninsula with the mainland on the east via the Arthur Ravenel Jr. Bridge and on the west via the Ashley River Bridges. Between the Ashley River Bridges and the I-26 terminus, US 17 is a six-lane divided roadway. US 17 becomes limited access and above grade once it reaches the I-26 terminus and is an eight-lane divided roadway over the Arthur Ravenel Jr. Bridge.
- Alternate US 17 runs northeast-southwest and connects Summerville to Moncks Corner. US 17A provides access to SC 165, I-26, and US 78 south to north, within the Study Area. Alternate US 17 begins as a two-lane roadway and then becomes a five-lane roadway with a center turn lane, north of the 1st North Street intersection. Continuing north, the corridor becomes a six-lane divided roadway shortly after its intersection with Berlin G. Myers Parkway, but returns to a five-lane roadway with a center turn lane north of Sangaree Parkway. Alternate US 17 is classified as a minor arterial south of Berlin G. Myers Parkway and as a principal arterial to the north.
- SC 7 (Cosgrove Avenue) is a four-lane roadway within the Study Area, and is classified as a principal arterial. The SC 7 corridor provides connectivity between West Ashley and North Charleston, and access to I-26 and US 52/US 78 (Rivers Avenue).
- SC 165 (Bacons Bridge Road/Berlin G. Myers Parkway) is a corridor that runs southwest/northeast and provides a connection between US 17 in Ravenel to Alternate US 17 in Summerville, along with access to US 78. Within the Study Area, south to north, Bacon's Bridge Road begins as a two-lane roadway and transitions into a five-lane roadway with a center turn lane north of Dolphin Drive. North of Old Trolley Road, SC-165 becomes Berlin G. Myers Parkway and is a four-lane divided roadway. The Bacons Bridge Road portion of SC 165 is classified as a minor arterial and the Berlin G. Myers portion as a principal arterial.
- Orangeburg Road (S-22) is classified as a minor arterial and has a general north-south orientation. The corridor provides a connection between US 78 and Dorchester Road, and access to US 17A in Summerville. Within the Study Area, the roadway is two lanes.
- College Park Road (S-62) runs northeast-southwest and provides connectivity between Ladson Road and Alternate US 17 in Sangaree, and access to I-26 and US 78. The roadway is classified as a minor arterial from Ladson Road to Crowfield Boulevard and as a collector from Crowfield Boulevard to Alternate US 17. South of Savannah Road, College Park Road is a five-lane roadway with a center turn lane, and north of Savannah Road it is a two-lane roadway.
- Old Trolley Road (S-199) is a five-lane roadway with a center turn lane and has a general north-south orientation. The roadway is classified as a minor arterial and provides a connection between Dorchester Road and Bacons Bridge Road in Summerville.
- Palmetto Commerce Parkway is a four-lane divided roadway that runs northwest-southeast between Ladson Road and Ashley Phosphate Road in North Charleston and provides access to various industrial/commercial facilities.

- Patriot Boulevard provides connectivity between Dorchester Road, Ashley Phosphate Road, and Palmetto Commerce Parkway. The corridor varies between a four-lane divided roadway and a five-lane roadway with a center turn lane south of Club Course Drive, and it varies between a two-lane undivided and a two-lane divided roadway to the north of Club Course Drive.
- Cross County Road (S-2028) is a three-lane roadway with a center turn lane that provides a connection between Ashley Phosphate Road and Dorchester Road. The corridor is classified as a collector road and provides access to various industrial and warehouse facilities.
- North Rhett Avenue (S-60/S-136)/Henry E. Brown Jr. Boulevard (S-136) has a general north-south orientation and provides connectivity between North Charleston, Hanahan, and Goose Creek, and access to I-526. Within the Study Area, the roadway is classified as a minor arterial and varies between four lanes with divided and undivided sections, and five lanes with a center turn lane.
- Virginia Avenue (S-58) has a general north-south orientation and runs between Remount Road and McMillan Avenue. Virginia Avenue is entirely in North Charleston and provides access to I-526 and various industrial facilities. North of I-526, Virginia Avenue is classified as a principal arterial and south as a collector roadway. North to south, Virginia Avenue starts as a two-way roadway and just north of I-526 becomes a four-lane divided roadway. South of I-526, Virginia Avenue is a five-lane roadway with a center turn lane.
- Spruill Avenue (S-32) is a three-lane roadway with a center turn lane that runs northwest-southeast between East Montague Avenue and Meeting Street. The corridor provides connectivity between the cities of Charleston and North Charleston, along with access to I-26. Between Meeting Street and Burton Lane/Naval Base Road, Spruill Avenue is classified as a minor arterial, between Burton Lane/Naval Base Road and McMillan Avenue a principal arterial, and between McMillan Avenue and East Montague Avenue a minor arterial.
- Meeting Street (S-107) has a general north-south orientation and is a four-lane undivided roadway between Broad Street and Line Street, and a two-way roadway south of Broad Street. Meeting Street provides access to the southern edge of the Charleston peninsula and turns into US 52 north of Line Street. The roadway is classified as a principal arterial between Line Street and Calhoun Street, a minor arterial between Calhoun Street and Broad Street, and a collector south of Broad Street.
- King Street (S-104) has a general north-south orientation and is classified as a principal arterial north of Calhoun Street and as a collector south of Calhoun Street. King Street provides access to the southern edge of the Charleston peninsula and turns into US 78 north of Line Street. The corridor is a two-lane roadway between Line Street and Calhoun Street, a two-lane one-way southbound roadway between Calhoun Street and Broad Street, a one-lane one-way southbound roadway between Broad Street and South Battery, and a two-lane roadway between South Battery and Murray Boulevard.
- Rutledge Avenue (S-46) is a minor arterial and has a general north-south orientation. The corridor provides connectivity in the southbound direction between I-26 and the southern edge of the Charleston peninsula, and provides access to US 17. Rutledge Avenue is a two-lane roadway between Heriot Street and Race Street, a two-lane one-way southbound roadway between Race Street and Calhoun Street, a two-way roadway between Calhoun Street and Broad Street, and a two-lane one-way southbound roadway between Broad Street and Murray Boulevard.
- Ashley Avenue (S-103) has a general south-north orientation and is classified as a minor arterial north of Broad Street and as a collector south of Broad Street. Ashley Avenue is a two-lane one-way northbound roadway between Moultrie Street and Calhoun Street, a two-lane roadway between Calhoun Street and Broad Street, and two-lane one-way roadway south of Broad Street. Ashley Avenue provides northbound access from Tradd Street to Moultrie Street within the Charleston peninsula, and also provides access to US 17 northbound.
- Lockwood Drive/Lockwood Boulevard (S-1194) runs northwest-southeast between Fishburne Street and Broad Street, and provides access to US 17 and the James Island Expressway. Lockwood Drive is classified as a collector north of Cannon Street, a principal arterial between Cannon Street and Calhoun Street, and

a minor arterial south of Calhoun Street. The corridor is a four-lane roadway and is divided north of Calhoun Street and undivided south of Calhoun Street.

The major east-west roadway corridors within the Study Area include Interstate 26, Interstate 526, US 52, US 52 Spur, US 78, US 176, SC 30 (James Island Expressway), SC 642 (Dorchester Road), Crowfield Boulevard, Ladson Road, Red Bank Road, N.A.D. Road/Goose Creek Road/Old State Road, Ashley Phosphate Road, Aviation Avenue, Remount Road, East/West Montague Avenue, McMillan Avenue, Reynolds Avenue, Naval Base Road/Viaduct Road, Azalea Drive, Line Street, Spring Street, Cannon Street, Calhoun Street, and Broad Street.

- I-26 is a major interstate corridor in South Carolina that runs northwest/southeast through the state with connections from Johnson City, TN, Asheville, NC, and Columbia, SC and ends in Charleston, SC. Within the Study Area, I-26 has six lanes except for the portion between Ashley Phosphate Road and I-526, which has eight lanes and provides connectivity between Summerville, North Charleston, and Charleston areas.
- I-526 is a half-loop, four-lane roadway corridor which begins at US 17 west of the Ashley River and terminates in Mount Pleasant. I-526 provides connectivity between West Ashley, North Charleston, Daniel Island and Mount Pleasant.
- US 52 is a principal arterial that runs northwest/southeast within the Study Area, provides connectivity between Moncks Corner, Goose Creek, North Charleston, and Charleston, and provides access to I-26 and I-526. US 52 shares a concurrency with US 78 for approximately 11 miles between University Boulevard and Carner Avenue. Within the Study Area, north of its intersection with Durant Avenue and Meeting Street, US 52 varies between a six-lane divided roadway, eight-lane divided roadway, and seven-lane roadway with a center turn lane. South of Durant Avenue/Meeting Street, US 52 is a five-lane roadway with a center turn lane until the name of the route changes from Rivers Avenue to Carner Avenue. The majority of the Carner Avenue portion of US 52 is a two-lane roadway. US 52 then changes names to Meeting Street and the roadway becomes four lanes with a small section having five lanes with a center turn lane.
- US 52 Spur is a spur of US 52 that extends northwest/southeast from US 52 to Broad Street, entirely in the City of Charleston. The northern portion of US 52 Spur is named Morrison Drive and the southern portion East Bay Street. US 52 Spur provides truck access to the Columbus Street and Union Pier Terminals and varies between two lanes, three lanes (2 lanes northbound, 1 lane southbound), four lanes, and five lanes with a center turn lane. North of Calhoun Street, US 52 Spur is classified as a minor arterial and south of Calhoun Street as a principal arterial.
- The US 78 corridor provides connectivity between Summerville, North Charleston, and Charleston and access to I-526 and I-26 within the Study Area. US 78 shares a concurrency with US 52 between the convergence of University Boulevard (US 78) and Rivers Avenue (US 52) in North Charleston and the split of Rivers Avenue (US 78) and Carner Avenue (US 52) in North Charleston near the City of Charleston line. US 52 enters into Charleston as King Street and terminates at Line Street. Within the Study Area, the corridor varies between two lanes and five lanes with a center turn lane, except during its concurrency with US 52 (Rivers Avenue), in which the roadway varies between six, seven and eight lanes. US 78 is classified as a major arterial north of the US 78 (Rivers Avenue)/US 52 (Carner Avenue) split, and as a minor arterial south of it.
- US 176 is classified as a minor arterial that runs northwest/southeast from Hendersonville, NC, through Spartanburg, SC and Columbia, SC, and terminates in Goose Creek at its intersection with US 52 (North Goose Creek Boulevard). US 176 provides access to US 17A and US 52. Within the Study Area, north of Alternate US 17, US 176 is named State Road and is a two-way roadway. South of Alternate US 17, US 176 is named St. James Avenue and varies between five lanes with a center turn lane and seven lanes with a center turn lane.
- SC 642 (Dorchester Road) is a principal arterial that runs northwest/southeast and provides connectivity between Summerville and North Charleston, along with access to I-526 and I-26. Dorchester Road varies between a four-lane divided and five-lane roadway with a center turn lane.

- Crowfield Boulevard (S-1093) is a minor arterial and has a general east-west orientation providing connectivity between College Park Road and US 176 in Goose Creek, and access to residential areas. The majority of the corridor is a two-way roadway, but the eastern and western ends are four-lane divided roadways.
- Ladson Road (S-230/S-76) is a minor arterial that runs northeast-southwest and provides connectivity between Dorchester Road and US 78 in North Charleston/Ladson. Ladson Road is a five-lane roadway with a center turn lane.
- Red Bank Road (S-37/S-29) runs northwest-southeast and provides access to the Charleston Naval Weapons Station. It is classified as a minor arterial north of Howe Hall Road and as a principal arterial south of Howe Hall Road. The corridor is a five-lane roadway with a center turn lane north of Howe Hall Road, a seven-lane roadway with a center turn lane between Howe Hall Road and Henry E. Brown Jr Boulevard, a five-lane roadway with a center turn lane between Henry E Brown Jr Boulevard and Deke Giles Avenue, and a two-lane roadway to the east of Deke Giles Avenue.
- N.A.D. Road/Goose Creek Road/Old State Road (S-29) is a four-lane divided principal arterial and has a general east-west orientation, which provides connectivity between US 78, US 52, and Red Bank Road in Goose Creek.
- Ashley Phosphate Road (S-75) is a seven-lane roadway with a center turn lane and is classified as a minor arterial. Ashley Phosphate runs east-west and provides a connection between Dorchester Road and US 52/US 78 (Rivers Avenue) in North Charleston, and access to I-26. The corridor is the main route for travel for east-west trips within the northern half of North Charleston.
- Aviation Avenue (S-1342) is a principal arterial that runs northeast-southwest between US 52/US 78 (Rivers Avenue) and South Aviation Avenue in North Charleston and provides access to I-26. Aviation Avenue varies between a four-lane divided roadway and four-lane undivided roadway.
- Remount Road (S-13) has a general east-west orientation and provides a connection between Virginia Avenue and South Aviation Avenue, along with access to US 52/US78 (Rivers Avenue) and I-26. The roadway is classified as a primary arterial east of I-26 and as a collector road west of I-26. Remount Road is a three-lane roadway with a center turn lane west of the I-26 eastbound approach ramps, and varies between a four-lane divided roadway and five-lane roadway with a center turn lane to the east of the I-26 eastbound approach ramps.
- East/West Montague Avenue (S-62) runs northeast-southwest from Virginia Avenue to Dorchester Road in North Charleston, and provides access to I-26 and I-526. The corridor is classified as a collector from Virginia Avenue to Spruill Avenue and as a minor arterial from Spruill Avenue to Dorchester Road and provides connectivity between the eastern and western boundaries of North Charleston. Montague Avenue varies between four lanes and five lanes with a center turn lane to the west of Park Circle and is two lanes to the east of Park Circle.
- McMillan Avenue (S-48) is a four-lane principal arterial that runs northeast-southwest from Meeting Street to North Hobson Avenue (by the edge of the Cooper River) in North Charleston. The corridor provides access to various commercial and industrial/marine facilities and also provides access to US 52/US 78 (Rivers Avenue).
- Reynolds Avenue (S-31) is a two-lane principal arterial that runs northeast-southwest from Meeting Street to Kephart Street in North Charleston and provides access to US 52/US 78 (Rivers Avenue) and Spruill Avenue.
- Naval Base Road/Viaduct Road (S-86) is a three-lane (two lanes eastbound, one lane westbound) principal arterial that runs northeast-southwest from Spruill Avenue to Hobson Avenue in North Charleston. The corridor provides access to Veterans Terminal, and via Bainbridge Avenue, access to the Federal Law Enforcement Training Center (FLETC) and to the site of the future Charleston Naval Base Container Terminal.
- Azalea Drive (S-894) is classified as a collector roadway and has a general east-west orientation. Azalea Drive provides a connection between Leeds Avenue and US 78 (King Street Extension), and provides

access to Cosgrove Avenue. From west to east, Azalea Drive begins as a four-lane roadway then converges to a two-way roadway just past Cosgrove Avenue.

- Line Street is a roadway that runs southwest-northeast and is not contiguous. From west to east, the first segment is a two-lane roadway that runs from Horizon Street to Ashley Avenue. Next, there is a small segment between Ashley Avenue and US 17 that is a one-lane westbound roadway and can only be entered from US 17. The last segment runs from US 17 to Aiken Street. From US 17 to King Street, Line Street is a two-lane one-way eastbound roadway, and from King Street to Nassau Street it is a two-lane roadway. East of Nassau Street, Line Street is a one-lane eastbound roadway. The entire roadway is located in the City of Charleston. Line Street provides access to US 78 (King Street) and US 52 (Meeting Street).
- Spring Street (S-3) is a two-lane one-way westbound minor arterial that runs northeast-southwest providing a connection between Meeting Street and US 17 in the City of Charleston. Spring Street provides access from US 52/Meeting Street to US 78 and US 17.
- Cannon Street (S-1037) is a two-lane one-way eastbound minor arterial that runs southwest-northeast from US 17 to King Street in the City of Charleston. Cannon Street provides access from US 17 to US 78/King Street.
- Calhoun Street (S-404) is a principal arterial that runs northeast-southwest providing a connection between the James Island Expressway and US 52 Spur in the city of Charleston. Additionally, Calhoun Street provides access to King Street and Meeting Street. Calhoun Street varies between two and four lanes.
- Broad Street (S-1015) is a minor arterial and has a general east-west orientation which spans from Lockwood Boulevard to US 52 Spur in the City of Charleston, and provides access to King Street and Meeting Street. The roadway has two lanes to the east of Rutledge Avenue, and three-lanes (one eastbound and two westbound) west of Rutledge Avenue.

Figure 2 - 9: Classification of Major Roadways within Study Corridor

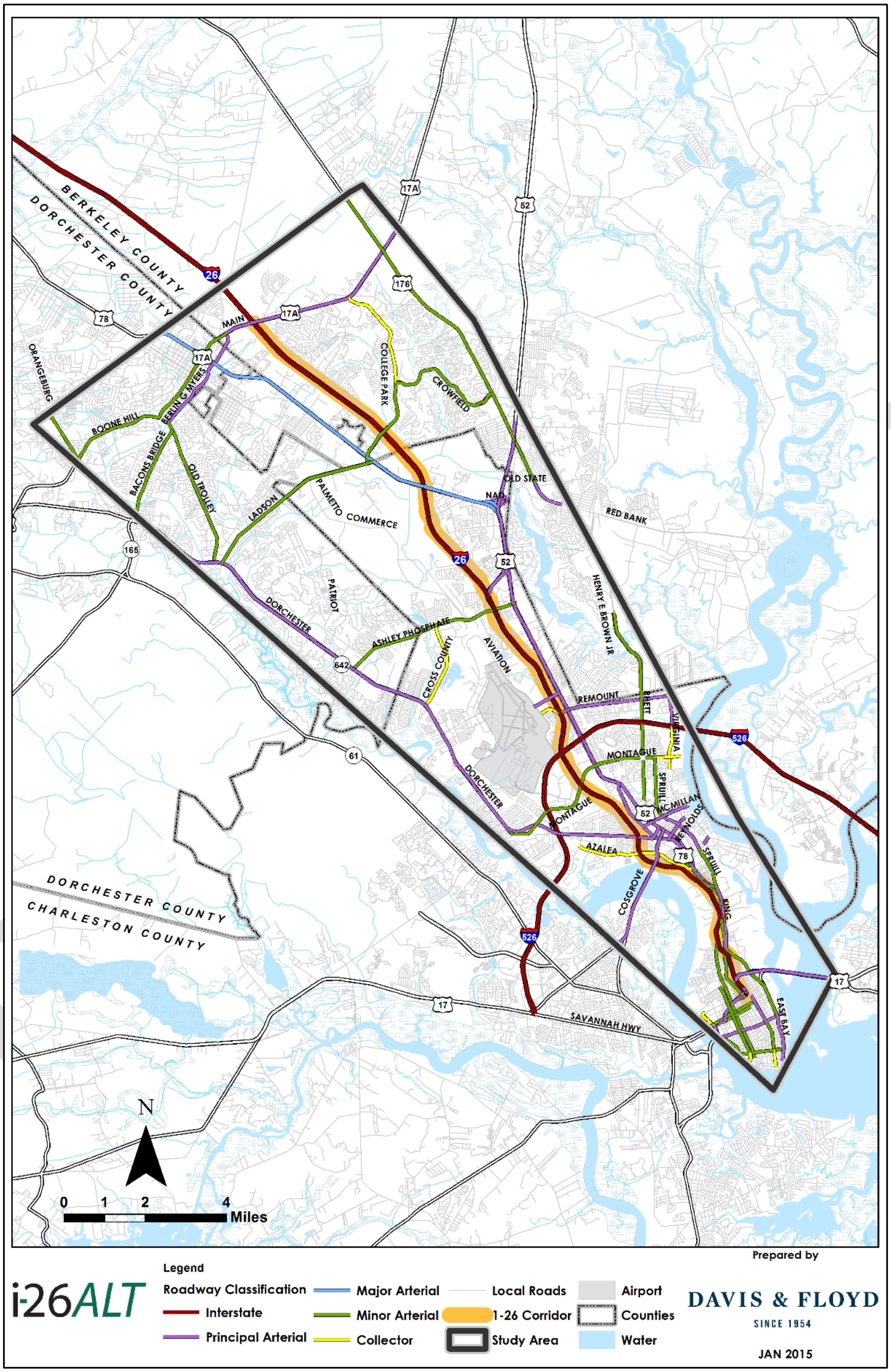
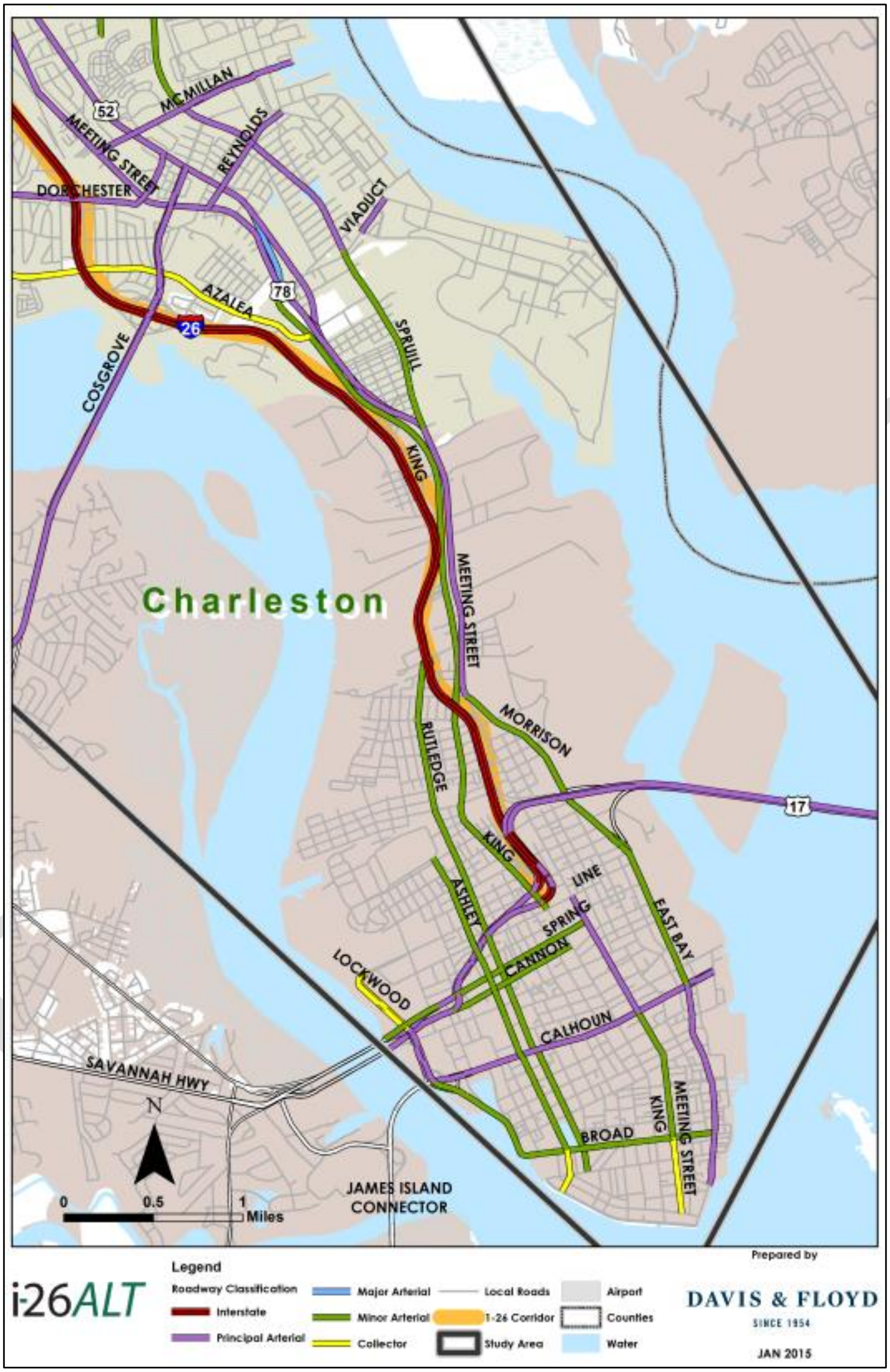


Figure 2 - 10: Major Roads – Charleston Neck Area and Peninsula



2.3.2 Constrained LRTP

Several committed roadway projects listed in the 2035 Charleston Area Transportation Study (CHATS) Long Range Transportation Plan (LRTP) lie within the Study Area limits. These projects include Berlin G. Myers Parkway, Future Drive Loop & Northside Drive Extension, and the Port Access Road.

- Berlin G. Myers Parkway: This project includes the extension of Berlin G. Myers Parkway from its current termination point at Bacons Bridge Road (SC 165) to US 17A, providing an alternative route to US 17A. The facility is proposed as a 4-lane divided roadway.
- Future Drive Loop & Northside Drive Extension: This project includes the construction of a network of three new roads which will connect US 78 to Palmetto Commerce Parkway and Northside Drive. Northside Drive is an existing frontage road along the west side of I-26, which starts at Ashley Phosphate Road and dead ends to the north. The first roadway that was to be constructed, Ingleside Boulevard (approx. 2000-ft in length), is already complete and provides a connection to US 78. The Northside Drive Extension (approx. 3 miles in length) will be constructed next and will connect Northside Drive to Ingleside Boulevard. Future Drive (approx. 2900-ft in length) will connect Palmetto Commerce Parkway to Northside Drive Extension and will include a bridge over an existing roadway.
- Port Access Road: This project consists of the construction of a new road facility (primarily elevated) to provide a direct connection between the new port terminal and I-26. Existing Exit 218 (Spruill Avenue) will be removed to accommodate the new I-26 interchange.

Additionally, in the City of Charleston, funding for the Spring Cannon Streetscape Project has been allocated and the design completed. This project will include new streetscapes for Spring and Cannon Streets to include the re-establishment of two-way traffic on each street. Currently, these roadways are both two-lane one-way streets with Spring Street providing westbound access, and Cannon Street providing eastbound access.

2.3.3 Traffic Data

Traffic congestion data sourced from the CHATS Regional Transportation Model are provided in Figures 2-11 and 2-12 for the years 2010 and 2035. Level of Service (LOS) standards use the letter rankings presented in Table 2-4.

Table 2 - 4: Level of Service (LOS) Standards A-F

LOS	Definition
A	Free Flow: traffic flows at or above the posted speed limit and motorists have complete mobility between lanes.
B	Reasonably Free Flow: speeds are maintained, however maneuverability within traffic stream is slightly restricted.
C	Stable Flow: travel at or near free flow speeds, movements are restricted due to higher volumes but not objectionable by users.
D	Approaching Unstable Flow: speeds are slightly decreased, higher volumes are noted and operator comfort is reduced.
E	Unstable Flow: operating at capacity levels, vehicles are closely spaced and maneuverability is limited , incidents can cause flow breakdown
F	Forced Flow: Demand volumes are greater than capacity with resulting breakdown in traffic flow, travel times cannot be predicted.

LOS standards are illustrated for combined levels C-D and E-F to identify facilities or segments that are operating near or at capacity within the i-26*ALT* Study Area that might be most impacted by increased traffic volumes. For the projection year 2035, network segments move from LOS C-D to LOS E-F on facilities in the Summerville area, along Ladson Road, College Park Road, Palmetto Commerce Parkway, Cosgrove Avenue, Cross County Road and on select segments along I-26 and I-526. Roadway segments also move from LOS A-B to LOS C-D along US 17A and US 78, Aviation Avenue, King and Meeting Streets, Palmetto Commerce Parkway, and along I-26 from Summerville to Ladson Road. Traffic data providing the system estimated 2013 AADT counts from SCDOT (South Carolina Department of Transportation) are also provided in Figure 2-13.

2.3.4 Bridge Infrastructure

National Bridge Inventory (NBI) data compiled by the U.S. Department of Transportation Federal Highway Administration (FHWA) is provided in Figure 2-14. The NBI provides a summary of the number, location, and general condition of highway bridges within the network. The structures maintained in this database include bridges that are open to the public, carry vehicular traffic and have an opening longer than 20 feet as measured along the center of the roadway. The definition of bridges includes culverts with openings measuring more than 20 feet along the centerline of the road. There are more than 150 bridges and culverts identified within the i-26*ALT* Study Area. The majority of these structures are owned and maintained by the South Carolina Department of Transportation (SCDOT).

The Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges defines a bridge as a structure, including supports, erected over a depression or an obstruction, such as water, highway or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between abutments or spring lines of arches, or extreme ends of the openings for multiple box culverts. A culvert is a structure designed to take advantage of submergence to increase hydraulic capacity or convey water runoff under a highway, railroad, or other embankment. Culverts, as distinguished from bridges, are usually covered with an embankment and are generally composed of structural material around the entire perimeter. Culverts may qualify to be considered "bridge" length.

Roughly five percent of bridges within the Corridor are classified as structurally deficient based on a condition rating of four (poor condition) or less in one or more of the evaluated components including deck, superstructure and substructure. The Corridor's bridges carry three to six percent (3%-6%) average daily truck traffic while bridges primarily along I-526 and I-26 carry as much as 12 percent average daily truck traffic. Inspections of bridges and culverts in the Study Area were performed between 2011 and 2013.

Appendix 1-A provides indexed bridge tables with statistics including minimum clearance, lane widths, shoulder or sidewalk widths, medians, lanes on structure, etc.

2.3.5 Safety

Fatality Analysis Reporting System (FARS) data obtained from the BTS's National Transportation Atlas Database provides qualifying fatal motor vehicle crashes. To be included in FARS, a crash must involve a motor vehicle traveling on a trafficway customarily open to the public, and must result in the death of an occupant of a vehicle or a non-occupant within 30 days of the crash. Figure 2-15 shows the location of reported fatal vehicular accidents for the year 2012. Each data point represents one incident and is grouped according to the non-vehicular mode involved, either pedestrian or rail. Incidents not involving a pedestrian or rail are categorized as vehicular incidents. Within the study corridor, all crash incidents resulted in one fatality except for the vehicular incident that occurred along I-26 just north of US 17, which resulted in two fatalities. The two pedestrian fatalities recorded on Ashley Phosphate Road were reported near or at Hunters Ridge Road.

Figure 2 - 11: 2010 Congestion by LOS (CHATS Regional Transportation Model)

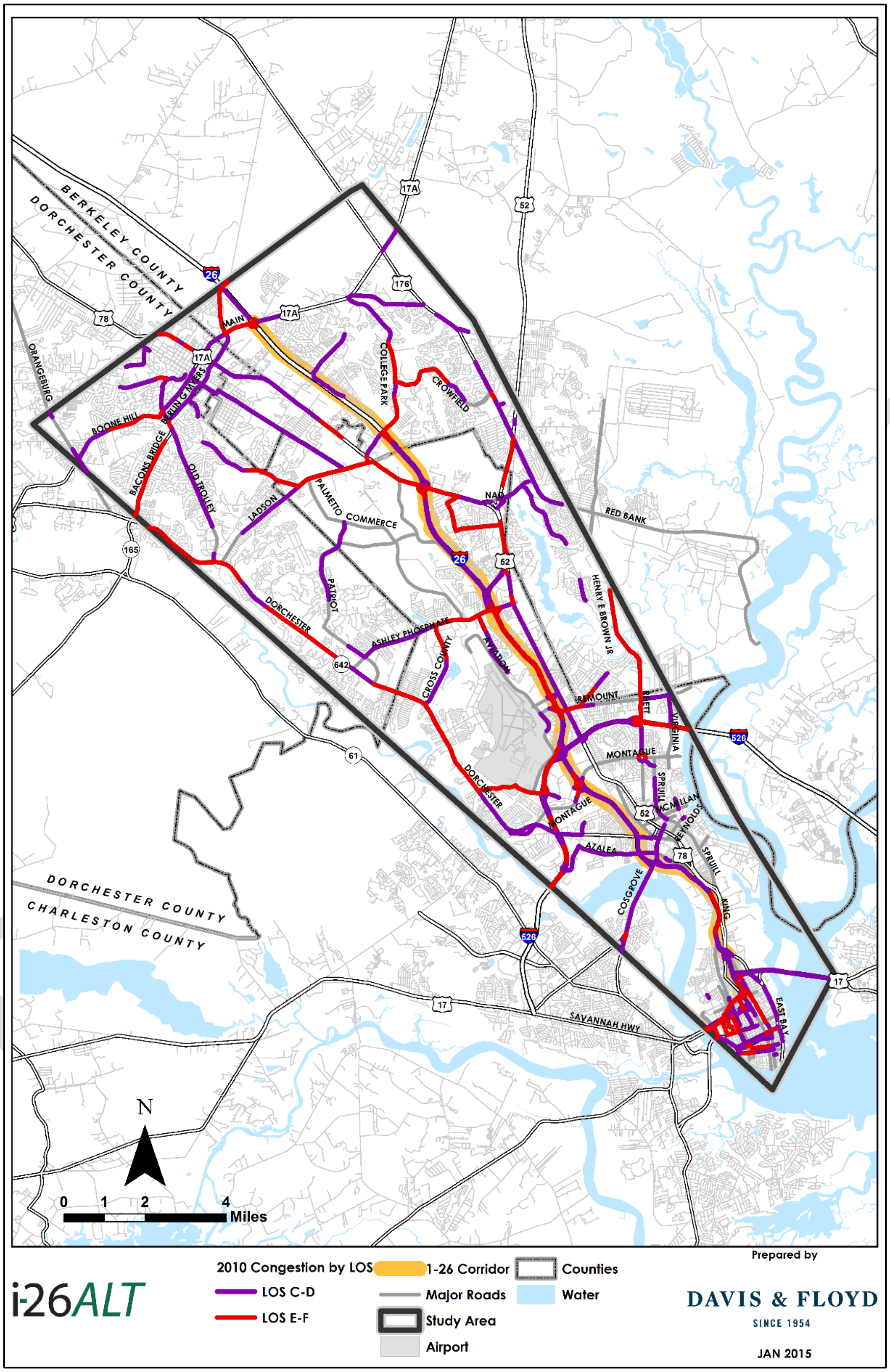


Figure 2 - 12: 2035 Projected Congestion by LOS (CHATS Regional Transportation Model)

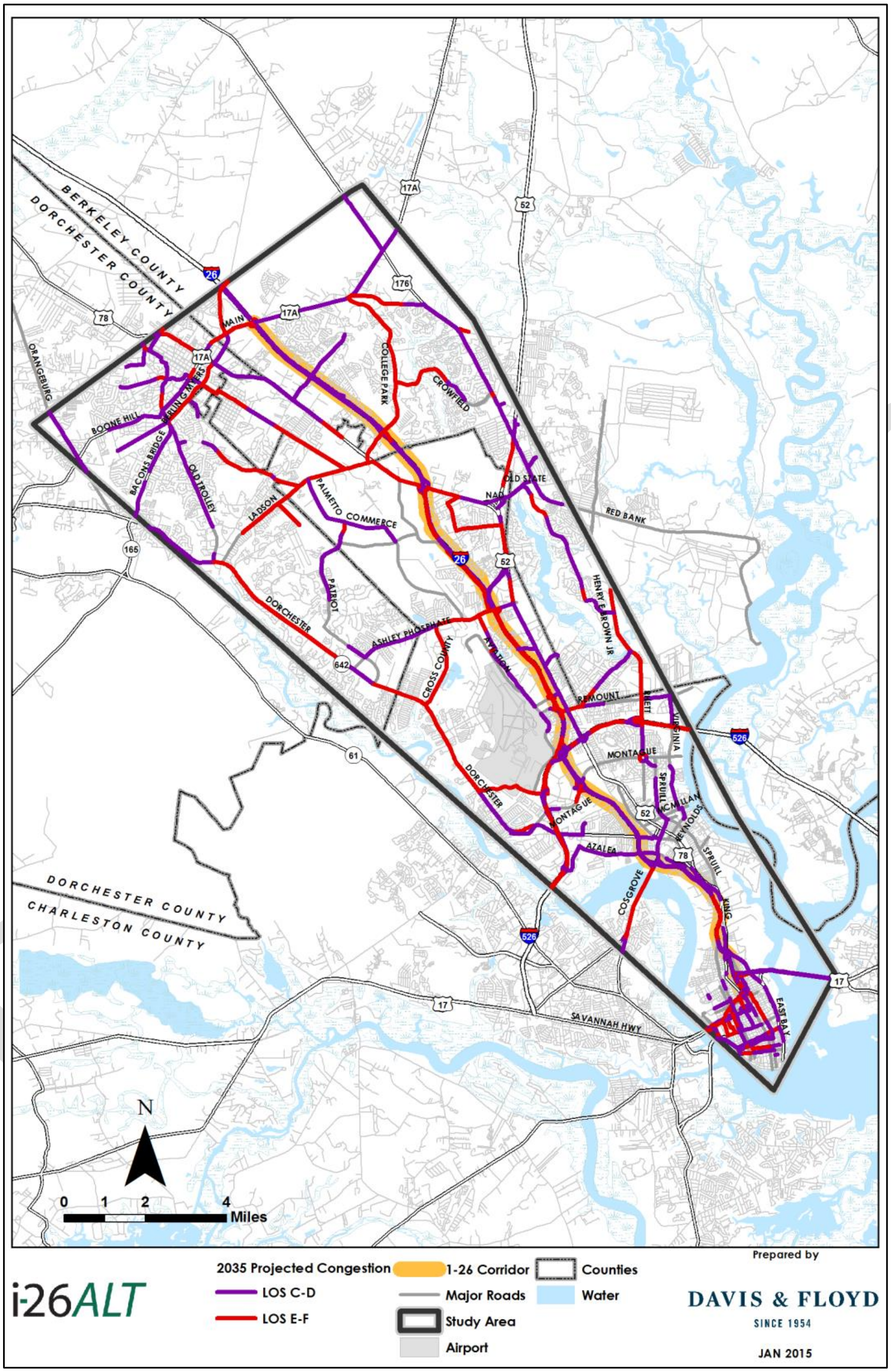


Figure 2 - 13: 2013 AADT Estimates (SCDOT)

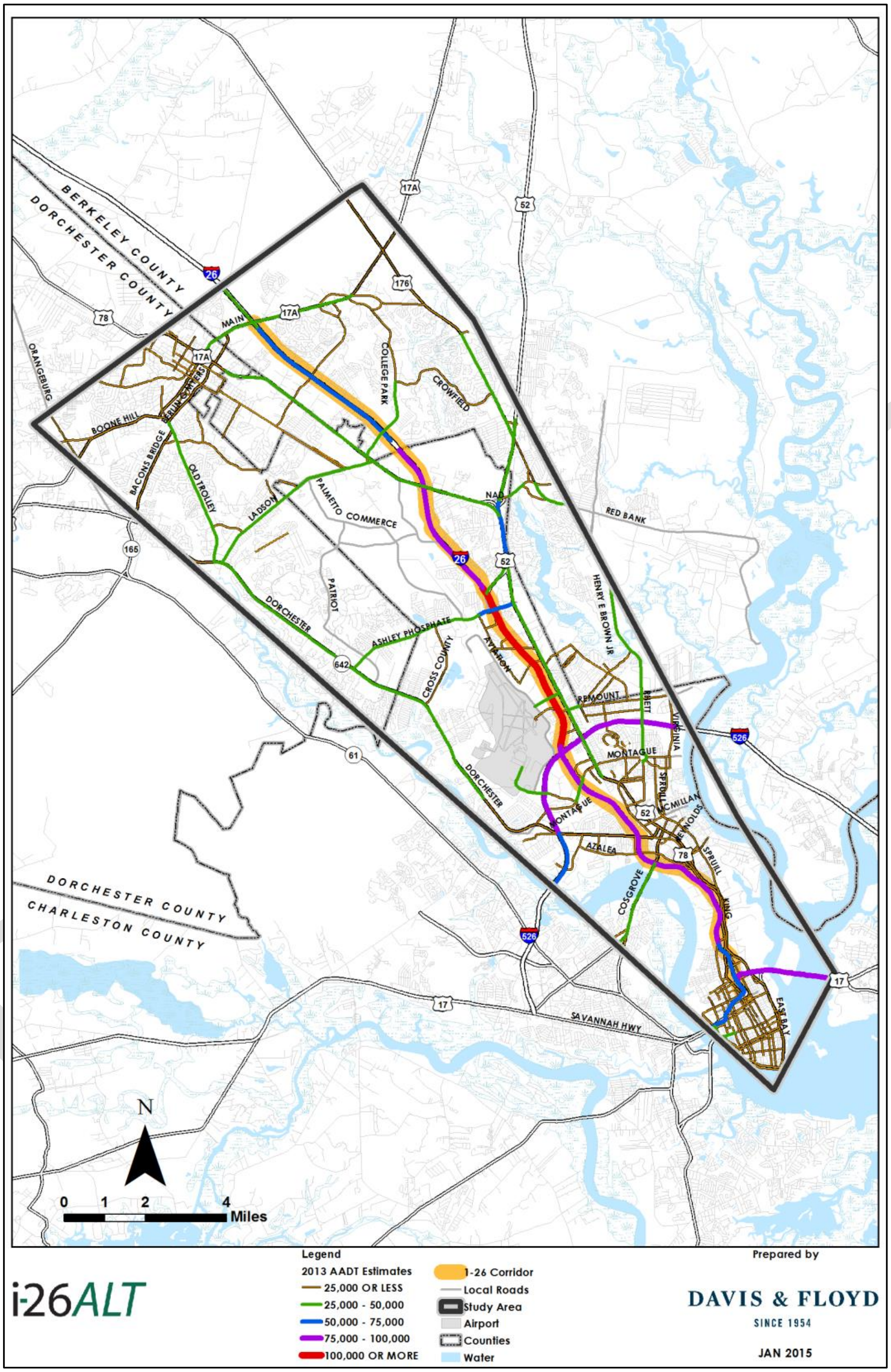


Figure 2 - 14: Corridor Bridge Inventory (FHWA)

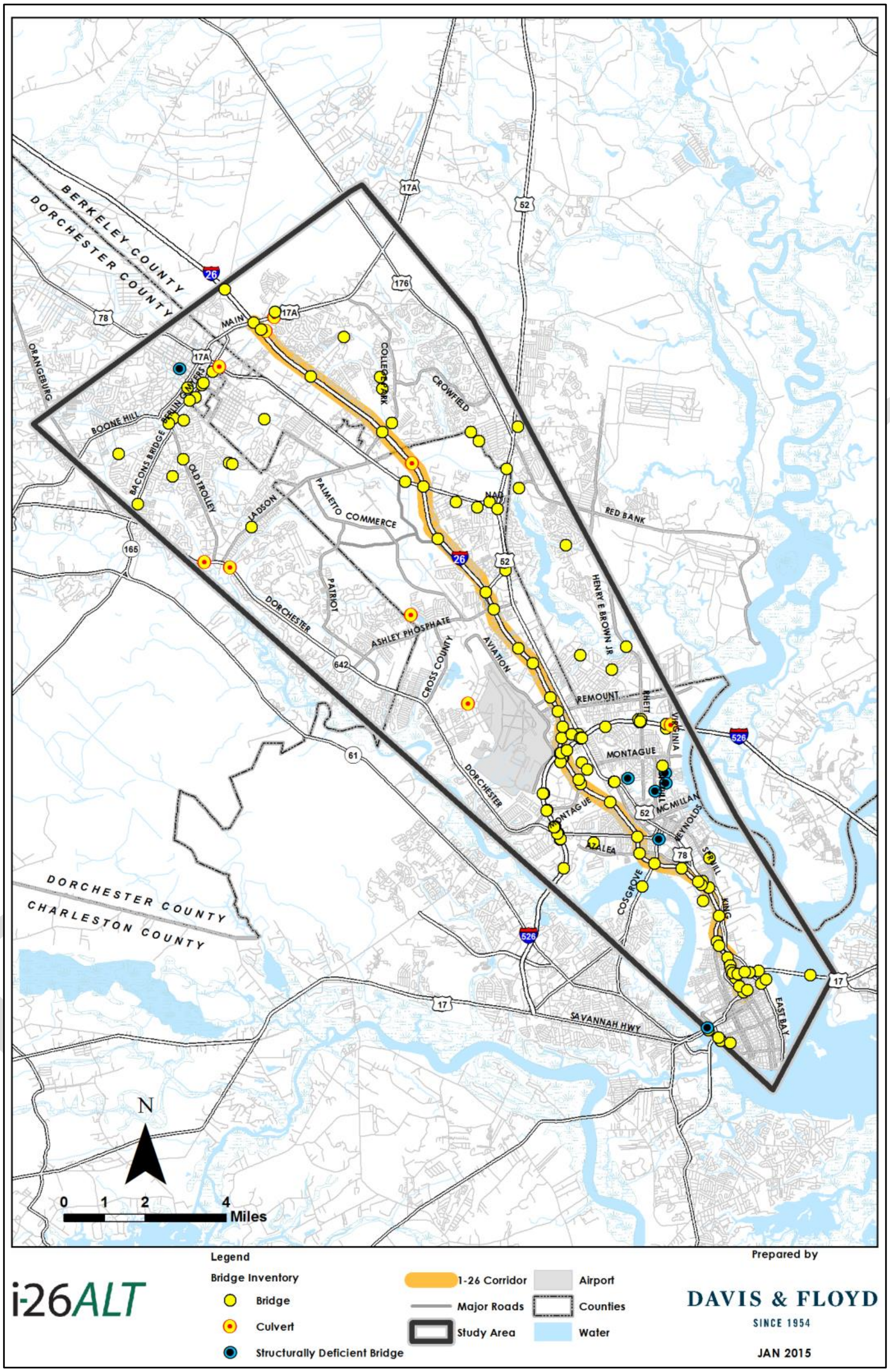
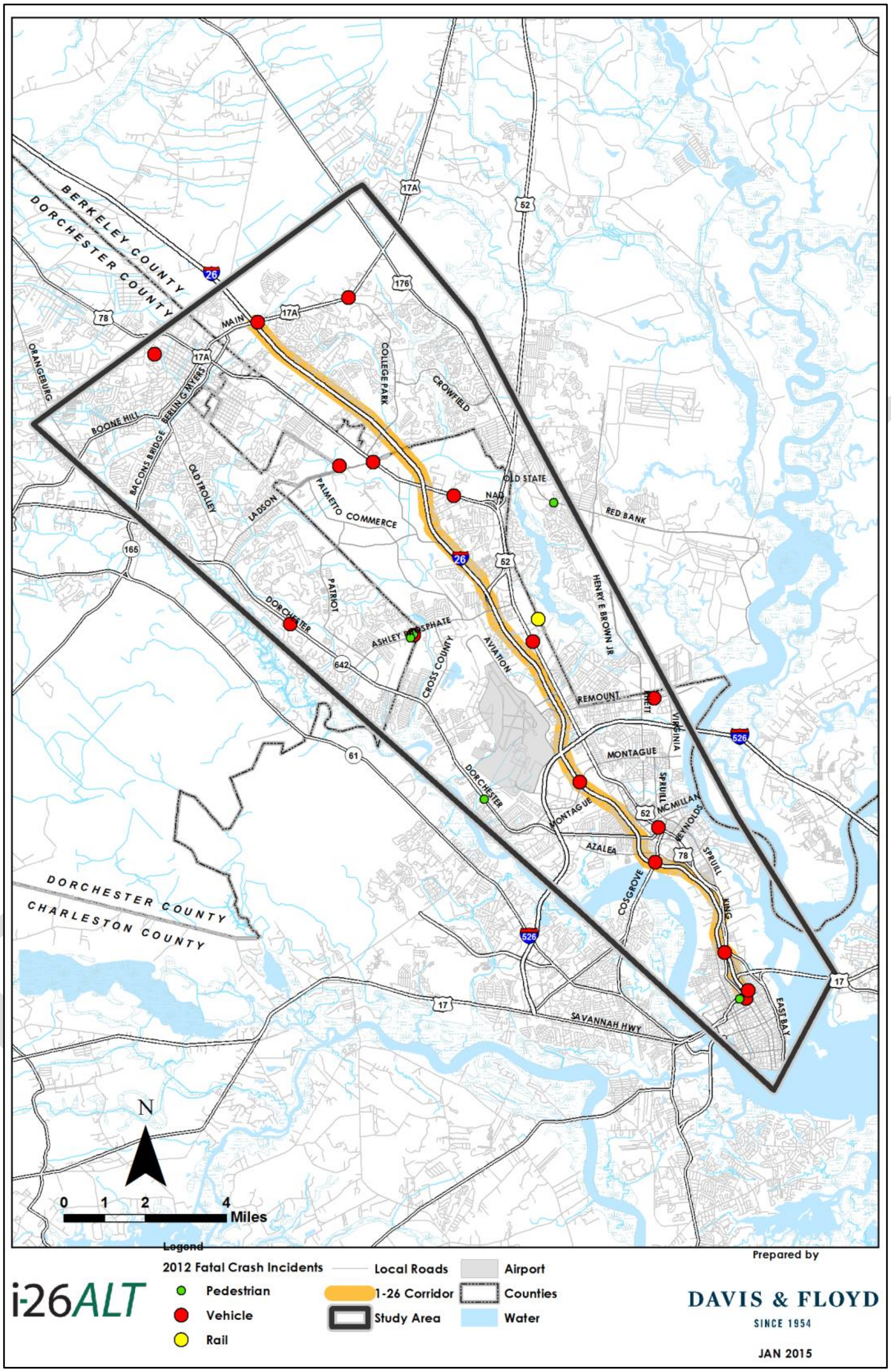


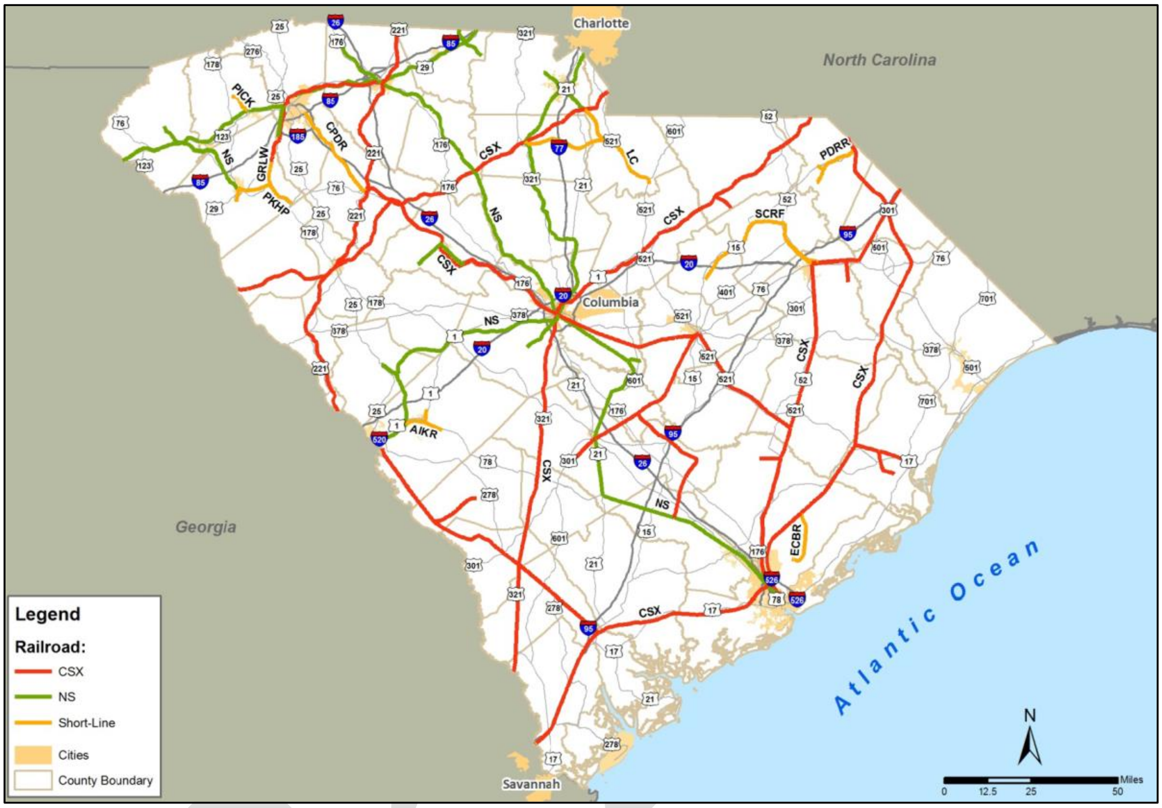
Figure 2 - 15: FARS Crash Data 2012



2.4 Rail Corridors

The rail system in the tri-county region includes two Class I railroads and a Class III carrier or switching and terminal provider. Figure 2-16 depicts the South Carolina rail system and major rail providers.

Figure 2 - 16: South Carolina Rail System



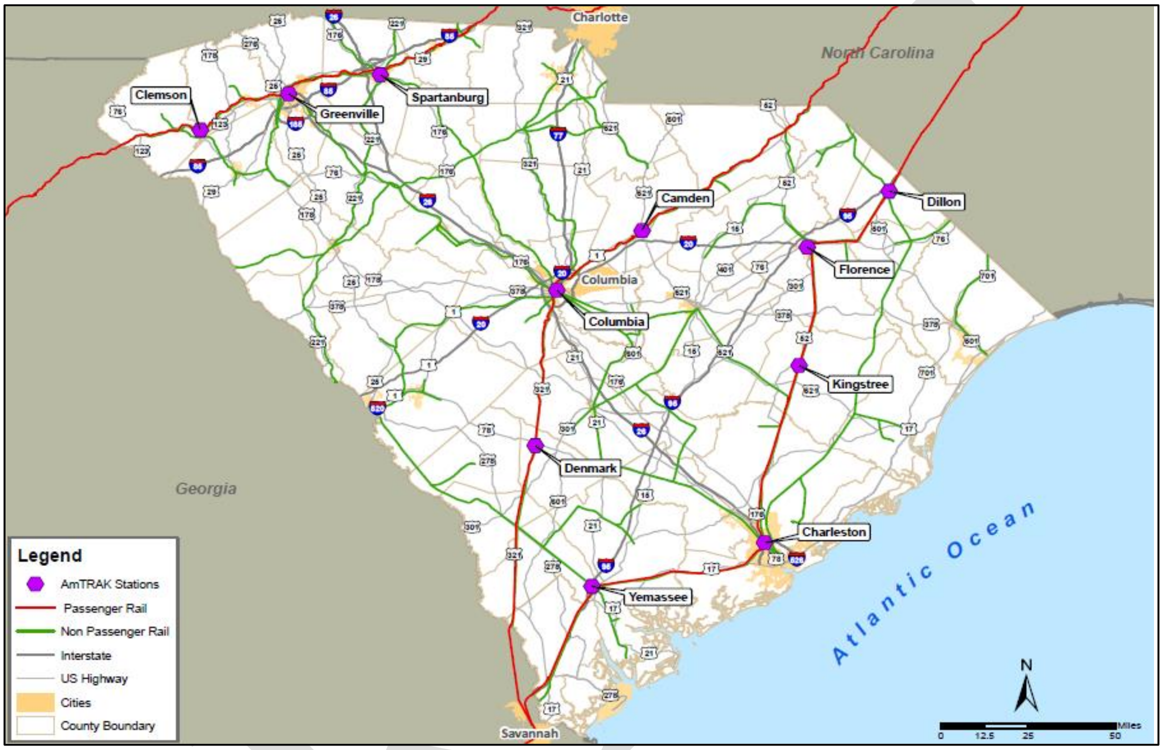
Source: Draft South Carolina State Rail Plan (2014)

The two Class I railroads that operate within the Berkeley-Charleston-Dorchester Region are CSX Transportation (CSX) and the Norfolk Southern Railway (NS). CSX operates roughly 23,000 route miles serving 23 US states, the District of Columbia, and two Canadian provinces. It is South Carolina's largest railroad representing 56 percent of the state's rail system. In addition to the rail mileage it owns, CSX also has trackage rights over the NS line between Columbia and Charleston. NS operates 21,500 route miles over 22 states, the District of Columbia, and one Canadian province. It is the second largest carrier in South Carolina representing 30 percent of the state rail system. These carriers provide long-haul services across the state and country at large.

Palmetto Railways, previously South Carolina Public Railways (SCPR), provides terminal switching services and operates three railroad divisions; two of which operate in the I-26 study corridor. The Charleston Subdivision, formerly Port Utilities Commission of Charleston (PUCC), is a terminal switching rail located in Charleston that provides terminal switching services to South Carolina State Ports Authority's Columbus Street and Union Pier Terminals on the Charleston Peninsula. The North Charleston Subdivision, formerly Port Terminal Railroad (PTR), is located in North Charleston and provides service to South Carolina Ports Authority's North Charleston Terminal and the Charleston Naval Complex. Palmetto Railway's rail facilities interchange traffic with both CSX and NS. The Charleston Region also houses major rail facilities for both Class I rails. CSX has sited Charleston for its principal yard, intermodal hub, and bulk transfer facility. NS also has its intermodal facility and automotive terminal located in Charleston, South Carolina.

In addition to freight rail, the region also has passenger rail service provided by Amtrak. Amtrak operates over rail lines owned by both Class I freight railroads. Amtrak routes operate over one NS and two CSX lines. Two of the four Amtrak routes that operate in South Carolina run through the Charleston Region on CSX rail lines: the Silver Meteor service, which operates from NY-Washington-Miami, and the Palmetto service, which operates from NY-Washington-Savannah. Figure 2-17 provides the passenger rail routes in South Carolina. The CSX rail line that serves the Amtrak Passenger service to Charleston are located inside the Study Area.

Figure 2 - 17: South Carolina Passenger Rail Routes



Source: Draft South Carolina State Rail Plan (2014)

Using data collected from the Bureau of Transportation Statistics (BTS), the following (Figure 2-18) presents the i-26*ALT* Study Area's rail inventory including rail lines, ownership, and rail crossings. The NS rail corridor runs from the north of the Study Area in the Town of Summerville and terminates in Downtown Charleston. This rail line parallels the I-26 facility along the length of the corridor. The CSX rail corridor includes two rail lines that operate within the i-26*ALT* Study Area. Unlike the NS rail corridor that covers the extent of the Study Area, the CSX rail lines enter mid-corridor from Goose Creek to the north and parallels the I-26 facility from North Charleston to the Charleston Peninsula. Both CSX and NS Intermodal facilities are located in North Charleston.

The region's rail infrastructure is densest in the Charleston Neck Area and Charleston Peninsula with a mix of both long haul rails (NS and CSX) and terminal rails that serve the needs of the port facilities. Figure 2-19 provides the region's ports and the rail lines that serve these facilities. The identified Promenade rail line is currently an abandoned line. CSX has an unused/out of service segment of line which runs south of Buist Avenue to just north of the intersection of Meeting Street and Spruill Avenue. NS also has a segment of unused/out of service rail that runs roughly from Heriot Street to north of Spring Street in Midtown Charleston. This unused rail segment parallels the Meeting Street, King Street, and I-26 facilities.

Figure 2 - 18: Study Area Rail Corridors and Rail Crossings

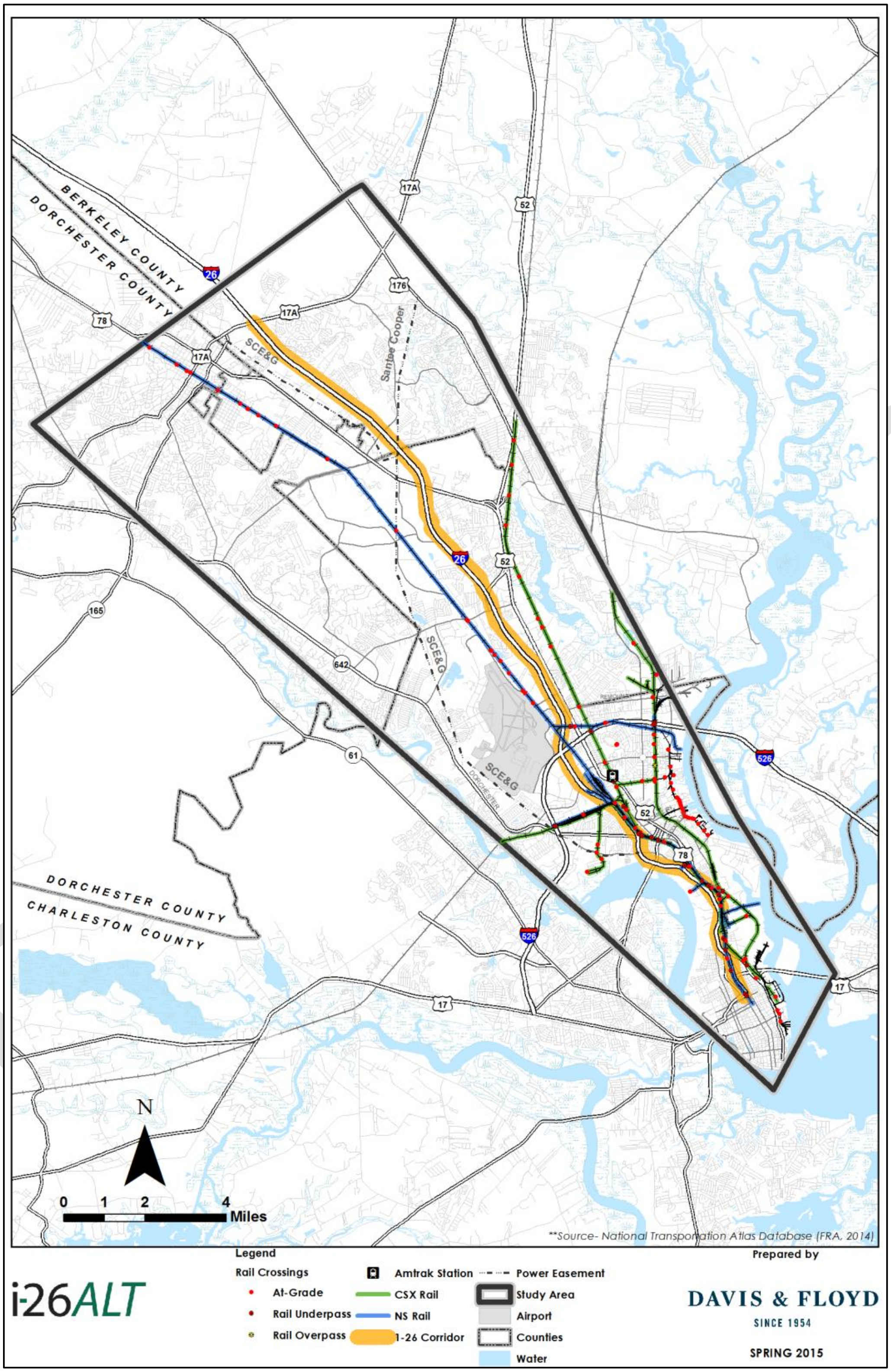
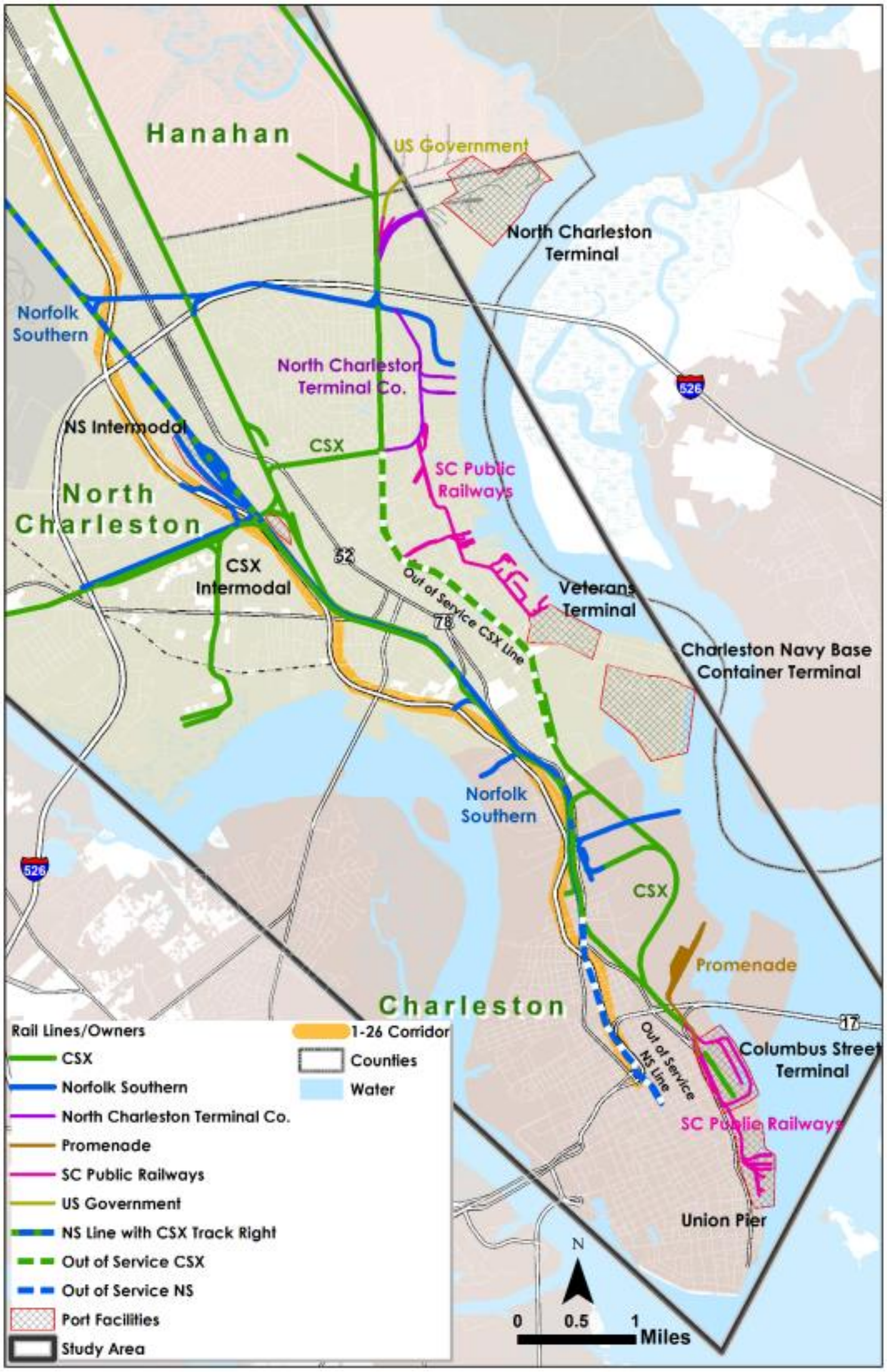


Figure 2 - 19: Port/Intermodal Facilities and Terminal Rails



The SCE&G utility corridor consists of overhead lines that originate in the Summerville area and terminate in the Charleston Neck Area. Starting at North Main Street/US 17A and Berlin G. Myers Parkway/SR 165 in Summerville, this utility corridor runs southeast between I-26 and US 78 until it reaches North Charleston where it veers south at Ladson Road and crosses US 78, Palmetto Commerce Parkway, and Ashley Phosphate Road. It continues parallel to Dorchester Road along the Charleston International Airport facility and crosses Michaux Parkway, West Montague Avenue, and the intersection of Dorchester Road and I-526. The SCE&G corridor then continues along Azalea Drive, south of Dorchester Road, until it crosses I-26 and terminates shortly thereafter. This corridor is approximately 18.5 miles in length and provides a connection between Summerville and North Charleston. The Santee Cooper power easement parallels the same corridor from Ladson Road to Dorchester Road. However it provides a spur corridor in the northeast of the Study Area. The easement runs from a point south of US 17A on US 176, crosses I-26 and merges with the Santee Cooper easement just west of I-26. This segment of the Santee Cooper utility corridor is approximately five miles long. Figures 2-20 and 2-21 provide a closer look at the Study Area utility corridors.

Figure 2 - 20: Utility Corridor, Summerville – North Charleston

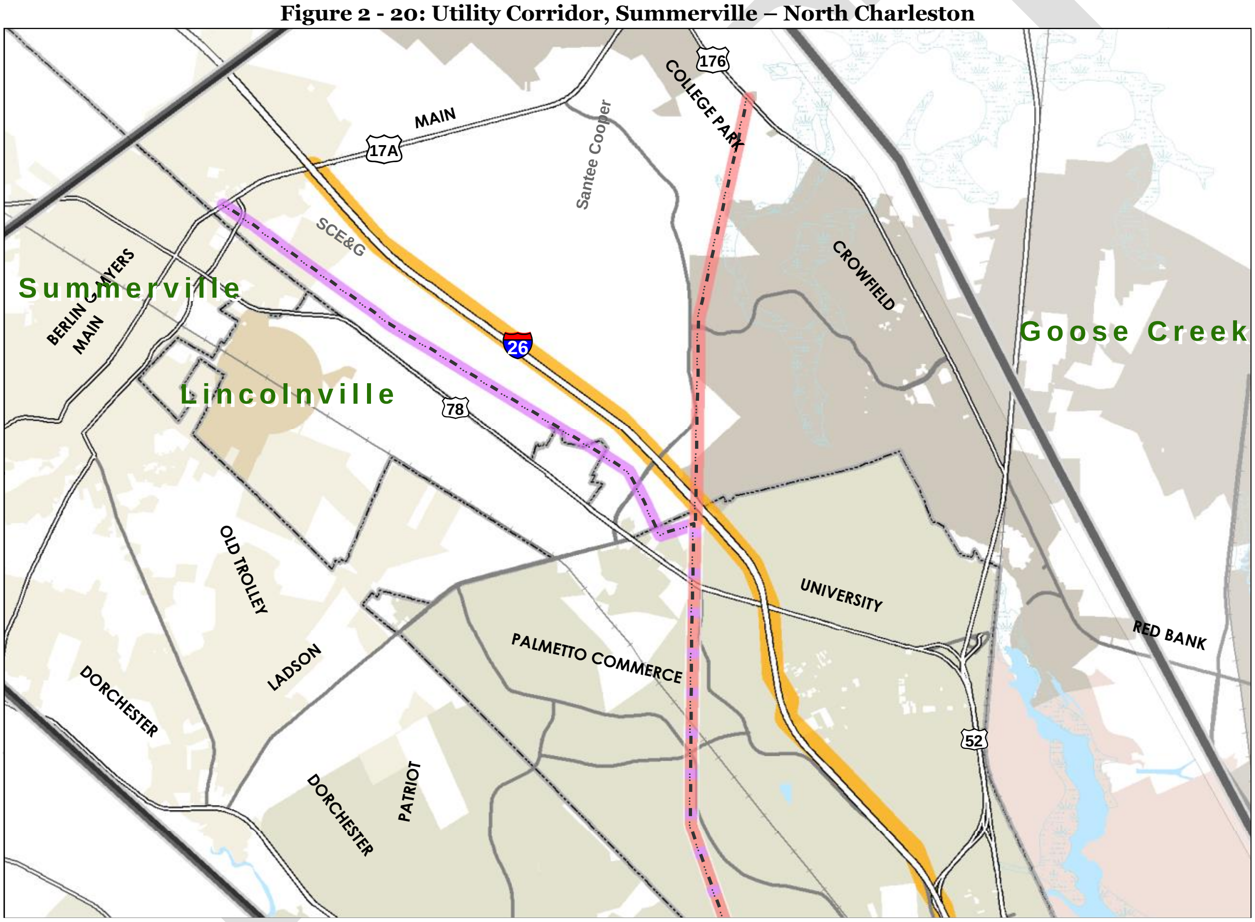


Figure 2 - 21: Utility Corridor, North Charleston – Charleston Neck Area

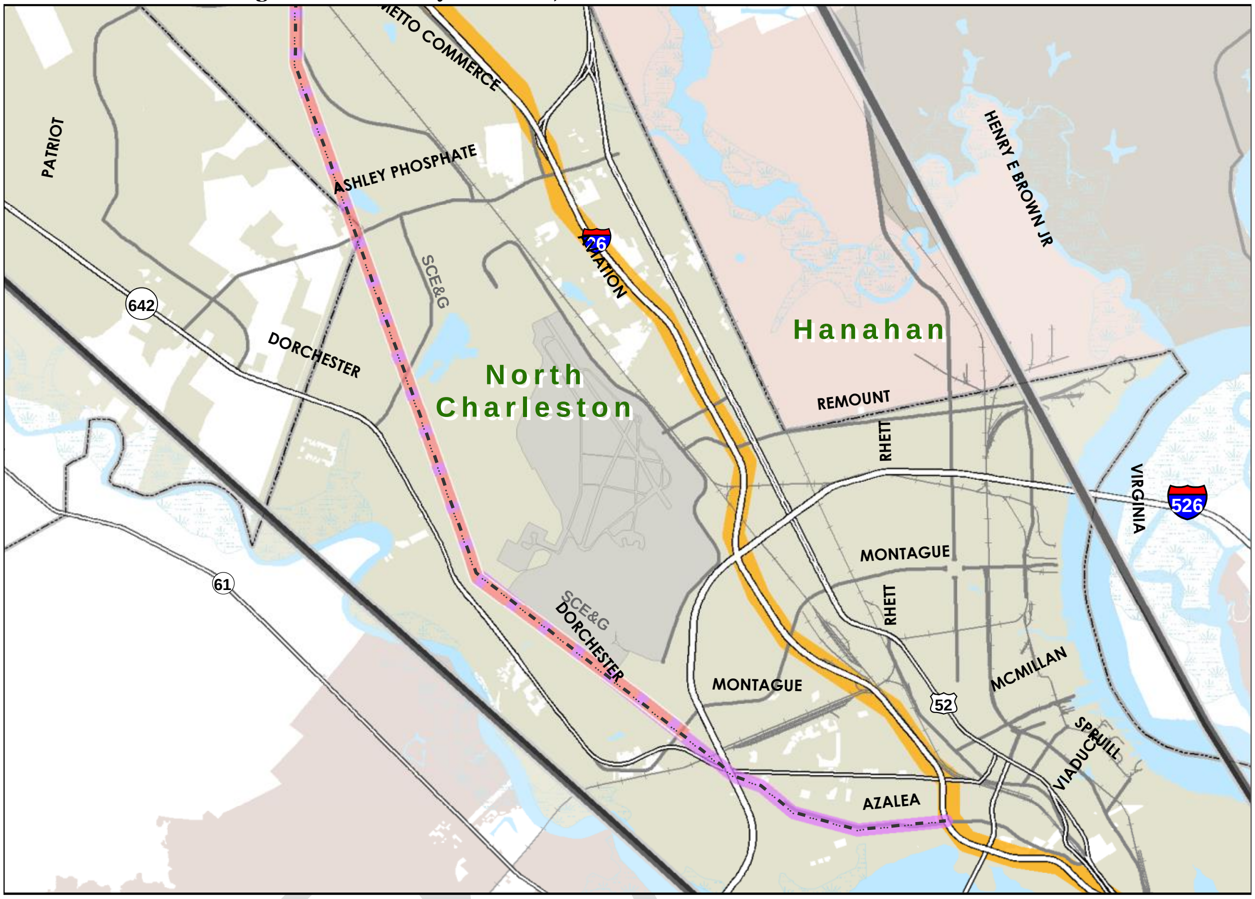
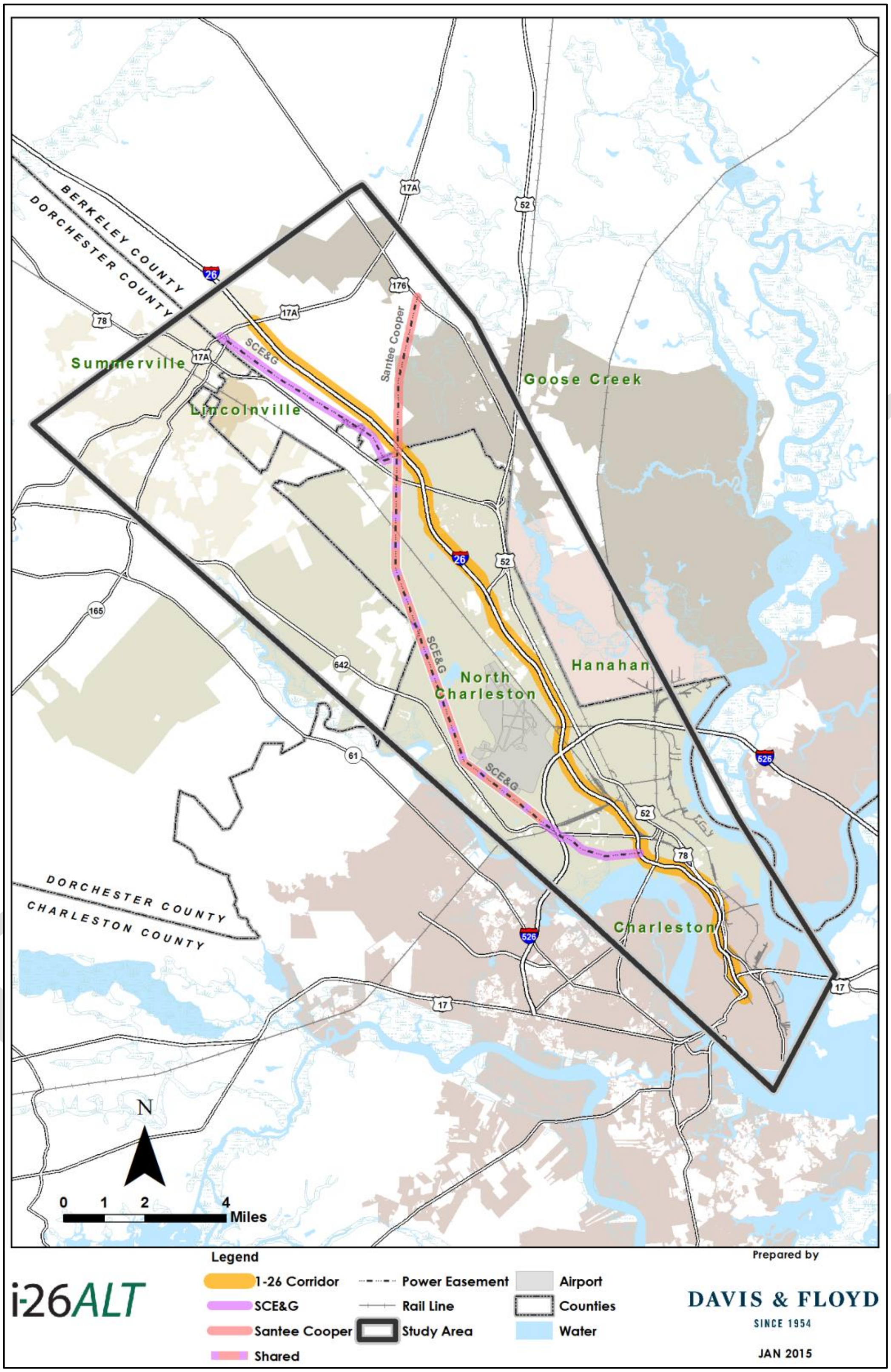


Figure 2-22 identifies the full utility corridors in the i-26*ALT* Study Area which include an SCE&G utility line and a Santee Cooper power easement.

Figure 2 - 22: SCE&G and Santee Cooper Utility Corridors



2.5 Existing Transit

The Berkeley-Charleston-Dorchester Region is served by two transit providers, the Charleston Area Regional Transportation Authority (CARTA), which operates in the Charleston-North Charleston urbanized area, as designated by the 2010 Census, and TriCounty Link (TCL) transit, which primarily operates in the rural areas of Berkeley, Charleston and Dorchester Counties as well as the urbanized towns of Summerville, Lincolnville, and Goose Creek. The i-26*ALT* Study Area is served mainly by CARTA transit service. TCL routes that serve Summerville and Lincolnville are considered "feeder" routes to the CARTA system along the i-26*ALT* Study Area. These TCL routes connect at CARTA bus stops or park-and-ride facilities allowing TCL passengers to transfer to the CARTA system if necessary. Figure 2-23 provides a map of the region's transit services and accompanying areas of coverage.

2.5.1 Charleston Area Regional Transportation Authority

CARTA's bus service includes express commuter bus, local fixed route bus, free Downtown Area Shuttle (DASH) trolley service, free North Area Shuttle (NASH), and Tel-a-Ride (ADA paratransit) services. For a comprehensive analysis of the complete CARTA transit system and routes, refer to the Comprehensive Operational Analysis (COA) Existing Conditions Report; CARTA System and Service Analysis Report; CARTA I-26 Alternatives Analysis: Passenger Ridecheck Survey Report (Appendix 1-B) and I-26 Fixed Guideway Alternatives Analysis: Employer Survey (Appendix 1-C). The following (Table 2-5) provides a list of CARTA routes and associated areas of operation relative to the i-26*ALT* Study Area. Although some transit routes do not operate directly within the Study Area, they serve as "feeders" to the corridor routes since they access CARTA transfer points/transit centers that provide connections to other in-corridor CARTA routes.

Table 2 - 5: CARTA Routes and Route Types

Route Name	Route Type	Direction	i-26 ALT Study Area
#1 James Island – North Charleston	Express	N-S	In Corridor
#2 West Ashley – Mount Pleasant Express	Express	W-E	Feeder
#3 Dorchester Road/Summerville Express	Express	N-S	In Corridor
#4 NASH Express	Express	N-S	In Corridor
#10 Rivers Avenue	Local Fixed	N-S	In Corridor
#11 Dorchester/Airport	Local Fixed	N-S	In Corridor
#12 Upper Dorchester	Local Fixed	N-S	In Corridor
#13 Remount Road	Local Fixed	N-S	In Corridor
#20 King Street/Citadel	Local Fixed	N-S	In Corridor/Peninsula
#21 Rutledge/Grove	Local Fixed	N-S	In Corridor/Peninsula
#30 Savannah Highway	Local Fixed	W-E	Feeder
#31 Folly Road	Local Fixed	N-S	Feeder
#32 Northbridge	Local Fixed	W-E	Feeder
#40 Mount Pleasant	Local Fixed	W-E	Feeder
#41 Coleman Boulevard	Local Fixed	W-E	Feeder
#102 Northern Neck	Neighborhood Circulator	N-S	In Corridor
#103 Leeds Avenue	Neighborhood Circulator	W-E	In Corridor
#104 Montague Avenue	Neighborhood Circulator	W-E	In Corridor
#105 NASH Circulator	NASH	W-E	In Corridor
#201 North Beltline	Neighborhood Circulator	Circulator	Feeder/Peninsula
#203 Medical Shuttle	Neighborhood Circulator	Circulator	Feeder/Peninsula
#210 College of Charleston/Aquarium	DASH	Circulator	Feeder/Peninsula
#211 Meeting/King	DASH	Circulator	Feeder/Peninsula
#213 Lockwood/Calhoun	DASH	Circulator	Feeder/Peninsula
#301 St. Andrews	Neighborhood Circulator	W-E	Feeder

Table 2-6 provides a list of service frequencies and hours of operation for all CARTA routes.

Table 2 - 6: CARTA Express, Local Fixed Route, DASH, and NASH Service (October, 2014)

Route Number	Route Name *(as of 10/01/2014)*	Weekday		Saturday		Sunday	
		Hours	Headway	Hours	Headway	Hours	Headway
CARTA Express							
1	James Island-North Charleston Express	5:19 AM - 9:08 AM 3:07 AM - 8:23 PM	30-45	No Service		No Service	
2	West Ashley - Mount Pleasant Express	5:35 AM - 9:30 AM 3:24 PM – 8:23 PM	30-50	No Service		No Service	
3	Dorchester Road/Summerville Express	5:15 AM - 9:07 AM 2:20 PM - 8:04 PM	30-50	No Service		No Service	
4	NASH Express	8:00 AM – 11:59 PM	60	8:00 AM – 11:59 PM	60	12:00 PM – 8:59 PM	60
CARTA Local Route							
10	Rivers Avenue	5:34 AM - 12:51 AM	20	6:33 AM - 12:03 AM	30	8:32 AM - 9:16 PM	45-65
11	Dorchester/Airport	5:52 AM - 9:33 PM	20-60	7:09 AM - 9:31 PM	20-60	8:18 AM - 7:41 PM	60
12	Upper Dorchester	5:35 AM - 9:54 PM	40-65	7:00 AM - 9:56 PM	50	8:00 AM - 7:47 PM	120
13	Remount Road	6:00 AM- 8:57 PM	60	7:00 AM - 8:57 PM	60	*No Service*	
20	King Street/Citadel	6:03 AM - 9:33 PM	30-60	6:03 AM - 9:33 PM	30-60	8:23 AM - 7:57 PM	30-60
21	Rutledge/Grove	6:12 AM - 7:07 PM	60	9:12 AM - 7:07 PM	60	*No Service*	
30	Savannah Highway	6:30 AM - 9:30 PM	45	7:15 AM - 9:30 PM	45	8:00 AM - 7:10 PM	90
31	Folly Road	6:15 AM - 8:11 PM	90	8:00 AM - 7:56 PM	90	8:00 AM - 6:26 PM	90
32	Northbridge	6:02 AM - 9:02 PM	60	7:02 AM - 9:02 PM	60	8:00 AM - 5:56 PM	120
40	Mount Pleasant	6:18 AM - 9:42 PM	40	6:18 AM - 9:35 PM	40-70	8:38 AM - 7:08 PM	60
41	Coleman Boulevard	7:30 AM - 8:25 PM	70	8:30 AM - 8:10 PM	70	*No Service*	
CARTA Local - Neighborhood Route							
102	Northern Neck	6:02 AM - 8:02 PM	60	7:02 AM - 8:02 PM	60	*No Service*	
103	Leeds Avenue	6:33 AM - 7:22 PM	60	8:33 AM - 6:22 PM	60	*No Service*	
104	Montague Avenue	6:00 AM - 9:00 PM	60	9:00 AM - 7:58 PM	60	*No Service*	
201	North Beltline	7:00 AM - 7:55 PM	60	7:00 AM - 7:55 PM	60	*No Service*	
203	Medical Shuttle	5:02 AM - 8:12 AM 3:02 PM-7:57 PM	5-20	*No Service*		*No Service*	
301	St. Andrews	6:12 AM - 9:17 PM	42-53	9:12 AM - 8:57 PM	42-53	8:30 AM - 6:15 PM	90
NASH							
105	NASH Circulator	11:00 AM - 10:00 PM	60	11:00 AM - 10:00 PM	60	12:00 PM - 9:00 PM	60
DASH							
210	College of Charleston/Aquarium	6:28 AM - 10:14 PM	12-24	8:04 AM - 8:21 PM	20	8:04 AM - 8:21 PM	20
211	Meeting/King	7:16 AM - 9:08 PM	12-44	8:16 AM - 9:06 PM	12-44	8:16 AM - 9:06 PM	12-44
213	Lockwood/Calhoun	6:20 AM - 8:57 PM	40	8:20 AM - 8:57 PM	40	9:20 AM - 6:37 PM	40

2.5.2 TriCounty Link

TCL serves primarily the rural areas of Berkeley, Charleston and Dorchester Counties, outside the CARTA service area. At present TCL routes also serve the towns of Summerville, Moncks Corner, and Goose Creek; all of which, since the 2010 Census, fall within the designated UZA for the region. TCL operates nine regular fixed routes, four commuter routes and a commuter shuttle. Of these routes, two fixed routes (Routes B102 and D305), four commuter routes (Routes #1, #2, #4, and #6), and the Dorchester Connector Shuttle each serve as feeders to the CARTA system within the I-26 study corridor. Each of the routes mentioned either stop at the CARTA Rivers Avenue Park and Ride or the Trident Medical/Health South CARTA stop, or serve as feeders to a route that connects to these facilities allowing TCL passengers to transfer to the CARTA system if necessary. Table 2- provides a list of TriCounty Link routes serving the study corridor. TriCounty Link is a flagstop system; therefore, buses stop for any passenger along the route who indicates they need a ride.

Route #1 Berkeley County Commuter Route and Route #2 Dorchester County Commuter Route connects commuters from Moncks Corner and the Town of Ridgeville, respectively, to the North Charleston CARTA Rivers Avenue Park and Ride facility. Route #3, Dorchester County-Santee Cooper Commuter Route, and Route #6, Dorchester Connector, link commuters from Moncks Corner and the Town of St. George to the Dorchester Park and Ride facility in Summerville. The Dorchester Connector Shuttle provides service between the Dorchester Park and Ride in Summerville to the CARTA Trident Medical/Health South bus stop in North Charleston. TCL is a flagstop system, which means vehicles will stop for passengers outside designated stop locations along the bus route upon request. The local route B102 provides service from Moncks Corner to Summerville, North Charleston, Hanahan and Goose Creek. It parallels some CARTA routes in Hanahan and North Charleston along Rivers Avenue. This route provides a connection to CARTA service at the Rivers Avenue Park and Ride. Route D305 travels from Moncks Corner to North Charleston via Summerville. This route traverses through Downtown Summerville and Lincolnville before connecting to CARTA service at the Rivers Avenue Park and Ride in North Charleston. Tables 2-7 and 2-8 provide a list of the seven (7) routes identified within the I-26 study corridor and their service frequencies and hours of operation.

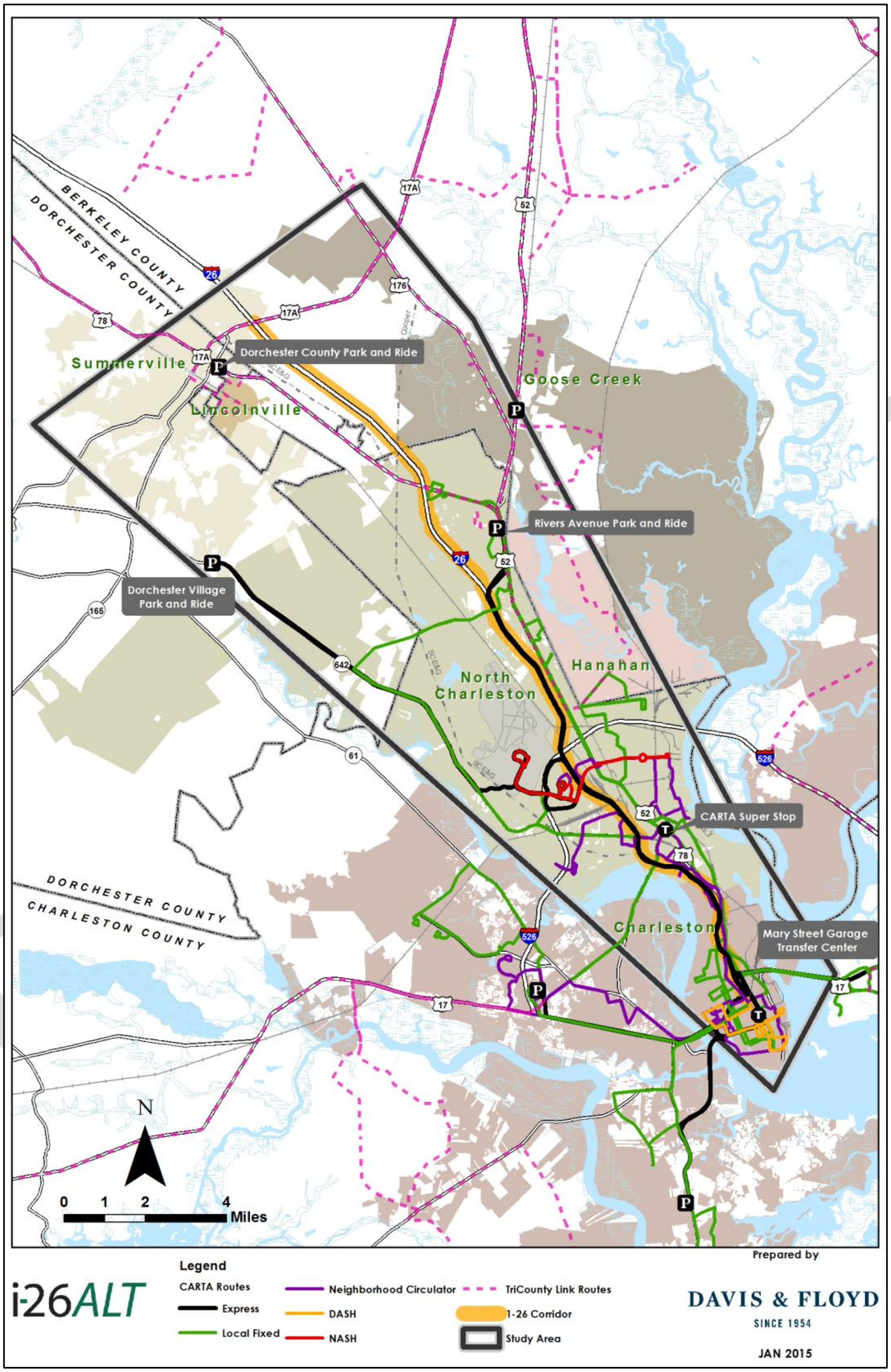
Table 2 - 7: TriCounty Link i-26*ALT* Study Area Routes

Route Name	From	To	Route Type	Connection Point (s)
#1 Berkeley Commuter Route	Moncks Corner	N. Charleston	Express	Rivers Ave K-Mart P&R
#2 Dorchester Commuter Route	Ridgeville	N. Charleston	Express	Rivers Ave K-Mart P&R
#3 Dorchester-Santee Cooper	Moncks Corner	Summerville	Express	Dorchester County P&R
#6 Dorchester Connector	St. George	Summerville	Express	Dorchester County P&R
Dorchester Connector Shuttle	Summerville	N. Charleston	Express Shuttle	Trident/Health South Bus
B102	-		Local	Rivers Ave K-Mart P&R
D305	-		Local	Rivers Ave K-Mart P&R

Table 2 - 8: TriCounty Service within Study Corridor (October, 2014)

Route Number	Route Name *(as of 10/15/2012)*	Weekday	
		Hours	Headway
Commuter Routes			
1	Berkeley Commuter Route	5:30 AM - 9:00 AM 3:30 PM - 7:25 PM	Varies
2	Dorchester Commuter Route	5:15 AM - 9:00 AM 3:45 PM - 8:05 PM	Varies
3	Dorchester-Santee Cooper Commuter Route	6:15 AM - 8:00 AM 3:40 PM - 6:10 PM	Varies
6	Dorchester Connector	6:00 AM - 6:55 PM	60
Commuter Shuttle			
	Dorchester Connector Shuttle	9:00 AM - 2:55 PM	60
Local Routes			
B-102	Moncks Corner-Goose Creek	5:45 AM - 9:30 AM 2:00 PM - 5:45 PM	1 AM Trip 1 PM Trip
D-305	Moncks Corner - Sangaree - Summerville - Lincolnville - Ladson - N. Charleston	6:25 AM - 7:30 AM 7:15 PM - 5:50 PM	1 AM Trip 1 PM Trip

Figure 2 - 23: Regional Transit Providers - CARTA and TriCounty Link Systems



2.6 Relevant Planning Studies

In an effort to ensure consistency amongst planning efforts and to gain a better understanding of the i-26*ALT* Study Area, a comprehensive review of existing studies that have been completed or that are in progress within the Study Area is provided in Appendix 1-D. Major recommendations or items of interest that may influence the transportation, land development patterns, housing or transit environment within the Study Area were considered and noted. Reviewed documents include but are not limited to:

- *Transit Consolidation Feasibility Analysis, 2013, BCDCOG*
- *North Charleston Regional Intermodal Transportation Center, CARTA*
- *Charleston Metropolitan Area Commuter Rail Feasibility Study, 2006, CARTA*
- *Charleston Metropolitan Area Commuter Rail Feasibility Study – Phase 2, 2011, CARTA*
- *TriCounty Link Routes, 2014, BCDCOG*
- *Partnership for Prosperity: A Master Plan for the Neck Area of Charleston and North Charleston, 2013, BCDCOG*
- *Berkeley-Charleston-Dorchester Housing Needs Assessment, 2014, BCDCOG*
- *Our Region Our Plan: Vision Plan, BCDCOG*
- *Sheep Island Interchange EA*
- *Port Access Road FEIS*
- *SCDOT HOV/HOT Lane Feasibility Study, 2010, SCDOT*
- *Environmental Assessment for I-26 Improvements, 2007, SCDOT*
- Berkeley County Comprehensive Plan, 2010, BCDCOG
- North Charleston Comprehensive Plan Update
- Charleston County Comprehensive Plan
- City of Charleston Century V, 2010 Comprehensive Plan Update
- Dorchester Comprehensive Plan
- Goose Creek Comprehensive Plan
- Hanahan Comprehensive Plan
- Summerville Comprehensive Plan
- Charleston Area Regional Transportation Authority 2015-2019 Strategic Plan, 2014, CARTA
- Statewide Multimodal Transportation Plan, 2014, SCDOT
- Statewide Rail Plan, Draft 2014
- SCDOT Interstate Corridor Plan
- SCDOT Strategic Corridor Plan

Some studies provide insight into regional transportation, transit, land use, housing and development conditions, and others provide information of great relevance to specific sub areas within the Study Area. While all plans were reviewed, a summary of the most relevant to the i-26*ALT* Study Area are further summarized in Appendix 1-D and are identified by italicized font in the list above.

2.7 Natural Resources and Cultural Resources

Like much of the region, the i-26*ALT* Study Area is rich in cultural, historic and natural resources. Figure 2-24 provides the USGS Quadrangle Maps for the Study Area along with historic resources identified by the National Register of Historic Places (NHRP).

2.7.1 Watersheds

The Ashley River Basin is located in the Berkeley-Charleston-Dorchester Region and encompasses nine watersheds and approximately 1,545 square miles. The i-26*ALT* Study Area is located within two contiguous watersheds: the Ashley River Watershed to the west and the Cooper River/Charleston Harbor Watershed to the east. Generally, areas to the west of I-26 fall within the Ashley River Watershed and include portions of the Town of Summerville and Ladson, and the Cities of Charleston and North Charleston. Within the Study Area, primary outlets draining into the Ashley River include Dorchester Creek, Sawmill Creek, Eagle Creek, Coosaw Creek, and Chandler Bridge Creek in Dorchester County; and Popperdam Creek, Sawpit Creek, and Brickyard Creek in Charleston County. High growth potential exists within this watershed. In particular, potential high growth areas identified include Amberwood, Jerico on the Ashley, Summerfield, River Oaks, and Shadowmoss in Charleston County; and Coosaw Creek, Whitehall, Avanti Tract, Appian Landing, Bakers Landing, Indigo Fields, and Ricefield/Windsor Hill in Dorchester County. Currently, water and sewer services are available to all identified growth areas.

Portions of the Study Area located east of I-26 including Goose Creek, Hanahan, parts of the Cities of North Charleston and Charleston, the Neck Area and Peninsula generally fall within the Cooper River/Charleston Harbor Watershed. Major outlets within the Study Area that contribute to this watershed include Ancrum Swamp, Bluehouse Swamp, Huckhole Swamp, Goose Creek, Goose Creek Reservoir, Town Creek, Newmarket Creek, Shipyard Creek, Filbin Creek, and Noisette Creek. A high potential for growth also exists within this watershed. Significant growth in the upper area of the watershed is expected in Berkeley County and the Town of Goose Creek within the Study Area. County/town operated water and sewer systems in these areas may allow for scattered development. Summerville, Hanahan, North Charleston, Charleston and parts of Berkeley County are identified as population growth areas in the central region of the watershed. The lower portions of the watershed contain the Peninsula of the City of Charleston and environs which offer potential for residential and commercial growth. The major suburban growth areas in this area are located outside the Study Area on James, Johns and Kiawah Islands, all of which have water and sewer services available.

2.7.2 Wetlands

Wetlands are generally defined as lands where persistent saturation of water results in specific soil types and identifiable plant and animal communities. Wetlands are essential to any region's water supply. They source downstream waters, trap floodwater and storm surges, recharge groundwater supplies, filter and remove pollutants, and provide habitat for an abundance of wildlife. These lands are also economically significant because they offer opportunities for recreational and commercial uses. The Charleston Region has a rich mix of both tidal and non-tidal wetlands.

2.7.3 Wildlife: Rare, Threatened and Endangered Species Inventory

The SC Department of Natural Resources (DNR) provides the following information identifying threatened and endangered species within the tri-county region. State Protected Species (threatened or endangered) within Dorchester County include the Spotted Turtle, Rafinesque's Big-eared Bat, American Swallow-tailed Kite, Gopher Tortoise, Bald Eagle, Red-cockaded Woodpecker, Gopher Frog, and Least Tern. Species identified within Berkeley County include the Shortnose Sturgeon, Flatwoods Salamander, Spotted Turtle, Rafinesque's Big-eared Bat, American Swallow-tailed Kite, Bald Eagle, Red-cockaded Woodpecker, Gopher Frog, and Least Tern. Within Charleston County, they include the Shortnose Sturgeon, Flatwoods Salamander, Loggerhead Turtle, Wilson's Plover, Spotted Turtle, Rafinesque's Big-eared Bat, American Swallow-tailed Kite, Bald Eagle, Wood Stork, Dwarf Siren, Red-cockaded Woodpecker, Gopher Frog, Least Tern, and Bachman's Warbler.

An inventory of the area's natural resources was collected from a number of sources. Wetland data was collected from the US Fish & Wildlife National Wetlands Inventory (NWI); protected lands from the USGS GAP Analysis Program and the National Conservation Easement Database (NCED); and rural/conservation lands from compiled land use, zoning and parcel data from local jurisdictions. Figure 25 provides an inventory of the Study Area's natural land resources which include the area's rivers, streams and other water bodies; forested and non-forested wetlands; coastal estuarine and marine wetlands; protected lands; and zoned rural/undeveloped lands.

The waters and wetlands surrounding the Charleston Peninsula and Neck Area are primarily estuarine and marine waters. There is rich holding of wetlands in Berkeley County to the northeast of the Study Area comprising many of the tributaries that flow into the Cooper River. To the west of the Study Area, there are noted wetlands comprising the tributaries of the Ashley River. Wetlands in the Study Area are sparser than in surrounding areas and are located primarily in the northern areas of North Charleston, Lincolnville and Summerville. The major protected land within the i-26*ALT* Study Area is the Charleston Air Force Base which falls under the Department of Defense.

Figure 2 - 24: Study Area USGS Quadrangle Map and NRHP Historic Landmarks

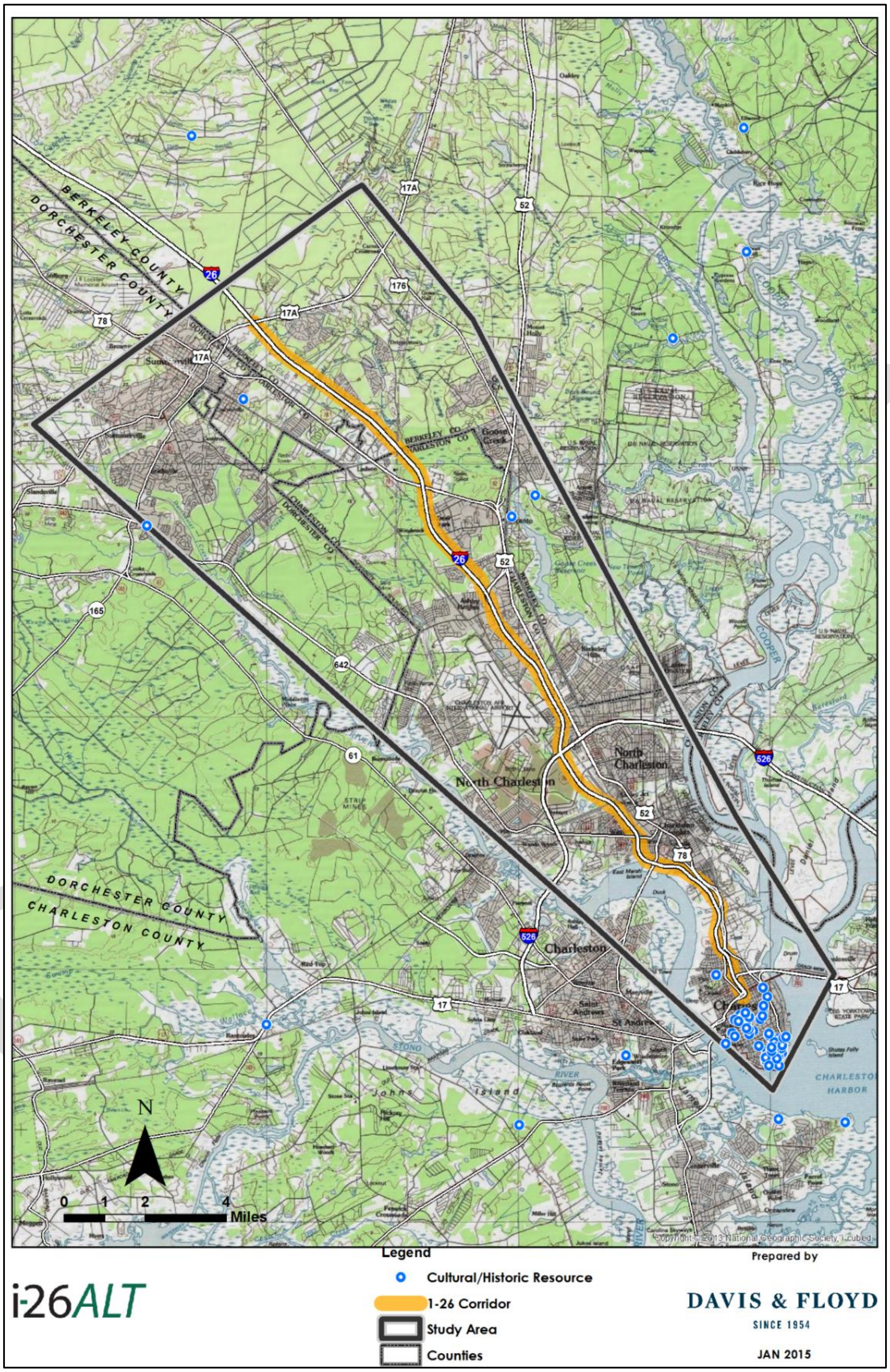
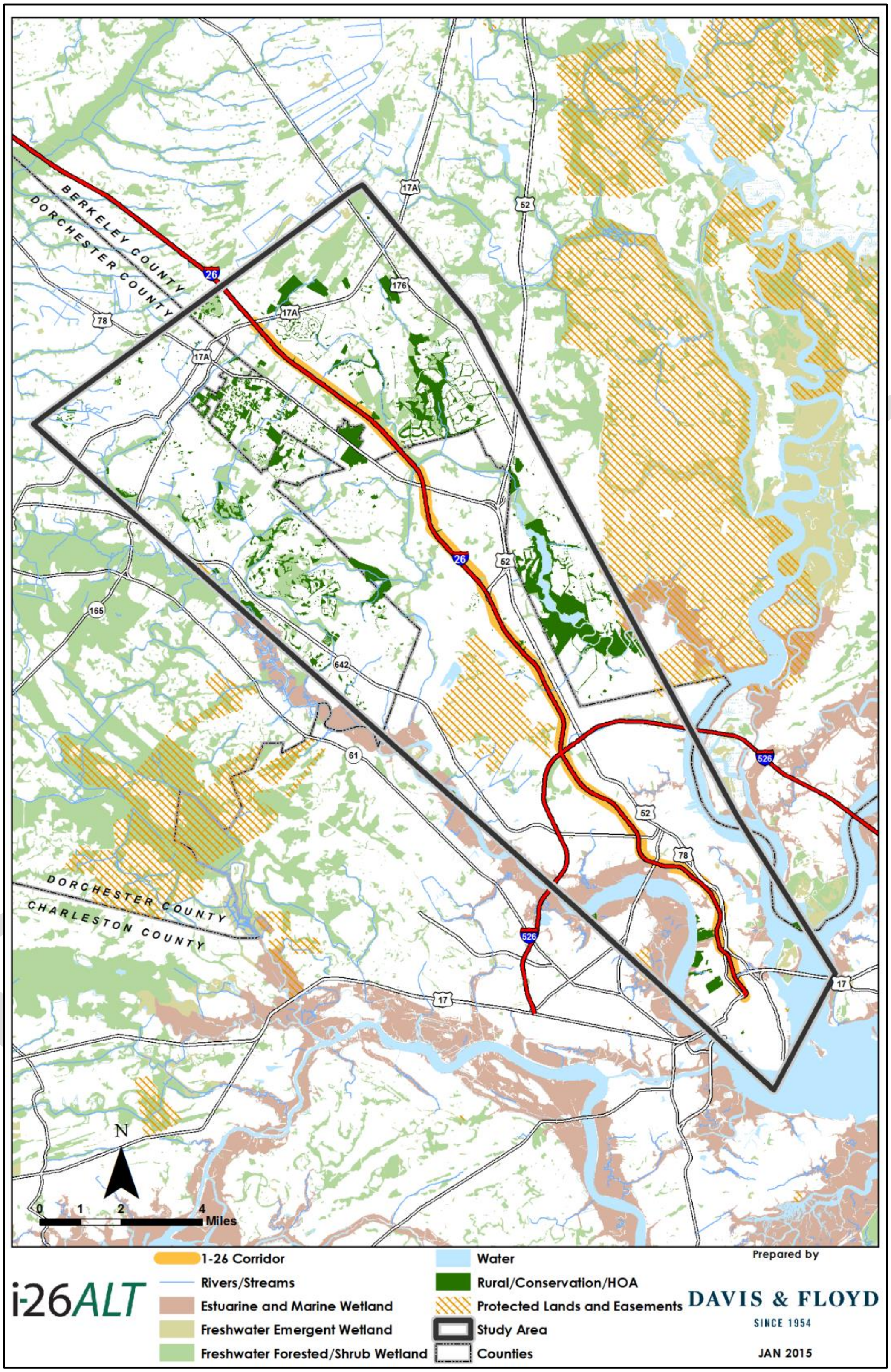


Figure 2 - 25: Study Area Natural Resources



3 Sub Area Analysis

Given the large extent of the i-26*ALT* Study Area, this analysis is further broken down into sub areas. This section defines the designated sub areas and provides a detailed micro-level summary of the existing conditions within each area to include existing transportation infrastructure, traffic data, existing transit routes and facilities, parking supply, land development patterns, and environmental resources.

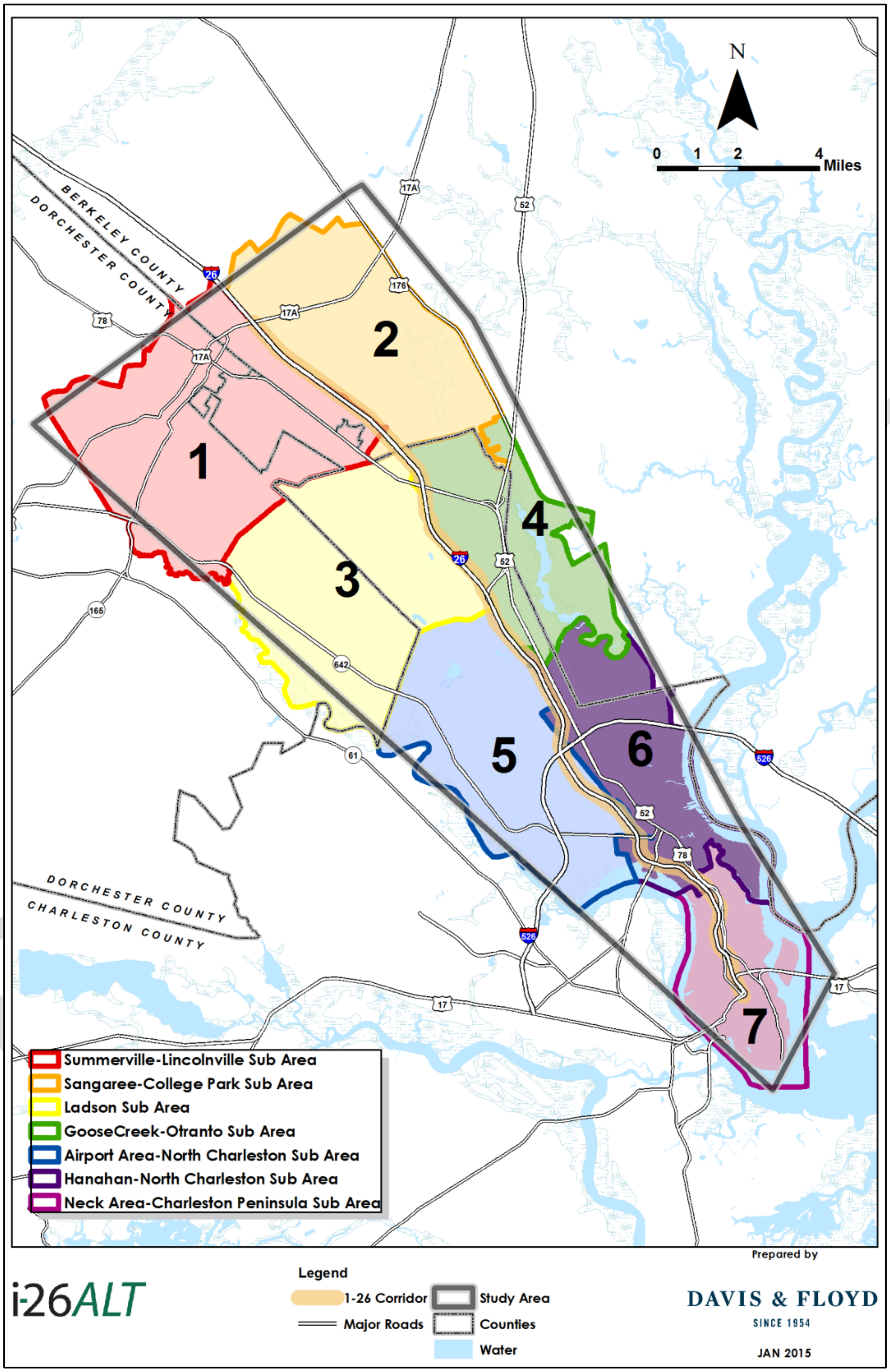
3.1 General Description of Sub Areas

The I-26 Study Area is broken into seven (7) sub areas along the Corridor (Figure 3-1). The sub areas include:

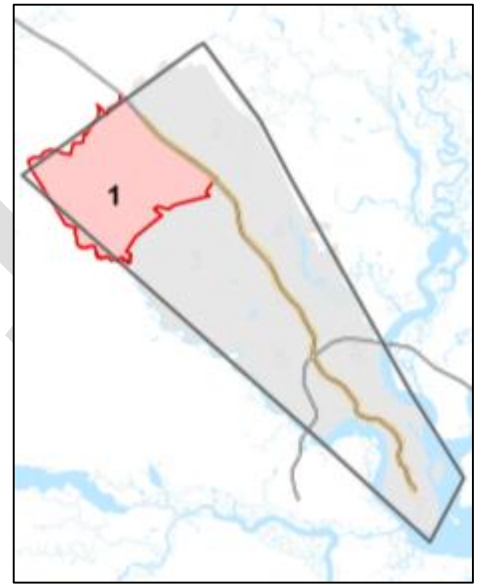
Sub Area 1: Summerville-Lincolnville Sub Area
Sub Area 2: Sangaree-College Park Sub Area
Sub Area 3: Ladson Sub Area
Sub Area 4: Goose Creek-Otranto Sub Area
Sub Area 5: Airport Area-North Charleston Sub Area
Sub Area 6: Hanahan-North Charleston Sub Area
Sub Area 7: Neck Area-Charleston Peninsula Sub Area

Sub areas were determined by aggregating Census Block Group data into manageable sectors primarily along the travel shed of the interstate within the Study Area. Illustrated sub areas extend beyond the boundaries of the defined Study Area in an effort to keep census blocks intact. However, analysis will focus on facilities and infrastructure located within the boundaries of the Corridor Study Area.

Figure 3 - 1: I-26 Study Corridor Sub Areas



3.2 Sub Area 1: Summerville-Lincolnville



The Summerville-Lincolnville Sub Area includes the Towns of Summerville and Lincolnville, primarily to the west of I-26. It is bordered to the west by Dorchester Road and to the south by Ladson Road. This Sub Area falls within the 2010 Census designated Charleston-North Charleston Urbanized Area (UZA). Located at the outskirts of the UZA, this Sub Area has several distinct rural characteristics.

3.2.1 Field Review/General Observations

US 17A to the west of the Sub Area has clear residential characteristics. The Boone Hill Road/US 17A roadway segment is primarily a two-lane, tree-lined arterial. The major commercial/retail areas in this Sub Area are concentrated around the Dorchester Village, the Berlin G. Myers Parkway and Bacons Bridge Road intersection, Old Trolley Road and along Main St/US 17A around I-26.

The Town of Summerville has a well-defined downtown area with on-street parking and local retail shopping areas. Street blocks in the downtown area are relatively small, and streets are wide and easy to navigate around the main arterial. Berlin G. Myers Parkway currently does not have sidewalk infrastructure despite noted pedestrian activity along Berlin G. Myers Parkway between US 17A and US 78 segment.

3.2.2 Transportation Infrastructure

The following summarizes general transportation infrastructure in the corridor. Appendix 1-E provides detailed tables for the major roadways inside the sub area to identify peak and daily Volume over Capacity (V/C) and flow by link.

<u>On-going Construction</u>

A roadway-widening project is currently under construction in this Sub Area. Bacons Bridge Road (SC 165) is being widened from two lanes to five lanes with a center turn lane from the end of the existing four-lane section to SC 61 (Ashley River Road).

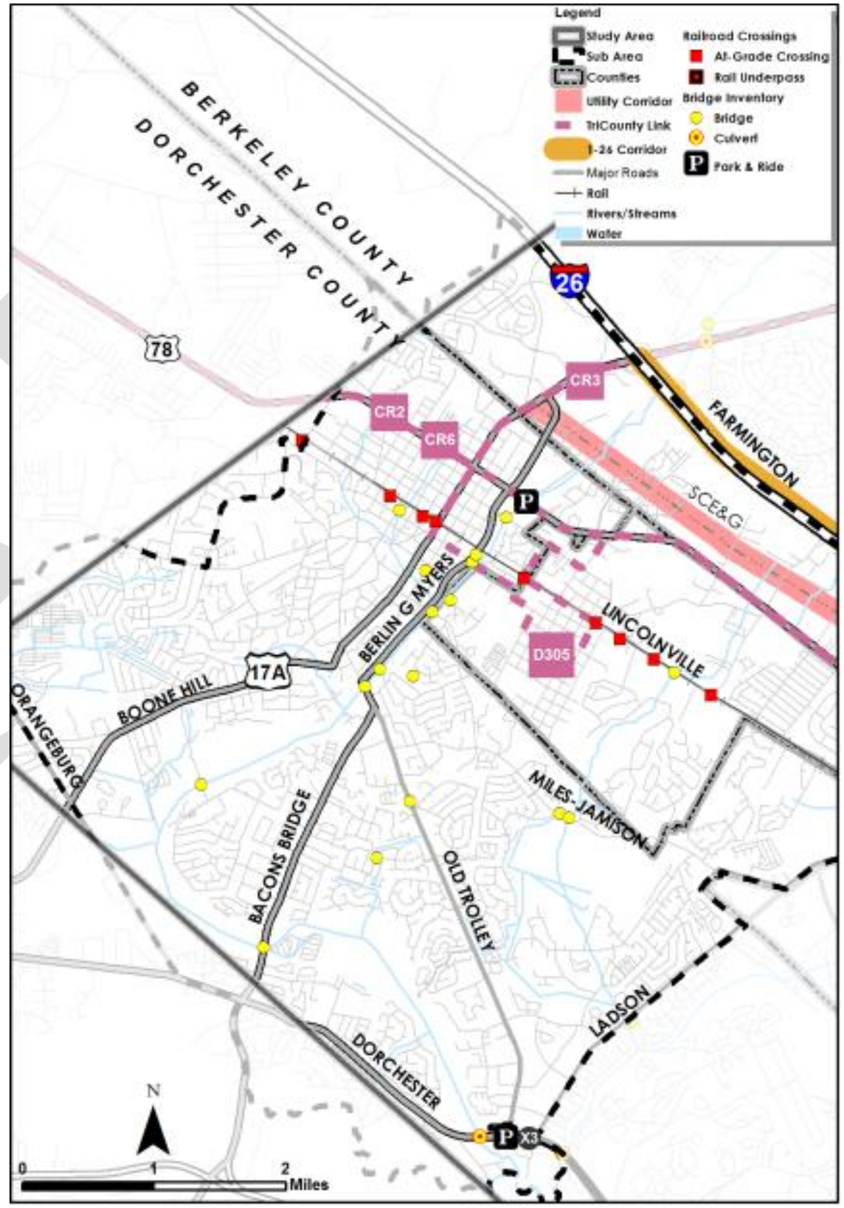
<u>Parking</u>

The Summerville downtown area has on-street parking available along its Main Street blocks in the city center. The City also has a free parking garage to the rear of the Summerville Town Hall at W. Richardson Avenue and S. Main Street.

3.2.3 Existing Transit Routes and Facilities

The Summerville-Lincolnville Sub Area is served primarily by TriCounty Link Transit. There are two Park and Ride facilities located in this Sub Area; the Dorchester County Park and Ride facility located at Berlin Myers Parkway and Gahagan Road in Summerville; and the Dorchester Village Shopping Center Park and Ride facility located at Dorchester Road and Old Trolley Road at the municipal line between Summerville and North Charleston. The Dorchester County Park and Ride serves TriCounty Link bus routes, while the Dorchester Village Park and Ride provides a connection to CARTA #3 Express (Dorchester Road/Summerville) service.

The TriCounty Link service in the Sub Area includes Route D-305 from Goose Creek to North Charleston. This route travels along US 17A/N. Main Street into Summerville; circulates through Downtown Summerville and Lincolnville; and continues south along US 78 to the CARTA Rivers Avenue Park and Ride in North Charleston. The area is also served by three commuter routes and the Dorchester Commuter Shuttle. Route #2 Dorchester Commuter Route provides service along US 78 from Ridgeville to the Dorchester County Park and Ride and continues along US 78 to the CARTA Rivers Avenue Park and Ride in North Charleston. Route #3 Dorchester-Santee Cooper Commuter Route from Goose Creek travels along US 17A to Summerville and terminates at the Dorchester County Park and Ride facility. Route #6 Dorchester Connector Commuter Route provides service from St. George to Summerville along US 78 and terminates at the Dorchester County Park and Ride. The Dorchester Connector Shuttle provides service along Berlin G. Myers Parkway from the Dorchester County Park and Ride facility to Summerville's Azalea Square shopping area to North Charleston's Trident/Health South CARTA stop via I-26.



3.2.4 Land Use and Development Patterns

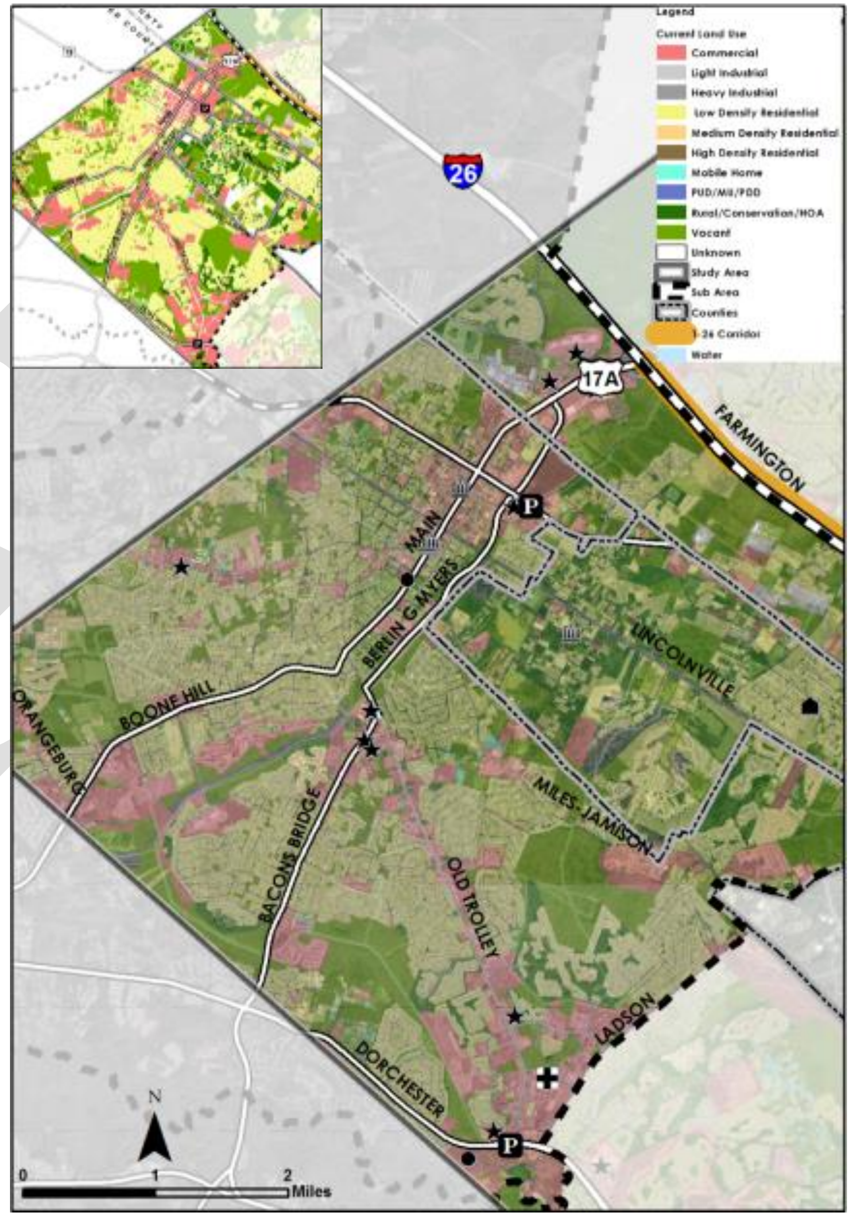
The major commercial corridors and hubs in this Sub Area are concentrated along Old Trolley Road; around Ladson Road and Dorchester Road; around US 17A/Boone Hill Road and Orangeburg Road; and along US 17A/N. Main Street and Berlin G. Myers Parkway from I-26 to US 78. Much of the Sub Area is zoned for single-family low density residential use, with pockets of multi-family residential use off Miles Jamison Road.

Light industrial uses are limited to areas east of Summerville and Lincolnville along US 78 and I-26. A large proportion of Rural/Conservation/HOA uses are located in and around the municipality of Lincolnville.

The Town of Summerville Comprehensive Plan (2009) encourages nodal commercial development around major intersections, commercial corridor development along Ladson Road, and economic growth centers/nodes to the north of the town along I-26.

This Sub Area has the highest population of all designated Sub Areas. Employment figures stand at approximately one-third of the area's population level.

Sub Area 1	Region			% of Corridor	
	2010	2035	% Change	2010	2035
Population	64,834	73,959	14%	23%	22%
Households	24,983	28,857	16%	23%	21%
Employment	21,511	24,215	13%	13%	12%



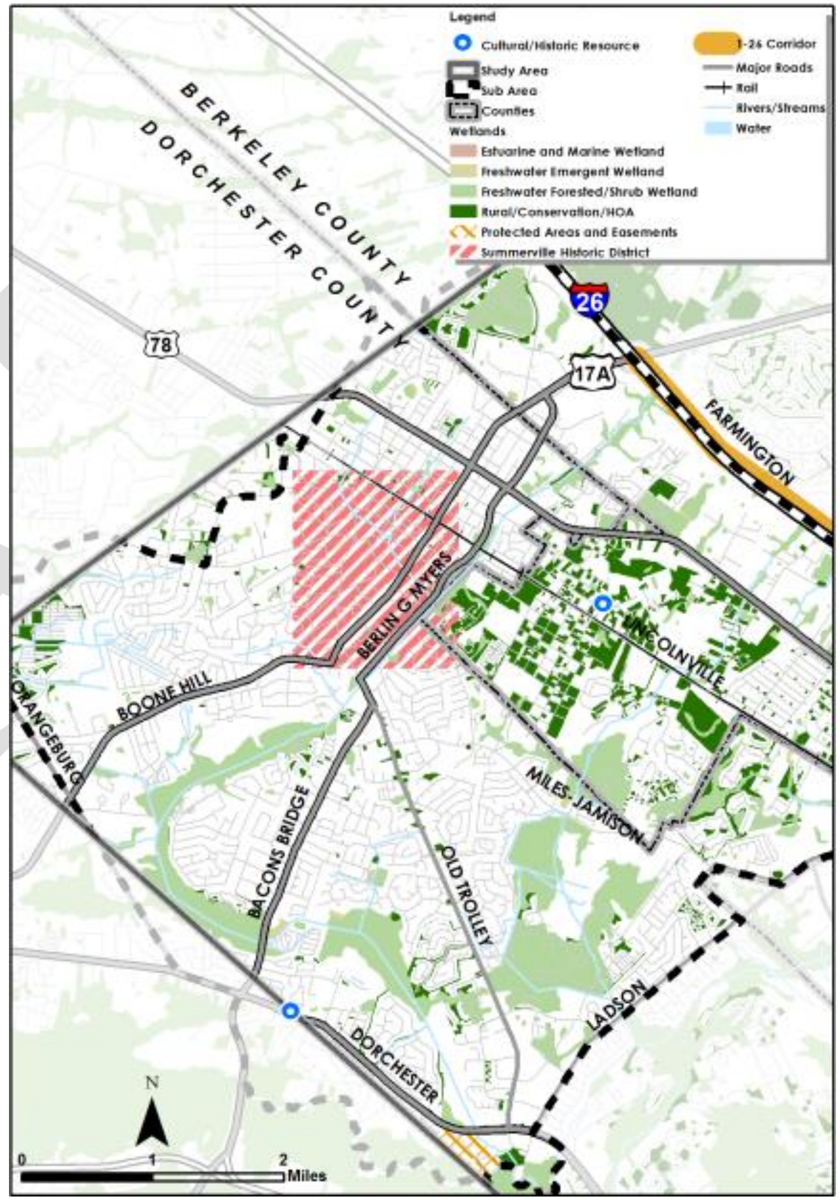
3.2.5 Environmental/Cultural Resource

The Summerville-Lincolnville Sub Area has many streams and rivers that feed into the Ashley River watershed. Many of the forested wetlands are located along these water bodies and are most prominent in the southwest portion of the Sub Area.

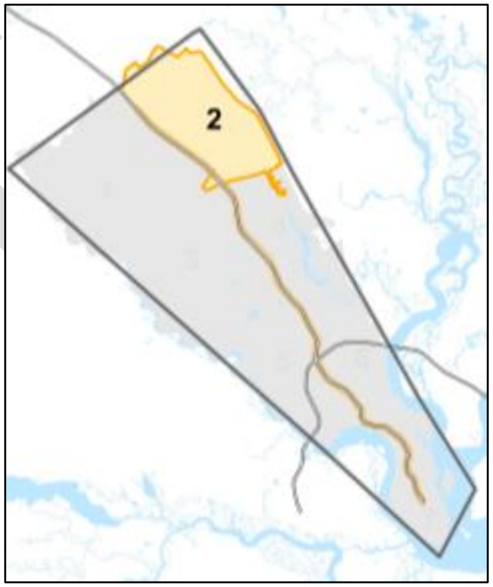
The Colonial Dorchester State Historical Site located off Dorchester Road and Old Trolley Road is identified as protected lands under State management. The area's cultural/historic resources include:

- Summerville Historic District
- Williams Grade School
- Old White Meeting House Ruins and Cemetery

The Ashley River Historic District is located just outside the boundaries of the Study Area and south of Dorchester Road.



3.3 Sub Area 2: Sangaree-College Park



The Sangaree-College Park Sub Area is located to the east of I-26. It is bounded to the south by the municipal line dividing North Charleston and Goose Creek along Westview Boulevard. Areas within this Sub Area have both rural and urban designations. Within the i-26*ALT* Study Area, the area bounded by I-26, US 17A and US 176 is classified as urban, while the area to the north of US 17A is classified as rural.

3.3.1 Field Review/General Observations

US 17A from I-26 to US 176 has wide travel lanes and a center turn lane. Land use along US 17A is a mix of commercial and residential with sidewalk infrastructure present.

The planned Nexton development in Summerville is situated to the northeast of the I-26 and US 17A intersection. This 4,500 acre development will be a mixed-use development with over 10,000 homes including 2,000 apartments and 6 million square feet of commercial space upon build out.

3.3.2 Transportation Infrastructure

The following summarizes general transportation infrastructure in the corridor. Appendix 1-E provides detailed tables for the major roadways inside the sub area to identify peak and daily Volume over Capacity (V/C) and flow by link.

<u>On-going Construction</u>

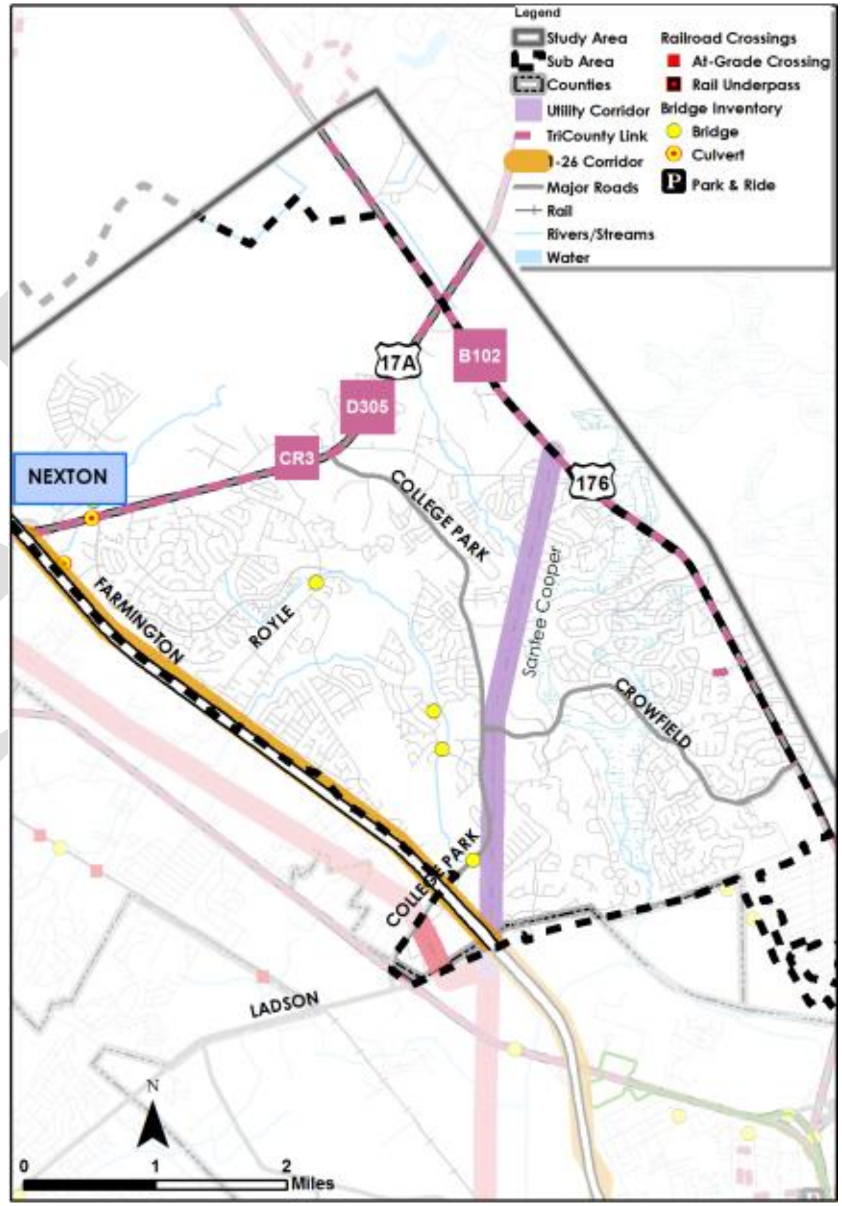
There is a roadway widening project under construction in this Sub Area. The existing two-lane section of College Park Road is being widened from two lanes to four lanes/five lanes with accommodations for bicycles and pedestrians.

<u>Parking</u>

No major parking infrastructure nor major parking concerns exist in this Sub Area.

3.3.3 Existing Transit Routes and Facilities

The Sangaree-College Park Sub Area is served primarily by TriCounty Link Transit. Route B-102 provides service from Moncks Corner to Goose Creek and Hanahan along US 52; through North Charleston along Rivers Avenue, and also serves communities north of the Study Area along US 176. Within the Study Area, Route B-102 travels along US 176. This route provides a connection to CARTA services at the Rivers Avenue Park and Ride in North Charleston. Route #3 Dorchester County-Santee Cooper Commuter Route passes through this Sub Area along US 17A from Moncks Corner to Summerville. Route D305 travels along US 17A into Summerville from Moncks Corner. Since TriCounty Link is a flagstop system, buses along routes B102 and D-305 stop for passengers along the route that signal for the bus to stop.



3.3.4 Land Use and Development Patterns

Commercial land use in this Sub Area is concentrated primarily along US 17A and US 176. The urban areas of the Sangaree-College Park Sub Area are zoned for Single-Family Residential low density use with pockets of Multi-Family Residential uses along College Park Road, Crowfield Road and US 176. Light industrial areas are concentrated to the east of US 176 and along Crowfield Road.

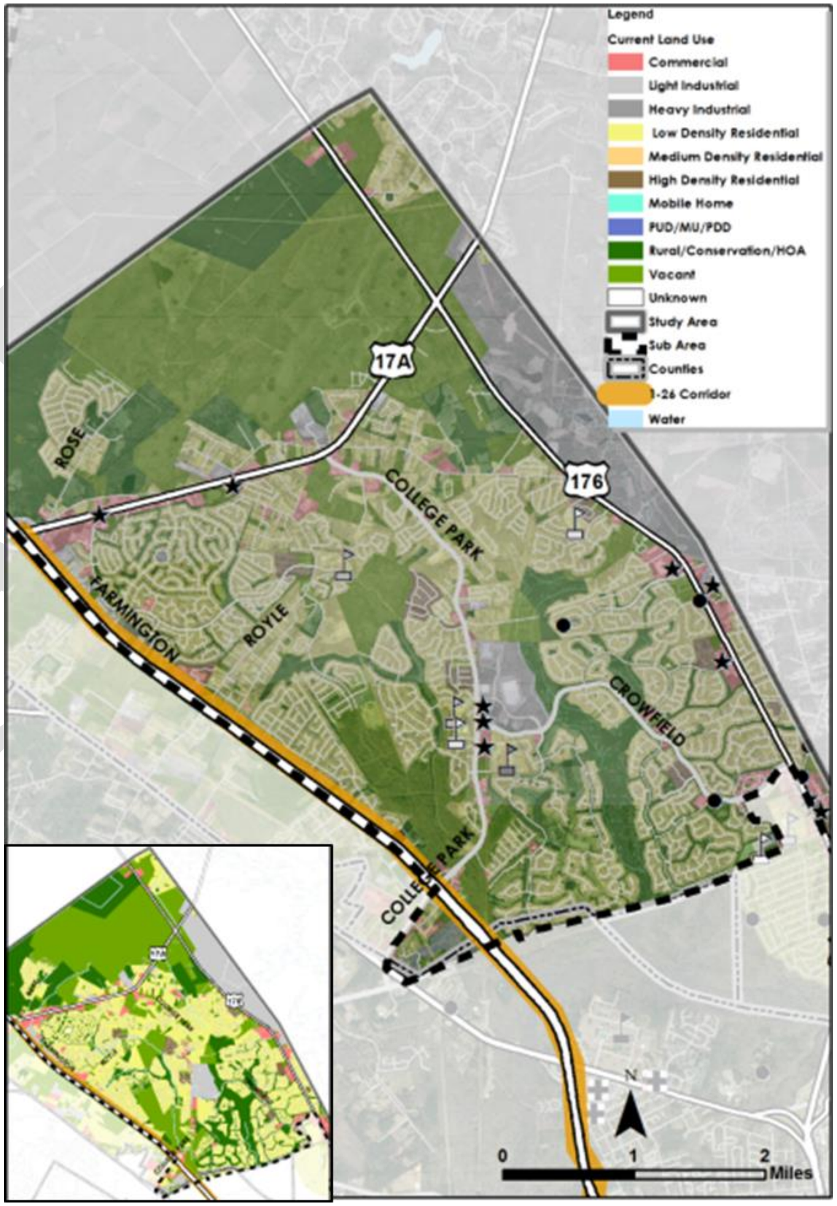
Much of the Sub Area's vacant and rural/conservation spaces are in the Sub Area's northern regions which fall outside the Charleston-North Charleston Urbanized Area.

The new Nexton development is sited in this Sub Area at I-26 and US 17A. At build-out, the 4,500 acre development will extend north of the Sub Area between I-26 and US 176. The development plan proposes the addition of a new interstate exit (Sheep Island Parkway Interchange) to facilitate access to the community. The Cane Bay and Carnes Crossroads developments are also located in this sub area around the US 17A and US 176 intersection and along US 176.

This Sub Area is primarily residential with over five times more population than employment.

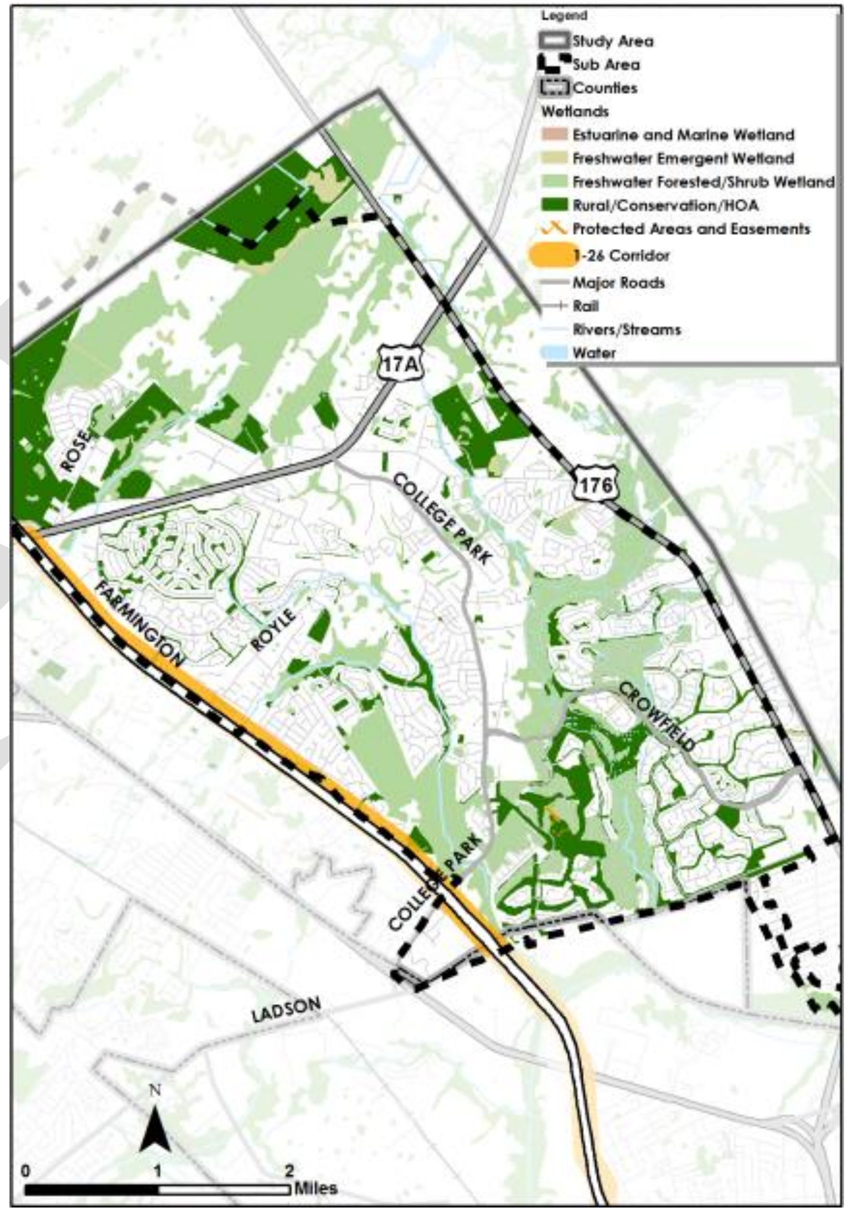
Sub Area 2	Region		
	2010	2035	% Change
Population	43,511	50,576	16%
Households	15,546	18,484	19%
Employment	6,975	8,262	18%

% of Corridor	
2010	2035
16%	15%
14%	14%
4%	4%

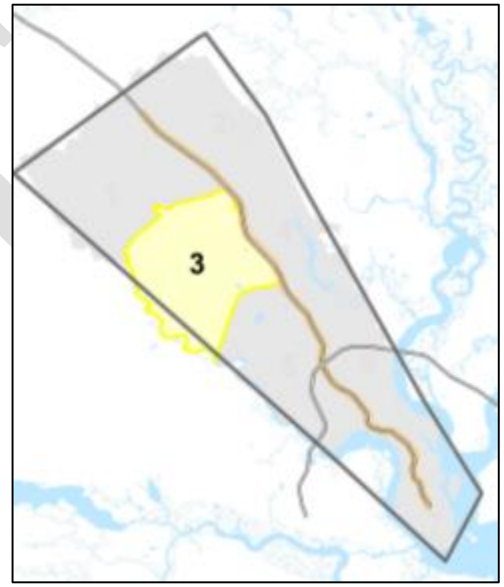


3.3.5 Environmental/Natural Resources

Compared to other Sub Areas, the Sangaree-College Park Sub Area has large wetland coverage. Crowfield Plantation is a privately held conservation easement located off of College Park and Crowfield Roads.



3.4 Sub Area 3: Ladson



The Ladson Sub Area is located west of I-26 and is bordered to the north by Ladson Road, to the south by a segment of Ashley Phoshate Road and Ruff Road, and to the west by the Ashley River. The Sub Area falls within the Charleston-North Charleston UZA.

3.4.1 Field Review/General Observations

Most of the major roads (Ashley Phosphate Road, Ladson Road, Palmetto Commerce Parkway and Patriot Road) have some multi-use trail infrastructure that could facilitate non-motorized travel. Uses along Palmetto Commerce Parkway are primarily industrial. This corridor has wide travel lanes and large right-of-ways.

The major commercial/retail areas are located along Dorchester Road to the west of the Sub Area, with clustered retail around the Dorchester Road and Ashley Phosphate Road intersection.

3.4.2 Transportation Infrastructure

The following summarizes general transportation infrastructure in the sub area. Appendix 1-E provides detailed tables for the major roadways inside the sub area to identify peak and daily Volume over Capacity (V/C) and flow by link.

<u>On-going Construction</u>

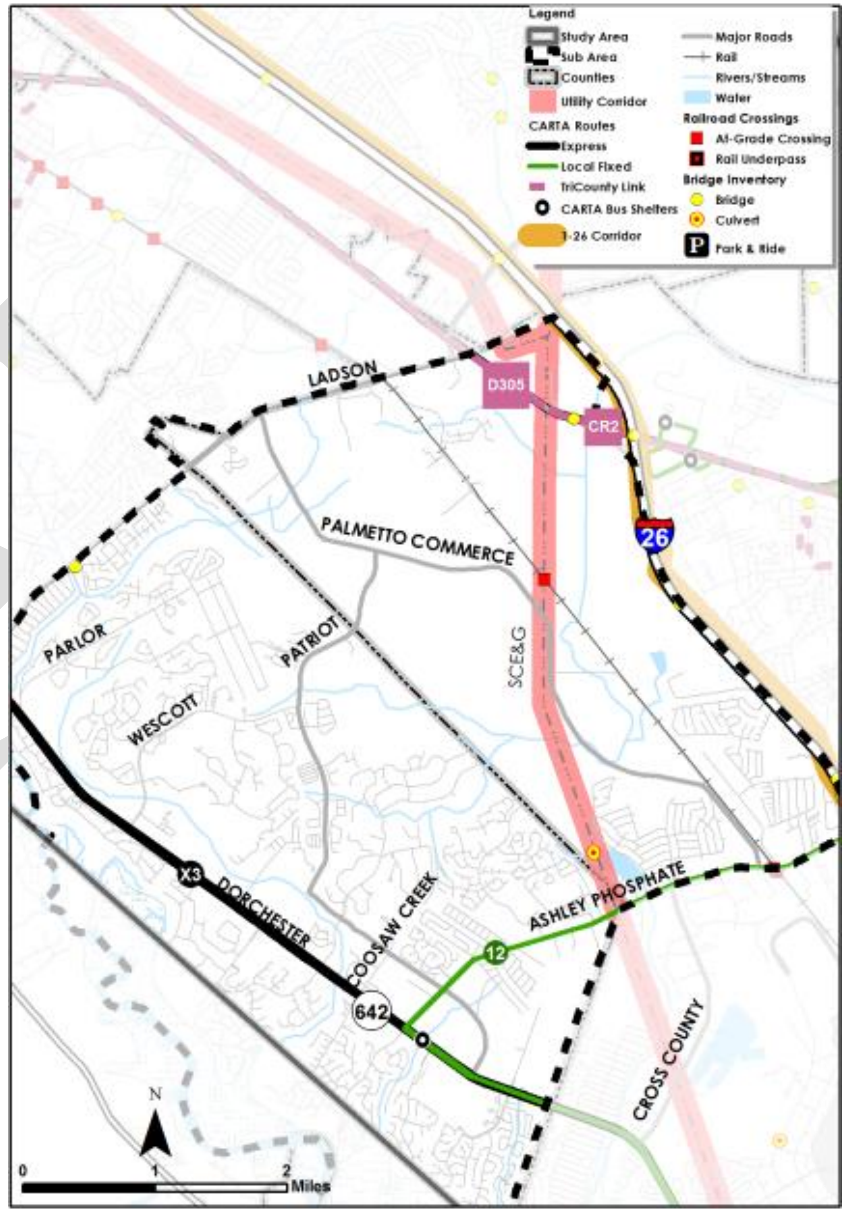
The northern extents of Phase III of Palmetto Commerce Parkway, as initiated by Charleston County Government, are located in this Sub Area. Phases I and II were completed in 2011, and Phase III is estimated to begin in 2017. The third phase will provide the final roadway segment in a new connector parkway from Ladson Road (Sub Area 3) to Aviation Avenue (Sub Area 5) and Joint Base Charleston.

<u>Parking</u>

There is no major parking infrastructure nor any major parking concerns in this Sub Area.

3.4.3 Existing Transit Routes and Facilities

The Ladson Sub Area has minimal transit service. TriCounty Link's #2 Dorchester Commuter Route and Route D-305 travel on a short segment of US 78 to the north of the Sub Area. CARTA has two bus routes that traverse the boundaries of the Ladson Sub Area. Route #3 Express (Dorchester Road/Summerville) route travels from the Dorchester Village Center Park and Ride facility along Dorchester Road to Downtown Charleston. The CARTA #12 Upper Dorchester fixed bus route travels along Ashley Phosphate Road on the southern edge of the Sub Area before turning south on Dorchester Road to the CARTA Super Stop transfer facility in North Charleston.



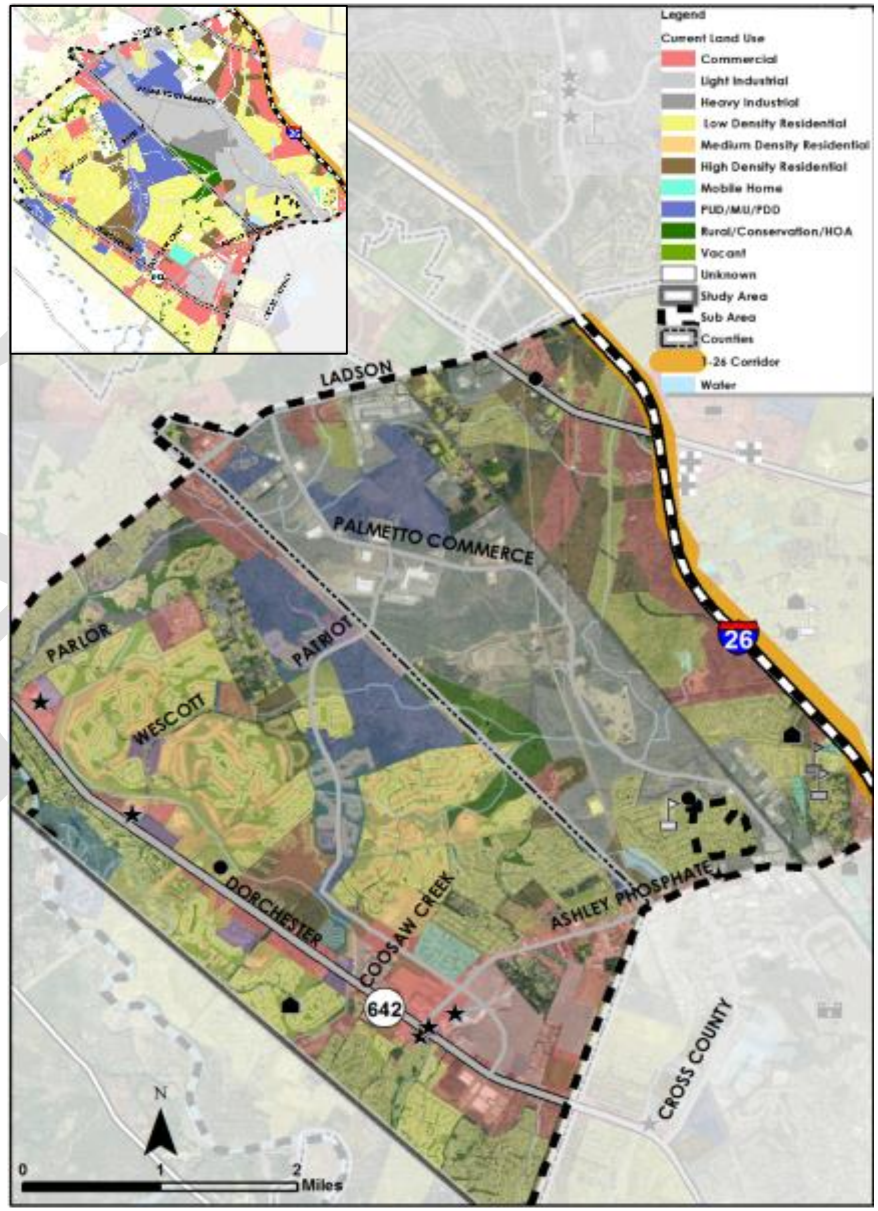
3.4.4 Land Use and Development Patterns

Palmetto Commerce Parkway is the primary arterial in the sub area serving the extensive light industrial land uses along its corrridor. The industrial sites currently located along this corridor include Boeing, Cummins Turbo, Daimler Vans Manufacturing, Food Handler Inc., Strit Amoring USA, TIGHITCO Aerospace Inc., and MTU Driveshafts.

Commercial/retail uses are located on the periphery of the Sub Area along I-26, Dorchester Road, Ladson Road, and Ashley Phosphate Road. Much of the Sub Area's mixed-use/planned unit development areas are located along Patriot Boulevard and within the light industrial areas along Palmetto Commerce Parkway.

Projected increases in both population and employment in this Sub Area are well above the Study Area average of 22 percent. The large industrial/commercial park located off Palmetto Commerce Parkway is projected to attract a large numbers of jobs to this area through 2035.

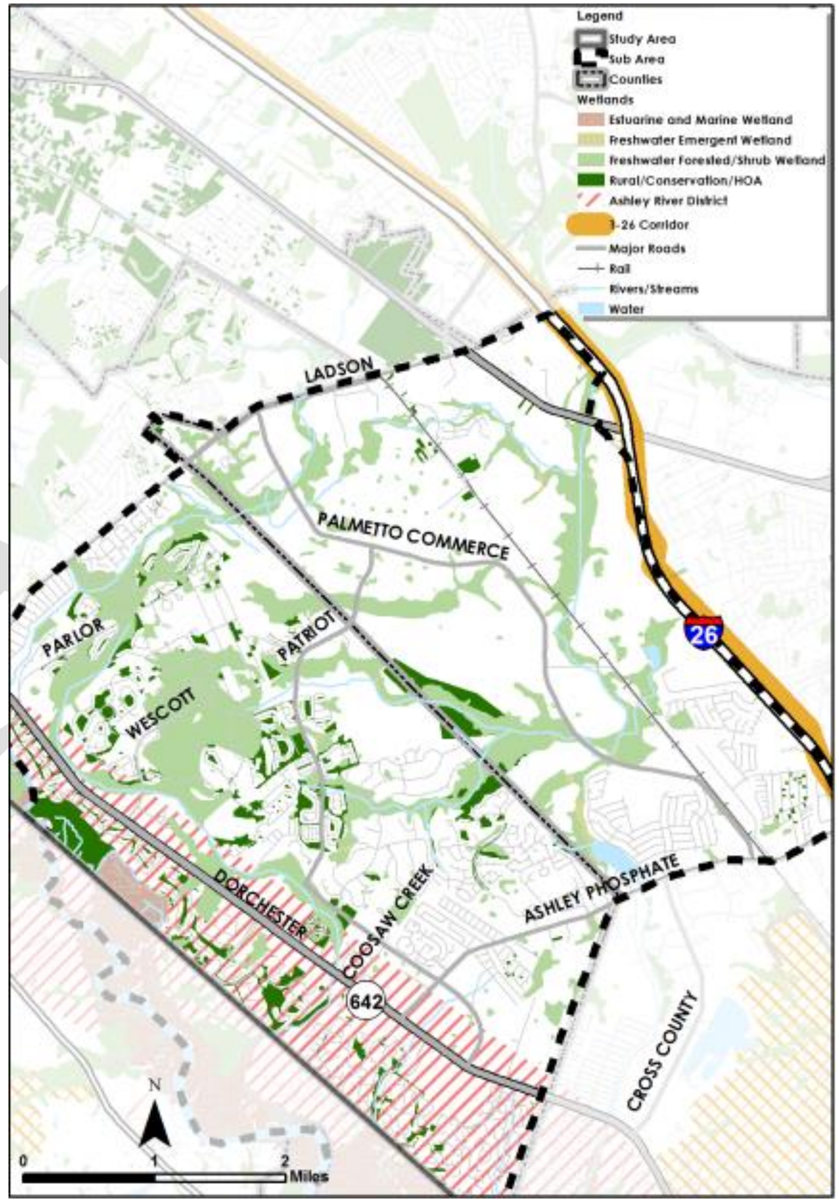
Sub Area 3	Region			% of Corridor	
	2010	2035	% Change	2010	2035
Population	42,758	65,004	52%	15%	19%
Households	15,688	25,156	60%	14%	19%
Employment	11,441	25,687	125%	7%	13%



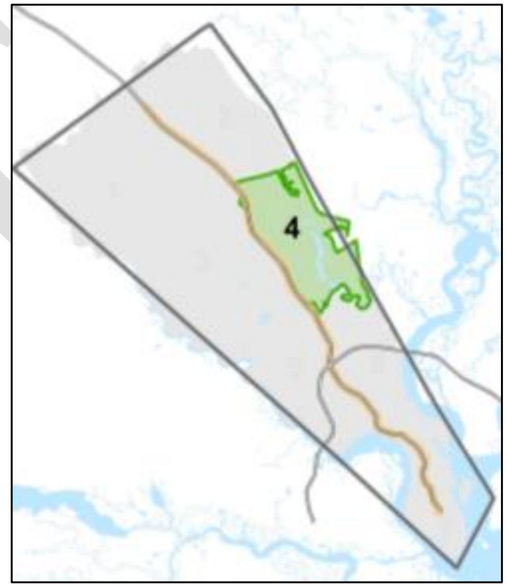
3.4.5 Environmental/Natural Resources

Located on the Ashley River watershed, this Sub Area contains many tributaries that feed the Ashley River to the west. The area's forested freshwater wetlands occur along the rivers and creeks that punctuate the landscape.

The Ashley River Historic District is located on the western boundary of the Ladson Sub Area along Dorchester Road.



3.5 Sub Area 4: Otranto-Goose Creek



The Otranto-Goose Creek Sub Area is bounded to the east by I-26, to the south by Hanahan Road and the Goose Creek Reservoir/Goose Creek, and to the east by Henry Brown Jr. Boulevard. It includes sections of North Charleston, Hanahan, and Goose Creek. This Sub Area falls within the region's UZA.

3.5.1 Field Review/General Observations

In this Sub Area, the CARTA Park and Ride facility and bus stop at Trident/Health South serve as major transfer points between TriCounty Link and CARTA services. Rivers Avenue is a high activity corridor within the Goose Creek-Otranto Sub Area. Activity centers include Charleston Southern University, Trident Medical Center, Northwoods Mall, Trident Technical College, Trident One Stop, and a number of retail/commercial properties along the extent of the corridor.

Due to the large Goose Creek Reservoir located in the eastern portion of the Sub Area, the closest major north-south parallel facility to I-26 and Rivers Avenue is Red Bank Road and Henry E Brown Jr. Boulevard.

3.5.2 Transportation Infrastructure

The following summarizes general transportation infrastructure in the sub area. Appendix 1-E provides detailed tables for the major roadways inside the sub area to identify peak and daily Volume over Capacity (V/C) and flow by link.

<u>On-going Construction</u>

There is no major roadway improvement construction occuring on any of the major roadways in this Sub Area.

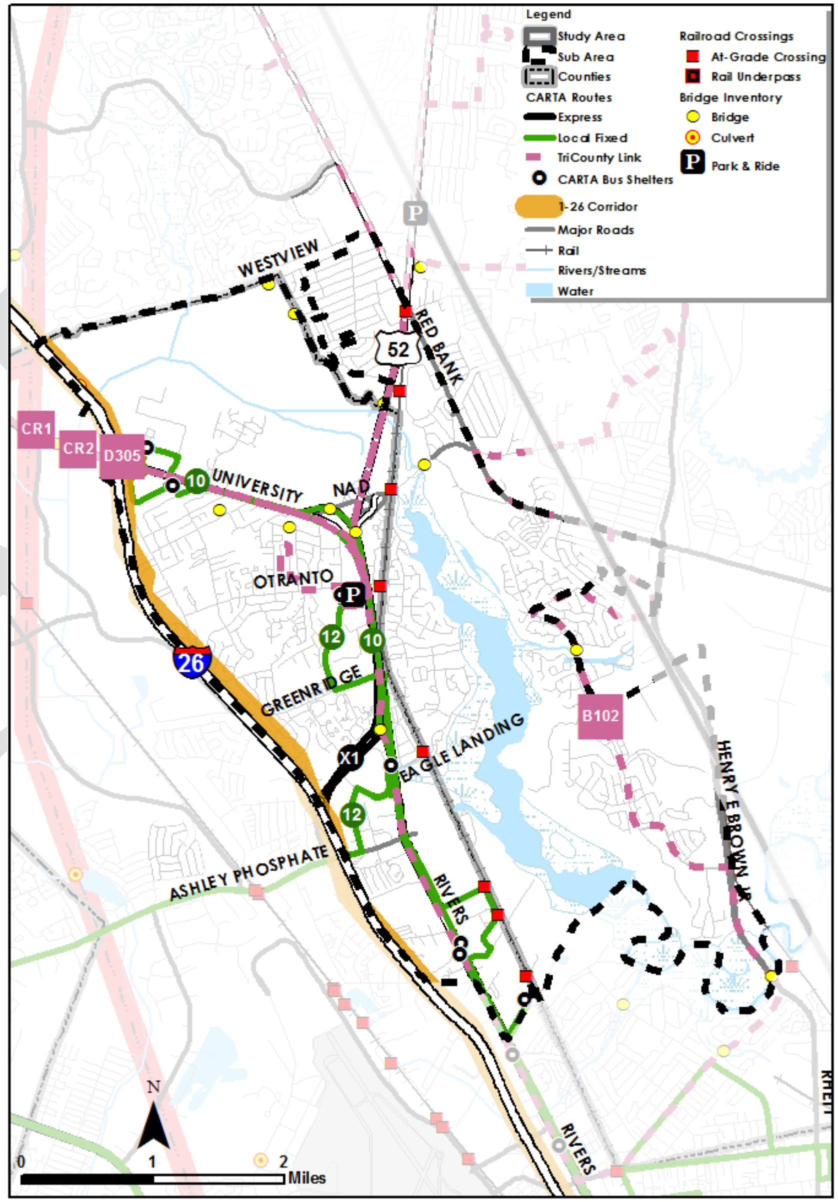
<u>Parking</u>

There is no major parking infrastructure nor any major parking concerns in this Sub Area.

3.5.3 Existing Transit Routes and Facilities

The Otranto-Goose Creek Sub Area is served by both CARTA and TriCounty Link Transit. The CARTA Rivers Avenue Park and Ride facility at the Super K-Mart on Rivers Avenue is located in this Sub Area. This Park and Ride facility serves as the end point of CARTA's #1 Express and #12 Dorchester Road fixed route, and it also serves as a transfer/connection point for TriCounty Link passengers needing to transfer to the CARTA system from TriCounty Link (#1 Dorchester Commuter Route, #2 Dorchester – Santee Cooper Commuter Route; and B-102 and D-305 fixed bus routes).

Route #1 Express (North Charleston/James Island) starts in this Sub Area at the at the Rivers Avenue Park and Ride facility. This express route continues into Downtown Charleston on I-26. Route #12 Upper Dorchester also starts/terminates at this location and serves the shopping area at Northwoods Mall in this Sub Area before turning on to Ashley Phosphate Road. The northern end of Route #10 Rivers Avenue, the most heavily utilized route of the CARTA system, is located in this Sub Area at the Health South stop near Trident Medical Center on US 78. This stop also provides TriCounty Link riders (Route B-102) with an opportunity to transfer to CARTA services.



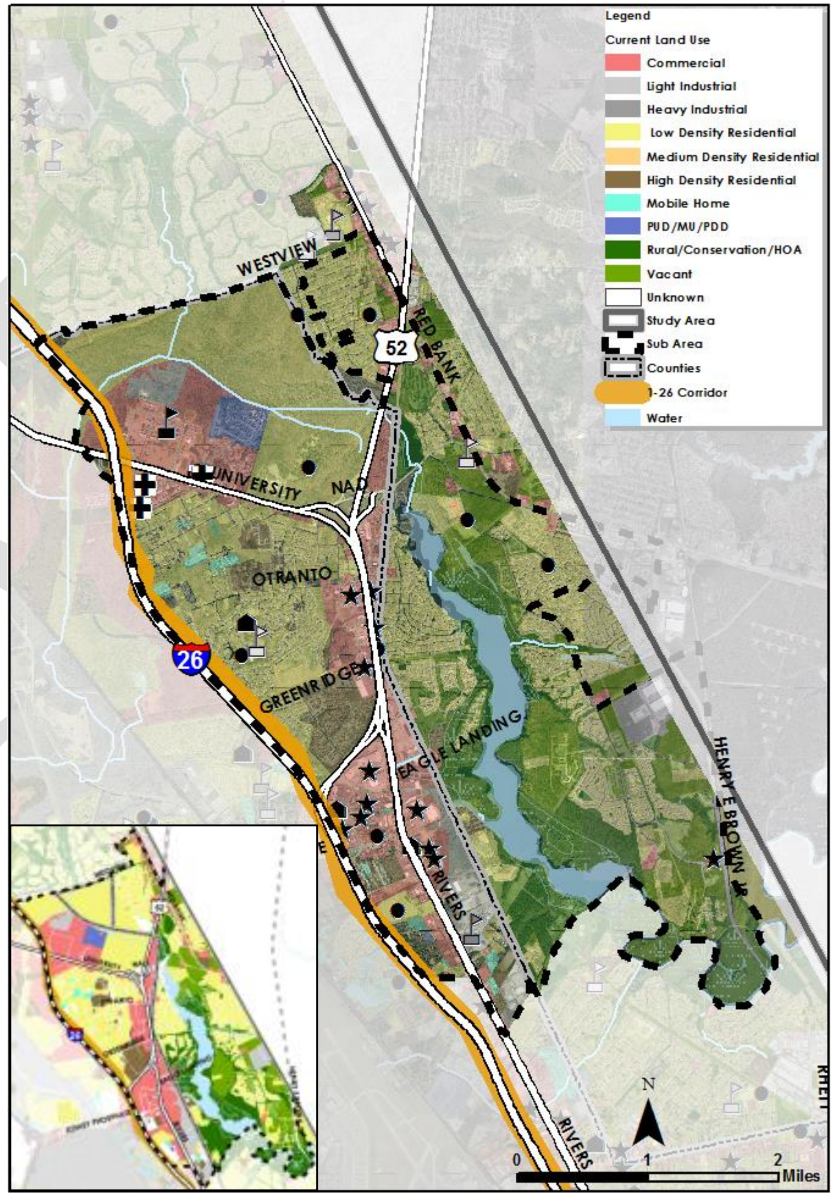
3.5.4 Land Use and Development Patterns

This Sub Area's commercial land use is concentrated along the Rivers Avenue/US 52 corridor and around the Charleston Southern University and Trident Medical Center campuses. This concentrated activity corridor supports the most productive CARTA bus route (#10 Rivers Avenue).

The most dominant residential land use in this Sub Area is single- family low density with pockets of multi-family along Otranto Road and Greenridge Drive. This area is primarily residential with most of the employment concentrated along University Boulevard and Rivers Avenue. Projected growth in population and especially employment in this sub area are below the Study Area average of 22 percent.

Sub Area 4	Region		
	2010	2035	% Change
Population	31,394	37,874	21%
Households	12,715	15,468	22%
Employment	15,814	17,948	13%

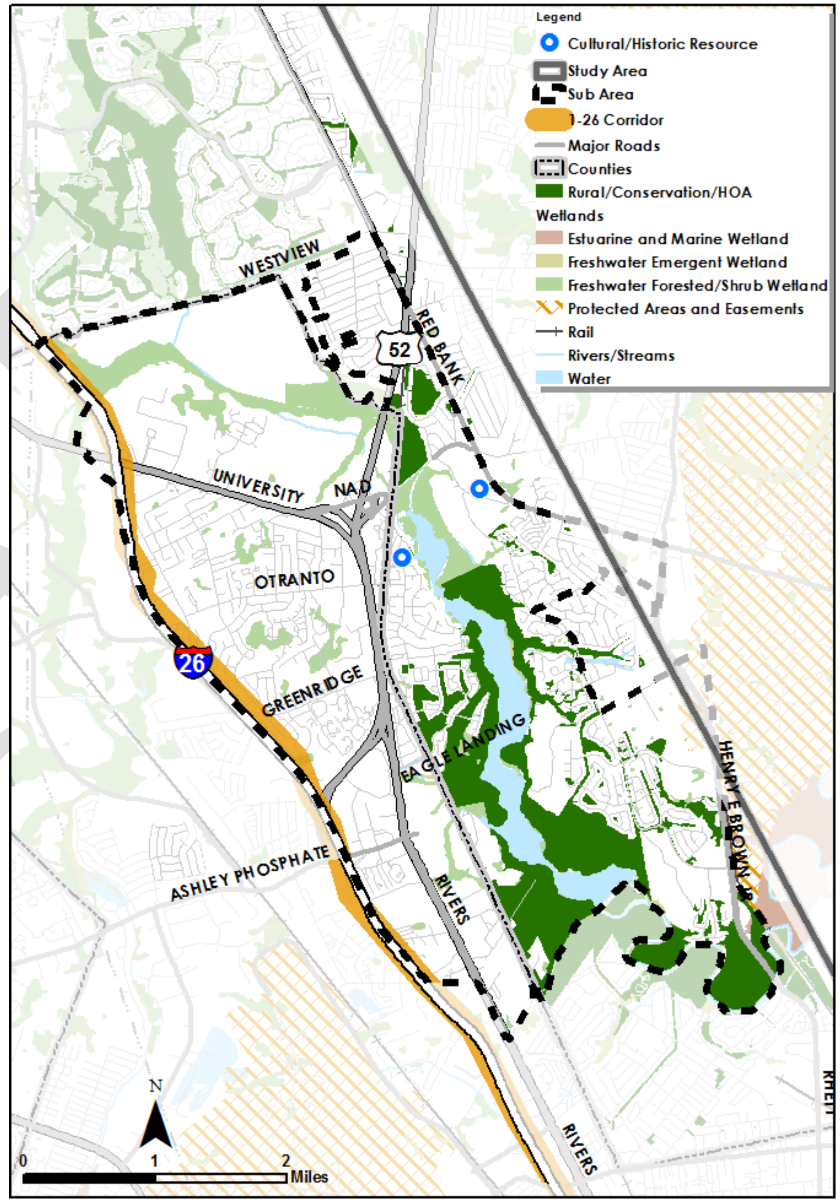
% of Corridor	
2010	2035
11%	11%
12%	11%
9%	9%



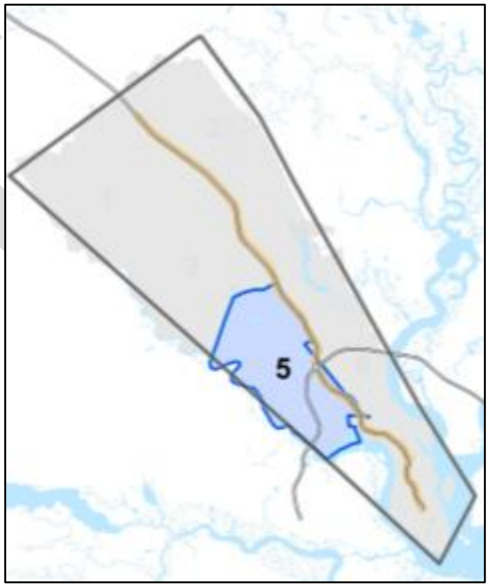
3.5.5 Environmental/Natural Resources

The Goose Creek Reservoir is located in this Sub Area and includes sizable wetland areas, most of which have been zoned rural/conservation by local planning authorities. There are no major protected areas in this Sub Area except for areas east of Henry E. Brown Jr. Boulevard which fall under the Department of Defense.

The National Registry of Historic Places has recorded Otranto Plantation and St. James Church, Goose Creek as major cultural resources in this area.



3.6 Sub Area 5: Airport Area-North Charleston



This Sub Area is located primarily to the west of I-26 and bounded to the east and south by the Ashley River. The entire Sub Area falls within the jurisdiction of the City of North Charleston and is classified as urban. A large extent of the Airport Area-North Charleston Sub Area is occupied by the Charleston International Airport and Charleston Joint Air Force Base. The NS and CSX intermodal rail facilites are also located in this sub area.

3.6.1 Field Review/General Observations

Dorchester Road serves as a primary corridor in this Sub Area and features wide travel lanes and large grassed medians that separate traffic. This facility has preserved rights-of-way in grassed medians from Ladson Road through to Michaux Parkway.

3.6.2 Transportation Infrastructure

The following summarizes general transportation infrastructure in the Sub Area. Appendix 1-E provides detailed tables for the major roadways inside the sub area to identify peak and daily Volume over Capacity (V/C) and flow by link.

On-going Construction

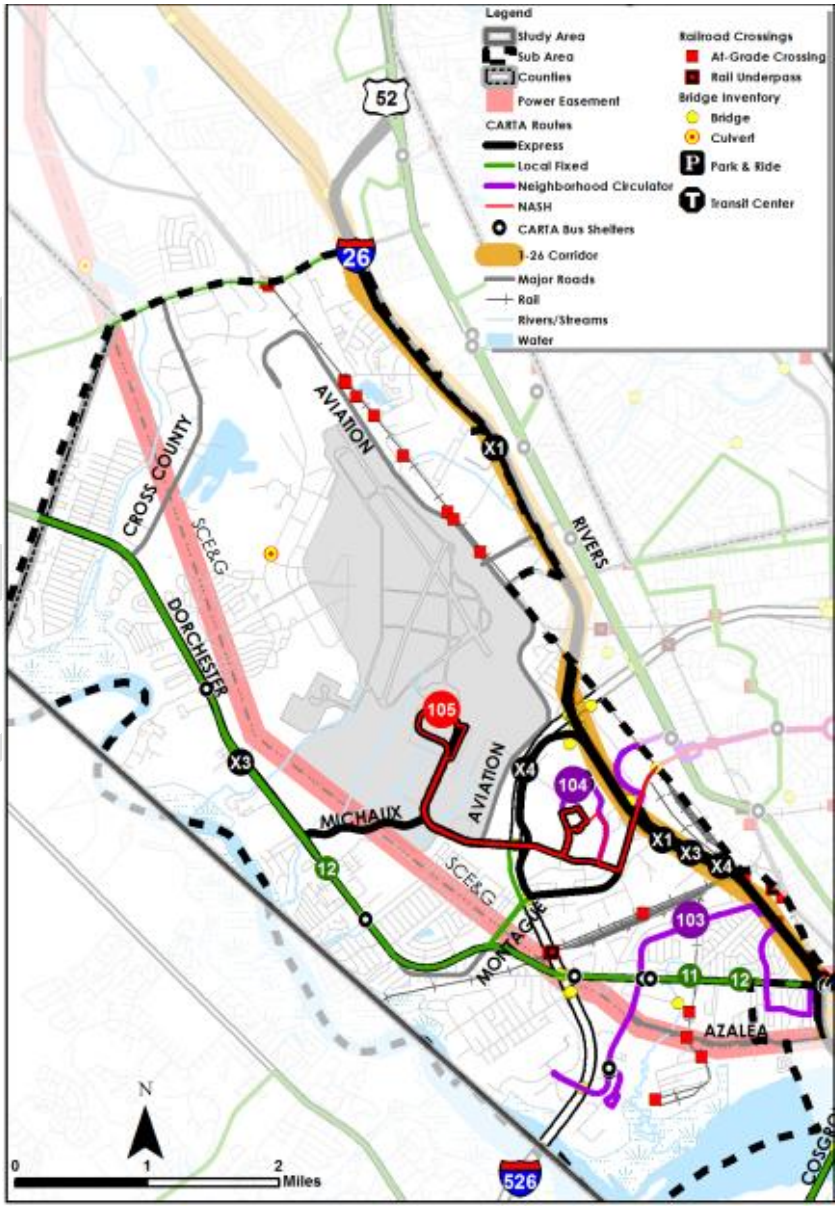
Palmetto Commerce Parkway Phase III, as initiated by the Charleston County Government, is primarily located within this Sub Area. Phases I and II were completed in 2011, and Phase III is estimated to begin in 2017. The third phase will provide the final roadway segment in a new connector parkway from Ladson Road (Sub Area 3) to Aviation Avenue (Sub Area 5) and the Joint Base Charleston.

Parking

There are no major parking infrastructure nor parking concerns in this Sub Area.

3.6.3 Existing Transit Routes and Facilities

The Airport Area-North Charleston Sub Area is served exclusively by CARTA. As the Corridor moves into the Neck Area and Charleston Peninsula, development and services are confined to the limited land available for use. The Charleston International Airport and Joint Air Force Base facilities occupy a large portion of the north end of this Sub Area; thus, CARTA routes serve primarily the southern portion of this sub area. Route #3 Express travels along Dorchester Road; Route #1 Express travels along the Sub Area's I-26 segment; and Route #4 NASH Express connects the Charleston International Airport to shopping/retail in Tanger Outlets/Wal-mart retail areas and Downtown Charleston via I-26. The Sub Area is also served by neighborhood Route #103 Leeds Avenue serving communities along Dorchester Road and government services on Leeds Avenue. Route #11 Dorchester/Airport serves the Charleston International Airport, Tanger Outlets, and Dorchester Road to Downtown Charleston; Route #12 Upper Dorchester travels along Dorchester Road to the Super Stop; Route #104 Montague Avenue serves Tanger Outlets along International Boulevard and Montague Avenue; and Route #105 NASH Circulator serves Boeing, Tanger Outlets along International Boulevard and Montague Avenue including the Park Circle community.



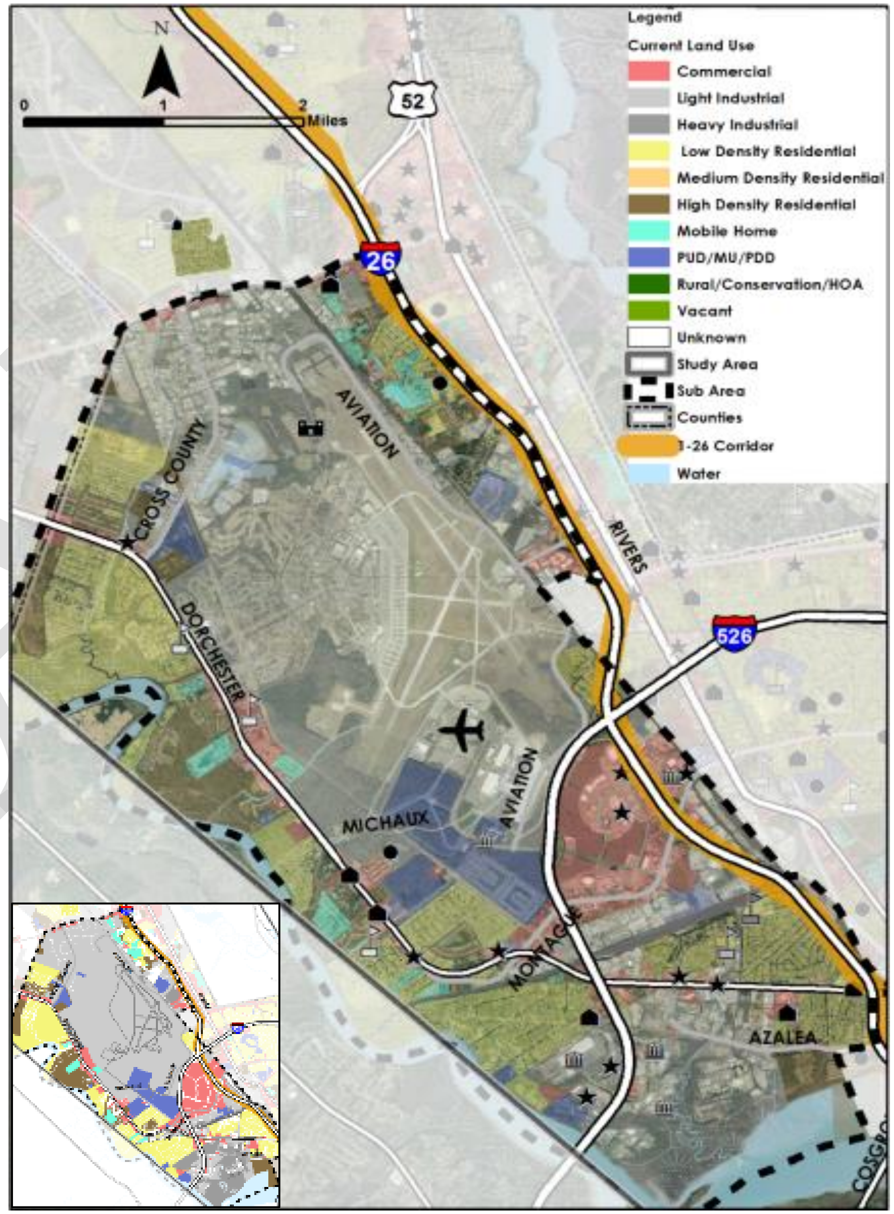
3.6.4 Land Use and Development Patterns

The Airport Area-North Charleston Sub Area includes large light industrial areas that are primarily occupied by the Charleston International Airport and Charleston Joint Air Force Base. There is also a mix of light and heavy industrial uses north of Dorchester Road around the CSX and NS Intermodal rail facilities and at the southern end of the Sub Area off of Azalea Drive and I-526.

Major commercial areas are concentrated along Dorchester Road, in the large commercial node around Tanger Outlets located north of W. Montague Avenue, and to the south of the intersection of I-526 and I-26. Residential uses are found mainly along Dorchester Road and in pockets along I-26.

This Sub Area has proportionately high employment levels as compared to population. Both employment and population are set to increase approximately 18 percent.

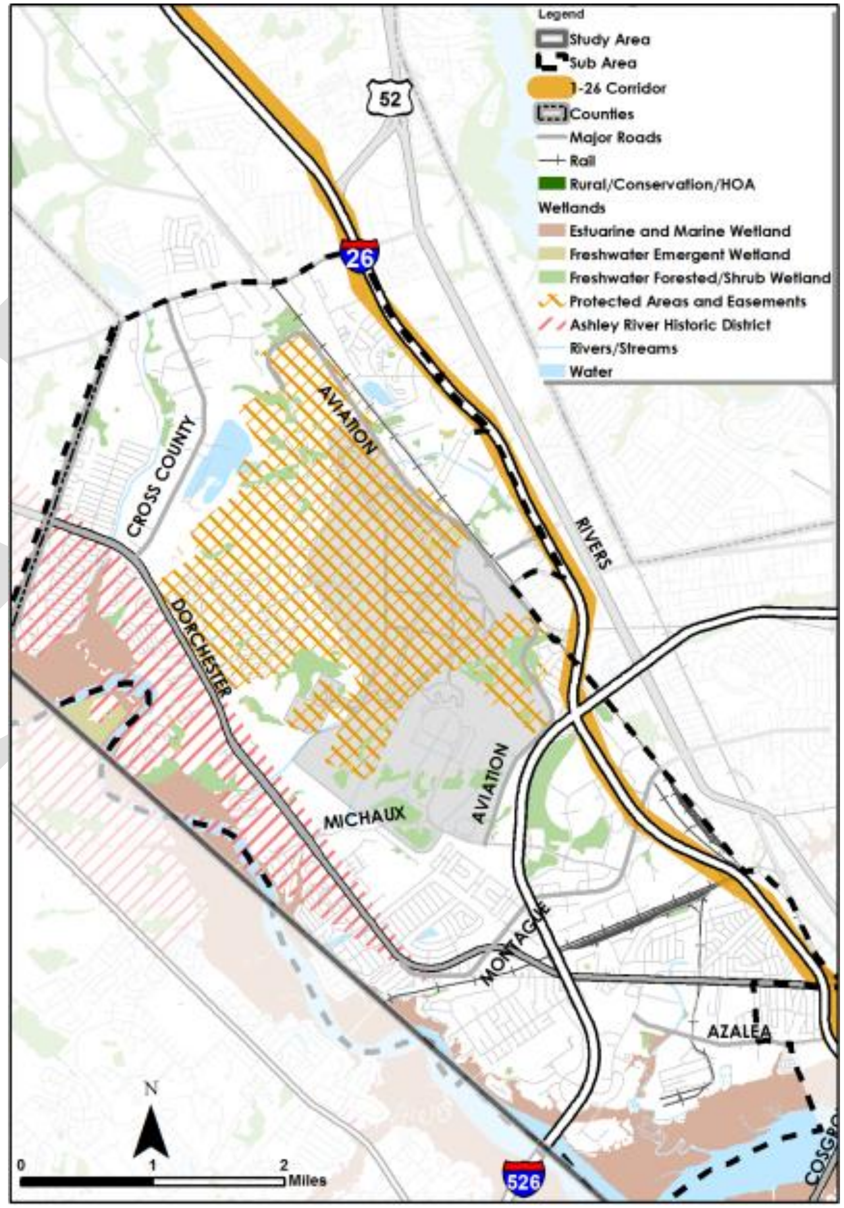
Sub Area 5	Region			% of Corridor	
	2010	2035	% Change	2010	2035
Population	29,720	34,670	17%	11%	10%
Households	11,577	13,688	18%	11%	10%
Employment	41,952	49,542	18%	25%	24%



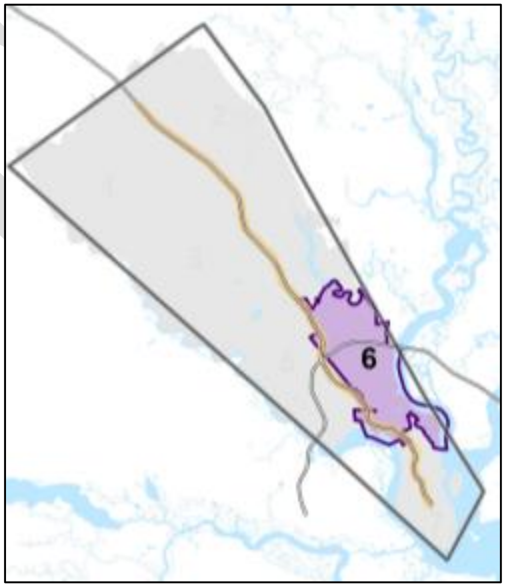
3.6.5 Environmental/Natural Resources

The wetlands in this Sub Area are found primarily around the Charleston International Airport/Charleston Joint Base, and along the Ashley River. The Ashley River Historic District extends into this Sub Area south of Dorchester Road.

The documented Ashley River Historic District Boundary generally follows the wetland areas of the Ashley River. The District does not include the Dorchester Road facility.



3.7 Sub Area 6: Hanahan-North Charleston



South of Goose Creek and the Goose Creek Reservoir, the Hanahan-North Charleston Sub Area lies to the east of I-26, west of the Cooper River, and is bounded to the south by Stromboli Avenue. This Sub Area houses the North Charleston Port and rail facilities. The seven Environmental Justice (EJ) neighborhoods identified in the Lowcountry Alliance for Model Communities (LAMC) Revitilization Plan are located in this Sub Area, and include Accabee, Chicora/Cherokee, Five Miles, Howard Heights, Liberty Hill, Union Heights and Windsor neighborhoods.

3.7.1 Field Review/General Observations

The rail infrastructure is very dense in this Sub Area with many at-grade crossings, particularly along Virginia Avenue. The major shopping areas are located along Rivers Avenue and Remount Road.

The CARTA Super Stop/Transfer Center is also located in this Sub Area at the intersection of Rivers Avenue and Cosgrove Avenue. Transit operations at this facility were observed for their impact on vehicular traffic on both Rivers and Cosgrove Avenues. Pedestrian infrastructure improvements should be made at this location to accommodate the high levels of pedestrian traffic observed.

3.7.2 Transportation Infrastructure

The following summarizes general transportation infrastructure in the sub area. Appendix 1-E provides detailed tables for the major roadways inside the sub area to identify peak and daily Volume over Capacity (V/C) and flow by link.

<u>On-going Construction</u>

There is no major roadway improvement construction occuring on any of the major roadways in this Sub Area.

<u>Parking</u>

There are no major parking infrastructure nor any parking concerns in this Sub Area.

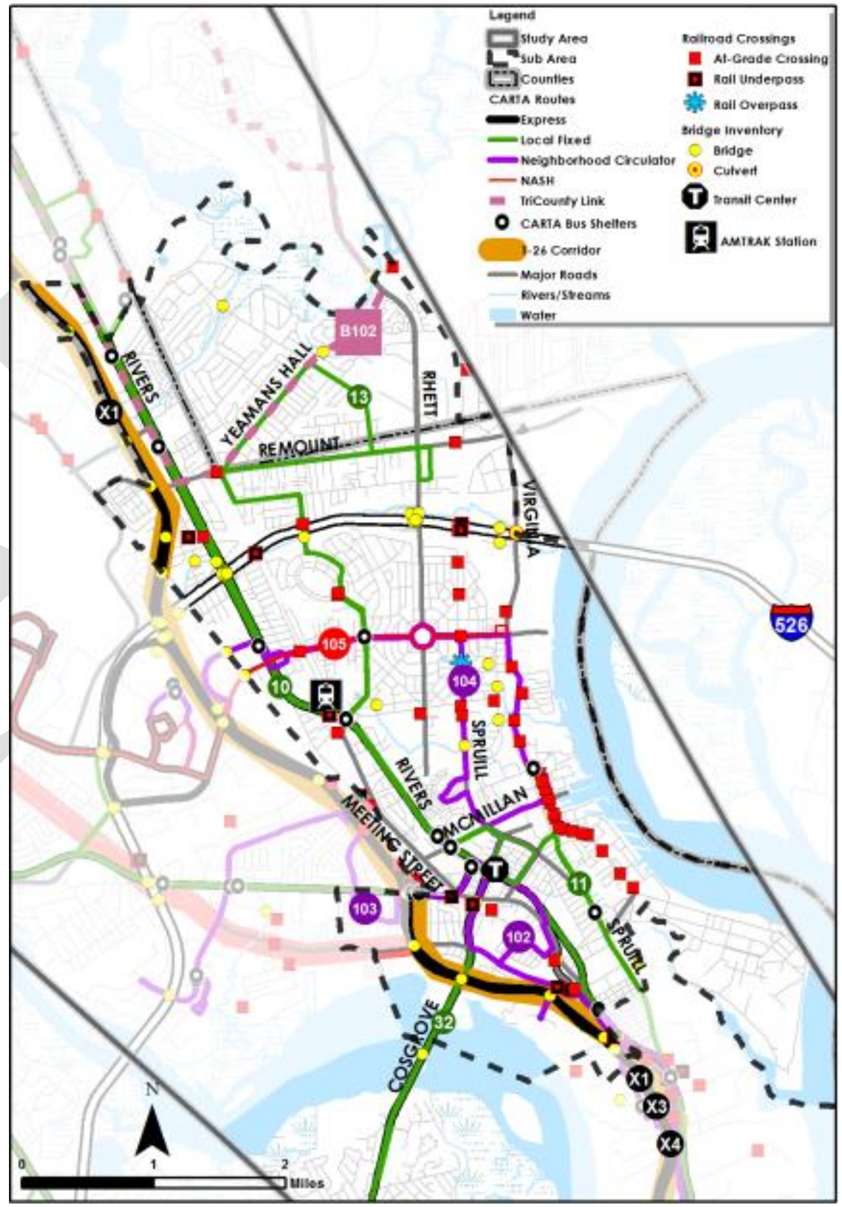
3.7.3 Existing Transit Routes and Facilities

This Sub Area consists primarily of the City of Hanahan to the north and the City of North Charleston to the south. The North Charleston Super Stop, located on Rivers Avenue and Cosgrove Avenue is a major transfer point for several CARTA routes. The routes that access this center include:

- #10 Rivers Avenue
- #11 Dorchester Road
- #12 Upper Dorchester
- #13 Remount Road
- #32 Northbridge
- #102 North Neck
- #103 Leeds Avenue
- #104 Montague Avenue

CARTA routes that operate in/circulate through the Sub Area include Route #13 Remount Road, which travels north along Rivers Avenue to Remount Road; Route #105 NASH Circulator, which travels along W. Montague Avenue and the Park Circle community; and Route #104 Montague Avenue, which travels along Montague Avenue/Park Circle to Noisette Boulevard and McMillan Avenue.

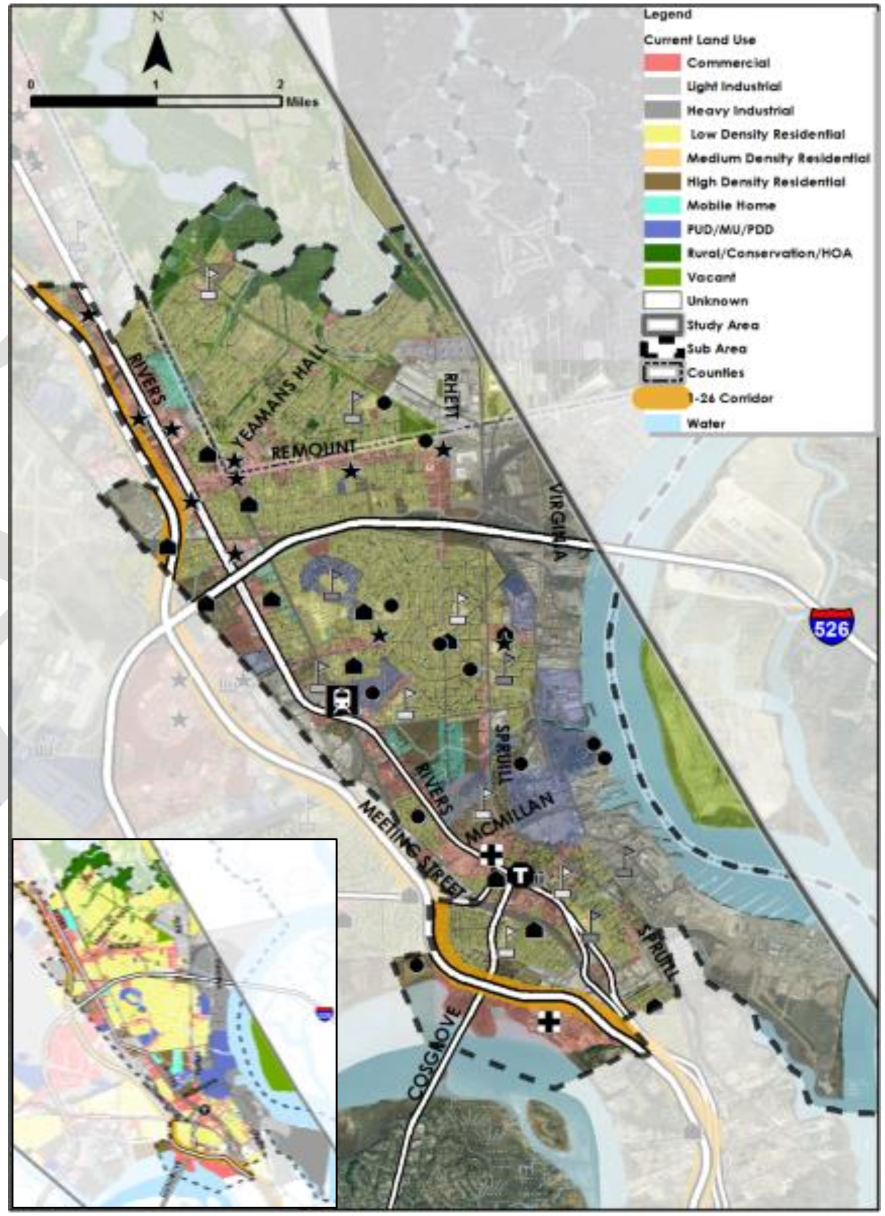
The Charleston AMTRAK Station is also located in this Sub Area on Gaynor Avenue. This location is sited for the planned North Charleston Regional Intermodal Facility. The proposed transportation hub will provide intermodal connections to CARTA, inter-city bus service, AMTRAK trains, and taxis.



3.7.4 Land Use and Development Patterns

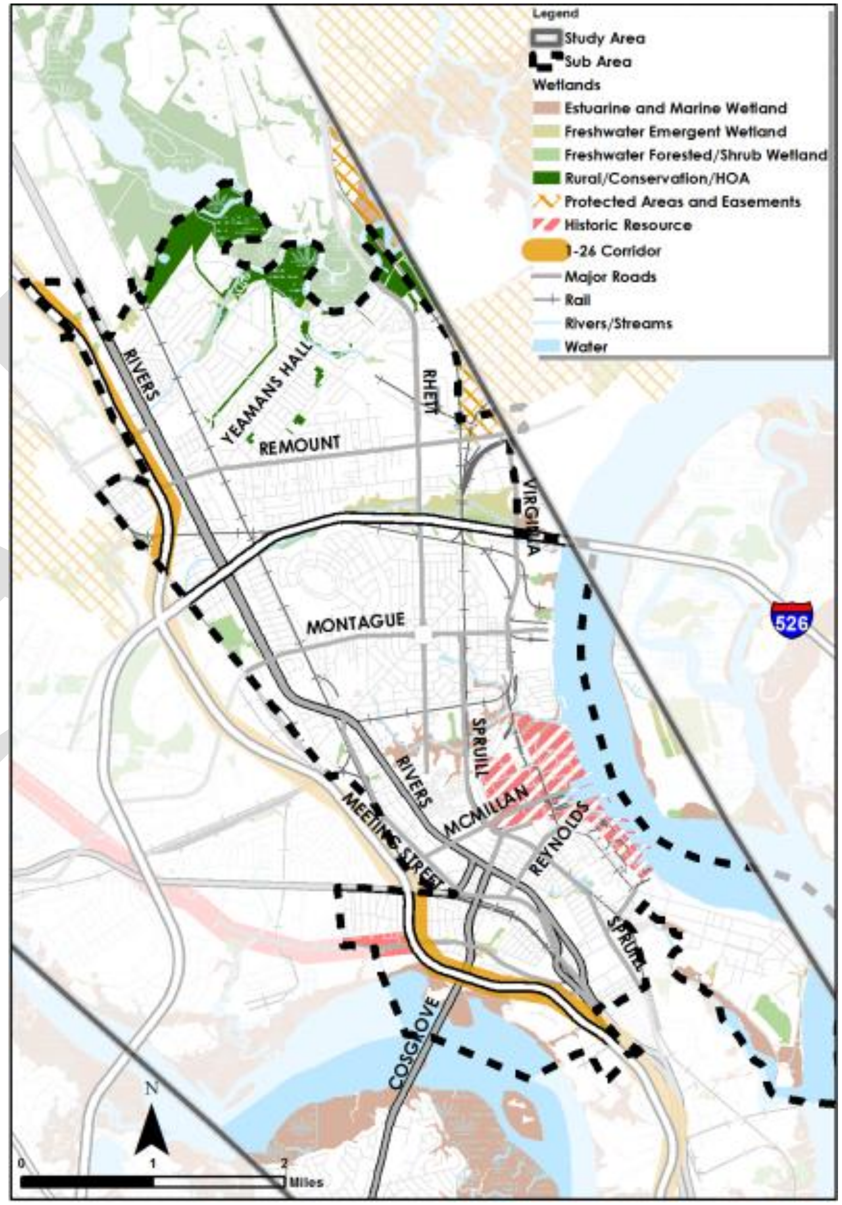
This Sub Area includes a large proportion of single-family low density land use. The commercial corridors are primarily along Rivers Avenue and Remount Road. There are also heavy industrial uses along the Sub Area's eastern coastline that encompass the port facilities along Spruill Avenue and Virginia Avenue. The mixed use/planned unit developments in this Sub Area include Mixson, Oak Terrace Preserve and the Navy Yard at Noisette. Projected employment growth in this sub area is relatively small at roughly 7 percent.

Sub Area 6	Region			% of Corridor	
	2010	2035	% Change	2010	2035
Population	34,794	42,116	21%	13%	12%
Households	14,024	17,255	23%	13%	13%
Employment	20,164	21,636	7%	12%	11%

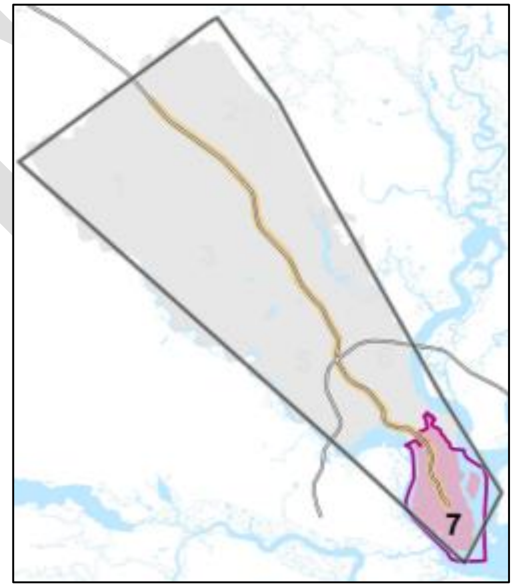


3.7.5 Environmental/Natural Resources

The wetlands in this Sub Area are a mix of forested and non-forested freshwater wetlands and some estuarine and marine wetlands. The major historic resource in this area is the Charleston Navy Historic District, which includes the Navy Hospital, Navy Yard, and Navy Officers' Quarters Districts. The major areas zoned rural/conservation through local zoning efforts are located to the north of the Sub Area along the Goose Creek Reservoir and Goose Creek wetlands.



3.8 Sub Area 7: Neck Area- Charleston Peninsula



South of Stromboli Avenue, this Sub Area encompasses the Charleston Peninsula and Neck Area. Due to the geography of the Peninsula, this Sub Area has limited available land since it is bounded to the west and east by the Ashley and Cooper Rivers.

3.8.1 Field Review/General Observations

The Peninsula has a distinct street grid pattern. Blocks are relatively small (300ft - 600ft) and walkable. Sidewalks and pedestrian infrastructure appear to be present on most downtown streets. On-street parking along both commercial and residential corridors tends to reduce traffic speeds, but it also may compromise lane widths and turning radii for larger vehicles, especially trucks and city buses. Pedestrian facilities are reduced in the northern parts of the sub area.

3.8.2 Transportation

<u>On-going Construction</u>

The Spring Cannon Streetscape project is located in this Sub Area. Funding for this project has been allocated, and the design is complete. The project consists of new streetscapes for Spring Street and Cannon Streets and includes the re-establishment of two-way traffic on each. Currently, these roadways are two-lane one-way streets with Spring Street providing westbound access and Cannon Street providing eastbound access.

<u>Parking</u>

The parking supply on the Charleston Peninsula includes a mix of on-street parking, public and private surface lot parking, and public and private garages. Metered on-street parking is located along the city's major commercial streets. The City/County maintains eleven (11) parking garages, eight (8) metered lots and three (3) non-metered lots. The City has also established 11 residential parking districts on the Peninsula, nine of which are located south of the Crosstown and allow 1-hour and 2-hour parking to non-permitted users, as shown in Figures 27 & 28.

Parking rates vary as follows:

- City Garage Parking – $1/30 mins. with a maximum of $16/day; Private Garage prices vary
- Non-Metered Lots – $1/30 mins. with a maximum of $16/day
- Metered Lots – $.75/hr. (approximate)

Metered lots also offer nickel, dime and quarter rates which allow parking for periods less than an hour. Depending on the facility, metered lots have parking limits of 30 minutes, two, four and 10 hours.

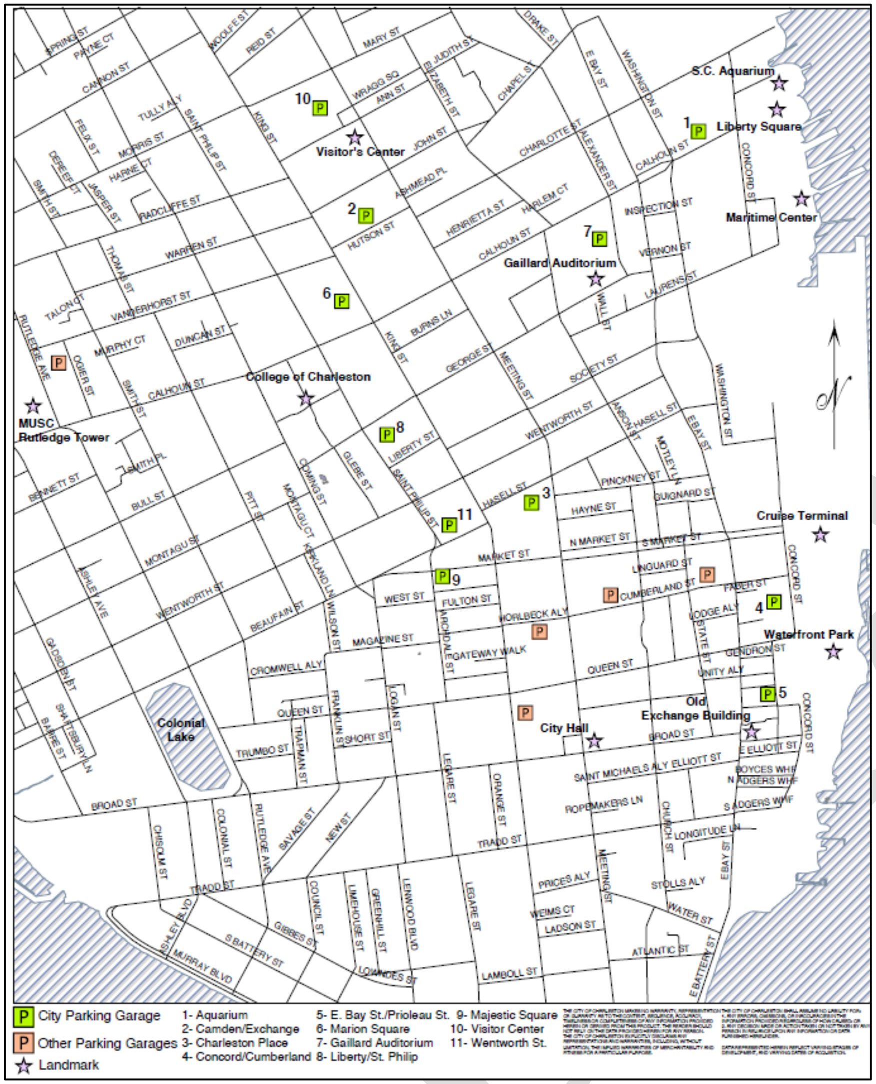


Figure 1: City of Charleston – Downtown Parking Garage Locations

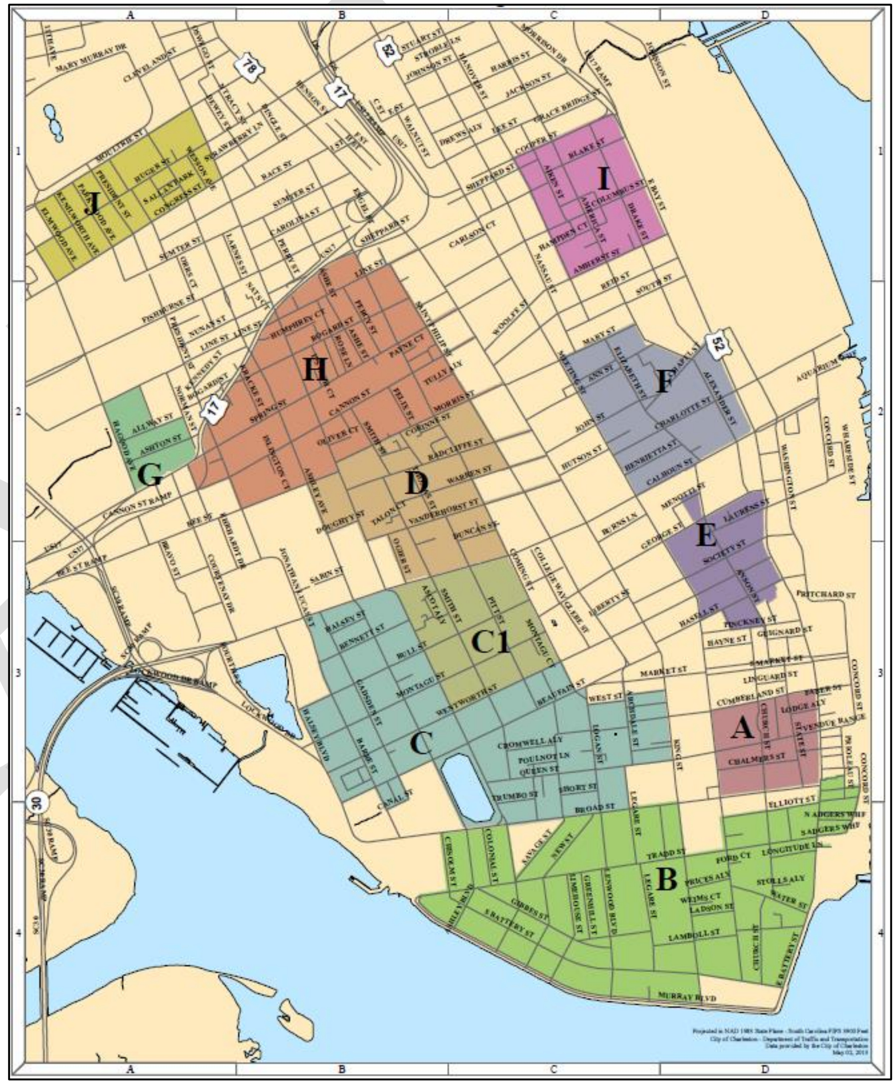


Figure 2: Charleston Peninsula Residential Parking Districts

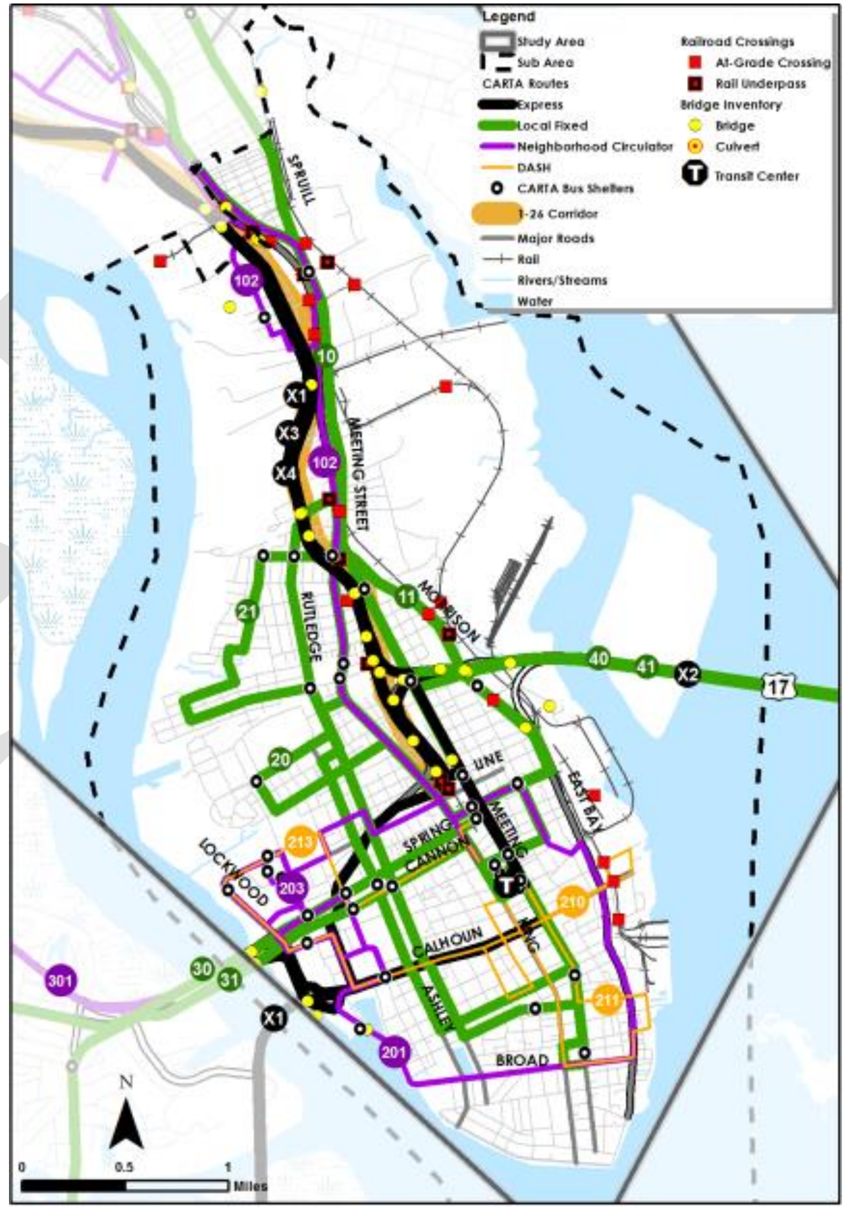
3.8.3 Existing Transit Routes and Facilities

This Sub Area is made up of the dense urban core of the City of Charleston and is constrained by the Ashley and Cooper Rivers. It has the densest concentration and coverage of transit routes. The routes operating on the Peninsula include Route #201 North Beltline, which circulates around the perimeter of the Peninsula along Broad Street to the south, Lockwood Drive to the west, Fishburne and Columbus Streets to the north, and East Bay Street to the east. Other neighborhood/circulator routes that operate entirely in the Peninsula and Neck Area are the DASH routes #210 College of Charleston/Aquarium, #211 Meeting/King Street and #213 Lockwood/Calhoun; Route #102 North Neck, and Route #203 MUSC Shuttle. CARTA local fixed routes include Route #20 King Street/Citadel and Route #21 Rutledge/Grove.

The second of two CARTA transfer/transit centers is also located in this Sub Area. The Mary Street Garage Transit Center facilitates the following CARTA routes that operate in the i-26*ALT* Study Area and others which serve as “feeder” routes to the Corridor:

- #1 Express North Charleston/James Island
- #2 Express West Ashley/Mt. Pleasant (Feeder Route)
- #3 Express Dorchester Road/Summerville
- #4 NASH Express
- #10 Rivers Avenue
- #11 Dorchester/Airport
- #20 King Street/Citadel
- #21 Rutledge/Grove
- #30 Savannah Highway (Feeder Route)
- #31 Folly Road (Feeder Route)
- #40 Mount Pleasant (Feeder Route)
- #41 Coleman Boulevard (Feeder Route)
- #102 North Neck

The DASH routes (#210, #211, #213) connect on John Street, which is located one block south of the Mary Street facility.



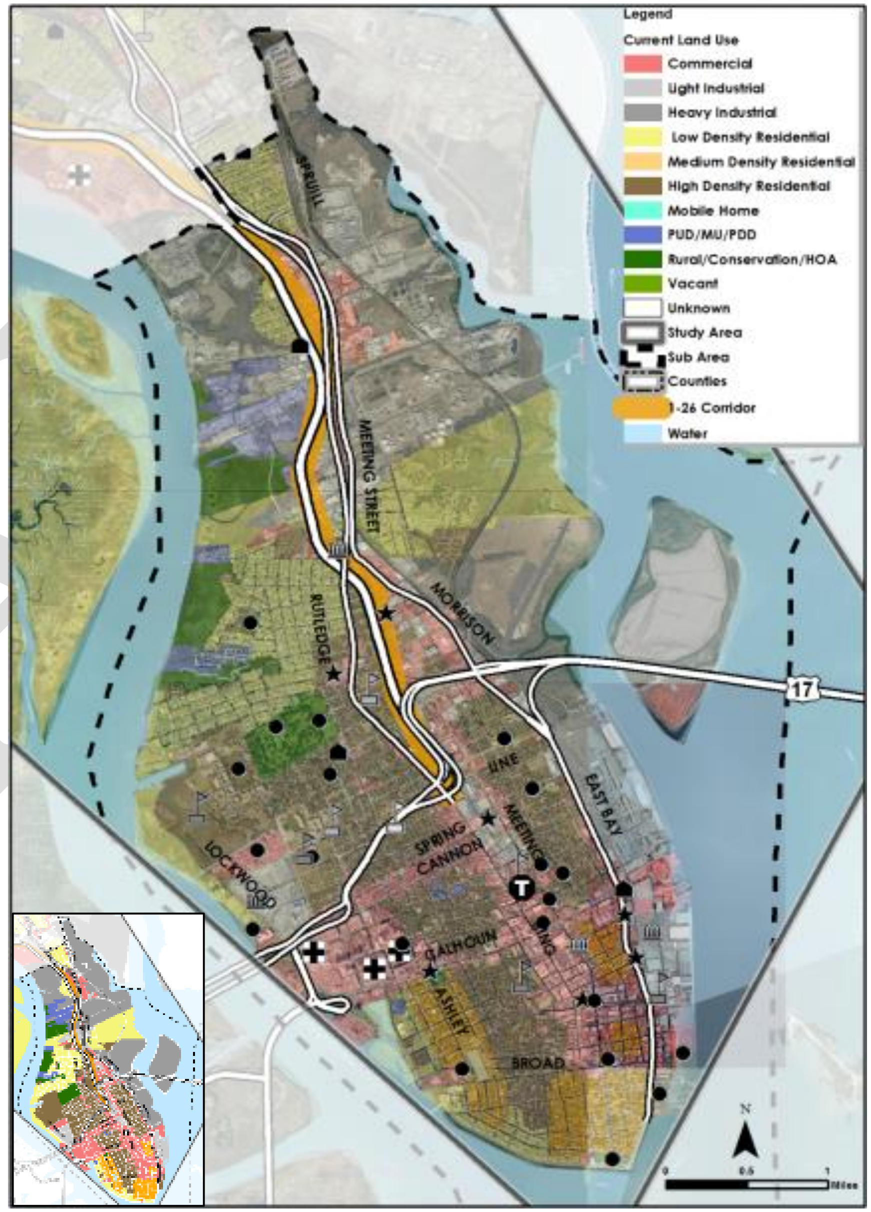
3.8.4 Land Use and Development Patterns

The Charleston Peninsula has well-defined commercial land use along distinct corridors including King Street, Meeting Street, Calhoun Street, Cannon Street and East Bay Street. The majority of the Lower Peninsula is zoned for multi-family residential use with pockets of single-family medium and low density along Ashley Avenue, south of Broad Street, and along the shoreline. Lands zoned for heavy industrial use are located north of the downtown core in the Charleston Neck Area, and along Morrison Street and East Bay Street around the Columbus Street Port Terminal. Lands zoned conservation/rural are found mainly west of I-26.

This Sub Area is largely built-out and does not have any major vacant land holdings. The Upper Peninsula Initiative is designated as an Eco District by the City of Charleston and is generally bounded to the west by Morrison Drive, south by US17 and north by Mt. Pleasant Street. The area is identified for mixed use, high density, and multimodal types of development.

Sub Area 7	Region		
	2010	2035	% Change
Population	29,858	34,394	15%
Households	14,112	16,235	15%
Employment	49,475	55,970	13%

% of Corridor	
2010	2035
11%	10%
13%	12%
30%	28%

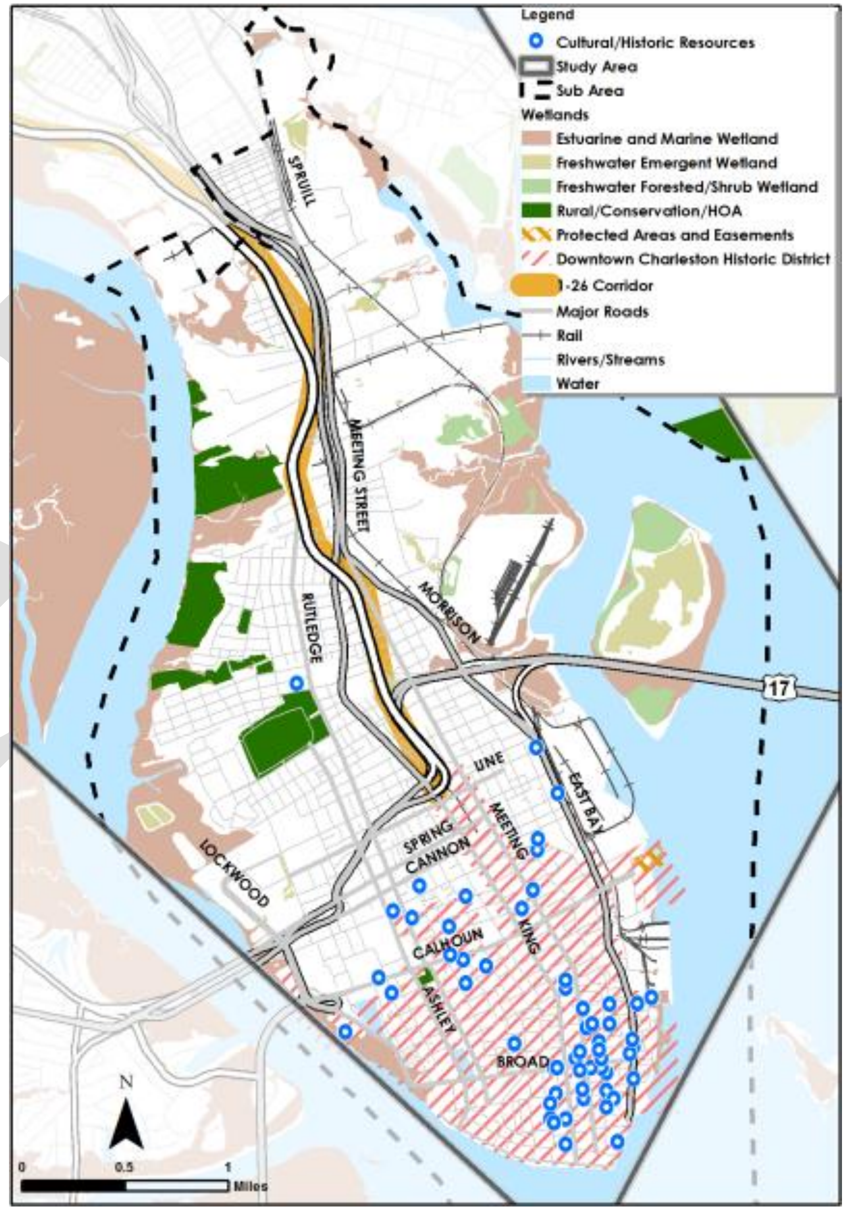


3.8.5 Environmental/Natural Resources

The majority of the Charleston Peninsula is at or near sea level. The low elevation and coastal location subject Charleston to hazards of various flooding events and South Atlantic hurricanes throughout the year. To address these hazards, planning has required stringent building standards for elevations and wind resistance, stormwater management and other sustainability practices. The wetlands in this Sub Area are found primarily along the shorelines and are estuarine and marine wetlands.

Downtown Charleston has a culturally rich historic district with many historic buildings, sites and landmarks. These include, but are not limited to:

- William Aiken House
- Thomas Bennett House
- William Blacklock House
- French Quarter District
- Coming Street Cemetery
- Dock Street Theatre
- Fort Sumter
- Rutledge House
- Charleston Market



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Appendix 1-B: CARTA I-26 Alternatives Analysis: Passenger Ridecheck Survey Report

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(Bridge and Culvert Inventory Table)

Appendix 1-B

(CARTA I-26 Alternatives Analysis: Passenger Ridecheck Survey Report)

Appendix 1-C

(I-26 Fixed Guideway Alternatives Analysis: Employer Survey Report)

Appendix 1-D

(Planning Study Summary Matrix)

Appendix 1-E

(Major Road Segment V/C and Flow Tables)

i-26ALT

I-26 Fixed Guideway Alternatives Analysis

CHAPTER II: Pre-Screen "Fatal Flaw" Analysis

Draft Report – February 2016

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1 Introduction

The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) initiated the I-26 Regional Fixed Guideway Transit Alternatives Analysis Study (i-26*ALT*) to improve transit options for residents and businesses along the I-26 Corridor. The purpose of the I-26 Alternatives Analysis is to improve transit service and enhance regional mobility along the I-26 Corridor connecting Summerville, North Charleston, and Charleston in South Carolina. Following FTA's Capital Investment Grant (CIG) Program methodology, the I-26 Regional Fixed Guideway Alternatives Analysis is currently in the Pre-Project Development Phase for a high capacity fixed guideway system along the I-26 corridor. During the initial outreach process, a study area was delineated, and land use, economic development, environmental, community and mobility goals were identified. This pre-screening analysis identified twenty alignment and mode combinations to be considered during the Pre-Project Development Phase. Through this process, the project team will conduct a series of subsequent screenings to select a Locally Preferred Alternative (LPA) to recommend for progression into the Project Development Phase.

1.1 Screening Process

Three levels of screening will be conducted as part of the Pre-Project Development phase of the alternatives analysis. The first round of screening is the *Pre-Screen*, which eliminates transit modes and alignments based on a fatal flaw analysis. This process brings the universe of alternatives down to a smaller set of alignments and transit modes that meet the overall project goals. Section 2.0 details the results of the pre-screening analysis.

The next round of screenings include the initial screening, *Screen One* and more detailed screening, *Screen Two Analysis*. Each will be addressed in subsequent chapters. The Screen One Analysis uses the project goals and objectives to develop specific criteria intended to further refine the number of alignments and modes to move forward to the detailed screening. This screen utilizes a combination of subjective and objective analyses to identify those modes that best meet the project goals and warrant a more detailed analysis.

The more detailed *Screen Two Analysis* identifies objective criteria that can be measured against each alignment and mode pair to identify the best alternative that meets the project goals as well as the FTA criteria for projects in the CIG Program. The results of this screening will provide the necessary information to identify a locally preferred alternative to move forward into further refinement and project development.

2 Pre-Screen Analysis

A pre-screen analysis is performed to identify a list of alternatives to be analyzed in the initial *Screen One* evaluation. This pre-screening analysis relies on previous planning studies, stakeholder interviews, public outreach, project goals and objectives, and alternative characteristics. The purpose of the analysis is to conduct a high-level, qualitative assessment of modal and alignment options due to the large number of alternatives that could be considered. The pre-screening analysis includes an assessment of fatal flaws and identifies modes and alignments that should be dropped from further consideration, and those that should move forward into a more detailed analysis. The following defines the universe of transit alternatives considered for the I-26 Alternatives Analysis and the pre-screening evaluation of these alternatives to move forward into *Screen One*.

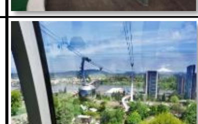
2.1 Premium Transit Modes

The following outlines the universe of premium transit modes evaluated in the pre-screening process. Table 2-1 summarizes the relevant characteristics of each mode.

- **Standard bus technology:** Roadway vehicles powered by diesel, gasoline, battery, or alternative fuel engines operating on streets and roadways in fixed-route or other regular service, which can include local buses, trolleys, express buses and commuter buses.

- **Bus Rapid Transit (BRT):** Bus Rapid Transit is a flexible, premium “rail-like” bus service that operates in its own lane or in mixed traffic with stations. It is similar to Light Rail in that it provides (relatively) high speed, high frequency service from dedicated stops along a fixed route.
- **Commuter Rail Service (CR)** (Locomotive)**:** Urban passenger train service consisting of local short distance travel between a central city and adjacent suburbs using electric or diesel locomotive hauled or self-propelled railroad passenger cars.
- **Hybrid Rail (Diesel Multiple Units/Electric Multiple Units) (DMU/EMU):** A passenger vehicle similar to a commuter rail but with lower capacity used for short or medium distance passenger travel. Vehicles are self-propelled, typically powered by diesel, as single or multiple units. Limited options for FRA compliant vehicles are available.
- **Light Rail Transit (LRT):** Light Rail Transit is a lightweight passenger rail car that operates single or short train sets in right-of-way that may or may not run in street traffic. Light Rail is driven by an operator on board the vehicle and is often powered by overhead electric lines.
- **Heavy Rail Transit –** (Metro, Subway, Rapid Transit or Rapid Rail) Rail service operating on electric railway with the capacity for heavy traffic with rapid acceleration passenger cars in a separate right-of-way.
- **High Speed Rail (HSR)**: Rail service that operates on rail lines designed to operate at high speeds up to 150 miles per hour, powered by diesel-electric locomotives or electricity from overhead wires. Not applicable in urban areas and in short distances.
- **Magnetic Levitation (Maglev):** Trains that hover above tracks or guideways that are levitated and propelled by magnetic force, eliminating friction to allow for high speeds of 300 miles per hour. Not applicable for short distances.
- **Monorail:** Electric guided transit vehicles that operate while suspending from or straddling on a guideway formed by a single beam, rail, or tube.
- **People Mover:** Driverless electric transit (without a crew) vehicles operating on a guideway. This mode of transport is mostly used in airports.
- **Personal Rapid Transit (PRT):** Small, lightweight, driverless electric vehicles running on a special guideway, with on-demand, nonstop service. It is often used for short journeys, like airports or interchange stations.
- **Aerial Tramway:** Electric system of passenger vehicles running on a special guideway, with on-demand, nonstop service. Aerial Tramways excel at transporting people from point to point (with few or no middle stops) in abrupt landscapes where speed is not a determinant factor (under 30 mph).
- **Waterborne Transit (WW):** A water taxi or water bus is a watercraft used to provide public transport, usually but not always in an urban environment. Service may be scheduled with multiple stops, operating in a similar manner to a bus, or on demand to many locations, operating in a similar manner to a taxi. A boat service shuttling between two points would normally be described as a ferry rather than a water bus or taxi. Modern ships can offer a wide range of capacities depending on its average speed. Ships reaching 25 and 30 knots usually have a 50 passenger capacity, while traditional ships can carry up to 150 passengers but seldom surpass 10 knots.

Table 2-1: Universe of Alternatives Matrix

Universe of Alternatives	Overview		Capacity		Right of Way Requirements		Service Characteristics				Operating Costs (2013 NTD Data)		Capital Cost (2016 FTA CIG)	
Mode	Image	Description	Avg. Wkday Riders (2013 NTD)	Vehicle Capacity	Typical Cross Section	Designated ROW	Service Frequency	Travel Speed	Typical Corridor Length	Stop Spacing	Operating Cost/Hour	Operating Cost/Passenger	Avg. Capital Cost /Mile	Federal Share
Standard Bus Technology		Roadway vehicles powered by diesel, gasoline, battery, or alternative fuel engines operating on streets and roadways in fixed-route or other regular service, which can include local buses, trolleys, express buses and commuter buses.	300-4,000	Varies: 45 Seated for 40' Bus; 60 Seated for Articulated	10 to 12 Ft (Mixed Traffic)	N/A	5 Min. to 60 Min.	8 to 16 MPH (Local); 16 to 21 MPH (Express)	Varies	1/4- 1/2 mile	$76	$3.32/25%	N/A	N/A
Bus Rapid Transit		Bus Rapid Transit is a flexible, premium "rail-like" bus service that operates in its own lane or mixed traffic with stations. It provides (relatively) high speed, high frequency service from dedicated stops along a fixed route. BRT differs from rail in the type of vehicle used and in the ability to utilize and enhance existing roadway facilities instead of requiring new rail lines.	2,800 - 13,000 (Does not include NYC & LA)	Varies: 45 Seated for 40' Bus; 60 Seated for Articulated	12 Ft (Single Lane); 24 Ft (Double Lane)	Can operate in mixed traffic or designated roadway. Operation. In dedicated ROW section, at grade BRT would require two travel lanes to be devoted to transit; otherwise a grade separated ROW is needed.	5 Min to 10 Min. Peak; 15 Min. Off Peak	Typical: 15 to 20 MPH (Mixed Flow) 20-60 (Dedicated ROW); NTD Average: 6 to 12 MPH	5 to 20 Mile	1/2 to 1 Mile	$104	$1.98/ 34%	$17.04	63%
Commuter Rail (Locomotive)		Urban passenger train service consisting of local short distance travel between a central city and adjacent suburbs using electric or diesel locomotive hauled or self-propelled railroad passenger cars.	1,000 - 19,000 (Cities w/ <2M Pop	80 to 170 Seated	>37' (Double Track)	Shared ROW with freight rail or parallel to existing rail.	15 Min. to 30 Min.; Often peak hour only operations	Typical: 30 to 79 MPH; NTD Average: 25 to 60 MPH	20 to 100 Miles	2 to 5 Miles	$649	$18.47/30%	$27.08	53%
DMU		A passenger vehicle similar to a commuter rail but with lower capacity used for short or medium distance passenger travel. Vehicles are self propelled, typically powered by diesel, as single or multiple units. Limited options for FRA compliant vehicles.	1,700 - 8,000 (Does not include Newark)	80 Seated	25 to 37 ft. (Double Track)	Shared ROW with freight rail/parallel to existing rail if FRA compliant vehicle is used.	Varies: 15 to 30 Min.	Typical: 25 to 40 MPH; NTD Average: 22 to 27 MPH	20 to 100 Miles	2 to 5 Miles	$811	$15.47/8%	Similar to Commuter Rail	N/a
Light Rail		Light Rail Transit is a lightweight passenger rail car that operates singly or in short trains in right-of-way that may or may not run in street traffic. Light Rail is driven by an operator on board the vehicle and is often powered by overhead electric lines.	5,500 to 145,000 (Cities < 2 Million)	30 to 100 Seated; 150 to 200 with Standees	25 to 33 Ft (Double Track), 11 to 13 Ft (Single Track)	Operates in dedicated right-of-way, can operate in mixed traffic. If at grade, LRT would require two travel lanes dedicated to transit; otherwise a grade separation is needed.	5 to 30 Min. Peak	Typical: 20 to 60 MPH; NTD Average 9 to 24 MPH	10 to 20 Miles	1/2 to 1 Mile	$250	$3.24/32%	$289.31	48%
Heavy Rail		Rail service operating on electric railway with the capacity for heavy traffic with rapid acceleration passenger cars in a separate right-of-way.	17,500 to 8.5M	60 to 80 seated; 120 to 150 with Standees	25 to 33 Ft (Double Track)	Fully dedicated, grade separated ROW is needed with no cross traffic.	5 to 10 Min. Peak	Typical: 30 to 80 MPH; NTD Average: 16 to 36 MPH	5 to 20 Miles	1 to 3 Miles	$310	$3.49/43%	$427.55	37%
High Speed Rail		Rail service that operates on rail lines designed to operate at high speeds up to 150 miles per hour, powered by diesel-electric locomotives or electricity from overhead wires. Not applicable in urban areas and in short distances.	N/A	N/A	N/A	Dedicated right-of-way, typically in a freight corridor.	Intercity	Up to 150 MPH	300 Miles	50 to 100 Miles (Intercity)	N/A	N/A	N/A	N/A
Magnetic Levitation		Trains that hover above tracks or guideways that are levitated and propelled by magnetic force, eliminating friction to allow for high speeds of 300 miles per hour. Not applicable for short distances.	N/A	N/A	N/A	Fully dedicated, grade separated ROW is needed with no cross traffic.	Intercity	Up to 300 MPH	300 Miles	50 to 100 Miles (Intercity)	N/A	N/A	N/A	N/A
Monorail		Electric guided transit vehicles operating suspending from or straddling on a guideway formed by a single beam, rail, or tube.	4,000 - 30,000	10 to 40 per Vehicle; 240 Max	25 Ft Over Street (6' X 8' Support Pillars)	Fully dedicated, grade separated ROW is needed with no cross traffic.	5 to 10 Min.	Typical 25 to 45 MPH; NTD Average: 10 to 13 MPH	4 Miles	1 to 2 Miles	$190	$3.65/56%	$50M to $100M (Excluding ROW)	N/A
People Mover		Driverless electric transit (without a crew) vehicles operating on a guideway. This mode of transport is mostly used in airports.	4,000 - 30,000	See Monorail	25 Ft Over Street (6' X 8' Support Pillars)	Fully dedicated, grade separated ROW is needed with no cross traffic.	5 to 10 Min.	Typical 25 to 45 MPH; NTD Average: 10 to 13 MPH	4 Miles	1/8 to 2 Miles	$222	$4.0/44%	Similar to Monorail	N/A
PRT		Small, lightweight, driverless electric vehicles running on a special guideway, with on-demand, nonstop service. It is often used for short journeys, like airports or interchange stations.	No FTA Funded System	3 to 4 for small vehicles; 12 to 15 for large vehicles	10 to 12 ft. for Single; 20 to 25 ft. for double	Fully dedicated, grade separated ROW is needed with no cross traffic.	Demand Response; Can be as low as 1 Min.	4 MPH (Only 1 US system in university setting)	3 Miles (Only 1 System in revenue operations in US - Not FTA funded system)	<1/2 Mile	N/A Only US System is university setting	N/A Only US system is university setting	Est. $10 to $20 M - no recent systems in US	N/A
Aerial Tramway		Electric system passenger vehicles running on a special guideway, with on-demand, nonstop service. Aerial Tramways excel at transporting people from point to point (with few or no middle stops) in abrupt landscapes where speed is not a determinant factor (under 30 mph).	9000	4 to 150/Cabin	25'	Requires a series of big guideposts to support and guide the catenary from which the cabins suspend.	As low a few seconds depending on cabin size	<30 MPH; NTD Average 9 MPH	Varies	Varies - Point to Point	$111.33	0.23/109%	Up to $65M	N/A
Waterborne Transit		A water taxi or water bus is a watercraft used to provide public transport, usually but not always in an urban environment. Service may be scheduled with multiple stops, operating in a similar manner to a bus, or on demand to many locations, operating in a similar manner to a taxi. A boat service shuttling between two points would normally be described as a ferry rather than a water bus or taxi.	35 to 5,800 (Cities <2M)	Up to 150 Passenger	Waterway	Requires a waterway to operate, to reach the full length of the corridor, a mode change to bus would be required.	Varies	25 to 30 Knots (50 Passengers); 10 Knots: (150 Passengers); NTD Average (2 to 20)	Varies	Varies - Typically Point to Point	$486.15	$20.55/28%	$3 to $5 Million /Vessel	N/A

2.2 Fatal Flaw Analysis – Transit Modes

Transit can be provided in a variety of modes; however, not all modes are appropriate for all environments. As such, a fatal flaw analysis of premium modes is conducted to determine:

1) Has the alternative been eliminated previously for reasons that are still valid?
2) Is a mode or alignment (including alignment segments) ill-suited to address the purpose and need and project goals?
3) Does the mode or alignment have a fatal flaw considering the market and environment within which it would operate or the amount of funding likely to be available?

At the start of the project, the steering committee and technical advisory committee identified the following purpose and goals for the I-26 Alternatives Analysis:

The purpose of the I-26 Alternatives Analysis is to improve transit service and enhance regional mobility along the I-26 Corridor between Summerville, North Charleston, and Charleston in South Carolina. The project goals include:

1. *Improve mobility, accessibility, safety, and connectivity of the transit system and region;*
2. *Promote a cost effective and financially feasible transit alternative;*
3. *Support local land use objectives;*
4. *Plan for projected growth in an environmentally sustainable manner;*
5. *Respond to community needs and support; and*
6. *Support a diverse regional economy.*

2.3 Evaluation of Premium Transit Modes

The pre-screening evaluation of premium transit modes identifies the technologies that best fit the project goals. The following criteria are used to pre-screen the transit modes.

1) Does the mode provide the appropriate level of transit capacity?
2) Can the mode utilize existing ROW?
3) Is the mode consistent with local and regional plans?
4) Will the alternative avoid significant impacts during its construction to either the environment or the affected neighborhoods?
5) Is the mode compatible with community character?
6) Will the alternative generate significant new permanent jobs associated with its operation and maintenance?

Table 2-2 shows the pre-screening matrix.

Table 2-2: Transit Mode Fatal Flaw Matrix

Fatal Flaw Matrix	GOAL 1: Improve Mobility, Accessibility and Connectivity of the Transit System and Region	GOAL 2: Provide a Cost Effective and Financially Feasible Transit Alternative	GOAL 3: Support Local Land Use Objectives	GOAL 4: Plan for projected Growth in an Environmentally Sustainable Manner	GOAL 5: Respond to Community Needs and Support	GOAL 6: Support a Diverse Regional Economy
Measure Matrix	Does the mode provide the appropriate level of transit capacity?	Can the mode utilize existing ROW?	Is the mode consistent with local and regional plans?	Will the alternative avoid significant impacts during its construction to either the environment or the affected neighborhoods?	Is the mode compatible with the community character?	Will the alternative generate significant new permanent jobs associated to its operation and maintenance?
Std. bus technology	Yes	Yes	Yes	Yes	Yes	Yes
Commuter Rail Service (CMR)	Yes	Yes	Yes	Yes	Yes	Yes
Bus Rapid Transit (BRT)	Yes	Yes	Yes	Yes	Yes	Yes
Diesel Multiple Unit (DMU)	Yes	Yes	Yes	Yes	Yes	Yes
Light Rail Transit (LRT)	Yes	Yes	Yes	No	Yes	Yes
Heavy Rail	No	No	No	No	No	Yes
High Speed Rail	No	No	No	No	Yes	Yes
Maglev	No	No	No	No	No	Yes
Monorail	Yes	No	No	No	No	Yes
People Mover	No	No	No	No	Yes	No
Personal Rapid Transit (PRT)	No[1]	No[1]	No	No	Yes	No
Aerial Tramway	No	No	No	No	No	Yes
Waterborne Transit (WW)	No[2]	Yes	Yes	Yes	No[2]	Yes

1. PRT is unproven technology, currently no FTA funded projects in operation
2. Waterborne Transit does not reach Summerville

Based on the fatal flaw analysis, the following transit modes were discarded for future studies:

- **Heavy Rail:** Heavy rail is applicable for high density, high capacity corridors, such as subway systems in New York City and Chicago. The dedicated right-of-way and capacity requirements are not compatible with the Charleston region.
- **High Speed Rail (HSR):** High speed rail is intended for intercity travel, and as such, is not compatible with the I-26 Corridor between Summerville and Charleston. HSR would need its own dedicated ROW and is not consistent with previous planning studies. HSR would have significant impacts on the surrounding communities and environment.
- **Maglev:** Maglev's requirements are not flexible enough to adapt to Charleston's complex network. It would require a specific infrastructure that would generate notorious impacts during its construction and would be very difficult to adapt to future community demands.
- **Monorail:** Monorail requirements are not flexible enough to adapt to Charleston's complex network. It would require a specific infrastructure that would generate notorious impacts during its construction and would be very difficult to adapt to future community demands.
- **People Mover**: This technology would not be apt for its implementation in Charleston due to the long length of alignments. Driverless technology would not generate new jobs for operations.
- **Personal Rapid Transit (PRT):** This technology is unproven in the US, and no FTA projects have been funded using this technology. The only US system in operation is a University setting that was not built with FTA funding. PRT would not provide appropriate capacity requirements for the purpose of this project and has not been identified in any previous local plans. This technology would not be apt for its implementation between Summerville and Charleston due to the long length of alignments and small capacity. Driverless technology would not generate new jobs for operations.
- **Aerial Tramway:** Needed requirements are not flexible enough to adapt to Charleston's complex network. It would require a specific infrastructure that would be very difficult to adapt to future community demands. This technology has not been identified in any local plans**.**
- **Waterborne Transit:** Although this technology has been identified in regional planning studies, it is eliminated from this corridor as there is no direct waterway access from Summerville to North Charleston and Charleston. Travel time when combined with multiple modes does not improve mobility.

Alternatives Moved Forward for Further Analysis:
As a result of the fatal flaw analysis, the following modes moved forward for consideration:

- **Commuter Rail:** Commuter rail was identified in the previous planning studies and advances into the initial screening phase.
- **Diesel Multiple Unit (Hybrid Rail):** Although EMU/DMU has not been specifically identified in previous planning studies, it provides a hybrid alternative between Light Rail and Commuter Rail in that it is a light rail vehicle that can operate parallel to freight corridors if FRA compliant vehicles are used.
- **Light Rail Transit:** This technology has been identified in previous planning studies and through community outreach and will move forward into the initial screening phase.
- **Bus Rapid Transit:** Bus Rapid Transit has been identified in numerous planning studies, and has received strong support from stakeholders and community members due to its faster implementation time. As such, this alternative will move forward into the initial screening phase.
- **Express Bus (No Build):** As described above, express bus options are considered the "No Build" Alternative and will be included in each subsequent phase.

2.4 Conceptual Alignments Pre-Screening

Through stakeholder meetings, community outreach, steering and technical committee meetings, field surveys, and planning study reviews, a high-level assessment of potential alignments that parallel the I-26 Corridor was completed. Several potential alignments have been prescreened to move forward based on the goals and objectives.

Goal 1: Improve Mobility, Accessibility, Safety, and Connectivity of the transit system.

A) Does the proposed alignment have existing transit service, and would performance improve with fixed guideway?

Goal 2: Provide a cost effective and financially feasible transit alternative.

A) Is there readily available ROW for the alignment?
B) Does the alignment have sufficient capacity to add a transit alignment?

Goal 3: Support Local Land Use Objectives.

A) Does the alignment have sufficient capacity to support Transit Oriented Development?

Goal 4: Plan for projected growth in an environmentally sustainable manner.

A) Does the alignment avoid adverse impacts to environmentally sensitive areas (i.e. natural, cultural, and or historic)?

Goal 5: Respond to community needs and support.

A) Does the alignment serve populations with no access to a vehicle?

Goal 6: Support a diverse regional economy.

A) Does the alignment serve current and future employment centers?

Alignments are evaluated based on these criteria and a ranking system of high (yes it meets the criteria); medium (yes it meets the criteria with restrictions), and low (does not meet the criteria). Those alignments with overall low rankings are eliminated from further screening.

The following alignments are evaluated based on these criteria, and are shown in Figure 2-1 and Table 2-3.

Figure 2-1: Pre-Screen Alignments

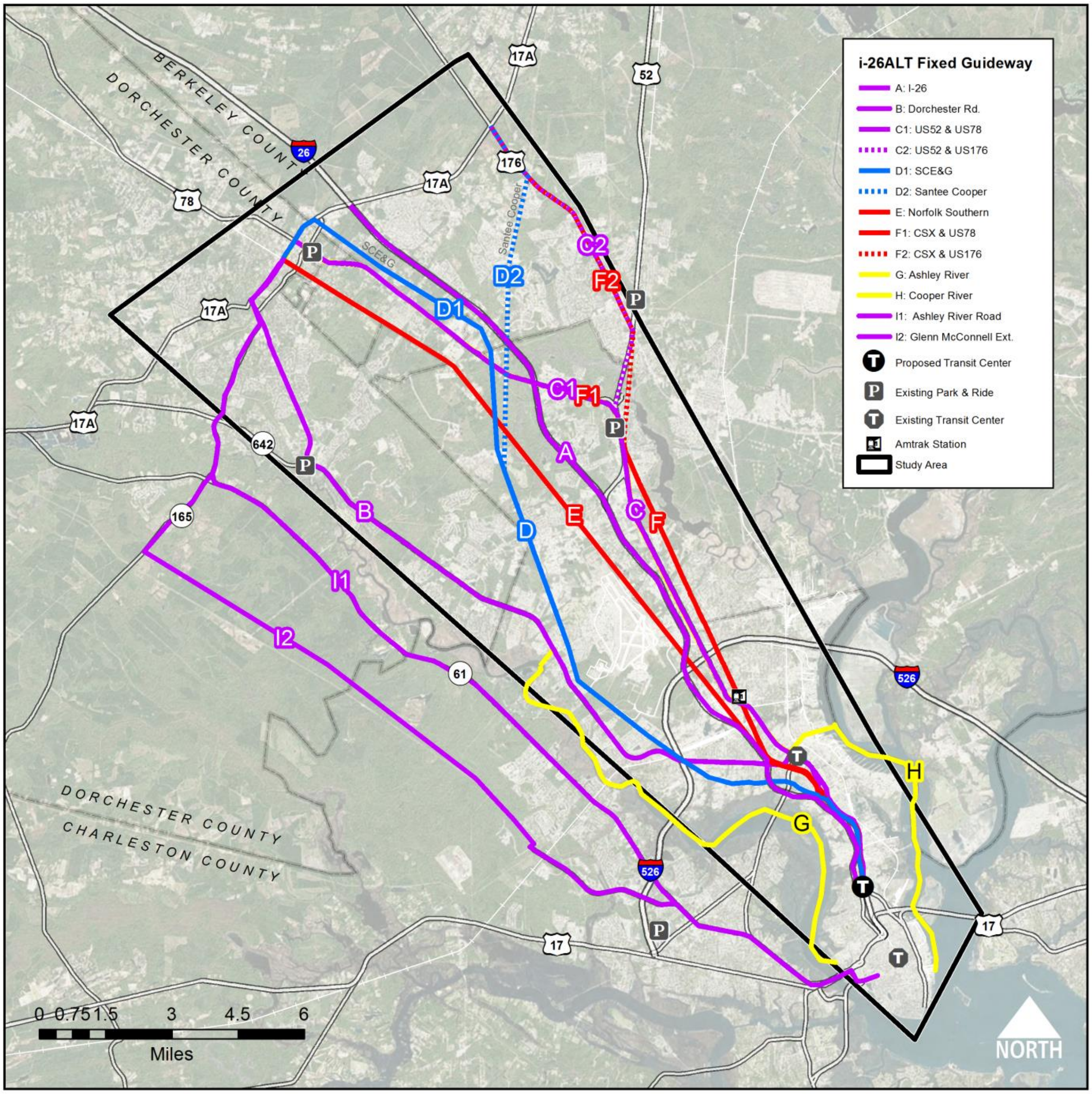


Table 2-3: I-26ALT Alignments Fatal Flaw Matrix

Fatal Flaw Matrix			GOAL 1: Improve Mobility, Accessibility, Safety, and Connectivity of the Transit System and Region		GOAL 2: Provide a Cost Effective and Financially Feasible Transit Alternative	GOAL 3: Support Local Land Use Objectives	GOAL 4: Plan for projected Growth in an Environmentally Sustainable Manner	GOAL 5: Respond to Community Needs and Support	GOAL 6: Support a Diverse Regional Economy	
	Alignment	*Description*	**Does the alignment have current transit service operating along the corridor, and would the alignment improve performance?**	**Does the alignment have sufficient capacity to add a transit mode?**	**Is there available ROW for the alignment?**	**Does the alignment have sufficient capacity for TOD?**	**Does the alignment avoid impacts to cultural, historical or natural resources?**	**Does the alignment serve higher than average populations with no access to vehicle?**	**Does the alignment connect to current and future employment centers?**	**Overall Ranking**
A	**I-26**	*DT Summerville Via 17A to DT Charleston*	High	Low	Medium	Low	Medium	Medium	High	Medium
B	**Dorchester Road**	*DT Summerville via Old Trolley Rd, Dorchester Rd. & US 52/78 to DT Charleston*	High	High	High	Medium	Low	Low	High	Medium
C-1	**US 52 / US 78**	*DT Summerville via 17A, US 78 & US 52 to DT Charleston*	High	High	High	High	High	High	High	High
C-2	**US 52/ US 176**	*17A via US 176 & US 52 to DT Charleston*	High	High	High	High	Medium	Medium	Medium	High
D-1	**SCE&G Utility Corridor**	*DT Summerville via SCE&G Utility Corridor & US 52/78 to DT Charleston*	Medium	Medium[3]	Medium	Low	Low	Medium	High	Medium
D-2	**Santee Cooper Utility Corridor**	*17A/US 176 via Santee Cooper Utility Corridor & US 52/78 to DT Charleston*	Medium	Medium[3]	Medium	Low	Low	Low	High	Medium
E	**Norfolk Southern Rail Line**	*DT Summerville via Norfolk Southern Rail Line to DT Charleston*	Medium	Low[1]	Medium	Medium	High	Medium-Low	High	Medium
F-1	**CSX Rail Line/Bus via US 78**	*DT Summerville via bus on US 78 to US 52/CSX Rail Line to DT Charleston*	Medium	Low[1]	Medium	Medium	Medium	High	High	Medium
F-2	**CSX Rail Line/Bus via US 176**	*17A via bus on US 176 to CSX Rail Line to DT Charleston*	Medium	Low[1]	Medium	Medium	Medium	Medium	Medium	Medium
G	**Ashley River /Bus Via Dorchester**	*DT Summerville via bus on Dorchester to Ashley River waterway at I-526 to DT Charleston*	Low	Low[2]	High	Low	Low	Low	Low	Low
H	**Cooper River/ Bus Via US 78**	*DT Summerville via bus on US 78 to Cooper River Waterway at Riverfront Park to DT Charleston*	Low	Low[2]	High	Low	Low	Low	Low	Low
I-1	**Ashley River Road**	*DT Summerville via bus on Dorchester to Ashley River waterway at I-526 to DT Charleston*	Low	Low	High	Low	Low	Low	Low	Low
I-2	**Glenn McConnell Ext.**	*DT Summerville via bus on US 78 to Cooper River Waterway at Riverfront Park to DT Charleston*	Low	Medium	High	Low	Low	Low	Low	Low

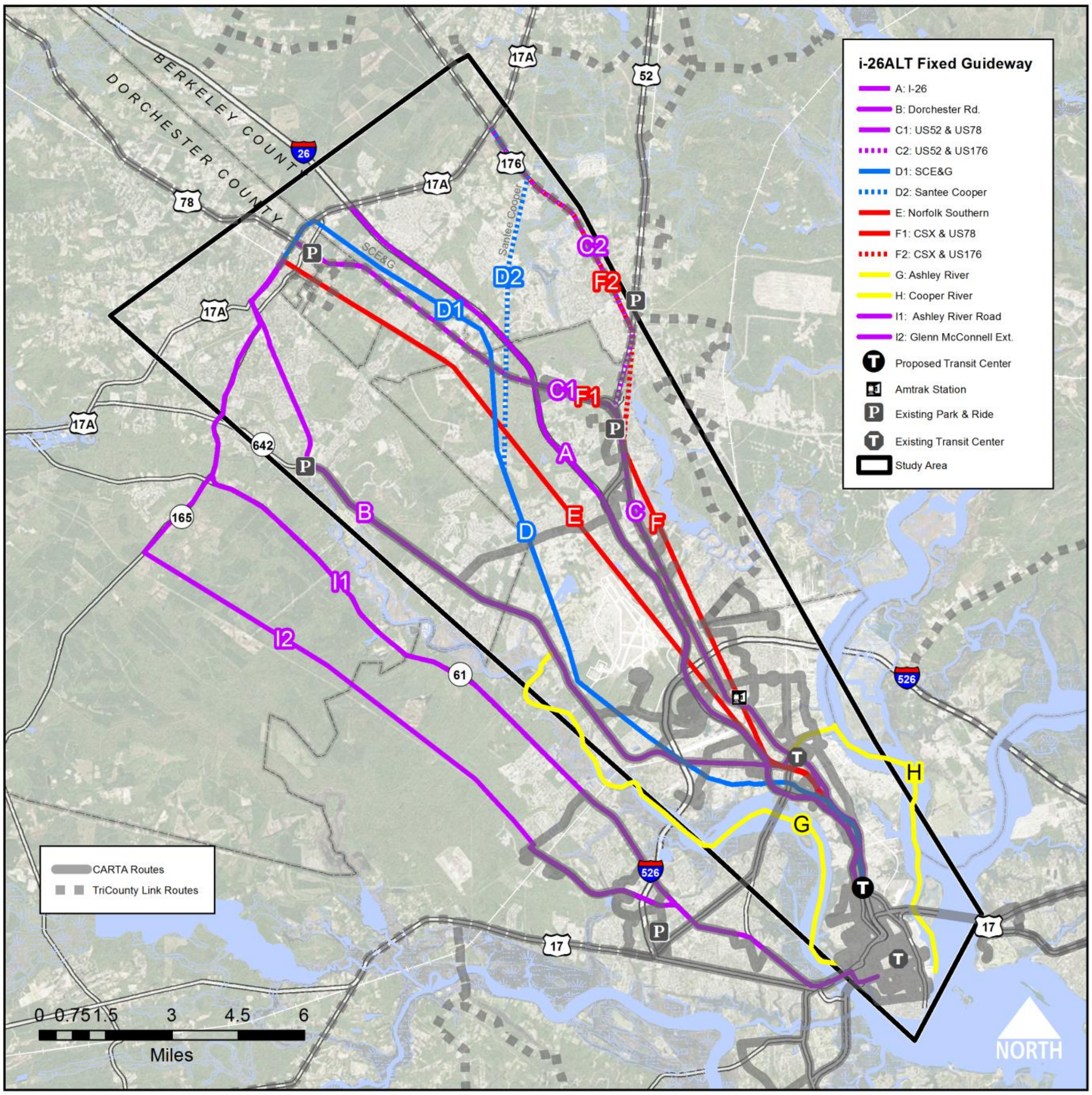
1. Initial indications from freight operators is that existing lines will not have capacity and may require running parallel
2. Requires mode change from ferry to bus, reducing the travel time & capacity
3. Initial discussions with utlity owners identified that parralel corridor would need to be acquired

Alignments are screened based on stakeholder and public outreach, field work, and GIA data collected during the existing conditions phase. The following GIS datasets were used as part of the evaluation of alignments.

2.4.1 Existing Transit

Alignments are evaluated based on the level of existing transit on the corridor, and if the service would be improved based on the alignment under consideration. One of the project goals is to improve existing transit service, and this can be achieved by improving the frequency and quality of service along existing transit corridor that have proven transit demand with a fixed guideway system. Alignments that serve the Rivers Avenue Corridor, which includes CARTA Routes 10 and Express Route 1 ranked highest due to the existing transit ridership, which makes up 25 percent of the system riders. Alignments that improved the Dorchester Road transit services scored medium and alignments that did not improve existing transit service, due to lack of current service, and/or alignments that would have a longer travel time scored lower than other corridors.

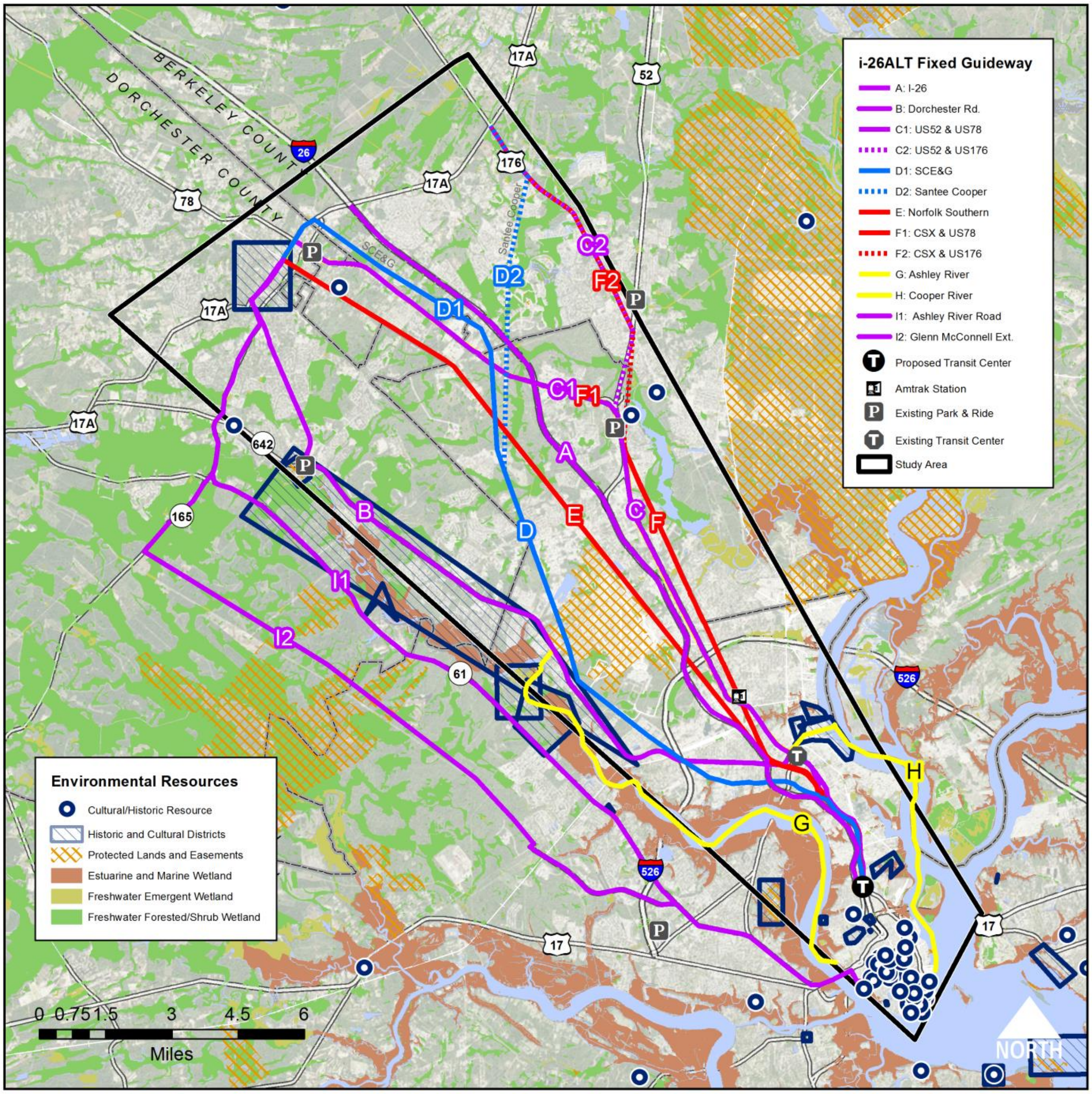
Figure 2-2: Pre-Screen Alignments & Existing Transit



2.4.2 Environmental Criteria

Impacts to cultural, historical or natural resources are subjectively evaluated based on the alignment crossing wetlands, protected lands, or overlay districts. Corridors that have minimal crossings score high. Alignments that cross fewer wetlands compared to other corridors score medium. Those alignments that cross significant areas of wetlands or overlay districts score low.

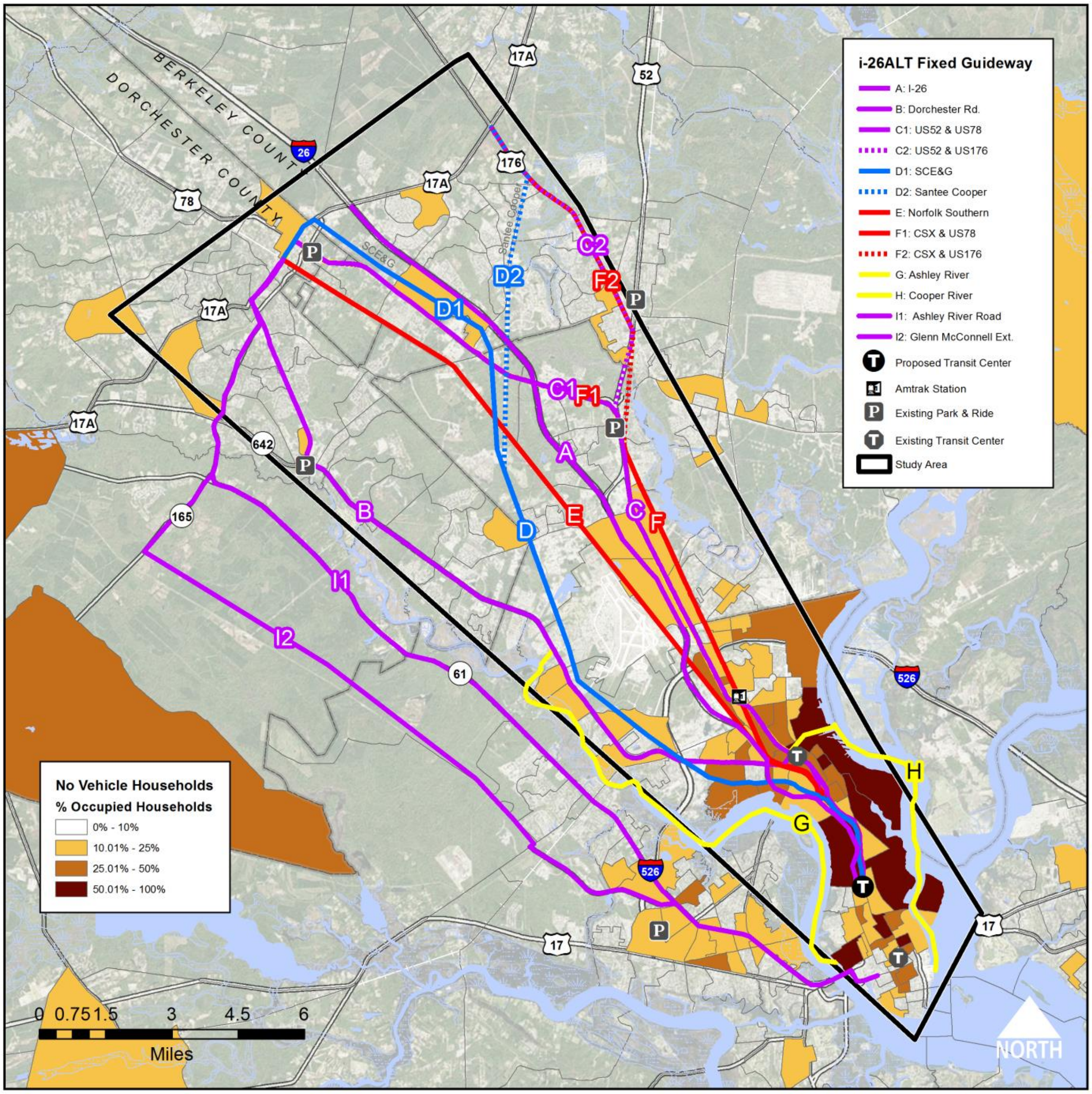
Figure 2-3: Pre-Screen Alignments and Environmental and Cultural Resources



2.4.3 No Vehicle Households Criteria

To gauge community needs, alignments are evaluated based on how well each serves areas with higher percentages of households with no access to a vehicle. Corridors that serve more areas score higher than those that serve fewer areas. The most intense density of households with no vehicle access is in North Charleston and the Neck area.

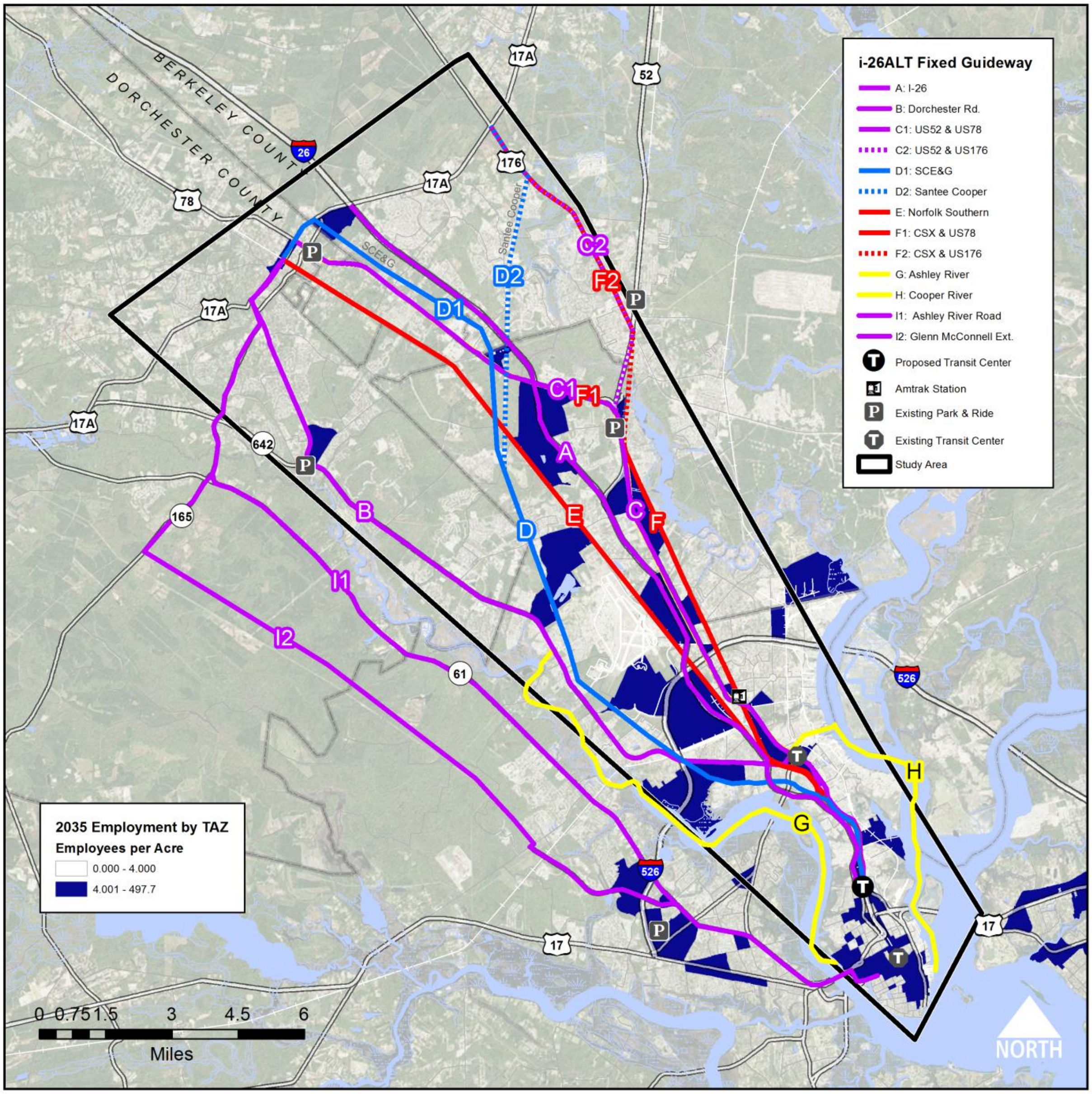
Figure 2-4: Pre-screen Alignments and No Vehicle Households



2.4.4 Employment Centers

The alignments are also evaluated based on how well they connect to current and future employment centers. Using traffic analysis zones from the BCDCOG for 2035, alignments are evaluated based on the greater number of employment centers served, with key differences being the end of the line in Summerville in terms of reverse commute trips, and alignments that serve Trident Health/Remount Road job centers versus Palmetto Commerce Parkway and Airport Area employment areas in North Charleston.

Figure 2-5: Pre-screen Alignments and Transit Supportive Areas of Employment



2.5 Evaluation of Alignments

The following summarizes the rankings of the alignments into a scoring of high, medium, and low. Alignments that score a medium or high ranking are recommended to move forward to the next screening level. Those that score a low ranking are not recommended to move forward.

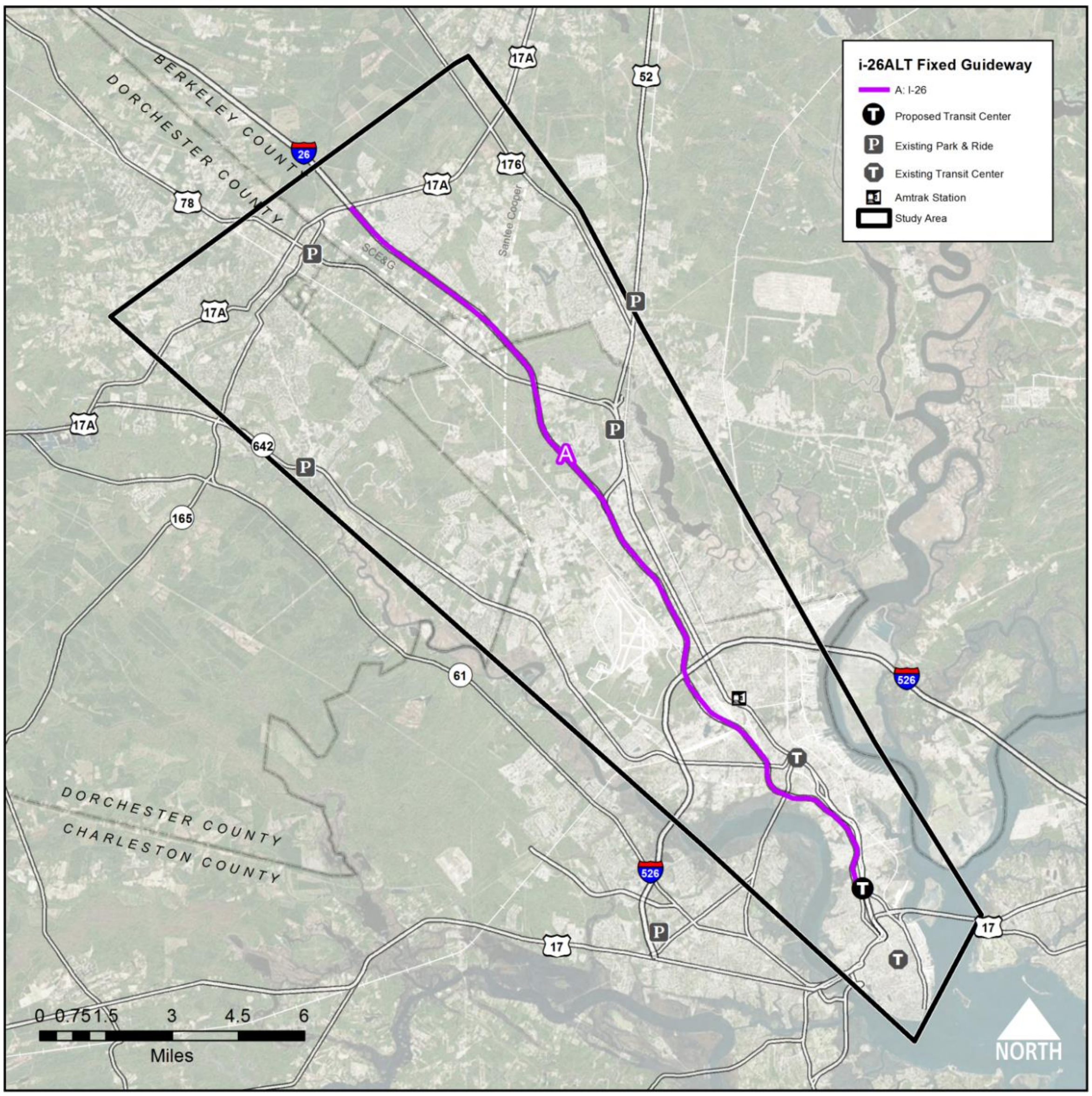
2.5.1 Alignment A: I-26

Overall Rating: Medium

Recommendation: Move forward into next phase of screening

The I-26 Alignment A extends from US 17A in Summerville to its termination in downtown Charleston as shown in Figure 2-6.

Figure 2-6: Alignment A – I-26



Although the I-26 Corridor does not have consistent transit service from end to end, it does parallel multiple express routes that serve the same travel market, and as such, would be an improvement to current transit service. Previous studies and community outreach have indicated that widening I-26 would be cost prohibitive and taking a lane of traffic for transit would not be supported by the public. Although I-26 is an existing roadway and portions of it would accommodate additional lanes near Summerville, as the route moves closer to North Charleston and DT Charleston, bridges and adjacent buildings would be cost prohibitive to add additional lanes for transit. This alignment is conducive for park & ride facilities; however, mixed use transit oriented development on the interstate would be less desirable. Although environmental impacts would be minimal on the existing facility, historic and community impacts would be anticipated as the alignment moves closer to North Charleston and DT Charleston as a result of widening. This alignment serves populations with no vehicle access in North Charleston and Charleston; however, as an interstate; pedestrian access is low. This alignment serves many of the current and planned employment centers in the corridor.

Pre-Screen Criteria	Rank
Does the alignment have current transit service operating along the corridor, and would the alignment improve performance?	High
Does the alignment have sufficient capacity to add a transit mode?	Low
Is there available ROW for the alignment?	Medium
Does the alignment have sufficient capacity for TOD?	Low
Does the alignment avoid impacts to cultural, historical or natural resources?	Medium
Does the alignment serve higher than average populations with no access to vehicle?	Medium
Does the alignment connect to current and future employment centers?	High
Overall Ranking	Medium

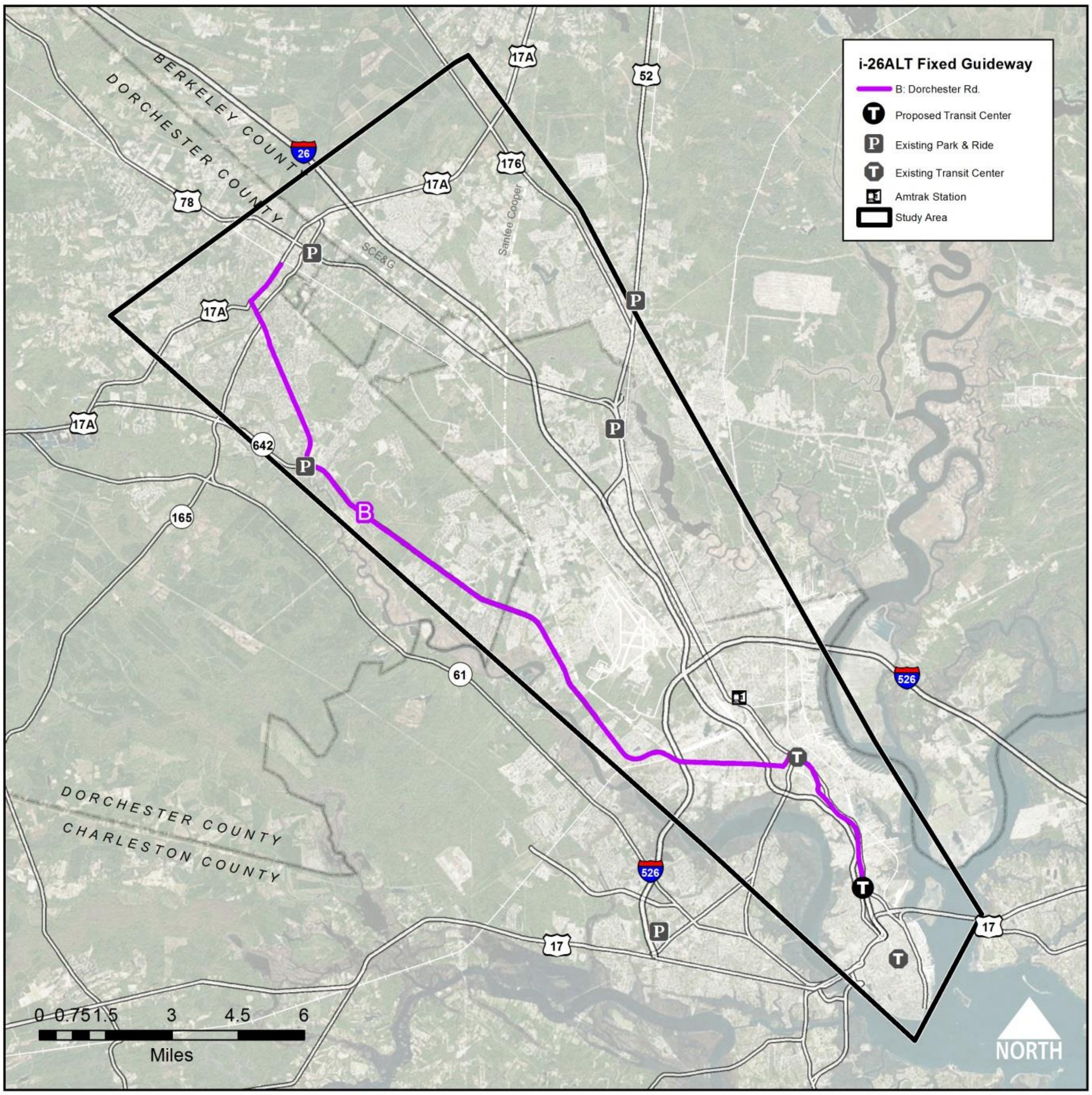
2.5.2 Alignment B: Dorchester Road

Overall Rating: Medium

Recommendation: Move forward into next phase of screening

SC 642 (Dorchester Road) is a principal arterial that runs northwest/southeast and provides connectivity between Summerville and North Charleston, along with access to I-526 and I-26. Dorchester Road varies between a four-lane divided and five-lane roadway with a center turn lane. The Dorchester Road alignment would travel from Downtown Summerville (via Old Trolley Road) to Dorchester Road and would connect to US 52/78 segments, as shown in Figure 2-7.

Figure 2-7: Alignment B – Dorchester Road



The Dorchester Road alignment is currently served by local bus service and CARTA Express service. Community outreach has identified a need to extend these services to DT Summerville, which would be an improvement to the existing transit service. Although traffic congestion is perceived to be bad on Dorchester Road, a center median in the roadway could support a fixed guideway alternative, and as such, the capacity and right-of-way rankings are high. Much of Dorchester Road is located in historic overlay districts, and development is primarily single family neighborhoods. Although portions closer to North Charleston have redevelopment opportunity, overall existing land use and zoning does not support transit oriented development. The Dorchester Road alignment includes a historic overlay district, which would be impacted by a fixed guideway alternative. This alignment does not serve a greater number of households with no vehicle access than comparable corridors. The Dorchester Road alignment serves major employment centers in the Airport Area and downtown Charleston.

Pre-Screen Criteria	Rank
Does the alignment have current transit service operating along the corridor, and would the alignment improve performance?	High
Does the alignment have sufficient capacity to add a transit mode?	High
Is there available ROW for the alignment?	High
Does the alignment have sufficient capacity for TOD?	Medium
Does the alignment avoid impacts to cultural, historical or natural resources?	Low
Does the alignment serve higher than average populations with no access to vehicle?	Low
Does the alignment connect to current and future employment centers?	High
Overall Ranking	Medium

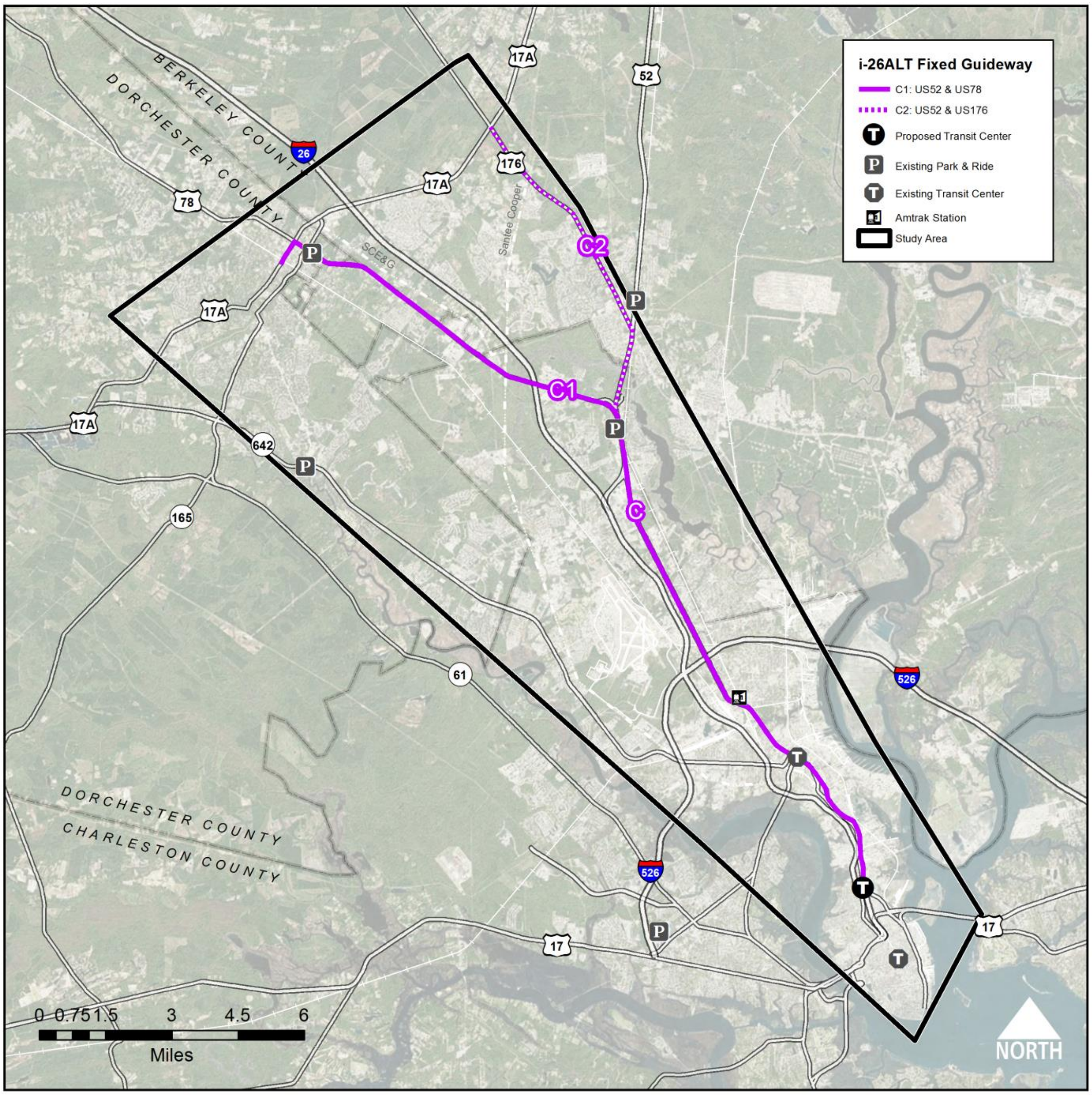
2.5.3 Alignment C: US 52

Overall Ranking: High

Recommendation: Move forward into next phase of screening

US 52 is a principal arterial that runs northwest/southeast within the Study Area and provides connectivity between Moncks Corner, Goose Creek, North Charleston, and Charleston, and provides access to I-26 and I-526. US 52 shares a concurrency with US 78 for approximately 11 miles between University Boulevard and Carner Avenue. Two potential alignments are operating on US 52 are identified as follows and as shown in Figure 2-8.

Figure 2-8: Alignment C – US 52



Variant C-1 US 52 & US 78: The US 78 corridor provides connectivity between Summerville, North Charleston, and Charleston and access to I-526 and I-26 within the Study Area. US 78 shares a concurrency with US 52 between the convergence of University Boulevard (US 78) and Rivers Avenue (US 52) in North Charleston and the split of Rivers Avenue (US 78) and Carner Avenue (US 52) in North Charleston near the City of Charleston line. US 52 enters into Charleston as King Street and terminates at Line Street. This alignment would connect to Summerville via US 17A and would travel via US 78 and US 52 to DT Charleston

Variant C-2 US 52 & 176: US 176 is classified as a minor arterial that runs northwest/southeast from Hendersonville, NC, through Spartanburg, SC and Columbia, SC, and terminates in Goose Creek at its intersection with US 52 (North Goose Creek Boulevard). US 176 provide access to US 17A and US 52. Within the Study Area, north of Alternate US 17, US 176 is named State Road and is a two-way roadway. South of Alternate US 17, US 176 is named St. James Avenue and varies between five lanes with a center turn lane and seven lanes with a center turn lane**.** This alignment would run from 17A via 176 to US 52/US 78.

Variant C-1 would travel via US 78 and US 52 between Summerville and Charleston, and would improve transit services already operating via US 52. Route 10 – Rivers Avenue travels via US 52 between North Charleston and Charleston and carries 1.2M annual riders a year. Additionally, CARTA's express Route 1 carries the highest number of express riders via that same alignment. Rivers Avenue parallels I-26 and has a center median that could support a fixed guideway alternative. The corridor has been identified in numerous planning studies for redevelopment and transit oriented development. Much of the corridor has been developed and would have minimal impact to natural or historic resources. This corridor has the greatest potential to serve households with no access to a vehicle. The alignment serves employment centers at Palmetto Commerce, Remount Road and DT Charleston. Bus service would be required to connect to Airport area employment.

Variant C-2 would travel via US 176 to US 52 and would continue to DT Charleston. Much of the same criteria ratings apply to variant C-2 as did variant C-1. The US 176 segment; however, impacts more natural areas and does not serve as many households with no vehicle access as the US 78 variant. Additionally, the C-2 variant does not serve Summerville directly.

Pre-Screen Criteria	C-1	C-2
Does the alignment have current transit service operating along the corridor, and would the alignment improve performance?	High	High
Does the alignment have sufficient capacity to add a transit mode?	High	High
Is there available ROW for the alignment?	High	High
Does the alignment have sufficient capacity for TOD?	High	High
Does the alignment avoid impacts to cultural, historical or natural resources?	High	Medium
Does the alignment serve higher than average populations with no access to vehicle?	High	Medium
Does the alignment connect to current and future employment centers?	High	Medium
Overall Ranking	High	High

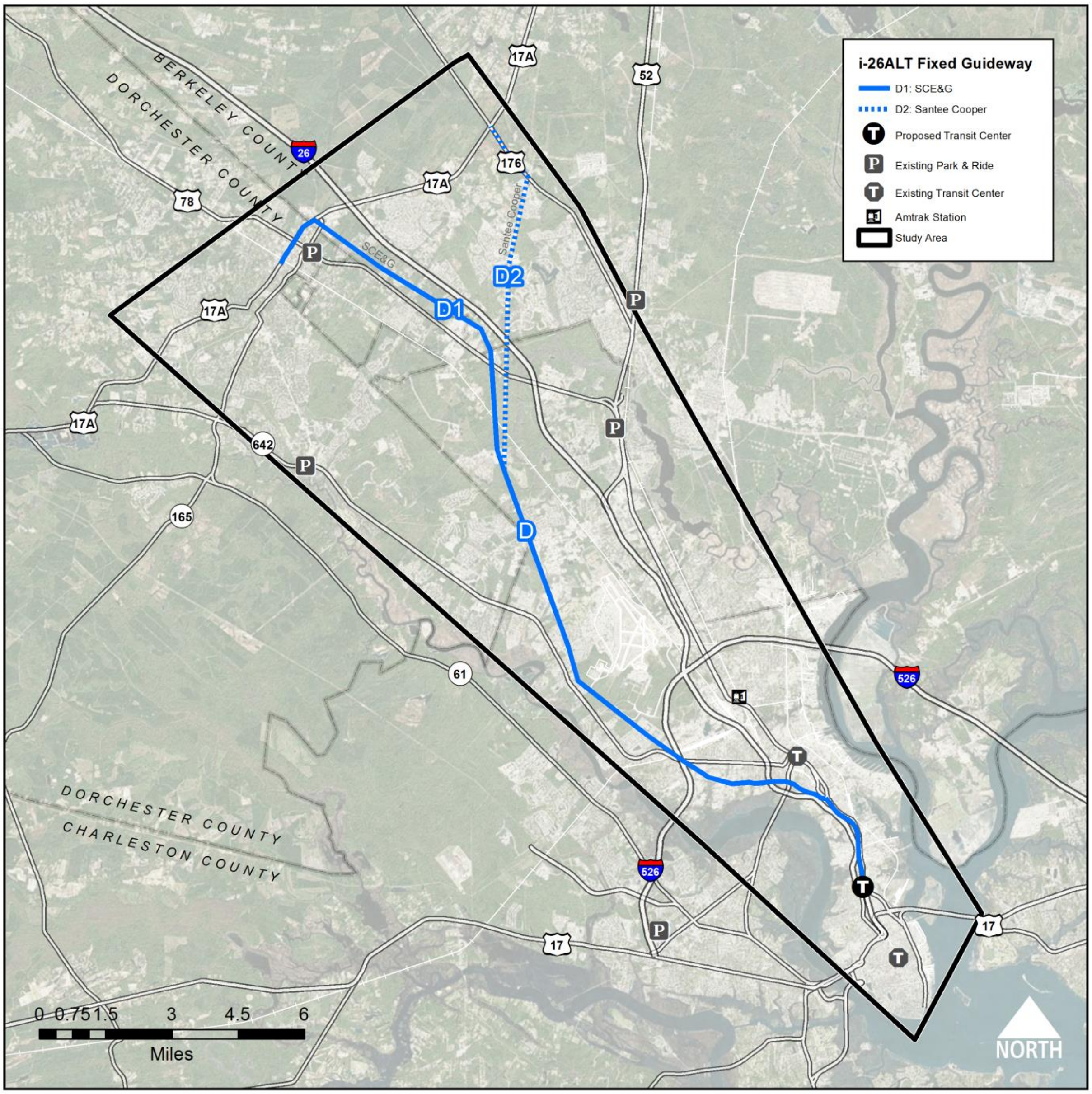
2.5.4 Alignment D: SCE&G/Santee Cooper Utility Corridor

Overall Rating: Medium

Recommendation: Move forward into next phase of screening

Alignment D includes the utility corridor that crosses the study area from US 17A to Azalea Road, where the corridor parallels the roadways. Two utility providers have easements in this corridor, SCE&G and Santee Cooper, and as such, two alignments have been identified, as shown in Figure 2-9.

Figure 2-9: Alignment D – SCE&G & Santee Cooper Utility Corridor



<u>Alignment D-1 SCE&G Utility Corridor:</u> This alignment utilizes the SCE&G corridor beginning at the point where it crosses Hwy. 17A near downtown Summerville. The alignment joins a Santee Cooper easement and runs alongside Azalea Road, where the utilities run parallel to the roadways.

<u>Alignment D-2 Santee Cooper:</u> This alignment incorporates US 176 from the intersection at Hwy. 17A and joins the Santee Cooper Utility Corridor as it crosses US 176. This alignment joins the SCE&G Corridor described above.

Alignment D-1 is assumed to operate via the utility corridor from 17A near downtown Summerville to downtown Charleston. Although this alignment does not have existing transit service, it does operate parallel to Dorchester Road, which has transit service for portions of the alignment and is considered to rank medium in terms of improving existing transit service. This corridor is ranked medium for sufficient capacity. Initial conversations with utility providers identified the need to preserve their existing right-of-way for future utility needs; however, parallel alignments would be acceptable. Many of the adjoining properties are privately owned and would require the project to purchase easements from property owners. In terms of land use objectives, this alignment is less conducive to transit oriented development due to the high voltage transmission lines that would be located along the alignment. This alignment also scored low for impacts to environmental resources. The alignment traverses wetlands, as well as the Air Force base, which adds additional limitations to development. This alignment does serve some households with higher than average populations with no access to a vehicle and connects to major employment centers throughout the corridor.

Alignment D-2 shares much of the same alignment as D-1 and its scoring is similar. The primary difference is the northern alignment to US 176, which serves fewer households with no vehicle access, and as such, receives a lower ranking.

Pre-Screen Criteria	**D-1**	**D-2**
Does the alignment have current transit service operating along the corridor, and would the alignment improve performance?	Medium	Medium
Does the alignment have sufficient capacity to add a transit mode?	Medium	Medium
Is there available ROW for the alignment?	Medium	Medium
Does the alignment have sufficient capacity for TOD?	Low	Low
Does the alignment avoid impacts to cultural, historical or natural resources?	Low	Low
Does the alignment serve higher than average populations with no access to vehicle?	Medium	Low
Does the alignment connect to current and future employment centers?	High	High
Overall Ranking	Medium	Medium

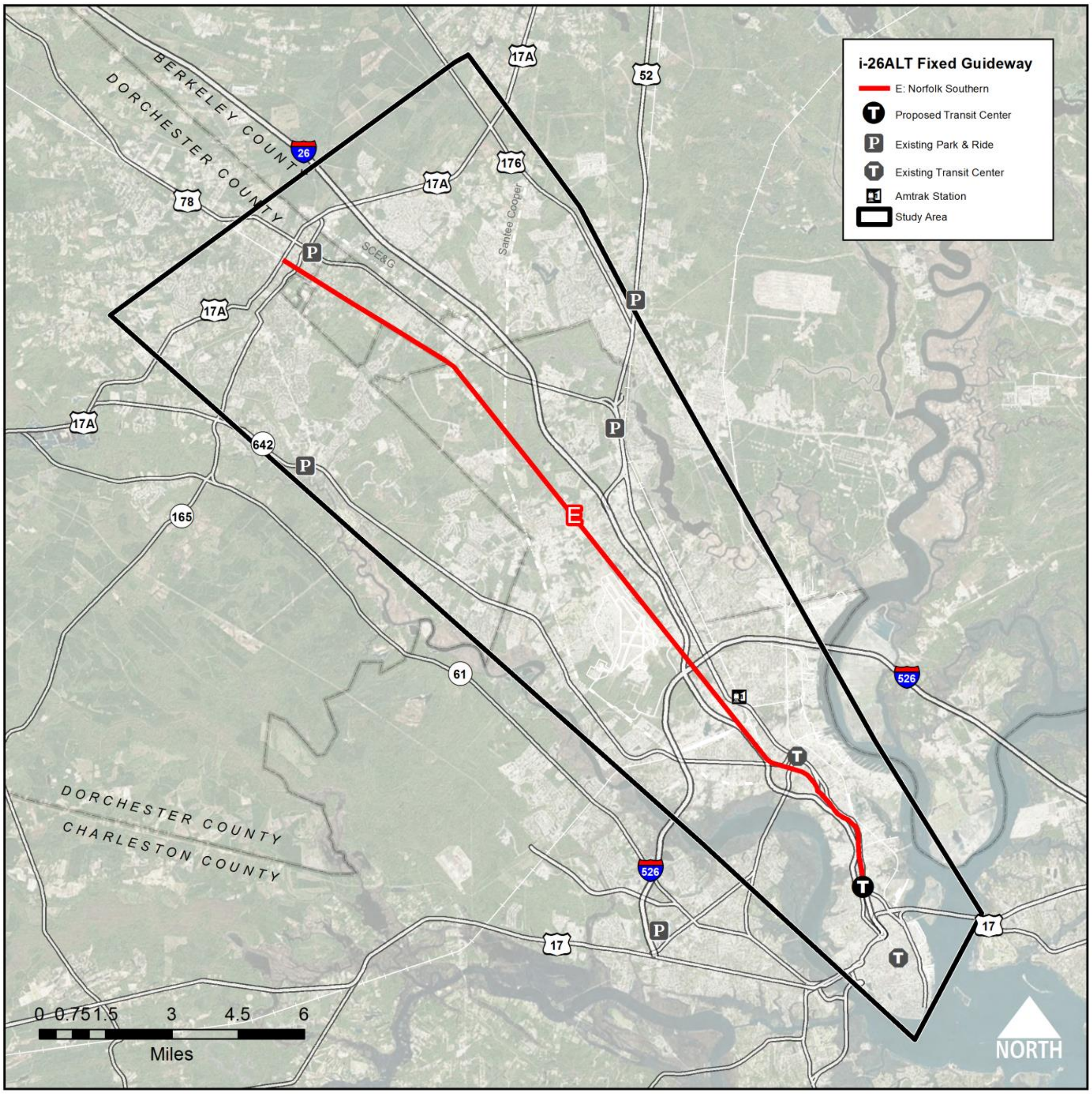
2.5.5 Alignment E: Norfolk Southern Rail

Overall Rating: Medium

Recommendation: Move forward into next phase of screening

This alignment is the original commuter rail alignment studied on Norfolk Southern rail lines from downtown Summerville to downtown Charleston. This alignment would operate on existing freight lines, or parallel right-of-way depending on the mode selected. Alignment E is shown in Figure 2-10.

Figure 2-10: Alignment E – Norfolk Southern Rail Line



This alignment does not have existing transit service; however, it parallels the Dorchester Road transit service, and as such, scores a medium for improvements to existing transit service. Alignment E scores low for sufficient capacity to add a transit mode due to initial conversations with rail providers. Future port expansions have left a level of unknown future capacity needs for freight operators in the region, and they are less compelled to give up capacity for passenger service. Service levels identified in the first phase will not have opportunity for expansion in the future. Parallel right-of-way may be available; however, this would require the project to purchase the right-of-way from the rail line operators. Portions of the alignment are undeveloped and provide the opportunity for transit oriented development; however, due to the active freight service, much of the existing land use along the track is industrial. Since this corridor is already developed, the impacts to environmental resources will be lower. This alignment serves households with no access to a vehicle in North Charleston; yet fewer in the Summerville area than other alignments. This alignment serves all of the major employment centers in the study area.

Pre-Screen Criteria	Rank
Does the alignment have current transit service operating along the corridor, and would the alignment improve performance?	Medium
Does the alignment have sufficient capacity to add a transit mode?	Low
Is there available ROW for the alignment?	Medium
Does the alignment have sufficient capacity for TOD?	Medium
Does the alignment avoid impacts to cultural, historical or natural resources?	High
Does the alignment serve higher than average populations with no access to vehicle?	Medium-Low
Does the alignment connect to current and future employment centers?	High
Overall Ranking	Medium

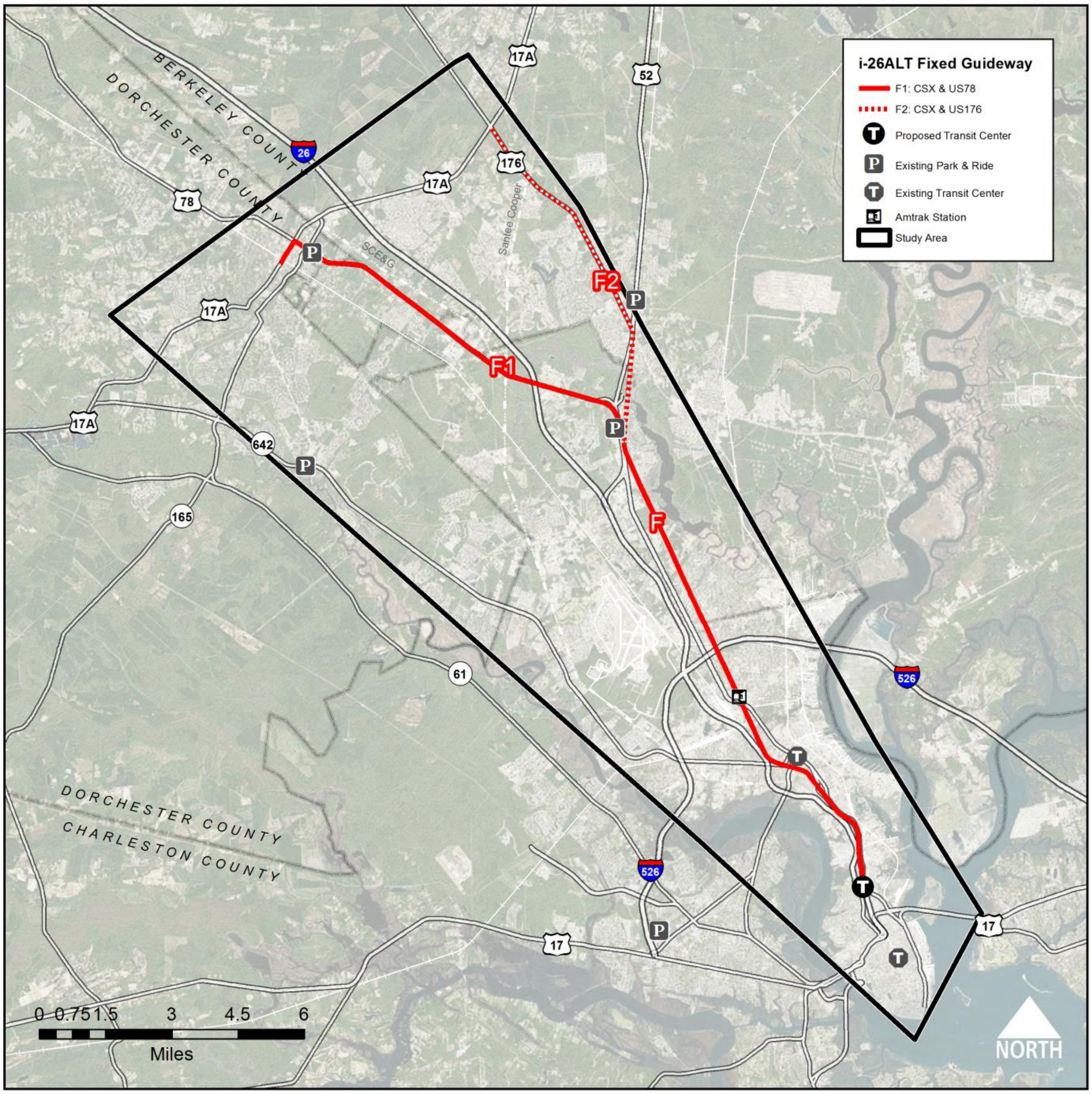
2.5.6 Alignment F: CSX Rail Line

Overall Rating: Medium

Recommendation: Move forward into next phase of screening

Alignment F would operate on the CSX rail line between US 52 and downtown Charleston. Commuter Rail technology would require connections via bus to serve Summerville. Two alternative alignments are identified as combined with the rail alignment, as shown in Figure 2-11.

Figure 2-11: Alignment F – CSX Rail Line



<u>F-1 CSX & US 78:</u> This alignment would travel along the CSX corridor from downtown Charleston and would connect to downtown Summerville via US 78 to 17A.

<u>F-2 CSX & US 176:</u> This alignment would travel along the CSX corridor from downtown Charleston and would connect to 17A via US 176.

Both variants for Alignment F score high for transit service improvements, since the core alignment parallels Route 10 – Rivers Avenue, which has the highest ridership of any CARTA route. This alignment scores low for capacity to add service, since initial conversations have indicated that future capacity for freight is unknown due to growth with the port. There may be available right-of-way parallel to the track; however, it would require purchasing the right-of-way from the rail line owners. This alternative serves areas identified for redevelopment; however, the alignment operates in industrial areas as well. The variants on US 78 and US 176 travel through areas with wetlands and natural areas and could impact environmental resources. Variant F-1 serves a greater number of households with no vehicle access compared to Variant F-2. Variant F-1 – US 78 serves future employment centers on 17A; whereas the 176 variant F-2 does not serve those alignments.

Pre-Screen Criteria	F-1	F-2
Does the alignment have current transit service operating along the corridor, and would the alignment improve performance?	Medium	Medium
Does the alignment have sufficient capacity to add a transit mode?	Low	Low
Is there available ROW for the alignment?	Medium	Medium
Does the alignment have sufficient capacity for TOD?	Medium	Medium
Does the alignment avoid impacts to cultural, historical or natural resources?	Medium	Medium
Does the alignment serve higher than average populations with no access to vehicle?	High	Medium
Does the alignment connect to current and future employment centers?	High	Medium
Overall Ranking	Medium	Medium

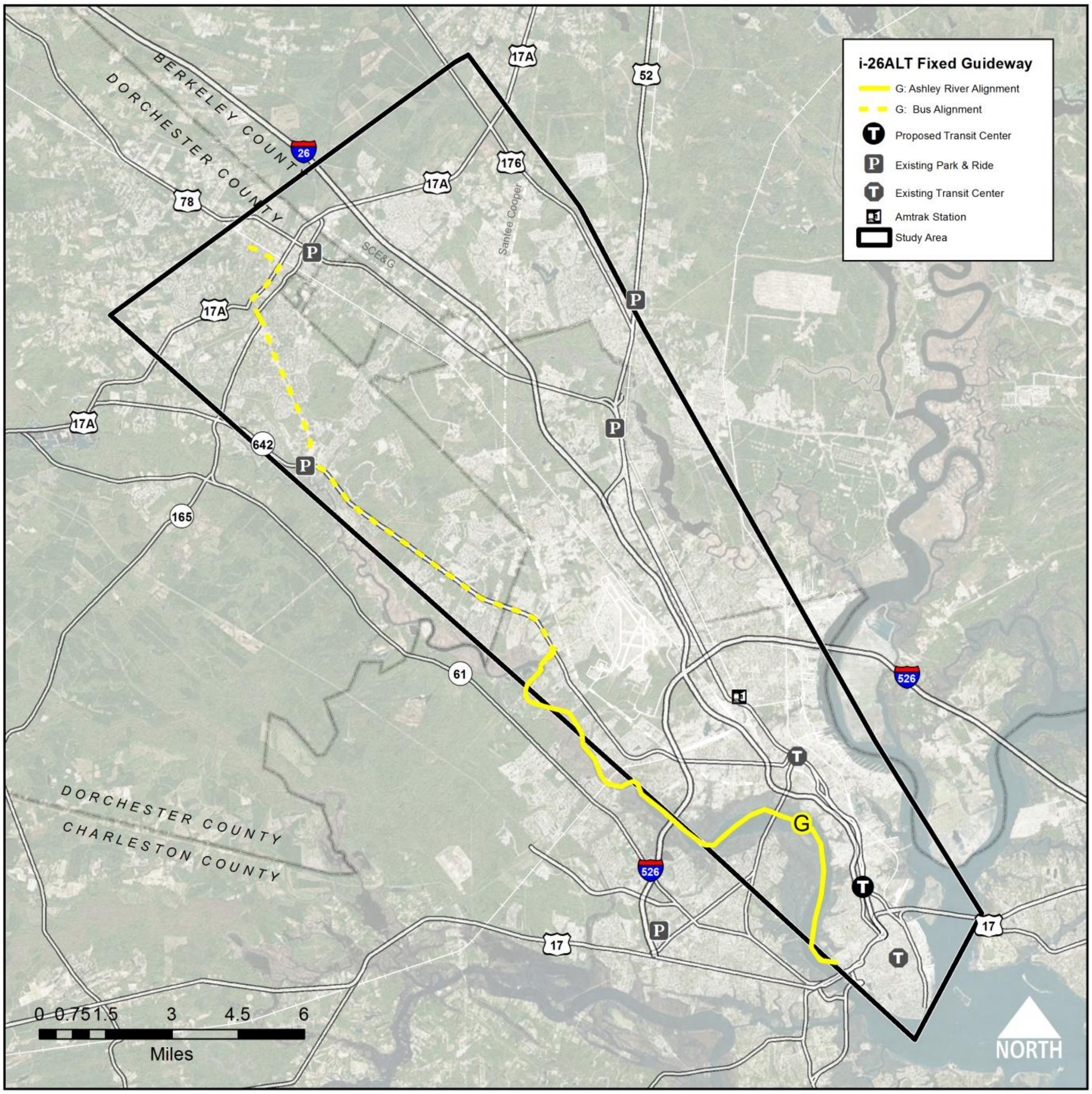
2.5.7 Alignment G: Ashley River Waterway

Overall Rating: Low

Recommendation: Do not move forward into next phase of screening

The Ashley River Waterway alignment includes ferry service between North Charleston and Charleston, with connecting bus service to Summerville, as shown in Figure 2-12. Waterway navigation limitations north to Summerville make water service to Summerville infeasible.

Figure 2-12: Alignment G – Ashley River Waterway



This alternative has a low score in terms of transit service improvements, in that the travel time would actually be longer when combined with a bus transfer to Summerville. Due to this transition, this alignment scores low for capacity as well, since the likely bus alternative would operate on Dorchester Road. The alignment has sufficient right-of-way for both the waterway and bus segments; however, the waterway would eliminate transit oriented development opportunities in North Charleston, particularly those identified in previous studies as catalyst areas. Since the vehicle would operate in a waterway, and Dorchester Road segment is in a historic overlay district, this alignment scores low for environmental and community impacts. This alignment serves the fewest households with no access to vehicles and does not directly connect to employment centers in North Charleston.

Pre-Screen Criteria	Rank
Does the alignment have current transit service operating along the corridor, and would the alignment improve performance?	Low
Does the alignment have sufficient capacity to add a transit mode?	Low
Is there available ROW for the alignment?	High
Does the alignment have sufficient capacity for TOD?	Low
Does the alignment avoid impacts to cultural, historical or natural resources?	Low
Does the alignment serve higher than average populations with no access to vehicle?	Low
Does the alignment connect to current and future employment centers?	Low
Overall Ranking	Low

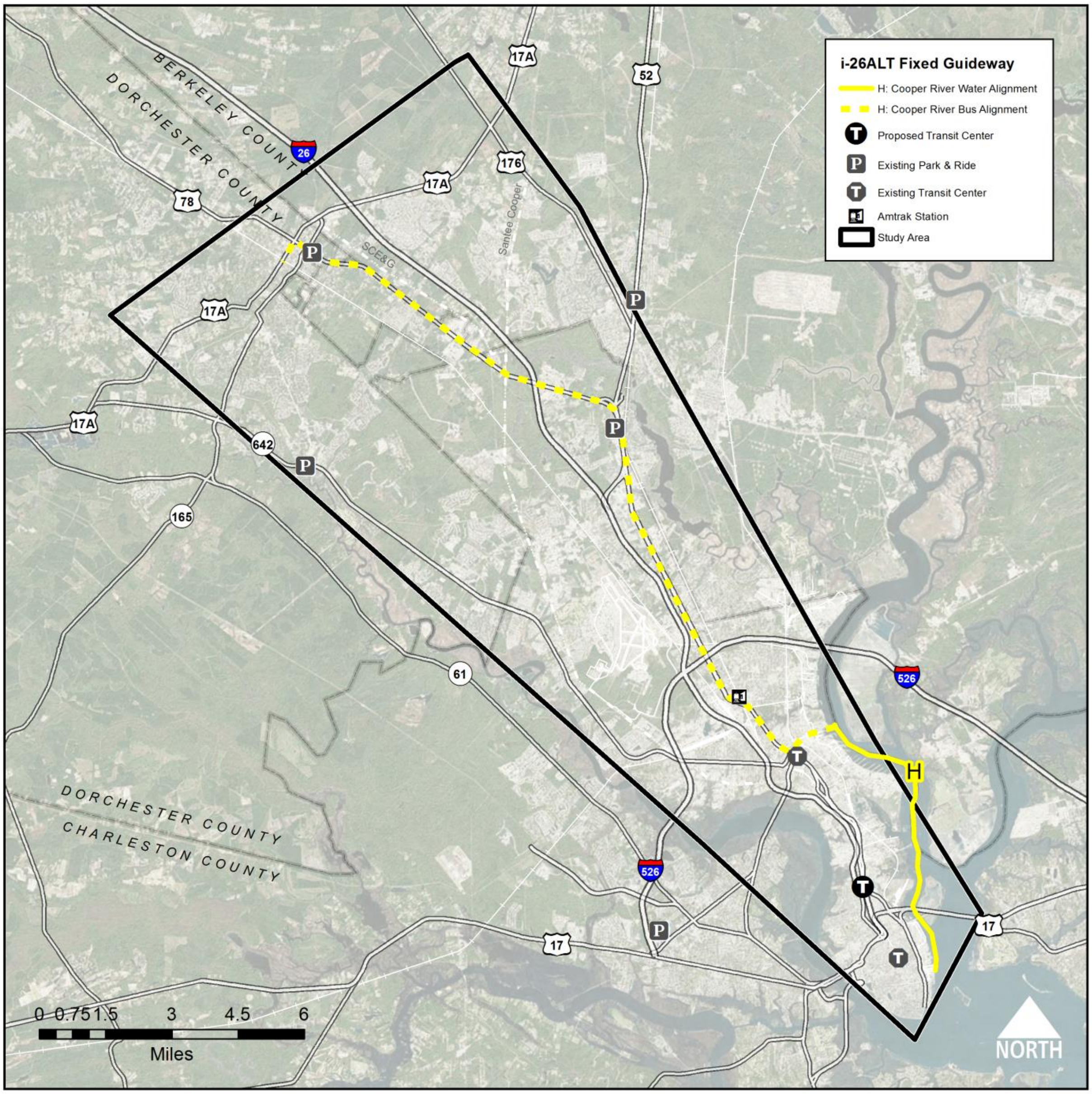
2.5.8 Alignment H: Cooper River

Overall Rating: Low

Recommendation: Do not move forward into next phase of screening

The Cooper River Alignment would connect Charleston and North Charleston near Riverfront Park in North Charleston with a bus transfer required via US 78 to connect to Summerville, as shown in Figure 2-13.

Figure 2-13: Alignment H – Cooper River



As a result of the mode transfer required, this alternative scores low in terms of existing transit improvements and capacity requirements. Both alternatives have right-of-way available with both the waterway and existing roadway. As a point-to-point ferry service, this alignment does not provide transit oriented development opportunity in North Charleston and avoids several of the communities identified in previous planning studies as catalyst areas for future development. This alignment would impact historical and environmental areas near the North Charleston dock location and does not directly connect to major employment centers.

Pre-Screen Criteria	Rank
Does the alignment have current transit service operating along the corridor, and would the alignment improve performance?	Low
Does the alignment have sufficient capacity to add a transit mode?	Low
Is there available ROW for the alignment?	High
Does the alignment have sufficient capacity for TOD?	Low
Does the alignment avoid impacts to cultural, historical or natural resources?	Low
Does the alignment serve higher than average populations with no access to vehicle?	Low
Does the alignment connect to current and future employment centers?	Low
Overall Ranking	Low

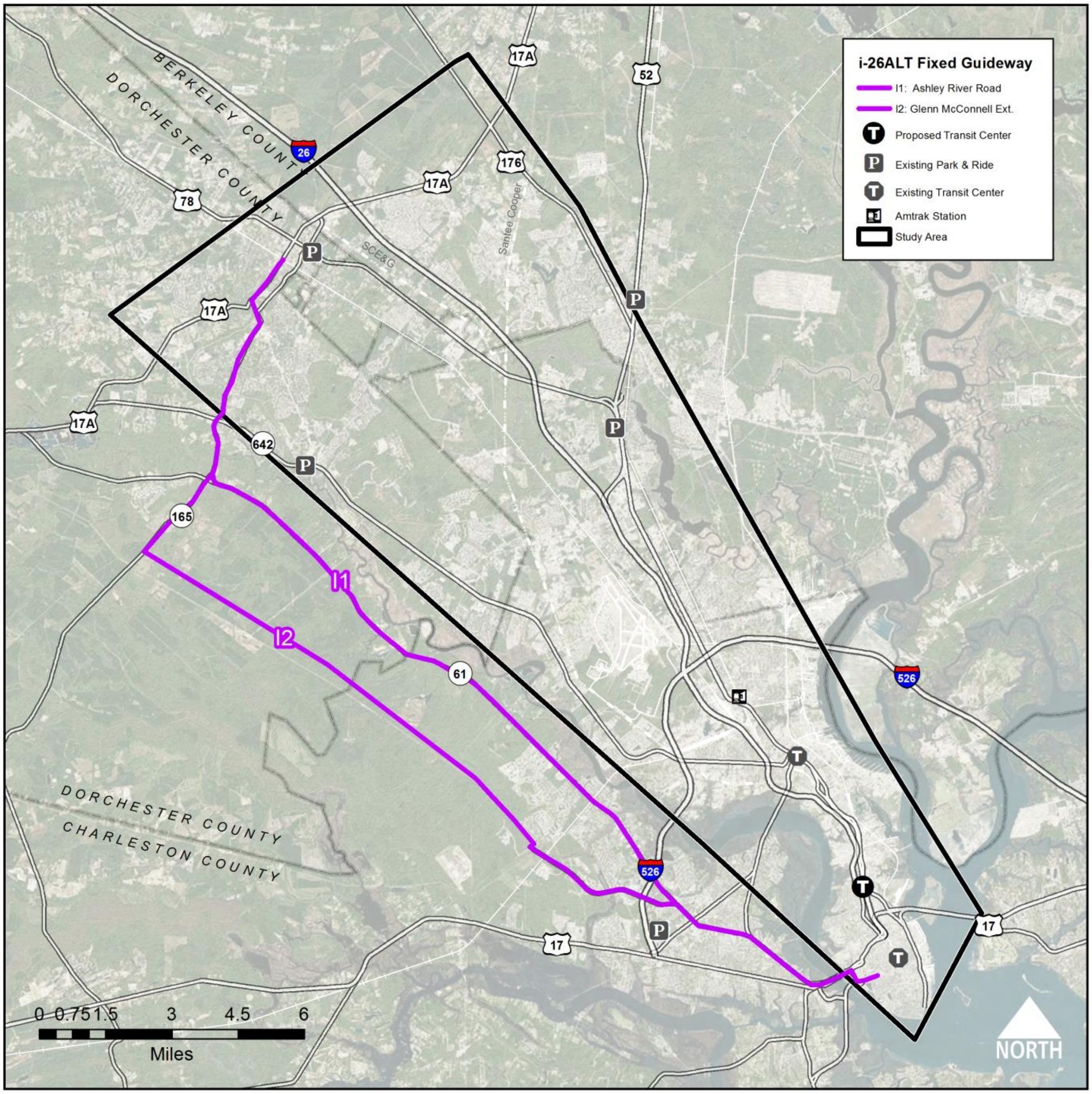
2.5.9 Alignment I: West Ashley Alignments

Overall Rating: Low

Recommendation: Do not move forward into next phase of screening

Although outside of the study area, the West Ashley alignments were added by the Steering Committee members as an alternative route between Summerville and Charleston with potential road expansion projects that could incorporate transit. Although this alignment does not meet the overall purpose and need, two alignments are considered as part of the pre-screen analysis as shown in Figure 2-14.

Figure 2-14: Alignment I – West Ashley Alignments



<u>I-1 Ashley River Road:</u> This alignment would travel west on Bacons Bridge Road across the Ashley River to Ashley River Road (HWY 61). The alignment would continue southeast on Ashley River Road to Hwy. 17 and continue northeast into downtown Charleston.

<u>I-2 Glenn McConnell Ext.:</u> Alignment I-2 would travel via Bacons Bridge Road from downtown Summerville across the Ashley River Road to a utility corridor that joins Glenn McConnell Parkway where it would travel to connect to Ashley River Road and continue to US 17 to downtown Charleston.

Both of these alignments score low in many of the categories, in addition to not meeting the overall purpose and need to connect Charleston, North Charleston, and Summerville. These alignments are not considered to improve overall transit performance, since out of direction travel would create longer travel times than the bus transit alternatives. Alignment I-2 has better capacity to add a transit mode compared to I-1, which has roadways that are only two lanes. Alignment I-2 also has a greater opportunity for available right-of-way, assuming the utility corridor could be utilized. This alignment has significant vacant land; however, much of the development is single family residential, which is not conducive to transit oriented development. Both alignments would have adverse impact to natural and historic areas, with the close proximity to the Ashley River and the Historic Plantations on Ashley River Road. Wetlands impacts would be significant for the undeveloped portion of Alignment I-2. This alignment serves fewer areas with no vehicle access households compared to the other alignments. Lastly, this alignment does not serve employment centers in North Charleston.

Pre-Screen Criteria	I-1	I-2
Does the alignment have current transit service operating along the corridor, and would the alignment improve performance?	Low	Low
Does the alignment have sufficient capacity to add a transit mode?	Low	Medium
Is there available ROW for the alignment?	Medium	High
Does the alignment have sufficient capacity for TOD?	Low	Low
Does the alignment avoid impacts to cultural, historical or natural resources?	Low	Low
Does the alignment serve higher than average populations with no access to vehicle?	Low	Low
Does the alignment connect to current and future employment centers?	Low	Low
Overall Ranking	Low	Low

i-26ALT

I-26 Fixed Guideway Alternatives Analysis

CHAPTER III: Screen One Analysis

Draft Report – February 2016

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1 Introduction

The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) initiated the I-26 Regional Fixed Guideway Transit Alternatives Analysis Study (I-26*ALT*) to improve transit options for residents and businesses along the I-26 Corridor. The purpose of the I-26 Alternatives Analysis is to improve transit service and enhance regional mobility along the I-26 Corridor connecting Summerville, North Charleston, and Charleston in South Carolina. Following FTA's Capital Investment Grant Program methodology, the I-26 Regional Fixed Guideway Alternatives Analysis is currently in the Pre-Project Development Phase for a high capacity fixed guideway system along the I-26 corridor. During the initial outreach process, a study area was delineated, and land use, economic development, environmental, community and mobility goals were identified. A pre-screening analysis identified twenty alignment and mode combinations to be considered during the Screen One Analysis. The I-26 Alternatives Analysis, through multiple screenings, will ultimately arrive at a Locally Preferred Alternative (LPA) to recommend for progression into the Project Development Phase.

1.1 Screening Process

Three levels of screening will be conducted as part of the Pre-Project Development phase of the alternatives analysis. The first round of screening is the *Pre-Screening*, which eliminates transit modes and alignments based on a fatal flaw analysis. This process brings the universe of alternatives down to a smaller set of alignments and transit modes that meet the overall project goals. The alternatives identified in the Pre-Screening Analysis are carried forward into this Screen One Analysis.

This phase of screening (*Screen One*) uses the project goals and objectives to develop specific criteria intended to further refine the number of alignments and modes to move forward to the detailed screening. *Screen One* includes a combination of subjective and objective analyses to identify those modes that best meet the project goals and warrant a more detailed analysis. Section 2.0 provides the results of the Screen One analysis.

The Screen Two Detailed Screening Analysis will be provided in a subsequent chapter. This process is a detailed screening process that identifies objective criteria that can be measured against each alignment and mode pair to identify the best alternative that meets the project goals. The results of this screening will provide the necessary information to identify a locally preferred alternative to move forward into further refinement and project development.

2 Screen One – Initial Screening

This section summarizes the criteria and scoring used in the *Screen One* analysis, which screens the transit modes and alignments identified to move forward from the *Pre-Screen Analysis* (Chapter 2). Section 3.0 provides a summary of the Screen One Screening. Appendix 3-A includes a peer review analysis, which was used to develop criteria for each transit mode. Appendix 3-B provides a land use analysis, which was used to develop criteria for each transit alignment.

2.1 Overview

As described in Chapter 2, five modes were identified to move forward into the Screen One Analysis. The no-build alternative incorporates the existing conditions and includes Commuter Bus services to Summerville and North Charleston, i.e. CARTA Express Bus Route 1 – North Charleston, and Route 3 – Summerville.

Screen One Transit Modes

- **Commuter Bus (No Build)**– Roadway vehicles powered by diesel, gasoline, battery, or alternative fuel engines operating on streets and roadways in fixed-route or other regular service, which can include local buses, trolleys, express buses and commuter buses.
- **Bus Rapid Transit (BRT)** - Bus Rapid Transit is a flexible, premium "rail-like" bus service that operates in its own lane or in mixed traffic with stations. It 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.
- **Light Rail Transit (LRT)** - Light Rail Transit is a lightweight passenger rail car that operates single or short train sets in right-of-way that may or may not run in street traffic. Light Rail is driven by an operator on board the vehicle and is often powered by overhead electric lines.
- **Commuter Rail (CR)** - Urban passenger train service consisting of local short distance travel between a central city and adjacent suburbs using electric or diesel locomotive hauled or self-propelled railroad passenger cars.
- **Hybrid Rail (Diesel Multiple Units/Electric Multiple Units (DMU/EMU)** - A passenger vehicle similar to a commuter rail but with lower capacity used for short or medium distance passenger travel. Vehicles are self-propelled, typically powered by diesel, as single or multiple units. Limited options for FRA compliant vehicles are available.

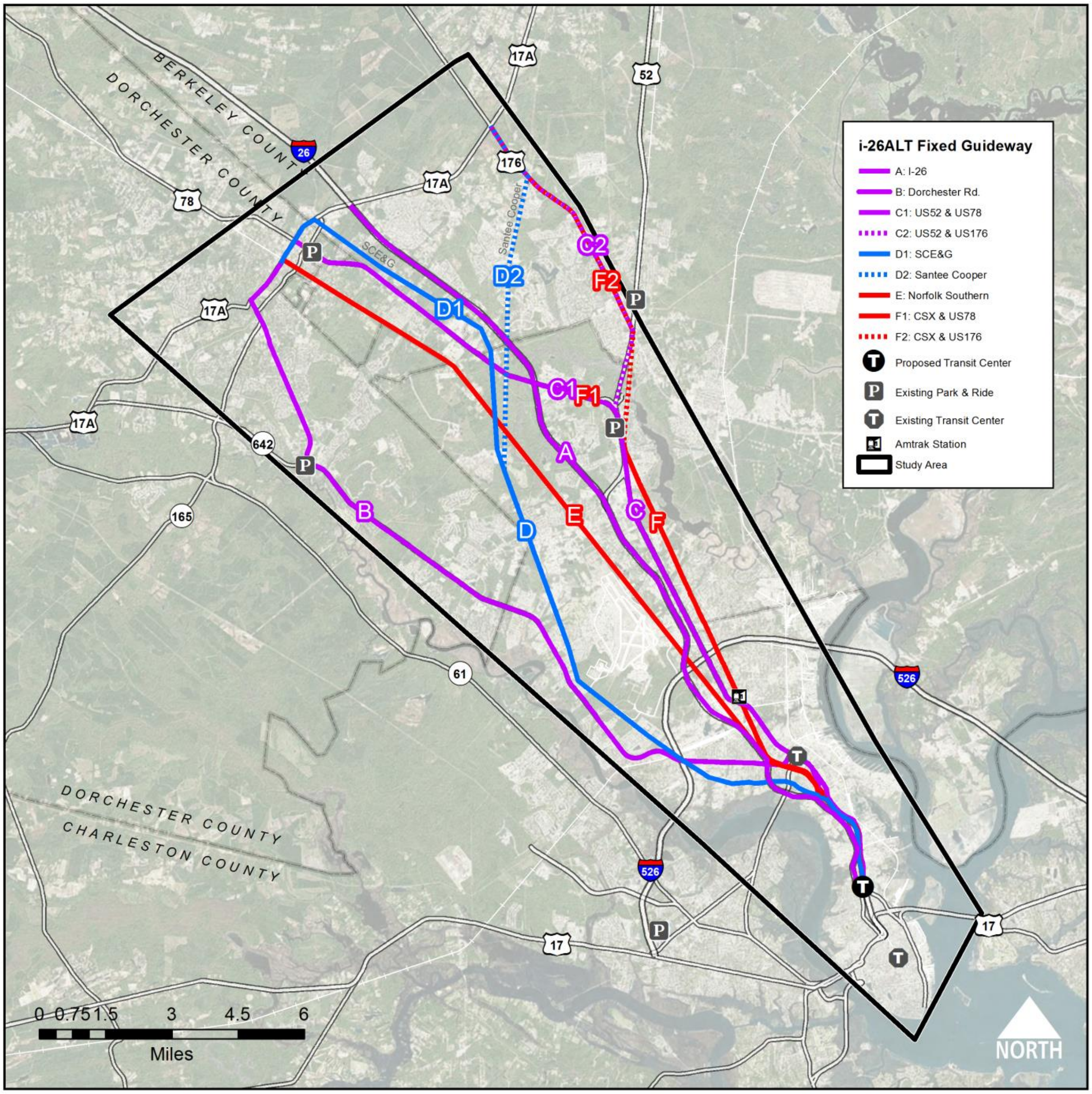
Screen One Alignments

Nine corridors and their variants were identified in the Pre-Screen Analysis to move forward into Screen One. These include:

- Alignment A: I-26
- Alignment B: Dorchester Road
- Alignment C: US 52 (Variant C1-US 78/Variant C-2 – US 176)
- Alignment D: Utility Corridors (Variant D-1 -SCE&G/Variant D-2 - Santee Cooper)
- Alignment E: Norfolk Southern Rail Lines
- Alignment F: CSX Rail Lines (Variant F-1 – US 78/Variant F-2 – US 176)

Figure 2-1 shows the pre-screen alignments recommended to move forward in Screen One.

Figure 2 - 1: Pre-Screen Alignments Recommended for Screen One Assessment



2.2 Technology Assessment

The four fixed guideway transit modes are assigned to the nine alignments based on the characteristics of the transit mode and the corridor being considered. Although some modes are compatible along all corridors (i.e. Bus Rapid Transit), others, such as commuter rail, would not be compatible with the roadway alignments. Transit modes are applied to the alignments based on the most practical use of the corridor, resulting in 20 alternatives for Screen One. The following provides an overview of each transit technology and considerations for is application in the I-26ALT Study Area.

2.2.1 Commuter Rail

Commuter Rail alignments are assumed to share the existing Norfolk Southern (NS) or CSX rail corridors. Since the previous commuter rail study was conducted, both CSX and Norfolk Southern have updated their policies toward commuter rail. Appendix 3-C shows the policies as provided by CSX and NS.

Considerations for commuter rail projects include:

1) Transparent freight operations and delay to freight trains is unacceptable to freight operators;
2) New services must pay fully allocated costs for access to the existing freight corridor;
3) Must provide adequate liability protection;
4) No at-grade passenger crossings;
5) No “Passenger Only” operational windows;
6) Cost to bring the track and crossing up to FRA compliance are borne by the project sponsor;
7) Indemnify any income taxes paid or incurred as a result of public financing;
8) Fair Compensation to include any new equipment and costs that would not have occurred without passenger service; and
9) Sovereign immunity.

A **shared-use railroad corridor,** as defined by the FRA, can include one of the following:

- **Shared track,** where the trains of two or more rail service providers operate over the same tracks.
- **Shared right-of-way,** where two rail services are operated on separate parallel tracks having a track centerline separation less than 30 feet. Separation of 30 feet or less triggers the application of certain FRA safety regulations. Separation also may be referenced in shared-corridor agreements between railroads, for example, as limiting the kinds of permitted operation or requiring specific safety precautions.
- **Shared corridors,** where track centerline separation is between 30 and 200 feet. Two hundred feet is considered the outer limit of separation where an accident on one line could interfere with operations on the other.

Although shared-corridor arrangements are considerably diverse, common and very challenging situations occur when a new or expanded passenger service seeks to operate on the tracks of a busy corridor owned and operated by a major freight railroad, where the freight railroad will be the host for the new service. This analysis assumes the alignment will be shared with a 26’ buffer from the centerline of the existing track to a new rail track.

Additionally, *Screen One* assumes that where sufficient ROW is not available, or it appears that freight operations would be impacted, the alignment would avoid the freight rail line, which would require property acquisition or other design measures. Several major conflicts are anticipated at train yards as well as the AY Junction. As the alignments converge in the Neck Area, multiple freight operators become a factor. This Screen One Analysis does not address the Neck Area to Downtown alignment. This analysis assumes all commuter rail alignments follow the rail alignment and end at Mt. Pleasant Street. *Screen Two* will provide a more in-depth analysis of the alignment through the Neck Area and into Downtown Charleston for the modes that move forward to the detailed screening.

For shared track services, a feasibility study of the Full Build Scenario and in-depth train capacity analysis is required to determine if the proposed service can operate on the shared track. Funding for the capacity analysis is the responsibility of the project sponsor; however, freight owners will hire and lead the capacity analysis. Light rail vehicles would require physical separation and FRA compliant vehicles.

Other issues to consider are:

1) Ownership of the tracks;
2) Future expansion of service if successful;
3) Insurance and liability; and
4) Sharing of ongoing maintenance costs;

2.2.2 Hybrid Rail

Hybrid Rail is a "light rail" vehicle that is self-propelled via Diesel (DMU) or Electric (EMU) trainsets. Although the vehicles can cost more on the front end and are slower than a light rail vehicle, DMU vehicles do not require overhead wires, which can reduce the capital costs associated with the construction of light rail. Additionally, FRA compliant vehicles can be utilized for parallel rail operations. This Screen One assessment assumes Hybrid Rail Vehicles (DMU or EMU) would be used for the light rail alignments that parallel the rail corridors.

2.2.3 Light Rail

Traditional light rail vehicles as described in Section 2.1, powered electrically with overhead wires, are assumed for the roadway and utility corridors. Light rail in the utility corridors can present challenges with vertical clearances and wire sagging. Light rail vehicles receiving power from overhead wires require a clearance of 15 feet from the top of the rail to the overhead wire. Best practices identify corridors less than 250 feet provide little room for rail to negotiate obstacles. Another consideration for utility corridors is the need to relocate one structure may create a "domino" effect. It is not uncommon to find that the relocation or modification of one tower creates the need to relocate or modify the adjacent towers until the transmission lines can be set at a constant tension throughout the tangent section of the corridor. Alignments in the utility corridors assume that the light rail right-of-way would be parallel to the existing utility right-of-way, and property acquisitions would be required.

2.2.4 Bus Rapid Transit

Bus Rapid Transit can range from mixed traffic operations to full BRT assumptions. Screen One assumes full BRT implementation with features such as:

- Dedicated Running Ways
- Level Boarding Stations
- Premium Vehicles
- Automated Fare Collection
- ITS/Signal Preemption
- Unique Branding Identity.

Utility and rail alignments assume BRT would operate parallel to the corridor, with sufficient buffers as required by the corridor owner. Roadway alignments assume center median or outside lane alignments.

2.2.5 No Build

The no-build alternative assumes continuation of current Commuter Bus service as operated by CARTA and TriCounty Link. CARTA's Route 1- North Charleston and Route 3- Summerville provide peak hour service on US 52 (Route 1) and Dorchester Road (Route 3), and serve the I-26*ALT* Study Area.

2.3 Screen One Alternatives

Twenty alternatives were identified for Screen One as follows:

- 1-I-26 (A)-BRT
- 2-Dorchester Road (B)-BRT
- 3-Dorchester Road (B)-LRT
- 4-US 52 / US 78 (C1)-BRT
- 5-US 52 / US 78 (C1)-LRT
- 6-US 52/ US 176 (C2)-BRT
- 7-US 52/ US 176 (C2)-LRT
- 8-SCE&G Utility Corridor (D1)-BRT
- 9-SCE&G Utility Corridor (D1)-LRT
- 10-Santee Cooper Utility Corridor (D2)-BRT
- 11-Santee Cooper Utility Corridor (D2)-LRT
- 12-Norfolk Southern Rail Line (E)-BRT
- 13-Norfolk Southern Rail Line (E)-DMU
- 14-Norfolk Southern Rail Line (E)-CR
- 15-CSX Rail Line/Bus via US 78 (F1)-BRT
- 16-CSX Rail Line/Bus via US 78 (F1)-DMU
- 17-CSX Rail Line/Bus via US 78 (F1)-CR
- 18-CSX Rail Line/Bus via US 176 (F2)-BRT
- 19-CSX Rail Line/Bus via US 176 (F2)-DMU
- 20-CSX Rail Line/Bus via US 176 (F2)-CR

2.4 Screen One Criteria

This initial screening utilizes project goals and objectives to identify which alternatives warrant a more detailed review in *Screen Two*. Criteria used for the *Screen One* Assessment are as follows:

Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region

Objective 1.1: Provide convenient connections from bike, pedestrian, and transit modes to the alternative

- Number of bus routes connecting with the alternative

Objective 1.2: Increase transit travel time to make it competitive with the automobile

- Ratio of Mode Typical Speed vs. Express Bus Travel time

Objective 1.3: Improve efficiency of transit service

- Existing transit ridership on corridor as a % of overall systemwide ridership

Objective 1.4: Reduce traffic congestion

- Peer System Average Daily Riders as percentage of 2013 AADT Traffic change along Corridor

Objective 1.5: Technology/alignments ease and flexibility to extend/expand to other regional corridors

- Alignment connection to other regional corridors
- Mode technology is flexible to expand to a regional system

Goal 2: Promote a cost effective and financially feasible transit alternative

Objective 2.1: Select an alternative that meets the needs in a cost effective manner

- Subjective assessment of mode capital construction and ongoing operating and maintenance costs compared to peer systems

Objective 2.2: Select an alternative that is technically feasible

- Subjective assessment of constructability

Objective 2.3: Select an alternative that is financially feasible

- Subjective assessment of ROW available
- Comparison of order of magnitude capital costs

Objective 2.4: Select an alternative that will compete for FTA funds

- Subjective assessment of competitiveness for FTA funding

Goal 3: Support local land use objectives

Objective 3.1: Provide convenient and accessible transit service to employment and activity centers in Summerville, North Charleston, and Charleston

- Number of activity centers directly served

Objective 3.2: Provide opportunity for transit oriented development to occur along the alignment

- TOD score from Land Use Analysis

Objective 3.3: Alternative is adjacent to future growth areas

- Subjective assessment of connection to planned major employment and residential developments

Goal 4: Plan for projected growth in an environmentally sustainable manner

Objective 4.1: Reduce air pollution and emissions

- Subjective assessment of technology/air quality impacts

Objective 4.2: Avoid, minimize and mitigate adverse impacts on environment and community resources

- Linear miles of wetlands crossed by alignments
- Acres of wetlands within ½ mile
- Linear miles of historic districts

Goal 5: Respond to community needs and support

Objective 5.1: Provide service to areas with transit dependent populations

- Number of low income households within ½ mile
- Number of zero car households within ½ mile

Objective 5.2: Select an alternative that is consistent with local and regional plans

- Subjective assessment of alternatives' consistency with existing plans

Objective 5.3: Fast implementation time

- Subjective assessment of typical planning/engineering/construction time for mode as applicable to I-26 Corridor

Objective 5.4: Public response

- Public Meeting "Votes" for alignment/mode

Goal 6: Support a diverse regional economy

Objective 6.1: Serve areas with greatest density of jobs and employment

- Number of households within ½ mile
- Number of jobs within ½ mile
- Job density
- Percent change in employment from 2010-2035

Objective 6.2: Increase transit mode share for work trips

- Mode typical passengers per hour

Table 2 - 1: Screen One Goals and Objectives

Goal		Objective	Screen 1 Measures
1	**Improve mobility, accessibility, safety and connectivity of the transit system and region**	1.1 Provide convenient connections from bike, pedestrian,	Number of Bus routes connecting with the alternative
		1.2 Increase transit travel time to be competitive with automobile	Ratio of transit travel time to auto travel time
		1.3 Improve efficiency of transit service	Existing transit ridership on corridor as % of overall systemwide ridership
		1.4 Reduce traffic congestion	Subjective assessment of modes capacity to reduce congestion
2	**Promote a cost effective and financially feasible transit alternative**	2.1 Meet the needs in a cost effective manner	Subjective assessment of mode capital and O&M costs compared to peer systems
		2.2 Technically feasible alternative	Subjective assessment of constructability
		2.3 Financially feasible alternative	Subjective assessment of ROW availability
			Comparison of order of magnitude capital costs
		2.4 Alternative that will compete for federal funds	Competitiveness for FTA Discretionary funds
3	**Support local land use objectives**	3.1 Provide convenient and accessible transit service to existing and planned activity centers	Number of activity centers directly served
		3.2 Opportunity for Transit Oriented Development	TOD Score
		3.3.	Adjacent to Future Growth Areas
4	**Plan for projected growth in an environmentally sustainable manner**	4.1 Reduce air pollution and emissions	Qualitative/quantitative assessment
		4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	Linear miles of wetlands crossed by alignments
			Linear miles of historic districts
5	**Respond to community needs and support**	5.1 Service areas with transit dependent populations	Number of low income households within 1/2 Mile
			Number of zero car households within 1/2 mile
		5.2 Consistency with local plans	Subjective assessment of alternative being supported by planning studies
		5.3 Fast Implementation Time	
		5.4 Public Response	
6	**Support a diverse regional economy**	6.1 Areas with greatest density of Jobs and Employment	Number of Household w/in 1/2 Mile
			Number of Jobs w/in 1/2 Mile
			Job Density
			Change in Employment from 2010 to 2035
		6.2 Increase transit mode share for works trips	Subjective mode share based on commuting patterns

2.5 Screening Methodology

As part of this Screen One assessment, each alternative is screened to evaluate how well the alignment and mode meets the specific goals and objectives of the project. This planning level assessment includes GIS spatial analysis based on the alignment and/or ½ mile radius; a peer system review (Appendix 3-A); field and visual assessment of the alignments; typical capacity and operating environments of modes; and stakeholder and public discussions. The following describes the criteria and methodology used for the Screen One assessment. Section 3.0 provides an overview of each alternative's overall ranking.

2.5.1 Goal 1 – Improve mobility, accessibility, safety, and connectivity of the transit system and region

Several criteria are used to assess how well each alternative can improve mobility, accessibility, safety, and connectivity of the transit system. Based on the objectives identified in the previous section, the following criteria are used to evaluate the alternatives for mobility and connectivity.

1) Number of bus routes connecting to the alternative;
2) Current express route transit travel time as compared to the proposed mode's typical speed;
3) Existing transit ridership along the corridor as a percentage of overall systemwide ridership;
4) Peer systems' average daily riders as compared to 2013 Annualized Average Daily Traffic (AADT) along the alignment;
5) Connections to regional corridors; and
6) Flexibility to extend/expand into a regional system.

The following describes the screening process for each objective and criteria under Goal 1.

2.5.1.1 Objective 1.1: Provide convenient connections to/from bike, pedestrian, and transit to the alternative

Criteria: Number of bus routes connecting to the alternative

The viability of a regional fixed guideway system depends on a robust fixed route transit system that provides last mile connectivity. Adding transit service to fixed guideway stations outside of the existing service area requires new bus routes and can add to the cost of operating the transit system. Thus, this criterion promotes alignments that serve existing transit routes to improve mobility, as compared to alignments serving areas not served by transit.

Using GIS, transit bus routes connecting to the alternatives are summed. Bus routes include CARTA express, local, DASH and NASH services, as well as TriCounty Link routes serving Summerville. The following Table 2-2 shows the routes connecting to each alignment. Figure 2-2 shows the existing transit system and the proposed alignments. Commuter rail alignments are assumed to end at Mt. Pleasant Street in DT Charleston; light rail and BRT are assumed to end at Line Street.

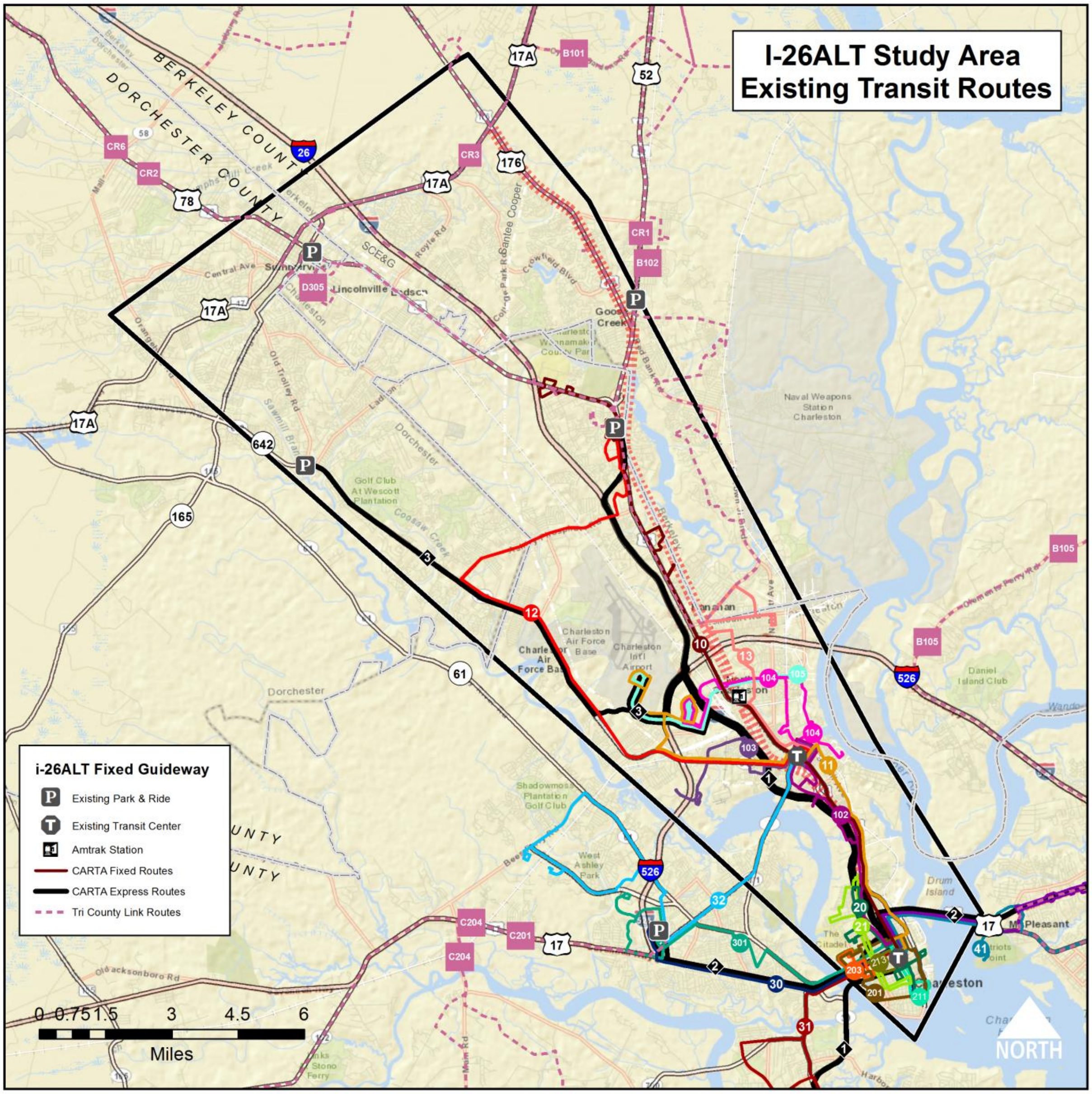
Scoring:

1-Low:	16 to 17 Connecting Bus Routes
2-Medium Low:	18 Connecting Bus Routes
3- Medium:	19 to 20 Connecting Bus Routes
4-Medium-High:	21 Connecting Bus Routes
5-High:	22 to 23 Connecting Bus Routes

Table 2 - 2: Transit Routes Connecting to Alternatives

Route Name (As of 10/01/2014)	Type	1-I-26 A-BRT	2-Dorchester Road B-BRT	3-Dorchester Road B-LRT	4-US 52 / US 78 C-1 -BRT	5-US 52 / US 78 C-1 -LRT	6-US 52/ US 176 C-2-BRT	7-US 52/ US 176 C-2-LRT	8-SCE&G Utility Corridor D-1-BRT	9-SCE&G Utility Corridor D-1-LRT	10-Santee Cooper Utility Corridor D-2-BRT	11-Santee Cooper Utility Corridor D-2-LRT	12-Norfolk Southern Rail Line E-BRT	13-Norfolk Southern Rail Line E-DMU	14-Norfolk Southern Rail Line E-CR	15-CSX Rail Line/Bus via US 78 F-1-BRT	16-CSX Rail Line/Bus via US 78 F-1-DMU	17-CSX Rail Line/Bus via US 78 F-1-CR	18-CSX Rail Line/Bus via US 176 F-2 -BRT	19-CSX Rail Line/Bus via US 176 F-2 -DMU	20-CSX Rail Line/Bus via US 176 F-2-CR
CARTA Bus Routes																					
1 James Island-North Charleston Express	Express	Y	N	N	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
2 West Ashley - Mount Pleasant Express	Express	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3 Dorchester Road/Summerville Express	Express	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
4- NASH Express	Express	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
10-Rivers Avenue	Local	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
11-Dorchester/Airport	Local	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
12-Upper Dorchester	Local	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
13-Remount Road	Local	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
20-King Street/Citadel	Local	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
21-Rutledge/Grove	Local	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
30-Savannah Highway	Local	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
31-Folly Road to DT Charleston	Local	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
32-Northbridge	Local	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40-Mount Pleasant to DT Charleston	Local	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
41-Coleman Boulevard	Local	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
102-Northern Neck	Local	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
103-Leeds Avenue	Local	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
104-Montague Avenue	Local	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
105-North Area Shuttle (NASH)	NASH	Y	N	N	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
201-North Beltline	Local	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
203-Medical Shuttle	Local	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
301-St. Andrews	Local	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
210-College of Charleston/Aquarium	DASH	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
211-Meeting/King	DASH	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
213-Lockwood/Calhoun	DASH	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
Total CARTA Routes		***17***	***16***	***16***	***16***	***16***	***16***	***16***	***13***	***13***	***13***	***13***	***15***	***12***	***12***	***16***	***16***	***16***	***16***	***16***	***16***
TriCounty Link (TCL)																					
B102	Local	Y	N	N	Y	Y	Y	Y	N	N	Y	Y	N	N	N	Y	Y	Y	Y	Y	Y
D-305	Local	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CR1	Commuter	N	N	N	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
CR2	Commuter	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CR3	Commuter	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CR6	Commuter	N	Y	Y	Y	Y	N	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	N	N
DCS	Commuter	Y	Y	Y	Y	Y															
Total TCL Routes		***5***	***5***	***5***	***7***	***7***	***5***	***5***	***4***	***4***	***4***	***4***	***4***	***4***	***4***	***6***	***6***	***6***	***5***	***5***	***5***
Total Connecting Routes		**22**	**21**	**21**	**23**	**23**	**21**	**21**	**17**	**17**	**17**	**17**	**19**	**16**	**16**	**22**	**22**	**22**	**21**	**21**	**21**
Connecting Routes Score		**5**	**4**	**4**	**5**	**5**	**4**	**4**	**1**	**1**	**1**	**1**	**3**	**1**	**1**	**5**	**5**	**5**	**4**	**4**	**4**
Connecting Routes Ranking		**High**	**Medium-High**	**Medium-High**	**High**	**High**	**Medium-High**	**Medium-High**	**Low**	**Low**	**Low**	**Low**	**Medium**	**Low**	**Low**	**High**	**High**	**High**	**Medium-High**	**Medium-High**	**Medium-High**

Figure 2 - 2: I-26 Corridor Existing Transit Service



Objective 1.2: Increase transit travel time to be competitive with automobile

Criteria: Ranking of transit mode's typical speed compared with express bus travel time

A fixed guideway alternative is intended to improve the transit service to make it an attractive alternative to the automobile. One means to improve service is to increase the travel time for transit trips. Under this planning level analysis, typical speeds for the proposed modes compared to the current express bus travel time nearest the corridor are used to identify what level of magnitude a particular mode could improve transit travel time. This analysis is a subjective assessment. Screen Two will look at actual anticipated transit travel times for those alternatives that move forward. Assumptions for typical transit speed are as follows:

Mode Typical Speed:

1) BRT: 15 to 20 MPH (Mixed Flow) 20 to 60 MPH (Dedicated ROW)
2) Light Rail: 20 to 60 MPH
3) DMU: Typical: 25 to 40 MPH
4) Commuter Rail: 30 to 79 MPH

Current Express Bus Routes operating in the corridor include:

- Route 1: James Island-North Charleston Express: Schedule Speed (North Charleston segment) is 16.3 MPH
- Route 3: Dorchester Road Express: Schedule Speed is 23.4 MPH

Corridors that parallel Express Route 1 – North Charleston are assumed to be I-26 and alignments northeast including Santee Cooper Utility Corridor & CSX Rail Line. Express Route 3 – Dorchester Road corridors are primarily southwest of I-26 and include Norfolk Southern Rail Line and the SCE&G Utility Corridor.

Scoring:

1-Low: BRT on Route 3-Dorchester Rd Corridors

2- Medium-Low: BRT on Route 1-North Charleston Corridor

3-Medium: LRT/DMU on Route 3-Dorchester Rd. Corridor; CSX Commuter Rail Corridor that requires transfer to BRT

4-Medium-High: LRT/DMU on Route 1 Corridor

5-High: CR on Rail Corridors*

*Note- commuter rail corridor travel times assume there are no speed restrictions on existing tracks, as well as no freight traffic impeding travel time.

The following Table 2-3 shows the travel time rankings for each corridor.

Table 2 - 3: Improve Transit Travel Time

Objective 1.2 Increase transit travel time to be competitive with automobile				
Screen 1 Measures	Current Express Bus Transit Travel Time	Avg. Speed	1.2 Score - Ranking of Mode Typical Speed compared to Corridor Express Bus Travel Time (1 Lowest - 5 Highest)	1.2 Ranking
1-I-26 A-BRT	Route 1	16.3	2	Medium-Low
2-Dorchester Road B-BRT	Route 3	23.4	1	Low
3-Dorchester Road B-LRT	Route 3	23.4	3	Medium
4-US 52 / US 78 C-1 -BRT	Route 1	16.3	2	Medium-Low
5-US 52 / US 78 C-1 -LRT	Route 1	16.3	4	Medium-High
6-US 52/ US 176 C-2-BRT	Route 1	16.3	2	Medium-Low
7-US 52/ US 176 C-2-LRT	Route 1	16.3	4	Medium-High
8-SCE&G Utility Corridor D-1-BRT	Route 3	23.4	1	Low
9-SCE&G Utility Corridor D-1-LRT	Route 3	23.4	3	Medium
10-Santee Cooper Utility Corridor D-2-BRT	Route 1	16.3	3	Medium
11-Santee Cooper Utility Corridor D-2-LRT	Route 1	16.3	4	Medium-High
12-Norfolk Southern Rail Line E-BRT	Route 3	23.4	1	Low
13-Norfolk Southern Rail Line E-DMU	Route 3	23.4	3	Medium
14-Norfolk Southern Rail Line E-CR	Route 3	23.4	5	High
15-CSX Rail Line/Bus via US 78 F-1-BRT	Route 1	16.3	1	Low
16-CSX Rail Line/Bus via US 78 F-1-DMU	Route 1	16.3	4	Medium-High
17-CSX Rail Line/Bus via US 78 F-1-CR	Route 1	16.3	3	Medium
18-CSX Rail Line/Bus via US 176 F-2 -BRT	Route 1	16.3	2	Medium-Low
19-CSX Rail Line/Bus via US 176 F-2 -DMU	Route 1	16.3	4	Medium-High
20-CSX Rail Line/Bus via US 176 F-2-CR	Route 1	16.3	3	Medium

Objective 1.3: Improve the efficiency of transit services

Criteria: Existing transit ridership on corridor as a percentage of overall system ridership

An efficient transit corridor carries more passengers, and thus, the cost per passenger is reduced. Existing transit riders are likely to gravitate toward a faster transit mode, and as such, corridors with a larger existing transit market are ranked higher than those corridors that do not have a demonstrated transit demand. Additionally, BRT and LRT transit modes are more likely to attract local walking trips versus commuter rail, which has fewer stations and serves a drive market. Using ridership data collected in November 2014, bus stop level boardings and alightings (ons & offs) are summed within a ½ mile "walk" radius of each alignment. For this Screen One planning level analysis, each corridor is ranked based on its percentage of transit ridership as compared to the overall system ridership activity (338,360 daily boardings and alightings). Commuter rail alternatives are reduced by one rank, due to fewer stops. The Screen Two analyses will utilize actual modeled ridership for each mode and alignment that moves forward.

<u>Scoring:</u>

1-Low: .8% to 1.2% of System Level Ridership

2-Medium-Low: 1.3% to 1.6% of System Level Ridership

3-Medium: 1.7% to 2.0% of System Level Ridership

4- Medium-High: 2.1% to 2.4% of System Level Ridership

5-High: 2.5% to 2.9% of System Level Ridership

*-1 for Commuter Rail Modes

Table 2 - 4: Corridor Percentage of Overall Existing Transit Ridership

1.3 Improve Efficiency of Transit Service						
Alignment	Boardings w/in 1/2 Mile Radius	Alightings w/in 1/2 Mile Radius	Total Existing Ridership w/in 1/2 Mile Radius	% of CARTA System Ridership	1.3 Score	1.3 Ranking
1-I-26 A-BRT	2,366	2,518	4,884	1.4%	2	Medium-Low
2-Dorchester Road B-BRT	3,807	3,482	7,289	2.2%	4	Medium-High
3-Dorchester Road B-LRT	3,807	3,482	7,289	2.2%	4	Medium-High
4-US 52 / US 78 C-1 -BRT	4,973	4,745	9,718	2.9%	5	High
5-US 52 / US 78 C-1 -LRT	4,973	4,745	9,718	2.9%	5	High
6-US 52/ US 176 C-2-BRT	4,973	4,745	9,718	2.9%	5	High
7-US 52/ US 176 C-2-LRT	4,973	4,745	9,718	2.9%	5	High
8-SCE&G Utility Corridor D-1-BRT	1,448	1,421	2,869	0.8%	1	Low
9-SCE&G Utility Corridor D-1-LRT	1,448	1,422	2,870	0.8%	1	Low
10-Santee Cooper Utility Corridor D-2-BRT	1,448	1,422	2,870	0.8%	1	Low
11-Santee Cooper Utility Corridor D-2-LRT	1,448	1,422	2,870	0.8%	1	Low
12-Norfolk Southern Rail Line E-BRT	3,490	3,267	6,757	2.0%	3	Medium
13-Norfolk Southern Rail Line E-DMU	3,490	3,267	6,757	2.0%	3	Medium
14-Norfolk Southern Rail Line E-CR	3,490	3,267	6,757	2.0%	2	Medium-Low
15-CSX Rail Line/Bus via US 78 F-1-BRT	5,103	4,835	9,938	2.9%	5	High
16-CSX Rail Line/Bus via US 78 F-1-DMU	5,103	4,835	9,938	2.9%	5	High
17-CSX Rail Line/Bus via US 78 F-1-CR	5,103	4,835	9,938	2.9%	4	Medium-High
18-CSX Rail Line/Bus via US 176 F-2 -BRT	4,980	4,733	9,713	2.9%	5	High
19-CSX Rail Line/Bus via US 176 F-2 -DMU	4,980	4,733	9,713	2.9%	5	High
20-CSX Rail Line/Bus via US 176 F-2-CR	4,980	4,733	9,713	2.9%	4	Medium-High
CARTA System Total			338,360			

Objective 1.4: Reduce traffic congestion

Criteria: Subjective assessment of the Average Daily Riders from peer systems as a percentage of the Annualized Average Daily Traffic (AADT) changes in traffic counts along corridor

This planning level analysis incorporates annualized average daily traffic counts along the roadway alignments to understand the level of congestion and incorporates the average daily riders for peer transit systems identified in the peer review (Appendix 1) to estimate the potential decrease in traffic that a particular mode could generate. Modes with higher percentage of average daily ridership as compared to the traffic count data generate a higher score. To estimate how much traffic a particular corridor generates, annualized average daily traffic counts conducted in 2013 by SCDOT are used from 17A to Ashley Phosphate. The change (increase or decrease) in traffic counts between each segment counted is summed to identify "new traffic" joining the corridor as part of that segment.

Transit capacities for each mode being considered are defined as follows:

1) BRT – 9,135 Average Daily Riders
2) LRT – 9,662 Average Daily Riders
3) DMU – 4,330 Average Daily Riders
4) CR – 2,628 Average Daily Riders

Table 2-5 shows the percent capacity of the transit node as a percentage of change in corridor traffic. Table 2-6 shows the change in traffic counts along each of the corridors in 2013.

<u>Scoring</u>

1-Low: 3% to 7%
2-Medium-Low: 8% to 12%
3-Medium: 13% to 18%
4-Medium-High: 19% to 23%
5-High: 24% to 28%

Table 2 - 5: Corridor Mode Average Daily Rider as a percentage of Increase in Average Daily Traffic

Alternative	2013 AADT Traffic Increase Phosphate	Peer Mode - Average Daily Riders	% Mode Avg. Daily Riders/Traffic Increase	1.4 Ranking	1.4 Score
1-I-26 A-BRT	80,000	9,135	11%	Medium-Low	2
2-Dorchester Road B-BRT	37,900	9,135	24%	Medium-High	4
3-Dorchester Road B-LRT	37,900	9,662	25%	High	5
4-US 52 / US 78 C-1 -BRT	34,400	9,135	27%	High	5
5-US 52 / US 78 C-1 -LRT	34,400	9,662	28%	High	5
6-US 52/ US 176 C-2-BRT	36,100	9,135	25%	High	5
7-US 52/ US 176 C-2-LRT	36,100	9,662	27%	High	5
8-SCE&G Utility Corridor D-1-BRT	80,000	9,135	11%	Medium-Low	2
9-SCE&G Utility Corridor D-1-LRT	80,000	9,662	12%	Medium-Low	2
10-Santee Cooper Utility Corridor D-2-BRT	73,300	9,135	12%	Medium-Low	2
11-Santee Cooper Utility Corridor D-2-LRT	73,300	9,662	13%	Medium	3
12-Norfolk Southern Rail Line E-BRT	80,000	9,135	11%	Medium-Low	2
13-Norfolk Southern Rail Line E-DMU	80,000	4,330	5%	Low	1
14-Norfolk Southern Rail Line E-CR	80,000	2,628	3%	Low	1
15-CSX Rail Line/Bus via US 78 F-1-BRT	34,400	9,135	27%	High	5
16-CSX Rail Line/Bus via US 78 F-1-DMU	34,400	4,330	13%	Medium	3
17-CSX Rail Line/Bus via US 78 F-1-CR	34,400	2,628	8%	Medium-Low	2
18-CSX Rail Line/Bus via US 176 F-2 -BRT	34,400	9,135	27%	High	5
19-CSX Rail Line/Bus via US 176 F-2 -DMU	34,400	4,330	13%	Medium	3
20-CSX Rail Line/Bus via US 176 F-2-CR	34,400	2,628	8%	Medium-Low	2

Table 2 - 6: 2013 AADT Change traffic by segment from US 17A to Ashley Phosphate

Corridor Segment	Traffic Count After Segment Node	Traffic Count Prior to Segment Node	Change in Traffic Count
I-26			
I26 & 17A	69,100	49,800	19,300
I26 & College Park	84,900	69,100	15,800
I26 & 78	96,000	84,900	11,100
I-26 and 52 Merge	155,100	96,000	59,100
52 Merge to Ashley Phosphate	129,800	155,100	-25,300
Total Traffic Change from 17A to Ashley Phosphate			***80,000***
Dorchester Road			
17A & Old Trolley	32,100	9,400	22,700
Od Trolley & Miles Jamison	26,700	32,100	-5,400
Old Trolley & Dorchester	39,600	26,700	12,900
Dorchester & Ashley Phosphate	39,800	32,100	7,700
Total Traffic Change from 17A to Ashley Phosphate			***37,900***
US 78/ US 52			
US 78 & 17A	43,000	10,300	32,700
US 78 & I26	40,800	43,000	-2,200
us 78 & US 52	70,700	40,800	29,900
US 52 & I26 Merge	43,900	70,700	-26,800
US 52 & Ashley Phosphate	44,700	43,900	800
Total Traffic Change from 17A to Ashley Phosphate			***34,400***
US 176/US 52			
176 & 17A	12,200	8,600	3,600
176 & Santee Utility	23,200	12,200	11,000
176 & Liberty Hall	31,300	23,200	8,100
176 & US52	48,900	31,300	17,600
US 176/52	70,700	48,900	21,800
US 52 & I26 Merge	43,900	70,700	-26,800
US 52 & Ashley Phosphate	44,700	43,900	800
Total Traffic Change from 17A to Ashley Phosphate			**36,100**
Santee Cooper (Assumed to be College Park Rd to I-26)			
College Park	28,400		28,400
I26 & 78	96,000	84,900	11,100
I-26 and 52 Merge	155,100	96,000	59,100
52 Merge to Ashley Phosphate	129,800	155,100	-25,300
Total Traffic Changefrom 17A to Ashley Phosphate			***73,300***
SCE&G & Norfolk Southern Assumed to be I-26			
CSX Assumed to be Corresponding US 52 Corridor			

Objective 1.5: Flexibility to extend or expand into other regional corridors

Criteria: Alignment connects to regional corridors; mode technology is flexible enough to extend/connect to create a regional system.

One of the priorities identified during public and stakeholder outreach is the ability for the alternative to easily expand to other corridors to create a regional premium transit service. Regional corridors identified for the purpose of this analysis include: US 52 to Goose Creek & Moncks Corner; US 78 to Summerville & Ridgeville; US 176 to Summerville & Holly Hill; US 17N to Mt. Pleasant & Awendaw; and US 17S to West Ashley, James Island & Hollywood. Each alignment is subjectively assessed to identify logical connections to other regional corridors. Each mode is identified as being more flexible to less flexible (BRT being the most flexible and commuter rail being the least flexible).

Corridors are assessed subjectively based on their regional connectivity as follows:

- High (5 Pts): I-26, US 52 & US 78, and US 52 & US 176
- Medium (3 Pts): Dorchester Road, SCE&G Utility Corridor, Santee Cooper Utility Corridor
- Low (1 Pt): Norfolk Southern Rail Line, CSX Rail Line

Modes are given a score, based on the flexibility of the mode as follows:

- High (5 pts): BRT is a flexible mode that can easily be expanded to a regional system.
- Medium (3 pts): DMU requires rail lines that are not readily available to expand along regional travel corridors.
- Low: (1 pt.): LRT is a capital intensive mode, with overhead electric wires that present challenges over large bridge spans; Commuter Rail locomotives require heavy rail that does not exist from DT to all regional corridors and requires a mode change to BRT.

<u>Scoring:</u>

The scores for both the alignment and the mode are summed and divided by two to develop the total ranking, as listed below and shown in Table 2-7.

5-High

4-Medium-High

3-Medium

2-Medium-Low

1-Low

Table 2 - 7: Flexibility Measures

Objective 1.5 Alternative's Flexibility to Extend/Expand into Other Corridors					
Screen 1 Measures	**Alignment connects to regional corridors**	**Mode - technology is flexible to extend/connect to create regional system.**	**Total Score**	**1.5 Score**	**1.5 Ranking**
1-I-26 A-BRT	I-26 is a regional corridor.	BRT is a flexible mode that can easily be expanded to a regional system.	10.0	5	High
2-Dorchester Road B-BRT	Dorchester Road provides connectivity southwest of I-26; limits to US52 Corridor (Moncks Corner, Goose Creek; Berkeley County)	BRT is a flexible mode that can easily be expanded to a regional system.	8.0	4	Medium-High
3-Dorchester Road B-LRT	Dorchester Road provides connectivity southwest of I-26; limits to US52 Corridor (Moncks Corner, Goose Creek; Berkeley County)	LRT is a capital intensive mode, with overhead electric wires that present challenges over large bridge spans.	6.0	3	Medium
4-US 52 / US 78 C-1 -BRT	US58/78 is a major travel corridor that parallels I-26 and provides connections to Berkeley County, Moncks Corner, and Goose Creek.	BRT is a flexible mode that can easily be expanded to a regional system.	10.0	5	High
5-US 52 / US 78 C-1 -LRT	US58/78 is a major travel corridor that parallels I-26 and provides connections to Berkeley County, Moncks Corner, and Goose Creek.	LRT is a capital intensive mode, with overhead electric wires that present challenges over large bridge spans.	6.0	3	Medium
6-US 52/ US 176 C-2-BRT	Provides a connection to Berkeley County (Goose Creek, Moncks Corner, etc.) DT Summerville west of I-26 access is limited	BRT is a flexible mode that can easily be expanded to a regional system.	10.0	5	High
7-US 52/ US 176 C-2-LRT	US 52/176 corridor provides a connection to Berkeley County (Goose Creek, Moncks Corner, etc.). DT Summerville west of I-26 access is limited.	LRT is a capital intensive mode, with overhead electric wires that present challenges over large bridge spans.	6.0	3	Medium
8-SCE&G Utility Corridor D-1-BRT	Utility Corridor does not provide consistent routing on travel sheds throughout the region.	BRT is a flexible mode that can easily be expanded to a regional system.	8.0	4	Medium-High
9-SCE&G Utility Corridor D-1-LRT	Utility Corridor does not provide consistent routing on travel sheds throughout the region.	LRT is a capital intensive mode, with overhead electric wires that present challenges over large bridge spans	4.0	2	Medium-Low
10-Santee Cooper Utility Corridor D-2-BRT	Utility Corridor does not provide consistent routing on travel sheds throughout the region	BRT is a flexible mode that can easily be expanded to a regional system.	8.0	4	Medium-High
11-Santee Cooper Utility Corridor D-2-LRT	Utility Corridor does not provide consistent routing on travel sheds throughout the region.	LRT is a capital intensive mode, with overhead electric wires that present challenges over large bridge spans.	4.0	2	Low
12-Norfolk Southern Rail Line E-BRT	Rail Corridor is accessible to Berkeley County, Goose Creek & Moncks Corner, Not accessible to Mt. Pleasant/West Ashley from DT.	BRT is a flexible mode that can easily be expanded to a regional system.	6.0	3	Medium
13-Norfolk Southern Rail Line E-DMU	Rail Corridor is accessible to Berkeley County, Goose Creek & Moncks Corner, Not accessible to Mt. Pleasant/West Ashley from DT	DMU requires rail lines that are not readily available to expand along regional travel corridors	4.0	2	Medium-Low
14-Norfolk Southern Rail Line E-CR	Rail Corridor is accessible to Berkeley County, Goose Creek & Moncks Corner, Not accessible to Mt. Pleasant/West Ashley from DT	Locomotives require heavy rail from DT to all regional corridors or requires a connection to bus.	2.0	1	Low
15-CSX Rail Line/Bus via US 78 F-1-BRT	Rail Corridor is accessible to Berkeley County, Goose Creek & Moncks Corner, Not accessible to Mt. Pleasant/West Ashley from DT	BRT is a flexible mode that can easily be expanded to a regional system.	6.0	3	Medium
16-CSX Rail Line/Bus via US 78 F-1-DMU	Rail corridor is accessible to Berkeley County, Goose Creek & Moncks Corner: however it is not accessible to Mt. Pleasant/West Ashley from DT.	DMU requires rail lines that are not readily available to expand along regional travel corridors	4.0	2	Medium-Low
17-CSX Rail Line/Bus via US 78 F-1-CR	Rail corridor is accessible to Berkeley County, Goose Creek & Moncks Corner: however it is not accessible to Mt. Pleasant/West Ashley from DT.	Locomotives require heavy rail from DT to all regional corridors or requires a connection to bus.	2.0	1	Low
18-CSX Rail Line/Bus via US 176 F-2 -BRT	Rail corridor is accessible to Berkeley County, Goose Creek & Moncks Corner: however it is not accessible to Mt. Pleasant/West Ashley from DT.	BRT is a flexible mode that can easily be expanded to a regional system.	6.0	3	Medium
19-CSX Rail Line/Bus via US 176 F-2 -DMU	Rail corridor is accessible to Berkeley County, Goose Creek & Moncks Corner: however it is not accessible to Mt. Pleasant/West Ashley from DT.	DMU requires rail lines that are not readily available to expand along regional travel corridors.	4.0	2	Medium-Low
20-CSX Rail Line/Bus via US 176 F-2-CR	Rail corridor is accessible to Berkeley County, Goose Creek & Moncks Corner: however it is not accessible to Mt. Pleasant/West Ashley from DT.	Locomotives require heavy rail from DT to all regional corridors or requires a connection to bus.	2.0	1	Low

Goal 1: Overall Alternative Rankings

The following Table 2-8 provides the overall rankings for each alternative based on its ability to improve mobility, accessibility, safety, and connectivity of the transit system and the region. US 52 and Dorchester Road alternatives ranked highest in terms of improving mobility, accessibility, safety, and connectivity. Utility corridors and commuter rail alignments scored lowest.

Table 2 - 8: Goal One Overall Rankings

Total Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region			
Alternative	**Criteria Score**	**Ranking**	**Total Score**
1-I-26 A-BRT	16	Medium	3.2
2-Dorchester Road B-BRT	17	Medium	3.4
3-Dorchester Road B-LRT	19	Medium-High	3.8
4-US 52 / US 78 C-1 -BRT	22	Medium-High	4.4
5-US 52 / US 78 C-1 -LRT	22	Medium High	4.4
6-US 52/ US 176 C-2-BRT	21	Medium-High	4.2
7-US 52/ US 176 C-2-LRT	21	Medium-High	4.2
8-SCE&G Utility Corridor D-1-BRT	9	Medium-Low	1.8
9-SCE&G Utility Corridor D-1-LRT	9	Medium-Low	1.8
10-Santee Cooper Utility Corridor D-2-BRT	11	Medium-Low	2.2
11-Santee Cooper Utility Corridor D-2-LRT	11	Medium-Low	2.2
12-Norfolk Southern Rail Line E-BRT	12	Medium-Low	2.4
13-Norfolk Southern Rail Line E-DMU	10	Medium-Low	2
14-Norfolk Southern Rail Line E-CR	10	Medium-Low	2
15-CSX Rail Line/Bus via US 78 F-1-BRT	19	Medium-High	3.8
16-CSX Rail Line/Bus via US 78 F-1-DMU	19	Medium-High	3.8
17-CSX Rail Line/Bus via US 78 F-1-CR	15	Medium	3
18-CSX Rail Line/Bus via US 176 F-2 -BRT	19	Medium-High	3.8
19-CSX Rail Line/Bus via US 176 F-2 -DMU	18	Medium-High	3.6
20-CSX Rail Line/Bus via US 176 F-2-CR	14	Medium	2.8

2.5.2 Goal 2 – Promote a Cost Effective and Financially Feasible Transit Alternative

Several criteria are used to understand how each alternative can meet the needs of the region in a cost effective manner that is technically and financially feasible. These include:

1) Estimated capital costs and local match funds needed
2) Estimated operating costs
3) Subjective assessment of the alignment's technical feasibility
4) Subjective assessment of ROW availability
5) Subjective assessment of alternative's ability to compete for federal funds

The following describes the objectives and criteria evaluated for Goal 2.

Objective 2.1: Meet the needs in a cost effective manner

Criteria:

a) Estimated Capital Costs (not including excessive ROW)
b) *Estimated Operating Costs*

2.1.a. Capital Costs

Objective 2.1.a. incorporates the estimated construction capital costs and local need based on each alternative's total one-way mileage and number of stations.

To estimate capital costs, FTA Capital Investment Grant Program (CIG) participants are reviewed to identify the project mode, project miles, number of stations, capital cost per mile, and percentage share of federal funds. These projects are averaged by mode, and the average applied to each alignment to estimate the potential capital costs based on the alternative's one-way mileage. The average share of the projects funded with federal funds by mode is applied to determine the local capital funding needed. These totals were ranked from high to low by alternative based on the lowest local funding need to highest local funding need and a score is assigned as follows:

1-Low: Rank 17-20

2-Medium Low: Rank 13-16

3-Medium: Rank 9-12

4-Medium-High: Rank 5-8

5-High: Rank 1-4

Two points are removed from the rail right-of-way (ROW) alternatives due to ROW cost to freight or adjacent property owners.

The following Tables 2-9 through 2-11 show the FTA's Capital Investment Grant projects and average costs per mile used to estimate the costs. Table 2-12 shows the ranking by alternative.

Table 2 - 9: Average Federal Capital Grant Projects in Program (2014-2016)

Average Federal Captial Investment Grant Projects by Mode in Program (FTA 2014 - 2016 CIG Funding)								
Total Projects	Mode	Total Cost (in Millions)	Federal Share (in Millions)	Federal Share (%)	One-Way Miles	Total Vehicles	Total Stations	Cost per Mile (in Millions)
19.0	BRT	$2,386.48	$1,505.26	63%	10.4	16.8	17	$17.04
5.0	CR	$3,426.27	$1,847.02	54%	21.7	15.8	8	$27.99
4.0	SC	$571.93	$309.24	54%	3.0	6.3	17	$49.55
18.0	LR	$27,597.28	$12,758.08	46%	8.5	21.0	10	$293.66
4.0	HR	$12,994.45	$4,637.17	36%	8.9	34.5	4	$427.55
Total Projects		**$46,976.41**	**$21,056.77**	**45%**				

Mode Key:

- BRT – Bus Rapid transit:
- CR – Commuter Rail
- SC – Street Car
- LR – Light Rail
- HR – Heavy Rail

Note DMU (Hybrid Rail) is not called out, and as such, it is assumed to fall under commuter rail projects.

Light rail capital costs per mile range based on ROW requirements. Although the average cost per mile is $293.66M; this analysis utilizes recently completed projects to estimate a cost per mile of $90M.

Table 2 - 10: Average Capital Cost per Mile for Recently Completed Light Rail Projects (In Millions)

System City	Cost per Mile
Norfolk	$43
San Francisco	$69
Houston	$146
Phoenix	$86
Salt Lake	$70
Minneapolis	$88
Average	**$84**

Commuter rail project costs per mile also range based on ROW availability. Many recent commuter rail projects are operating on abandoned or underutilized freight railroads. Another cost consideration for this project is that Norfolk Southern does not have passenger service operating on the alignment, and as such, the cost per mile is anticipated to be higher than average.

Table 2 - 11: FTA Capital Investment Grant Project in Pipeline (FY 2014-2016)

Project Status	Urbanized Area	State	Project Name	Planned Opening	Mode	Total Cost (Millions)	Federal Share (Millions)	Federal Share (%)	Miles of Line	Vehicles	Stations	Cost per Mile
FFGA	Hartford	CT	New Britain-Harford Busway	2015	BRT	$567.05	$454.84	80.2%	9.4	31	11	$60.32
NSPD	Minneapolis	MN	Orange Line BRT		BRT	$150.70	$64.63	42.9%	17	11	11	$8.86
SSPD	Fresno	CA	Fresno Area Express BRT	2015	BRT	$48.75	$39.00	80.0%	15.7	8	27	$3.11
SSPD	Oakland	CA	East Bay BRT	2017	BRT	$177.99	$119.40	67.1%	9.5	38	34	$18.74
SSPD	San Francisco	CA	Van Ness Ave BRT	2018	BRT	$162.07	$75.00	46.3%	2	38	9	$81.04
SSPD	San Jose	CA	El Camino Real Corridor BRT Project	2018	BRT	$188.00	$74.99	39.9%	17.4	0	16	$10.80
SSPD	Jacksonville	FL	BRT Southeast Corridor	2016	BRT	$23.88	$19.10	80.0%	11.1	8	7	$2.15
SSPD	Jacksonville	FL	BRT North Corridor	2015	BRT	$33.23	$26.59	80.0%	9.3	8	14	$3.57
SSPD	Chicago	IL	Ashland Avenue BRT Phase 1		BRT	$116.90	$58.30	49.9%	5.4	50	14	$21.65
SSPD	Lansing	MD	Grand River BRT	2016	BRT	$215.36	$164.46	76.4%	8.5	17	28	$25.34
SSPD	Reno	NV	4th Street Prater Way Corridor		BRT	$52.57	$6.47	12.3%	3.1	0	8	$16.96
SSPD	Columbus	OH	Northeast Corridor BRT	2017	BRT	$47.67	$38.13	80.0%	15.6	13	43	$3.06
SSPD	Eugene	OR	West Eugene EMX	2017	BRT	$95.57	$74.99	78.5%	8.9	7	13	$10.74
SSPD	Nashville	TN	East West Connector BRT	2016	BRT	$174.00	$78.99	45.4%	7.1	11	16	$24.51
SSPD	El Paso	TX	Dyer Corridor BRT	2017	BRT	$35.89	$27.69	77.2%	12	10	12	$2.99
SSPD	El Paso	TX	Montana Corridor BRT	2016	BRT	$45.52	$26.97	59.2%	16.8	12	16	$2.71
SSPD	Provo-Orem	UT	Provo-Orem BRT	2016	BRT	$149.93	$74.99	50.0%	10.5	30	15	$14.28
SSPD	Everett	WA	Swift II BRT		BRT	$48.00	$38.00	79.2%	12		18	$4.00
SSPD	Vancouver	WA	Forth Plain BRT	2016	BRT	$53.40	$42.72	80.0%	6	10	20	$8.90
FFGA	Denver	CO	Eagle Commuter Rail	2016	CR	$2,043.14	$1,092.55	53.5%	30.2	44	13	$67.65
NSE	Orlando	FL	SunRail Phase 2 South	2017	CR	$173.60	$86.80	50.0%	17.2	6	4	$10.09
Built	Orlando	FL	Sun rail Phase 1	2014	CR	$357.23	$178.61	50.0%	32	21	12	$11.16
NSPD	Fort Worth	TX	Tex Rail	2017	CR	$809.77	$466.53	57.6%	27.2	8	10	$29.77
SSPD	San Rafael	CA	San Rafael to Lakespur Regional Connection		CR	$42.53	$22.53	53.0%	2	0	1	$21.27
FFGA	San Francisco	CA	Third Street Light Rail Phase 2	2018	LR	$1,578.30	$983.22	62.3%	1.7	4	4	$928.41
FFGA	St Paul -Minneapolis	MN	Central Corridor	2014	LR	$956.90	$478.45	50.0%	9.8	31	19	$97.64
FFGA	Charlotte	NC	Lynx Blue Line Extension - Northeast Corridor	2018	LR	$1,160.08	$580.04	50.0%	9.3	22	11	$124.74
FFGA	Portland	OR	Portland Milwaukie Light Rail	2016	LR	$1,490.35	$885.83	59.4%	7.3	18	10	$204.16
FFGA	Seattle	WA	University Link	2017	LR	$1,947.68	$825.00	42.4%	3.1	27	2	$628.28
NSE	Boston	MA	Cambridge	2019	LR	$1,656.56	$714.41	43.1%	4.7	24	7	$352.46
NSE	Portland	OR	Columbia River Crossing Project	2019	LR	$2,711.83	$934.23	34.5%	2.9	19	5	$935.11
NSE	Houston	TX	university Corridor LRT		LR	$1,563.07	$781.53	50.0%	11.3	32	19	$138.32
NSPD	San Diego	CA	Mid Coast Corridor Transit Project	2018	LR	$1,984.69	$980.43	49.4%	10.9	36	8	$182.08
NSPD	Denver	CO	Southeast Extension	2019	LR	$210.74	$99.50	47.2%	2.3	8	3	$91.63
NSPD	Baltimore	MD	Baltimore Red Line	2022	LR	$2,644.52	$900.00	34.0%	14.1	26	19	$187.55
NSPD	Washington	MD	Maryland National Capital Purple Line	2020	LR	$2,371.15	$900.00	38.0%	16.2	58	21	$146.37
NSPD	Minneapolis	MN	Southwest Light Rail Transit	2018	LR	$1,250.48	$625.24	50.0%	15.8	26	17	$79.14
NSPD	Minneapolis	MN	Blue Line extension		LR	$1,002.00	$501.00	50.0%	13	26	11	$77.08
NSPD	Durham	NC	Durham - Orange LRT Project	**2026**	LR	$1,800.00	$910.30	50.6%	17.1	12	17	$105.26
NSPD	Seattle	WA	Lynwood Link Extension	2023	LR	$1,700.00	$850.00	50.0%	8.5	0	0	$200.00
SSPD	Tacoma	WA	Tacoma Link Rail Extension		LR	$166.00	$75.00	45.2%	2.4	5	6	$69.17
Average All Projects & Modes (Including other Modes not listed)						**$1,021.53**	**$447.48**	**53.4%**	**10**	**20**	**13**	**$155.18**

Table 2 - 12: Local Share Capital Construction Costs based on FTA Average

Objective 2.1 - A Capital Costs	i-26ALT Alternatives		Average FTA Capital Investment Grant Program Recipients				I-26ALT Estimates			Project Score	
i-26ALT Alternative	One-Way Miles	Number of Stations	Avg. FTA CIG One-Way Miles	Avg. FTA CIG Stations	Avg. Capital Cost per Mile by Mode (In Millions)	Average Federal Share Funded by Mode	Estimated Alternative Capital Cost (In Millions)	Estimated Local Need (In Millions)	Rank of Local Need (1-20)	*2.1A Capital Cost Score*	2.1 A Local Need Ranking
1-I-26 A-BRT	22	16	10	17	$17.04	63%	$371.13	$137.32	5	*4*	Medium-High
2-Dorchester Road B-BRT	24	18	10	17	$17.04	63%	$408.45	$151.13	8	*4*	Medium-High
3-Dorchester Road B-LRT	24	18	9	10	$90.00	46%	$2,157.30	$1,164.94	19	*1*	Low
4-US 52 / US 78 C-1 -BRT	23	18	10	17	$17.04	63%	$389.36	$144.06	6	*4*	Medium-High
5-US 52 / US 78 C-1 -LRT	23	18	9	10	$90.00	46%	$2,056.50	$1,110.51	17	*1*	Low
6-US 52/ US 176 C-2-BRT	22	16	10	17	$17.04	63%	$367.89	$136.12	4	*5*	High
7-US 52/ US 176 C-2-LRT	22	16	9	10	$90.00	46%	$1,943.10	$1,049.27	16	*2*	Medium-Low
8-SCE&G Utility Corridor D-1-BRT	24	18	10	17	$17.04	63%	$412.03	$152.45	9	*3*	Medium
9-SCE&G Utility Corridor D-1-LRT	24	18	9	10	$90.00	46%	$2,176.20	$1,175.15	20	*1*	Low
10-Santee Cooper Utility Corridor D-2-BRT	24	17	10	17	$17.04	63%	$401.97	$148.73	7	*4*	Medium-High
11-Santee Cooper Utility Corridor D-2-LRT	24	17	9	10	$90.00	46%	$2,123.10	$1,146.47	18	*1*	Low
12-Norfolk Southern Rail Line E-BRT	20	12	10	17	$17.04	63%	$338.93	$125.40	1	*3*	Medium
13-Norfolk Southern Rail Line E-DMU	20	12	18	6	*$27.08*	*54%*	$538.62	$247.77	10	*1*	Low
14-Norfolk Southern Rail Line E-CR	20	5	18	6	$27.08	54%	$538.62	$247.77	10	1	Low
15-CSX Rail Line/Bus via US 78 F-1-BRT	22	14	18	6	$17.04	63%	$367.21	$135.87	3	3	Medium
16-CSX Rail Line/Bus via US 78 F-1-DMU	22	14	18	6	*$27.08*	*54%*	$583.57	$268.44	15	*1*	Low
17-CSX Rail Line/Bus via US 78 F-1-CR	22	8	18	6	$27.08	54%	$583.57	$268.44	14	1	Low
18-CSX Rail Line/Bus via US 176 F-2 -BRT	20	12	10	17	$17.04	63%	$344.38	$127.42	2	*3*	Medium
19-CSX Rail Line/Bus via US 176 F-2 -DMU	20	12	18	6	*$27.08*	*54%*	$547.29	$251.75	12	*1*	Low
20-CSX Rail Line/Bus via US 176 F-2-CR	20	6	18	6	$27.08	54%	$547.29	$251.75	13	1	Low

2.1.b. Operating Costs

To estimate operating costs, standard productivity measures from the National Transit Database (NTD) peer review are used to identify how well a particular mode performs in terms of operating cost per hour, operating cost per mile, and operating cost per passenger.

For projects in the Capital Investment Grant program, FTA requires a fully allocated cost model. *A cost allocation model assumes that each expense incurred by a transit system is "driven" by a key supply variable such as revenue hours, revenue miles, and peak vehicles.* For this planning level analysis, performance measures that capture operating cost per revenue hour; operating cost per revenue mile, and operating cost per passenger are ranked and scored based on a peer review of each mode as follows:

-Operating cost per revenue hour measures how efficient a transit system is at controlling costs associated with hourly variables. Operating cost per revenue hour measures how much it costs to operate one hour of revenue service.

-Operating cost per revenue mile measures the efficiency of a transit system based on the number of revenue miles are in service. This cost is typically influenced by maintenance related variables.

- Operating cost per passenger: This variable looks at how efficient a mode is at carrying passenger s (i.e. the more passengers riding per vehicle, the lower cost per passenger).

<u>Scoring</u>

5-High: BRT Alignments on Roadways & Utility Corridors:

- Cost per Hour ($119.41): 5 Pts
- Cost per Mile ($10.80): 5 Pts
- Cost per Passenger ($2.15): 5 Pts

4-Medium High: BRT Alignments on Rail Corridors (same scoring as above less 1 point for each variable on the commuter rail alignment and the potential for increased liability).

3-Medium: LRT Alignments

- Cost per Hour ($291.14): 3 Pts
- Cost per Mile ($21.08): 3 Pts
- Cost per Passenger ($4.57): 4 Pts

4-Medium-Low: Commuter Rail Alignments

- Cost per Hour ($753.78): 1 Pt
- Cost per Mile ($19.52): 3 Pt
- Cost per Passenger ($24.07): 1 Pt

5- Low: DMU

- Cost per Hour ($768.08): 1 Pt
- Cost per Mile ($31.92): 1 pt.
- Cost per Passenger (15.32): 2 Pts

1 Pt is removed from BRT operating in rail alignments due to additional liability costs that would be anticipated.

Table 2-13 shows the operating cost performance measures for each alternative.

Table 2 - 13: Average Operating Cost Measures

2.1b: Operating Costs	Based on Standard Productivity Measures, from NTD Peer Review for FY 2013						Alternative Scoring		
Screen 1 Measures	Avg. Hours of Service	Average Annual Riders	Average Operating Cost	Operating Cost Hour	Operating Cost per Mile	Operating Cost per Passenger	Ranking Sum of 3 Variables	2.1b Operating Cost Score	2.1b Operating Cost Ranking
1-I-26 A-BRT	49,726	3,018,368	$5,937,782	$119.41	$10.80	$2.15	15	5	High
2-Dorchester Road B-BRT	49,726	3,018,368	$5,937,782	$119.41	$10.80	$2.15	15	5	High
3-Dorchester Road B-LRT	45,787	3,108,937	$13,330,427	$291.14	$21.08	$4.57	10	3	Medium
4-US 52 / US 78 C-1 -BRT	49,726	3,018,368	$5,937,782	$119.41	$10.80	$2.15	15	5	High
5-US 52 / US 78 C-1 -LRT	45,787	3,108,937	$13,330,427	$291.14	$21.08	$4.57	10	3	Medium
6-US 52/ US 176 C-2-BRT	49,726	3,018,368	$5,937,782	$119.41	$10.80	$2.15	15	5	High
7-US 52/ US 176 C-2-LRT	45,787	3,108,937	$13,330,427	$291.14	$21.08	$4.57	10	3	Medium
8-SCE&G Utility Corridor D-1-BRT	49,726	3,018,368	$5,937,782	$119.41	$10.80	$2.15	15	5	High
9-SCE&G Utility Corridor D-1-LRT	45,787	3,108,937	$13,330,427	$291.14	$21.08	$4.57	10	3	Medium
10-Santee Cooper Utility Corridor D-2-BRT	49,726	3,018,368	$5,937,782	$119.41	$10.80	$2.15	15	5	High
11-Santee Cooper Utility Corridor D-2-LRT	45,787	3,108,937	$13,330,427	$291.14	$21.08	$4.57	10	3	Medium
12-Norfolk Southern Rail Line E-BRT	49,726	3,018,368	$5,937,782	$119.41	$10.80	$2.15	15	4	Meduim-High
13-Norfolk Southern Rail Line E-DMU	19,329	1,146,210	$14,846,218	$768.08	$31.92	$15.32	4	1	Low
14-Norfolk Southern Rail Line E-CR	24,345	783,909	$18,350,774	$753.78	$19.52	$24.07	5	2	Medium-Low
15-CSX Rail Line/Bus via US 78 F-1-BRT	49,726	3,018,368	$5,937,782	$119.41	$10.80	$2.15	15	4	Medium-High
16-CSX Rail Line/Bus via US 78 F-1-DMU	19,329	1,146,210	$14,846,218	$768.08	$31.92	$15.32	4	1	Low
17-CSX Rail Line/Bus via US 78 F-1-CR	24,345	783,909	$18,350,774	$753.78	$19.52	$24.07	5	2	Medium-Low
18-CSX Rail Line/Bus via US 176 F-2 -BRT	49,726	3,018,368	$5,937,782	$119.41	$10.80	$2.15	15	4	Medium - High
19-CSX Rail Line/Bus via US 176 F-2 -DMU	19,329	1,146,210	$14,846,218	$768.08	$31.92	$15.32	4	1	Low
20-CSX Rail Line/Bus via US 176 F-2-CR	24,345	783,909	$18,350,774	$753.78	$19.52	$24.07	5	2	Medium-Low

Objective 2.2: Select an Alternative that is technically feasible

Criteria: Subjective assessment of constructability:

Objective 2.2 takes a subjective look at how high a particular mode on a specified alignment would rank in terms of constructability for the following criteria:

1) Miles of elevated alignment: Using aerial photography, an estimate of elevated roadways and rail lines are identified.
2) Total number of Overpasses: The quantity of overpasses is included to understand other potential obstacles to construction.
3) Major obstacles to construction: Finally a subjective assessment of anticipated major obstacles for the identified modes as follows.

<u>Scoring:</u>

High: BRT Alignments on State and Local Roadways

- BRT is flexible, no major obstacles or bridge lengths to construct. Can operate in mixed traffic or fixed guideway. US 52 & US 78 merge may require some elevated alignment.

Medium-High: LRT on State & Local Roadways

- LRT presents additional technical difficulty with overhead wires; requires rail installation; some height restrictions may come from overpasses (11 to 13 overpasses on the roadway alignments).

Medium: BRT on Utility & Rail Corridors

- Utility corridors may present the need for bridges; height restrictions and buffer requirements push alignments into adjacent property.
- BRT on rail corridors will require adjacent ROW and the need to avoid rail infrastructure.

Medium Low: DMU on Rail Corridors; LRT on Utility Corridors

- LRT: Height restrictions on utility corridors and buffer requirements create restrictions on the placement of overhead catenary wires. Elevated rail requirements are unknown.
- DMU will require rail construction to avoid existing freight rail corridors.

Low: CR on Rail Corridors; I-26 BRT

- I-26: I-26 HOV study identified HOV lanes as not cost feasible. Public opinion is not favorable to removing a lane of traffic. Five miles (23%) of the alignment is comprised of bridges and elevated roadways (based on aerial imagery).
- Rail Corridors: Active freight lines and new policy create greater restrictions on passenger service operating on active freight lines, which will likely require using adjacent ROW on all or part of the rail alignments. Rail yards, AY junction, and parallel track providers will require alignments to travel over or around these obstacles

Objective 2.3: Select an alternative that is financially feasible

Criteria: Right-of-way availability

For the initial screening criteria, a subjective assessment of the ROW requirements is conducted based on field surveys and aerial imagery of the corridor. The standard ROW requirement for each mode is as follows:

1) BRT: 12 ft. (Single Lane); 24 ft. (Double Lane)
2) Light Rail: 11 to 13 ft. (Single Track); 25 to 33 ft. (Double Track)
3) DMU: 25 to 37 ft. Double Track + 26 ft. Buffer between freight track centerlines
4) Commuter Rail: >37' Double Track + 26' Buffer between freight track centerline

The following describes the scoring for ROW availability analysis. In the Neck Area of the Peninsula, all of the modes and alignments converge into parallel ROWs. This segment is assumed to score equally across all modes. Screen Two will further define the Neck Area Alignment to Downtown.

Scoring:

I-26: Medium

- Parallel and center lane ROW availability from US 17A until US 78: Medium-High
- Parallel ROW availability from US 78 to Ashley Phosphate: Medium
- Parallel ROW availability from Ashley Phosphate to DT: Low

US 52/US 78: Medium-High

- Parallel ROW availability on US 78 from US 17A to College Park Road: Medium
  - Utility lines along side of roadway would need to be buried or relocated.
  - May require acquiring property along the roadway
- Parallel ROW & Center Lane from College Park Rd to US 52 Merge/Ashley Phosphate: Medium-High
  - Some bridges and overpasses on alignment
  - Center lane design would require reconfiguring turning lane;
  - Some areas where parallel alignment could require acquiring adjacent property
- Center Median and Parallel ROW availability from Ashley Phosphate to Montague: High
  - Up to 70' in center median width
  - Some power lines may need relocation
  - I-526 and Montague overpass may restrict width
- Montague to Neck Area: Center lane and parallel ROW: High
  - May require changes to turning lanes
  - Rivers Avenue bridge over CSX railway may be limited on width.

US 52/US 176: High

- Parallel ROW availability on US 176 & US 52 from US 17A to Ashely Phosphate: High
  - US 52 & US 78 Merge may require elevated roadway
- Center median and parallel ROW availability from Ashley Phosphate to Montague: High
  - Up to 70' in center median width
  - Some power lines may need relocation
  - I-526 and Montague overpass may restrict width.
- Montague to Neck Area: Center lane and parallel ROW: High
  - May require changes to turning lanes
  - Rivers Ave bridge over CSX railway may be limited on width.

Dorchester Road: Medium High

- Main Street from DT Summerville to Old Trolley Road: Low
  - Would require mixed traffic operations
- Old Trolley Road to Dorchester Road: Medium High
  - Center lane ROW and parallel ROW available
  - May require changing turning lane operations
  - Parallel alignments may require partial property acquisitions
- Dorchester Road from Old Trolley to Michaux: High
  - Large center median and parallel ROW availability
  - May require relocating or burying power lines
- Dorchester Road from Michaux to I-26: Medium-High
  - Center lane and parallel ROW available
  - Parallel alignments may require partial property acquisition

  - I-26 Overpass may restrict widths
- Dorchester to Neck Area: Center lane and parallel ROW: High
  - May require changes to turning lanes
  - Rivers Avenue bridge over CSX railway may be limited on width.

SCE&G Utility Corridor: Medium

- Height and buffer restrictions in proximity to power lines
- Will require adjacent ROW, which could result in partial or complete property acquisition
- May require relocating power structures.

Santee Cooper Utility Corridor: Medium

- Height and buffer restrictions in proximity to power lines
- Will require Adjacent ROW, which could result in partial or complete property acquisition
- May require relocating power structures.

Norfolk Southern: Medium-Low

- Unknown ROW availability and future capacity
- Limits to operating on freight alignment
- Train Yards and AY Junction reconfiguration may be required
- Parallel ROW would require partial or complete property acquisition

CSX: Medium-Low

- Unknown ROW availability and future capacity
- Limits to operating on freight alignment
- Train Yards and AY Junction reconfiguration may be required
- Parallel ROW would require partial or complete property acquisition

Adjustments to Score based on Mode:

- BRT: -0 Points: Most cost effective mode
- LRT: -1 Point: Additional financial implications with rail & overhead wires; requires train yard on alignment
- DMU: -2 Points: Requires ROW outside of freight corridor; requires train yard on alignment
- CR: -2 Points: Widest ROW requirement; requires train yard on alignment

Objective 2.4: Competitiveness for FTA discretionary funds

Criteria: Potential to compete for federal funds based on the number of new projects in the FTA Capital Investment Program based on transit mode

This category ranks the alternative's mode and its ability to compete for federal funds based on current trends with the Capital Investment Grant program. The total number of recently completed project or those active projects in the CIG program that are not classified as an extension to an existing line are identified by mode. There are currently 19 new BRT projects, seven new LRT projects, and three new CR projects in 2014 & 2015. Hybrid rail (DMU) is not identified as a mode.

<u>Scoring:</u>

5-High: BRT

3-Medium: LRT/DMU

1-Low: CR

Goal 2 Overall Rankings

The following shows the overall rankings for all objectives identified above for Goal 2. US 52 and Dorchester Road BRT alternatives score highest in terms of a cost effective and financially feasible alternative.

Table 2 - 14: Overall Goal 2 Cost Measures Ranking

Goal 2: Promote a cost effective and financially feasible transit alternative			
Alternative	**Criteria Score**	**Ranking**	**Total Score**
1-I-26 A-BRT	18	Medium-High	3.5
2-Dorchester Road B-BRT	23	High	4.6
3-Dorchester Road B-LRT	14	Medium	2.8
4-US 52 / US 78 C-1 -BRT	23	High	4.7
5-US 52 / US 78 C-1 -LRT	15	Medium	2.9
6-US 52/ US 176 C-2-BRT	25	High	5.0
7-US 52/ US 176 C-2-LRT	16	Medium	3.3
8-SCE&G Utility Corridor D-1-BRT	19	Medium-High	3.8
9-SCE&G Utility Corridor D-1-LRT	11	Medium-Low	2.3
10-Santee Cooper Utility Corridor D-2-BRT	20	Medium-High	4.0
11-Santee Cooper Utility Corridor D-2-LRT	11	Medium-Low	2.3
12-Norfolk Southern Rail Line E-BRT	17	Medium	3.4
13-Norfolk Southern Rail Line E-DMU	8	Medium-Low	1.7
14-Norfolk Southern Rail Line E-CR	6	Low	1.1
15-CSX Rail Line/Bus via US 78 F-1-BRT	17	Medium	3.4
16-CSX Rail Line/Bus via US 78 F-1-DMU	8	Medium-Low	1.7
17-CSX Rail Line/Bus via US 78 F-1-CR	6	Low	1.1
18-CSX Rail Line/Bus via US 176 F-2 -BRT	17	Medium	3.4
19-CSX Rail Line/Bus via US 176 F-2 -DMU	8	Medium-Low	1.7
20-CSX Rail Line/Bus via US 176 F-2-CR	6	Low	1.1

2.5.3 Goal 3 – Support Local Land Use Objective

Land use criteria rankings use the analysis conducted as part of the Land Use Analysis (Appendix 3-B) as well as an assessment of an alternative's access to activity centers and future growth areas

Objective 3.1: Provide convenient and accessible transit service to existing and planned activity centers

Criteria: Number of activity centers directly served

Using GIS analysis, the total number of field surveyed activity centers are identified and counted within ½ mile radius of each alternative. Each activity center is given a weight of 1. These activity centers include:

- Military
- Primary & Secondary Schools
- Shopping centers
- Civic Building
- Parks
- Community Centers

Figure 2-3 shows the activity centers included in the analysis.

Additionally, station types for each alignment are defined based on the location of the stop, and the station types are scored and summed to evaluate the attraction the station would have. Each station type is ranked based on the following:

1) Regional Center (Trident Health, North Charleston City Centre): 3 Pts
2) Activity Center (Major Employment Center): 2 Pts
3) Park & Ride: 2 Pts
4) Transit Hub (CARTA SuperStop, Proposed DT hub): 2 Pts
5) Intermodal Facility (North Charleston Amtrak Station) 1.5 Pts
6) Airport (North Charleston): 1.5 Pts
7) Local Stop: .5 Pt

<u>Scoring</u>

The sum of the weighted activity center score and station type score is split into equal intervals as follows:

5-High: 30-33

4-Medium High: 26-29

3-Medium: 23-25

2-Medium Low: 19-22

1-Low: 15-18

Activity center scores are given a weight of 2 for the overall Land Use Ranking.

Table 2-15 shows the activity center rankings by alternative.

Figure 2 - 3: Activity Centers

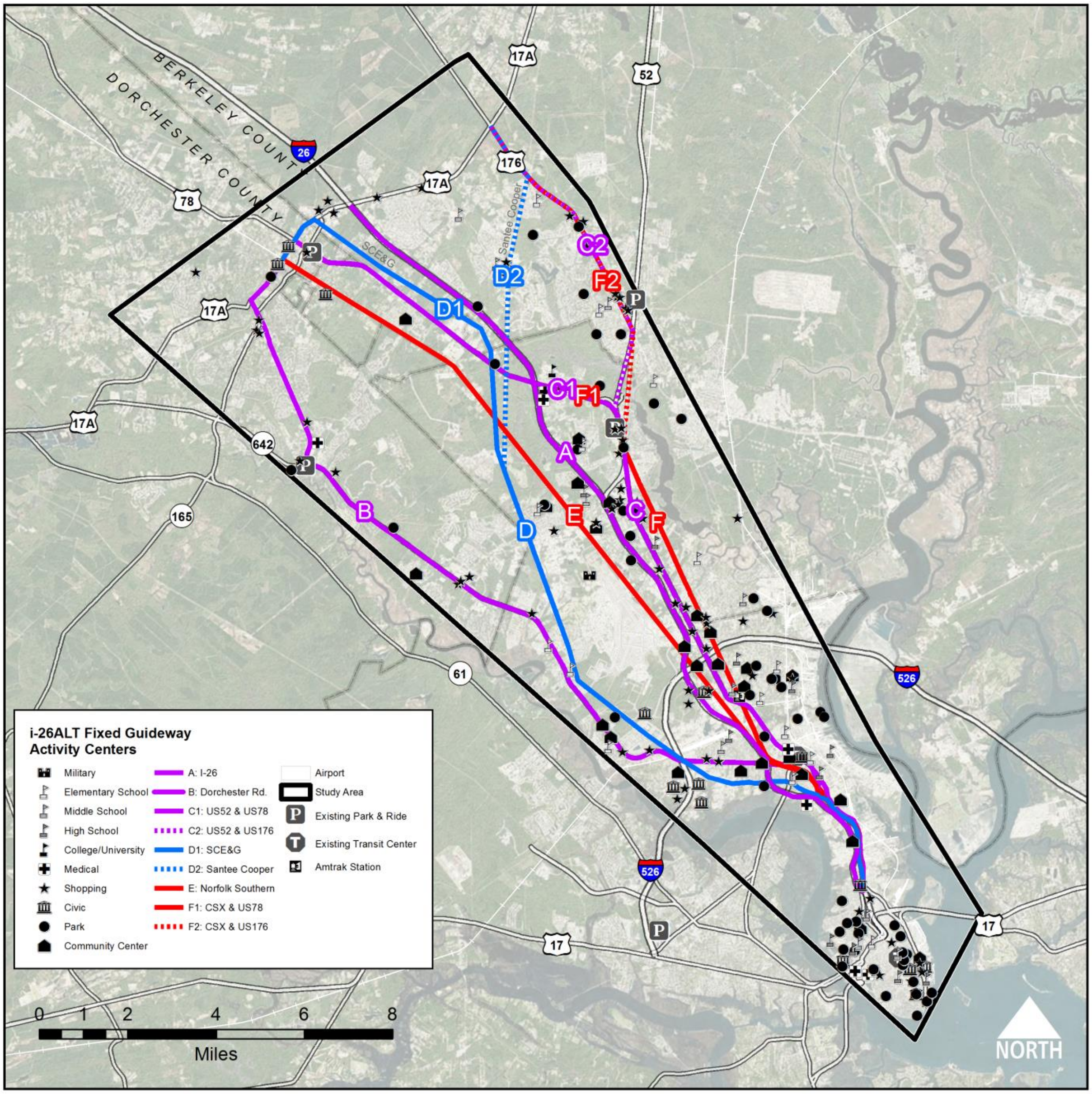


Table 2 - 15: Station and Activity Center Measures

Objective	3.1 Provide convenient and accessible transit service to existing and planned activity centers											
Screen 1 Measures	***Total Stations***	*Number of activity centers directly served*	Regional Center	Activity Center	PNR	Transit Hub	Intermodal	Airport	Neighborhood	Total Community Activity Centers	3.1 Total Weight Rank	3.1 Total Weigh Score
	12.6	*Weight*	*3*	*2*	*2*	*2*	*1.5*	*1.5*	*0.5*	*0.1*	***12.5***	***1***
1-I-26 A-BRT	***16***	*Quantity*	2	1	3	1	0	1	8	47	Medium-High	4
		Weighted	6	2	6	2	0	2	4	5	**26**	
2-Dorchester Road B-BRT	***18***	*Quantity*	0	4	2	2	0	1	9	57	Medium-High	4
		Weighted	0	8	4	4	0	2	5	6	**28**	
3-Dorchester Road B-LRT	***18***	*Quantity*	0	4	2	2	0	1	9	57	Medium-High	4
		Weighted	0	8	4	4	0	2	5	6	**28**	
4-US 52 / US 78 C-1 -BRT	***18***	*Quantity*	1	3	3	2	1	1	7	72	High	5
		Weighted	3	6	6	4	2	2	4	7	**33**	
5-US 52 / US 78 C-1 -LRT	***18***	*Quantity*	1	3	3	2	1	1	7	72	High	5
		Weighted	3	6	6	4	2	2	4	7	**33**	
6-US 52/ US 176 C-2-BRT	***16***	*Quantity*	0	2	3	2	1	1	7	72	Medium-High	4
		Weighted	0	4	6	4	2	2	4	7	**28**	
7-US 52/ US 176 C-2-LRT	***16***	*Quantity*	0	2	3	2	1	1	7	72	Medium-High	4
		Weighted	0	4	6	4	2	2	4	7	**28**	
8-SCE&G Utility Corridor D-1-BRT	***18***	*Quantity*	0	4	1	1	0	1	11	37	Medium	3
		Weighted	0	8	2	2	0	2	6	4	**23**	
9-SCE&G Utility Corridor D-1-LRT	***18***	*Quantity*	0	4	1	1	0	1	11	37	Medium	3
		Weighted	0	8	2	2	0	2	6	4	**23**	
10-Santee Cooper Utility Corridor D-2-BRT	***17***	*Quantity*	0	3	2	1	0	1	10	34	Medium-Low	2
		Weighted	0	6	4	2	0	2	5	3	**22**	
11-Santee Cooper Utility Corridor D-2-LRT	***17***	*Quantity*	0	3	2	1	0	1	10	34	Medium-Low	2
		Weighted	0	6	4	2	0	2	5	3	**22**	
12-Norfolk Southern Rail Line E-BRT	***12***	*Quantity*	1	3	1	1	0	1	5	42	Medium-Low	2
		Weighted	3	6	2	2	0	2	3	4	**21**	
13-Norfolk Southern Rail Line E-DMU	***12***	*Quantity*	1	3	1	1	0	1	5	42	Medium-Low	2
		Weighted	3	6	2	2	0	2	3	4	**21**	
14-Norfolk Southern Rail Line E-CR	***5***	*Quantity*	1	2	1	1	0	0	0	42	Low	1
		Weighted	3	4	2	2	0	0	0	4	**15**	
15-CSX Rail Line/Bus via US 78 F-1-BRT	***14***	*Quantity*	1	1	2	1	1	0	8	66	Medium	3
		Weighted	3	2	4	2	2	0	4	7	**23**	
16-CSX Rail Line/Bus via US 78 F-1-DMU	***14***	*Quantity*	1	1	2	1	1	0	8	66	Medium	3
		Weighted	3	2	4	2	2	0	4	7	**23**	
17-CSX Rail Line/Bus via US 78 F-1-CR	***8***	*Quantity*	1	1	2	1	1	0	2	66	Medium-Low	2
		Weighted	3	2	4	2	2	0	1	7	**20**	
18-CSX Rail Line/Bus via US 176 F-2 -BRT	***12***	*Quantity*	0	0	3	1	1	0	7	65	Medium-Low	2
		Weighted	0	0	6	2	2	0	4	7	**20**	
19-CSX Rail Line/Bus via US 176 F-2 -DMU	*12*	*Quantity*	0	0	3	1	1	0	7	65	Medium-Low	2
		Weighted	0	0	6	2	2	0	4	7	20	
20-CSX Rail Line/Bus via US 176 F-2-CR	***6***	*Quantity*	0	0	4	1	1	0	0	65	Low	1
		Weighted	0	0	8	2	2	0	0	7	18	

Objective 3.2: Opportunity for Transit Oriented Development

Criteria: Using the scoring criteria identified in the Land Use Analysis, each alternative is ranked based on its ability to meet specified criteria. For detailed information about the methodology used, please reference the Land Use Analysis in Appendix 3-B. The following Table 2-16 provides the TOD Score ranking for each alternative. The TOD scores are given a weight of 2 for the overall land use score.

Scoring:

5- High

4- Medium-High

3-Medium

2-Medium-Low

1-Low

Objective 3.3: Adjacency to Growth Areas

Stakeholders expressed an interest in giving higher priority to corridors that connect to future growth areas. A subjective assessment was conducted in the Land Use Analysis, as shown in the Table 2-16.

Scoring:

5- High

4- Medium-High

3-Medium

2-Medium-Low

1-Low

Table 2 - 16: Land Use Analysis Scoring

	Mode	Alignment	*Activity / Node Access Score*	*Adjacency to 2035 High Density Areas Outside of Peninsula*	*Composite Activity / Node / Density Score*	Station / Node / Activity Center Access Ranking	Avoidance of Significant Prohibitive Zoning / Overlays along Alignment	Avoidance of AICUZ (Air Installation Compatible Use Zone)	Adjacency to Developable Vacant Land	Avoidance of Environmentally Sensitive / Cultural Resource Areas	Composite Land Use Score	Rank (1=Most Suitable)	*Adjacency to Projected Growth Areas Outside of the Corridor?*
A	BRT / LRT	I-26	*14.5*	*4*	*18.5*	Low	Medium	Medium	High	High	11	6	*Y*
B	BRT / LRT	Dorchester Road	*21*	*7*	*28*	High	Low	High	Low	Low	9	8	*N*
C-1	BRT / LRT	US 52 / US 78	*23*	*12*	*35*	High +	Medium	High	Medium	Medium	13	2	*N*
C-2	BRT / LRT	US 52/ US 176	*19*	*8*	*27*	High	High	High	High	Medium	14	1	*Y*
D-1	BRT / LRT	SCE&G Utility Corridor	*13.5*	*5*	*18.5*	Low	Medium	High	High	Medium	11	6	*N*
D-2	BRT / LRT	Santee Cooper Utility Corridor	*11*	*2*	*13*	Low	Low	High	High	Medium	10	9	*Y*
E	CR	Norfolk Southern Rail Line	*18*	*6*	*24*	Medium	High	Medium	High	Medium	12	5	*N*
F-1	BRT & CR	CSX Rail Line/Bus via US 78	*21.5*	*8*	*29.5*	High	High	High	Medium	Medium	13	2	*N*
F-2	BRT & CR	CSX Rail Line/Bus via US 176	*18.5*	*4*	*22.5*	Medium	High	High	High	Medium	13	2	*Y*

High > 25	High 0% - 33.33% affected by TOD prohibitive zoning overlays	High <5% of alignment falls within AICUZ
Medium 20-25	Medium 33.34% - 50% affected by TOD prohibitive zoning overlays	Medium 5% - 19.99% of alignment falls within AICUZ
Low < 20	Low >50% affected by TOD prohibitive zoning overlays	Low >20% of alignment falls within AICUZ

Goal 3 Overall Rankings

The following Table 2-17 shows the overall ranking for each alternative and objective identified under Goal 3. To develop the overall score Objective 3.1 and 3.2 are given a weight of 2 per point; whereas, the Growth Area Adjacency score is given a weight of one.

Table 2 - 17: Goal 3 Overall Rankings

Goal 3: Support Local Land Use Objectives			
Alternative	**Criteria Score**	**Ranking**	**Total Score**
1-I-26 A-BRT	16	Medium	3.2
2-Dorchester Road B-BRT	12	Medium-Low	2.4
3-Dorchester Road B-LRT	12	Medium-Low	2.4
4-US 52 / US 78 C-1 -BRT	20	Medium-High	4.0
5-US 52 / US 78 C-1 -LRT	20	Medium-High	4.0
6-US 52/ US 176 C-2-BRT	22	Medium-High	4.4
7-US 52/ US 176 C-2-LRT	22	Medium-High	4.4
8-SCE&G Utility Corridor D-1-BRT	12	Medium-Low	2.4
9-SCE&G Utility Corridor D-1-LRT	12	Medium-Low	2.4
10-Santee Cooper Utility Corridor D-2-BRT	12	Medium-Low	2.4
11-Santee Cooper Utility Corridor D-2-LRT	12	Medium-Low	2.4
12-Norfolk Southern Rail Line E-BRT	12	Medium-Low	2.4
13-Norfolk Southern Rail Line E-DMU	12	Medium-Low	2.4
14-Norfolk Southern Rail Line E-CR	10	Medium-Low	2.0
15-CSX Rail Line/Bus via US 78 F-1-BRT	14	Medium	2.8
16-CSX Rail Line/Bus via US 78 F-1-DMU	14	Medium	2.8
17-CSX Rail Line/Bus via US 78 F-1-CR	12	Medium-Low	2.4
18-CSX Rail Line/Bus via US 176 F-2 -BRT	16	Medium	3.2
19-CSX Rail Line/Bus via US 176 F-2 -DMU	16	Medium	3.2
20-CSX Rail Line/Bus via US 176 F-2-CR	14	Medium	2.8

2.5.4 Goal 4 – Plan for projected growth in an environmentally sustainable manner.

Goal 4 objectives include minimizing, avoiding, or mitigating adverse impacts to the community and environment, as well as reducing air pollution.

Objective 4.1: Reduce Air Pollution

Criteria: Qualitative assessment of modes ability to improve air quality.

All alternatives are assumed to provide some air quality benefit, with BRT (and the potential for diesel bus emission) being the lowest air quality benefit and commuter rail receiving the highest score for air quality benefit. It is important to note that all four mode choices have a diesel, hybrid and all electric options, and the technology selected will provide greater measures in later screenings.

<u>Scoring:</u>

5-High: Commuter Rail Alternatives

4-Medium High: DMU/LRT Alternatives

3-Medium: BRT Alternatives

Table 2 - 18: Mode Likelihood to Reduce Air Pollution

4.1 Reduce air pollution and emissions		
Alternative	Air Quality Rank	Air Quality Score
1-I-26 A-BRT	Medium	3
2-Dorchester Road B-BRT	Medium	3
3-Dorchester Road B-LRT	Medium-High	4
4-US 52 / US 78 C-1 -BRT	Medium	3
5-US 52 / US 78 C-1 -LRT	Medium-High	4
6-US 52/ US 176 C-2-BRT	Medium	3
7-US 52/ US 176 C-2-LRT	Medium-High	4
8-SCE&G Utility Corridor D-1-BRT	Medium	3
9-SCE&G Utility Corridor D-1-LRT	Medium-High	4
10-Santee Cooper Utility Corridor D-2-BRT	Medium	3
11-Santee Cooper Utility Corridor D-2-LRT	Medium-High	4
12-Norfolk Southern Rail Line E-BRT	Medium	3
13-Norfolk Southern Rail Line E-DMU	Medium-High	4
14-Norfolk Southern Rail Line E-CR	High	5
15-CSX Rail Line/Bus via US 78 F-1-BRT	Medium	3
16-CSX Rail Line/Bus via US 78 F-1-DMU	Medium-High	4
17-CSX Rail Line/Bus via US 78 F-1-CR	High	5
18-CSX Rail Line/Bus via US 176 F-2 -BRT	Medium	3
19-CSX Rail Line/Bus via US 176 F-2 -DMU	Medium-High	4
20-CSX Rail Line/Bus via US 176 F-2-CR	High	5

Objective 4.2: Avoid, minimize, and mitigate adverse impacts on environment and community resources

Criteria:

1) Linear Miles of Wetlands

2) Acres of Wetlands

3) Linear Miles of Historic District/Limited development districts

4) Opportunity for Redevelopment over Greenfield Development

The following describes the environmental and community resource criteria evaluated in Screen One.

1) Linear Miles of Wetlands: This measure includes one-way linear feet for each alignment that travels across a known wetland based on national Department of Natural Resources (DNR) GIS database files. Because of the source of the data, several roadway alignments do not identify any wetlands where preexisting roadways have been constructed across wet areas.

   Scoring:

   5-High: 0 to 2,296 Linear Feet

   4-Medium-High: 2,297 to 4,592 Linear Feet

   3-Medium: 4,593 to 6,889 Linear Feet

   2-Medium-Low: 6,890 to 9,185 Linear Feet

   1-Low: 9,186 to 11,483 Linear Feet

2) Acreage of Wetlands within ½ Mile Radius: Using the same spatial database as described in item 1 above, the total acreage of wetlands was calculated using ½ mile radius around each proposed alternative. The range was equally divided into five categories as described below:

<u>Scoring:</u>

5-High: 1,040 to 1,305 Acres

4-Medium-High: 1,306 to 1,570 Acres

3-Medium: 1,571 to 1,836 Acres

2-Medium-Low: 1,837 to 2,102 Acres

1-Low: 2,103 to 2,368 Acres

3) Linear Miles of Historic District/Limited Development Districts (i.e. Conservation Areas, etc.)

Using data from national GIS and local planning documents as presented in the existing conditions report, the one-way linear miles of historic or restricted development areas are estimated for each alternative. The range is equally divided and scored based on the following:

<u>Scoring</u>

5-High: 0 to 11,389 Linear Feet

4-Medium-High: 11,389 to 22,778 Linear Feet

3-Medium: 22,778 to 34,166 Linear Feet

2-Medium-Low: 34,166 to 45,555 Linear Feet

1-Low: 45,555 to 56,944 Linear Feet

4) Opportunity for Redevelopment over Greenfield Development

Stakeholders have expressed an interest in catalyzing areas with aging development that can support reinvestment. This measure is a subjective look at the corridor land use and opportunity to redevelop existing property as opposed to developing greenfields. Vacant land availability is quantified in the Land Use Analysis. This subjective analysis is scored based on the following.

<u>Scoring:</u>

5-High:

- US 78/US 52: This alignment has aging "suburban" sprawl-like shopping centers and other land uses that are developed but underutilized.
- CSX/US 78: Although much of the CSX alignment is industrial, aging infrastructure and communities adjacent to rail may present opportunities for redevelopment. BRT & LRT could take advantage of localized redevelopment areas at neighborhood stops; however, commuter rail alignments have fewer stops, primarily at key activity centers.

4-Medium High:

- US 176/US 52 Alignments: Although US 176 has vacant greenfield land available, the US 52 corridor is developed with aging centers that are underutilized.
- CSX/US 176: Although much of the CSX alignment is industrial, aging infrastructure is present in communities adjacent to rail. BRT & LRT could take advantage of localized redevelopment areas at neighborhood stops. Commuter rail alignments have fewer stops, primarily at key activity centers.

3- Medium:

- I-26: I-26 travels through segments with vacant land, although some of the centers adjacent are aging centers, as well as newly constructed centers.

2- Medium-Low

- SCE&G & Santee Cooper Utility Corridors: These corridors travel primarily through greenfields and the backs of neighborhoods and businesses, and thus, redevelopment potential is less. Additionally, power lines present limitations to development.

1- Low

- Norfolk Southern: Much of this alignment goes through greenfields or industrial areas not conducive to redevelopment.
- Dorchester Road-Although segments closer to I-526 & I-26 contain suburban shopping centers, much of the corridor is adjacent to single family neighborhoods and are located in an overlay district that limits redevelopment.

Figure 2-4 shows the area used to conduct the spatial analysis. Table 2-19 shows the criteria ranking for Objective 4.2.

Figure 2 - 4: Wetlands, Historic and Conservation Areas

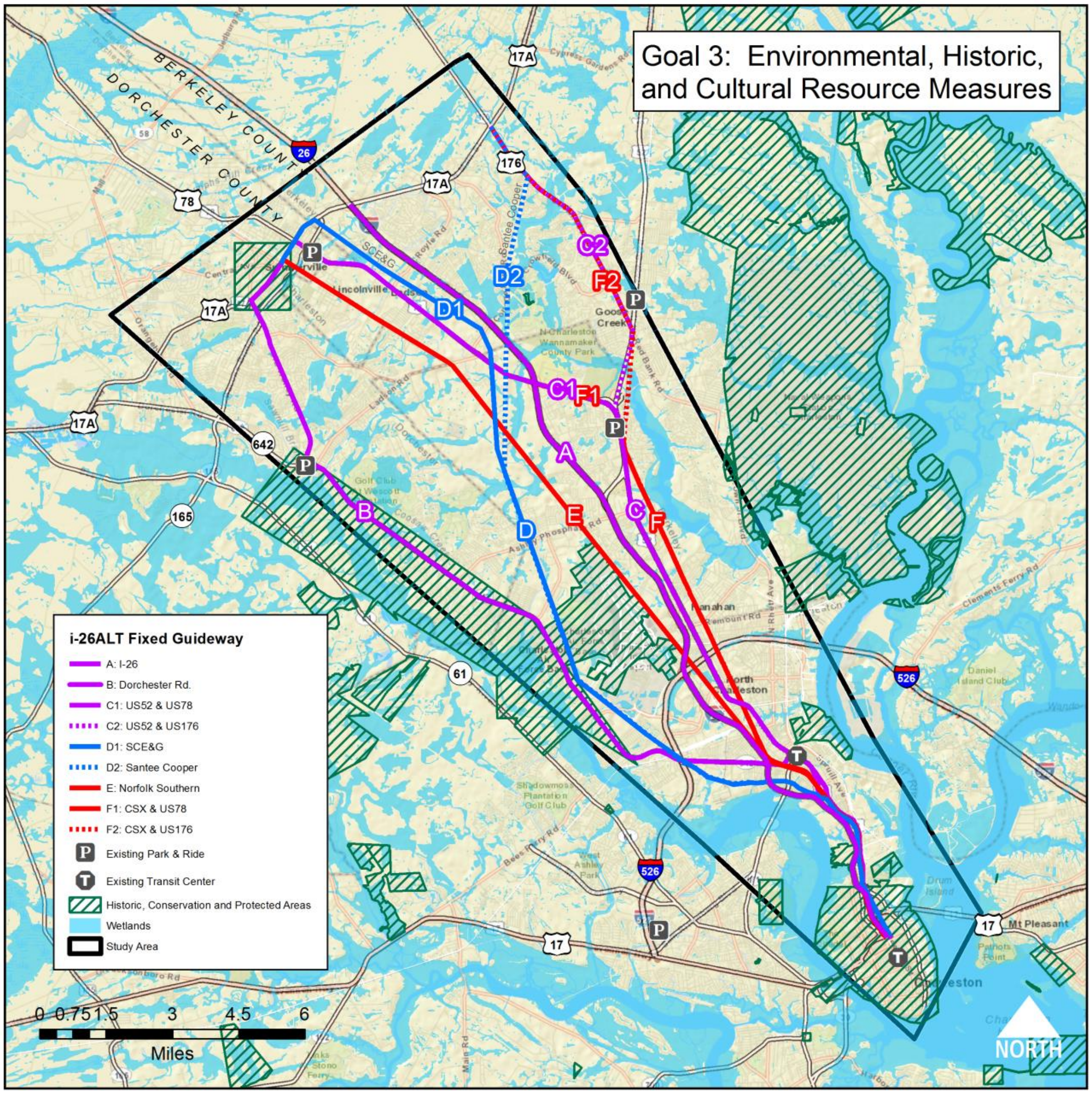


Table 2 - 19: Measures of Environment and Community Impacts

Objective 4.2: Avoid, minimize mitigate adverse impacts on environment and community resources											
Screen 1 Measures	Linear ft. of wetlands crossed by alignments	Linear Wetland Miles Rank	Linear Wetland Miles Score	Acres of Wetlands within 1/2 Mile Radius	1/2 Mile Acres Ranking	1/2 Mile Acres Score	Linear ft. of historic districts/development restricted areas	1/2 Mile Acres Ranking	1/2 Mile Acres Score	Opportunity for Redevelopment	Redevelopment Score
Unit	Linear Ft			Acres			Linear Ft				
1-I-26 A-BRT	227	High	5	1,625	Medium	3	0	High	5	Medium	3
2-Dorchester Road B-BRT	371	High	5	1,614	Medium	3	56,944	Low	1	Low	1
3-Dorchester Road B-LRT	371	High	5	1,614	Medium	3	56,944	Low	1	Low	1
4-US 52 / US 78 C-1 -BRT	262	High	5	1,040	High	5	2,285	High	5	High	5
5-US 52 / US 78 C-1 -LRT	262	High	5	1,040	High	5	2,285	High	5	High	5
6-US 52/ US 176 C-2-BRT	0	High	5	1,510	Medium-High	4	0	High	5	Medium-High	4
7-US 52/ US 176 C-2-LRT	0	High	5	1,510	Medium-High	4	0	High	5	Medium-High	4
8-SCE&G Utility Corridor D-1-BRT	11,483	Low	1	1,742	Medium	3	8,931	High	5	Medium-Low	2
9-SCE&G Utility Corridor D-1-LRT	11,483	Low	1	1,742	Medium	3	8,931	High	5	Medium-Low	2
10-Santee Cooper Utility Corridor D-2-BRT	10,959	Low	1	2,368	Low	1	6,656	High	5	Low	1
11-Santee Cooper Utility Corridor D-2-LRT	10,959	Low	1	2,368	Low	1	6,656	High	5	Low	1
12-Norfolk Southern Rail Line E-BRT	2,312	Medium-High	4	1,078	High	5	1,064	High	5	Low	1
13-Norfolk Southern Rail Line E-DMU	2,312	Medium-High	4	1,078	High	5	1,064	High	5	Low	1
14-Norfolk Southern Rail Line E-CR	2,312	Medium-High	4	1,078	High	5	1,064	High	5	Low	1
15-CSX Rail Line/Bus via US 78 F-1-BRT	1,187	High	5	1,291	High	5	2,285	High	5	High	5
16-CSX Rail Line/Bus via US 78 F-1-DMU	1,187	High	5	1,291	High	5	2,285	High	5	High	5
17-CSX Rail Line/Bus via US 78 F-1-CR	1,187	High	5	1,291	High	5	2,285	High	5	High	5
18-CSX Rail Line/Bus via US 176 F-2 -BRT	4,217	Medium-High	4	1,814	Medium	3	0	High	5	Medium-High	4
19-CSX Rail Line/Bus via US 176 F-2 -DMU	4,217	Medium-High	4	1,814	Medium	3	0	High	5	Medium-High	4
20-CSX Rail Line/Bus via US 176 F-2-CR	4,217	Medium-High	4	1,814	Medium	3	0	High	5	Medium-High	4

Goal 4 Overall Ranking

The following Table 2-20 shows the overall ranking for Goal 4 for each alternative.

Table 2 - 20: Environment and Sustainability Measures

Goal 4: Plan for projected growth in an environmentally sustainable manner			
Alternative	Criteria Score	Ranking	Total Score
1-I-26 A-BRT	19	Medium-High	3.8
2-Dorchester Road B-BRT	13	Medium	2.6
3-Dorchester Road B-LRT	14	Medium	2.8
4-US 52 / US 78 C-1 -BRT	23	High	4.6
5-US 52 / US 78 C-1 -LRT	24	High	4.8
6-US 52/ US 176 C-2-BRT	21	Medium-High	4.2
7-US 52/ US 176 C-2-LRT	22	Medium-High	4.4
8-SCE&G Utility Corridor D-1-BRT	14	Medium	2.8
9-SCE&G Utility Corridor D-1-LRT	15	Medium	3
10-Santee Cooper Utility Corridor D-2-BRT	11	Medium-Low	2.2
11-Santee Cooper Utility Corridor D-2-LRT	12	Medium-Low	2.4
12-Norfolk Southern Rail Line E-BRT	18	Medium-High	3.6
13-Norfolk Southern Rail Line E-DMU	19	Medium-High	3.8
14-Norfolk Southern Rail Line E-CR	20	Medium-High	4
15-CSX Rail Line/Bus via US 78 F-1-BRT	23	High	4.6
16-CSX Rail Line/Bus via US 78 F-1-DMU	24	High	4.8
17-CSX Rail Line/Bus via US 78 F-1-CR	25	High	5
18-CSX Rail Line/Bus via US 176 F-2 -BRT	19	Medium-High	3.8
19-CSX Rail Line/Bus via US 176 F-2 -DMU	20	Medium-High	4
20-CSX Rail Line/Bus via US 176 F-2-CR	21	Medium-High	4.2

2.5.5 Goal 5 – Respond to Community Needs & Support

Goal 5 addresses how well the alternatives serve community needs, as well as identifies the level community support. Criteria include transit dependent populations, consistency with planning studies, fast implementation time, and public meeting responses.

Objective 5.1: Service areas with transit dependent populations

Criteria: Low Income Households & Zero Car Households

Using American Community Survey Data for 2013 and GIS spatial analysis, the total number of households that reported household income below poverty and households with zero cars are summed within a ½ mile radius of each alignment. Table 2-21 shows the rankings. The range is equally divided into five parts and scored as follows.

<u>Scoring</u>

5-High: 3.8% to 4.2%

4-Medium-High: 3.3% to 3.7%

3-Medium: 2.9% to 3.2%

2-Medium-Low: 2.5% to 2.8%

1-Low: 2.1% to 2.4%

Table 2 - 21: Measures of Transit Dependent Populations

Alternative	5.1 Service areas with transit dependent populations								
	Total Households	Number of low income households within 1/2 Mile	% of Study Area Households	Low Income Rank	Low Income Score	Number of zero car households within 1/2 mile	% of Study Area Households	No Vehicle Rank	No Vehicle Score
Unit	HH	HH	%HH			HH	%HH		
1-I-26 A-BRT	14,480	3,361	3.1%	Medium	3	2,008	1.9%	Medium	3
2-Dorchester Road B-BRT	19,276	3,730	3.5%	Medium-High	4	2,258	2.1%	Medium-High	4
3-Dorchester Road B-LRT	19,276	3,730	3.5%	Medium-High	4	2,258	2.1%	Medium-High	4
4-US 52 / US 78 C-1 -BRT	16,717	4,500	4.2%	High	5	2,615	2.4%	High	5
5-US 52 / US 78 C-1 -LRT	16,717	4,500	4.2%	High	5	2,615	2.4%	High	5
6-US 52/ US 176 C-2-BRT	17,138	4,155	3.9%	High	5	2,555	2.4%	High	5
7-US 52/ US 176 C-2-LRT	17,138	4,155	3.9%	High	5	2,555	2.4%	High	5
8-SCE&G Utility Corridor D-1-BRT	12,210	2,453	2.3%	Low	1	1,500	1.4%	Low	1
9-SCE&G Utility Corridor D-1-LRT	12,210	2,453	2.3%	Low	1	1,500	1.4%	Low	1
10-Santee Cooper Utility Corridor D-2-BRT	12,554	2,265	2.1%	Low	1	1,371	1.3%	Low	1
11-Santee Cooper Utility Corridor D-2-LRT	12,554	2,265	2.1%	Low	1	1,371	1.3%	Low	1
12-Norfolk Southern Rail Line E-BRT	11,661	3,181	3.0%	Medium	3	2,093	1.9%	Medium	3
13-Norfolk Southern Rail Line E-DMU	11,661	3,181	3.0%	Medium	3	2,093	1.9%	Medium	3
14-Norfolk Southern Rail Line E-CR	11,661	3,181	3.0%	Medium	3	2,093	1.9%	Medium	3
15-CSX Rail Line/Bus via US 78 F-1-BRT	17,381	4,463	4.1%	High	5	2,552	2.4%	High	5
16-CSX Rail Line/Bus via US 78 F-1-DMU	17,381	4,463	4.1%	High	5	2,552	2.4%	High	5
17-CSX Rail Line/Bus via US 78 F-1-CR	17,381	4,463	4.1%	High	5	2,552	2.4%	High	5
18-CSX Rail Line/Bus via US 176 F-2 -BRT	17,806	4,090	3.8%	High	5	2,491	2.3%	High	5
19-CSX Rail Line/Bus via US 176 F-2 -DMU	17,806	4,090	3.8%	High	5	2,491	2.3%	High	5
20-CSX Rail Line/Bus via US 176 F-2-CR	17,806	4,090	3.8%	High	5	2,491	2.3%	High	5

Objective 5.2: Consistency with Local Plans

This measure evaluates whether an alternative is consistent with local planning studies and referenced in one or more of the following:

1) Long Range Transportation Plan
2) Our Region Our Plan
3) Neck Area Plan
4) Comprehensive Plans
5) Other Relevant Planning Studies

For alternatives that are not recommended based on a planning study, a score of Low is given. For alternatives that are only partially included, the score is reduced by one point. The following Table 2-22 shows the planning studies matrix.

Scoring:

5-High: Alternative is in both Long Range Transportation Plan & Our Region Our Plan

4-Medium-High: Alternative is in either LRTP or OROP and one or more other planning studies

3-Medium: Alternative is partially covered in LRTP & OROP, or identified in more than one other plan (Commuter Rail, Neck Area, Peninsula Study, Comp. Plans, etc.)

2-Medium-Low: Alternative is identified in one of Neck Area Plan, Comprehensive Plans, or other relevant planning studies.

1-Low: Alternative is not recommended in existing planning studies; planning study recommends not implementing.

Table 2 - 22: Measures of Consistency with Planning Studies

5.2 Consistency with local plans							
Screen 1 Measures	LRTP	OROP	Neck Area/LAMC Plans	Other Plans (Commuter Rail, Peninsula Study, Comp Plans)	Plans not recommending	Consistency Ranking	Consistency Score
1-I-26 A-BRT		1			1	Low	1
2-Dorchester Road B-BRT				1*Partial		Medium-Low	2
3-Dorchester Road B-LRT				1* Partial		Medium-Low	2
4-US 52 / US 78 C-1 -BRT	1	1	1			High	5
5-US 52 / US 78 C-1 -LRT	1	1	1			High	5
6-US 52/ US 176 C-2-BRT				2* Partial		Medium	3
7-US 52/ US 176 C-2-LRT				2* Partial		Medium	3
8-SCE&G Utility Corridor D-1-BRT						Low	1
9-SCE&G Utility Corridor D-1-LRT						Low	1
10-Santee Cooper Utility Corridor D-2-BRT						Low	1
11-Santee Cooper Utility Corridor D-2-LRT						Low	1
12-Norfolk Southern Rail Line E-BRT	1	1		1		High	5
13-Norfolk Southern Rail Line E-DMU	1	1		1		High	5
14-Norfolk Southern Rail Line E-CR	1	1		1		High	5
15-CSX Rail Line/Bus via US 78 F-1-BRT	1	1		1		High	5
16-CSX Rail Line/Bus via US 78 F-1-DMU	1	1		1		High	5
17-CSX Rail Line/Bus via US 78 F-1-CR	1	1		1		High	5
18-CSX Rail Line/Bus via US 176 F-2 -BRT				2* Partial		Medium	4
19-CSX Rail Line/Bus via US 176 F-2 -DMU				2* Partial		Medium	4
20-CSX Rail Line/Bus via US 176 F-2-CR				2* Partial		Medium	4

Objective 5.3: Implementation Time Is Fast

Criteria: Average Years to Implement

Stakeholders and public have identified the desire to implement a project that can be completed quickly. Based on typical implementation times and the corridor alignments, the following assumptions are made on the various alignments and modes as described below and in Table 2-23.

Scoring

5-High: 2 to 4 Years (BRT in Road Alignments)

4-Medium High: 4-6 Years (BRT Utility Corridors)

3-Medium: 6-8 Years (LRT in Road Alignments)

2-Medium-Low: 8 -10 Years (BRT & LRT in Parallel Rail Corridors; LRT in Utility Corridors; BRT on I-26)

1- Low: 10+ Years (Commuter Rail in Freight ROW)

Table 2 - 23: Typical Implementation Time

5.3 Implementation Time (Avg. Years)		
Alternative	Implementation Time Rank	Implementation Time Score
1-I-26 A-BRT	Medium-Low	2
2-Dorchester Road B-BRT	High	5
3-Dorchester Road B-LRT	Medium	3
4-US 52 / US 78 C-1 -BRT	High	5
5-US 52 / US 78 C-1 -LRT	Medium	3
6-US 52/ US 176 C-2-BRT	High	5
7-US 52/ US 176 C-2-LRT	Medium	3
8-SCE&G Utility Corridor D-1-BRT	Medium-High	4
9-SCE&G Utility Corridor D-1-LRT	Medium Low	2
10-Santee Cooper Utility Corridor D-2-BRT	Medium-High	4
11-Santee Cooper Utility Corridor D-2-LRT	Medium-Low	2
12-Norfolk Southern Rail Line E-BRT	Medium-Low	2
13-Norfolk Southern Rail Line E-DMU	Medium-Low	2
14-Norfolk Southern Rail Line E-CR	Low	1
15-CSX Rail Line/Bus via US 78 F-1-BRT	Medium-Low	2
16-CSX Rail Line/Bus via US 78 F-1-DMU	Medium-Low	2
17-CSX Rail Line/Bus via US 78 F-1-CR	Low	1
18-CSX Rail Line/Bus via US 176 F-2 -BRT	Medium-Low	2
19-CSX Rail Line/Bus via US 176 F-2 -DMU	Medium-Low	2
20-CSX Rail Line/Bus via US 176 F-2-CR	Low	1

Objective 5.4: Public Response

Criteria: Public Meeting Response

During the public meetings in April, meeting attendees were asked to pick an alignment/mode on a series of boards based on their preference. A total of 67 responses were received from a high of 18 votes to a low of zero votes. Votes are ranked based on an equal division of the range as described below. Table 2-24 shows the total votes and quantities for each alternative.

Scoring:

5-High: 15 to 18 Votes

4-Medium High 11 to 14 Votes

3-Medium: 8 to 10 Votes

2: Medium-Low: 4 to 7 Votes

1: Low: 0 to 3 Votes

Table 2 - 24: Measures of Public Response

Alternative	5.4 Public Response		
	Public Meeting Votes	Public Meeting Rank	Public Meeting Score
Total Votes	67		
1-I-26 A-BRT	0	Low	1
2-Dorchester Road B-BRT	0	Low	1
3-Dorchester Road B-LRT	2	Low	1
4-US 52 / US 78 C-1 -BRT	18	High	5
5-US 52 / US 78 C-1 -LRT	9	Medium	3
6-US 52/ US 176 C-2-BRT	0	Low	1
7-US 52/ US 176 C-2-LRT	0	Low	1
8-SCE&G Utility Corridor D-1-BRT	6	Medium-Low	2
9-SCE&G Utility Corridor D-1-LRT	3	Low	1
10-Santee Cooper Utility Corridor D-2-BRT	0	Low	1
11-Santee Cooper Utility Corridor D-2-LRT	2	Low	1
12-Norfolk Southern Rail Line E-BRT	3	Low	1
13-Norfolk Southern Rail Line E-DMU	3	Low	1
14-Norfolk Southern Rail Line E-CR	3	Low	1
15-CSX Rail Line/Bus via US 78 F-1-BRT	3	Low	1
16-CSX Rail Line/Bus via US 78 F-1-DMU	3	Low	1
17-CSX Rail Line/Bus via US 78 F-1-CR	3	Low	1
18-CSX Rail Line/Bus via US 176 F-2 -BRT	3	Low	1
19-CSX Rail Line/Bus via US 176 F-2 -DMU	3	Low	1
20-CSX Rail Line/Bus via US 176 F-2-CR	3	Low	1

Goal 5 Overall Ranking

The following Table 2-25 shows the overall ranking for each alternative and objective under Goal 5.

Table 2 - 25: Overall Community Rankings

Goal 5: Respond to community needs and support			
Alternative	Criteria Score	Ranking	Total Score
1-I-26 A-BRT	10	Medium-Low	2
2-Dorchester Road B-BRT	16	Medium	3.2
3-Dorchester Road B-LRT	14	Medium	2.8
4-US 52 / US 78 C-1 -BRT	25	High	5
5-US 52 / US 78 C-1 -LRT	21	Medium-High	4.2
6-US 52/ US 176 C-2-BRT	19	Medium-High	3.8
7-US 52/ US 176 C-2-LRT	17	Medium	3.4
8-SCE&G Utility Corridor D-1-BRT	9	Medium-Low	1.8
9-SCE&G Utility Corridor D-1-LRT	6	Low	1.2
10-Santee Cooper Utility Corridor D-2-BRT	8	Medium-Low	1.6
11-Santee Cooper Utility Corridor D-2-LRT	6	Low	1.2
12-Norfolk Southern Rail Line E-BRT	14	Medium	2.8
13-Norfolk Southern Rail Line E-DMU	14	Medium	2.8
14-Norfolk Southern Rail Line E-CR	13	Medium	2.6
15-CSX Rail Line/Bus via US 78 F-1-BRT	18	Medium-High	3.6
16-CSX Rail Line/Bus via US 78 F-1-DMU	18	Medium-High	3.6
17-CSX Rail Line/Bus via US 78 F-1-CR	17	Medium	3.4
18-CSX Rail Line/Bus via US 176 F-2 -BRT	16	Medium	3.2
19-CSX Rail Line/Bus via US 176 F-2 -DMU	16	Medium	3.2
20-CSX Rail Line/Bus via US 176 F-2-CR	15	Medium	3.0

2.5.6 Goal 6 – Support a diverse Regional Economy

This goal is intended to capture the economic development priority to connect people to jobs using quantitative measures from the 2010 and 2035 travel demand model and qualitative anticipated mode share.

Objective 6.1: Areas with greatest density of jobs and employment

Several criteria are used to identify coverage of areas with the greatest density of jobs and employment within ½ mile radius of the alignments.

1) Total Households per Acre. The total households per acre are counted within ½ mile radius of each alternative by TAZ for 2010 and 2035. Each is weighted by 0.5 to be consistent with FTA practices for current and horizon year estimates. Household totals are scored based on equal divisions of the range as follows:

5-High:	20,871-22,439 Total Households
4: Medium-High:	19,302 to 20,870 Total Households
3: Medium:	17,733 to 19,201 Total Households
2: Medium-Low:	16,165 to 17,732 Total Households
1: Low:	14,596 to 16,164 total Households

2) Using the same methodology as described above, total employment for 2010 and 2035 by TAZ is summed and weighted for each alternative. Employment total ranges are scored based on equal divisions of the following:

5-High:	37,250 to 40,349
4-Medium-High:	34,150 to 37,249
3-Medium:	31,050 to 34,149
2-Medium-Low:	27,951 to 31,050
1-Low:	24,851 to 27,950

3) Employment densities are also estimated for each alternative based on Jobs per Acre within ½ mile radius for 2035 and 2010. Each is weighted by .5 to determine current year and horizon year employment densities. The range is scored based on equal intervals as follows:

5-High:	2.6 to 2.8
4-Medium-High:	2. 4 to 2.6
3-Medium:	2.2 to 2.4
2: Medium-Low:	1.9 to 2.2
1: Low:	1.7 to 1.9

4) Change in Employment: To capture the future growth in the corridor, change in employment is estimated for each alternative from 2010 to 2035 by TAZ. The percent change in employment is scored based on equal intervals of the range.

5-High:	37.0 to 43.9%
4-Medium-High:	30.1 to 37.0%
3-Medium:	23.2 to 30.1%
2-Medium-Low:	16.4 to 12.2%
1-Low:	9.5 to 16.4%

The following Table 2-26 shows the measures for Objective 6.1

Table 2 - 26: Household and Employment by TAZ (2010 & 2035)

6.1 Areas with greatest density of Jobs and Employment

Alternative	1/2 Mile Area	Number of Household w/in 1/2 Mile		Weighted 2 to 1 2010 to 2035	Households Rank	Households Score	Number of Jobs w/in 1/2 Mile		Weighted 2 to 1 2010 to 2035	Jobs Rank	Jobs Score	Jobs Per Acre		Weighted Job Density	Job Density Rank	Job Density Score	% Change in Employment	% Employment Change Rank	% Employment Change Score
Weight		0.5	0.5				0.5	0.5				0.5	0.5						
Unit	Acre	2010	2035	Weighted			2010	2035				2010	2035						
1-I-26 A-BRT	13,667	14,529	20,062	17,295	Medium Low	2	33,487	42,521	38,004	High	5	2.5	3.1	2.8	High	5	27.0%	Medium	3
2-Dorchester Road B-BRT	15,040	20,388	24,490	22,439	High	5	25,262	28,094	26,678	Low	1	1.7	1.9	1.8	Low	1	11.2%	Low	1
3-Dorchester Road B-LRT	15,040	20,388	24,490	22,439	High	5	25,262	28,094	26,678	Low	1	1.7	1.9	1.8	Low	1	11.2%	Low	1
4-US 52 / US 78 C-1 -BRT	14,348	15,853	20,165	18,009	Medium	3	37,035	43,664	40,349	High	5	2.6	3.0	2.8	High	5	17.9%	Medium	3
5-US 52 / US 78 C-1 -LRT	14,348	15,853	20,165	18,009	Medium	3	37,035	43,664	40,349	High	1	2.6	3.0	2.8	High	5	17.9%	Medium	3
6-US 52/ US 176 C-2-BRT	13,474	16,400	19,220	17,810	Medium	3	32,123	35,421	33,772	Medium	3	2.4	2.6	2.5	Medium-High	4	10.3%	Low	1
7-US 52/ US 176 C-2-LRT	13,474	16,400	19,220	17,810	Medium	3	32,123	35,421	33,772	Medium	3	2.4	2.6	2.5	Medium-High	4	10.3%	Low	1
8-SCE&G Utility Corridor D-1-BRT	15,133	12,374	17,118	14,746	Low	1	25,836	34,763	30,300	Medium-Low	2	1.7	2.3	2.0	Medium-Low	2	34.5%	Medium-High	4
9-SCE&G Utility Corridor D-1-LRT	15,133	12,374	17,118	14,746	Low	1	25,836	34,763	30,300	Medium-Low	2	1.7	2.3	2.0	Medium-Low	2	34.5%	Medium-High	4
10-Santee Cooper Utility Corridor D-2-BRT	14,533	12,907	17,659	15,283	Low	1	20,379	29,323	24,851	Low	1	1.4	2.0	1.7	Low	1	43.9%	High	5
11-Santee Cooper Utility Corridor D-2-LRT	14,533	12,907	17,659	15,283	Low	1	20,379	29,323	24,851	Low	1	1.4	2.0	1.7	Low	1	43.9%	High	5
12-Norfolk Southern Rail Line E-BRT	13,257	11,776	17,416	14,596	Low	1	29,222	38,275	33,748	Medium	3	2.2	2.9	2.5	Medium-High	4	31.0%	Medium-High	4
13-Norfolk Southern Rail Line E-DMU	13,257	11,776	17,416	14,596	Low	1	29,222	38,275	33,748	Medium	3	2.2	2.9	2.5	Medium-High	4	31.0%	Medium-High	4
14-Norfolk Southern Rail Line E-CR	13,257	11,776	17,416	14,596	Low	1	29,222	38,275	33,748	Medium	3	2.2	2.9	2.5	Medium-High	4	31.0%	Medium-High	4
15-CSX Rail Line/Bus via US 78 F-1-BRT	14,296	16,838	20,800	18,819	Medium	3	30,203	35,968	33,085	Medium	3	2.1	2.5	2.3	Medium	3	19.1%	Medium	3
16-CSX Rail Line/Bus via US 78 F-1-DMU	14,296	16,838	20,800	18,819	Medium	3	30,203	35,968	33,085	Medium	3	2.1	2.5	2.3	Medium	3	19.1%	Medium	3
17-CSX Rail Line/Bus via US 78 F-1-CR	14,296	16,838	20,800	18,819	Medium	3	30,203	35,968	33,085	Medium	3	2.1	2.5	2.3	Medium	3	19.1%	Medium	3
18-CSX Rail Line/Bus via US 176 F-2 -BRT	13,390	17,341	19,798	18,569	Medium	3	25,270	27,667	26,469	Low	1	1.9	2.1	2.0	Medium-Low	2	9.5%	Low	1
19-CSX Rail Line/Bus via US 176 F-2 -DMU	13,390	17,341	19,798	18,569	Medium	3	25,270	27,667	26,469	Low	1	1.9	2.1	2.0	Medium-Low	2	9.5%	Low	1
20-CSX Rail Line/Bus via US 176 F-2-CR	13,390	17,341	19,798	18,569	Medium	3	25,270	27,667	26,469	Low	1	1.9	2.1	2.0	Medium-Low	2	9.5%	Low	1

Objective 6.2: Increase transit mode share for work trips

Criteria: Typical Passengers per hour based on peer city review

For this planning level screening, the typical passengers per hour measure for each mode under consideration, based on the Peer Review in Appendix 3-A, is rated from highest to lowest, as described below. Table 2-27 shows the corridor rankings for this measure.

Scoring

5-High: LRT

4-Medium High: BRT

3-Medium: DMU

2: Medium Low: CR

Table 2 - 27: Peer System Average Passengers per Hour

6.2 Increase transit mode share for works trips			
Alternative	**Passengers per Hour**	**Passenger per Hour Rank**	**Passengers per Hour Score**
1-I-26 A-BRT	60.7	Medium-High	5
2-Dorchester Road B-BRT	60.7	Medium-High	1
3-Dorchester Road B-LRT	67.9	High	1
4-US 52 / US 78 C-1 -BRT	60.7	Medium-High	5
5-US 52 / US 78 C-1 -LRT	67.9	High	5
6-US 52/ US 176 C-2-BRT	60.7	Medium-High	4
7-US 52/ US 176 C-2-LRT	67.9	High	4
8-SCE&G Utility Corridor D-1-BRT	60.7	Medium-High	2
9-SCE&G Utility Corridor D-1-LRT	67.9	High	2
10-Santee Cooper Utility Corridor D-2-BRT	60.7	Medium-High	1
11-Santee Cooper Utility Corridor D-2-LRT	67.9	High	1
12-Norfolk Southern Rail Line E-BRT	60.7	Medium-High	4
13-Norfolk Southern Rail Line E-DMU	59.3	Medium	4
14-Norfolk Southern Rail Line E-CR	32.2	Medium-Low	4
15-CSX Rail Line/Bus via US 78 F-1-BRT	60.7	Medium-High	3
16-CSX Rail Line/Bus via US 78 F-1-DMU	59.3	Medium	3
17-CSX Rail Line/Bus via US 78 F-1-CR	32.2	Medium-Low	3
18-CSX Rail Line/Bus via US 176 F-2 -BRT	60.7	Medium-High	2
19-CSX Rail Line/Bus via US 176 F-2 -DMU	59.3	Medium	2
20-CSX Rail Line/Bus via US 176 F-2-CR	32.2	Medium-Low	2

Goal 6 Overall Ranking

The following Table 2-28 presents the overall ranking for each alternative for the combined objectives in Goal 6.

Table 2 - 28: Overall Rankings for Goal 6

Goal 6: Support a diverse regional economy			
Alternative	**Criteria Score**	**Ranking**	**Total Score**
1-I-26 A-BRT	19	Medium-High	3.8
2-Dorchester Road B-BRT	12	Medium-Low	2.4
3-Dorchester Road B-LRT	13	Medium	2.6
4-US 52 / US 78 C-1 -BRT	20	Medium-High	4.0
5-US 52 / US 78 C-1 -LRT	17	Medium	3.4
6-US 52/ US 176 C-2-BRT	15	Medium	3.0
7-US 52/ US 176 C-2-LRT	16	Medium	3.2
8-SCE&G Utility Corridor D-1-BRT	11	Medium-Low	2.2
9-SCE&G Utility Corridor D-1-LRT	14	Medium	2.8
10-Santee Cooper Utility Corridor D-2-BRT	12	Medium-Low	2.4
11-Santee Cooper Utility Corridor D-2-LRT	13	Medium	2.6
12-Norfolk Southern Rail Line E-BRT	16	Medium	3.2
13-Norfolk Southern Rail Line E-DMU	16	Medium	3.2
14-Norfolk Southern Rail Line E-CR	16	Medium	3.2
15-CSX Rail Line/Bus via US 78 F-1-BRT	16	Medium	3.2
16-CSX Rail Line/Bus via US 78 F-1-DMU	15	Medium	3.0
17-CSX Rail Line/Bus via US 78 F-1-CR	14	Medium	2.8
18-CSX Rail Line/Bus via US 176 F-2 -BRT	11	Medium-Low	2.2
19-CSX Rail Line/Bus via US 176 F-2 -DMU	10	Medium-Low	2.0
20-CSX Rail Line/Bus via US 176 F-2-CR	9	Medium-Low	1.8

2.6 Alternative Overall Rankings

The following Table 2-29 presents the overall rankings for each corridor for all six goals identified. Each goal is given an equal weight of 0.14 with the exception of Goal 2, promote a cost effective and financially feasible alternative, which is given a weight of 0.29. Goal 2 receives a higher weight because FTA criteria weighs financial capacity a 50 percent of the overall score, with the remaining criteria making up the other 50 percent. Additionally, the steering committee identified a cost effective and financially feasible alternative as the most important objective. As such, Goal 2 receives a higher weight to capture both the federal and local objectives. Each alternative is ranked based on equal intervals of the score from high to low, as well as ranking from 1 to 20.

Table 2 - 29: Screen One Alternative Goals 1 through 6 Combined Scores (By Rank)

Alternative	I-26 ALT Screen One Goals						Screen One Overall Scoring			
	Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	Goal 2: Promote a cost effective and financially feasible transit alternative	Goal 3: Support Local Land Use Objectives	Goal 4: Plan for projected growth in an environmentally sustainable manner	Goal 5: Respond to community needs and support	Goal 6: Support a diverse regional economy	Total Score (Out of 175)	Rank (1-20)	Score (1-5) Low to High	Score (1-5) Number Equivalent
4-US 52 / US 78 C-1 -BRT	22	23	20	23	25	20	157	1	Medium-High	4
6-US 52/ US 176 C-2-BRT	21	25	22	21	19	15	148	2	Medium-High	4
5-US 52 / US 78 C-1 -LRT	22	15	20	24	21	17	133	3	Medium-High	4
7-US 52/ US 176 C-2-LRT	21	16	22	22	17	16	131	4	Medium-High	4
15-CSX Rail Line/Bus via US 78 F-1-BRT	19	17	14	23	18	16	124	5	Medium-High	4
2-Dorchester Road B-BRT	17	23	12	13	16	12	116	6	Medium	3
1-I-26 A-BRT	16	18	16	19	10	19	115	7	Medium	3
18-CSX Rail Line/Bus via US 176 F-2 -BRT	19	17	16	19	16	11	115	8	Medium	3
16-CSX Rail Line/Bus via US 78 F-1-DMU	19	8	14	24	18	15	107	9	Medium	3
12-Norfolk Southern Rail Line E-BRT	12	17	12	18	14	16	106	10	Medium	3
3-Dorchester Road B-LRT	19	14	12	14	14	13	100	11	Medium	3
19-CSX Rail Line/Bus via US 176 F-2 -DMU	18	8	16	20	16	10	97	12	Medium	3
17-CSX Rail Line/Bus via US 78 F-1-CR	15	6	12	25	17	14	94	13	Medium	3
10-Santee Cooper Utility Corridor D-2-BRT	11	20	12	11	8	12	94	14	Medium	3
8-SCE&G Utility Corridor D-1-BRT	9	19	12	14	9	11	93	15	Medium	3
13-Norfolk Southern Rail Line E-DMU	10	8	12	19	14	16	88	16	Medium	3
20-CSX Rail Line/Bus via US 176 F-2-CR	14	6	14	21	15	9	84	17	Medium-Low	2
14-Norfolk Southern Rail Line E-CR	10	6	10	20	13	16	80	18	Medium-Low	2
9-SCE&G Utility Corridor D-1-LRT	9	11	12	15	6	14	79	19	Medium-Low	2
11-Santee Cooper Utility Corridor D-2-LRT	11	11	12	12	6	13	77	20	Medium-Low	2

Alternatives ranked one through six, highlighted in green, are selected to move forward into Screen Two.

3 Screen One Alternatives Ranking Summary

The following summarizes the Screen One Analysis for each Alternative. Table 3-1 provides the overall Scoring. This is followed by individual profiles for each alternative.

Screen One Alternatives

- 1-I-26 (A)-BRT
- 2-Dorchester Road (B)-BRT
- 3-Dorchester Road (B)-LRT
- 4-US 52 / US 78 (C1)-BRT
- 5-US 52 / US 78 (C1)-LRT
- 6-US 52/ US 176 (C2)-BRT
- 7-US 52/ US 176 (C2)-LRT
- 8-SCE&G Utility Corridor (D1)-BRT
- 9-SCE&G Utility Corridor (D1)-LRT
- 10-Santee Cooper Utility Corridor (D2)-BRT
- 11-Santee Cooper Utility Corridor (D2)-LRT
- 12-Norfolk Southern Rail Line (E)-BRT
- 13-Norfolk Southern Rail Line (E)-DMU
- 14-Norfolk Southern Rail Line (E)-CR
- 15-CSX Rail Line/Bus via US 78 (F1)-BRT
- 16-CSX Rail Line/Bus via US 78 (F1)-DMU
- 17-CSX Rail Line/Bus via US 78 (F1)-CR
- 18-CSX Rail Line/Bus via US 176 (F2)-BRT
- 19-CSX Rail Line/Bus via US 176 (F2)-DMU
- 20-CSX Rail Line/Bus via US 176 (F2)-CR

3.1 No Build

The no build alternative includes CARTA Express Route 1-North Charleston and Express Route -3 to Summerville. A 20-Year Comprehensive Operational Analysis being conducted concurrent with this process for CARTA will identify any additional commuter bus services for inclusion in the no build scenario.

3.2 I-26ALT Build Alternatives

The following summarizes the Screen One build alternatives.

Table 3 - 1: Screen One Alternatives Overall Scoring

Alternative	I-26 ALT Screen One Goals						Screen One Overall Scoring			
	Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	Goal 2: Promote a cost effective and financially feasible transit alternative	Goal 3: Support Local Land Use Objectives	Goal 4: Plan for projected growth in an environmentally sustainable manner	Goal 5: Respond to community needs and support	Goal 6: Support a diverse regional economy	Total Score (Out of 175)	Rank (1-20)	Score (1-5) Low to High	Score (1-5) Number Equivalent
4-US 52 / US 78 C-1 -BRT	22	23	20	23	25	20	157	1	Medium-High	4
6-US 52/ US 176 C-2-BRT	21	25	22	21	19	15	148	2	Medium-High	4
5-US 52 / US 78 C-1 -LRT	22	15	20	24	21	17	133	3	Medium-High	4
7-US 52/ US 176 C-2-LRT	21	16	22	22	17	16	131	4	Medium-High	4
15-CSX Rail Line/Bus via US 78 F-1-BRT	19	17	14	23	18	16	124	5	Medium-High	4
2-Dorchester Road B-BRT	17	23	12	13	16	12	116	6	Medium	3
1-I-26 A-BRT	16	18	16	19	10	19	115	7	Medium	3
18-CSX Rail Line/Bus via US 176 F-2 -BRT	19	17	16	19	16	11	115	8	Medium	3
16-CSX Rail Line/Bus via US 78 F-1-DMU	19	8	14	24	18	15	107	9	Medium	3
12-Norfolk Southern Rail Line E-BRT	12	17	12	18	14	16	106	10	Medium	3
3-Dorchester Road B-LRT	19	14	12	14	14	13	100	11	Medium	3
19-CSX Rail Line/Bus via US 176 F-2 -DMU	18	8	16	20	16	10	97	12	Medium	3
17-CSX Rail Line/Bus via US 78 F-1-CR	15	6	12	25	17	14	94	13	Medium	3
10-Santee Cooper Utility Corridor D-2-BRT	11	20	12	11	8	12	94	14	Medium	3
8-SCE&G Utility Corridor D-1-BRT	9	19	12	14	9	11	93	15	Medium	3
13-Norfolk Southern Rail Line E-DMU	10	8	12	19	14	16	88	16	Medium	3
20-CSX Rail Line/Bus via US 176 F-2-CR	14	6	14	21	15	9	84	17	Medium-Low	2
14-Norfolk Southern Rail Line E-CR	10	6	10	20	13	16	80	18	Medium-Low	2
9-SCE&G Utility Corridor D-1-LRT	9	11	12	15	6	14	79	19	Medium-Low	2
11-Santee Cooper Utility Corridor D-2-LRT	11	11	12	12	6	13	77	20	Medium-Low	2

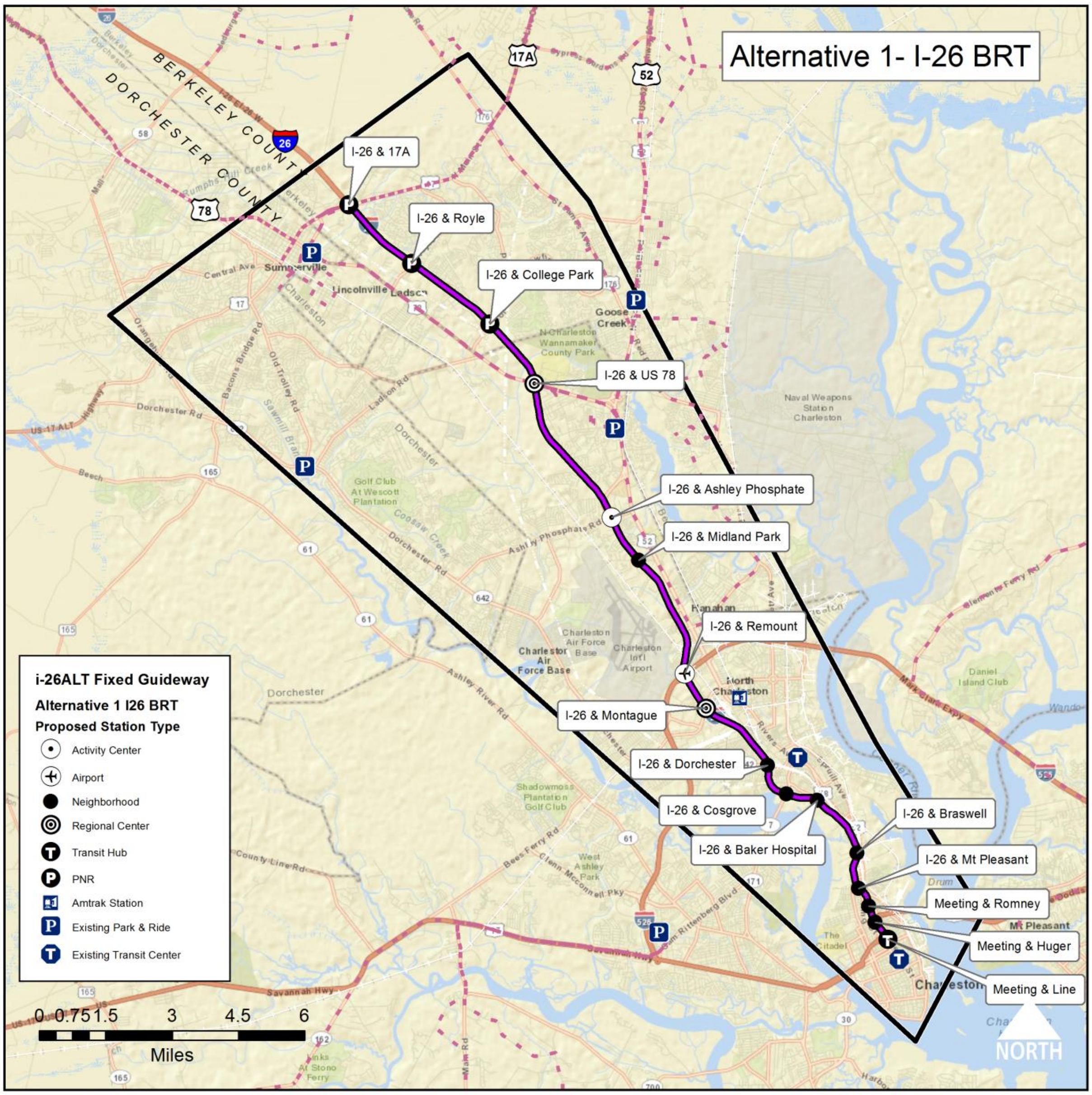
3.2.1 Alternative 1: I-26 Bus Rapid Transit

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 1 is Bus Rapid Transit on I-26 from US 17A in Summerville to Line Street in DT Charleston:

- Overall Screen 1 Score: Medium (115 Total PTs)
- Overall Screen 1 Ranking: #7 out of 20

I-26 BRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	16
Goal 2: Promote a cost effective and financially feasible transit alternative	18
Goal 3: Support local land use objectives	16
Goal 4: Plan for projected growth in an environmentally sustainable manner	19
Goal 5: Respond to community needs and support	10
Goal 6: Support a diverse regional economy	19
Total Score (Out of 150)	**115**
Rank (1-20)	**7**
Rank (1-5) Low to High	**Medium**
Rank (1-5) Number Equivalent	**3.3**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**High**
Total Number of Transit Routes	22
1.2 Increase transit travel time to be competitive with automobile	**Medium-Low**
1.3 Improve efficiency of transit service	**Medium-Low**
% of Systemwide Transit Ridership on Corridor	1.4%
1.4 Reduce traffic congestion (Subjective Assessment	**Medium-Low**
Change in AADT Traffic along 17A to Ashley Phosphate	80,000
Typical Average Daily Passengers for Peer System	9,135
Average Daily Passenger per Change in AADT	11%
1.5 Flexibility to expand/extend to regional corridors	**High**
Total Goal 1 Score	**16**
Total Goal 1 Ranking	**Medium**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Medium-High**
Capital Construction Cost per Mile	$17.04
Typical Federal Share	63%
Estimated Project Capital Cost (In Millions)	$371.13
Estimated Local Need	$137.32
Rank of Local Need (1-20)	5
2.1b: Operating Costs	**High**
1) Operating Cost Hour	$119.41
2) Operating Cost per Mile	$10.80
3) Operating Cost per Passenger	$2.15
Ranking Sum of 3 Variables	15
2.2 Technically feasible alternative	**Low**

1) Miles of Elevated Alignment	5
2) Quantities of Overpasses	18
3) Major Obstacles to Construction	H
2.2 Constructability Score	1
2.3 Financially feasible alternative	**Medium**
Financially Feasible Score	3
2.4 Alternative that will compete for federal funds	**High**
Number of New Starts & Small Starts in CIG Program	19
2.4 FTA Competitiveness Score	**5**
Total Goal 2 Score	**18**
Total Goal 2 Ranking	**Medium-High**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-High**
Total Stops	16
Total Activity Centers Served	47
Weighted Score	26
3.2 Opportunity for Transit Oriented Development	**Medium-Low**
TOD Score (From Land Use Analysis)	11
3.3 Adjacency to Growth Areas	**Medium-High**
Total Goal 3 Score	**16**
Total Goal 3 Ranking	**Medium**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium**
Air Quality Score	3
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	High
Total Linear Feet Crossed	227
Acres of Wetlands within 1/2 Mile Radius	Medium
Acres of Wetlands within 1/2 Mile Radius	1,625
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	0
Opportunity for redevelopment	Medium
Redevelopment Score	3
Total Goal 4 Score	**19**
Total Goal 4 Ranking	**Medium-High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**Medium**
% of Households with Low Income w/in 1/2 Mile	3.1%
% of Households with No Vehicle Access w/in 1/2 Mile	1.9%
5.2 Consistency with local plans	**Low**
5.3 Implementation Time	**Medium-Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	0
Total Goal 5 Score	**10**
Total Goal 5 Ranking	**Medium-Low**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Medium Low
Weighted 2010 & 2035 Total	17,295
Number of Jobs w/in 1/2 Mile	High
Weighted 2010 & 2035 Total	38,004
Jobs per Acre	High
Weighted 2010 & 2035 Total	2.8
Change in Employment	Medium
% Change in Employment from 2010 to 2035	27.0%
6.2 Increase transit mode share for works trips	**Medium-High**
Passengers per Hour	60.7
Total Goal 6 Score	**19**
Total Goal 6 Ranking	**Medium-High**

Due to the challenges with widening and public response to taking a lane of I-26, it is not recommended that this alternative move forward. Commuter bus service in existing lanes will be included in Screen Two as the no build.

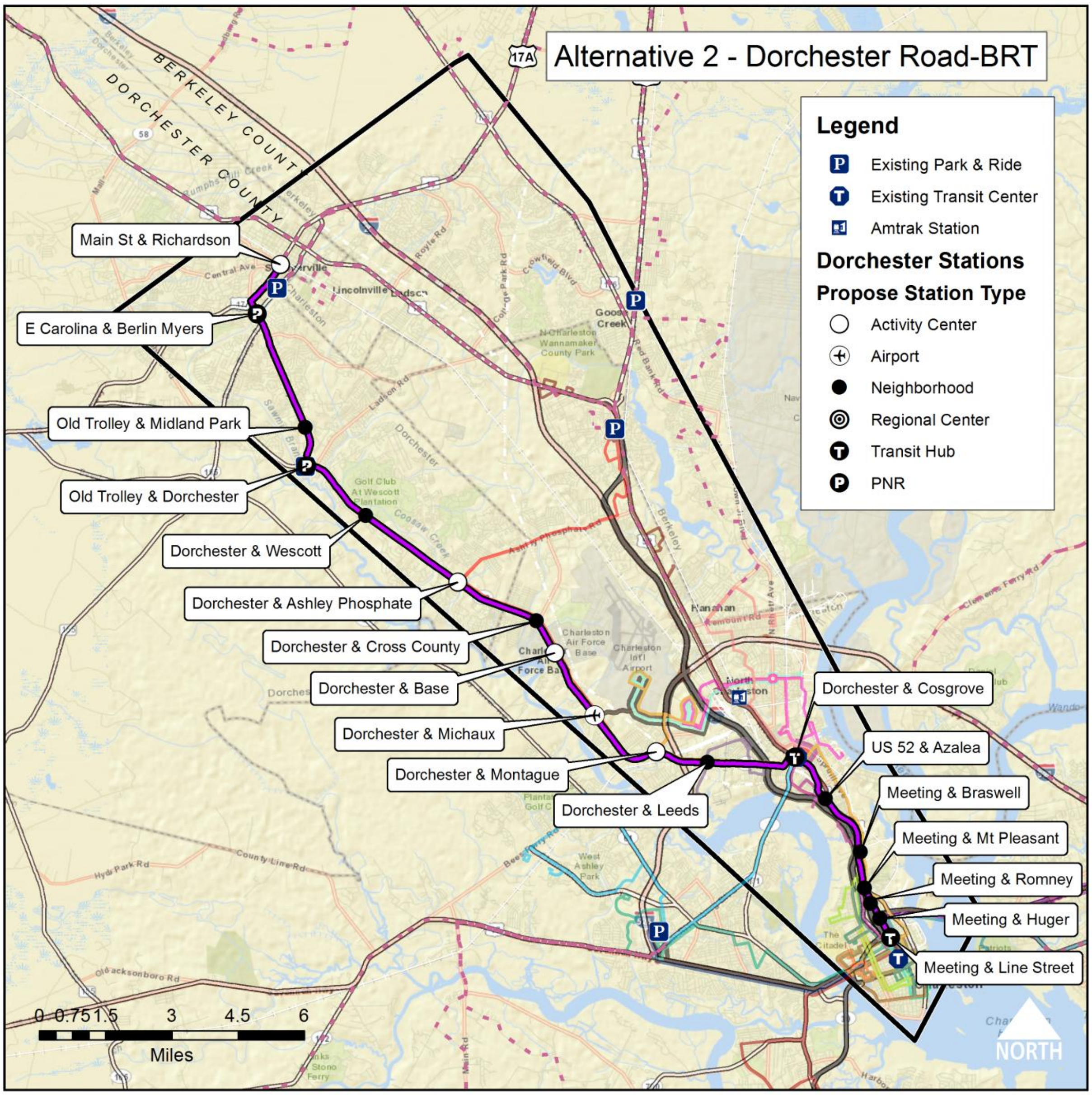
3.2.2 Alternative 2: Dorchester Road Bus Rapid Transit

Steering Committee Recommendation:			
Move forward to Screen 2:	X	Do not move forward to Screen 2:	

Alternative 2 is Bus Rapid Transit on Old Trolley Road, Dorchester Road & US 52

- Overall Screen 1 Score: Medium (116 Total PTs)
- Overall Screen 1 Ranking: #6 out of 20

Dorchester BRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	17
Goal 2: Promote a cost effective and financially feasible transit alternative	23
Goal 3: Support local land use objectives	12
Goal 4: Plan for projected growth in an environmentally sustainable manner	13
Goal 5: Respond to community needs and support	16
Goal 6: Support a diverse regional economy	12
Total Score (Out of 150)	**116**
Rank (1-20)	**6**
Rank (1-5) Low to High	**Medium**
Rank (1-5) Number Equivalent	**3.3**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Medium-High**
Total Number of Transit Routes	21
1.2 Increase transit travel time to be competitive with automobile	**Low**
1.3 Improve efficiency of transit service	**Medium-High**
% of Systemwide Transit Ridership on Corridor	2.2%
1.4 Reduce traffic congestion (Subjective Assessment	**Medium-High**
Change in AADT Traffic along 17A to Ashley Phosphate	37,900
Typical Average Daily Passengers for Peer System	9,135
Average Daily Passenger per Change in AADT	24%
1.5 Flexibility to expand/extend to regional corridors	**Medium-High**
Total Goal 1 Score	17
Total Goal 1 Ranking	Medium

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Medium-High**
Capital Construction Cost per Mile	$17.04
Typical Federal Share	63%
Estimated Project Capital Cost (In Millions)	$408.45
Estimated Local Need	$151.13
Rank of Local Need (1-20)	8
2.1b: Operating Costs	**High**
1) Operating Cost Hour	$119.41
2) Operating Cost per Mile	$10.80
3) Operating Cost per Passenger	$2.15
Ranking Sum of 3 Variables	15

2.2 Technically feasible alternative	**High**
1) Miles of Elevated Alignment	1
2) Quantities of Overpasses	11
3) Major Obstacles to Construction	L
2.2 Constructability Score	5
2.3 Financially feasible alternative	**Medium High**
Financially Feasible Score	4
2.4 Alternative that will compete for federal funds	**High**
Number of New Starts & Small Starts in CIG Program	19
2.4 FTA Competitiveness Score	**5**
Total Goal 2 Score	**23**
Total Goal 2 Ranking	**High**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-High**
Total Stops	18
Total Activity Centers Served	57
Weighted Score	28
3.2 Opportunity for Transit Oriented Development	**Low**
TOD Score (From Land Use Analysis)	9
3.3 Adjacency to Growth Areas	**Medium-Low**
Total Goal 3 Score	**12**
Total Goal 3 Ranking	**Medium-Low**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium**
Air Quality Score	3
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	High
Total Linear Feet Crossed	371
Acres of Wetlands within 1/2 Mile Radius	Medium
Acres of Wetlands within 1/2 Mile Radius	1,614
Historic and conservation district	Low
Linear feet crossed (Not including DT Charleston)	56,944
Opportunity for redevelopment	Low
Redevelopment Score	1
Total Goal 4 Score	**13**
Total Goal 4 Ranking	**Medium**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**Medium-High**
% of Households with Low Income w/in 1/2 Mile	3.5%
% of Households with No Vehicle Access w/in 1/2 Mile	2.1%
5.2 Consistency with local plans	**Medium-Low**
5.3 Implementation Time	**High**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	0
Total Goal 5 Score	**16**
Total Goal 5 Ranking	**Medium**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	High
Weighted 2010 & 2035 Total	22,439
Number of Jobs w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	26,678
Jobs per Acre	Low
Weighted 2010 & 2035 Total	1.8
Change in Employment	Low
% Change in Employment from 2010 to 2035	11.2%
6.2 Increase transit mode share for works trips	**Medium-High**
Passengers per Hour	60.7
Total Goal 6 Score	**12**
Total Goal 6 Ranking	**Medium-Low**

Due to available ROW, this alternative is recommended to move forward into Screen Two.

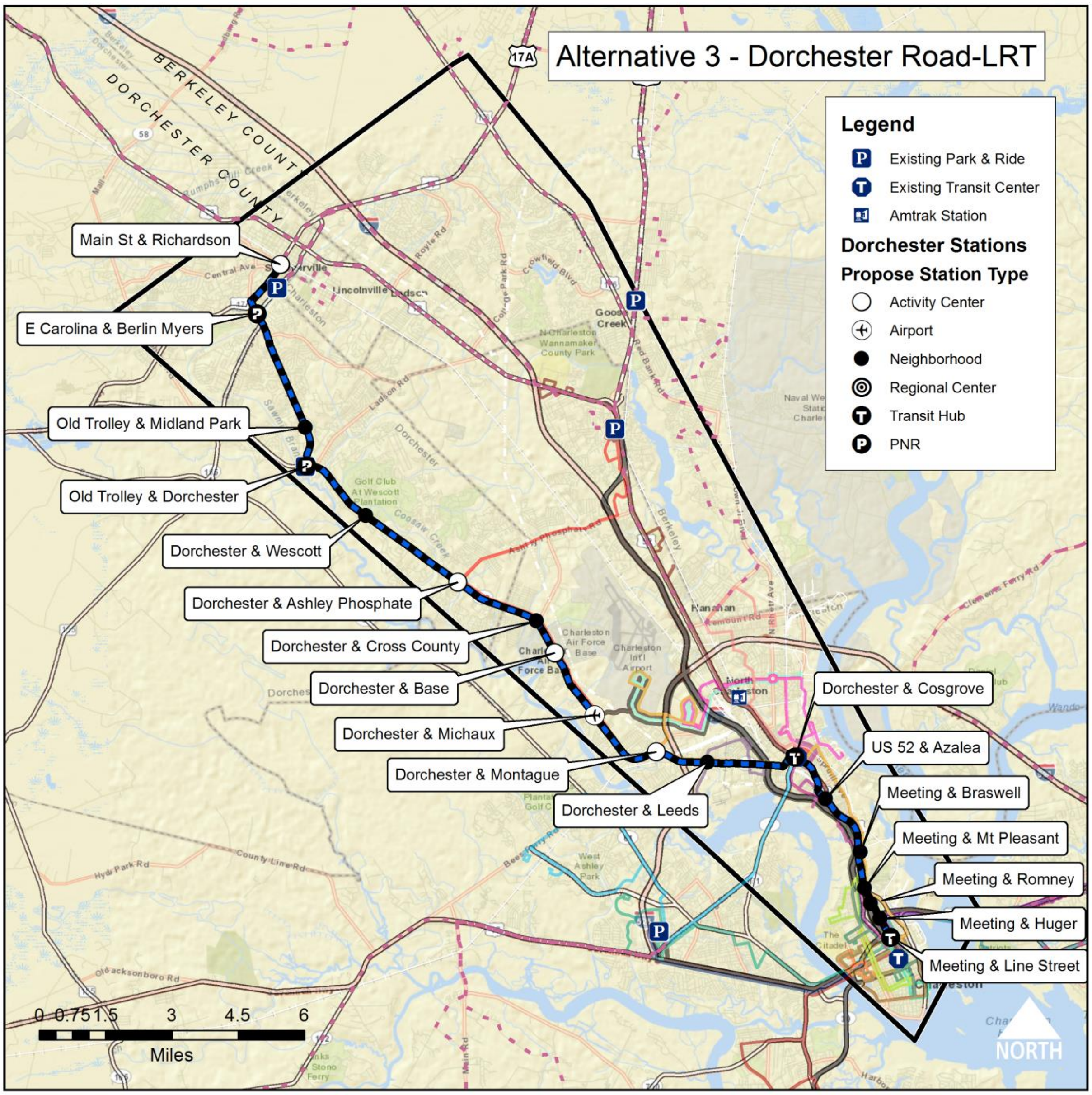
3.2.3 Alternative 3: Dorchester Road Light Rail Transit

Steering Committee Recommendation:			
Move forward to Screen 2:	X	Do not move forward to Screen 2:	

Alternative 3 is Bus Rapid Transit on Old Trolley Road, Dorchester Road & US 52.

- Overall Screen 1 Score: Medium (100 Total PTs)
- Overall Screen 1 Ranking: #11 out of 20

Dorchester LRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	19
Goal 2: Promote a cost effective and financially feasible transit alternative	14
Goal 3: Support local land use objectives	12
Goal 4: Plan for projected growth in an environmentally sustainable manner	14
Goal 5: Respond to community needs and support	14
Goal 6: Support a diverse regional economy	13
Total Score (Out of 150)	**83**
Rank (1-20)	**13**
Rank (1-5) Low to High	**Medium**
Rank (1-5) Number Equivalent	**2.9**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Medium-High**
Total Number of Transit Routes	21
1.2 Increase transit travel time to be competitive with automobile	**Medium**
1.3 Improve efficiency of transit service	**Medium-High**
% of Systemwide Transit Ridership on Corridor	2.2%
1.4 Reduce traffic congestion (Subjective Assessment	**High**
Change in AADT Traffic along 17A to Ashley Phosphate	37,900
Typical Average Daily Passengers for Peer System	9,662
Average Daily Passenger per Change in AADT	25%
1.5 Flexibility to expand/extend to regional corridors	**Medium**
Total Goal 1 Score	**19**
Total Goal 1 Ranking	**Medium-High**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Low**
Capital Construction Cost per Mile	$90.00
Typical Federal Share	46%
Estimated Project Capital Cost (In Millions)	$2,157.30
Estimated Local Need	$1,164.94
Rank of Local Need (1-20)	19
2.1b: Operating Costs	**Medium**
1) Operating Cost Hour	$291.14
2) Operating Cost per Mile	$21.08
3) Operating Cost per Passenger	$4.57
Ranking Sum of 3 Variables	10

2.2 Technically feasible alternative	**Medium-High**
1) Miles of Elevated Alignment	1
2) Quantities of Overpasses	11
3) Major Obstacles to Construction	L
2.2 Constructability Score	4
2.3 Financially feasible alternative	**Medium**
Financially Feasible Score	3
2.4 Alternative that will compete for federal funds	**Medium**
Number of New Starts & Small Starts in CIG Program	7
2.4 FTA Competitiveness Score	**3**
Total Goal 2 Score	**14**
Total Goal 2 Ranking	**Medium**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-High**
Total Stops	18
Total Activity Centers Served	57
Weighted Score	28
3.2 Opportunity for Transit Oriented Development	**Low**
TOD Score (From Land Use Analysis)	9
3.3 Adjacency to Growth Areas	**Medium-Low**
Total Goal 3 Score	**12**
Total Goal 3 Ranking	**Medium-Low**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium-High**
Air Quality Score	4
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	High
Total Linear Feet Crossed	371
Acres of Wetlands within 1/2 Mile Radius	Medium
Acres of Wetlands within 1/2 Mile Radius	1,614
Historic and conservation district	Low
Linear feet crossed (Not including DT Charleston)	56,944
Opportunity for redevelopment	Low
Redevelopment Score	1
Total Goal 4 Score	**14**
Total Goal 4 Ranking	**Medium**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**Medium-High**
% of Households with Low Income w/in 1/2 Mile	3.5%
% of Households with No Vehicle Access w/in 1/2 Mile	2.1%
5.2 Consistency with local plans	**Medium-Low**
5.3 Implementation Time	**Medium**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	2
Total Goal 5 Score	**14**
Total Goal 5 Ranking	**Medium**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	High
Weighted 2010 & 2035 Total	22,439
Number of Jobs w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	26,678
Jobs per Acre	Low
Weighted 2010 & 2035 Total	1.8
Change in Employment	Low
% Change in Employment from 2010 to 2035	11.2%
6.2 Increase transit mode share for works trips	**High**
Passengers per Hour	67.9
Total Goal 6 Score	**13**
Total Goal 6 Ranking	**Medium-Low**

Although this Alternative did not score in the top 5, this alternative is recommended to move forward to Screen Two since the BRT mode along this corridor moved forward.

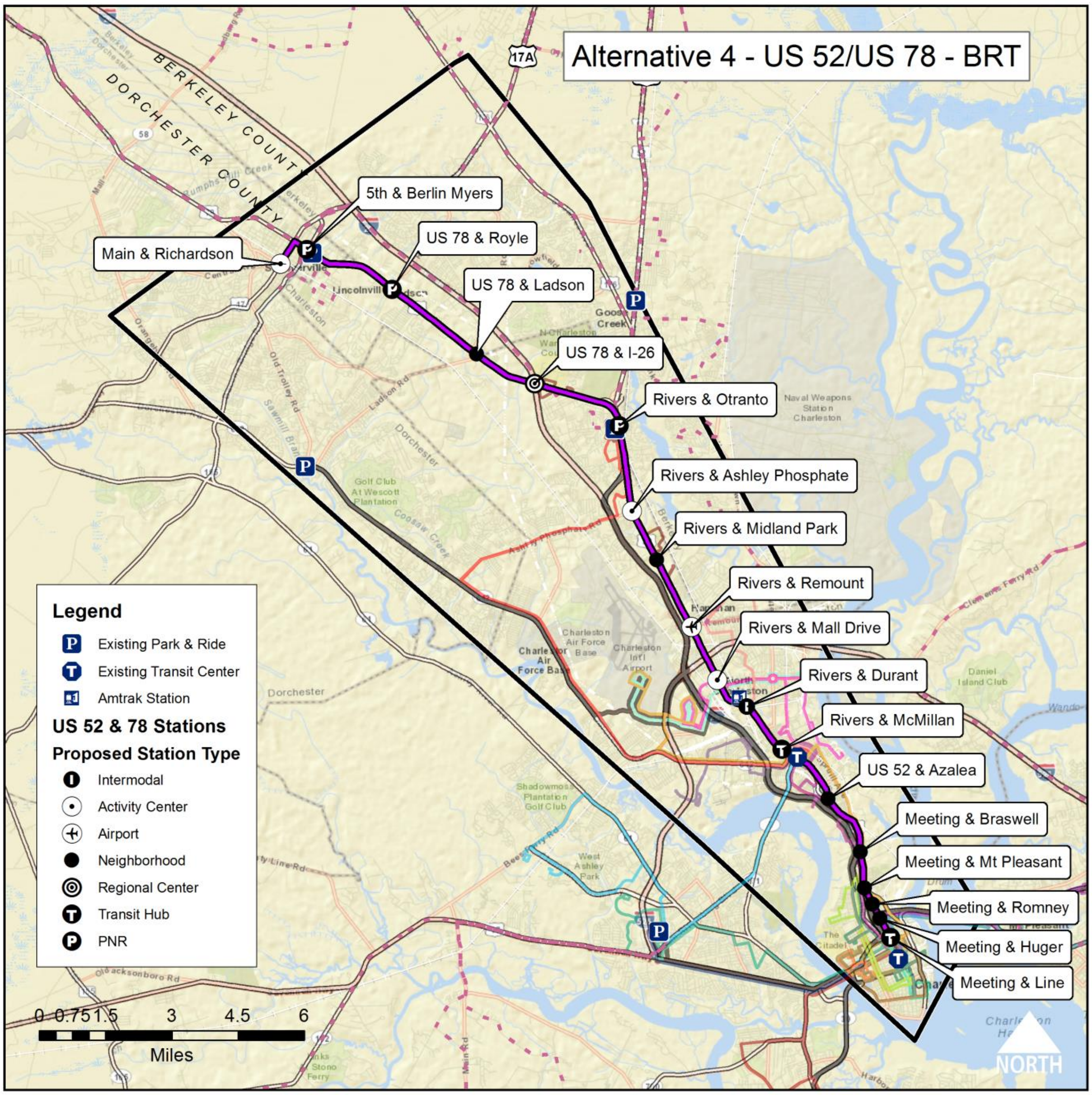
3.2.4 Alternative 4: US 52/US 78 Bus Rapid Transit

Steering Committee Recommendation:			
Move forward to Screen 2:	X	Do not move forward to Screen 2:	

Alternative 3 is Bus Rapid Transit on US 78 and US 52 between downtown Summerville and Charleston.

- Overall Screen 1 Score: Medium-High (157 Total PTs)
- Overall Screen 1 Ranking: #1 out of 20

US 52 & US 78 BRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	22
Goal 2: Promote a cost effective and financially feasible transit alternative	23
Goal 3: Support local land use objectives	20
Goal 4: Plan for projected growth in an environmentally sustainable manner	23
Goal 5: Respond to community needs and support	25
Goal 6: Support a diverse regional economy	20
Total Score (Out of 150)	**157**
Rank (1-20)	**1**
Rank (1-5) Low to High	**Medium-High**
Rank (1-5) Number Equivalent	**4.5**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**High**
Total Number of Transit Routes	23
1.2 Increase transit travel time to be competitive with automobile	**Medium-Low**
1.3 Improve efficiency of transit service	**High**
% of Systemwide Transit Ridership on Corridor	2.9%
1.4 Reduce traffic congestion (Subjective Assessment	**High**
Change in AADT Traffic along 17A to Ashley Phosphate	34,400
Typical Average Daily Passengers for Peer System	9,135
Average Daily Passenger per Change in AADT	27%
1.5 Flexibility to expand/extend to regional corridors	**High**
Total Goal 1 Score	**22**
Total Goal 1 Ranking	**Medium-High**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Medium-High**
Capital Construction Cost per Mile	$17.04
Typical Federal Share	63%
Estimated Project Capital Cost (In Millions)	$389.36
Estimated Local Need	$144.06
Rank of Local Need (1-20)	6
2.1b: Operating Costs	**High**
1) Operating Cost Hour	$119.41
2) Operating Cost per Mile	$10.80
3) Operating Cost per Passenger	$2.15
Ranking Sum of 3 Variables	15

2.2 Technically feasible alternative	**High**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	11
3) Major Obstacles to Construction	L
2.2 Constructability Score	5
2.3 Financially feasible alternative	**Medium High**
Financially Feasible Score	4
2.4 Alternative that will compete for federal funds	**High**
Number of New Starts & Small Starts in CIG Program	19
2.4 FTA Competitiveness Score	**5**
Total Goal 2 Score	**23**
Total Goal 2 Ranking	**High**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**High**
Total Stops	18
Total Activity Centers Served	72
Weighted Score	33
3.2 Opportunity for Transit Oriented Development	**Medium-High**
TOD Score (From Land Use Analysis)	13
3.3 Adjacency to Growth Areas	**Medium-Low**
Total Goal 3 Score	**20**
Total Goal 3 Ranking	**Medium-High**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium**
Air Quality Score	3
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	High
Total Linear Feet Crossed	262
Acres of Wetlands within 1/2 Mile Radius	High
Acres of Wetlands within 1/2 Mile Radius	1,040
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	2,285
Opportunity for redevelopment	High
Redevelopment Score	5
Total Goal 4 Score	**23**
Total Goal 4 Ranking	**High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**High**
% of Households with Low Income w/in 1/2 Mile	4.2%
% of Households with No Vehicle Access w/in 1/2 Mile	2.4%
5.2 Consistency with local plans	**High**
5.3 Implementation Time	**High**
5.4 Public Response	**High**
Total Public Meeting Votes (Out of 67)	18
Total Goal 5 Score	**25**
Total Goal 5 Ranking	**High**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	18,009
Number of Jobs w/in 1/2 Mile	High
Weighted 2010 & 2035 Total	40,349
Jobs per Acre	High
Weighted 2010 & 2035 Total	2.8
Change in Employment	Medium
% Change in Employment from 2010 to 2035	17.9%
6.2 Increase transit mode share for works trips	**Medium-High**
Passengers per Hour	60.7
Total Goal 6 Score	**20**
Total Goal 6 Ranking	**Medium-High**

This alternative scored highly across all measures. Additionally, public support has been strongest for this alignment and it is recommended that Alternative 4 move forward to Screen Two.

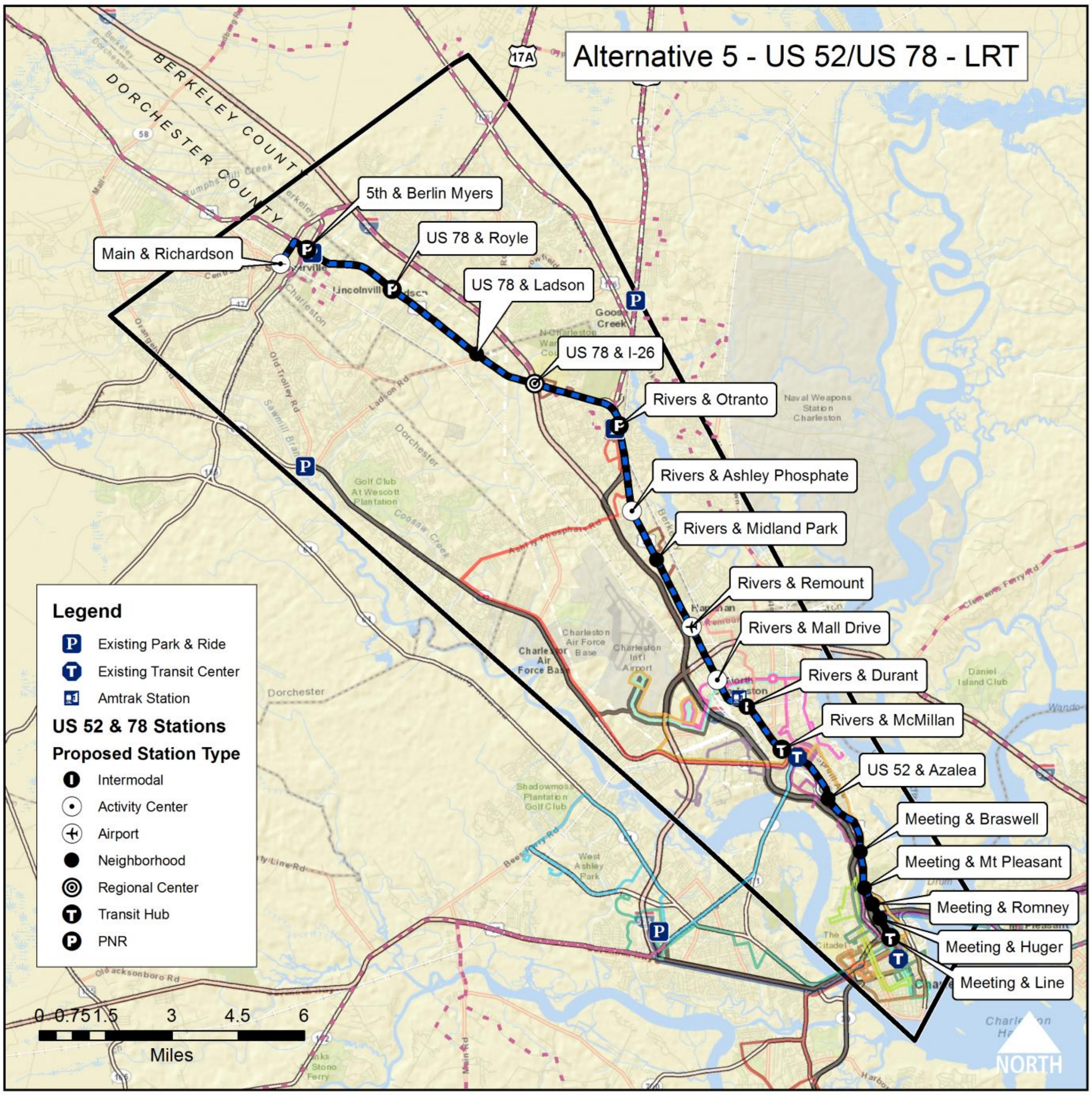
3.2.5 Alternative 5: US 52/US 78 Light Rail Transit

Steering Committee Recommendation:			
Move forward to Screen 2:	X	Do not move forward to Screen 2:	

Alternative 5 is Light Rail Transit on US 78 and US 52 between downtown Summerville and Charleston.

- Overall Screen 1 Score: Medium-High (133 Total PTs)
- Overall Screen 1 Ranking: #3 out of 20

US 52 & US 78 LRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	22
Goal 2: Promote a cost effective and financially feasible transit alternative	15
Goal 3: Support local land use objectives	20
Goal 4: Plan for projected growth in an environmentally sustainable manner	24
Goal 5: Respond to community needs and support	21
Goal 6: Support a diverse regional economy	17
Total Score (Out of 150)	**133**
Rank (1-20)	**3**
Rank (1-5) Low to High	**Medium-High**
Rank (1-5) Number Equivalent	**3.8**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**High**
Total Number of Transit Routes	23
1.2 Increase transit travel time to be competitive with automobile	**Medium-High**
1.3 Improve efficiency of transit service	**High**
% of Systemwide Transit Ridership on Corridor	2.9%
1.4 Reduce traffic congestion (Subjective Assessment	**High**
Change in AADT Traffic along 17A to Ashley Phosphate	34,400
Typical Average Daily Passengers for Peer System	9,662
Average Daily Passenger per Change in AADT	28%
1.5 Flexibility to expand/extend to regional corridors	**Medium**
Total Goal 1 Score	**22**
Total Goal 1 Ranking	**Medium High**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Low**
Capital Construction Cost per Mile	$90.00
Typical Federal Share	46%
Estimated Project Capital Cost (In Millions)	$2,056.50
Estimated Local Need	$1,110.51
Rank of Local Need (1-20)	17
2.1b: Operating Costs	**Medium**
1) Operating Cost Hour	$291.14
2) Operating Cost per Mile	$21.08
3) Operating Cost per Passenger	$4.57
Ranking Sum of 3 Variables	10

2.2 Technically feasible alternative	**Medium High**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	11
3) Major Obstacles to Construction	L
2.2 Constructability Score	4
2.3 Financially feasible alternative	**Medium**
Financially Feasible Score	3
2.4 Alternative that will compete for federal funds	**Medium**
Number of New Starts & Small Starts in CIG Program	7
2.4 FTA Competitiveness Score	**3**
Total Goal 2 Score	**15**
Total Goal 2 Ranking	**Medium**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**High**
Total Stops	18
Total Activity Centers Served	72
Weighted Score	33
3.2 Opportunity for Transit Oriented Development	**Medium-High**
TOD Score (From Land Use Analysis)	13
3.3 Adjacency to Growth Areas	**Medium-Low**
Total Goal 3 Score	**20**
Total Goal 3 Ranking	**Medium-High**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium-High**
Air Quality Score	4
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	High
Total Linear Feet Crossed	262
Acres of Wetlands within 1/2 Mile Radius	High
Acres of Wetlands within 1/2 Mile Radius	1,040
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	2,285
Opportunity for redevelopment	High
Redevelopment Score	5
Total Goal 4 Score	**24**
Total Goal 4 Ranking	**High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**High**
% of Households with Low Income w/in 1/2 Mile	4.2%
% of Households with No Vehicle Access w/in 1/2 Mile	2.4%
5.2 Consistency with local plans	**High**
5.3 Implementation Time	**Medium**
5.4 Public Response	**Medium**
Total Public Meeting Votes (Out of 67)	9
Total Goal 5 Score	**21**
Total Goal 5 Ranking	**Medium-High**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	18,009
Number of Jobs w/in 1/2 Mile	High
Weighted 2010 & 2035 Total	40,349
Jobs per Acre	High
Weighted 2010 & 2035 Total	2.8
Change in Employment	Medium
% Change in Employment from 2010 to 2035	17.9%
6.2 Increase transit mode share for works trips	**High**
Passengers per Hour	67.9
Total Goal 6 Score	**17**
Total Goal 6 Ranking	**Medium**

This alternative scored highly across many measures. Additionally, public support has been strongest for this alignment and it is recommended that Alternative 5 move forward to Screen Two.

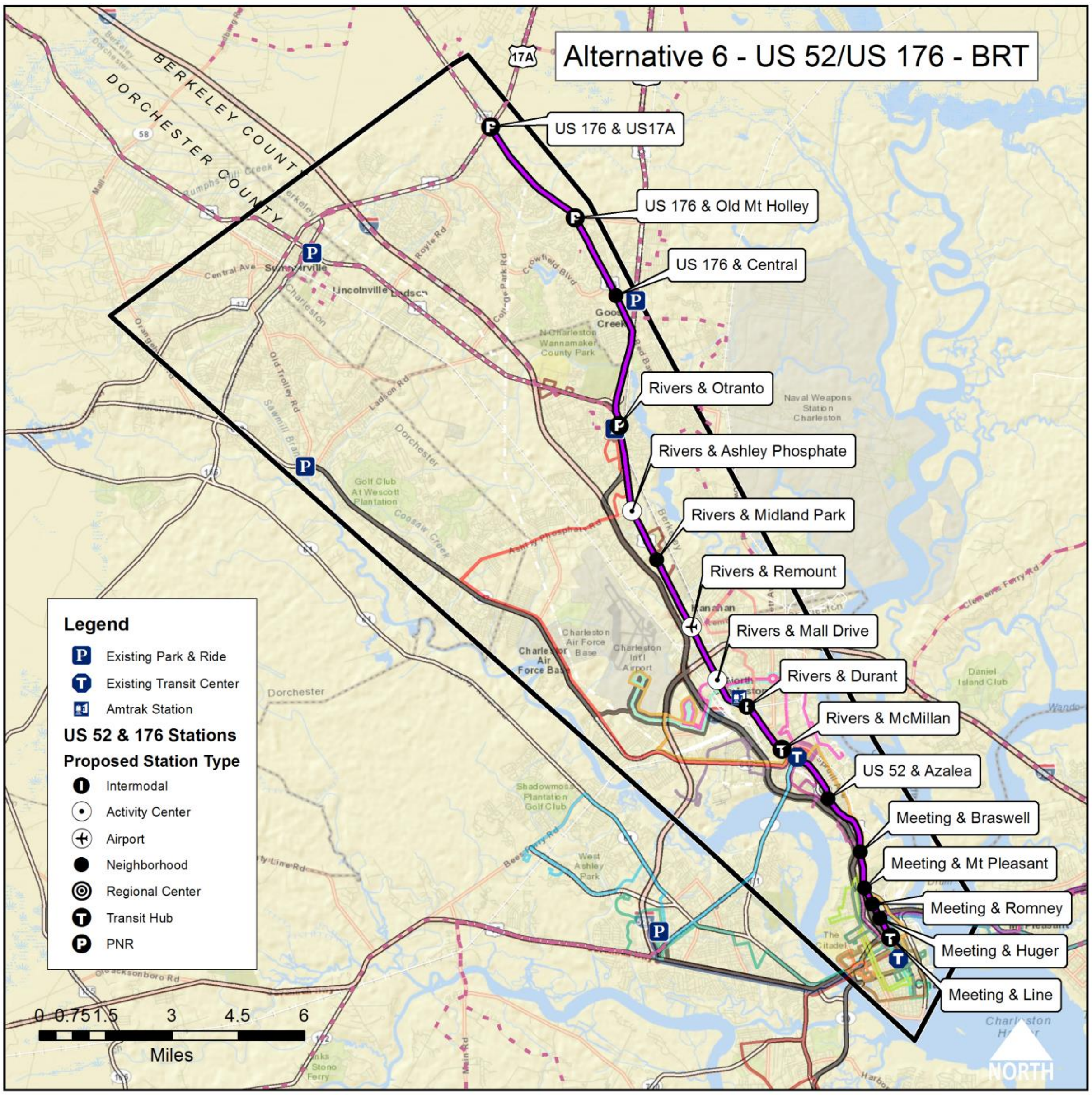
3.2.6 Alternative 6: US 52/US 176 Bus Rapid Transit

Steering Committee Recommendation:			
Move forward to Screen 2:	X	Do not move forward to Screen 2:	

Alternative 6 is Bus Rapid Transit on US 176 and US 52 between US 17A in Summerville and Charleston.

- Overall Screen 1 Score: Medium-High (148 Total PTs)
- Overall Screen 1 Ranking: #2 out of 20

US 52 & US 176 BRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	21
Goal 2: Promote a cost effective and financially feasible transit alternative	25
Goal 3: Support local land use objectives	22
Goal 4: Plan for projected growth in an environmentally sustainable manner	21
Goal 5: Respond to community needs and support	19
Goal 6: Support a diverse regional economy	15
Total Score (Out of 150)	**133**
Rank (1-20)	**2**
Rank (1-5) Low to High	**Medium-High**
Rank (1-5) Number Equivalent	**4.2**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Medium-High**
Total Number of Transit Routes	21
1.2 Increase transit travel time to be competitive with automobile	**Medium-Low**
1.3 Improve efficiency of transit service	**High**
% of Systemwide Transit Ridership on Corridor	2.9%
1.4 Reduce traffic congestion (Subjective Assessment	**High**
Change in AADT Traffic along 17A to Ashley Phosphate	36,100
Typical Average Daily Passengers for Peer System	9,135
Average Daily Passenger per Change in AADT	25%
1.5 Flexibility to expand/extend to regional corridors	**High**
Total Goal 1 Score	**21**
Total Goal 1 Ranking	**Medium-High**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**High**
Capital Construction Cost per Mile	$17.04
Typical Federal Share	63%
Estimated Project Capital Cost (In Millions)	$367.89
Estimated Local Need	$136.12
Rank of Local Need (1-20)	4
2.1b: Operating Costs	**High**
1) Operating Cost Hour	$119.41
2) Operating Cost per Mile	$10.80
3) Operating Cost per Passenger	$2.15
Ranking Sum of 3 Variables	15

2.2 Technically feasible alternative	**High**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	13
3) Major Obstacles to Construction	L
2.2 Constructability Score	5
2.3 Financially feasible alternative	**High**
Financially Feasible Score	5
2.4 Alternative that will compete for federal funds	**High**
Number of New Starts & Small Starts in CIG Program	19
2.4 FTA Competitiveness Score	**5**
Total Goal 2 Score	**25**
Total Goal 2 Ranking	**High**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-High**
Total Stops	16
Total Activity Centers Served	72
Weighted Score	28
3.2 Opportunity for Transit Oriented Development	**High**
TOD Score (From Land Use Analysis)	14
3.3 Adjacency to Growth Areas	**Medium-High**
Total Goal 3 Score	**22**
Total Goal 3 Ranking	**Medium-High**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium**
Air Quality Score	3
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	High
Total Linear Feet Crossed	0
Acres of Wetlands within 1/2 Mile Radius	Medium-High
Acres of Wetlands within 1/2 Mile Radius	1,510
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	0
Opportunity for redevelopment	Medium-High
Redevelopment Score	4
Total Goal 4 Score	**21**
Total Goal 4 Ranking	**Medium-High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**High**
% of Households with Low Income w/in 1/2 Mile	3.9%
% of Households with No Vehicle Access w/in 1/2 Mile	2.4%
5.2 Consistency with local plans	**Medium**
5.3 Implementation Time	**High**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	0
Total Goal 5 Score	**19**
Total Goal 5 Ranking	**Medium-High**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	17,810
Number of Jobs w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	33,772
Jobs per Acre	Medium-High
Weighted 2010 & 2035 Total	2.5
Change in Employment	Low
% Change in Employment from 2010 to 2035	10.3%
6.2 Increase transit mode share for works trips	**Medium-High**
Passengers per Hour	60.7
Total Goal 6 Score	**15**
Total Goal 6 Ranking	**Medium**

This alternative scored highly across many measures. This alignment is recommended to move forward to Screen Two.

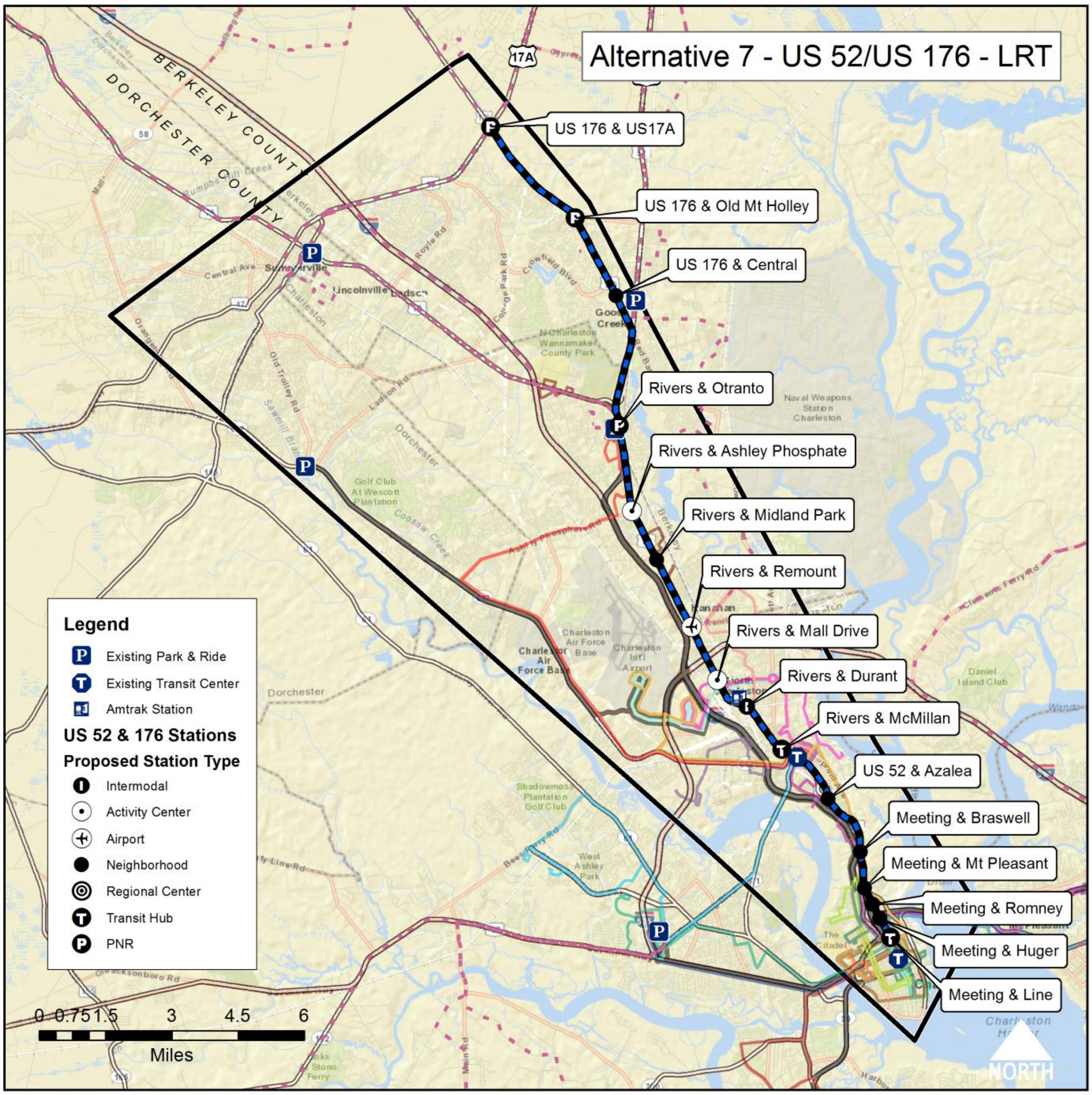
3.2.7 Alternative 7: US 52/US 176 Light Rail Transit

Steering Committee Recommendation:			
Move forward to Screen 2:	X	Do not move forward to Screen 2:	

Alternative 7 is Light Rail Transit on US 176 and US 52 between US 17A in Summerville and Charleston.

- Overall Screen 1 Score: Medium-High (131 Total PTs)
- Overall Screen 1 Ranking: #4 out of 20

US 52 & US 176 LRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	21
Goal 2: Promote a cost effective and financially feasible transit alternative	16
Goal 3: Support local land use objectives	22
Goal 4: Plan for projected growth in an environmentally sustainable manner	22
Goal 5: Respond to community needs and support	17
Goal 6: Support a diverse regional economy	16
Total Score (Out of 150)	**115**
Rank (1-20)	**4**
Rank (1-5) Low to High	**Medium-High**
Rank (1-5) Number Equivalent	**3.8**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Medium-High**
Total Number of Transit Routes	21
1.2 Increase transit travel time to be competitive with automobile	**Medium-High**
1.3 Improve efficiency of transit service	**High**
% of Systemwide Transit Ridership on Corridor	2.9%
1.4 Reduce traffic congestion (Subjective Assessment	**High**
Change in AADT Traffic along 17A to Ashley Phosphate	36,100
Typical Average Daily Passengers for Peer System	9,662
Average Daily Passenger per Change in AADT	27%
1.5 Flexibility to expand/extend to regional corridors	**Medium**
Total Goal 1 Score	**21**
Total Goal 1 Ranking	**Medium-High**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Medium-Low**
Capital Construction Cost per Mile	$90.00
Typical Federal Share	46%
Estimated Project Capital Cost (In Millions)	$1,943.10
Estimated Local Need	$1,049.27
Rank of Local Need (1-20)	16
2.1b: Operating Costs	**Medium**
1) Operating Cost Hour	$291.14
2) Operating Cost per Mile	$21.08
3) Operating Cost per Passenger	$4.57
Ranking Sum of 3 Variables	10

2.2 Technically feasible alternative	**Medium-High**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	13
3) Major Obstacles to Construction	L
2.2 Constructability Score	4
2.3 Financially feasible alternative	**Medium-High**
Financially Feasible Score	4
2.4 Alternative that will compete for federal funds	**Medium**
Number of New Starts & Small Starts in CIG Program	7
2.4 FTA Competitiveness Score	**3**
Total Goal 2 Score	**16**
Total Goal 2 Ranking	**Medium**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-High**
Total Stops	16
Total Activity Centers Served	72
Weighted Score	28
3.2 Opportunity for Transit Oriented Development	**High**
TOD Score (From Land Use Analysis)	14
3.3 Adjacency to Growth Areas	**Medium-High**
Total Goal 3 Score	**22**
Total Goal 3 Ranking	**Medium-High**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium-High**
Air Quality Score	4
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	High
Total Linear Feet Crossed	0
Acres of Wetlands within 1/2 Mile Radius	Medium-High
Acres of Wetlands within 1/2 Mile Radius	1,510
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	0
Opportunity for redevelopment	Medium-High
Redevelopment Score	4
Total Goal 4 Score	**22**
Total Goal 4 Ranking	**Medium-High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**High**
% of Households with Low Income w/in 1/2 Mile	3.9%
% of Households with No Vehicle Access w/in 1/2 Mile	2.4%
5.2 Consistency with local plans	**Medium**
5.3 Implementation Time	**Medium**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	0
Total Goal 5 Score	**17**
Total Goal 5 Ranking	**Medium**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	17,810
Number of Jobs w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	33,772
Jobs per Acre	Medium-High
Weighted 2010 & 2035 Total	2.5
Change in Employment	Low
% Change in Employment from 2010 to 2035	10.3%
6.2 Increase transit mode share for works trips	**High**
Passengers per Hour	67.9
Total Goal 6 Score	**16**
Total Goal 6 Ranking	**Medium**

This alternative scored highly across many measures. This alignment is recommended to move forward to Screen Two.

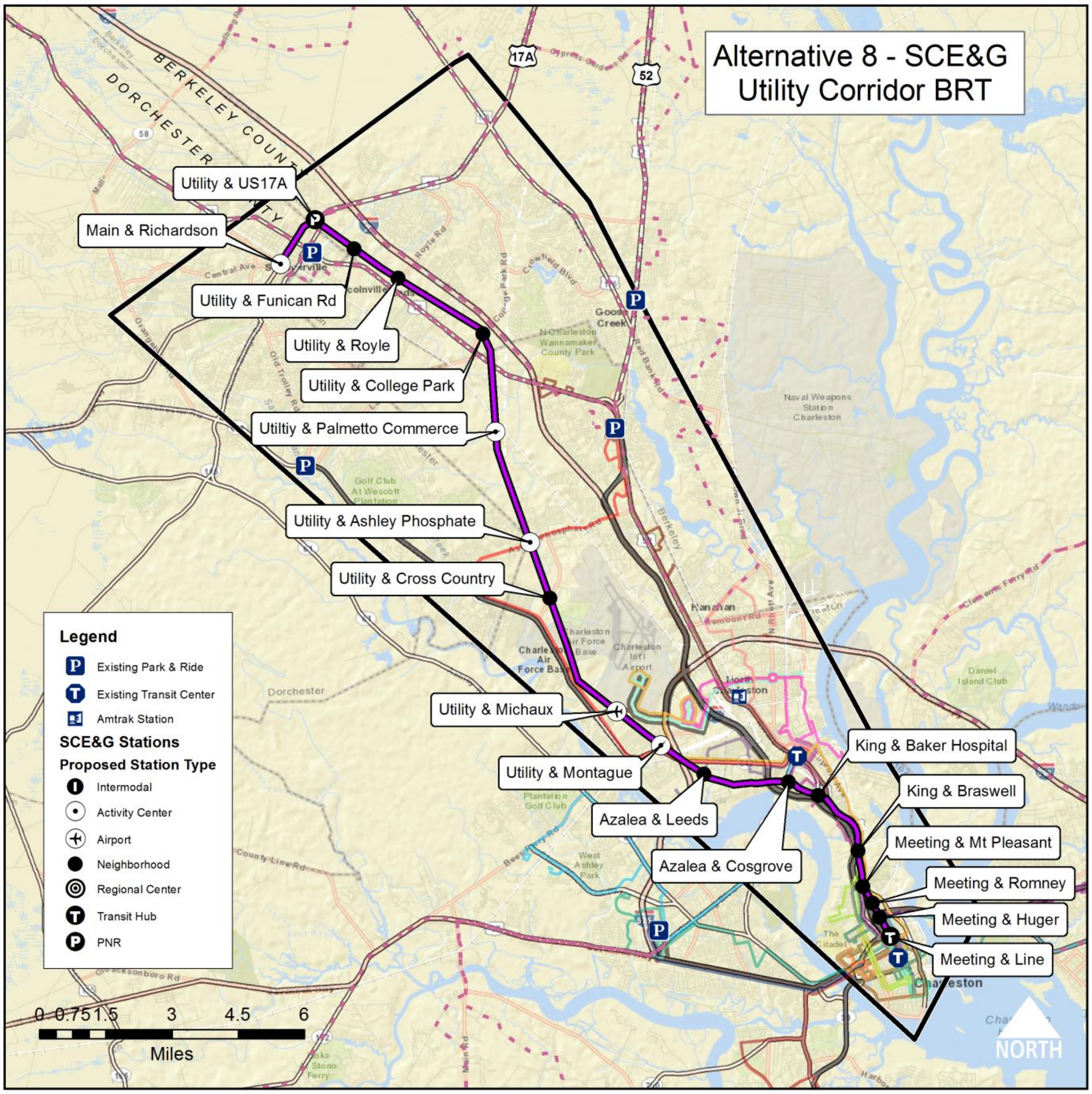
3.2.8 Alternative 8: SCE&G Utility Corridor Bus Rapid Transit

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 8 is Bus Rapid Transit along the SCE&G Utility Corridor from 17A near Azalea Square to DT Charleston.

- Overall Screen 1 Score: Medium (93 Total PTs)
- Overall Screen 1 Ranking: #15 out of 20

SCE&G Bus Rapid Transit Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	9
Goal 2: Promote a cost effective and financially feasible transit alternative	19
Goal 3: Support local land use objectives	12
Goal 4: Plan for projected growth in an environmentally sustainable manner	14
Goal 5: Respond to community needs and support	9
Goal 6: Support a diverse regional economy	11
Total Score (Out of 150)	**93**
Rank (1-20)	**15**
Rank (1-5) Low to High	**Medium**
Rank (1-5) Number Equivalent	**2.7**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Low**
Total Number of Transit Routes	17
1.2 Increase transit travel time to be competitive with automobile	**Low**
1.3 Improve efficiency of transit service	**Low**
% of Systemwide Transit Ridership on Corridor	0.8%
1.4 Reduce traffic congestion (Subjective Assessment	**Medium-Low**
Change in AADT Traffic along 17A to Ashley Phosphate	80,000
Typical Average Daily Passengers for Peer System	9,135
Average Daily Passenger per Change in AADT	11%
1.5 Flexibility to expand/extend to regional corridors	**Medium-High**
Total Goal 1 Score	**9**
Total Goal 1 Ranking	**Medium-Low**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Medium**
Capital Construction Cost per Mile	$17.04
Typical Federal Share	63%
Estimated Project Capital Cost (In Millions)	$412.03
Estimated Local Need	$152.45
Rank of Local Need (1-20)	9
2.1b: Operating Costs	**High**
1) Operating Cost Hour	$119.41
2) Operating Cost per Mile	$10.80
3) Operating Cost per Passenger	$2.15
Ranking Sum of 3 Variables	15

2.2 Technically feasible alternative	**Medium**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	0
3) Major Obstacles to Construction	M
2.2 Constructability Score	3
2.3 Financially feasible alternative	**Medium**
Financially Feasible Score	3
2.4 Alternative that will compete for federal funds	**High**
Number of New Starts & Small Starts in CIG Program	19
2.4 FTA Competitiveness Score	**5**
Total Goal 2 Score	**19**
Total Goal 2 Ranking	**Medium-High**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium**
Total Stops	18
Total Activity Centers Served	37
Weighted Score	23
3.2 Opportunity for Transit Oriented Development	**Medium-Low**
TOD Score (From Land Use Analysis)	11
3.3 Adjacency to Growth Areas	**Medium Low**
Total Goal 3 Score	**12**
Total Goal 3 Ranking	**Medium-Low**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium**
Air Quality Score	3
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	Low
Total Linear Feet Crossed	11,483
Acres of Wetlands within 1/2 Mile Radius	Medium
Acres of Wetlands within 1/2 Mile Radius	1,742
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	8,931
Opportunity for redevelopment	Medium-Low
Redevelopment Score	2
Total Goal 4 Score	**14**
Total Goal 4 Ranking	**Medium**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**Low**
% of Households with Low Income w/in 1/2 Mile	2.3%
% of Households with No Vehicle Access w/in 1/2 Mile	1.4%
5.2 Consistency with local plans	**Low**
5.3 Implementation Time	**Medium-High**
5.4 Public Response	**Medium-Low**
Total Public Meeting Votes (Out of 67)	6
Total Goal 5 Score	**9**
Total Goal 5 Ranking	**Medium-Low**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	14,746
Number of Jobs w/in 1/2 Mile	Medium-Low
Weighted 2010 & 2035 Total	30,300
Jobs per Acre	Medium-Low
Weighted 2010 & 2035 Total	2.0
Change in Employment	Medium-High
% Change in Employment from 2010 to 2035	34.5%
6.2 Increase transit mode share for works trips	**Medium-High**
Passengers per Hour	60.7
Total Goal 6 Score	**11**
Total Goal 6 Ranking	**Medium-Low**

This alternative scored poorly in terms of transit improvements and land use. Additionally, because the alignment would need to be parallel to the utility corridor, right of way acquisition and power structure limitations would require a longer and potentially more costly alternative. As a result, this alignment is not recommended to move forward to Screen Two.

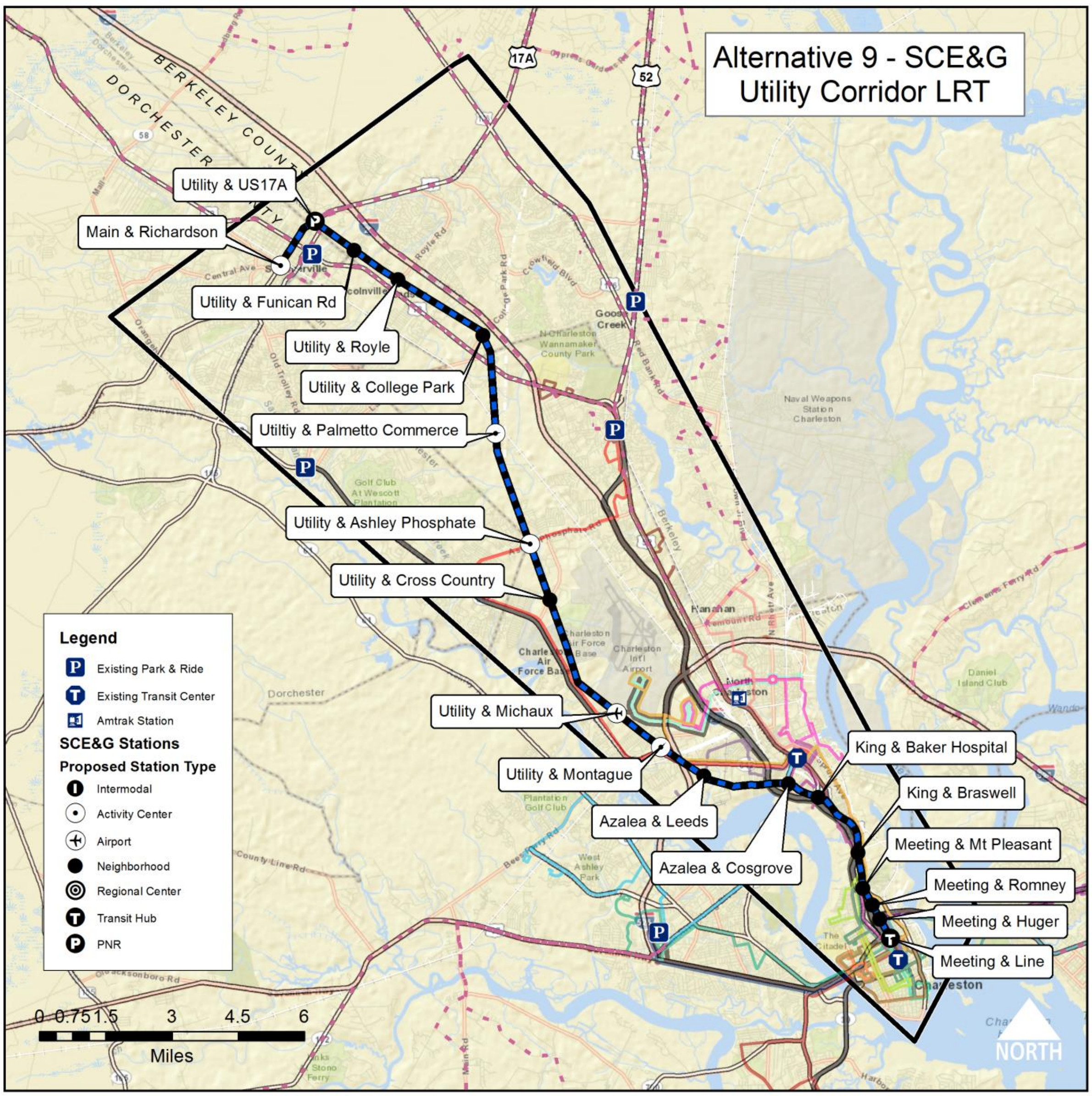
3.2.9 Alternative 9: SCE&G Utility Corridor Light Rail Transit

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 9 is Light Rail Transit along the SCE&G Utility Corridor from US 17A near Azalea Square to DT Charleston.

- Overall Screen 1 Score: Medium-Low (79 Total PTs)
- Overall Screen 1 Ranking: #19 out of 20

SCE&G LRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	9
Goal 2: Promote a cost effective and financially feasible transit alternative	11
Goal 3: Support local land use objectives	12
Goal 4: Plan for projected growth in an environmentally sustainable manner	15
Goal 5: Respond to community needs and support	6
Goal 6: Support a diverse regional economy	14
Total Score (Out of 150)	**79**
Rank (1-20)	**19**
Rank (1-5) Low to High	**Medium-Low**
Rank (1-5) Number Equivalent	**2.2**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Low**
Total Number of Transit Routes	17
1.2 Increase transit travel time to be competitive with automobile	**Medium**
1.3 Improve efficiency of transit service	**Low**
% of Systemwide Transit Ridership on Corridor	0.8%
1.4 Reduce traffic congestion (Subjective Assessment	**Medium-Low**
Change in AADT Traffic along 17A to Ashley Phosphate	80,000
Typical Average Daily Passengers for Peer System	9,662
Average Daily Passenger per Change in AADT	12%
1.5 Flexibility to expand/extend to regional corridors	**Medium-Low**
Total Goal 1 Score	**9**
Total Goal 1 Ranking	**Medium-Low**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Low**
Capital Construction Cost per Mile	$90.00
Typical Federal Share	46%
Estimated Project Capital Cost (In Millions)	$2,176.20
Estimated Local Need	$1,175.15
Rank of Local Need (1-20)	20
2.1b: Operating Costs	**Medium**
1) Operating Cost Hour	$291.14
2) Operating Cost per Mile	$21.08
3) Operating Cost per Passenger	$4.57
Ranking Sum of 3 Variables	10

2.2 Technically feasible alternative	**Medium-Low**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	0
3) Major Obstacles to Construction	M
2.2 Constructability Score	2
2.3 Financially feasible alternative	**Medium-Low**
Financially Feasible Score	2
2.4 Alternative that will compete for federal funds	**Medium**
Number of New Starts & Small Starts in CIG Program	7
2.4 FTA Competitiveness Score	**3**
Total Goal 2 Score	**11**
Total Goal 2 Ranking	**Medium-Low**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium**
Total Stops	18
Total Activity Centers Served	37
Weighted Score	23
3.2 Opportunity for Transit Oriented Development	**Medium-Low**
TOD Score (From Land Use Analysis)	11
3.3 Adjacency to Growth Areas	**Medium-Low**
Total Goal 3 Score	**12**
Total Goal 3 Ranking	**Medium-Low**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium-High**
Air Quality Score	4
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	Low
Total Linear Feet Crossed	11,483
Acres of Wetlands within 1/2 Mile Radius	Medium
Acres of Wetlands within 1/2 Mile Radius	1,742
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	8,931
Opportunity for redevelopment	Medium-Low
Redevelopment Score	2
Total Goal 4 Score	**15**
Total Goal 4 Ranking	**Medium**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**Low**
% of Households with Low Income w/in 1/2 Mile	2.3%
% of Households with No Vehicle Access w/in 1/2 Mile	1.4%
5.2 Consistency with local plans	**Low**
5.3 Implementation Time	**Medium Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	3
Total Goal 5 Score	**6**
Total Goal 5 Ranking	**Low**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	14,746
Number of Jobs w/in 1/2 Mile	Medium-Low
Weighted 2010 & 2035 Total	30,300
Jobs per Acre	Medium-Low
Weighted 2010 & 2035 Total	2.0
Change in Employment	Medium-High
% Change in Employment from 2010 to 2035	34.5%
6.2 Increase transit mode share for works trips	**High**
Passengers per Hour	67.9
Total Goal 6 Score	**14**
Total Goal 6 Ranking	**Medium**

This alternative scored poorly in terms of transit improvements and land use. Additionally, because the alignment would need to be parallel to the utility corridor, right of way acquisition and power structure limitations would require a longer implementation time and potentially costly alternative. As a result, this alignment is not recommended to move forward to Screen Two.

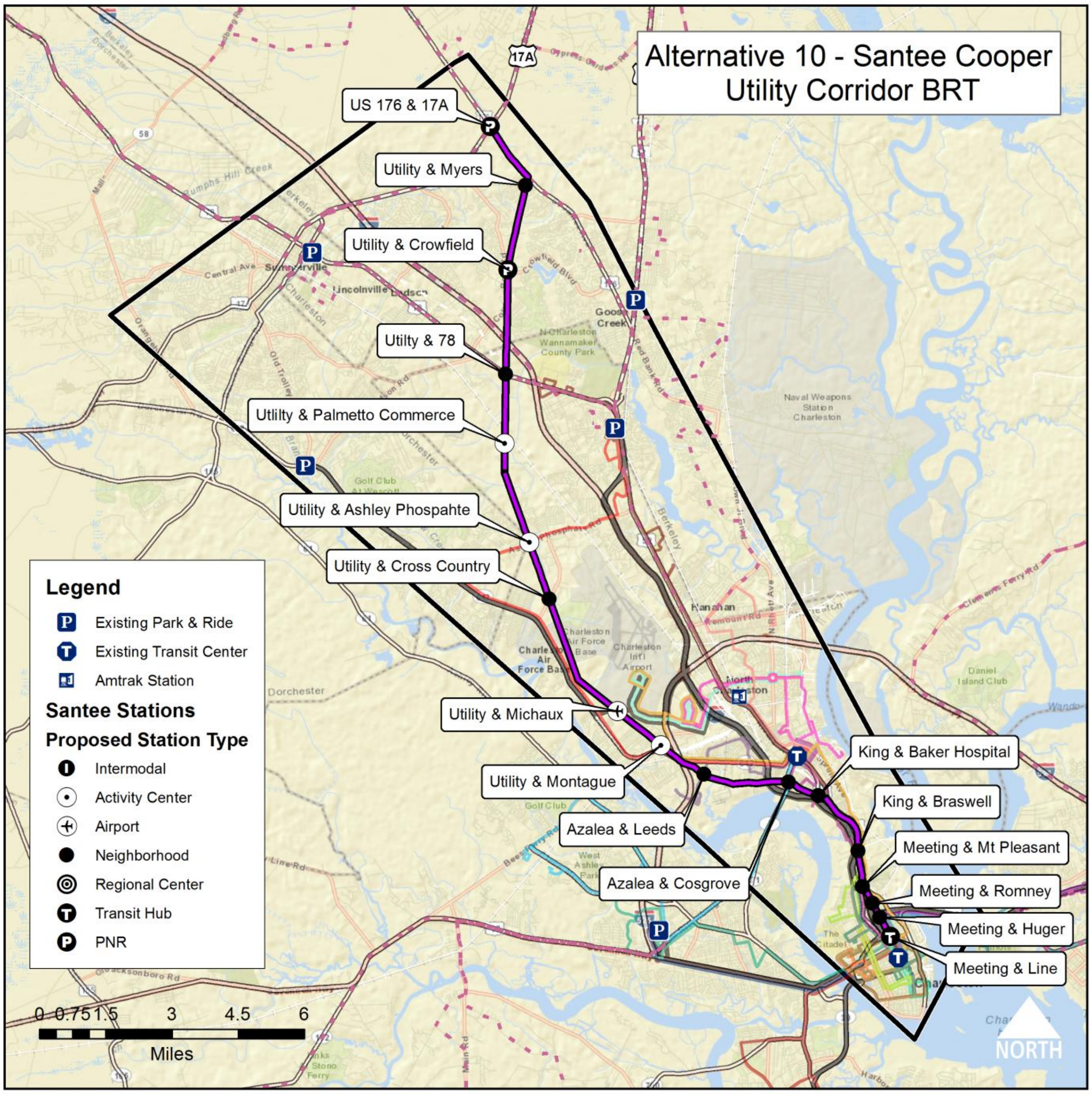
3.2.10 Alternative 10: Santee Cooper Utility Corridor Bus Rapid Transit

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 10 is Bus Rapid Transit along US 176 and the Santee Cooper Utility Corridor from US 17A to DT Charleston.

- Overall Screen 1 Score: Medium (94 Total PTs)
- Overall Screen 1 Ranking: #14 out of 20

Santee Cooper BRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	11
Goal 2: Promote a cost effective and financially feasible transit alternative	20
Goal 3: Support local land use objectives	12
Goal 4: Plan for projected growth in an environmentally sustainable manner	11
Goal 5: Respond to community needs and support	8
Goal 6: Support a diverse regional economy	12
Total Score (Out of 150)	**94**
Rank (1-20)	**14**
Rank (1-5) Low to High	**Medium**
Rank (1-5) Number Equivalent	**2.7**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Low**
Total Number of Transit Routes	17
1.2 Increase transit travel time to be competitive with automobile	**Medium**
1.3 Improve efficiency of transit service	**Low**
% of Systemwide Transit Ridership on Corridor	0.8%
1.4 Reduce traffic congestion (Subjective Assessment	**Medium-Low**
Change in AADT Traffic along 17A to Ashley Phosphate	73,300
Typical Average Daily Passengers for Peer System	9,135
Average Daily Passenger per Change in AADT	12%
1.5 Flexibility to expand/extend to regional corridors	**Medium-High**
Total Goal 1 Score	**11**
Total Goal 1 Ranking	**Medium-Low**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Medium-High**
Capital Construction Cost per Mile	$17.04
Typical Federal Share	63%
Estimated Project Capital Cost (In Millions)	$401.97
Estimated Local Need	$148.73
Rank of Local Need (1-20)	7
2.1b: Operating Costs	**High**
1) Operating Cost Hour	$119.41
2) Operating Cost per Mile	$10.80
3) Operating Cost per Passenger	$2.15
Ranking Sum of 3 Variables	15

2.2 Technically feasible alternative	**Medium**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	0
3) Major Obstacles to Construction	15
2.2 Constructability Score	3
2.3 Financially feasible alternative	**Medium**
Financially Feasible Score	3
2.4 Alternative that will compete for federal funds	**High**
Number of New Starts & Small Starts in CIG Program	19
2.4 FTA Competitiveness Score	**5**
Total Goal 2 Score	**20**
Total Goal 2 Ranking	**Medium-High**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-Low**
Total Stops	17
Total Activity Centers Served	34
Weighted Score	22
3.2 Opportunity for Transit Oriented Development	**Medium-Low**
TOD Score (From Land Use Analysis)	10
3.3 Adjacency to Growth Areas	**Medium-High**
Total Goal 3 Score	**12**
Total Goal 3 Ranking	**Medium-Low**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium**
Air Quality Score	3
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	Low
Total Linear Feet Crossed	10,959
Acres of Wetlands within 1/2 Mile Radius	Low
Acres of Wetlands within 1/2 Mile Radius	2,368
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	6,656
Opportunity for redevelopment	Low
Redevelopment Score	1
Total Goal 4 Score	**11**
Total Goal 4 Ranking	**Medium-Low**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**Low**
% of Households with Low Income w/in 1/2 Mile	2.1%
% of Households with No Vehicle Access w/in 1/2 Mile	1.3%
5.2 Consistency with local plans	**Low**
5.3 Implementation Time	**Medium-High**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	0
Total Goal 5 Score	**8**
Total Goal 5 Ranking	**Medium-Low**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	15,283
Number of Jobs w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	24,851
Jobs per Acre	Low
Weighted 2010 & 2035 Total	1.7
Change in Employment	High
% Change in Employment from 2010 to 2035	43.9%
6.2 Increase transit mode share for works trips	**Medium-High**
Passengers per Hour	60.7
Total Goal 6 Score	**12**
Total Goal 6 Ranking	**Medium-Low**

This alternative scored poorly in terms of transit improvements and land use. Additionally, because the alignment would need to be parallel to the utility corridor, right of way acquisition and power structure limitations would require a longer implementation and potentially costly alternative. As a result, this alignment is not recommended to move forward to Screen Two.

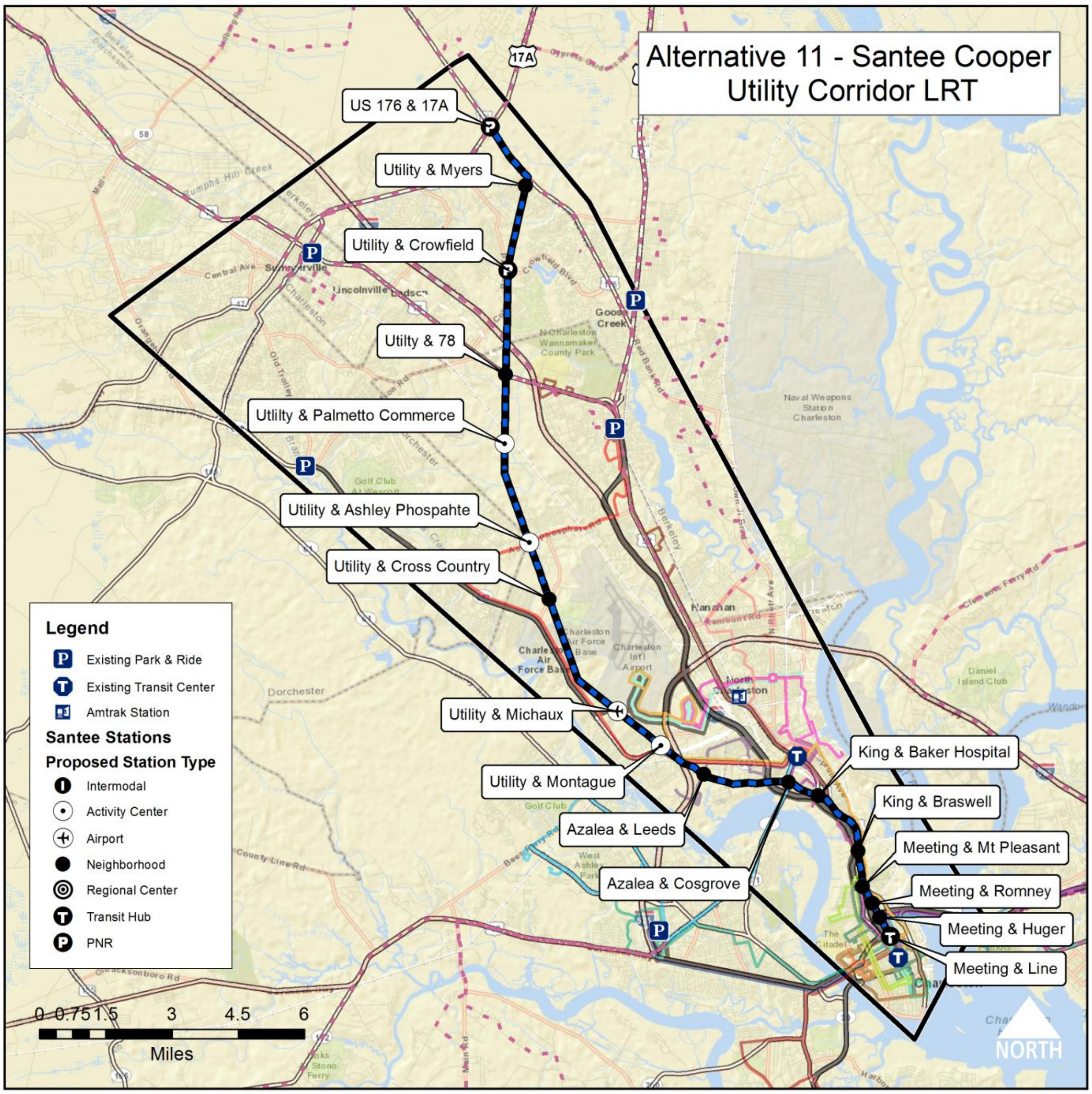
3.2.11 Alternative 11: Santee Cooper Utility Corridor Light Rail Transit

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 11 is Light Rail Transit along US 176 and the Santee Cooper Utility Corridor from US 17A to DT Charleston.

- Overall Screen 1 Score: Medium-Low (77 Total PTs)
- Overall Screen 1 Ranking: #20 out of 20

Santee Cooper LRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	11
Goal 2: Promote a cost effective and financially feasible transit alternative	11
Goal 3: Support local land use objectives	12
Goal 4: Plan for projected growth in an environmentally sustainable manner	12
Goal 5: Respond to community needs and support	6
Goal 6: Support a diverse regional economy	13
Total Score (Out of 150)	**65**
Rank (1-20)	**20**
Rank (1-5) Low to High	**Medium-Low**
Rank (1-5) Number Equivalent	**2.2**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Low**
Total Number of Transit Routes	17
1.2 Increase transit travel time to be competitive with automobile	**Medium-High**
1.3 Improve efficiency of transit service	**Low**
% of Systemwide Transit Ridership on Corridor	0.8%
1.4 Reduce traffic congestion (Subjective Assessment	**Medium**
Change in AADT Traffic along 17A to Ashley Phosphate	73,300
Typical Average Daily Passengers for Peer System	9,662
Average Daily Passenger per Change in AADT	13%
1.5 Flexibility to expand/extend to regional corridors	**Medium-Low**
Total Goal 1 Score	**11**
Total Goal 1 Ranking	**Medium-Low**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Low**
Capital Construction Cost per Mile	$90.00
Typical Federal Share	46%
Estimated Project Capital Cost (In Millions)	$2,123.10
Estimated Local Need	$1,146.47
Rank of Local Need (1-20)	18
2.1b: Operating Costs	**Medium**
1) Operating Cost Hour	$291.14
2) Operating Cost per Mile	$21.08
3) Operating Cost per Passenger	$4.57
Ranking Sum of 3 Variables	10

2.2 Technically feasible alternative	**Medium-Low**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	0
3) Major Obstacles to Construction	M
2.2 Constructability Score	2
2.3 Financially feasible alternative	**Medium-Low**
Financially Feasible Score	2
2.4 Alternative that will compete for federal funds	**Medium**
Number of New Starts & Small Starts in CIG Program	7
2.4 FTA Competitiveness Score	**3**
Total Goal 2 Score	**11**
Total Goal 2 Ranking	**Medium-Low**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-Low**
Total Stops	17
Total Activity Centers Served	34
Weighted Score	22
3.2 Opportunity for Transit Oriented Development	**Medium-Low**
TOD Score (From Land Use Analysis)	10
3.3 Adjacency to Growth Areas	**Medium-High**
Total Goal 3 Score	**12**
Total Goal 3 Ranking	**Medium-Low**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium-High**
Air Quality Score	4
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	Low
Total Linear Feet Crossed	10,959
Acres of Wetlands within 1/2 Mile Radius	Low
Acres of Wetlands within 1/2 Mile Radius	2,368
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	6,656
Opportunity for redevelopment	Low
Redevelopment Score	1
Total Goal 4 Score	**12**
Total Goal 4 Ranking	**Medium-Low**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**Low**
% of Households with Low Income w/in 1/2 Mile	2.1%
% of Households with No Vehicle Access w/in 1/2 Mile	1.3%
5.2 Consistency with local plans	**Low**
5.3 Implementation Time	**Medium-Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	2
Total Goal 5 Score	**6**
Total Goal 5 Ranking	**Low**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	15,283
Number of Jobs w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	24,851
Jobs per Acre	Low
Weighted 2010 & 2035 Total	1.7
Change in Employment	High
% Change in Employment from 2010 to 2035	43.9%
6.2 Increase transit mode share for works trips	**High**
Passengers per Hour	67.9
Total Goal 6 Score	**13**
Total Goal 6 Ranking	**Medium**

This alternative scored poorly in terms of transit improvements and land use. Additionally, because the alignment would need to be parallel to the utility corridor, right of way acquisition and power structure limitations would require a longer implementation time and potentially costly alternative. As a result, this alignment is not recommended to move forward to Screen Two.

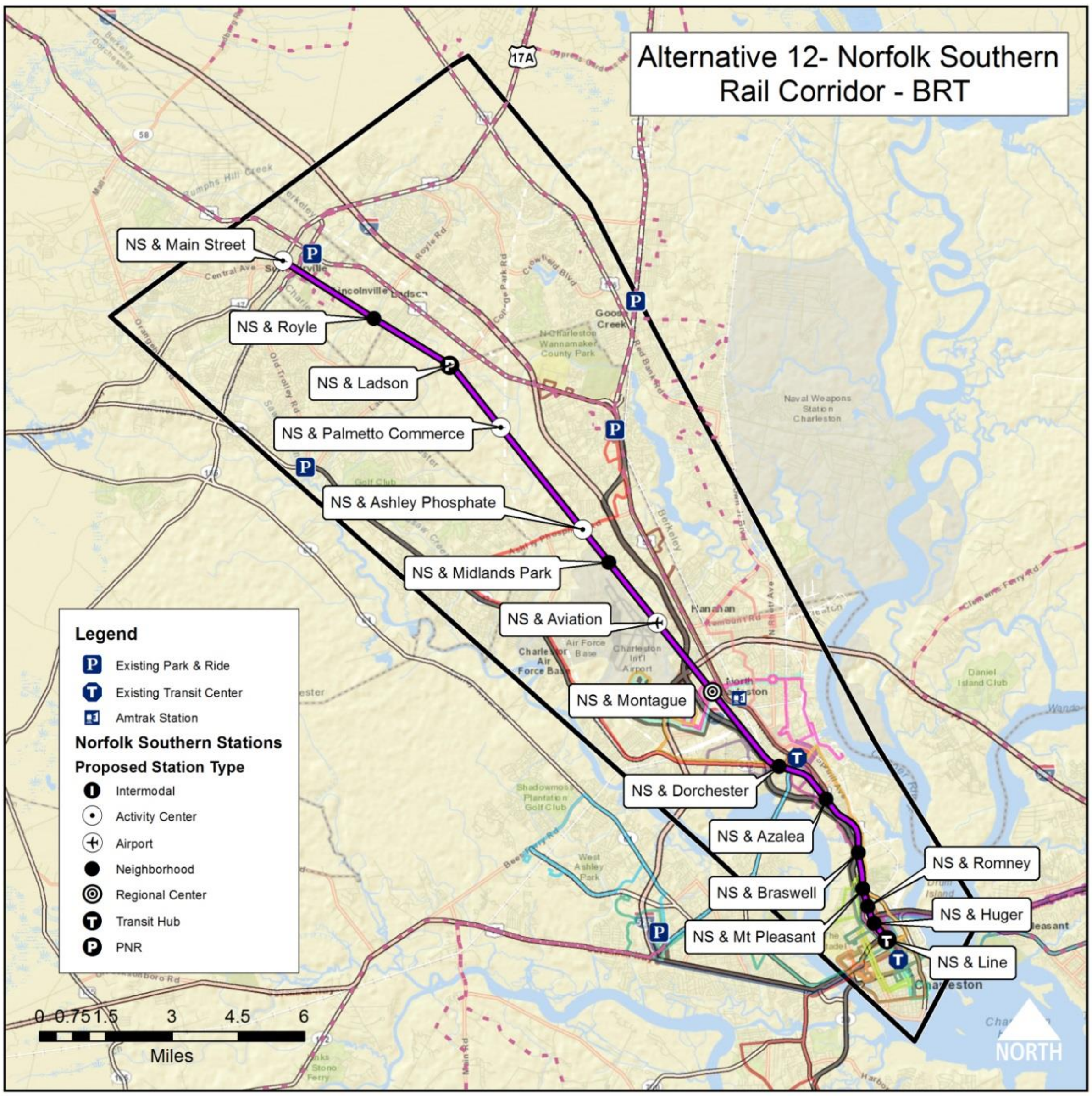
3.2.12 Alternative 12: Norfolk Southern Rail Line Bus Rapid Transit

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 12 is Bus Rapid Transit parallel to Norfolk Southern Rail Lines between Summerville and Charleston.

- Overall Screen 1 Score: Medium (106 Total PTs)
- Overall Screen 1 Ranking: #10 out of 20

Norfolk Southern BRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	12
Goal 2: Promote a cost effective and financially feasible transit alternative	17
Goal 3: Support local land use objectives	12
Goal 4: Plan for projected growth in an environmentally sustainable manner	18
Goal 5: Respond to community needs and support	14
Goal 6: Support a diverse regional economy	16
Total Score (Out of 150)	**106**
Rank (1-20)	**10**
Rank (1-5) Low to High	**Medium**
Rank (1-5) Number Equivalent	**3.0**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Medium**
Total Number of Transit Routes	19
1.2 Increase transit travel time to be competitive with automobile	**Low**
1.3 Improve efficiency of transit service	**Medium**
% of Systemwide Transit Ridership on Corridor	2.0%
1.4 Reduce traffic congestion (Subjective Assessment	**Medium-Low**
Change in AADT Traffic along 17A to Ashley Phosphate	80,000
Typical Average Daily Passengers for Peer System	9,135
Average Daily Passenger per Change in AADT	11%
1.5 Flexibility to expand/extend to regional corridors	**Medium**
Total Goal 1 Score	**12**
Total Goal 1 Ranking	**Medium-Low**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Medium**
Capital Construction Cost per Mile	$17.04
Typical Federal Share	63%
Estimated Project Capital Cost (In Millions)	$338.93
Estimated Local Need	$125.40
Rank of Local Need (1-20)	1
2.1b: Operating Costs	**Medium-High**
1) Operating Cost Hour	$119.41
2) Operating Cost per Mile	$10.80
3) Operating Cost per Passenger	$2.15
Ranking Sum of 3 Variables	15

2.2 Technically feasible alternative	**Medium**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	14
3) Major Obstacles to Construction	H
2.2 Constructability Score	1
2.3 Financially feasible alternative	**Medium-Low**
Financially Feasible Score	2
2.4 Alternative that will compete for federal funds	**High**
Number of New Starts & Small Starts in CIG Program	19
2.4 FTA Competitiveness Score	**5**
Total Goal 2 Score	**17**
Total Goal 2 Ranking	**Medium**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-Low**
Total Stops	12
Total Activity Centers Served	42
Weighted Score	21
3.2 Opportunity for Transit Oriented Development	**Medium**
TOD Score (From Land Use Analysis)	12
3.3 Adjacency to Growth Areas	**Medium-Low**
Total Goal 3 Score	**12**
Total Goal 3 Ranking	**Medium-Low**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium**
Air Quality Score	3
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	Medium-High
Total Linear Feet Crossed	2,312
Acres of Wetlands within 1/2 Mile Radius	High
Acres of Wetlands within 1/2 Mile Radius	1,078
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	1,064
Opportunity for redevelopment	Low
Redevelopment Score	1
Total Goal 4 Score	**18**
Total Goal 4 Ranking	**Medium-High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**Medium**
% of Households with Low Income w/in 1/2 Mile	3.0%
% of Households with No Vehicle Access w/in 1/2 Mile	1.9%
5.2 Consistency with local plans	**High**
5.3 Implementation Time	**Medium-Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	3
Total Goal 5 Score	**14**
Total Goal 5 Ranking	**Medium**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	14,596
Number of Jobs w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	33,748
Jobs per Acre	Medium-High
Weighted 2010 & 2035 Total	2.5
Change in Employment	Medium-High
% Change in Employment from 2010 to 2035	31.0%
6.2 Increase transit mode share for works trips	**Medium-High**
Passengers per Hour	60.7
Total Goal 6 Score	**16**
Total Goal 6 Ranking	**Medium**

This alternative scored average across all measures. Because the alignment is parallel to a rail corridor, property acquisition costs could increase the overall project costs. Additionally liability insurance may raise the cost of operations due to proximity to freight corridor. Due to its ranking in the lower 50% of alternatives, this alignment is not recommended to move forward.

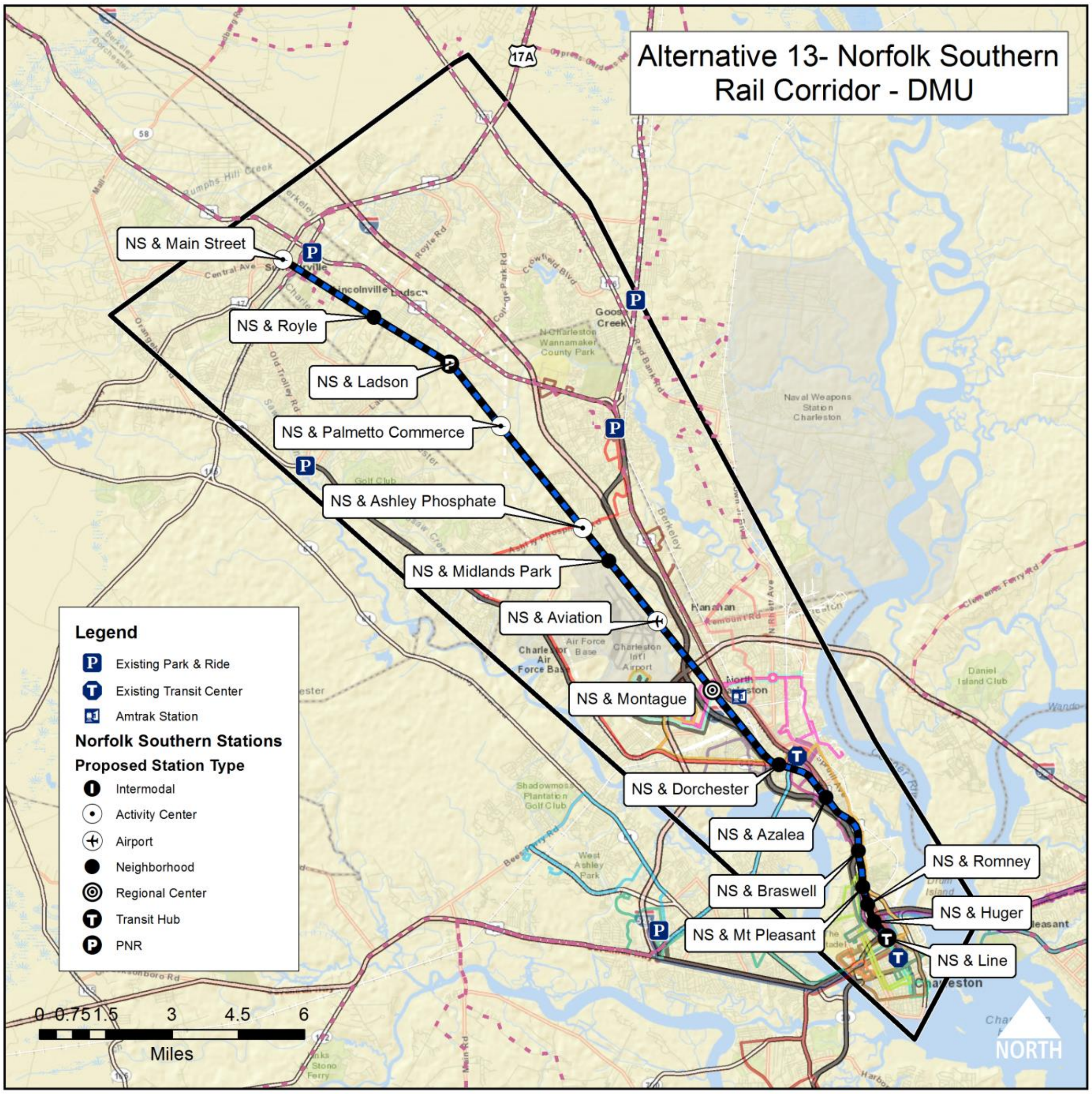
3.2.13 Alternative 13: Norfolk Southern Line Light Rail Transit (DMU)

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 13 is Light Rail Transit parallel to Norfolk Southern Rail Lines between Summerville and Charleston.

- Overall Screen 1 Score: Medium (88 Total PTs)
- Overall Screen 1 Ranking: #16 out of 20

Norfolk Southern LRT (DMU Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	10
Goal 2: Promote a cost effective and financially feasible transit alternative	8
Goal 3: Support local land use objectives	12
Goal 4: Plan for projected growth in an environmentally sustainable manner	19
Goal 5: Respond to community needs and support	14
Goal 6: Support a diverse regional economy	16
Total Score (Out of 150)	**88**
Rank (1-20)	**16**
Rank (1-5) Low to High	**Medium**
Rank (1-5) Number Equivalent	**2.5**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Low**
Total Number of Transit Routes	16
1.2 Increase transit travel time to be competitive with automobile	**Medium**
1.3 Improve efficiency of transit service	**Medium**
% of Systemwide Transit Ridership on Corridor	2.0%
1.4 Reduce traffic congestion (Subjective Assessment	**Low**
Change in AADT Traffic along 17A to Ashley Phosphate	80,000
Typical Average Daily Passengers for Peer System	4,330
Average Daily Passenger per Change in AADT	5%
1.5 Flexibility to expand/extend to regional corridors	**Medium-Low**
Total Goal 1 Score	**10**
Total Goal 1 Ranking	**Medium-Low**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Low**
Capital Construction Cost per Mile	$27.08
Typical Federal Share	54%
Estimated Project Capital Cost (In Millions)	$538.62
Estimated Local Need	$247.77
Rank of Local Need (1-20)	10
2.1b: Operating Costs	**Low**
1) Operating Cost Hour	$768.08
2) Operating Cost per Mile	$31.92
3) Operating Cost per Passenger	$15.32
Ranking Sum of 3 Variables	4

2.2 Technically feasible alternative	**Medium-Low**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	14
3) Major Obstacles to Construction	H
2.2 Constructability Score	2
2.3 Financially feasible alternative	**Low**
Financially Feasible Score	1
2.4 Alternative that will compete for federal funds	**Medium**
Number of New Starts & Small Starts in CIG Program	7
2.4 FTA Competitiveness Score	**3**
Total Goal 2 Score	**8**
Total Goal 2 Ranking	**Medium-Low**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-Low**
Total Stops	12
Total Activity Centers Served	42
Weighted Score	21
3.2 Opportunity for Transit Oriented Development	**Medium**
TOD Score (From Land Use Analysis)	12
3.3 Adjacency to Growth Areas	**Medium-Low**
Total Goal 3 Score	**12**
Total Goal 3 Ranking	**Medium-Low**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium-High**
Air Quality Score	4
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	Medium-High
Total Linear Feet Crossed	2,312
Acres of Wetlands within 1/2 Mile Radius	High
Acres of Wetlands within 1/2 Mile Radius	1,078
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	1,064
Opportunity for redevelopment	Low
Redevelopment Score	1
Total Goal 4 Score	**19**
Total Goal 4 Ranking	**Medium-High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**Medium**
% of Households with Low Income w/in 1/2 Mile	3.0%
% of Households with No Vehicle Access w/in 1/2 Mile	1.9%
5.2 Consistency with local plans	**High**
5.3 Implementation Time	**Medium-Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	3
Total Goal 5 Score	**14**
Total Goal 5 Ranking	**Medium**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	14,596
Number of Jobs w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	33,748
Jobs per Acre	Medium-High
Weighted 2010 & 2035 Total	2.5
Change in Employment	Medium-High
% Change in Employment from 2010 to 2035	31.0%
6.2 Increase transit mode share for works trips	**Medium**
Passengers per Hour	59.3
Total Goal 6 Score	**16**
Total Goal 6 Ranking	**Medium**

This alternative scored average across all measures. Because the alignment is parallel to a rail corridor, property acquisition costs could increase the overall project costs. Additionally, liability insurance may raise the cost of operations due to proximity to freight corridor. FRA compliant vehicles may be required, which would raise the price. Due to its ranking in the lower 50% of alternatives, this alignment is not recommended to move forward.

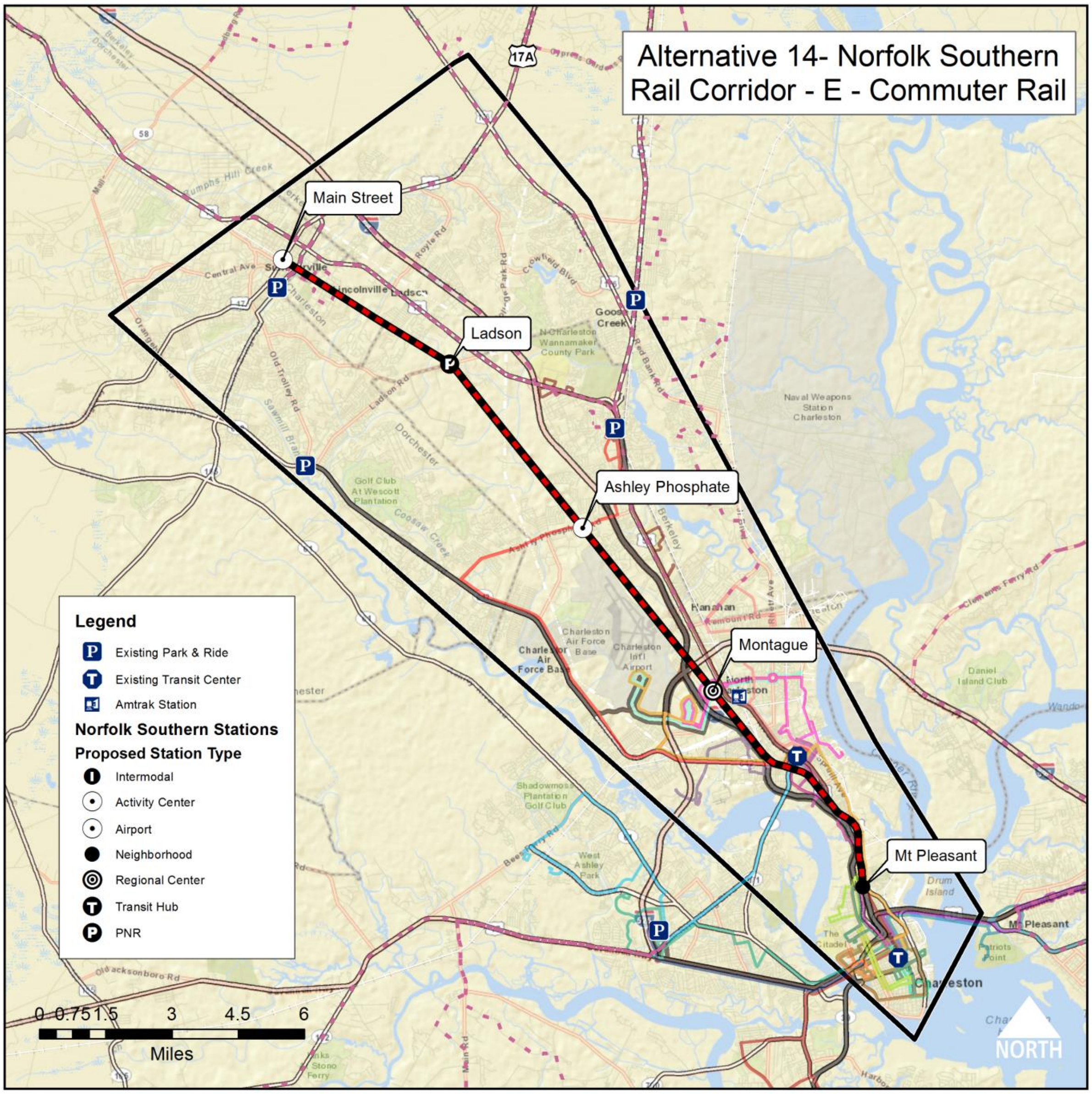
3.2.14 Alternative 14: Norfolk Southern Line Commuter Rail

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 14 is Commuter Rail parallel to Norfolk Southern Rail Lines between Summerville and Charleston.

- Overall Screen 1 Score: Medium (80 Total PTs)
- Overall Screen 1 Ranking: #18 out of 20

Norfolk Southern Commuter Rail Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	10
Goal 2: Promote a cost effective and financially feasible transit alternative	6
Goal 3: Support local land use objectives	10
Goal 4: Plan for projected growth in an environmentally sustainable manner	20
Goal 5: Respond to community needs and support	13
Goal 6: Support a diverse regional economy	16
Total Score (Out of 150)	**80**
Rank (1-20)	**18**
Rank (1-5) Low to High	**Medium-Low**
Rank (1-5) Number Equivalent	**2.3**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Low**
Total Number of Transit Routes	16
1.2 Increase transit travel time to be competitive with automobile	**High**
1.3 Improve efficiency of transit service	**Medium-Low**
% of Systemwide Transit Ridership on Corridor	2.0%
1.4 Reduce traffic congestion (Subjective Assessment	**Low**
Change in AADT Traffic along 17A to Ashley Phosphate	80,000
Typical Average Daily Passengers for Peer System	2,628
Average Daily Passenger per Change in AADT	3%
1.5 Flexibility to expand/extend to regional corridors	**Low**
Total Goal 1 Score	**10**
Total Goal 1 Ranking	**Medium-Low**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Low**
Capital Construction Cost per Mile	$27.08
Typical Federal Share	54%
Estimated Project Capital Cost (In Millions)	$538.62
Estimated Local Need	$247.77
Rank of Local Need (1-20)	10
2.1b: Operating Costs	**Medium-Low**
1) Operating Cost Hour	$753.78
2) Operating Cost per Mile	$19.52
3) Operating Cost per Passenger	$24.07
Ranking Sum of 3 Variables	5

2.2 Technically feasible alternative	**Low**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	14
3) Major Obstacles to Construction	H
2.2 Constructability Score	1
2.3 Financially feasible alternative	**Low**
Financially Feasible Score	1
2.4 Alternative that will compete for federal funds	**Low**
Number of New Starts & Small Starts in CIG Program	3
2.4 FTA Competitiveness Score	**1**
Total Goal 2 Score	**6**
Total Goal 2 Ranking	**Low**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Low**
Total Stops	5
Total Activity Centers Served	42
Weighted Score	15
3.2 Opportunity for Transit Oriented Development	**Medium**
TOD Score (From Land Use Analysis)	12
3.3 Adjacency to Growth Areas	**Medium-Low**
Total Goal 3 Score	**10**
Total Goal 3 Ranking	**Medium-Low**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**High**
Air Quality Score	5
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	Medium-High
Total Linear Feet Crossed	2,312
Acres of Wetlands within 1/2 Mile Radius	High
Acres of Wetlands within 1/2 Mile Radius	1,078
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	1,064
Opportunity for redevelopment	Low
Redevelopment Score	1
Total Goal 4 Score	**20**
Total Goal 4 Ranking	**Medium-High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**Medium**
% of Households with Low Income w/in 1/2 Mile	3.0%
% of Households with No Vehicle Access w/in 1/2 Mile	1.9%
5.2 Consistency with local plans	**High**
5.3 Implementation Time	**Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	3
Total Goal 5 Score	**13**
Total Goal 5 Ranking	**Medium**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	14,596
Number of Jobs w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	33,748
Jobs per Acre	Medium-High
Weighted 2010 & 2035 Total	2.5
Change in Employment	Medium-High
% Change in Employment from 2010 to 2035	31.0%
6.2 Increase transit mode share for works trips	**Medium-Low**
Passengers per Hour	32.2
Total Goal 6 Score	**16**
Total Goal 6 Ranking	**Medium**

This alternative scored average across all measures. Because of the activity on the exiting freight line, the alignment would likely need to be parallel to the rail corridor, and as such, property acquisition costs would increase the overall project costs. Additionally, infrastructure improvements to crossing would be needed. Operating costs are higher, particularly with liability insurance due to proximity to freight corridor. Due to its ranking in the lower 50% of alternatives, this alignment is not recommended to move forward.

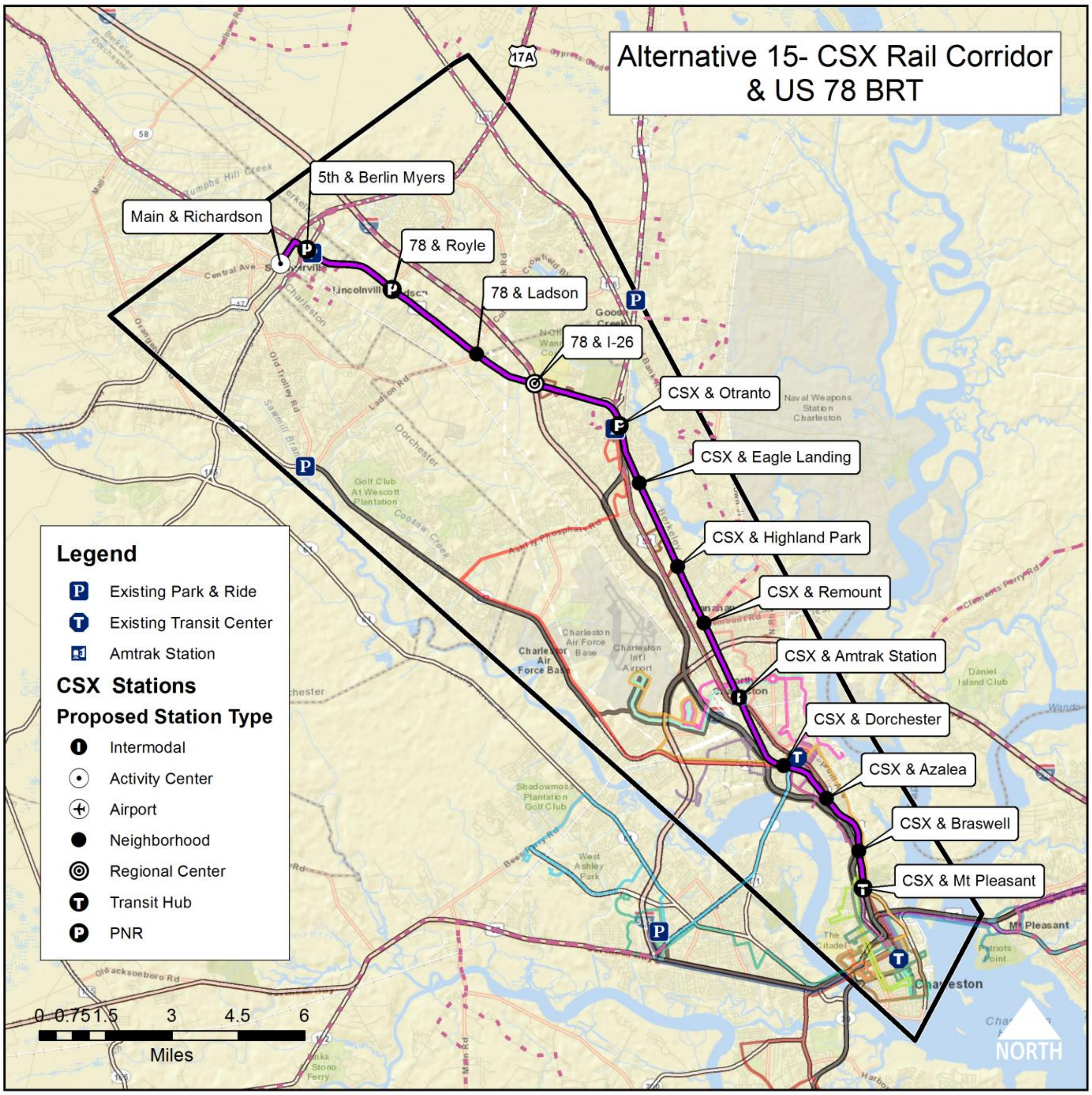
3.2.15 Alternative 15: CSX Rail Line & US 78 Bus Rapid Transit

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 15 is Bus Rapid Transit along CSX Rail Lines and US 78 between Summerville and Charleston.

- Overall Screen 1 Score: Medium-High (124 Total PTs)
- Overall Screen 1 Ranking: #5 out of 20

CSX & US 78 BRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	19
Goal 2: Promote a cost effective and financially feasible transit alternative	17
Goal 3: Support local land use objectives	14
Goal 4: Plan for projected growth in an environmentally sustainable manner	23
Goal 5: Respond to community needs and support	18
Goal 6: Support a diverse regional economy	16
Total Score (Out of 150)	**124**
Rank (1-20)	**5**
Rank (1-5) Low to High	**Medium-High**
Rank (1-5) Number Equivalent	**3.5**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Medium**
Total Number of Transit Routes	$17.04
1.2 Increase transit travel time to be competitive with automobile	63%
1.3 Improve efficiency of transit service	$367.21
% of Systemwide Transit Ridership on Corridor	$135.87
1.4 Reduce traffic congestion (Subjective Assessment	3
Change in AADT Traffic along 17A to Ashley Phosphate	**Medium-High**
Typical Average Daily Passengers for Peer System	$119.41
Average Daily Passenger per Change in AADT	$10.80
1.5 Flexibility to expand/extend to regional corridors	$2.15
Total Goal 1 Score	15
Total Goal 1 Ranking	**Medium**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Medium**
Capital Construction Cost per Mile	$17.04
Typical Federal Share	63%
Estimated Project Capital Cost (In Millions)	$338.93
Estimated Local Need	$125.40
Rank of Local Need (1-20)	1
2.1b: Operating Costs	**Medium-High**
1) Operating Cost Hour	$119.41
2) Operating Cost per Mile	$10.80
3) Operating Cost per Passenger	$2.15
Ranking Sum of 3 Variables	15

2.2 Technically feasible alternative	**Medium**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	8
3) Major Obstacles to Construction	H
2.2 Constructability Score	3
2.3 Financially feasible alternative	**Medium-Low**
Financially Feasible Score	2
2.4 Alternative that will compete for federal funds	**High**
Number of New Starts & Small Starts in CIG Program	19
2.4 FTA Competitiveness Score	**5**
Total Goal 2 Score	**17**
Total Goal 2 Ranking	**Medium**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium**
Total Stops	14
Total Activity Centers Served	66
Weighted Score	23
3.2 Opportunity for Transit Oriented Development	**Medium**
TOD Score (From Land Use Analysis)	13
3.3 Adjacency to Growth Areas	**Medium-Low**
Total Goal 3 Score	**14**
Total Goal 3 Ranking	**Medium**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium**
Air Quality Score	3
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	High
Total Linear Feet Crossed	1,187
Acres of Wetlands within 1/2 Mile Radius	High
Acres of Wetlands within 1/2 Mile Radius	1,291
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	2,285
Opportunity for redevelopment	High
Redevelopment Score	5
Total Goal 4 Score	**23**
Total Goal 4 Ranking	**High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**High**
% of Households with Low Income w/in 1/2 Mile	4.1%
% of Households with No Vehicle Access w/in 1/2 Mile	2.4%
5.2 Consistency with local plans	**High**
5.3 Implementation Time	**Medium-Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	3
Total Goal 5 Score	**18**
Total Goal 5 Ranking	**Medium-High**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	18,819
Number of Jobs w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	33,085
Jobs per Acre	Medium
Weighted 2010 & 2035 Total	2.3
Change in Employment	Medium
% Change in Employment from 2010 to 2035	19.1%
6.2 Increase transit mode share for works trips	**Medium-High**
Passengers per Hour	60.7
Total Goal 6 Score	**16**
Total Goal 6 Ranking	**Medium**

This alternative scored well across all measures. Because the alignment is parallel to a rail corridor, property acquisition costs could increase the overall project costs. Additionally liability insurance may raise the cost of operations due to proximity to freight corridor. This alignment is very similar to the US 78 & US 52 BRT Alternative 4, and as such, is recommended to be considered in future screenings as a potential design variant and not a stand-alone alternative.

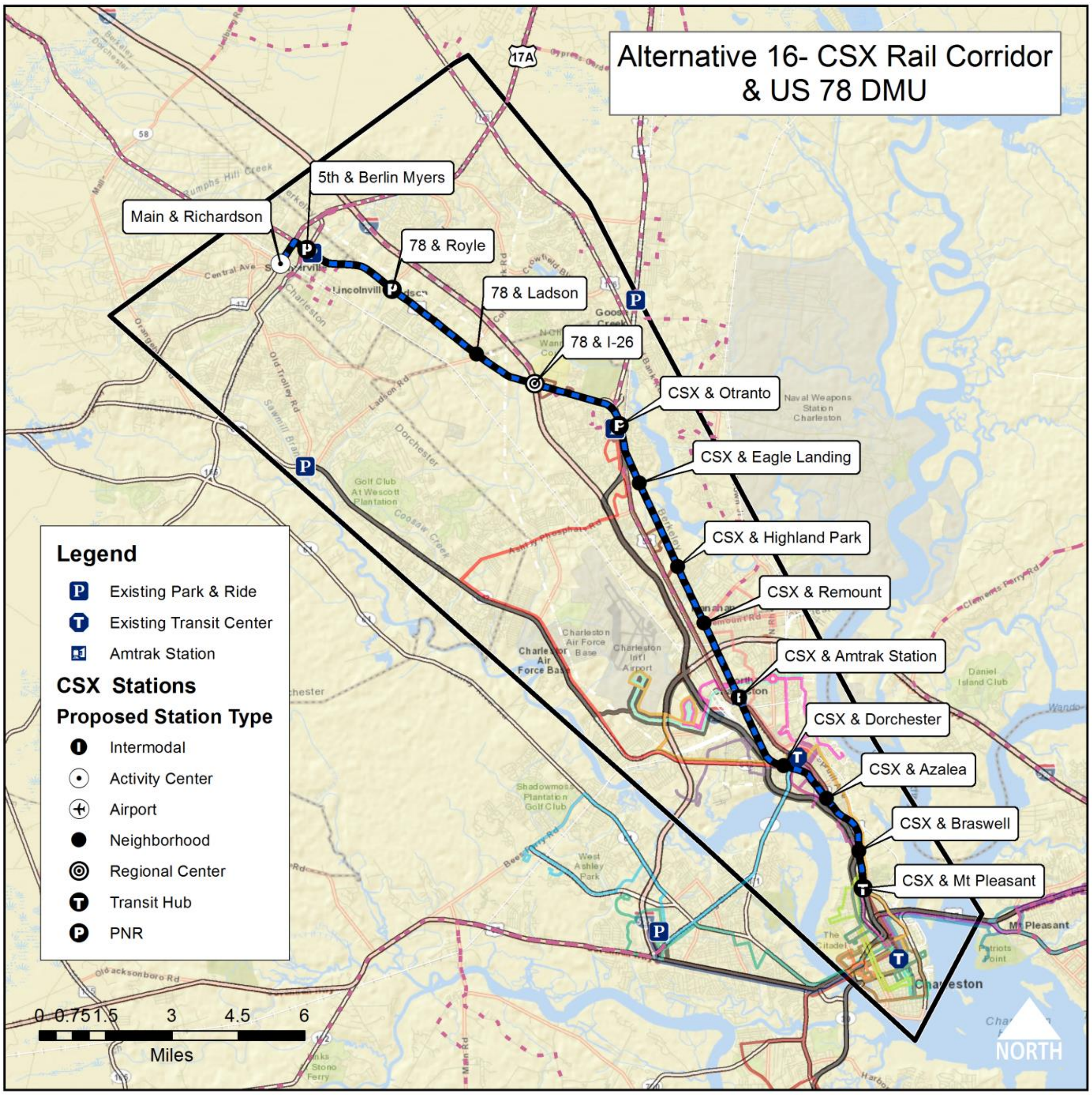
3.2.16 Alternative 16: CSX Rail Line & US 78 Light Rail (DMU) Transit

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 16 is Light Rail Transit along CSX Rail Lines and US 78 between Summerville and Charleston.

- Overall Screen 1 Score: Medium (107 Total PTs)
- Overall Screen 1 Ranking: #9 out of 20

CSX & US 78 LRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	19
Goal 2: Promote a cost effective and financially feasible transit alternative	8
Goal 3: Support local land use objectives	14
Goal 4: Plan for projected growth in an environmentally sustainable manner	24
Goal 5: Respond to community needs and support	18
Goal 6: Support a diverse regional economy	15
Total Score (Out of 150)	**107**
Rank (1-20)	**9**
Rank (1-5) Low to High	**Medium**
Rank (1-5) Number Equivalent	**3.0**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**High**
Total Number of Transit Routes	22
1.2 Increase transit travel time to be competitive with automobile	**Medium-High**
1.3 Improve efficiency of transit service	**High**
% of Systemwide Transit Ridership on Corridor	2.9%
1.4 Reduce traffic congestion (Subjective Assessment	**Medium**
Change in AADT Traffic along 17A to Ashley Phosphate	34,400
Typical Average Daily Passengers for Peer System	4,330
Average Daily Passenger per Change in AADT	13%
1.5 Flexibility to expand/extend to regional corridors	**Medium-Low**
Total Goal 1 Score	**19**
Total Goal 1 Ranking	**Medium-High**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Low**
Capital Construction Cost per Mile	$27.08
Typical Federal Share	54%
Estimated Project Capital Cost (In Millions)	$583.57
Estimated Local Need	$268.44
Rank of Local Need (1-20)	15
2.1b: Operating Costs	**Low**
1) Operating Cost Hour	$768.08
2) Operating Cost per Mile	$31.92
3) Operating Cost per Passenger	$15.32
Ranking Sum of 3 Variables	4

2.2 Technically feasible alternative	**Medium-Low**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	8
3) Major Obstacles to Construction	H
2.2 Constructability Score	2
2.3 Financially feasible alternative	**Low**
Financially Feasible Score	1
2.4 Alternative that will compete for federal funds	**Medium**
Number of New Starts & Small Starts in CIG Program	7
2.4 FTA Competitiveness Score	**3**
Total Goal 2 Score	**8**
Total Goal 2 Ranking	**Medium-Low**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium**
Total Stops	14
Total Activity Centers Served	66
Weighted Score	23
3.2 Opportunity for Transit Oriented Development	**Medium**
TOD Score (From Land Use Analysis)	13
3.3 Adjacency to Growth Areas	**Medium-Low**
Total Goal 3 Score	**14**
Total Goal 3 Ranking	**Medium**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium-High**
Air Quality Score	4
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	High
Total Linear Feet Crossed	1,187
Acres of Wetlands within 1/2 Mile Radius	High
Acres of Wetlands within 1/2 Mile Radius	1,291
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	2,285
Opportunity for redevelopment	High
Redevelopment Score	5
Total Goal 4 Score	**24**
Total Goal 4 Ranking	**High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**High**
% of Households with Low Income w/in 1/2 Mile	4.1%
% of Households with No Vehicle Access w/in 1/2 Mile	2.4%
5.2 Consistency with local plans	**High**
5.3 Implementation Time	**Medium-Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	3
Total Goal 5 Score	**18**
Total Goal 5 Ranking	**Medium-High**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	18,819
Number of Jobs w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	33,085
Jobs per Acre	Medium
Weighted 2010 & 2035 Total	2.3
Change in Employment	Medium
% Change in Employment from 2010 to 2035	19.1%
6.2 Increase transit mode share for works trips	**Medium**
Passengers per Hour	59.3
Total Goal 6 Score	**15**
Total Goal 6 Ranking	**Medium**

This alternative scored well across all measures. Because the alignment is parallel to a rail corridor, property acquisition costs could increase the overall project costs. Additionally liability insurance may raise the cost of operations due to proximity to freight corridor. This alignment is very similar to the US 78 & US 52 LRT Alternative 5, and as such, is recommended to be considered in future screenings as a potential design variant or transit technology and not a stand-alone alternative.

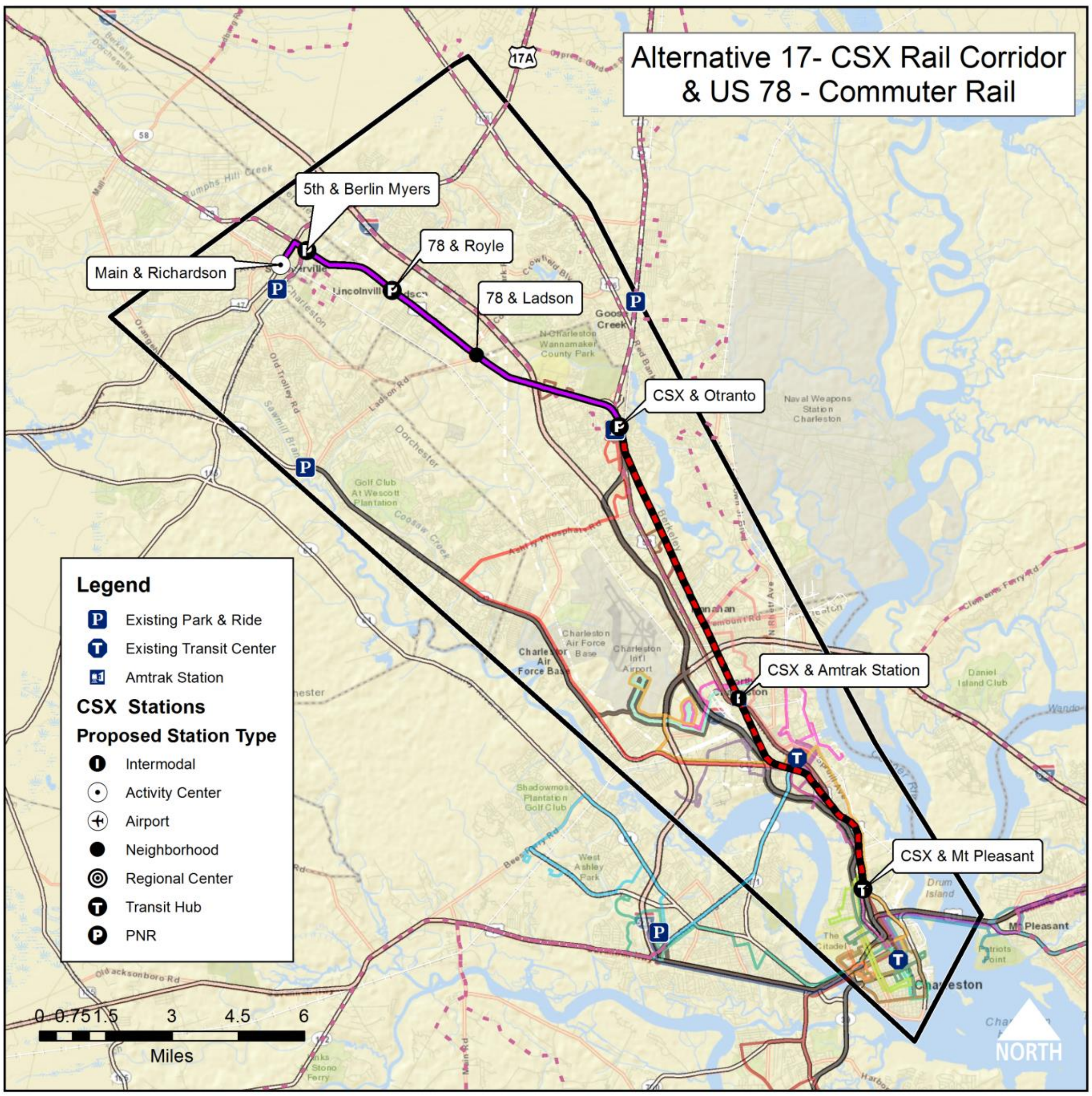
3.2.17 Alternative 17: CSX Rail Line Commuter Rail & US 78 Bus Rapid Transit

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 17 is Bus Rapid Transit along US 78 to US 52; where travelers transfer to a Commuter Rail mode on the CSX Rail Corridor

- Overall Screen 1 Score: Medium (94 Total PTs)
- Overall Screen 1 Ranking: #13 out of 20

CSX Commuter Rail & US 78 BRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	15
Goal 2: Promote a cost effective and financially feasible transit alternative	6
Goal 3: Support local land use objectives	12
Goal 4: Plan for projected growth in an environmentally sustainable manner	25
Goal 5: Respond to community needs and support	17
Goal 6: Support a diverse regional economy	14
Total Score (Out of 150)	**94**
Rank (1-20)	**13**
Rank (1-5) Low to High	**Medium**
Rank (1-5) Number Equivalent	**2.7**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**High**
Total Number of Transit Routes	22
1.2 Increase transit travel time to be competitive with automobile	**Medium**
1.3 Improve efficiency of transit service	**Medium-High**
% of Systemwide Transit Ridership on Corridor	2.9%
1.4 Reduce traffic congestion (Subjective Assessment	**Medium-Low**
Change in AADT Traffic along 17A to Ashley Phosphate	34,400
Typical Average Daily Passengers for Peer System	2,628
Average Daily Passenger per Change in AADT	8%
1.5 Flexibility to expand/extend to regional corridors	**Low**
Total Goal 1 Score	**15**
Total Goal 1 Ranking	**Medium**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Low**
Capital Construction Cost per Mile	$27.08
Typical Federal Share	54%
Estimated Project Capital Cost (In Millions)	$583.57
Estimated Local Need	$268.44
Rank of Local Need (1-20)	14
2.1b: Operating Costs	**Medium-Low**
1) Operating Cost Hour	$753.78
2) Operating Cost per Mile	$19.52
3) Operating Cost per Passenger	$24.07
Ranking Sum of 3 Variables	5

2.2 Technically feasible alternative	**Low**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	8
3) Major Obstacles to Construction	H
2.2 Constructability Score	1
2.3 Financially feasible alternative	**Low**
Financially Feasible Score	1
2.4 Alternative that will compete for federal funds	**Low**
Number of New Starts & Small Starts in CIG Program	3
2.4 FTA Competitiveness Score	**1**
Total Goal 2 Score	**6**
Total Goal 2 Ranking	**Low**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-Low**
Total Stops	8
Total Activity Centers Served	66
Weighted Score	20
3.2 Opportunity for Transit Oriented Development	**Medium**
TOD Score (From Land Use Analysis)	13
3.3 Adjacency to Growth Areas	**Medium-Low**
Total Goal 3 Score	**12**
Total Goal 3 Ranking	**Medium-Low**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**High**
Air Quality Score	5
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	High
Total Linear Feet Crossed	1,187
Acres of Wetlands within 1/2 Mile Radius	High
Acres of Wetlands within 1/2 Mile Radius	1,291
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	2,285
Opportunity for redevelopment	High
Redevelopment Score	5
Total Goal 4 Score	**25**
Total Goal 4 Ranking	**High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**High**
% of Households with Low Income w/in 1/2 Mile	4.1%
% of Households with No Vehicle Access w/in 1/2 Mile	2.4%
5.2 Consistency with local plans	**High**
5.3 Implementation Time	**Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	3
Total Goal 5 Score	**17**
Total Goal 5 Ranking	**Medium**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	18,819
Number of Jobs w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	33,085
Jobs per Acre	Medium
Weighted 2010 & 2035 Total	2.3
Change in Employment	Medium
% Change in Employment from 2010 to 2035	19.1%
6.2 Increase transit mode share for works trips	**Medium-Low**
Passengers per Hour	32.2
Total Goal 6 Score	**14**
Total Goal 6 Ranking	**Medium**

This alternative scored average. This alternative requires a mode transfer from bus rapid transit to commuter rail in order to meet the purpose and need of the project to serve Summerville, and as such does not rank well in terms of improvements to transit and travel time. Additionally, active freight would require parallel alignments in developed areas, which would add to the project cost. This alternative is not recommended to move forward in Screen Two.

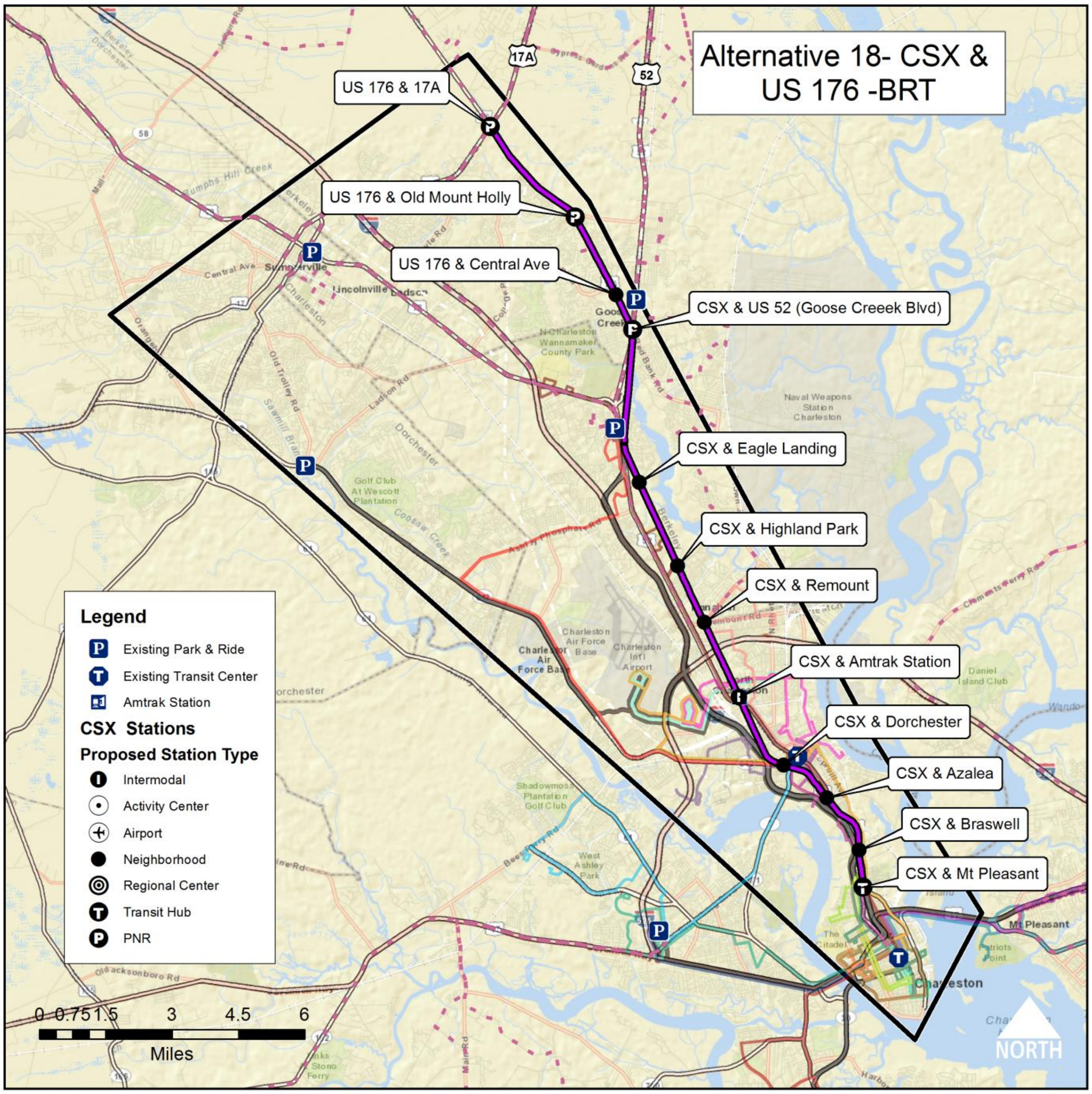
3.2.18 Alternative 15: CSX Rail Line & US 176 Bus Rapid Transit

Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X

Alternative 18 is Bus Rapid Transit along CSX Rail Lines and US 176 between Summerville and Charleston.

- Overall Screen 1 Score: Medium (115 Total PTs)
- Overall Screen 1 Ranking: #8 out of 20

CSX & US 176 BRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	19
Goal 2: Promote a cost effective and financially feasible transit alternative	17
Goal 3: Support local land use objectives	16
Goal 4: Plan for projected growth in an environmentally sustainable manner	19
Goal 5: Respond to community needs and support	16
Goal 6: Support a diverse regional economy	11
Total Score (Out of 150)	**115**
Rank (1-20)	**8**
Rank (1-5) Low to High	**Medium**
Rank (1-5) Number Equivalent	**3.3**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Medium-High**
Total Number of Transit Routes	21
1.2 Increase transit travel time to be competitive with automobile	**Medium-Low**
1.3 Improve efficiency of transit service	**High**
% of Systemwide Transit Ridership on Corridor	2.9%
1.4 Reduce traffic congestion (Subjective Assessment	**High**
Change in AADT Traffic along 17A to Ashley Phosphate	34,400
Typical Average Daily Passengers for Peer System	9,135
Average Daily Passenger per Change in AADT	27%
1.5 Flexibility to expand/extend to regional corridors	**Medium**
Total Goal 1 Score	**19**
Total Goal 1 Ranking	**Medium-High**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Medium**
Capital Construction Cost per Mile	\$17.04
Typical Federal Share	63%
Estimated Project Capital Cost (In Millions)	\$344.38
Estimated Local Need	\$127.42
Rank of Local Need (1-20)	2
2.1b: Operating Costs	**Medium - High**
1) Operating Cost Hour	\$119.41
2) Operating Cost per Mile	\$10.80
3) Operating Cost per Passenger	\$2.15
Ranking Sum of 3 Variables	15

2.2 Technically feasible alternative	**Medium**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	8
3) Major Obstacles to Construction	H
2.2 Constructability Score	3
2.3 Financially feasible alternative	**Medium-Low**
Financially Feasible Score	2
2.4 Alternative that will compete for federal funds	**High**
Number of New Starts & Small Starts in CIG Program	19
2.4 FTA Competitiveness Score	**5**
Total Goal 2 Score	**17**
Total Goal 2 Ranking	**Medium**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-Low**
Total Stops	12
Total Activity Centers Served	65
Weighted Score	20
3.2 Opportunity for Transit Oriented Development	**Medium-High**
TOD Score (From Land Use Analysis)	13
3.3 Adjacency to Growth Areas	**Medium-High**
Total Goal 3 Score	**16**
Total Goal 3 Ranking	**Medium**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium**
Air Quality Score	3
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	Medium-High
Total Linear Feet Crossed	4,217
Acres of Wetlands within 1/2 Mile Radius	Medium
Acres of Wetlands within 1/2 Mile Radius	1,814
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	0
Opportunity for redevelopment	Medium-High
Redevelopment Score	4
Total Goal 4 Score	**19**
Total Goal 4 Ranking	**Medium-High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**High**
% of Households with Low Income w/in 1/2 Mile	3.8%
% of Households with No Vehicle Access w/in 1/2 Mile	2.3%
5.2 Consistency with local plans	**Medium**
5.3 Implementation Time	**Medium-Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	3
Total Goal 5 Score	**16**
Total Goal 5 Ranking	**Medium**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	18,569
Number of Jobs w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	26,469
Jobs per Acre	Medium-Low
Weighted 2010 & 2035 Total	2.0
Change in Employment	Low
% Change in Employment from 2010 to 2035	9.5%
6.2 Increase transit mode share for works trips	**Medium-High**
Passengers per Hour	60.7
Total Goal 6 Score	**11**
Total Goal 6 Ranking	**Medium-Low**

This alternative scored medium across all measures. Because the alignment is parallel to a rail corridor, property acquisition costs could increase the overall project costs. Additionally liability insurance may raise the cost of operations due to proximity to freight corridor. This alignment is very similar to the US 176 & US 52 BRT Alternative 6, and as such, is recommended to be considered in future screenings as a potential design variant and not a stand-alone alternative.

3.2.19 Alternative 19: CSX Rail Line & US 176 Light Rail (DMU) Transit

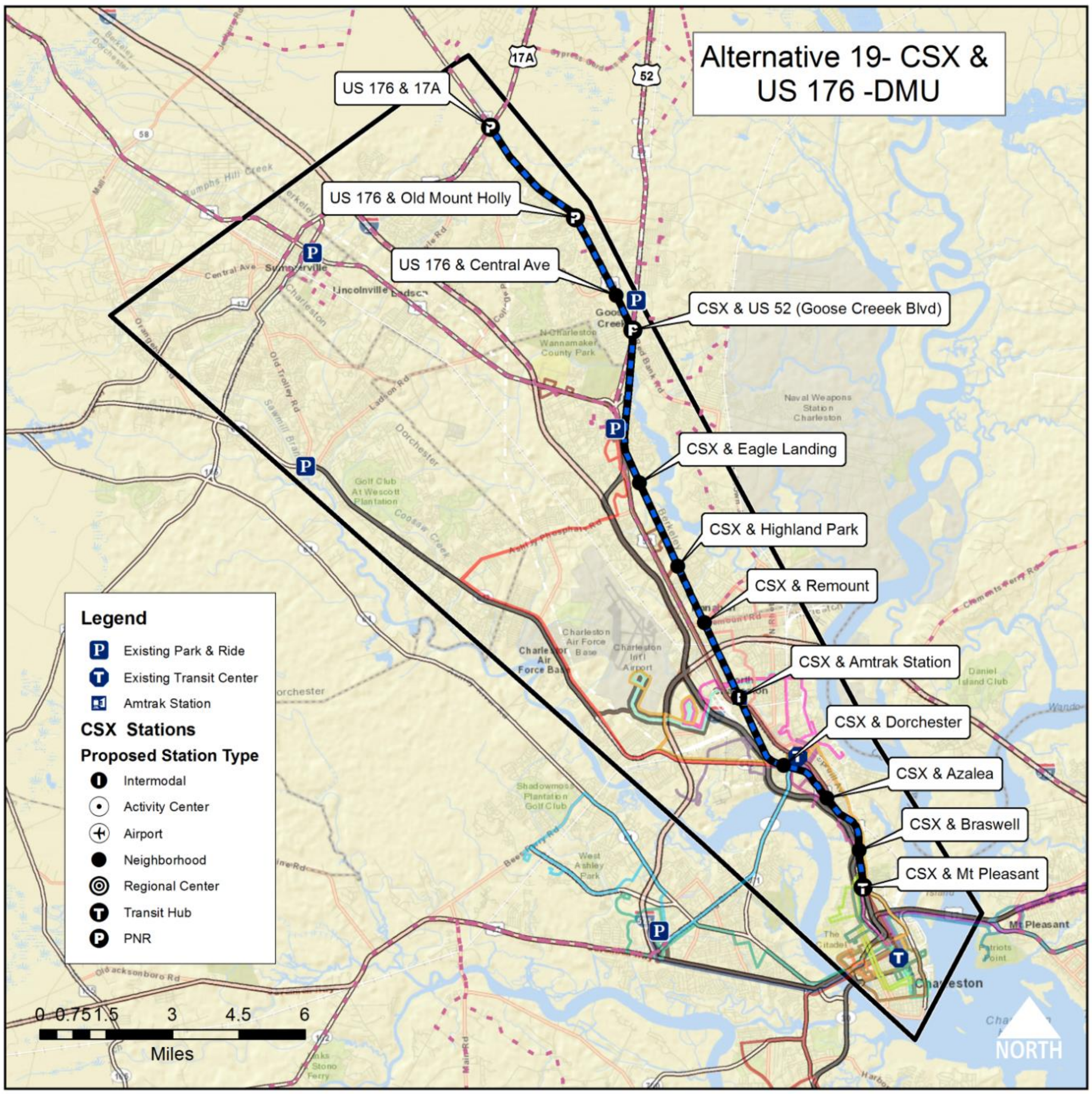
Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X*

* This alternative is recommended to be considered in future screenings as a potential design variant or transit technology and not a stand-alone alternative.

Alternative 19 is Light Rail Transit along CSX Rail Lines and US 176 between Summerville and Charleston.

- Overall Screen 1 Score: Medium (97 Total PTs)
- Overall Screen 1 Ranking: #12 out of 20

CSX & US 176 LRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	18
Goal 2: Promote a cost effective and financially feasible transit alternative	8
Goal 3: Support local land use objectives	16
Goal 4: Plan for projected growth in an environmentally sustainable manner	20
Goal 5: Respond to community needs and support	16
Goal 6: Support a diverse regional economy	10
Total Score (Out of 150)	**97**
Rank (1-20)	**1**
Rank (1-5) Low to High	**Medium**
Rank (1-5) Number Equivalent	**2.8**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Medium-High**
Total Number of Transit Routes	21
1.2 Increase transit travel time to be competitive with automobile	**Medium-High**
1.3 Improve efficiency of transit service	**High**
% of Systemwide Transit Ridership on Corridor	2.9%
1.4 Reduce traffic congestion (Subjective Assessment	**Medium**
Change in AADT Traffic along 17A to Ashley Phosphate	34,400
Typical Average Daily Passengers for Peer System	4,330
Average Daily Passenger per Change in AADT	13%
1.5 Flexibility to expand/extend to regional corridors	**Medium-Low**
Total Goal 1 Score	**18**
Total Goal 1 Ranking	**Medium-High**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Low**
Capital Construction Cost per Mile	$27.08
Typical Federal Share	54%
Estimated Project Capital Cost (In Millions)	$547.29
Estimated Local Need	$251.75
Rank of Local Need (1-20)	12
2.1b: Operating Costs	**Low**
1) Operating Cost Hour	$768.08
2) Operating Cost per Mile	$31.92
3) Operating Cost per Passenger	$15.32
Ranking Sum of 3 Variables	4

2.2 Technically feasible alternative	**Medium Low**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	8
3) Major Obstacles to Construction	H
2.2 Constructability Score	2
2.3 Financially feasible alternative	**Low**
Financially Feasible Score	1
2.4 Alternative that will compete for federal funds	**Medium**
Number of New Starts & Small Starts in CIG Program	7
2.4 FTA Competitiveness Score	**3**
Total Goal 2 Score	**8**
Total Goal 2 Ranking	**Medium-Low**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Medium-Low**
Total Stops	12
Total Activity Centers Served	65
Weighted Score	20
3.2 Opportunity for Transit Oriented Development	**Medium-High**
TOD Score (From Land Use Analysis)	13
3.3 Adjacency to Growth Areas	**Medium-High**
Total Goal 3 Score	**16**
Total Goal 3 Ranking	**Medium**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**Medium-High**
Air Quality Score	4
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	Medium-High
Total Linear Feet Crossed	4,217
Acres of Wetlands within 1/2 Mile Radius	Medium
Acres of Wetlands within 1/2 Mile Radius	1,814
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	0
Opportunity for redevelopment	Medium-High
Redevelopment Score	4
Total Goal 4 Score	**20**
Total Goal 4 Ranking	**Medium-High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**High**
% of Households with Low Income w/in 1/2 Mile	3.8%
% of Households with No Vehicle Access w/in 1/2 Mile	2.3%
5.2 Consistency with local plans	**Medium**
5.3 Implementation Time	**Medium-Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	3
Total Goal 5 Score	**16**
Total Goal 5 Ranking	**Medium**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	18,569
Number of Jobs w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	26,469
Jobs per Acre	Medium-Low
Weighted 2010 & 2035 Total	2.0
Change in Employment	Low
% Change in Employment from 2010 to 2035	9.5%
6.2 Increase transit mode share for works trips	**Medium**
Passengers per Hour	59.3
Total Goal 6 Score	**10**
Total Goal 6 Ranking	**Medium-Low**

This alternative scored average across measures. Because the alignment is parallel to a rail corridor, property acquisition costs could increase the overall project costs. Additionally liability insurance may raise the cost of operations due to proximity to freight corridor. This alignment is very similar to the US 176 & US 52 LRT Alternative 7, and as such, is recommended to be considered in future screenings as a potential design variant or transit technology and not a stand-alone alternative.

3.2.20 Alternative 20: CSX Rail Line Commuter Rail & US 176 Bus Rapid Transit

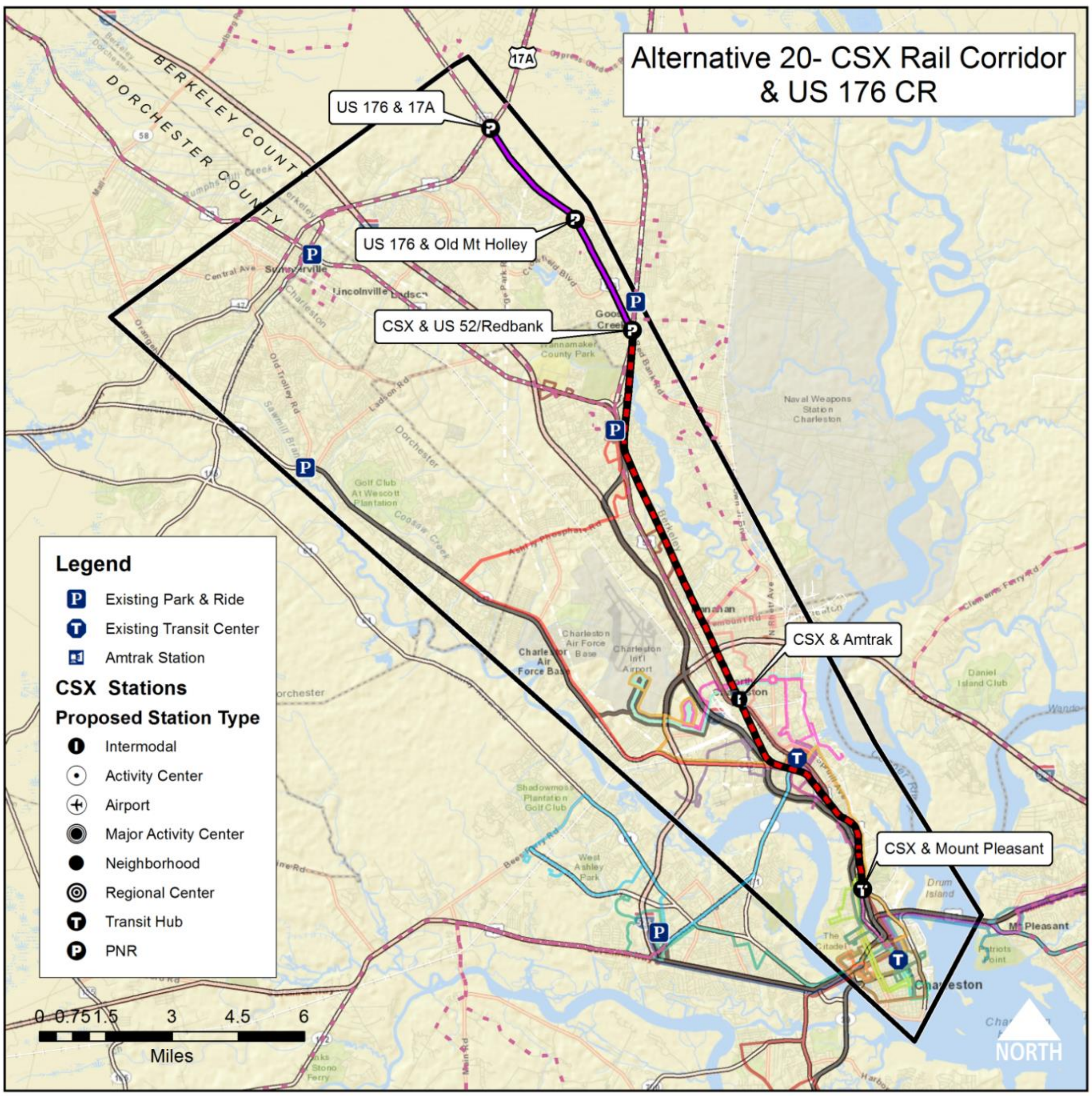
Steering Committee Recommendation:			
Move forward to Screen 2:		Do not move forward to Screen 2:	X*

This alternative is "recommended to be considered in future screenings as a potential design variant or transit technology and not a stand-alone alternative

Alternative 20 is Bus Rapid Transit along US 176 to US 52; where travelers transfer to a Commuter Rail mode on the CSX Rail Corridor

- Overall Screen 1 Score: Medium (84 Total PTs)
- Overall Screen 1 Ranking: #17 out of 20

CSX Commuter Rail & US 176 BRT Conceptual Alignment and Stations



Goal 1: Improve mobility, accessibility, safety and connectivity of the transit system and region	14
Goal 2: Promote a cost effective and financially feasible transit alternative	6
Goal 3: Support local land use objectives	17
Goal 4: Plan for projected growth in an environmentally sustainable manner	21
Goal 5: Respond to community needs and support	15
Goal 6: Support a diverse regional economy	9
Total Score (Out of 150)	**84**
Rank (1-20)	**17**
Rank (1-5) Low to High	**Medium-Low**
Rank (1-5) Number Equivalent	**2.4**

Scoring Summary:

Goal 1: Improve mobility, accessibility, safety, and connectivity of the transit system and region

1.1 Provide convenient connections from bike, pedestrian, and transit routes to the alternative	**Medium-High**
Total Number of Transit Routes	21
1.2 Increase transit travel time to be competitive with automobile	**Medium**
1.3 Improve efficiency of transit service	**Medium-High**
% of Systemwide Transit Ridership on Corridor	2.9%
1.4 Reduce traffic congestion (Subjective Assessment	**Medium-Low**
Change in AADT Traffic along 17A to Ashley Phosphate	34,400
Typical Average Daily Passengers for Peer System	2,628
Average Daily Passenger per Change in AADT	8%
1.5 Flexibility to expand/extend to regional corridors	**Low**
Total Goal 1 Score	**14**
Total Goal 1 Ranking	**Medium**

Goal 2: Promote a cost effective and financially feasible transit alternative:

2.1 Meet the needs in a cost effective manner	**Low**
Capital Construction Cost per Mile	$27.08
Typical Federal Share	54%
Estimated Project Capital Cost (In Millions)	$547.29
Estimated Local Need	$251.75
Rank of Local Need (1-20)	13
2.1b: Operating Costs	**Medium-Low**
1) Operating Cost Hour	$753.78
2) Operating Cost per Mile	$19.52
3) Operating Cost per Passenger	$24.07
Ranking Sum of 3 Variables	5

2.2 Technically feasible alternative	**Low**
1) Miles of Elevated Alignment	0
2) Quantities of Overpasses	8
3) Major Obstacles to Construction	H
2.2 Constructability Score	1
2.3 Financially feasible alternative	**Low**
Financially Feasible Score	1
2.4 Alternative that will compete for federal funds	**Low**
Number of New Starts & Small Starts in CIG Program	3
2.4 FTA Competitiveness Score	**1**
Total Goal 2 Score	**6**
Total Goal 2 Ranking	**Low**

Goal 3: Support Local Land Use Objectives

3.1 Provide convenient and accessible transit service to existing and planned activity centers	**Low**
Total Stops	6
Total Activity Centers Served	65
Weighted Score	18
3.2 Opportunity for Transit Oriented Development	**Medium-High**
TOD Score (From Land Use Analysis)	13
3.3 Adjacency to Growth Areas	**Medium-High**
Total Goal 3 Score	**14**
Total Goal 3 Ranking	**Medium**

Goal 4: Plan for projected growth in an environmentally sustainable manner

4.1 Reduce air pollution and emissions	**High**
Air Quality Score	5
4.2 Avoid, minimize mitigate adverse impacts on environment and community Resources	
Linear feet of wetlands crossed by alignments	Medium-High
Total Linear Feet Crossed	4,217
Acres of Wetlands within 1/2 Mile Radius	Medium
Acres of Wetlands within 1/2 Mile Radius	1,814
Historic and conservation district	High
Linear feet crossed (Not including DT Charleston)	0
Opportunity for redevelopment	Medium-High
Redevelopment Score	4
Total Goal 4 Score	**21**
Total Goal 4 Ranking	**Medium-High**

Goal 5: Respond to community needs and support

5.1 Service areas with transit dependent populations	**High**
% of Households with Low Income w/in 1/2 Mile	3.8%
% of Households with No Vehicle Access w/in 1/2 Mile	2.3%
5.2 Consistency with local plans	**Medium**
5.3 Implementation Time	**Low**
5.4 Public Response	**Low**
Total Public Meeting Votes (Out of 67)	3
Total Goal 5 Score	**15**
Total Goal 5 Ranking	**Medium**

Goal 6: Support a diverse regional economy

6.1 Areas with greatest density of Jobs and Employment	
Number of Household w/in 1/2 Mile	Medium
Weighted 2010 & 2035 Total	18,569
Number of Jobs w/in 1/2 Mile	Low
Weighted 2010 & 2035 Total	26,469
Jobs per Acre	Medium-Low
Weighted 2010 & 2035 Total	2.0
Change in Employment	Low
% Change in Employment from 2010 to 2035	9.5%
6.2 Increase transit mode share for works trips	**Medium-Low**
Passengers per Hour	32.2
Total Goal 6 Score	**9**
Total Goal 6 Ranking	**Medium-Low**

This alternative scored average. This alternative requires a mode transfer from bus rapid transit to commuter rail in order to meet the purpose and need of the project to serve Summerville, and as such does not rank well in terms of improvements to transit and travel time. Additionally, active freight would require parallel alignments in developed areas, which would add to the project cost. This alternative is not recommended to move forward in Screen Two.

3.3 Alternative Recommended to Move Forward into Screen Two

The following Table 3-2 shows the alternatives recommended to progress to Screen Two.

Table 3 - 2: Screen One Recommended Alternatives for Screen Two

Alternative	Rank (1-20)	Screen One Results	Steering Committee Recommendation
4-US 52 / US 78 C-1 -BRT	1	Y	Y
6-US 52/ US 176 C-2-BRT	2	Y	Y
5-US 52 / US 78 C-1 -LRT	3	Y	Y
7-US 52/ US 176 C-2-LRT	4	Y	Y
15-CSX Rail Line/Bus via US 78 F-1-BRT	5	N*	N
2-Dorchester Road B-BRT	6	Y	Y
1-I-26 A-BRT	7	N	N
18-CSX Rail Line/Bus via US 176 F-2 -BRT	8	N	N
16-CSX Rail Line/Bus via US 78 F-1-DMU	9	N	N
12-Norfolk Southern Rail Line E-BRT	10	N	N
3-Dorchester Road B-LRT	11	N	N
19-CSX Rail Line/Bus via US 176 F-2 -DMU	12	N	N
17-CSX Rail Line/Bus via US 78 F-1-CR	13	N	N
10-Santee Cooper Utility Corridor D-2-BRT	14	N	N
8-SCE&G Utility Corridor D-1-BRT	15	N	N
13-Norfolk Southern Rail Line E-DMU	16	N	N
20-CSX Rail Line/Bus via US 176 F-2-CR	17	N	N
14-Norfolk Southern Rail Line E-CR	18	N	N
9-SCE&G Utility Corridor D-1-LRT	19	N	N
11-Santee Cooper Utility Corridor D-2-LRT	20	N	N

*Not as a stand-alone alternative

4 List of Appendices

Appendix 3-A: Peer System Review

Appendix 3-B: Land Use Analysis

Appendix 3-C: Freight Railroad Policies for Passenger Service

Appendix 3-A

(Peer System Review)

Appendix 3-B

(Land Use Analysis)

Appendix 3-C

(Freight Rail Policies for Passenger Service)

i-26ALT

I-26 Fixed Guideway Alternatives Analysis

CHAPTER IV: Screen Two Alternatives

Draft Report – February 2016

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1 Introduction

The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) initiated the I-26 Regional Fixed Guideway Transit Alternatives Analysis Study (i-26*ALT*) to improve transit options for residents and businesses along the I-26 Corridor. The purpose of the I-26 Alternatives Analysis is to improve transit service and enhance regional mobility along the I-26 Corridor connecting Summerville, North Charleston, and Charleston in South Carolina.

1.1 Screen Two Alternatives

A total of 20 alternatives were evaluated in the Initial Alternatives Screening: Screen One Analysis. This phase of screening utilized a combination of subjective and objective analyses to identify those modes and alignments that best meet the project goals and objectives and warrant a more detailed analysis – Screen Two Analysis.

Results from the Screen One Analysis, input from the I-26 Alternative Analysis Steering and Technical Advisory Committees, and community feedback have identified the following alternatives to move forward into the Screen Two Analysis:

- Screen Two - Alternative A: No Build I-26 Commuter Bus
- Screen Two - Alternative B-1: US 78/US 52/Meeting– BRT
- Screen Two - Alternative B-2: US 78/US 52/Meeting – LRT
- Screen Two - Alternative B-3: US 78/US 52/East Bay – BRT
- Screen Two - Alternative B-4: US 78/US 52/East Bay – LRT
- Screen Two - Alternative C-1: US 176/US 52/Meeting – BRT
- Screen Two - Alternative C-2: US 176/US 52/Meeting – LRT
- Screen Two - Alternative C-3: US 176/US 52/East Bay – BRT
- Screen Two - Alternative C-4: US 176/US 52/East Bay – LRT
- Screen Two - Alternative D-1: Dorchester Rd/US 52/Meeting – BRT
- Screen Two - Alternative D-2: Dorchester Rd/US 52/Meeting – LRT
- Screen Two - Alternative D-3: Dorchester Rd/US 52/East Bay – BRT
- Screen Two - Alternative D-4: Dorchester Rd /US 52/East Bay – LRT

This chapter describes the fixed guideway operating plans and underlying transit network for each alternative. BRT and LRT alternatives share the same alignment and station locations. The supporting transit network assumes the existing CARTA transit network in operation as of the ridership survey in October 2014 with slight modifications to connect to proposed transit stations. This screening does not incorporate TriCounty Link rural transit services, since these routes serve the rural market with limited activity. TriCounty Link routes will be incorporated into future design and planning for the preferred alternative and are shown in the map graphics for context.

Section 2.0 describes the No Build Alternative, which assumes the existing transit network with the addition of a CARTA Express bus operating on I-26. Appendix 4-A (I) provides detailed existing transit system maps. Section 3.0 provides operating plans and transit network assumptions for the Build Alternatives. Section 4.0 summarizes the operating statistics for the identified alternatives. Detailed transit network maps for the build alternatives are provided in Appendices 4-A (II – IX).

2 Alternative A - No Build Alternative

The No Build Alternative assumes existing transit service as operated in 2015. The only addition to the No Build is a commuter bus route that would operate on I-26 in existing traffic, using a standard commuter coach bus. The proposed alignment and operating plan for the I-26 Commuter Bus service is provided below. This is followed by a summary of the existing CARTA transit routes. Figures 2-2 through 2-4 show the existing transit network with the I-26 Commuter Bus alternative.

2.1 I-26 Commuter Bus

The No Build alternative assumes the operation of express/commuter bus service along I-26 connecting Summerville, North Charleston, and Charleston. The route begins at Regal Squares Cinema in Azalea Square and travels via Azalea Square Boulevard, Berkeley Circle, and 17A (N. Main Street) to access I-26. The route continues south on I-26 to I-526, where it travels westbound to International Boulevard and proceeds to the Boeing facility stop on Dreamliner Drive. After serving the Boeing facility, the route returns east on International Boulevard and Montague Avenue and continues south on I-26 into downtown Charleston. The proposed commuter route travels the same alignment as Route 3 – Dorchester Road along Meeting Street, Calhoun Street, and Courtenay Drive. From MUSC, return trips travel via US 17/Septima P. Clark Parkway, I-26, Montague Avenue, International Blvd. to Boeing, I-526 eastbound and I-26 northbound to Summerville, where the route travels southwest on 17A (N. Main St.), northeast on Berkley Circle, north on Sheep Island Road, and east on Azalea Square Blvd. to a stop at Regal Cinemas. Figure 2-1 provides the alignment for the No Build I-26 Commuter Bus Alternative and the proposed stop locations.

2.1.1 I-26 Commuter Bus Service Frequencies

The following presents the proposed service frequencies and span of service for the I-26 Commuter Bus.

Weekday			Saturday	Sunday & Holiday
AM Peak	*PM Peak*	Frequencies	*No Service*	*No Service*
6 AM - 9 AM	*4 PM - 7 PM*	30		

2.1.2 I-26 Commuter Bus Stop Locations

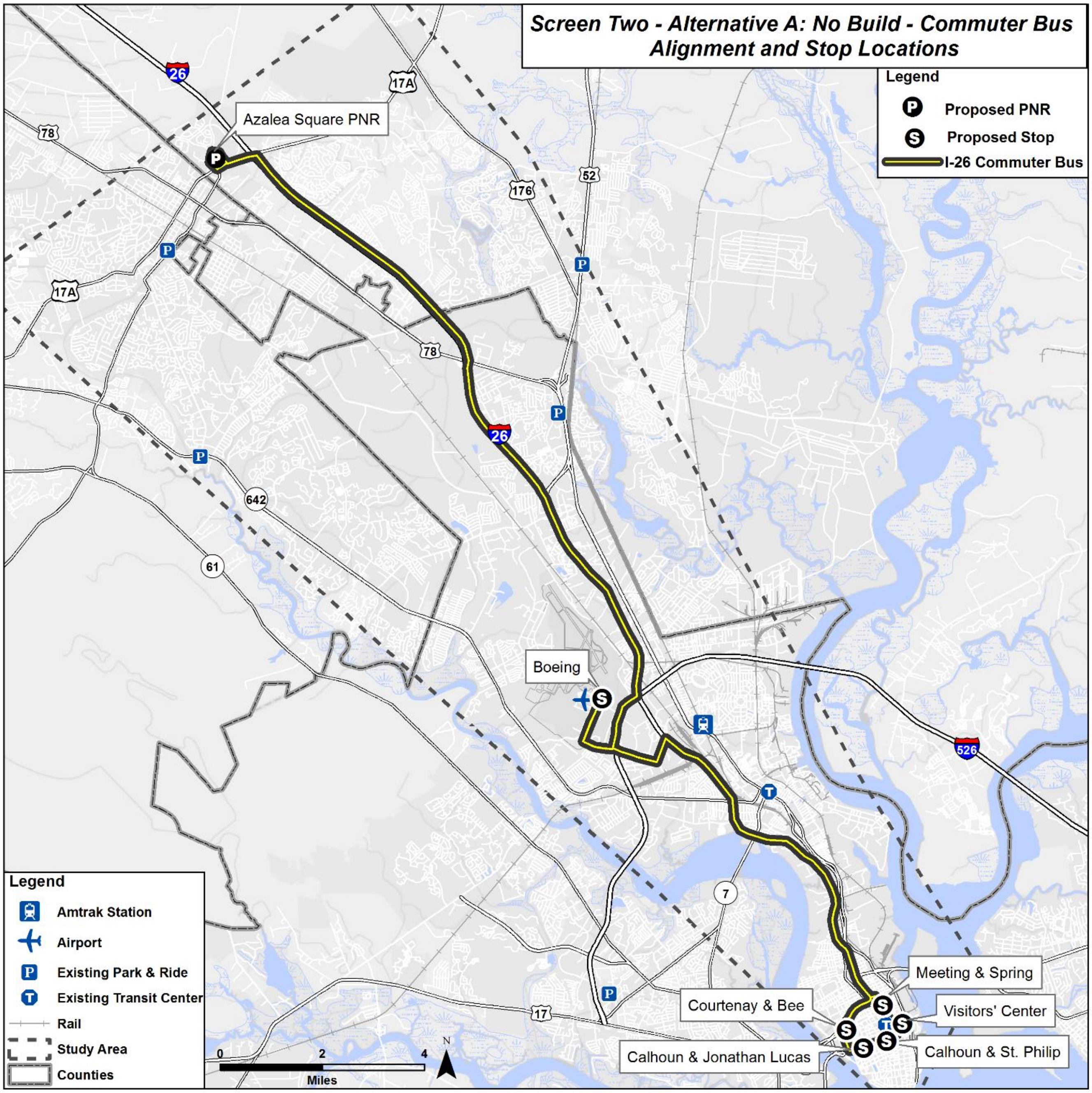
The express/commuter bus service assumes limited stops at:

- Azalea Square Shopping Center park-and-ride (proposed)
- Boeing/Airport
- Meeting Street & Spring Street
- Visitor's Center
- Calhoun Street and St. Philip Street (College of Charleston)
- Calhoun Street and Johnathan Lucas Street (MUSC)
- Courtenay Drive and Bee Street

2.1.3 I-26 Commuter Bus Travel Times

- One Way Distance: 29.5 Miles
- Travel Time: 90 minutes; Total Cycle Time: 180 minutes
- Total AM Peak Trips: 12; Total PM Peak Trips: 12
- Average Speed: 19.6 MPH

Figure 2 - 1: Alternative A: No Build I-26 Commuter Bus



2.2 Existing Transit Network

Under the No Build Alternative, the underlying transit network remains unchanged for both the CARTA and TriCounty Link transit networks. The following Figures 2-2 through 2-4 show the I-26 Commuter bus and existing (No Build) transit network. *Note: TriCounty Link routes, although shown on these maps for context, are not included in the Screen Two phase of this analysis.*

2.2.1 Existing CARTA Local Service

Route 10 – Rivers Avenue

This route travels from Trident Medical Center in North Charleston to the Mary Street Transfer Center in downtown Charleston primarily along US 52 (Rivers Avenue) and Meeting Street. This route also serves the North Charleston SuperStop. Destinations or major activity centers along this route include: Charleston Southern University, Trident Medical Center, Health South, Trident Technical College, Trident One Stop/SC Works Charleston, Super K-Mart P&R (Rivers Avenue), Northwoods Mall, North Charleston SuperStop, Mall Drive and Mary Street Transfer Center.

Route 10's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
5:42 am – 12:51 am	20/20/20/60	6:33 am – 11:33 pm	30/30	8:32 am – 9:16 am	45-60

Route 11 – Airport

This route travels from the Charleston International Airport in North Charleston to the Mary Street Transfer Center in downtown Charleston primarily along Dorchester Road, Spruill Avenue, Meeting Street, and Morrison Drive. The route serves the Tanger Outlet Shopping Center only on its northbound trip. This route also serves the North Charleston SuperStop. Destinations or major activity centers along this route include: Charleston International Airport, Tanger Outlets Shopping Center, Wal-Mart Center (North Charleston), Food Lion (Dorchester Road), Greyhound Lines/Southeastern Stages, Trident Technical College – Palmer Campus, SC Vocational Rehabilitation Center, and Mary Street Transfer Center.

This route's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
5:49 AM – 9:13 PM	40/40/40/40	7:01 AM – 9:13 PM	40/40	9:00 AM – 7:41 PM	60/60

Route 12 – Upper Dorchester

This route travels from Super K-Mart (Rivers Avenue) in North Charleston to the North Charleston SuperStop primarily along Ashley Phosphate and Dorchester Roads. Destinations or major activity centers along this route include: Super K-Mart P&R (Rivers Avenue), Northwoods Mall, Joint Base Charleston, BOSCH Corp., Festival Center, Oak Ridge Plaza/Shopping Center, Greyhound Lines/Southeastern Stages, SC Vocational Rehabilitation Center, Food Lion (Dorchester Road), and North Charleston SuperStop

Route 12's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
5:45 AM – 9:38 PM	45/45/45/45	7:00 AM – 9:50 PM	45/45	8:00 AM – 7:42 PM	120/120

Route 13 – Remount Road

This route travels from the North Charleston SuperStop to the Remount Road corridor. The route deviates off Remount Road to serve Yeamans Hall Road (Hanahan) on its southbound trip. Destinations or major activity centers along this route include: North Charleston SuperStop, Hanahan City Hall, SAIC Charleston, Booz Allen Hamilton, Food Lion (Remount Road), Yeamans Hall Plaza Shopping Center, Scientific Research Corporation, Oak Terrace Preserve Community, Carolina Youth Development Center, and Charleston School of the Arts.

Route 13's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:00 AM – 8:57 PM	60/60/60/60	7:00 AM – 8:57 PM	60/60	n/a	n/a

Route 20 – King Street

This route travels from The Citadel to Broad Street on the Charleston Peninsula mainly along King and Meeting Streets. The route serves the Mary Street Transfer Center by way of its Meeting and Mary Street stop. The route deviates off the major north-south arterials (King and Meeting Streets) on its northern alignment to serve The Citadel. Destinations or major activity centers along this route include: Meeting Street, Broad Street, The Charleston Market, Visitors' Center/Charleston Museum, The Citadel, and Charleston City Hall.

Route 20's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:03 AM – 9:33 PM	30/30/30/60	6:03 AM – 9:33 PM	30/60	8:23 AM – 7:57 PM	*60**

Route 21 – Rutledge/Grove

This route travels from King and Heriot Streets in the Upper Peninsula to the Canterbury House on Beaufain Street on the Charleston Peninsula. The route operates primarily along Rutledge and Ashley Avenues, and King Street. Destinations or major activity centers along this route include: Canterbury House, MUSC, Ashley Hall, College of Charleston, Hampton Park, Lowcountry Tech Academy, Charleston Charter School, and Food Lion (King Street).

Route 21's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:12 AM – 7:07 PM	60/60/60/	9:12 PM – 7:07 PM	60/60	n/a	n/a

Route 30 – Savannah Highway

This route travels from the Mary Street Transfer Center on the Charleston Peninsula to the Citadel Mall, primarily along US 17/Savannah Highway. Destinations or major activity centers along this route include: Charleston City Hall, Charleston City Market, Charleston Visitors' Center, Avondale Center, MUSC/VA Medical/Roper Hospital, and Citadel Mall.

Route 30's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:30 AM – 9:30 PM	45/45/45/90*	7:15 AM – 9:30 PM	45/90*	8:00 AM – 7:10 PM	90/90

**Note – Last trip*

Route 31 – Folly Road

This route travels from the Mary Street Transfer Center on the Charleston Peninsula to Battery Island Drive on James Island. The route operates primarily on Folly Road on its inbound alignment, with deviations on Riverland Drive and Fort Johnson/Secessionville Road on its southbound alignment. Destinations or major activity centers along this route include: Mary Street Transfer Center, Charleston Visitors' Center, Lowcountry Senior Center, Wal-Mart (Folly Road), Windermere Plaza, and Citadel Mall.

Route 31's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:15 AM – 8:11 PM	90/90/90/	8:00 AM – 7:56 PM	90/90	8:00 AM – 6:26 PM	90/90

Route 32 – Northbridge

This route serves the North Charleston SuperStop, Citadel Mall and West Ashley Wal-Mart (Bees Ferry Road). Destinations or major activity centers along this route include: North Charleston SuperStop, Wal-Mart (Bees Ferry Road), Ashley Landing Plaza, US Social Security Administration, Horizon Bay Assisted Living, CD Mental Health Center, West Ashley High School, and Citadel Mall.

Route 32's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:02 AM – 9:02 PM	60/60/60/60	7:02 AM – 9:02 PM	60/60	8:00 AM – 5:56 PM	120/120

Route 40 – Mount Pleasant

This route serves the Mary Street Transfer Center, Wando Crossing Wal-Mart park-and-ride, Oakland Plantation Wal-Mart park-and-ride and Wando High School in Mount Pleasant. Route 40 operates primarily east-west along the US 17 corridor. Destinations or major activity centers along this route include: Mary Street Transfer Center, Charleston Visitors' Center, Wando Crossing Shopping Center, Towne Centre (Mount Pleasant), The Market at Oakland Plantation, East Cooper Regional Center, Mount Pleasant Hospital, and Wando High School.

Route 40's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:18 AM – 9:42 PM	40/40/40/45	6:18 AM – 9:35 PM	40/50	8:38 AM – 7:08 PM	60/120*

**Note – Last trip*

Route 41 – Coleman Boulevard

This route serves the Mary Street Transfer Center, Patriots Point and Coleman Boulevard corridor. Destinations or major activity centers along this route include: Mary Street Transfer Center, Charleston Visitors' Center, Patriots Point, College of Charleston Athletic Complex, Mount Pleasant Visitors' Center, Coleman Boulevard Corridor, and Shem Creek (Activity/Entertainment Center).

Route 41's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
7:30 AM – 8:25 PM	70/70/70	8:30 AM – 8:10 PM	70/70	n/a	n/a

Route 102 – North Neck

This route travels from the North Charleston SuperStop to the Mary Street Transfer Center in downtown Charleston. This north-south route operates primarily along Rivers Avenue/US 52 and King Street. Destinations or major activity centers along this route include: North Charleston SuperStop, Charleston County DSS, Military Magnet Academy, Freddie Whaley Community Center, Palmetto Lowcountry Behavioral Health, and Mary Street Transfer Center.

Route 102's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:02 AM – 8:02 AM	60/60/60/60	7:02 AM – 8:02 PM	60/60	n/a	n/a

Route 103 – Leeds Avenue

This route travels from the North Charleston SuperStop to the Cummins Engine Plant off Leeds Avenue in North Charleston. This east-west neighborhood route operates primarily along Leeds Avenue with deviations into the neighborhoods north and south of Dorchester Road. Destinations or major activity centers along this route include: North Charleston SuperStop, Cummins Engine Plant, Charleston County Magistrates Office, Charleston County Detention Center, SC Department of Probation, Parole and Pardon, Department of Motor Vehicles, and Bi-Lo (Leeds Avenue).

Route 103's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:33 AM – 7:22 PM	60/60/60/60	8:33 AM – 6:22 PM	60/60	n/a	n/a

Route 104 – Montague Avenue

This route travels from the Wal-Mart Center/Tanger Outlets Shopping Center and the North Charleston SuperStop. This east-west neighborhood route operates along the Montague Avenue corridor. Destinations or major activity centers along this route include: North Charleston SuperStop, Wal-Mart Center (Centre Pointe Drive), North Charleston City Hall, Verizon Center, Felix C. Davis Community Center (Park Circle), North Charleston High School, and North Charleston Historic Business District.

Route 104's span of service and frequencies are as follows

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:00 AM – 9:00 PM	60/60/60/60	9:00 AM – 7:58 PM	60/60	n/a	n/a

Route 203 – Medical Shuttle

This route is a partner funded shuttle service that connects the MUSC Medical Campus to off-site parking options on Hagood Street. The route operates as an AM route and PM route. Destinations or major activity centers along this route include: MUSC Medical Campus and Hagood Parking Lot.

Route 203's span of service and frequencies are as follows

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
5:02 AM – 8:12 AM 3:02 PM – 7:57 PM	5/10 5/15	n/a	n/a	n/a	n/a

Route 210 – Aquarium/ College of Charleston (DASH)

This route is a DASH trolley route that serves from the SC Aquarium, John Street Visitors' Center and the College of Charleston campus. This fare-free trolley serves the College of Charleston campus on weekday service. Destinations or major activity centers along this route include: SC Aquarium, College of Charleston, Visitors' Center (John Street), and Liberty Square.

Route 210's span of service and frequencies are as follows

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:28 AM – 10:14 PM* 6:28 AM – 7:38 PM	6/12/12/25 24/24/24	8:04 AM – 8:21 PM	20/20	8:04 AM – 8:21 PM	20/20

*Note – College of Charleston in-session operating span of service and frequency (September through April). Weekend service does not serve COC campus

Route 211 – Meeting/King (DASH)

This fare-free DASH trolley route serves the major commercial/retail corridors of King and Meeting Streets on the Charleston Peninsula. Destinations or major activity centers along this route include: Visitors' Center (John Street), Charleston City Market, Waterfront Park, Charleston Museum, Broad Street Shopping District, Charleston City Hall, Historic King Street, and Upper King Street/Design District.

Route 211's span of service and frequencies are as follows

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
7:16 AM – 9:08 PM	15/22/40	8:16 AM – 9:06 PM	15/45	8:16 AM – 9:06 PM	15/45

Route 213 – Lockwood/Calhoun (DASH)

This fare-free DASH trolley route provides circulation on the Charleston Peninsula to areas to the west of King Street on the Peninsula including the MUSC campus. Destinations or major activity centers along this route include: Charleston Visitors' Center (John Street), College of Charleston, MUSC Medical Campus, Roper Hospital, Joseph P. Riley Ball Park, Burke High School, Mary Street Transfer Center, and St. Phillip Street Parking Garage.

Route 213's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:20 AM – 8:57 PM	40/40/40/40	8:20 AM – 8:57 PM	40/40	9:20 AM – 6:37 PM	40/40

Route 301 – St. Andrews

This route serves the Mary Street Transfer Center in Downtown Charleston, Citadel Mall and Bon Secours-St. Francis Hospital in West Ashley. The route operates within the West Ashley neighborhoods south of Ashley River Road and St. Andrews Boulevard, as well as the communities located along Savage Road and Castlewood Drive. Destinations or major activity centers along this route include: Mary Street Transfer Center, Citadel Mall, Bon Secours-St. Francis Hospital, and Castlewood Drive Community.

Route 301's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
6:16 AM – 9:17 PM	50/50/50/50	9:12 AM – 8:57 PM	52/52	8:30 AM – 6:15 PM	90/90

2.2.2 Existing CARTA Express and Limited Stop Service

Route 1 – North Charleston/James Island Express

This express route serves the North Charleston Super K-Mart park-and-ride, downtown Charleston Visitors' Center and James Island Wal-Mart park-and-ride (Folly Road). Destinations or major activity centers along this route include: Super K-Mart P&R, Bi-Lo (Meeting Street), Visitors' Center, College of Charleston, MUSC Medical Campus, and Wal-Mart (Folly Road) P&R.

Route 1's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
5:19 AM – 9:06 AM 3:07 PM – 8:08 PM	30 30	n/a	n/a	n/a	n/a

*Note – AM Service: 5 SB trips to James Island/ 2 SB trips to MUSC and 5 NB trips to K-Mart/1 NB trip to Meeting and Columbus
PM Service: 1 SB trip from Meeting and Columbus/6 SB trips from K-Mart and 3 NB trips from MUSC/7 NB trips from James Island

Route 2 – West Ashley/Mount Pleasant Express

This express route serves the Citadel Mall park-and-ride (West Ashley), the Wando Crossing Wal-Mart park-and-ride (Mount Pleasant), and Oakland Plantation Wal-Mart park-and-ride (Mount Pleasant). Destinations or major activity centers along this route include: Citadel Mall P&R, MUSC Medical Campus, College of Charleston, Visitors' Center, Wal-Mart P&R (Wando Crossing), and Wal-Mart P&R (Oakland Plantation).

Route 2's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
5:35 AM – 9:11 AM 3:20 PM – 8:03 PM	30 40-60	n/a	n/a	n/a	n/a

*Note – AM Service: 5 EB trips to Oakland PR/ 2 EB trips to Meeting and Columbus and 4 WB trips to Citadel Mall/2 WB trip to MUSC
PM Service: 3 EB trips from MUSC/4 EB trips from Citadel Mall and 1 WB trip from Meeting and Columbus/5 WB trips from Oakland

Route 3 – Dorchester Road/Summerville Express

This express route operates between the Dorchester Village Shopping Center park-and-ride (Summerville), and the MUSC Medical Campus on the Charleston Peninsula. It travels primarily along Dorchester Road and I-26 into downtown Charleston. Destinations or major activity centers along this route include: Dorchester Village Shopping Center P&R, BOSCH Charleston, Joint Base Charleston, Boeing, MUSC Medical Campus, College of Charleston, Visitors' Center and Roper Hospital.

Route 3's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
5:15 AM-9:00 AM 3:06 PM – 7:31 PM	30 30/40	n/a	n/a	n/a	n/a

Route 4 – NASH Airport

This NASH Express is a limited stop route that operates between the Charleston International Airport and the downtown Charleston Visitors' Center. The route operates with no stops on its southbound trip and limited stops serving the Tanger Outlets Shopping Center and North Charleston Visitors' Center on its northbound trip. Destinations or major activity centers along this route include: Charleston International Airport, Tanger Outlets Shopping Center, North Charleston Visitors' Center, and Charleston Visitors' Center.

This route's span of service and frequencies are as follows:

Weekday		Saturday		Sunday	
Span Of Service	*Frequency (Peak/Mid/Eve/Night)*	*Span Of Service*	*Frequency (Base/Eve)*	*Span Of Service*	*Frequency (Base/Eve)*
8:00 AM – 9:59 PM	60/60/60/60	8:00 AM – 9:59 PM	60/60	12:00 noon – 7:59 PM	60/60

Figure 2-1: Alternative A: No Build I-26 Commuter Bus (Summerville – North Charleston)

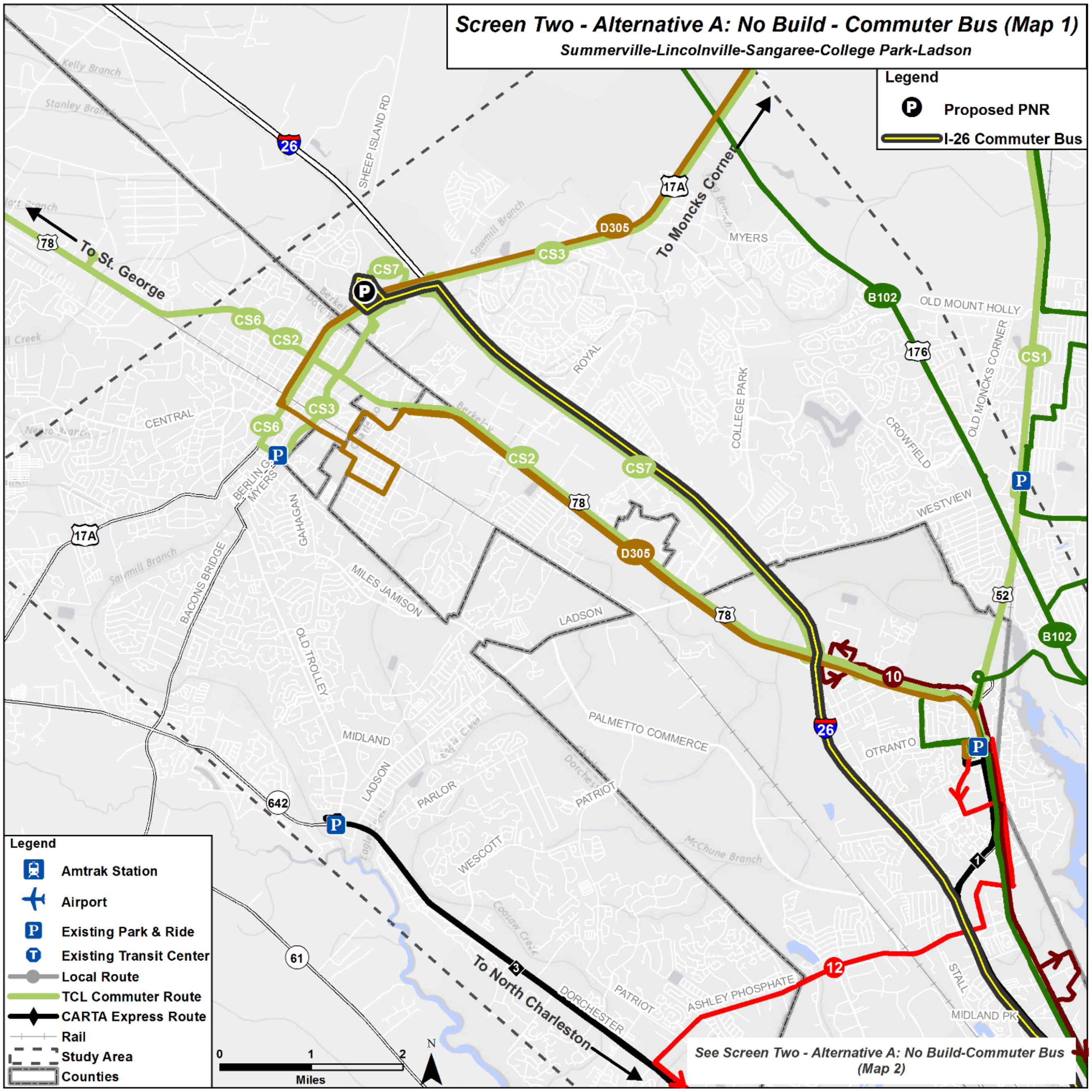


Figure 2-2: Alternative A: No Build I-26 Commuter Bus (Hanahan – North Charleston)

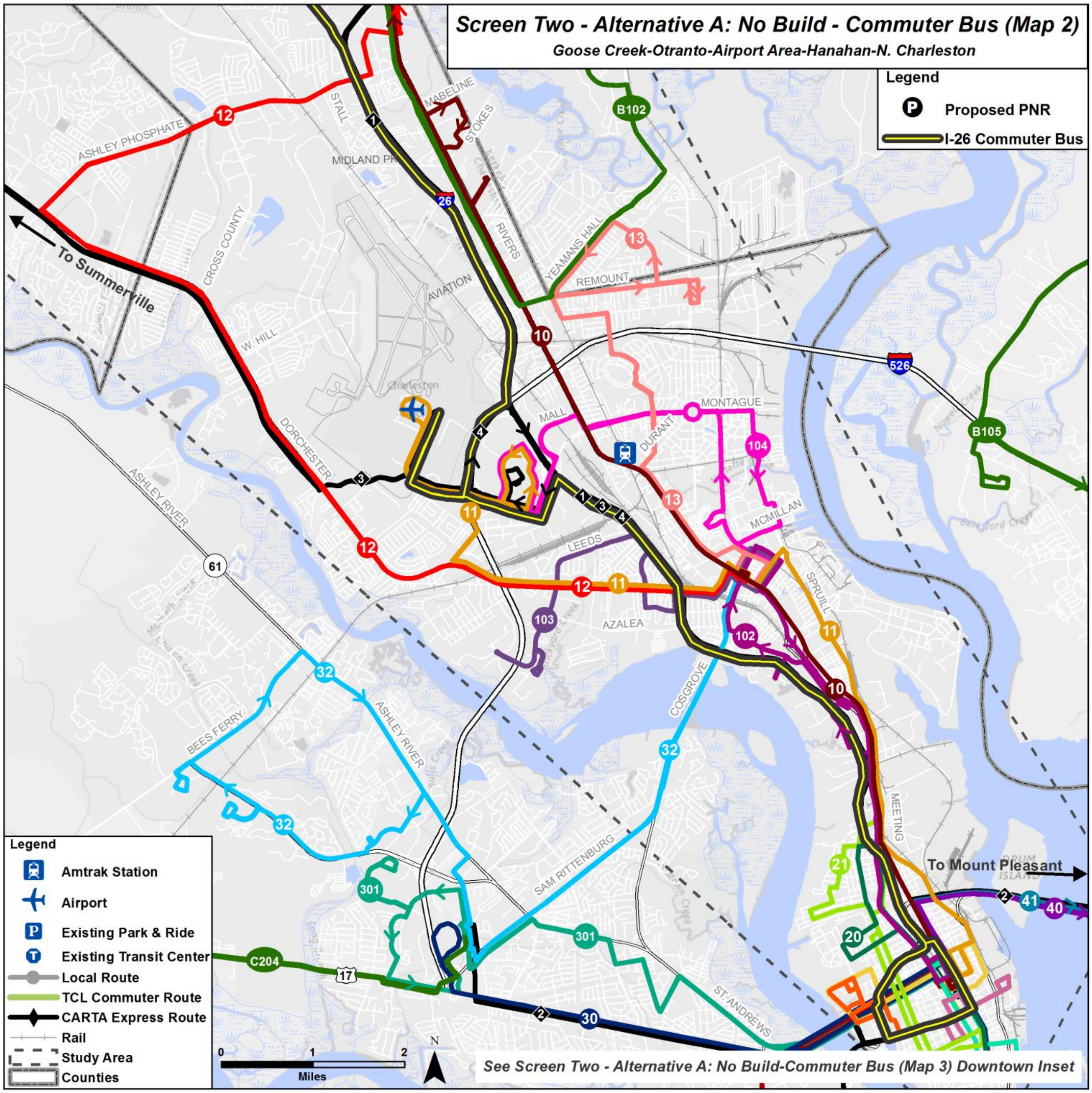
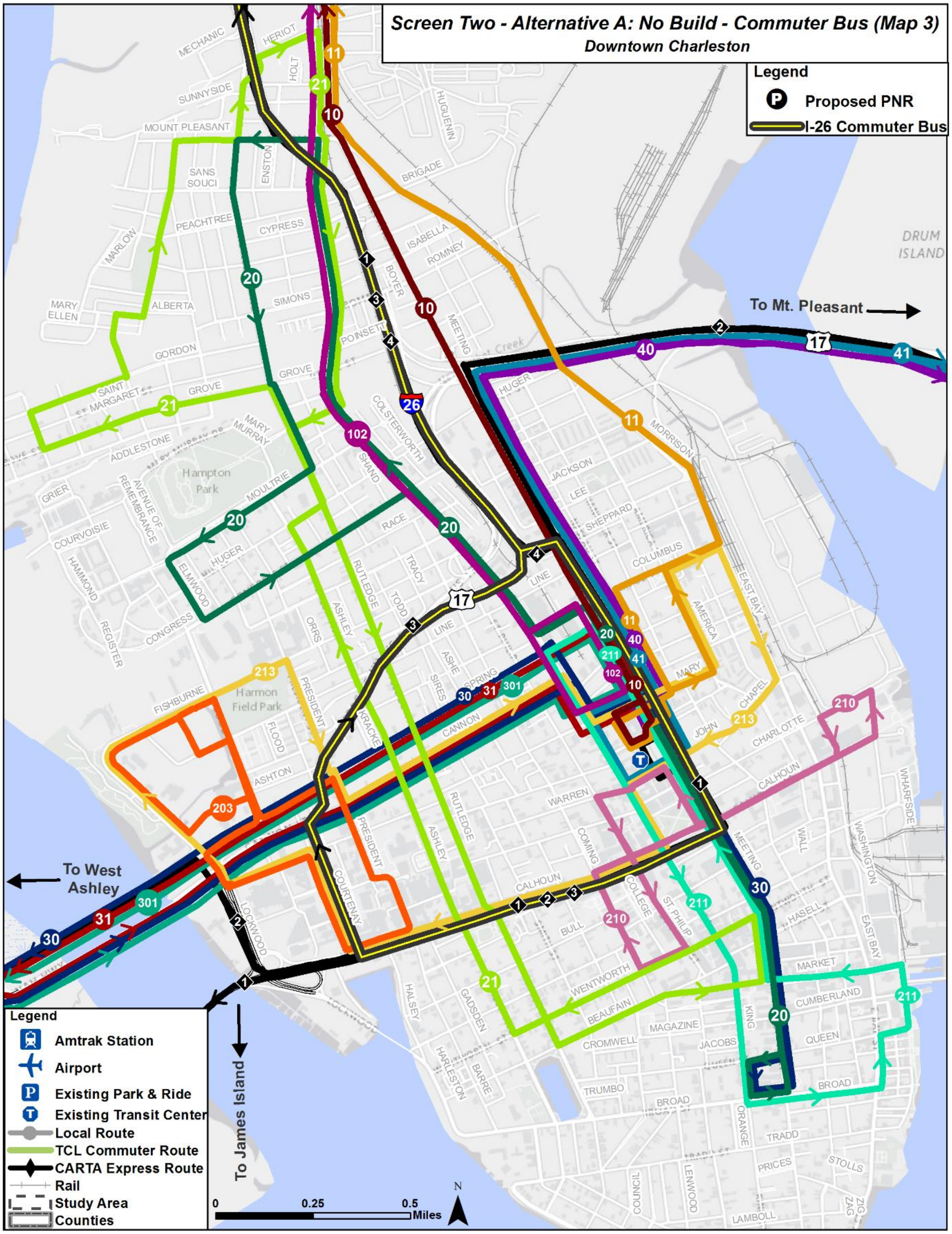


Figure 2-3: Alternative A: No Build I-26 Commuter Bus (Downtown Charleston)



3 Build Alternatives

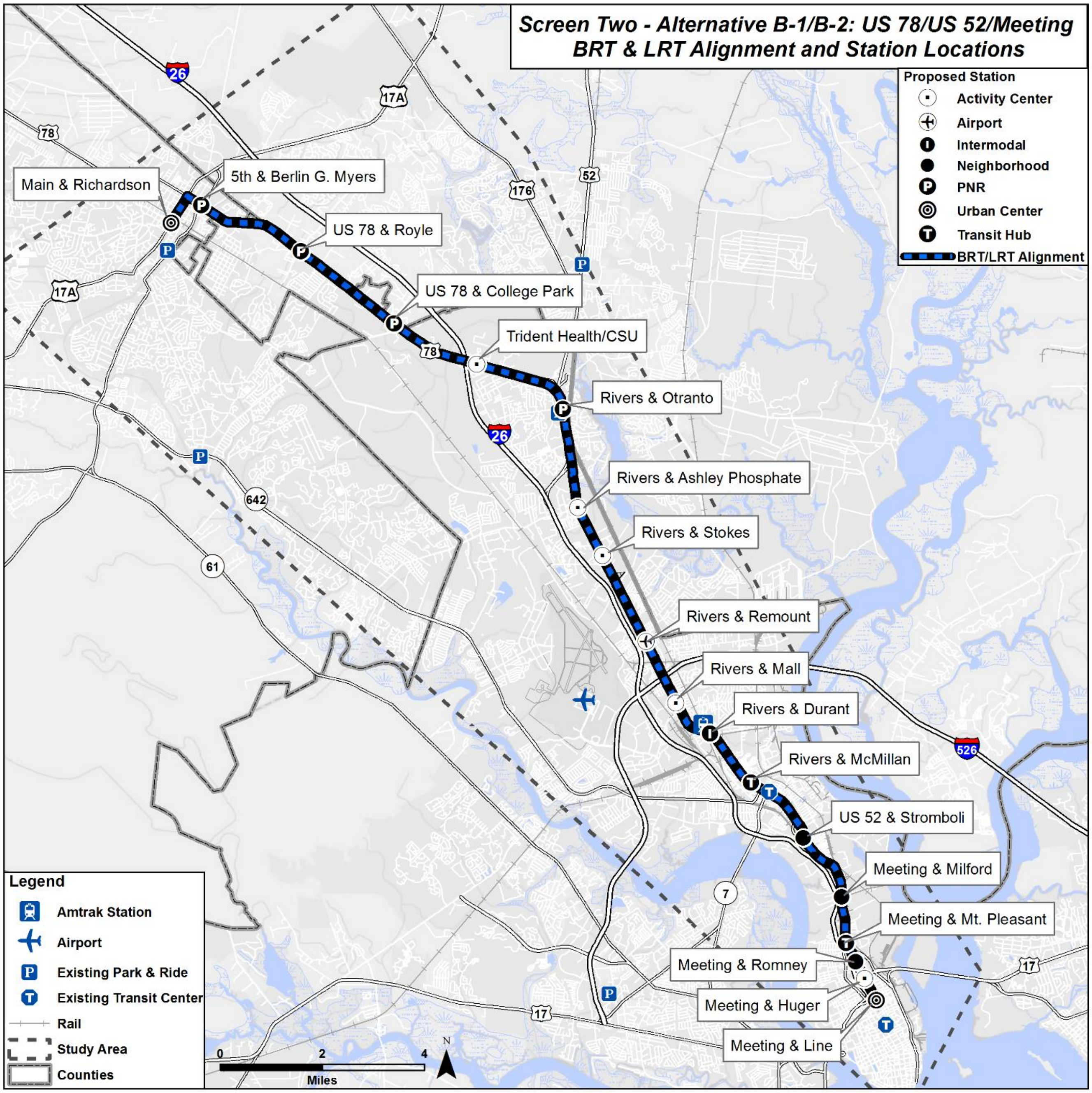
The following provides the alignments and operating plans for the six corridors identified for Screen Two. Each corridor is assumed to operate with either BRT or LRT. The station locations, transit network, and service frequencies are the same for both BRT and LRT modes on each corridor; however, travel time estimates vary by mode. Appendices 4-A (II – IX) provide detailed transit network maps for each alternative. The Build Alternatives are described as follows:

- Alternative B-1: US 78/US 52/Meeting-BRT/Alternative B-2: US 78/US 52/Meeting-LRT
- Alternative B-3: US 78/US 52/East Bay-BRT/Alternative B-4: US 78/US 52/East Bay-LRT
- Alternative C-1: US 176/US 52/Meeting-BRT/Alternative C-2: US 176/US 52/Meeting-LRT
- Alternative C-3: US 176/US 52/East Bay-BRT/Alternative C-4: US 176/US 52/East Bay-LRT
- Alternative D-1: Dorchester/US 52/Meeting-BRT/Alternative D-2: Dorchester Rd/US 52/Meeting-LRT
- Alternative D-3: Dorchester/US 52/East Bay-BRT/Alternative D-4: Dorchester Rd /US 52/East Bay-LRT

3.1 Alternative B-1 & B-2: US 78/US 52/Meeting (BRT & LRT)

Alternative B-1 assumes BRT along US 78, US 52, and Meeting Street from downtown Summerville to Line Street in downtown Charleston. Alternative B-2 assumes LRT along the same alignment as shown in Figure 3-1.

Figure 3-1: Alternatives B-1 & B-2 Alignment & Station Locations for BRT & LRT



3.1.1 Alternatives B-1 & B-2 Alignment

From Richardson and N. Main Street (US 17A) in downtown Summerville, southbound trips travel northwest on Richardson Street, northeast on S. Cedar Street, and southeast on W. Doty Street to access N. Main Street. From N. Main Street, the alignment travels northeast and turns southeast on US 78 to North Charleston. The alignment merges south onto US 52 (Rivers Avenue) and continues southbound via Rivers Avenue, Carner Avenue, and Meeting Street into downtown Charleston where the alignment ends at Meeting Street and Line Street. From Line Street, the route turns around to continue northbound via the same alignment. This Screen Two Analysis assumes that both alignments operate via dedicated guideway or mixed traffic with full signal preemption.

3.1.2 Alternatives B-1 & B-2 Service Frequencies

The following presents the proposed service frequencies and span of service for both alternatives.

Alternatives B-1 & B-2			**Weekday**	**Saturday**	**Sunday & Holiday**
Span of Service & Frequencies by Time Period			*4:00 AM - 1:00 AM*	*6:00 AM - 1:00 AM*	*7:00 AM- 11:00 PM*
Peak	*6 AM - 9 AM*	*4 PM - 7 PM*	10 minutes	20 minutes	30 minutes
Base	*9 AM- 4 PM*	*7 PM - 9 PM*	20 minutes	20 minutes	30 minutes
Early/Late	*4 AM-6 AM*	*9 PM - 1 AM*	30 minutes	30 minutes	30 minutes

3.1.3 Alternatives B-1 & B-2 Station Locations

The following Table 3-1 provides the station locations and connecting transit routes for both the BRT & LRT alternatives on the US 78/US 52/Meeting Street alignment.

Table 3-1: Alternatives B-1 & B-2 Station Locations & Connecting Transit Routes

Station Location	Transit Routes Serving BRT/LRT Station
Main St & Richardson Ave	Summerville Connector (TCL)
E 5th N St & Berlin G Myers Pkwy	Summerville Connector (TCL)
US 78 & Royle Rd	-
US 78 & College Park Rd	Summerville Connector (TCL), Ladson Area Shuttle (TCL)
US 78 & I-26	Route 10, Summerville Connector (TCL), Ladson Area Shuttle (TCL)
Rivers Ave & Otranto Blvd	Routes 10, 12, Summerville Connector (TCL), Ladson Area Shuttle (TCL)
Rivers Ave & Ashley Phosphate Rd	Route 10, 12
Rivers Ave & Stokes Ave	Route 10
Rivers Ave & Remount Rd	Route 10, 13
Rivers Ave & Mall Dr	Routes 10, 104
Rivers Ave & Durant Ave	Routes 10, 13
Rivers Ave & McMillan Ave*	Routes 10, 11, 12, 13, 32, 102, 103, 104
US 52 & Stromboli Ave	Routes 10, 102
Meeting St & Milford St	Routes 10, 11, 102
Meeting St & Mt. Pleasant St	Routes 10, 11, 20, 21, 102,
Meeting St & Romney St	Route 10
Meeting St & Huger St	Routes 10, 40, 41
Meeting St & Line St	Routes 10, 20, 30, 31, 40, 41, 102, 211, 213, 301

*Note – Routes 10, 11, 12, 13, 32, 102, 103, and 104 previously serving the North Charleston SuperStop are modified to operate along Cosgrove Ave, Reynold Avenue, Spruill Ave, McMillan Ave and Rivers Avenue to serve the BRT/LRT station at Rivers and McMillan as shown in Appendix 4-A (VIII).

3.1.4 Alternatives B-1 & B-2 Travel Times

Tables 3-2 and 3-3 present travel time estimates for both the BRT & LRT alignments. Estimates assume full signal priority or dedicated fixed guideway along the roadways for the entire length or the alignment. A one-minute delay is assumed for each station.

3.1.5 Alternatives B-1 & B-2 Transit Network

The underlying transit network for US 78/US 52/Meeting Street Alternatives (BRT and LRT) is assumed to be the same as the existing transit network as described in Section 2.0. While the major alignments of the existing network remains unchanged, the following minor route modifications to serve the BRT/LRT stations are noted. Detailed transit network maps for this alternative are provided in Appendix 4-A (II). Line Street Circulation is provided in Appendix 4-A (IX).

<u>CARTA Route Modifications</u>

- Route 1: Service is eliminated between the North Charleston K-Mart park-and-ride and the Visitors' Center stop in Downtown Charleston. Route 1 will operate between the Meeting & Line station and the Wal-Mart park-and-ride (Folly Road) on James Island. Route will travel south on Meeting Street and West on Calhoun Street to the James Island Connector.
- Route 12: Route alignment on Northwoods Boulevard is modified to serve the Rivers & Ashley Phosphate station and operates via Ashley Phosphate Road and Rivers Avenue.
- Route 13: Route is modified to extend westbound on Remount Road to serve the Rivers & Remount station.
- Route 20: Route is adjusted to serve the proposed BRT/LRT station located at Meeting Street and Line Street. The route is modified to travel on Line Street in both directions to serve the BRT/LRT station instead of Columbus Street.
- Route 30: Inbound trips come into the Peninsula via Cannon Street and turn north on King Street and east on Line Street to serve the station. The route continues south on Meeting Street to the end of the line on Broad Street. Outbound trips travel north on Meeting Street, west on Line Street, south on King Street and west on Spring Street to continue the existing alignment.
- Route 31: This route is modified to serve the Line Street Station. Eastbound trips come into the Peninsula via Cannon Street, and turn north on King Street and east on Line Street to the end of the line at the Line Street Station. Westbound trips continue east on Line Street, south on Meeting Street, west on Mary Street, north on King Street, and west on Spring Street to continue the existing alignment.
- Route 301: (See Route 31) Route modification the same as Route 31 to serve the Meeting & Line station.
- Route 102: Southbound trips along King Street are modified to turn east on Line Street from King Street to serve the Meeting Street and Line Street Station. The route will continue south on Meeting Street, west on Mary Street and north on King Street along its existing northbound alignment.
- Route 211: DASH trolley route is modified to serve the BRT/LRT station at Meeting Street and Line Street. The route is modified to operate on Line Street instead of Spring Street. No other changes are proposed to the alignment.
- Route 213: DASH trolley route is modified to serve BRT/LRT station at Meeting Street and Line Street. Modified alignment will travel east along Cannon Street, north on King Street, east on Line Street to serve the BRT/LRT station. The route will then turn south on Meeting Street, east on Columbus Street and continue along Columbus Street to East Bay Street, Chapel Street and John Street along its current alignment.

North Charleston SuperStop Circulation: The current North Charleston Transfer Hub at Rivers & Cosgrove is assumed to be relocated to Rivers & McMillan in the vicinity of Shipwatch Square. Routes are slightly modified as needed to serve this location as shown in Appendix 4-A (VIII).

Table 3-2: Alternative B-1 BRT Travel Time

Southbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Main & Richardson	5th & Berlin G Myers	1.28	1.28	0:06:15	0:06:15
5th & Berlin G Myers	Royle Road	2.22	3.50	0:04:25	0:10:40
Royle Road	Ladson Road	2.50	6.00	0:04:47	0:15:27
Ladson Road	Trident Health	1.64	7.64	0:03:38	0:19:05
Trident Health	Otranto	2.14	9.78	0:04:37	0:23:42
Otranto	Ashley Phosphate	1.97	11.75	0:04:05	0:27:47
Ashley Phosphate	Stokes Avenue	1.04	12.79	0:02:50	0:30:37
Stokes Avenue	Remount	1.91	14.70	0:04:00	0:34:37
Remount	Mall Drive	1.34	16.04	0:03:14	0:37:51
Mall Drive	Durant	0.96	17.00	0:02:44	0:40:35
Durant	McMillan	1.27	18.27	0:03:09	0:43:44
McMillan	Azalea/Stromboli	1.55	19.82	0:03:31	0:47:15
Azalea/Stromboli	Braswell/Milford	1.48	21.30	0:03:37	0:50:52
Braswell/Milford	Mt. Pleasant	0.91	22.21	0:02:46	0:53:38
Mt. Pleasant	Romney	0.41	22.62	0:02:05	0:55:43
Romney	Huger	0.37	22.99	0:02:00	0:57:43
Huger	Line Street	0.49	23.48	0:02:15	0:59:58
		Total	**23.48**		**0:59:58**
				Average Speed	23.49

Northbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Line Street	Huger	0.49	0.49	0:02:15	0:02:15
Huger	Romney	0.37	0.86	0:02:00	0:04:15
Romney	Mt Pleasant	0.41	1.27	0:02:05	0:06:20
Mt Pleasant	Braswell/Milford	0.91	2.18	0:02:46	0:09:06
Braswell/Milford	Stromboli	1.48	3.66	0:03:37	0:12:43
Stromboli	McMillan	1.55	5.21	0:03:31	0:16:14
McMillan	Durant	1.27	6.48	0:03:09	0:19:23
Durant	Mall Drive	0.96	7.44	0:02:44	0:22:07
Mall Drive	Remount	1.34	8.78	0:03:14	0:25:21
Remount	Stokes	1.91	10.69	0:04:00	0:29:21
Stokes	Ashley Phosphate	1.04	11.73	0:02:50	0:32:11
Ashley Phosphate	Otranto	1.97	13.70	0:04:05	0:36:16
Otranto	Trident Health	2.25	15.95	0:04:46	0:41:02
Trident Health	Ladson	1.64	17.59	0:03:38	0:44:40
Ladson	Royle	2.50	20.09	0:04:47	0:49:27
Royle	5th & Berlin Myers	2.22	22.31	0:04:25	0:53:52
5th & Berlin Myers	Main & Richardson	0.84	23.15	0:04:30	0:58:22
Total	**TOTAL**		**23.15**		**0:58:22**
Average Speed			Avg Speed		23.80

Table 3-3: Alternative B-2 LRT Travel Time

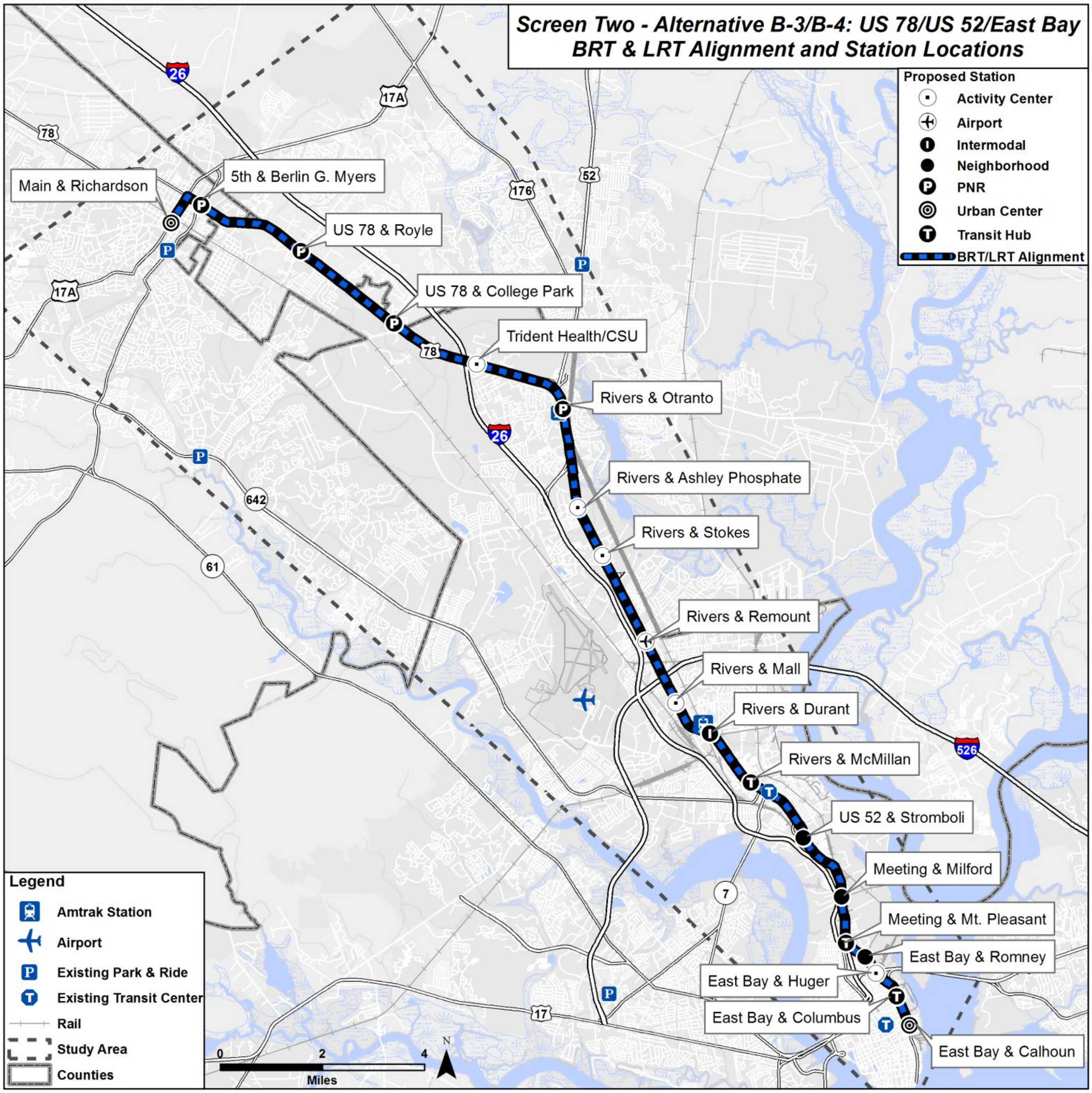
Southbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Main & Richardson	5th & Berlin G Myers	1.28	1.28	0:06:12	0:06:12
5th & Berlin G Myers	Royle Road	2.22	3.50	0:04:14	0:10:26
Royle Road	Ladson Road	2.50	6.00	0:04:36	0:15:02
Ladson Road	Trident Health	1.64	7.64	0:03:28	0:18:30
Trident Health	Otranto	2.14	9.78	0:04:27	0:22:57
Otranto	Ashley Phosphate	1.97	11.75	0:03:54	0:26:51
Ashley Phosphate	Stokes Avenue	1.04	12.79	0:02:40	0:29:31
Stokes Avenue	Remount	1.91	14.70	0:03:49	0:33:20
Remount	Mall Drive	1.34	16.04	0:03:04	0:36:24
Mall Drive	Durant	0.96	17.00	0:02:33	0:38:57
Durant	McMillan	1.27	18.27	0:02:58	0:41:55
McMillan	Azalea/Stromboli	1.55	19.82	0:03:20	0:45:15
Azalea/Stromboli	Braswell/Milford	1.48	21.30	0:03:27	0:48:42
Braswell/Milford	Mt. Pleasant	0.91	22.21	0:02:36	0:51:18
Mt. Pleasant	Romney	0.41	22.62	0:01:59	0:53:17
Romney	Huger	0.37	22.99	0:01:54	0:55:11
Huger	Line Street	0.49	23.48	0:02:09	0:57:20
		Total	**23.48**		**0:57:20**
				Average Speed	24.57

Northbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Line Street	Huger	0.49	0.49	0:02:09	0:02:09
Huger	Romney	0.37	0.86	0:01:54	0:04:03
Romney	Mt Pleasant	0.41	1.27	0:01:59	0:06:02
Mt Pleasant	Braswell/Milford	0.91	2.18	0:02:36	0:08:38
Braswell/Milford	Stromboli	1.48	3.66	0:03:27	0:12:05
Stromboli	McMillan	1.55	5.21	0:03:20	0:15:25
McMillan	Durant	1.27	6.48	0:02:58	0:18:23
Durant	Mall Drive	0.96	7.44	0:02:33	0:20:56
Mall Drive	Remount	1.34	8.78	0:03:04	0:24:00
Remount	Stokes	1.91	10.69	0:03:49	0:27:49
Stokes	Ashley Phosphate	1.04	11.73	0:02:40	0:30:29
Ashley Phosphate	Otranto	1.97	13.70	0:03:54	0:34:23
Otranto	Trident Health	2.25	15.95	0:04:37	0:39:00
Trident Health	Ladson	1.64	17.59	0:03:28	0:42:28
Ladson	Royle	2.50	20.09	0:04:36	0:47:04
Royle	5th & Berlin Myers	2.22	22.31	0:04:14	0:51:18
5th & Berlin Myers	Main & Richardson	0.84	23.15	0:04:27	0:55:45
		Total	**23.15**		**0:55:45**
				Average Speed	24.91

3.2 Alternatives B-3 & B-4: US 78/US 52/East Bay (BRT & LRT)

Alternative B-3 assumes BRT along US 78, US 52 and East Bay Street from downtown Summerville to Line Street in downtown Charleston. Alternative B-2 assumes LRT along the same alignment as shown in Figure 3-2.

Figure 3-2: Alternatives B-3 & B-4 Alignment & Station Locations for BRT & LRT



3.2.1 Alternatives B-3 & B-4 Alignment

From Richardson and N. Main Street (US 17A) in downtown Summerville, southbound trips travel northwest on Richardson Street, northeast on S. Cedar Street, and southeast on W. Doty Street to access N. Main Street. From N. Main Street, the alignment travels northeast and turns southeast on US 78 to North Charleston. The alignment merges south onto US 52 (Rivers Avenue) and continues to downtown Charleston via Rivers Avenue, Carner Avenue, Meeting Street and North Morrison/East Bay to Calhoun Street, where the alignment turns around via Calhoun Street, Washington Street and Chapel Street to continue northbound trips via the same alignment. Both alignments are assumed to operate in dedicated guideways along the road right-of-way or in mixed traffic with full signal preemption.

3.2.2 Alternatives B-3 & B-4 Service Frequencies

The following presents the proposed service frequencies and span of service for both BRT and LRT alternatives.

Alternatives B-3 & B-4			**Weekday**	**Saturday**	**Sunday & Holiday**
Span of Service & Frequencies by Time Period			*4:00 AM - 1:00 AM*	*6:00 AM - 1:00 AM*	*7:00 AM- 11:00 PM*
Peak	*6 AM - 9 AM*	*4 PM - 7 PM*	10 minutes	20 minutes	30 minutes
Base	*9 AM- 4 PM*	*7 PM - 9 PM*	20 minutes	20 minutes	30 minutes
Early/Late	*4 AM-6 AM*	*9 PM - 1 AM*	30 minutes	30 minutes	30 minutes

3.2.3 Alternatives B-3 & B-4 Station Locations

Table 3-4 lists the proposed station locations and connecting transit for the US 78/52/East Bay Alternatives.

Table 3-4: Alternatives B-3 & B-4 Station Locations & Connecting Transit Routes

Station Location	Routes Serving BRT/LRT Station
Main St & Richardson Ave	Summerville Connector (TCL)
E 5th N St & Berlin G Myers Pkwy	Summerville Connector (TCL)
US 78 & Royle Rd	-
US 78 & College Park Rd	Summerville Connector (TCL), Ladson Area Shuttle (TCL)
US 78 & I-26	Route 10, Summerville Connector (TCL), Ladson Area Shuttle (TCL)
Rivers Ave & Otranto Blvd	Routes 10, 12, Summerville Connector (TCL), Ladson Area Shuttle (TCL)
Rivers Ave & Ashley Phosphate	Route 10, 12
Rivers Ave & Stokes Ave	Route 10
Rivers Ave & Remount Rd	Route 10, 13
Rivers Ave & Mall Dr	Routes 10, 104
Rivers Ave & Durant Ave	Routes 10, 13
Rivers Ave & McMillan Ave*	Routes 10, 11, 12, 13, 32, 102, 103, 104
US 52 & Stromboli Ave	Routes 10, 102
Meeting St & Milford St	Routes 10, 11, 102
Meeting St & Mt. Pleasant St	Routes 10, 11, 20, 21, 102,
East Bay St & Romney St	Route 11
East Bay St & Huger St	Route 11, 40, 41
East Bay St & Columbus St	Routes 1, 2, 11, 31, 213, 301
East Bay St & Calhoun St	Route 30, 210

*Note – Routes 10, 11, 12, 13, 32, 102, 103, and 104 previously serving the North Charleston SuperStop are modified to operate along Cosgrove Ave, Reynold Avenue, Spruill Ave, McMillan Ave and Rivers Avenue to serve the BRT/LRT station at Rivers and McMillan as shown in Appendix 4-A (VIII).

3.2.4 Alternatives B-3 & B-4 Travel Times

Tables 3-5 and 3-6 present travel time estimates for both the BRT & LRT alignments. Estimates assume full signal priority or dedicated fixed guideway along the roadways for the entire length or the alignment. A one-minute delay is assumed for each station.

3.2.5 Alternatives B-3 & B-4 Transit Network

The underlying transit network for the US 78/US 52/East Bay Alternatives (BRT and LRT) is assumed to be relatively the same as the existing transit network as described in Section 2.0. Modifications to routes are made primarily in the downtown area to serve the BRT/LRT stations along the East Bay Corridor. Detailed transit network maps are provided in Appendix 4-A (III).

<u>CARTA Route Modifications</u>

- Route 1: Service is eliminated between the North Charleston K-Mart park-and-ride and the Visitors' Center stop in downtown Charleston. Route 1 will operate between the East Bay & Columbus station, and the Wal-Mart park-and-ride (Folly Road) on James Island. From the East Bay & Calhoun station the route will travel west on Columbus Street, south on Meeting Street, and west on Calhoun Street along its existing alignment to James Island.
- Route 2: Route 2 is modified to travel via East Bay, Columbus, and Meeting Street to travel from Mt. Pleasant to Mary Street with return trips traveling the same alignment.
- Route 12: Route alignment serving Northwoods Mall and Northwoods Boulevard modified to travel along Rivers Avenue to serve the Rivers & Ashley Phosphate station before continuing along Ashley Phosphate Road.
- Route 13: Modification/extension of route west along Remount Road to serve the Rivers & Remount station.
- Route 30: Route is modified to serve the East Bay & Calhoun station. Inbound route alignment will travel south on Meeting Street, and turn east on Calhoun Street to serve the East Bay & Calhoun station. The route's outbound trip will realign itself along Calhoun Street, Concord Street, Charlotte Street, and Washington Street before continuing west on Calhoun Street and north on Meeting Street along its existing outbound alignment.
- Route 31: Route modified such that inbound trips travel east on Mary Street, north on Meeting Street, and east on Columbus Street serving the East Bay & Columbus station. Outbound trip travels west on Columbus Street, south on Meeting Street and west on Spring Street along its existing alignment.
- Route 40: Inbound Route 40 is modified to travel west on the Arthur Ravenel Bridge and access the exit to East Bay Street. It travels south on East Bay Street serving the East Bay & Huger station (inbound only). From the East Bay & Huger station the route continues west on Huger Street, and south on Meeting Street along its current inbound alignment to the Mary Street transfer center.
- Route 41: Inbound Route 41 is modified to serve the East Bay & Huger Station as described for Route 40.
- Route 301: (See Route 31) Route modification the same as Route 31 to serve the East Bay and Columbus station.
- North Charleston SuperStop Circulation: The current North Charleston Transfer Hub at Rivers & Cosgrove is assumed to be relocated to Rivers & McMillan in the vicinity of Shipwatch Square. Routes are slightly modified as needed to serve this location as shown in Appendix 4-A (VIII).

Table 3-5: Alternative B-3 BRT Travel Time

Southbound					
From	To	Segment Distance	Total Distance	Segment Travel Time	Total Travel Time
Main & Richardson	5th & Berlin G Myers	1.28	1.28	0:06:15	0:06:15
5th & Berlin G Myers	Royle Road	2.22	3.50	0:04:25	0:10:40
Royle Road	Ladson Road	2.50	6.00	0:04:47	0:15:27
Ladson Road	Trident Health	1.64	7.64	0:03:38	0:19:05
Trident Health	Otranto	2.14	9.78	0:04:37	0:23:42
Otranto	Ashley Phosphate	1.97	11.75	0:04:05	0:27:47
Ashley Phosphate	Stokes Avenue	1.04	12.79	0:02:50	0:30:37
Stokes Avenue	Remount	1.91	14.70	0:04:00	0:34:37
Remount	Mall Drive	1.34	16.04	0:03:14	0:37:51
Mall Drive	Durant	0.96	17.00	0:02:44	0:40:35
Durant	McMillan	1.27	18.27	0:03:09	0:43:44
McMillan	Azalea/Stromboli	1.55	19.82	0:03:31	0:47:15
Azalea/Stromboli	Braswell/Milford	1.48	21.30	0:03:37	0:50:52
Braswell/Milford	Mt. Pleasant	0.91	22.21	0:02:46	0:53:38
Mt. Pleasant	Romney	0.47	22.68	0:02:12	0:55:50
Romney	Huger	0.38	23.06	0:02:02	0:57:52
Huger	Columbus	0.62	23.68	0:02:30	1:00:22
Columbus	Calhoun	0.72	24.40	0:05:25	1:05:47
		Total	**24.40**		**1:05:47**
				Average Speed	22.25

Northbound					
From	To	Segment Distance	Total Distance	Segment Travel Time	Total Travel Time
Calhoun	Columbus	0.62	0.62	0:03:37	0:03:37
Columbus	Huger	0.62	1.24	0:02:30	0:06:07
Huger	Romney	0.38	1.62	0:02:02	0:08:09
Romney	Mt Pleasant	0.47	2.09	0:02:12	0:10:21
Mt Pleasant	Braswell/Milford	0.91	3.00	0:02:46	0:13:07
Braswell/Milford	Stromboli	1.48	4.48	0:03:37	0:16:44
Stromboli	McMillan	1.55	6.03	0:03:31	0:20:15
McMillan	Durant	1.27	7.30	0:03:09	0:23:24
Durant	Mall Drive	0.96	8.26	0:02:44	0:26:08
Mall Drive	Remount	1.34	9.60	0:03:14	0:29:22
Remount	Stokes	1.91	11.51	0:04:00	0:33:22
Stokes	Ashley Phosphate	1.04	12.55	0:02:50	0:36:12
Ashley Phosphate	Otranto	1.97	14.52	0:04:05	0:40:17
Otranto	Trident Health	2.25	16.77	0:04:27	0:44:44
Trident Health	Ladson	1.64	18.41	0:03:38	0:48:22
Ladson	Royle	2.50	20.91	0:04:47	0:53:09
Royle	5th & Berlin Myers	2.22	23.13	0:04:25	0:57:34
5th & Berlin Myers	Main & Richardson	0.84	23.97	0:04:30	1:02:04
		Total	**23.97**		**1:02:04**
				Average Speed	23.17

Table 3-6: Alternative B-4 LRT Travel Time

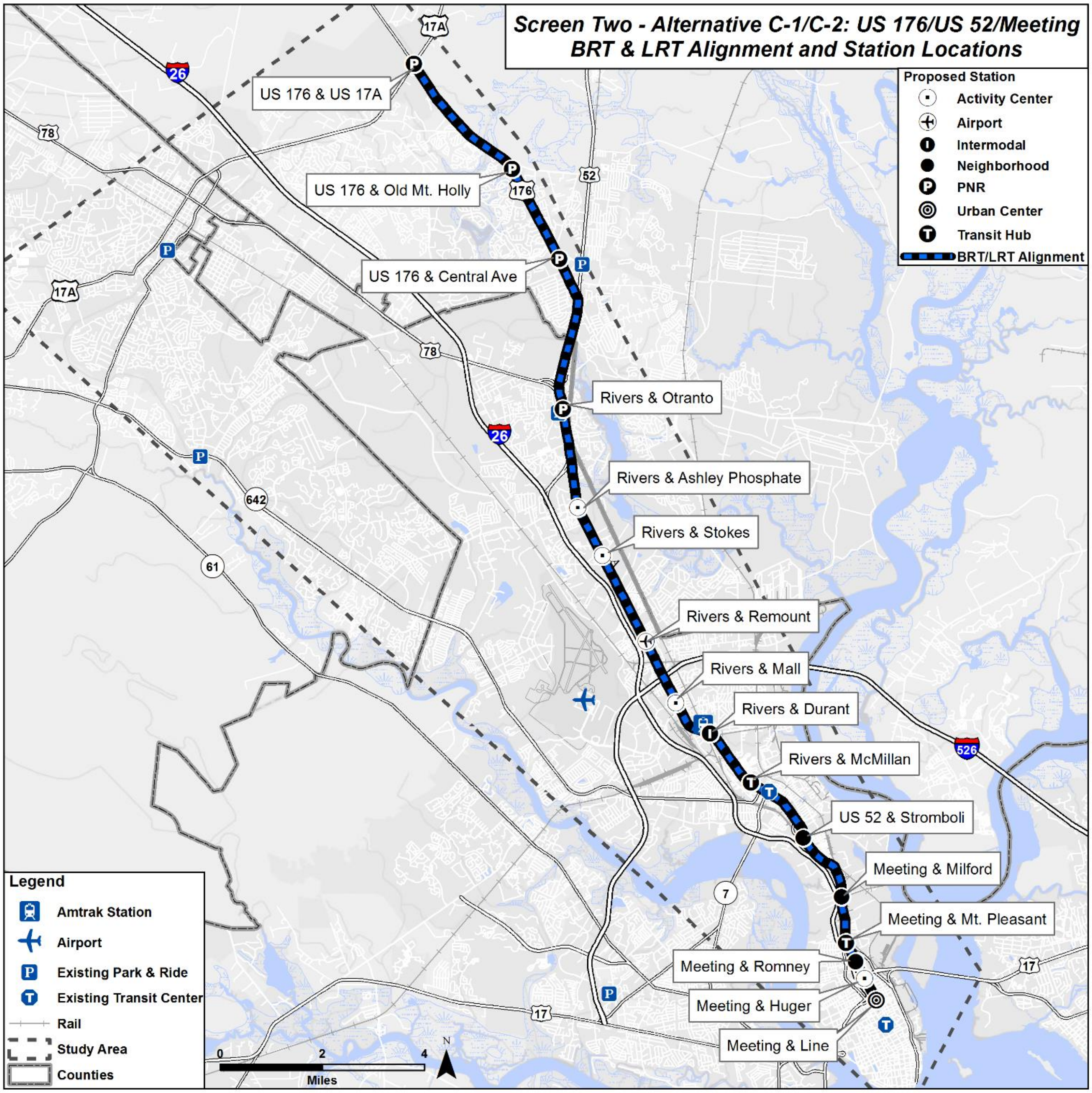
Southbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segme nt Travel Time**	**Total Travel Time**
Main & Richardson	5th & Berlin G Myers	1.28	1.28	0:06:12	0:06:12
5th & Berlin G Myers	Royle Road	2.22	3.50	0:04:14	0:10:26
Royle Road	Ladson Road	2.50	6.00	0:04:36	0:15:02
Ladson Road	Trident Health	1.64	7.64	0:03:28	0:18:30
Trident Health	Otranto	2.14	9.78	0:04:27	0:22:57
Otranto	Ashley Phosphate	1.97	11.75	0:03:54	0:26:51
Ashley Phosphate	Stokes Avenue	1.04	12.79	0:02:40	0:29:31
Stokes Avenue	Remount	1.91	14.70	0:03:49	0:33:20
Remount	Mall Drive	1.34	16.04	0:03:04	0:36:24
Mall Drive	Durant	0.96	17.00	0:02:33	0:38:57
Durant	McMillan	1.27	18.27	0:02:58	0:41:55
McMillan	Azalea/Stromboli	1.55	19.82	0:03:20	0:45:15
Azalea/Stromboli	Braswell/Milford	1.48	21.30	0:03:27	0:48:42
Braswell/Milford	Mt. Pleasant	0.91	22.21	0:02:36	0:51:18
Mt. Pleasant	Romney	0.47	22.68	0:02:06	0:53:24
Romney	Huger	0.38	23.06	0:01:56	0:55:20
Huger	Columbus	0.62	23.68	0:02:24	0:57:44
Columbus	Calhoun	0.72	24.40	0:05:22	1:03:06
		Total	**24.40**		**1:03:06**
				Average Speed	23.20

Northbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segme nt Travel Time**	**Total Travel Time**
Calhoun	Columbus	0.62	0.62	0:03:34	0:03:34
Columbus	Huger	0.62	1.24	0:02:24	0:05:58
Huger	Romney	0.38	1.62	0:01:56	0:07:54
Romney	Mt Pleasant	0.47	2.09	0:02:06	0:10:00
Mt Pleasant	Braswell/Milford	0.91	3.00	0:02:36	0:12:36
Braswell/Milford	Stromboli	1.48	4.48	0:03:27	0:16:03
Stromboli	McMillan	1.55	6.03	0:03:20	0:19:23
McMillan	Durant	1.27	7.30	0:02:58	0:22:21
Durant	Mall Drive	0.96	8.26	0:02:33	0:24:54
Mall Drive	Remount	1.34	9.60	0:03:04	0:27:58
Remount	Stokes	1.91	11.51	0:03:49	0:31:47
Stokes	Ashley Phosphate	1.04	12.55	0:02:40	0:34:27
Ashley Phosphate	Otranto	1.97	14.52	0:03:54	0:38:21
Otranto	Trident Health	2.25	16.77	0:04:37	0:42:58
Trident Health	Ladson	1.64	18.41	0:03:28	0:46:26
Ladson	Royle	2.50	20.91	0:04:36	0:51:02
Royle	5th & Berlin Myers	2.22	23.13	0:04:14	0:55:16
5th & Berlin Myers	Main & Richardson	0.84	23.97	0:04:27	0:59:43
		Total	**23.97**		**0:59:43**
				Average Speed	24.08

3.3 Alternatives C-1 & C-2: US 176/US 52/Meeting (BRT & LRT)

Alternative C-1 assumes BRT along US 176, US 52, and Meeting Street from US 176 & 17A in the vicinity of Carnes Crossroads to Line Street in downtown Charleston. Alternative C-2 assumes LRT along the same alignment as shown in Figure 3-3.

Figure 3-3: Alternatives C-1 & C-2 Alignment & Station Locations for BRT & LRT



3.3.1 Alternatives C-1 & C-2 Alignment

The US 176/US 52/Meeting Street alternatives operate between Carnes Crossroads (US 17A and US 176) and downtown Charleston. The fixed guideway alignment begins at the intersection of US 17A and US 176, travels south on US 176 (St. James Ave.) to US 52 (Goose Creek Boulevard). The alignment continues south on US 52 (Rivers Avenue), to Carner Avenue, and Meeting Street into downtown Charleston ending at Meeting Street and Line Street, where the alignment returns northbound via the same alignment. Both alignments are assumed to operate via dedicated guideway or with mixed traffic with full signal preemption along the road ROW.

3.3.2 Alternatives C-1 & C-2 Service Frequencies

The following presents the proposed service frequencies and span of service for both BRT and LRT alternatives.

Alternatives C-1 & C-2			**Weekday**	**Saturday**	**Sunday & Holiday**
Span of Service & Frequencies by Time Period			*4:00 AM - 1:00 AM*	*6:00 AM - 1:00 AM*	*7:00 AM- 11:00 PM*
Peak	*6 AM - 9 AM*	*4 PM - 7 PM*	10 minutes	20 minutes	30 minutes
Base	*9 AM- 4 PM*	*7 PM - 9 PM*	20 minutes	20 minutes	30 minutes
Early/Late	*4 AM-6 AM*	*9 PM - 1 AM*	30 minutes	30 minutes	30 minutes

3.3.3 Alternatives C-1 & C-2 Station Locations

Table 3-7 lists the proposed station locations and connecting transit for the US 176/US 52/Meeting Street Alternatives.

Table 3-7: Alternatives C-1 & C-2 Station Locations and Connecting Transit Routes

Station Location	Routes Serving BRT/LRT Station
US 176 & US 17A	Route B102 (TCL), Summerville Connector (TCL)
US 176 & Old Mount Holly Rd	Route B102 (TCL)
US 176 & Central Ave	Route B102 (TCL)
Rivers Ave & Otranto Blvd	Routes 10, 12, Summerville Connector (TCL), Ladson Area Shuttle (TCL)
Rivers Ave & Ashley Phosphate Rd	Route 10, 12
Rivers Ave & Stokes Ave	Route 10
Rivers Ave & Remount Rd	Route 10, 13
Rivers Ave & Mall Dr	Routes 10, 104
Rivers Ave & Durant Ave	Routes 10, 13
Rivers Ave & McMillan Ave*	Routes 10, 11, 12, 13, 32, 102, 103, 104
US 52 & Stromboli Ave	Routes 10, 102
Meeting St & Milford St	Routes 10, 11, 102
Meeting St & Mt. Pleasant St	Routes 10, 11, 20, 21, 102,
Meeting St & Romney St	Route 10
Meeting St & Huger St	Routes 10, 40, 41
Meeting St & Line St	Routes 10, 20, 30, 31, 40, 41, 102, 211, 213, 301

*Note – Routes 10, 11, 12, 13, 32, 102, 103, and 104 previously serving the North Charleston SuperStop are modified to operate along Cosgrove Ave, Reynold Avenue, Spruill Ave, McMillan Ave and Rivers Avenue to serve the BRT/LRT station at Rivers and McMillan as shown in Appendix 4-A (VIII).

3.3.4 Alternatives C-1 & C-2 Travel Times

Tables 3-8 and 3-9 present travel time estimates for both the BRT & LRT alignments. Estimates assume full signal priority or dedicated fixed guideway along the roadways for the entire length or the alignment. A one-minute delay is assumed for each station.

3.3.5 Alternatives C-1 & C-2 Supporting Transit Network

The following service changes are proposed for the US 176/US 52/Meeting Street BRT and LRT alternatives. Detailed transit network maps for this alternative are provided in Appendix 4-A (IV).

<u>CARTA Route Modifications</u>

- Route 1: Service is eliminated between the North Charleston K-Mart park-and-ride and the Visitors' Center stop in Downtown Charleston. Route 1 will operate between the Meeting & Line station and the Wal-Mart park-and-ride (Folly Road) on James Island. Route will travel south on Meeting Street and West on Calhoun Street to the James Island Connector.
- Route 12: Route alignment on Northwoods Boulevard is modified to serve the Rivers & Ashley Phosphate station and operates via Ashley Phosphate Road and Rivers Avenue.
- Route 13: Route is modified to extend westbound on Remount Road to serve the Rivers & Remount station.
- Route 20: Route is adjusted to serve the proposed BRT/LRT station located at Meeting Street and Line Street. The route is modified to travel on Line Street in both directions to serve the BRT/LRT station instead of Columbus Street.
- Route 30: Inbound trips come into the Peninsula via Cannon Street and turn north on King Street and east on Line Street to serve the station. The route continues south on Meeting Street to the end of the line on Broad Street. Outbound trips travel north on Meeting Street, west on Line Street, south on King Street and west on Spring Street to continue the existing alignment.
- Route 31: This route is modified to serve the Line Street Station. Eastbound trips come into the Peninsula via Cannon Street, and turn north on King Street and east on Line Street to the end of the line at the Line Street Station. Westbound trips continue east on Line Street, south on Meeting Street, west on Mary Street, north on King Street, and west on Spring Street to continue the existing alignment.
- Route 301: (See Route 31) Route modification the same as Route 31 to serve the Meeting & Line station.
- Route 102: Southbound trips along King Street are modified to turn east on Line Street from King Street to serve the Meeting Street and Line Street Station. The route will continue south on Meeting Street, west on Mary Street and north on King Street along its existing northbound alignment.
- Route 211: DASH trolley route is modified to serve the BRT/LRT station at Meeting Street and Line Street. The route is modified to operate on Line Street instead of Spring Street. No other changes are proposed to the alignment.
- Route 213: DASH trolley route is modified to serve BRT/LRT station at Meeting Street and Line Street. Modified alignment will travel east along Cannon Street, north on King Street, east on Line Street to serve the BRT/LRT station. The route will then turn south on Meeting Street, east on Columbus Street and continue along Columbus Street to East Bay Street, Chapel Street and John Street along its current alignment.

North Charleston SuperStop Circulation: The current North Charleston Transfer Hub at Rivers & Cosgrove is assumed to be relocated to Rivers & McMillan in the vicinity of Shipwatch Square. Routes are slightly modified as needed to serve this location as shown in Appendix 4-A (VIII).

Table 3-8: Alternative C-1 BRT Travel Times

Southbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
US 17A/Cane Bay Road	Old Mount Holley	2.85	2.85	0:05:15	0:05:15
Old Mount Holley	Central Avenue	1.99	4.84	0:04:06	0:09:21
Central Avenue	Otranto	3.09	7.93	0:06:59	0:16:20
Otranto	Ashley Phosphate	1.97	9.90	0:04:05	0:20:25
Ashley Phosphate	Stokes Avenue	1.04	10.94	0:02:50	0:23:15
Stokes Avenue	Remount	1.91	12.85	0:04:00	0:27:15
Remount	Mall Drive	1.34	14.19	0:03:14	0:30:29
Mall Drive	Durant	0.96	15.15	0:02:44	0:33:13
Durant	McMillan	1.27	16.42	0:03:09	0:36:22
McMillan	Azalea/Stromboli	1.55	17.97	0:03:31	0:39:53
Azalea/Stromboli	Braswell/Milford	1.48	19.45	0:03:37	0:43:30
Braswell/Milford	Mt. Pleasant	0.91	20.36	0:02:46	0:46:16
Mt. Pleasant	Romney	0.41	20.77	0:02:05	0:48:21
Romney	Huger	0.37	21.14	0:02:00	0:50:21
Huger	Line Street	0.49	21.63	0:02:15	0:52:36
		Total	**21.63**		**0:52:36**
				Average Speed	24.67

Northbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Line Street	Huger	0.49	0.49	0:02:15	0:02:15
Huger	Romney	0.37	0.86	0:02:00	0:04:15
Romney	Mt Pleasant	0.41	1.27	0:02:05	0:06:20
Mt Pleasant	Braswell/Milford	0.91	2.18	0:02:46	0:09:06
Braswell/Milford	Stromboli	1.48	3.66	0:03:37	0:12:43
Stromboli	McMillan	1.55	5.21	0:03:31	0:16:14
McMillan	Durant	1.27	6.48	0:03:09	0:19:23
Durant	Mall Drive	0.96	7.44	0:02:44	0:22:07
Mall Drive	Remount	1.34	8.78	0:03:14	0:25:21
Remount	Stokes	1.91	10.69	0:04:00	0:29:21
Stokes	Ashley Phosphate	1.04	11.73	0:02:50	0:32:11
Ashley Phosphate	Otranto	1.97	13.70	0:04:05	0:36:16
Otranto	Central Ave	3.09	16.79	0:06:58	0:43:14
Central Ave	Old Mount Holly	1.99	18.78	0:04:06	0:47:20
Old Mount Holly	US 17A/Cane Bay R	2.85	21.63	0:05:15	0:52:35
		Total	**21.63**		**0:52:35**
				Average Speed	24.68

Table 3-9: Alternative C-2 LRT Travel Times

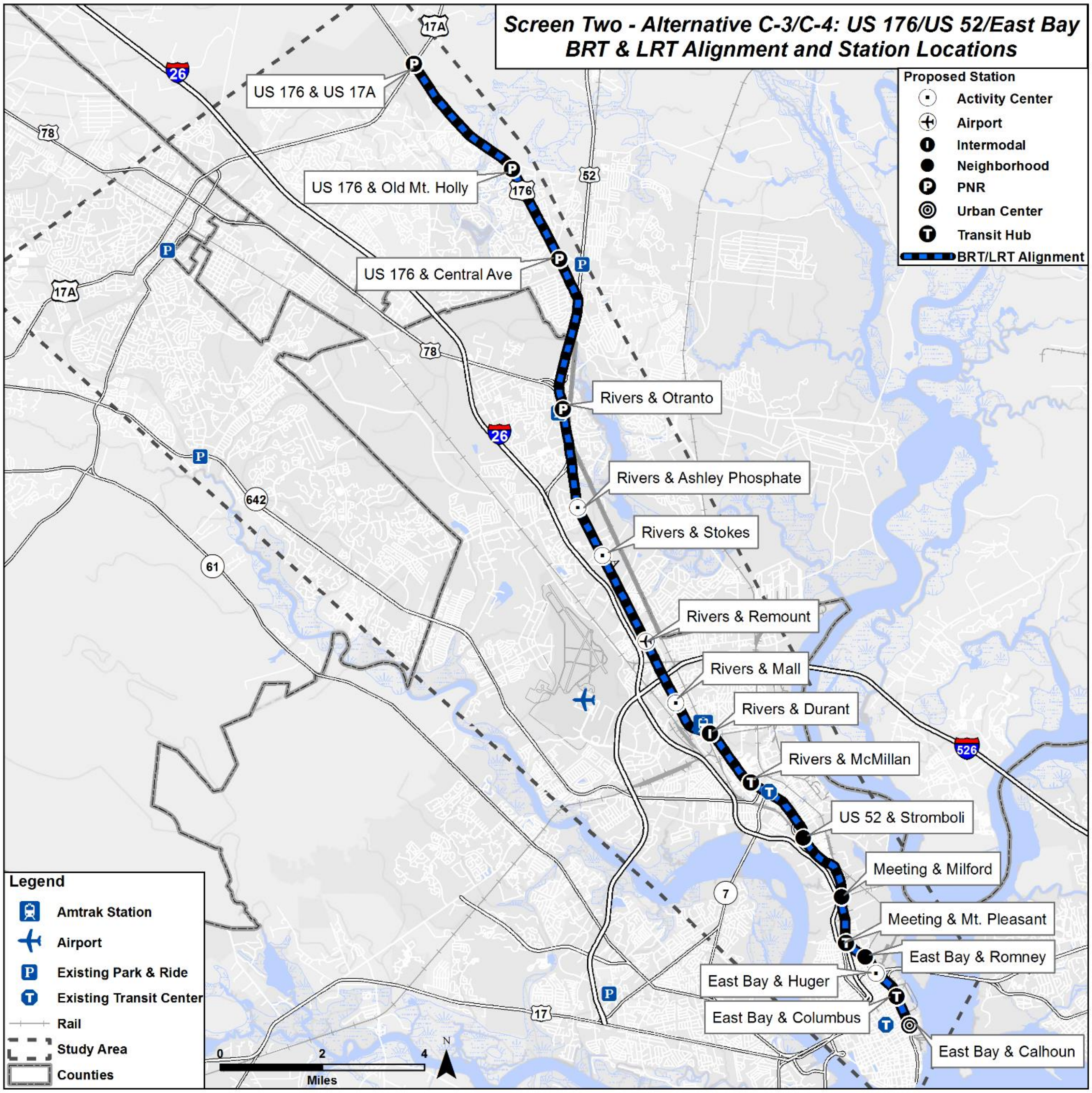
Southbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
US 17A/Cane Bay Road	Old Mount Holley	2.85	2.85	0:05:04	0:05:04
Old Mount Holley	Central Avenue	1.99	4.84	0:03:56	0:09:00
Central Avenue	Otranto	3.09	7.93	0:06:49	0:15:49
Otranto	Ashley Phosphate	1.97	9.90	0:03:54	0:19:43
Ashley Phosphate	Stokes Avenue	1.04	10.94	0:02:40	0:22:23
Stokes Avenue	Remount	1.91	12.85	0:03:49	0:26:12
Remount	Mall Drive	1.34	14.19	0:03:04	0:29:16
Mall Drive	Durant	0.96	15.15	0:02:33	0:31:49
Durant	McMillan	1.27	16.42	0:02:58	0:34:47
McMillan	Azalea/Stromboli	1.55	17.97	0:03:20	0:38:07
Azalea/Stromboli	Braswell/Milford	1.48	19.45	0:03:27	0:41:34
Braswell/Milford	Mt. Pleasant	0.91	20.36	0:02:36	0:44:10
Mt. Pleasant	Romney	0.41	20.77	0:01:59	0:46:09
Romney	Huger	0.37	21.14	0:01:54	0:48:03
Huger	Line Street	0.49	21.63	0:02:09	0:50:12
		Total	**21.63**		**0:50:12**
				Average Speed	25.85

Northbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Line Street	Huger	0.49	0.49	0:02:09	0:02:09
Huger	Romney	0.37	0.86	0:01:54	0:04:03
Romney	Mt Pleasant	0.41	1.27	0:01:59	0:06:02
Mt Pleasant	Braswell/Milford	0.91	2.18	0:02:36	0:08:38
Braswell/Milford	Stromboli	1.48	3.66	0:03:27	0:12:05
Stromboli	McMillan	1.55	5.21	0:03:20	0:15:25
McMillan	Durant	1.27	6.48	0:02:58	0:18:23
Durant	Mall Drive	0.96	7.44	0:02:33	0:20:56
Mall Drive	Remount	1.34	8.78	0:03:04	0:24:00
Remount	Stokes	1.91	10.69	0:03:49	0:27:49
Stokes	Ashley Phosphate	1.04	11.73	0:02:40	0:30:29
Ashley Phosphate	Otranto	1.97	13.70	0:03:54	0:34:23
Otranto	Central Ave	3.09	16.79	0:06:48	0:41:11
Central Ave	Old Mount Holly	1.99	18.78	0:03:56	0:45:07
Old Mount Holly	US 17A/Cane Bay Road	2.85	21.63	0:05:04	0:50:11
		Total	**21.63**		**0:50:11**
				Average Speed	25.86

3.4 Alternatives C-3 & C-4: US 176/US 52/East Bay (BRT & LRT)

Alternative C-3 assumes BRT along US 176, US 52, and East Bay Street from the vicinity of Carnes Crossroads at US 17A to Calhoun Street in downtown Charleston. Alternative C-4 assumes LRT along the same alignment as shown in Figure 3-4.

Figure 3-4: Alternatives C-3 & C-4 Alignment & Station Locations for BRT & LRT



3.4.1 Alternatives C-3 & C-4 Alignment

The US 176/US 52/East Bay alternatives operate between Carnes Crossroads (US 17A and US 176) and downtown Charleston. The fixed guideway alignment begins at the intersection of US 17A and US 176, travels south on US 176 (St. James Ave.) to US 52 (Goose Creek Boulevard). The alignment travels south on US 52 (Rivers Avenue), to Carner Avenue and Meeting Street into downtown Charleston. The route continues via Morrison Drive and East Bay Street to Calhoun Street, where the alignment turns around via Calhoun Street, Washington Street and Chapel Street to continue northbound trips via the same alignment. Both alignments are assumed to operate in dedicated guideways along the road right of way or in mixed traffic with full signal preemption.

3.4.2 Alternatives C-3 & C-4 Service Frequencies

The following presents the proposed service frequencies and span of service for both BRT and LRT alternatives.

Alternatives C-3 & C-4			**Weekday**	**Saturday**	**Sunday & Holiday**
Span of Service & Frequencies by Time Period			*4:00 AM - 1:00 AM*	*6:00 AM - 1:00 AM*	*7:00 AM- 11:00 PM*
Peak	*6 AM - 9 AM*	*4 PM - 7 PM*	10 minutes	20 minutes	30 minutes
Base	*9 AM- 4 PM*	*7 PM - 9 PM*	20 minutes	20 minutes	30 minutes
Early/Late	*4 AM-6 AM*	*9 PM - 1 AM*	30 minutes	30 minutes	30 minutes

3.4.3 Alternatives C-3 & C-4 Station Locations

Table 3-10 lists the proposed station locations and connecting transit for the US 176/US 52/East Bay Alternatives.

Table 3-10: Alternatives C-3 & C-4 Station Locations & Connecting Transit Routes

Station Location	Routes Serving BRT/LRT Station
US 176 & US 17A	Route B102 (TCL), Summerville Connector (TCL)
US 176 & Old Mount Holly Rd	Route B102 (TCL)
US 176 & Central Ave	Route B102 (TCL)
Rivers Ave & Otranto Blvd	Routes 10, 12, Summerville Connector (TCL), Ladson Area Shuttle (TCL)
Rivers Ave & Ashley Phosphate Rd	Route 10, 12
Rivers Ave & Stokes Ave	Route 10
Rivers Ave & Remount Rd	Route 10, 13
Rivers Ave & Mall Dr	Routes 10, 104
Rivers Ave & Durant Ave	Routes 10, 13
Rivers Ave & McMillan Ave*	Routes 10, 11, 12, 13, 32, 102, 103, 104
US 52 & Stromboli Ave	Routes 10, 102
Meeting St & Milford St	Routes 10, 11, 102
Meeting St & Mt. Pleasant St	Routes 10, 11, 20, 21, 102,
East Bay St & Romney St	Route 11
East Bay St & Huger St	Route 11, 40, 41
East Bay St & Columbus St	Routes 1, 2, 11, 31, 213, 301
East Bay St & Calhoun St	Route 30, 210

*Note – Routes 10, 11, 12, 13, 32, 102, 103, and 104 previously serving the North Charleston SuperStop are modified to operate along Cosgrove Ave, Reynold Avenue, Spruill Ave, McMillan Ave and Rivers Avenue to serve the BRT/LRT station at Rivers and McMillan as shown in Appendix 4-A (VIII).

3.4.4 Alternatives C-3 & C-4 Travel Times

Tables 3-11 and 3-12 present travel time estimates for both the BRT & LRT alignments. Estimates assume full signal priority or dedicated fixed guideway along the roadways for the entire length or the alignment. A one-minute delay is assumed for each station.

3.4.5 Alternatives C-3 & C-4 Transit Network

The following service changes are proposed for the US 176/US 52/East Bay BRT and LRT alternatives. Modifications to routes are made primarily in the downtown area to serve the BRT/LRT stations along the East Bay Corridor. Detailed transit network maps are provided in Appendix 4-A (V).

<u>CARTA Route Modifications</u>

- Route 1: Service is eliminated between the North Charleston K-Mart park-and-ride and the Visitors' Center stop in downtown Charleston. Route 1 will operate between the East Bay & Columbus station, and the Wal-Mart park-and-ride (Folly Road) on James Island. From the East Bay & Calhoun station the route will travel west on Columbus Street, south on Meeting Street, and west on Calhoun Street along its existing alignment to James Island.
- Route 2: Route 2 is modified to travel via East Bay, Columbus, and Meeting Street to travel from Mt. Pleasant to Mary Street with return trips traveling the same alignment.
- Route 12: Route alignment serving Northwoods Mall and Northwoods Boulevard modified to travel along Rivers Avenue to serve the Rivers & Ashley Phosphate station before continuing along Ashley Phosphate Road.
- Route 13: Modification/extension of route west along Remount Road to serve the Rivers & Remount station.
- Route 30: Route is modified to serve the East Bay & Calhoun station. Inbound route alignment will travel south on Meeting Street, and turn east on Calhoun Street to serve the East Bay & Calhoun station. The route's outbound trip will realign itself along Calhoun Street, Concord Street, Charlotte Street, and Washington Street before continuing west on Calhoun Street and north on Meeting Street along its existing outbound alignment.
- Route 31: Route modified such that inbound trips travel east on Mary Street, north on Meeting Street, and east on Columbus Street serving the East Bay & Columbus station. Outbound trip travels west on Columbus Street, south on Meeting Street and west on Spring Street along its existing alignment.
- Route 40: Inbound Route 40 is modified to travel west on the Arthur Ravenel Bridge and access the exit to East Bay Street. It travels south on East Bay Street serving the East Bay & Huger station (inbound only). From the East Bay & Huger station the route continues west on Huger Street, and south on Meeting Street along its current inbound alignment to the Mary Street transfer center.
- Route 41: Inbound Route 41 is modified to serve the East Bay & Huger Station as described for Route 40.
- Route 301: (See Route 31) Route modification the same as Route 31 to serve the East Bay and Columbus station.
- North Charleston SuperStop Circulation: The current North Charleston Transfer Hub at Rivers & Cosgrove is assumed to be relocated to Rivers & McMillan in the vicinity of Shipwatch Square. Routes are slightly modified as needed to serve this location as shown in Appendix 4-A (VIII).

Table 3-11: Alternative C-3 BRT Travel Times

Southbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
US 17A/Cane Bay Road	Old Mount Holley	2.85	2.85	0:05:15	0:05:15
Old Mount Holley	Central Avenue	1.99	4.84	0:04:06	0:09:21
Central Avenue	Otranto	3.09	7.93	0:06:59	0:16:20
Otranto	Ashley Phosphate	1.97	9.90	0:04:05	0:20:25
Ashley Phosphate	Stokes Avenue	1.04	10.94	0:02:50	0:23:15
Stokes Avenue	Remount	1.91	12.85	0:04:00	0:27:15
Remount	Mall Drive	1.34	14.19	0:03:14	0:30:29
Mall Drive	Durant	0.96	15.15	0:02:44	0:33:13
Durant	McMillan	1.27	16.42	0:03:09	0:36:22
McMillan	Azalea/Stromboli	1.55	17.97	0:03:31	0:39:53
Azalea/Stromboli	Braswell/Milford	1.48	19.45	0:03:37	0:43:30
Braswell/Milford	Mt. Pleasant	0.91	20.36	0:02:46	0:46:16
Mt. Pleasant	Romney	0.47	20.83	0:02:12	0:48:28
Romney	Huger	0.38	21.21	0:02:02	0:50:30
Huger	Columbus	0.62	21.83	0:02:30	0:53:00
Columbus	Calhoun	0.72	22.55	0:05:25	0:58:25
		Total	**22.55**		**0:58:25**
				Average Speed	23.16

Northbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Calhoun	Columbus	0.62	0.62	0:03:37	0:03:37
Columbus	Huger	0.62	1.24	0:02:30	0:06:07
Huger	Romney	0.38	1.62	0:02:02	0:08:09
Romney	Mt Pleasant	0.47	2.09	0:02:12	0:10:21
Mt Pleasant	Braswell/Milford	0.91	3.00	0:02:46	0:13:07
Braswell/Milford	Stromboli	1.48	4.48	0:03:37	0:16:44
Stromboli	McMillan	1.55	6.03	0:03:31	0:20:15
McMillan	Durant	1.27	7.30	0:03:09	0:23:24
Durant	Mall Drive	0.96	8.26	0:02:44	0:26:08
Mall Drive	Remount	1.34	9.60	0:03:14	0:29:22
Remount	Stokes	1.91	11.51	0:04:00	0:33:22
Stokes	Ashley Phosphate	1.04	12.55	0:02:50	0:36:12
Ashley Phosphate	Otranto	1.97	14.52	0:04:05	0:40:17
Otranto	Central Ave	3.09	17.61	0:06:58	0:47:15
Central Ave	Old Mount Holly	1.99	19.60	0:04:06	0:51:21
Old Mount Holly	US 17A/Cane Bay R	2.85	22.45	0:05:15	0:56:36
		Total	**22.45**		**0:56:36**
				Average Speed	23.80

Table 3-12: Alternative C-4 LRT Travel Times

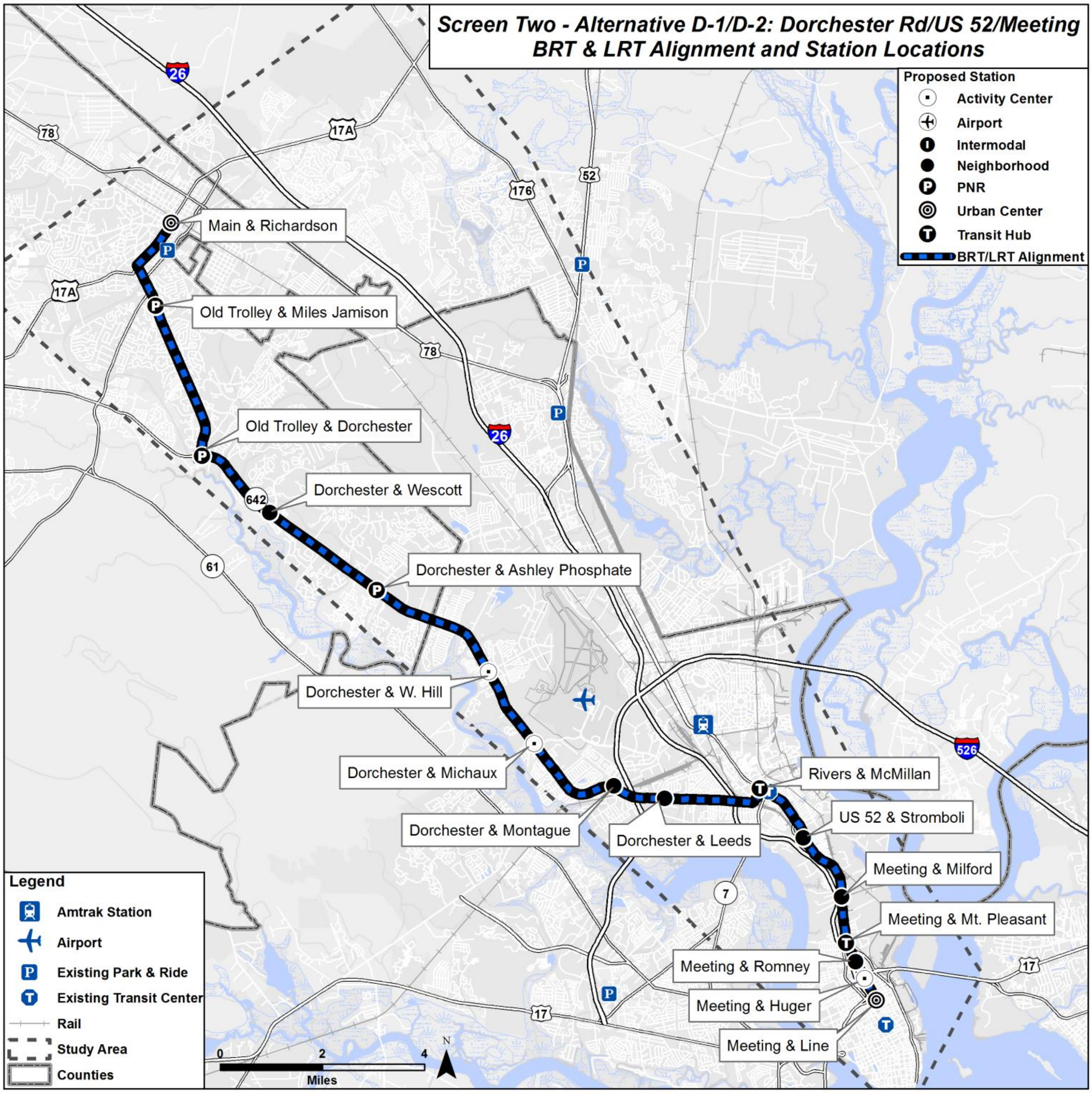
Southbound					
From	To	Segment Distance	Total Distance	Segment Travel Time	Total Travel Time
US 17A/Cane Bay Road	Old Mount Holley	2.85	2.85	0:05:04	0:05:04
Old Mount Holley	Central Avenue	1.99	4.84	0:03:56	0:09:00
Central Avenue	Otranto	3.09	7.93	0:06:49	0:15:49
Otranto	Ashley Phosphate	1.97	9.90	0:03:54	0:19:43
Ashley Phosphate	Stokes Avenue	1.04	10.94	0:02:40	0:22:23
Stokes Avenue	Remount	1.91	12.85	0:03:49	0:26:12
Remount	Mall Drive	1.34	14.19	0:03:04	0:29:16
Mall Drive	Durant	0.96	15.15	0:02:33	0:31:49
Durant	McMillan	1.27	16.42	0:02:58	0:34:47
McMillan	Azalea/Stromboli	1.55	17.97	0:03:20	0:38:07
Azalea/Stromboli	Braswell/Milford	1.48	19.45	0:03:27	0:41:34
Braswell/Milford	Mt. Pleasant	0.91	20.36	0:02:36	0:44:10
Mt. Pleasant	Romney	0.47	20.83	0:02:06	0:46:16
Romney	Huger	0.38	21.21	0:01:56	0:48:12
Huger	Columbus	0.62	21.83	0:02:24	0:50:36
Columbus	Calhoun	0.72	22.55	0:05:22	0:55:58
		Total	**22.55**		**0:55:58**
				Average Speed	24.18

Northbound					
From	To	Segment Distance	Total Distance	Segment Travel Time	Total Travel Time
Calhoun	Columbus	0.62	0.62	0:03:34	0:03:34
Columbus	Huger	0.62	1.24	0:02:24	0:05:58
Huger	Romney	0.38	1.62	0:01:56	0:07:54
Romney	Mt Pleasant	0.47	2.09	0:02:06	0:10:00
Mt Pleasant	Braswell/Milford	0.91	3.00	0:02:36	0:12:36
Braswell/Milford	Stromboli	1.48	4.48	0:03:27	0:16:03
Stromboli	McMillan	1.55	6.03	0:03:20	0:19:23
McMillan	Durant	1.27	7.30	0:02:58	0:22:21
Durant	Mall Drive	0.96	8.26	0:02:33	0:24:54
Mall Drive	Remount	1.34	9.60	0:03:04	0:27:58
Remount	Stokes	1.91	11.51	0:03:49	0:31:47
Stokes	Ashley Phosphate	1.04	12.55	0:02:40	0:34:27
Ashley Phosphate	Otranto	1.97	14.52	0:03:54	0:38:21
Otranto	Central Ave	3.09	17.61	0:06:48	0:45:09
Central Ave	Old Mount Holly	1.99	19.60	0:03:56	0:49:05
Old Mount Holly	US 17A/Cane Bay Road	2.85	22.45	0:05:04	0:54:09
		Total	**22.45**		**0:54:09**
				Average Speed	24.88

3.5 Alternatives D-1 & D-2: Dorchester Rd/US 52/Meeting (BRT & LRT)

Alternative D-1 assumes BRT along Old Trolley Road, Dorchester Road, US 52, and Meeting Street from Richardson & Main in downtown Summerville to Line Street in downtown Charleston. Alternative D-2 assumes LRT along the same alignment as shown in Figure 3-5.

Figure 3-5: Alternatives D-1 & D-2 Alignments & Station Locations for BRT & LRT



3.5.1 Alternatives D-1 & D-2 Alignment

The Dorchester Road BRT alternative assumes service operating between downtown Summerville and downtown Charleston primarily along the Dorchester Road Corridor. From Richardson and N. Main Street (US 17A) in downtown Summerville, southbound trips travel northwest on Richardson Street, northeast on S. Cedar Street, and southeast on W. Doty Street to access N. Main Street. From N. Main Street, the route travels southwest, where it turns south on East Carolina Avenue/Old Trolley Road. The alignment turns southeast on Dorchester Road and continues into North Charleston, where it turns south on US 52 (Rivers Avenue), Carner Avenue, and Meeting Street to Line Street in downtown Charleston, where the alignment returns northbound via the same alignment. Both alignments are assumed to operate in dedicated guideways along the road right of way or in mixed traffic with full signal preemption.

3.5.2 Alternatives D-1 & D-2 Service Frequencies

The following presents the proposed service frequencies and span of service for both BRT and LRT alternatives.

Alternatives D-1 & D-2			**Weekday**	**Saturday**	**Sunday & Holiday**
Span of Service & Frequencies by Time Period			*4:00 AM - 1:00 AM*	*6:00 AM - 1:00 AM*	*7:00 AM- 11:00 PM*
Peak	*6 AM - 9 AM*	*4 PM - 7 PM*	10 minutes	20 minutes	30 minutes
Base	*9 AM- 4 PM*	*7 PM - 9 PM*	20 minutes	20 minutes	30 minutes
Early/Late	*4 AM-6 AM*	*9 PM - 1 AM*	30 minutes	30 minutes	30 minutes

3.5.3 Alternatives D-1 & D-2 Station Locations

Table 3-13 lists the proposed station locations and connecting transit for the Dorchester Road/US 52/Meeting Street Alternatives.

Table 3-13: Alternatives D-1 & D-2 Station Locations and Connecting Transit Routes

Station Location	Routes Serving BRT/LRT Station
Main St & Richardson Ave	Summerville Connector (TCL)
Old Trolley Rd & Miles Jamison Rd	Summerville Connector (TCL)
Old Trolley Rd & Dorchester Rd	Summerville Connector (TCL)
Dorchester Rd & Wescott Blvd	-
Dorchester Rd & Ashley Phosphate	Route 12
Dorchester Rd & W. Hill Blvd	Route 12
Dorchester Rd & Michaux Pkwy	Route 12
Dorchester Rd & W Montague Ave	Routes 11, 12
Dorchester Rd & Leeds Ave	Route 11, 12, 103
Dorchester Rd & Rivers Ave*	Routes 10, 11, 12, 13, 32, 102, 103, 104
US 52 & Stromboli Ave	Routes 10, 102
Meeting St & Milford St	Routes 10, 11, 102
Meeting St & Mt. Pleasant St	Routes 10, 11, 20, 21, 102,
Meeting St & Romney St	Route 10
Meeting St & Huger St	Routes 10, 40, 41
Meeting St & Line St	Routes 10, 20, 30, 31, 40, 41, 102, 211, 213, 301

*Note – Routes 10, 11, 12, 13, 32, 102, 103, and 104 previously serving the North Charleston SuperStop are modified to operate along Cosgrove Ave, Reynold Avenue, Spruill Ave, McMillan Ave and Rivers Avenue to serve the BRT/LRT station at Dorchester and Rivers as shown in Appendix 4-A (VIII).

3.5.4 Alternatives D-1 & D-2 Travel Times

Tables 3-11 and 3-12 present travel time estimates for both the BRT & LRT alignments. Estimates assume full signal priority or dedicated fixed guideway along the roadways for the entire length or the alignment. A one-minute delay is assumed for each station.

3.5.5 Alternatives D-1 & D-2 Transit Network

The following service changes are proposed for the Dorchester Road BRT and LRT alternatives ending at Meeting Street and Line Street. Detailed transit network maps for this alternative are provided in Appendix 4-A (VI).

<u>CARTA Route Modifications</u>

- Route 1: Route adjusted to stop at the Meeting & Line station as one of its limited stops.
- Route 3: Route is eliminated.
- Route 20: Route is adjusted to serve the proposed BRT/LRT station located at Meeting Street and Line Street. The route is modified to travel on Line Street in both directions to serve the BRT/LRT station instead of Columbus Street.
- Route 30: Inbound trips come into the Peninsula via Cannon Street and turn north on King Street and east on Line Street to serve the station. The route continues south on Meeting Street to the end of the line on Broad Street. Outbound trips travel north on Meeting Street, west on Line Street, south on King Street and west on Spring Street to continue the existing alignment.
- Route 31: This route is modified to serve the Line Street Station. Eastbound trips come into the Peninsula via Cannon Street, and turn north on King Street and east on Line Street to the end of the line at the Line Street Station. Westbound trips continue east on Line Street, south on Meeting Street, west on Mary Street, north on King Street, and west on Spring Street to continue the existing alignment.
- Route 301: (See Route 31) Route modification the same as Route 31 to serve the Meeting & Line station.
- Route 102: Southbound trips along King Street are modified to turn east on Line Street from King Street to serve the Meeting Street and Line Street Station. The route will continue south on Meeting Street, west on Mary Street and north on King Street along its existing northbound alignment.
- Route 211: DASH trolley route is modified to serve the BRT/LRT station at Meeting Street and Line Street. The route is modified to operate on Line Street instead of Spring Street. No other changes are proposed to the alignment.
- Route 213: DASH trolley route is modified to serve BRT/LRT station at Meeting Street and Line Street. Modified alignment will travel east along Cannon Street, north on King Street, east on Line Street to serve the BRT/LRT station. The route will then turn south on Meeting Street, east on Columbus Street and continue along Columbus Street to East Bay Street, Chapel Street and John Street along its current alignment.
- North Charleston SuperStop Circulation: The current North Charleston Transfer Hub at Rivers & Cosgrove is assumed to be relocated to Rivers & McMillan in the vicinity of Shipwatch Square. Routes are slightly modified as needed to serve this location as shown in Appendix 4-A (VIII).

Table 3-14: Alternative D-1 BRT Travel Times

Southbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Main & Richardson	Miles Jamison	1.97	1.97	0:05:55	0:05:55
Miles Jamison	Old Trolley/Dorchester	3.14	5.11	0:05:38	0:11:33
Old Trolley/Dorchester	Westcott	1.79	6.90	0:03:50	0:15:23
Westcott	Ashley Phosphate	2.58	9.48	0:04:41	0:20:04
Ashley Phosphate	W. Hill	2.82	12.30	0:05:13	0:25:17
W. Hill	Michaux	1.68	13.98	0:03:41	0:28:58
Michaux	West Montague	1.90	15.88	0:05:10	0:34:08
West Montague	Leeds	1.21	17.09	0:04:08	0:38:16
Leeds	Rivers/McMillan	3.25	20.34	0:10:55	0:49:11
Rivers/McMillan	Azalea/Stromboli	1.34	21.68	0:03:14	0:52:25
Azalea/Stromboli	Braswell/Milford	1.48	23.16	0:03:37	0:56:02
Braswell/Milford	Mt. Pleasant	0.91	24.07	0:02:46	0:58:48
Mt. Pleasant	Romney	0.41	24.48	0:02:05	1:00:53
Romney	Huger	0.37	24.85	0:02:00	1:02:53
Huger	Line Street	0.49	25.34	0:02:15	1:05:08
		Total	**25.34**		**1:05:08**
				Average Speed	23.34

Northbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Line Street	Huger	0.49	0.49	0:02:15	0:02:15
Huger	Romney	0.37	0.86	0:02:00	0:04:15
Romney	Mt Pleasant	0.41	1.27	0:02:05	0:06:20
Mt Pleasant	Braswell/Milford	0.91	2.18	0:02:46	0:09:06
Braswell/Milford	Stromboli	1.48	3.66	0:03:37	0:12:43
Stromboli	Rivers	1.34	5.00	0:03:14	0:15:57
Rivers	Leeds	3.25	8.25	0:10:55	0:26:52
Leeds	W. Montague	1.21	9.46	0:04:08	0:31:00
W. Montague	Michaux	1.90	11.36	0:05:09	0:36:09
Michaux	W. Hill	1.68	13.04	0:03:41	0:39:50
W. Hill	Ashley Phosphate	2.82	15.86	0:05:13	0:45:03
Ashley Phosphate	Westcott	2.58	18.44	0:04:41	0:49:44
Westcott	Old Trolley	1.79	20.23	0:03:50	0:53:34
Old Trolley	Miles Jamison	3.14	23.37	0:05:38	0:59:12
Miles Jamison	Main & Richardson	2.37	25.74	0:07:44	1:06:56
		Total	**25.74**		**1:06:56**
				Average Speed	23.07

Table 3-15: Alternative D-2 LRT Travel Times

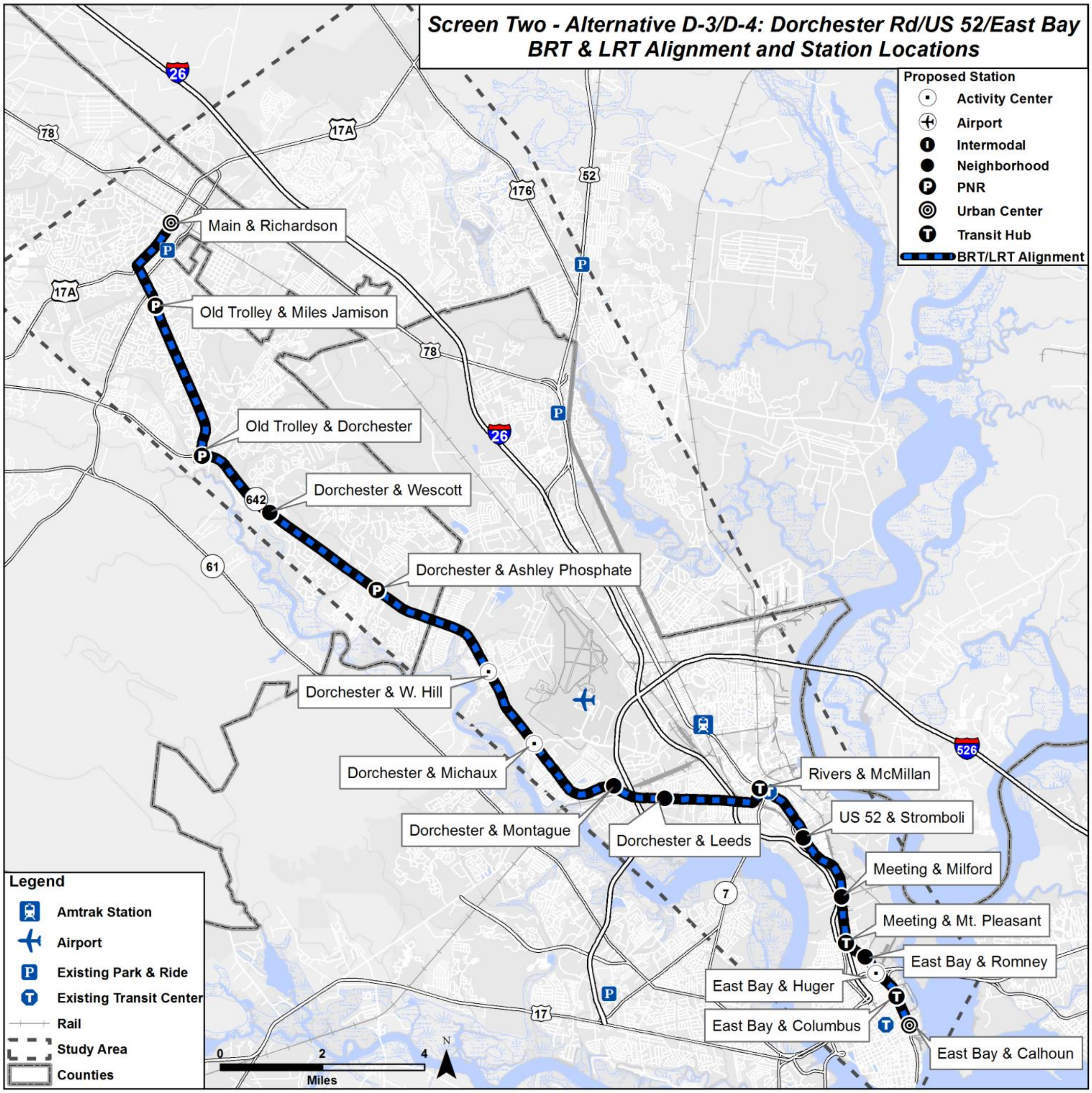
Southbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Main & Richardson	Miles Jamison	1.97	1.97	0:05:43	0:05:43
Miles Jamison	Old Trolley/Dorchester	3.14	5.11	0:05:28	0:11:11
Old Trolley/Dorchester	Westcott	1.79	6.90	0:03:40	0:14:51
Westcott	Ashley Phosphate	2.58	9.48	0:04:25	0:19:16
Ashley Phosphate	W. Hill	2.82	12.30	0:05:02	0:24:18
W. Hill	Michaux	1.68	13.98	0:03:31	0:27:49
Michaux	West Montague	1.90	15.88	0:05:02	0:32:51
West Montague	Leeds	1.21	17.09	0:04:03	0:36:54
Leeds	Rivers/McMillan	3.25	20.34	0:10:48	0:47:42
Rivers/McMillan	Azalea/Stromboli	1.34	21.68	0:03:04	0:50:46
Azalea/Stromboli	Braswell/Milford	1.48	23.16	0:03:27	0:54:13
Braswell/Milford	Mt. Pleasant	0.91	24.07	0:02:36	0:56:49
Mt. Pleasant	Romney	0.41	24.48	0:01:59	0:58:48
Romney	Huger	0.37	24.85	0:01:54	1:00:42
Huger	Line Street	0.49	25.34	0:02:09	1:02:51
		Total	**25.34**		**1:02:51**
				Average Speed	24.19

Northbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Line Street	Huger	0.49	0.49	0:02:09	0:02:09
Huger	Romney	0.37	0.86	0:01:54	0:04:03
Romney	Mt Pleasant	0.41	1.27	0:01:59	0:06:02
Mt Pleasant	Braswell/Milford	0.91	2.18	0:02:36	0:08:38
Braswell/Milford	Stromboli	1.48	3.66	0:03:27	0:12:05
Stromboli	Rivers	1.34	5.00	0:03:04	0:15:09
Rivers	Leeds	3.25	8.25	0:10:47	0:25:56
Leeds	W. Montagu	1.21	9.46	0:04:03	0:29:59
W. Montagu	Michaux	1.90	11.36	0:05:02	0:35:01
Michaux	W. Hill	1.68	13.04	0:03:31	0:38:32
W. Hill	Ashley Phosphate	2.82	15.86	0:05:02	0:43:34
Ashley Phosphate	Westcott	2.58	18.44	0:04:25	0:47:59
Westcott	Old Trolley	1.79	20.23	0:03:40	0:51:39
Old Trolley	Miles Jamison	3.14	23.37	0:05:28	0:57:07
Miles Jamison	Main & Richardson	2.37	25.74	0:07:25	1:04:32
		Total	**25.74**		**1:04:32**
				Average Speed	23.93

3.6 Alternatives D-3 & D-4: Dorchester Rd/US 52/East Bay (BRT & LRT)

Alternative D-3 assumes BRT along Old Trolley Road, Dorchester Road, US 52, and East Bay Street from Richardson & Main in downtown Summerville to Calhoun Street in downtown Charleston. Alternative D-4 assumes LRT along the same alignment as shown in Figure 3-6.

Figure 3-6: Alternatives D-3 & D-4 Alignments & Station Locations for BRT & LRT



3.6.1 Alternatives D-3 & D-4 Alignment

The Dorchester Road BRT alternative assumes service operating between downtown Summerville and downtown Charleston primarily along the Dorchester Road Corridor. From Richardson and N. Main Street (US 17A) in downtown Summerville, southbound trips travel northwest on Richardson Street, northeast on S. Cedar Street, and southeast on W. Doty Street to access N. Main Street. From N. Main Street, the route travels southwest, where it turns south on East Carolina Avenue/Old Trolley Road. The alignment turns southeast on Dorchester Road into North Charleston, where it turns south on US 52 (Rivers Avenue), Carner Avenue, and Meeting Street in downtown Charleston. The route continues via Morrison Drive and East Bay Street to Calhoun Street, where the alignment turns around via Calhoun Street, Washington Street and Chapel Street to continue northbound trips via the same alignment. Both alignments are assumed to operate in dedicated guideways along the road right of way or in mixed traffic with full signal preemption.

3.6.2 Alternatives D-3 & D-4 Service Frequencies

The following presents the proposed service frequencies and span of service for both BRT and LRT alternatives.

Alternatives D-3 & D-4			**Weekday**	**Saturday**	**Sunday & Holiday**
Span of Service & Frequencies by Time Period			*4:00 AM - 1:00 AM*	*6:00 AM - 1:00 AM*	*7:00 AM- 11:00 PM*
Peak	*6 AM - 9 AM*	*4 PM - 7 PM*	10 minutes	20 minutes	30 minutes
Base	*9 AM- 4 PM*	*7 PM - 9 PM*	20 minutes	20 minutes	30 minutes
Early/Late	*4 AM-6 AM*	*9 PM - 1 AM*	30 minutes	30 minutes	30 minutes

3.6.3 Alternatives D-3 & D-4 Station Locations

Table 3-16 lists the proposed station locations and connecting transit for the Dorchester Road/US 52/East Bay Alternatives.

Table 3-16: Alternatives D-3 & D-4 Station Locations & Connecting Transit Routes

Station Location	Routes Serving BRT/LRT Station
Main St & Richardson Ave	Summerville Connector (TCL)
Old Trolley Rd & Miles Jamison Rd	Summerville Connector (TCL)
Old Trolley Rd & Dorchester Rd	Summerville Connector (TCL)
Dorchester Rd & Wescott Blvd	-
Dorchester Rd & Ashley Phosphate	Route 12
Dorchester Rd & W. Hill Blvd	Route 12
Dorchester Rd & Michaux Pkwy	Route 12
Dorchester Rd & W Montague Ave	Routes 11, 12
Dorchester Rd & Leeds Ave	Route 11, 12, 103
Dorchester Rd & Rivers Ave	Routes 10, 11, 12, 13, 32, 102, 103, 104
US 52 & Stromboli Ave	Routes 10, 102
Meeting St & Milford St	Routes 10, 11, 102
Meeting St & Mt. Pleasant St	Routes 1, 10, 11, 20, 21, 102,
East Bay St & Romney St	Route 11
East Bay St & Huger St	Route 11, 40, 41
East Bay St & Columbus St	Routes 1, 2, 11, 31, 213, 301
East Bay St & Calhoun St	Route 30, 210

*Note – Routes 10, 11, 12, 13, 32, 102, 103, and 104 previously serving the North Charleston SuperStop are modified to operate along Cosgrove Ave, Reynold Avenue, Spruill Ave, McMillan Ave and Rivers Avenue to serve the BRT/LRT station at Dorchester and Rivers as shown in Appendix 4-A (VIII).

3.6.4 Alternatives D3 & D4 Travel Times

Tables 3-17 and 3-18 present travel time estimates for both the BRT & LRT alignments. Estimates assume full signal priority or dedicated fixed guideway along the roadways for the entire length or the alignment. A one-minute delay is assumed for each station.

3.6.5 Alternatives D-3 & D-4 Transit Network

The following service changes are proposed for the Dorchester Rd/US 52/East Bay Alternatives. Detailed transit network maps for this alternative are provided in Appendix 4-A (VII).

CARTA Route Modifications

- Route 1: Route adjusted to stop at the Meeting & Line station as one of its limited stops.
- Route 3: Route is eliminated.
- Route 2: Route 2 is modified to travel via East Bay, Columbus, and Meeting Street to travel from Mt. Pleasant to Mary Street with return trips traveling the same alignment.
- Route 30: Route is modified to serve the East Bay & Calhoun station. Inbound route alignment will travel south on Meeting Street, and turn east on Calhoun Street to serve the East Bay & Calhoun station. The route's outbound trip will realign itself along Calhoun Street, Concord Street, Charlotte Street, and Washington Street before continuing west on Calhoun Street and north on Meeting Street along its existing outbound alignment.
- Route 31: Route modified such that inbound trips travel east on Mary Street, north on Meeting Street, and east on Columbus Street serving the East Bay & Columbus station. Outbound trip travels west on Columbus Street, south on Meeting Street and west on Spring Street along its existing alignment.
- Route 40: Inbound Route 40 is modified to travel west on the Arthur Ravenel Bridge and access the exit to East Bay Street. It travels south on East Bay Street serving the East Bay & Huger station (inbound only). From the East Bay & Huger station the route continues west on Huger Street, and south on Meeting Street along its current inbound alignment to the Mary Street transfer center.
- Route 41: Inbound Route 41 is modified to serve the East Bay & Huger Station as described for Route 40.
- Route 301: (See Route 31) Route modification the same as Route 31 to serve the East Bay and Columbus station.
- North Charleston SuperStop Circulation: The current North Charleston Transfer Hub at Rivers & Cosgrove is assumed to be relocated to Rivers & McMillan in the vicinity of Shipwatch Square. Routes are slightly modified as needed to serve this location as shown in Appendix 4-A (VIII).

Table 3-17: Alternative D-3 BRT Travel Times

Southbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Main & Richardson	Miles Jamison	1.97	1.97	0:05:55	0:05:55
Miles Jamison	Old Trolley/Dorchester	3.14	5.11	0:05:38	0:11:33
Old Trolley/Dorchester	Westcott	1.79	6.90	0:03:50	0:15:23
Westcott	Ashley Phosphate	2.58	9.48	0:04:41	0:20:04
Ashley Phosphate	W. Hill	2.82	12.30	0:05:13	0:25:17
W. Hill	Michaux	1.68	13.98	0:03:41	0:28:58
Michaux	West Montague	1.90	15.88	0:05:10	0:34:08
West Montague	Leeds	1.21	17.09	0:04:08	0:38:16
Leeds	Rivers/McMillan	3.25	20.34	0:10:55	0:49:11
Rivers/McMillan	Azalea/Stromboli	1.34	21.68	0:03:14	0:52:25
Azalea/Stromboli	Braswell/Milford	1.48	23.16	0:03:37	0:56:02
Braswell/Milford	Mt. Pleasant	0.91	24.07	0:02:46	0:58:48
Mt. Pleasant	Romney	0.47	24.54	0:02:12	1:01:00
Romney	Huger	0.38	24.92	0:02:02	1:03:02
Huger	Columbus	0.62	25.54	0:02:30	1:05:32
Columbus	Calhoun	0.72	26.26	0:05:25	1:10:57
		Total	**26.26**		**1:10:57**
				Average Speed	22.21

Northbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Calhoun	Columbus	0.62	0.62	0:03:37	0:03:37
Columbus	Huger	0.62	1.24	0:02:30	0:06:07
Huger	Romney	0.38	1.62	0:02:02	0:08:09
Romney	Mt Pleasant	0.47	2.09	0:02:12	0:10:21
Mt Pleasant	Braswell/Milford	0.91	3.00	0:02:46	0:13:07
Braswell/Milford	Stromboli	1.48	4.48	0:03:37	0:16:44
Stromboli	Rivers	1.34	5.82	0:03:14	0:19:58
Rivers	Leeds	3.25	9.07	0:10:55	0:30:53
Leeds	W. Montague	1.21	10.28	0:04:08	0:35:01
W. Montague	Michaux	1.90	12.18	0:05:09	0:40:10
Michaux	W. Hill	1.68	13.86	0:03:41	0:43:51
W. Hill	Ashley Phosphate	2.82	16.68	0:05:13	0:49:04
Ashley Phosphate	Westcott	2.58	19.26	0:04:41	0:53:45
Westcott	Old Trolley	1.79	21.05	0:03:50	0:57:35
Old Trolley	Miles Jamison	3.14	24.19	0:05:38	1:03:13
Miles Jamison	Main & Richardson	2.37	26.56	0:07:36	1:10:49
		Total	**26.56**		**1:10:49**
				Average Speed	22.50

Table 3-18: Alternative D-4 LRT Travel Times

Southbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Main & Richardson	Miles Jamison	1.97	1.97	0:05:43	0:05:43
Miles Jamison	Old Trolley/Dorchester	3.14	5.11	0:05:28	0:11:11
Old Trolley/Dorchester	Westcott	1.79	6.90	0:03:40	0:14:51
Westcott	Ashley Phosphate	2.58	9.48	0:04:25	0:19:16
Ashley Phosphate	W. Hill	2.82	12.30	0:05:02	0:24:18
W. Hill	Michaux	1.68	13.98	0:03:31	0:27:49
Michaux	West Montague	1.90	15.88	0:05:02	0:32:51
West Montague	Leeds	1.21	17.09	0:04:03	0:36:54
Leeds	Rivers/McMillan	3.25	20.34	0:10:48	0:47:42
Rivers/McMillan	Azalea/Stromboli	1.34	21.68	0:03:04	0:50:46
Azalea/Stromboli	Braswell/Milford	1.48	23.16	0:03:27	0:54:13
Braswell/Milford	Mt. Pleasant	0.91	24.07	0:02:36	0:56:49
Mt. Pleasant	Romney	0.47	24.54	0:02:06	0:58:55
Romney	Huger	0.38	24.92	0:01:56	1:00:51
Huger	Columbus	0.62	25.54	0:02:24	1:03:15
Columbus	Calhoun	0.72	26.26	0:05:22	1:08:37
		Total	**26.26**		**1:08:37**
				Average Speed	22.96

Northbound					
From	**To**	**Segment Distance**	**Total Distance**	**Segment Travel Time**	**Total Travel Time**
Calhoun	Columbus	0.62	0.62	0:03:34	0:03:34
Columbus	Huger	0.62	1.24	0:02:24	0:05:58
Huger	Romney	0.38	1.62	0:01:56	0:07:54
Romney	Mt Pleasant	0.47	2.09	0:02:06	0:10:00
Mt Pleasant	Braswell/Milford	0.91	3.00	0:02:36	0:12:36
Braswell/Milford	Stromboli	1.48	4.48	0:03:27	0:16:03
Stromboli	Rivers	1.34	5.82	0:03:04	0:19:07
Rivers	Leeds	3.25	9.07	0:10:47	0:29:54
Leeds	W. Montagu	1.21	10.28	0:04:03	0:33:57
W. Montagu	Michaux	1.90	12.18	0:05:02	0:38:59
Michaux	W. Hill	1.68	13.86	0:03:31	0:42:30
W. Hill	Ashley Phosphate	2.82	16.68	0:05:02	0:47:32
Ashley Phosphate	Westcott	2.58	19.26	0:04:25	0:51:57
Westcott	Old Trolley	1.79	21.05	0:03:40	0:55:37
Old Trolley	Miles Jamison	3.14	24.19	0:05:28	1:01:05
Miles Jamison	Main & Richardson	2.37	26.56	0:07:25	1:08:30
		Total	**26.56**		**1:08:30**
				Average Speed	23.26

4 Build Alternatives Operating Summary

The following summarizes the operating characteristics of the Fixed Guideway Operating Characteristics

Table 4-1: BRT Operating Summary

Alternative	Cycle Time			Mileage			Station		Average Speed	
	SB Travel Time (w/Delay)	NB Travel Time (w/Delay)	Total Travel Time	SB Miles	NB Miles	Total Miles	Total Stations	Average Station Spacing (Miles)	SB	NB
B-1 US 78/US 52/Meeting BRT	0:59:58	0:58:22	1:58:20	23.48	23.15	46.63	18	1.38	23.49	23.80
B-3 US 78/US 52/East Bay BRT	1:05:47	1:02:04	2:07:51	24.40	23.97	48.37	19	1.36	22.25	23.17
C-1 US 176/US 52/Meeting BRT	0:52:36	0:52:35	1:45:11	21.63	21.63	43.26	16	1.44	24.67	24.68
C-3 US 176/US 52/East Bay BRT	0:58:25	0:56:36	1:55:01	22.55	22.45	45.00	17	1.41	23.16	23.80
D-1 Dorchester Rd/US 52/Meeting BRT	1:05:08	1:06:56	2:12:04	25.34	25.74	51.08	16	1.69	23.34	23.07
D-3 Dorchester Rd/US 52/East Bay BRT	1:10:57	1:10:49	2:21:46	26.26	26.56	52.82	17	1.75	22.21	22.50

Table 4-2: LRT Operating Summary

Alternative	Cycle Time			Mileage			Station		Average Speed	
	SB Travel Time (w/Delay)	NB Travel Time (w/Delay)	Total Cycle Time	SB Miles	NB Miles	Total Miles	Total Stations	Average Station Spacing (Miles)	SB	NB
B-2 US 78/US 52/Meeting LRT	0:57:20	0:55:45	1:53:05	23.48	23.15	46.63	18	1.38	24.57	24.91
B-4 US 78/US 52/East Bay LRT	1:03:06	0:59:43	2:02:49	24.40	23.97	48.37	19	1.36	23.20	24.08
C-2 US 176/US 52/Meeting LRT	0:50:12	0:50:11	1:40:23	21.63	21.63	43.26	16	1.44	25.85	25.86
C-4 US 176/US 52/East Bay LRT	0:55:58	0:54:09	1:50:07	22.55	22.45	45.00	17	1.41	24.18	24.88
D-2 Dorchester Rd/US 52/Meeting LRT	1:02:51	1:04:32	2:07:23	25.34	25.74	51.08	16	1.69	24.19	23.93
D-4 Dorchester Rd/US 52/East Bay LRT	1:08:37	1:08:30	2:17:07	26.26	26.56	52.82	17	1.75	22.96	23.26

5 List of Appendices

Appendix 4-A: Screen Two Alternatives Service Maps

Appendix 4-A

I-26 Fixed Guideway Alternatives Analysis

CHAPTER V: Screen Two – Financial Analysis

Draft Report – February 2016

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1 Introduction

The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) initiated the I-26 Regional Fixed Guideway Transit Alternatives Analysis Study (i-26*ALT*) to improve transit options for residents and businesses along the I-26 Corridor. The purpose of the I-26 Alternatives Analysis is to improve transit service and enhance regional mobility along the I-26 Corridor connecting Summerville, North Charleston, and Charleston in South Carolina.

Upon the conclusion of this Alternatives Analysis and selection of a preferred alternative, the project sponsor intends to submit a request for entry into Project Development under the Federal Transit Administration (FTA's) Capital Investment Program, which provides grant funding for capital projects on a competitive basis and uses a set of Project Justification and Financial Commitment Criteria to rate projects. Projects must receive a project rating of medium or better in order to move forward in each phase of the process.

Although projects do not need to be rated in order to begin project development, this Screen Two Analysis ranks each potential alternative using the FTA's Project Justification and Financial Commitment criteria to aid in the selection of a locally preferred alternative that can compete for federal funds. Once the preferred alternative enters into the Project Development phase of the Capital Investment Grant Program, project sponsors have two years to complete NEPA, develop preliminary engineering, obtain required funding commitments, and meet the required "medium" rating or better to move forward into Engineering.

1.1 Local Financial Commitment Rating

The measures FTA uses for the evaluation of local financial commitment for proposed New Starts projects are:

- The proposed share of total project capital costs from sources other than the Section 5309 CIG program;
- The current financial condition, both capital and operating, of the project sponsor and/or relevant project partners when more than one entity is involved in construction or operations;
- The commitment of funds for both the capital cost of the proposed project and the ongoing transit system operation and maintenance, including consideration of whether there is significant private participation;
- The reasonableness of the financial plan, including planning assumptions, cost estimates, and the capacity to withstand funding shortfalls or cost overruns.

1.2 Screen Two Financial Analysis

This Screen Two Financial Analysis is intended to review the three BRT alternatives and three LRT alternatives, as well as their variants, based on current planning levels to understand how each alternative ranks using the FTA financial commitment ratings. Section 2.0 provides a brief summary of the Screen Two Alternatives. Section 3.0 discusses the rating criteria applied under the current capital and operating conditions. Section 4.0 provides the capital construction and operating Cost assumptions used in the Screen Two Analysis and discusses the criteria for reasonableness of assumptions and financial capacity ratings. Section 5.0 provides a review of select non-FTA funding sources that have been used with success by other projects, in an effort to provide some insight on potential funding sources.

It is important to note that cost estimates used in the Screen Two Analysis are planning level estimates and not based on engineering or design drawings. Cost estimates will be updated as design progresses during project development. This analysis is for planning purposes only, as projects do not need to be rated to enter into the project development phase.

2 Screen Two Build Alternatives Overview

A total of 20 alternatives were evaluated in the Initial Alternatives Screening: Screen One Analysis. This phase of screening utilized a combination of subjective and objective analyses to identify those modes and alignments that best meet the project goals and objectives and warrant a more detailed Screen Two Analysis.

Results from the Screen One Analysis, input from the I-26 Alternative Analysis Steering and Technical Advisory Committees, and community feedback identified 12 Build alternatives to move forward into the Screen Two Analysis. A detailed description of the alternatives can be found in the I-26*ALT* Screen Two Alternatives Report.

2.1 BRT Alternatives:

The following BRT alternatives are analyzed in this Screen Two Analysis. Figures A-1 through A-6 (Appendix 5-A) show the BRT Screen Two Build Alternatives.

- Alternative B-1: US 78/US 52/Meeting– BRT
- Alternative B-3: US 78/US 52/East Bay – BRT
- Alternative C-1: US 176/US 52/Meeting – BRT
- Alternative C-3: US 176/US 52/East Bay – BRT
- Alternative D-1: Dorchester Rd/US 52/Meeting – BRT
- Alternative D-3: Dorchester Rd/US 52/East Bay – BRT

2.2 LRT Alternatives

The following LRT alternatives are analyzed in this Screen Two Analysis. Figures A-1 through A-6 (Appendix 5-A) show the LRT Screen Two Build Alternatives.

- Alternative B-2: US 78/US 52/Meeting – LRT
- Alternative B-4: US 78/US 52/East Bay – LRT
- Alternative C-2: US 176/US 52/Meeting – LRT
- Alternative C-4: US 176/US 52/East Bay – LRT
- Alternative D-2: Dorchester Rd/US 52/Meeting – LRT
- Alternative D-4: Dorchester Rd /US 52/East Bay – LRT

3 Current Capital and Operating Condition

The rating for current capital and operating conditions of the existing transit system includes measures of average fleet age, bond ratings within the last two years, ratio of current assets to current liabilities, and recent service history. Greater emphasis is placed on fleet age and current ratio than on bond rating and service history. At this planning level evaluation, the rating under these criteria would be the same for all of the Screen Two alternatives. In order to get a medium rating (or better), the following criteria must be met:

- Average bus fleet age under 8 years: CARTA's average fleet age is 13+ years. For a medium rating or better, the fleet age should be under 8 years. An average bus fleet age over 12 years results in a low rating.
- Current ratio exceeding 1.2: The current ratio identifies the agency's liquidity and ability to pay short-term liabilities (debts and payables) with its short-term assets (cash, inventory, receivables). The ratio of current assets to current liabilities should be 1.2 for a medium rating. A current ratio of less than 1.0 results in a low rating.
- Bond ratings of A (Fitch/S&P) or A3 (Moody's) or better: These ratings identify the financial strength of bond issuers. A low rating is given to bond ratings of BBB (Fitch/S&F) or Baa3 (Moody's) or below.
- Historical positive cash flow/no cash flow shortfalls: Sponsors that have recent historical cash flow problems receive a low rating.
- Only minor service adjustments in recent years: Agencies that have had major service cutbacks in recent years receive a low rating.

To address capital needs from an aging fleet and to ensure a strong financial position, CARTA is undergoing a Comprehensive Operational Analysis (COA) intended to address route performance and efficiencies as a result of a growing region and ridership base, while setting aside a capital reserve to modernize its fleet. The COA short range recommendations over the next several years should help to improve the projected rating under this category.

4 Capital and Operating Costs

The reasonableness of capital and operating cost estimates and planning assumptions/capital funding capacity make up 50 percent of the local financial commitment rating. To receive a medium rating, a project must have a financial plan that contains planning assumptions and cost estimates that are consistent with recent historic experience and includes committed funds to cover project cost shortfalls and operating expenses. The following provides the methodology and assumptions used to estimate the planning level costs for the Screen Two alternatives.

4.1 Capital Cost Estimation Methodology

Capital cost estimates were developed based on the Federal Transit Administration (FTA) Standard Cost Categories (SCC) database, estimates from projects under development, and local conditions. Standard Cost Categories utilize a database of cost information gathered from recent FTA projects across the country in a consistent format that can be used as a cost estimating resource for the transit industry. Costs are grouped into categories as follows:

1) Dedicated Guideway: Includes costs associated with construction of the guideway structures, roadbed, and pavement or track.
2) Stations: Includes costs associated with station platforms, ramps, fixtures, canopies, and passenger amenities as well as elevators and stairs.
3) Support Facilities: Includes operations, maintenance and storage facilities.
4) Sitework & Special Conditions: Includes all other construction activities that are not accounted for in categories 1 through 3 such as demolition, utility and other sitework.
5) Systems: Includes train control signals, communication systems, central control, hardware and software, traction power substations, overhead catenary systems, underground duct banks, automated fare collection, grade crossing protection and roadway traffic signal systems.
6) ROW, Land, & Existing Improvements: Includes acquisition and right-of-way costs.
7) Vehicles: Includes costs for LRT Vehicles and low-floor 60-foot articulated BRT buses.
8) Professional Services: Includes soft costs such as preliminary engineering, final design, project management, insurance, permitting, surveys and inspection, and other services.

Although the Screen Two cost estimates are at a planning level, capital costs are organized using these same categories in order to develop an annualized cost for the project justification criteria preliminary ratings, as well as to compare major project element costs.

4.2 BRT Alternatives Capital Cost Assumptions

The Screen Two BRT alternatives' cost estimates are based on unit costs for recent projects under development or completed to determine typical unit costs based on major standard cost categories as described below.

4.2.1 Guideway Assumptions

The guideway costs for the BRT alternatives are based on a cost of $4.2M per mile for all alternatives. Guideway assumptions for BRT alternatives are described in segments from west (Summerville) to east (Charleston) as follows:

Alternative B-1: US 78/US 52/Meeting BRT

Segment 1-Main & Richardson to US 78 & 165 (Berlin G Myers): This segment is assumed to operate in mixed traffic with one-way service circulating Summerville Square and curb-side lanes to Berlin G Myers.

Segment 2-US 78 (Berlin G Myers to Otranto): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic and curb-side lanes.

Segment 3-US 52 (Otranto to Carner): This segment is assumed to operate in an at-grade semi-exclusive guideway in the median with cross traffic.

Segment 4-US 52 (Carner to Mt. Pleasant): All BRT alternatives assume a semi-exclusive dedicated guideway. See design variant note below for more information on design variations along this segment.

Segment 5-US 52 (Mt. Pleasant to Line Street): This segment assumes curb-side mixed traffic operations.

Alternative B-3: US 78/US 52/East Bay BRT

Alternative B-3 shares the same alignment as Alternative B-1 for Segments 1 through 4. Segment 5 assumes a partial at-grade semi-exclusive guideway converting to mixed traffic close to Calhoun. The alternative would operate in dual lanes with one-way circulation at Calhoun for the turnaround.

Alternative C-1: US 176/US 52/Meeting BRT

Segment 1-US 176 (US 17A to Otranto): This segment is assumed to operate in an at-grade semi-exclusive guideway with curbside allowing mixed traffic.

Segment 2-US 52 (Otranto to Carner): This segment is assumed to operate in an at-grade semi-exclusive guideway in the median with cross traffic.

Segment 3-US 52 (Carner to Mt. Pleasant): All BRT alternatives assume a semi-exclusive dedicated guideway. See design variant note below for more information on design variations along this segment.

Segment 4-US 52 (Mt. Pleasant to Line Street): This segment assumes mixed traffic operations in curbside lanes.

Alternative C-3: US 176/US 52/East Bay BRT

This alternative shares the same alignment as Alternative C-1 for Segments 1 through 4. Segment 5 assumes a partial at-grade semi-exclusive guideway converting to mixed traffic closer to Calhoun. The alternative would operate in curbside lanes with one-way circulation at Calhoun for the turnaround.

Alternative D-1: Dorchester/US 52/Meeting BRT

Segment 1-Dt. Summerville (Main to Berlin G Myers): This segment is assumed to operate in mixed traffic with a one-way guideway operation circulating the Summerville Square and curbside lanes to Berlin G Myers.

Segment 2-Old Trolley (Berlin G Myers to Dorchester Rd): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic and curbside lanes.

Segment 3-Dorchester Road (Old Trolley to W. Montague): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic in the center median.

Segment 4-Dorchester Road (W. Montague to Rivers Avenue): This segment is assumed to operate in an at-grade semi-exclusive guideway with dual lanes and cross traffic for portions of the alignment. Sections where ROW narrows due to railroad, bridges, or other limitations are assumed to operate in mixed traffic operations.

Segment 5-US 52 (Dorchester to Carner): This segment is assumed to operate in an at-grade semi-exclusive dual lane guideway.

Segment 6-US 52 (Carner to Mt. Pleasant): All BRT alternatives assume a semi-exclusive dedicated guideway. See design variant note below for more information on design variations along this segment.

Segment 7-US 52 (Mt. Pleasant to Line Street): This segment assumes mixed traffic operations in dual lanes.

Alternative D-2: Dorchester/US 52/East Bay BRT

This alternative shares the same alignment as Alternative D-1 for Segments 1 through 6. Segment 7 assumes a partial at-grade semi-exclusive guideway converting to mixed traffic closer to Calhoun. The alternative would operate in dual lanes with one-way circulation at Calhoun for the turnaround.

***Design Variant Note*: Stakeholder outreach revealed a desire to operate the service along the US 78/King Street Extension segment between Stromboli and Mt. Pleasant, to serve future development at Braswell Street (Appendix 5-C). Due to limited available ROW and the presence of active rail lines on either side of this segment, mixed traffic operations would likely be required. Norfolk Southern expressed a concern for safety and traffic impacts on the King Street variant. Alternatively, the Meeting Street variant raises concerns over multiple rail crossings along that segment. Additionally, a pedestrian walkway over the rail ROW would be needed to allow safe access to the station. This variant will need to be resolved for all of the alternatives during project development for the preferred alternative. For the planning phase, the Meeting Street alternative is assumed in an at-grade semi-exclusive guideway for BRT and on an elevated guideway for LRT.

4.2.2 Station Assumptions

The BRT station alternatives are grouped into three station types for cost estimation purposes:

1) Neighborhood Stations: These stations are the simplest stops with enhanced shelters, benches, platforms, and other amenities. These are assumed to cost $150,000 per station.
2) Transit Nodes: These stations include additional amenities as they provide connections to other routes and are assumed to provide additional space for bus pullouts and larger waiting areas. They are assumed to be twice the cost of a neighborhood station at $300,000 per station.
3) PNR/Major Transfer Center: These stations are assumed to include park & ride facilities and transfer facilities for bus connections. These stations are assumed to be $1.8M per station to account for parking areas and transfer facilities.

4.2.3 Support Facilities Assumptions

The BRT alternatives assume the existing maintenance and storage facility would be expanded to accommodate the new larger vehicle types. The estimated capital cost is assumed to be $1,000,000 per vehicle.

4.2.4 Sitework and Special Conditions

Sitework costs include demolition, clearing, earthwork, sight utilities and utility relocation, hazardous material removal and mitigation, environmental mitigation, site structures and other sitework related to the project. For this planning level analysis, a cost of $400 per linear foot of guideway is assumed.

4.2.5 Systems

Systems costs include technological improvements such as traffic signal prioritization and crossing protections, passenger information systems, and fare payment systems. For the BRT planning level cost estimation, this cost is assumed at $150,000 per major intersection to account for these costs.

4.2.6 ROW & Land

For this planning level analysis, ROW acquisition is not known. A 50 percent contingency on construction costs of the project is applied for the analysis.

4.2.7 Vehicles

BRT vehicles assume a cost of $800,000 per vehicle for 60' articulated vehicles. Vehicle totals are based on the proposed operating plan for each alternative with a 1.2 spare ratio.

4.2.8 Professional Services

Professional services make up project development, engineering, project management, construction administration, legal and permitting, startup and other "soft" costs for the project. For this planning level analysis these costs are assumed to be 50 percent of the estimated construction costs.

The following Table 4-1 shows the design and cost assumptions for the Screen Two BRT alternatives used to develop the planning level capital cost estimates.

Table 4 - 1: Screen Two BRT Alternatives Design Assumptions and Unit Costs

Screen Two BRT Alternatives	Unit Cost	Measure	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
1.0 Dedicated Guideway	$4,200,000	Guideway Mile	23.12	24.30	22.06	23.24	24.61	25.79
2.0 Stations			18	19	16	17	16	17
Neighborhood	*$150,000*	*Station*	6	6	6	6	9	9
Node	*$300,000*	*Station*	6	8	4	6	3	5
PNR	*$1,800,000*	*Station*	6	5	6	5	4	3
3.0 Light Maintenance Facility	$1,000,000	Vehicle	16	17	14	15	17	18
4.0 Sitework	$400	Linear Ft	123,422	129,678	116,419	122,674	129,924	136,179
5.0 Systems	$150,000	Intersection	98	100	83	86	125	128
6.0 Real Estate & ROW	50%	Hard Costs	1	1	1	1	1	1
7.0 Vehicles	$800,000	Per Vehicle	16	17	14	15	17	18
8.0 Professional Services	50%	Hard Costs	1	1	1	1	1	1

**Note – Reflects planning level capital costs*

4.3 LRT Alternatives Capital Cost Assumptions

The Screen Two LRT Alternative cost estimates are based on unit costs for recently completed projects and local conditions to determine typical unit costs based on major standard cost categories.

4.3.1 Guideway Assumptions

The LRT alternatives' guideway costs are based on the guideway type and the track type. These costs assume a linear foot cost per guideway by type: at-grade semi-exclusive right of way ($4,500), at-grade in mixed traffic ($2,700), and aerial ($9,500). Light rail tracks may include either ballasted tracks or embedded tracks. Ballasted track is the most prevalent track type used consisting of rail, tie plates or fastening, crossties, and a sub-ballast bed supported on a prepared subgrade and is generally the standard on exclusive right-of-way. Embedded track is a track structure that is completely covered – except for the top of the rails - with pavement and is typically used for routes in public streets, pedestrian/transit malls, or any area where rubber tired traffic must operate. Embedded track is more expensive to design and construct. While the LRT alternatives would likely use a combination of ballasted and embedded tracks, for this planning level analysis, the more expensive embedded track cost is assumed at $650 per track foot. The following describes the design assumptions for the guideway and track for the LRT alternatives.

Alternative B-2: US 78/US 52/Meeting LRT

Segment 1-Main & Richardson to US 78 & 165 (Berlin G Myers): This segment is assumed to operate in mixed traffic with single track circulating the Summerville Square and dual tracks to Berlin G Myers.

Segment 2-US 78 (Berlin G Myers to Otranto): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic and dual tracks.

Segment 3-US 52 (Otranto to Carner): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic and dual tracks.

Segment 4-US 52 (Carner to Mt. Pleasant): LRT alternatives assume an elevated dedicated guideway with dual tracks. See design variant note in Section 4.2 for more information on this segment.

Segment 5-US 52 (Mt. Pleasant to Line Street): This segment assumes mixed traffic operations with dual tracks.

Alternative B-4: US 78/US 52/East Bay LRT

Alternative B-4 shares the same alignment as Alternative B-2 for Segments 1 through 4. Segment 5 assumes a partial at-grade semi-exclusive guideway converting to mixed traffic closer to Calhoun. The alternative would operate with dual tracks to Calhoun with single tracks assumed for the turnaround. More detailed engineering analysis is needed during project development to determine appropriate turnaround alternatives for this area.

Alternative C-2: US 176/US 52/Meeting LRT

Segment 1-US 176 (US 17A to Otranto): This segment is assumed to operate in an at-grade semi-exclusive guideway allowing cross traffic and dual tracks.

Segment 2-US 52 (Otranto to Carner): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic and dual tracks.

Segment 3-US 52 (Carner to Mt. Pleasant): LRT alternatives assume an elevated dedicated guideway with dual tracks. See design variant note in Section 4.2 for more information on this segment.

Segment 4-US 52 (Mt. Pleasant to Line Street): This segment assumes mixed traffic operations with dual tracks.

Alternative C-4: US 176/US 52/East Bay LRT

This alternative shares the same alignment as Alternative C-2 for Segments 1 through 4. Segment 5 assumes a partial at-grade semi-exclusive guideway converting to mixed traffic closer to Calhoun. The alternative would operate with dual tracks to Calhoun and singe tracks for the turnaround. More detailed engineering analysis is needed to determine appropriate turnaround alternatives for this area.

Alternative D-2: Dorchester/US 52/Meeting LRT

Segment 1-Dt. Summerville (Main to Berlin G Myers): This segment is assumed to operate in mixed traffic with single track operations circulating the Summerville Square and dual track service to Berlin G Myers.

Segment 2-Old Trolley (Berlin G Myers to Dorchester Rd): This segment is assumed to operate in at-grade semi-exclusive guideway with cross traffic on dual tracks.

Segment 3-Dorchester Road (Old Trolley to W. Montague): This segment is assumed to operate in at-grade semi-exclusive guideway with cross traffic on dual tracks.

Segment 4-Dorchester Road (W. Montague to Rivers Avenue): This segment is assumed to operate in at-grade semi-exclusive guideway with cross traffic and dual tracks for portions of the alignment. Sections where ROW narrows due to railroad, bridges, or other limitations are assumed to operate with mixed traffic operations.

Segment 5-US 52 (Dorchester to Carner): This segment is assumed to operate in at-grade semi-exclusive dual track guideway.

Segment 6-US 52 (Carner to Mt. Pleasant): LRT alternatives assume an elevated dedicated guideway with dual tracks. See design variant note in Section 4.2 for more information on this segment.

Segment 7-US 52 (Mt. Pleasant to Line Street): This segment assumes mixed traffic operations with dual tracks.

Alternative D-4: Dorchester/US 52/East Bay LRT

This alternative shares the same alignment as Alternative D-2 for Segments 1 through 6. Segment 7 assumes partial at-grade semi-exclusive guideway with mixed traffic close to Calhoun. The alternative would operate with dual tracks to Calhoun and single tracks for the turnaround. More detailed engineering analysis is needed to determine appropriate turnaround alternatives for this area.

4.3.2 Station Assumptions

The LRT alternatives' station costs include stop, shelter, mall, terminal, platform, parking garages, passenger overpasses, signage and graphics. Although stations are classified to include park & ride and transfer facilities at some locations, this planning level analysis normalizes the cost per station to $4.0 million based on historical project cost ranges of $1.5M to $8.5M, some of which are inclusive of these facilities.

4.3.3 Support Facilities Assumptions

The LRT alternatives assume one heavy maintenance facility and yard will be needed. The planning level capital cost estimate for these facilities assumes a cost of $1.8M per vehicle.

4.3.4 Sitework and Special Conditions

Sitework costs include demolition, clearing, earthwork, sight utilities and utility relocation, hazardous material removal and mitigation, environmental mitigation, site structures and other sitework related to the project. For this planning level analysis, a cost of $420 per linear foot of guideway is assumed.

4.3.5 Systems

Systems costs include train control and signals, traction power supply and distribution, communications, fare collection systems, and central control systems, and are estimated based on track feet. Based on historical projects, this planning level cost estimate assumes a capital cost of $750 per track foot.

4.3.6 ROW & Land

For this planning level analysis, ROW acquisition costs are not known. A 50 percent contingency on construction costs of the project is applied.

4.3.7 Vehicles

Vehicle cost assumptions are $5 million per vehicle for light rail vehicles. Vehicle totals are based on the proposed operating plan for each alternative with a 1.2 spare ratio.

4.3.8 Professional Services

Professional services make up project development, engineering, project management, construction administration, legal and permitting fees, startup costs and other "soft costs" for the project. For this planning level analysis these costs are assumed to be 50 percent of the estimated construction costs.

The following Table 4-2 shows the design and cost assumptions for the Screen Two LRT Alternatives used to develop the planning level capital cost estimates.

Table 4 - 2: Screen Two LRT Alternatives Design Assumptions and Unit Costs*

Screen Two LRT Alternatives	Unit Cost	Measure	Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
1.0 Dedicated Guideway			367,435	383,040	345,414	361,020	386,977	402,582
Guideway: At-grade semi-exclusive right-of-way	*$4,500*	*Linear Feet*	93493.5	101253.5	93214.7	100974.7	97076.12	104836.12
Guideway: At-grade in mixed traffic	*$2,700*	*Linear Feet*	13433.55	11929.25	6691	5186.72	16334.7	14830.42
Guideway: Aerial	*$9,500*	*Linear Feet*	16342.7	16342.7	16342.7	16342.7	16342.7	16342.7
Track: Embedded	*$650*	*Track Feet*	244165.01	253514.74	229165.86	238515.63	257223.29	266573.06
2.0 Stations	$4,000,000	Station	18	19	16	17	16	17
3.0 Support Facilities: Yards, Shops, Admin, Bldgs	$2,200,000	Vehicles	15	16	14	15	16	17
4.0 Sitework	$420	Linear Feet	123,270	129,508	116,249	122,504	129,754	136,009
5.0 Systems	$750	Track Feet	244,165	253,515	229,166	238,516	257,223	266,573
6.0 Real Estate & ROW	$1	Hard Costs						
Vehicles	$5,000,000	Vehicles	15	16	14	15	16	17
8.0 Professional Services	50%	Hard Costs	1	1	1	1	1	1

**Note – Estimates reflect planning level capital costs*

4.4 Estimated Capital Costs

The following (Tables 4-3 and 4-4) show the planning level capital cost estimates for each of the BRT and LRT alternatives. A 30 percent contingency is added to the construction costs for all alternatives.

Table 4 - 3: BRT Alternatives Estimated Capital Cost Summary*

BRT Estimated Capital Cost Summary (Base Year 2015)		Alternative B-1: US 78/Meeting BRT	Alternative B-3: US 78/East Bay BRT	Alternative C-1: US 176/Meeting BRT	Alternative C-3: US 176/East Bay BRT	Alternative D-1: Dorchester/Meeting BRT	Alternative D-3: Dorchester/East Bay BRT
10 GUIDEWAY & TRACK ELEMENTS (route miles)		***$97,104,000***	***$102,060,000***	***$92,652,000***	***$97,608,000***	***$103,362,000***	***$108,318,000***
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	$97,104,000	$102,060,000	$92,652,000	$97,608,000	$103,362,000	$108,318,000
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)		***$13,500,000***	***$12,300,000***	***$12,900,000***	***$11,700,000***	***$9,450,000***	***$8,250,000***
20.01	Neighborhood Station	$900,000	$900,000	$900,000	$900,000	$1,350,000	$1,350,000
20.02	Transit Node Station	$1,800,000	$2,400,000	$1,200,000	$1,800,000	$900,000	$1,500,000
20.04	PNR Ride Station	$10,800,000	$9,000,000	$10,800,000	$9,000,000	$7,200,000	$5,400,000
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		***$16,000,000***	***$17,000,000***	***$14,000,000***	***$15,000,000***	***$17,000,000***	***$18,000,000***
30.02	Expansion of Maintenance Facility	$16,000,000	$17,000,000	$14,000,000	$15,000,000	$17,000,000	$18,000,000
40 SITEWORK & SPECIAL CONDITIONS		***$49,368,832***	***$51,871,112***	***$46,567,496***	***$49,069,772***	***$51,969,512***	***$54,471,792***
40.01	Sitework (Linear Feet)	$49,368,832	$51,871,112	$46,567,496	$49,069,772	$51,969,512	$54,471,792
50 SYSTEMS		***$14,700,000***	***$15,000,000***	***$12,450,000***	***$12,900,000***	***$18,750,000***	***$19,200,000***
50.01	Traffic Signal prioritization, crossing protection, etc.	$14,700,000	$15,000,000	$12,450,000	$12,900,000	$18,750,000	$19,200,000
Construction Subtotal (10 - 50)		***$190,672,832***	***$198,231,112***	***$178,569,496***	***$186,277,772***	***$200,531,512***	***$208,239,792***
60 ROW, LAND, EXISTING IMPROVEMENTS		***$3,050,200***	***$2,998,884***	***$3,078,325***	***$3,019,318***	***$2,970,513***	***$2,917,847***
60.01	Purchase or lease of real estate	$3,050,200	$2,998,884	$3,078,325	$3,019,318	$2,970,513	$2,917,847
70 VEHICLES (number)		***$12,800,000***	***$13,600,000***	***$11,200,000***	***$12,000,000***	***$13,600,000***	***$14,400,000***
70.04	Bus	$12,800,000	$13,600,000	$11,200,000	$12,000,000	$13,600,000	$14,400,000
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)		***$95,336,416***	***$99,115,556***	***$89,284,748***	***$93,138,886***	***$100,265,756***	***$104,119,896***
80.01	Project Dev., Engineering, Project Mgmt, Construction Admin, etc.	$95,336,416	$99,115,556	$89,284,748	$93,138,886	$100,265,756	$104,119,896
Subtotal (10 - 80)		***$301,859,448***	***$313,945,552***	***$282,132,569***	***$294,435,976***	***$317,367,781***	***$329,677,535***
90 UNALLOCATED CONTINGENCY		***$57,201,850***	***$59,469,334***	***$53,570,849***	***$55,883,332***	***$60,159,454***	***$62,471,938***
Subtotal (10 - 90)		***$359,061,298***	***$373,414,886***	***$335,703,418***	***$350,319,307***	***$377,527,234***	***$392,149,473***
Cost per Mile (In Millions)		***$15.5***	***$15.4***	***$15.2***	***$15.1***	***$15.3***	***$15.2***

**Note – Estimates reflect planning level capital costs*

Notes:

1) 60 ROW, Land, Existing Improvements assumes 50% of construction costs
2) 70 Vehicles: Cost is inclusive of contingency
3) 80 Professional Services: Assumes 50% of Construction Costs
4) 90 Unallocated Contingency: 30% contingency is distributed across all construction cost categories

Table 4 - 4: LRT Alternatives Estimated Capital Cost Summary*

LRT Estimated Capital Cost Summary (Base Year 2015)		Alternative B-2: US 78/Meeting LRT	Alternative B-4: US 78/East Bay LRT	Alternative C-2: US 176/Meeting LRT	Alternative C-4: US 176/East Bay LRT	Alternative D-2: Dorchester/Meeting LRT	Alternative D-4: Dorchester/Eastbay LRT
10 GUIDEWAY & TRACK ELEMENTS		***$770,954,242***	***$807,889,956***	***$741,745,309***	***$778,681,104***	***$803,397,019***	***$840,332,813***
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	$420,720,750	$455,640,750	$419,466,150	$454,386,150	$436,842,540	$471,762,540
10.03	Guideway: At-grade in mixed traffic	$36,270,585	$32,208,975	$18,065,700	$14,004,144	$44,103,690	$40,042,134
10.04	Guideway: Aerial structure	$155,255,650	$155,255,650	$155,255,650	$155,255,650	$155,255,650	$155,255,650
10.11	Track: Embedded	$158,707,257	$164,784,581	$148,957,809	$155,035,160	$167,195,139	$173,272,489
20 STATIONS, STOPS, TERMINALS, INTERMODAL		***$72,000,000***	***$76,000,000***	***$64,000,000***	***$68,000,000***	***$64,000,000***	***$68,000,000***
20.01	At-grade station stop, shelter, mall terminal, platform	$72,000,000	$76,000,000	$64,000,000	$68,000,000	$64,000,000	$68,000,000
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		***$33,000,000***	***$35,200,000***	***$30,800,000***	***$33,000,000***	***$35,200,000***	***$37,400,000***
30.03	Heavy Maintenance Facility & Storage Yard	$33,000,000	$35,200,000	$30,800,000	$33,000,000	$35,200,000	$37,400,000
40 SITEWORK & SPECIAL CONDITIONS		***$51,773,295***	***$54,393,179***	***$48,824,378***	***$51,451,772***	***$54,496,499***	***$57,123,893***
40.01	Sitework	$51,773,295	$54,393,179	$48,824,378	$51,451,772	$54,496,499	$57,123,893
50 SYSTEMS		***$183,123,758***	***$190,136,055***	***$171,874,395***	***$178,886,723***	***$192,917,468***	***$199,929,795***
50.01	Train control & signals, traction power, communications, etc.	$183,123,758	$190,136,055	$171,874,395	$178,886,723	$192,917,468	$199,929,795
Construction Subtotal (10 - 50)		***$1,110,851,294***	***$1,163,619,190***	***$1,057,244,082***	***$1,110,019,598***	***$1,150,010,985***	***$1,202,786,501***
60 ROW, LAND, EXISTING IMPROVEMENTS		***$3,104,708***	***$3,104,574***	***$3,104,564***	***$3,104,441***	***$3,104,723***	***$3,104,593***
60.01	Purchase or lease of real estate, relocations	$3,104,708	$3,104,574	$3,104,564	$3,104,441	$3,104,723	$3,104,593
70 VEHICLES (number)		***$75,000,000***	***$80,000,000***	***$70,000,000***	***$75,000,000***	***$80,000,000***	***$85,000,000***
70.01	Light Rail	$75,000,000	$80,000,000	$70,000,000	$75,000,000	$80,000,000	$85,000,000
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)		***$555,425,647***	***$581,809,595***	***$528,622,041***	***$555,009,799***	***$575,005,493***	***$601,393,251***
80.01	Project Dev., Engineering, Project Mgmt, Construction Admin, etc.	$555,425,647	$581,809,595	$528,622,041	$555,009,799	$575,005,493	$601,393,251
Subtotal (10 - 80)		***$1,744,381,649***	***$1,828,533,360***	***$1,658,970,687***	***$1,743,133,838***	***$1,808,121,201***	***$1,892,284,345***
90 UNALLOCATED CONTINGENCY		***$333,255,388***	***$349,085,757***	***$317,173,225***	***$333,005,880***	***$345,003,296***	***$360,835,950***
Subtotal (10 - 90)		***$2,077,637,037***	***$2,177,619,117***	***$1,976,143,912***	***$2,076,139,718***	***$2,153,124,497***	***$2,253,120,295***
Cost per Mile (In Millions)		***$90.0***	***$89.7***	***$89.7***	***$89.5***	***$87.6***	***$87.5***

**Note – Estimates reflect planning level capital costs*

Notes:

1) 60 ROW, Land, Existing Improvements assumes 50% of construction costs
2) 70 Vehicles: Cost is inclusive of contingency
3) 80 Professional Services: Assumes 50% of Construction Costs
4) 90 Unallocated Contingency: 30% contingency is distributed across all construction cost categories

4.5 Operating & Maintenance (O&M) Costs

Operating and maintenance costs are developed based on a cost allocation model using typical and reasonable cost drivers, such as revenue hours, revenue miles, man-hours and other such variables. In the absence of historical costs at the agency level, costs are developed using other peer systems. For this planning level analysis, operating costs are based on the peer system review conducted in Screen One and use the revenue hour variable. The operating plan assumptions are the same for all alternatives as shown in Table 4-5.

Table 4 - 5: BRT and LRT Assumed Operating Plan

Span of Service		Peak	Base	Early/Late
		6 AM - 9 AM 4 PM - 7 PM	9 AM- 4 PM 7 PM - 9 PM	4 AM-6 AM 9 PM - 1 AM
Weekday	4:00 AM - 1:00 AM	10 Minutes	20 Minutes	30 Minutes
Saturday	6:00 AM - 1:00 AM	20 Minutes	20 Minutes	30 Minutes
Sunday & Holiday	7:00 AM- 11:00 PM	30 Minutes	30 Minutes	30 Minutes

4.5.1 BRT Operating Costs

BRT operating costs are assumed to be $120 per vehicle revenue hour. Table 5-2 shows the anticipated annual O&M costs for the BRT Alternatives. Appendix 5-B shows the operating statistics based on the travel time data and operating plans described in the Screen Two Alternatives Report. These cost measures are used in the Project Justification Preliminary Rating.

Table 4 - 6: BRT Alternatives Annual O&M Costs

Alternative	Annual Statistics		Operating Cost
	Total Revenue Hours	Total Revenue Miles	$120
B-1 US 78/US 52/Meeting BRT	48,752	1,096,830.86	$5,850,240
B-3 US 78/US 52/East Bay BRT	55,454	1,137,759.14	$6,654,480
C-1 US 176/US 52/Meeting BRT	45,544	1,017,561.72	$5,465,280
C-3 US 176/US 52/East Bay BRT	47,044	1,058,490.00	$5,645,280
D-1 Dorchester Rd/US 52/Meeting BRT	55,790	1,201,503.76	$6,694,800
D-3 Dorchester Rd/US 52/East Bay BRT	57,290	1,242,432.04	$6,874,800

4.5.2 LRT Operating Costs

LRT operating costs are assumed to be $291.14 per train revenue hour. Table 5-3 shows the anticipated annual O&M costs for the BRT Alternatives. Appendix 5-B shows the operating statistics based on the travel time data and operating plans described in the Screen Two Alternatives Report.

Table 4 - 7: LRT Alternatives Annual O&M Costs

Alternative	Annual Statistics		Operating Cost
	Total Vehicle Revenue Hours	Total Vehicle Revenue Miles	$291.14
B-2 US 78/US 52/Meeting LRT	47,044	1,096,830.86	$13,696,390.16
B-4 US 78/US 52/East Bay LRT	54,290	1,137,759.14	$15,805,990.60
C-2 US 176/US 52/Meeting LRT	45,544	1,017,561.72	$13,259,680.16
C-4 US 176/US 52/East Bay LRT	47,044	1,058,490.00	$13,696,390.16
D-2 Dorchester Rd/US 52/Meeting LRT	54,290	1,201,503.76	$15,805,990.60
D-4 Dorchester Rd/US 52/East Bay LRT	55,790	1,242,432.04	$16,242,700.60

5 Funding Analysis

The Capital Investment Grant Program can fund up to 80 percent of the capital costs for a project; however, a project with a greater proportion of local funds has a better chance of competing for limited federal funds. Additionally, financial commitment ratings require varying levels of committed matching funds depending on the stage of development. While no local funding source commitment is needed for entry into project development, the project must have at least 30 percent of the matching funds committed at the end of the Project Development phase under New Starts, and 50 percent under Small Starts. This section provides a summary of federal funding sources that have been used to fund fixed guideway transit projects, as well as state, local, and other funding mechanisms that have been successfully utilized by other project. Note, this summary is not all inclusive and does not include financing or bonding options.

5.1 Federal Funding

5.1.1 New Starts Program (Section 5309)

Description

The FTA New Starts Program, the largest discretionary funding source for major transit capital investment, provides funding to support the construction of new fixed guideway projects or extensions to existing fixed guideway systems. Funds cannot be used to support operating expenses. These projects include commuter rail, light rail, heavy rail, bus rapid transit, streetcars, and ferry. New Starts projects are those with a total estimated capital cost greater than $300 million and are seeking $100 million or more in Section 5309 Capital Improvement Grant (CIG) program funds. Capital funds are provided on a competitive basis to projects that complete the application and review process. The FTA formally submits an annual report to Congress with approved projects and their ratings, and the Administration's funding recommendations. Final funding for individual projects is determined by Congress.

Local financial commitment is a major rating criterion for projects seeking federal support through the New Starts Program. The statutory match for New Starts funding is 60 percent Federal CIG (up to 80 percent combined with other federal sources) and 20 percent local; however, most projects come in under that in order to be more competitive. On average, the program provides roughly 50 to 60 percent of project capital costs.

Example

HealthLine BRT (Cleveland, OH).

The 9.3-mile Cleveland HealthLine was constructed as part of the Euclid Corridor Transportation Enhancement Project at a capital cost of roughly $168.4 million. The Euclid Corridor Project was designed to improve transit service as well as increase the development and redevelopment potential along Euclid Avenue. The corridor project included the implementation of a BRT line as well as establishment of a downtown transit zone with infrastructure improvements (sidewalks, bike lanes, streetscape, upgraded sewer and water lines, and installation of fiber optic lines), an East Side Transit Center with customer amenity improvements (waiting areas and bike racks), traffic signal technology enhancements, and peak hour parking restrictions. Roughly 25 percent of the project cost included BRT vehicles, stations, and platforms, and 75 percent of costs were attributed to infrastructure and street-level improvements[1].

The Euclid Corridor Transportation Project was able to secure 50 percent of project funds from federal sources with a 50 percent local match. The HealthLine funding sources include:

- Federal – FTA New Starts: $82.2 million
- Federal – FTA Rail Modernization: $0.6 million
- State – Ohio DOT: $50 million
- Greater Cleveland RTA: $17.6 million
- Northeast Ohio Areawide Coordinating Agency (NOACA): $10 million
- City of Cleveland: $8 million

An additional $31.6 million was also secured, but not included under the FTA Full Funding Grant Agreement, to fund elements such as streetscapes, utilities, and public art. The Ohio DOT contributed $25 million, GCRTA contributed $3.75 million, and $3 million came from Cleveland Clinic.

A developed case study of the Cleveland HealthLine produced by the Institute for Sustainable Communities identified that the initial project package presented for consideration included a mix of rail station upgrades and a robust multi-modal project which included two downtown transit centers that connected BRT to both light and heavy rail. This initial program, estimated at $350 million, was deemed too expensive and the project needed to be redefined to lower the cost. The project team made the rail stations and a transit center stand-alone projects that would seek alternative funding at a later date. The project design team also engaged in a cost reduction exercise to lower the cost of implementing the BRT line without impacting ridership. Attention was placed on "low-hanging fruit" such as installing less expensive sidewalk treatments along certain extents of the corridor. Through this process, the team was able to reduce the project cost to a more acceptable level. The GCRTA was also challenged with a series of rule changes from the FTA throughout the alternatives analysis. The original cost share presented included an 80 percent federal grant, with a 20 percent local match. This ratio was modified to a 63 percent federal share, with 37 percent local match, and then modified again to a 60 percent federal share, with a 40 percent local match. By the time the project moved into final design the cost share was set at a 50 percent federal match, with a 50 percent local match.

The CEO of the Greater Cleveland RTA, Joe Calabrese, attributed the success of implementing the HealthLine BRT to the committed leadership from local and state governments, businesses and local citizens. A major leader of the project was George Voinovich, who was a strong proponent of the project during his tenure as Mayor,

[1] Hook, W., S. Lotshaw, and A. Weinstock. *More Development for Your Transit Dollars: An Analysis of 21 North American Transit Corridors*. Institute for Transportation & Development Policy (ITDP), 2013. Retrieved July 5, 2015 from https://www.itdp.org/wp-content/uploads/2013/11/More-Development-For-Your-Transit-Dollar_ITDP.pdf

Governor and US Senator. As Governor, Voinovich advanced the project by setting aside $70 million to fund the BRT project through the Ohio DOT. As Senator, Voinovich also advanced the project's New Starts funding by lobbying the FTA. As local leadership changed over the span of the project's design and construction, the GCRTA was very active in educating new administrations on the value of BRT and kept the local leaders engaged in the project[2].

5.1.2 Small Starts Program (Section 5309)

Description

The Small Starts Program is a federal-aid grant program that provides funding to state and local authorities for new fixed guideway projects, extensions to existing fixed guideway systems, or corridor-based bus rapid transit projects. The intent of this program is to expedite these small-scaled, low cost capital projects through use of a shorter and more simplified evaluation and approval process in comparison to the New Starts program. Small Starts projects must have a total estimated capital cost of $300 million or less and must be seeking less than $100 million in Section 5309 Capital Improvement Grant (CIG) program funds.

Examples

Emerald Express (EmX) (Eugene, OR)

In 2007 the region's first BRT system, the Emerald Express (EmX) line, began operating a 4-mile route along the Franklin Corridor between downtown Eugene and Springfield. The capital cost of the line was approximately $25 million and the project was able to secure funding from both Federal (80%) and local (20%) sources. Project funding sources are as follows:

- Federal – FTA New Starts: $13.3 million
- Federal – Formula Funds: $6.7 million
- Local – Lane Transit District (LTD): $5 million

The route was originally envisioned to be an 11.5-mile corridor between Eugene and Springfield; however, the corridor was re-scoped due to the scale of planning and the level of funding required to successfully implement a BRT line of that length. The line operates 60 percent over dedicated transit lanes and forms the foundation corridor from which future BRT lines could connect to form a regional BRT system. The remaining 40 percent of the route operates in mixed traffic and utilizes curbside bus lanes with queue jumping and signal priority technology. During project development, the 20-year EmX projected average weekday ridership was estimated at approximately 4,000 riders. During its first year of operation (2007-2008) ridership on the Emerald EmX was at a level above the 20-year projections.

Since the implementation of the initial Green Line, LTD has introduced the Gateway EmX Extension, a 3.8-mile extension BRT line which opened in 2011 at a cost of $41 million. The Gateway EmX was the first project in the country to receive Small Starts funding and secured $32.8 million or 80 percent federal support (the largest match allowed). Thirteen percent of project funds were secured through a statewide transportation infrastructure funding program, and seven percent was contributed by the LTD. The third corridor expansion, West Eugene EmX is currently under construction with an anticipated 2017 completion date. Funding for this latest 5.8-mile corridor totals roughly $94.4 million of which $75 million comes from Federal sources, $17.8 million from Oregon Lottery Bonds, and $1.6 million through the State's ConnectOregon program, to build two new bike-pedestrian bridges.

The EmX BRT line was the first of its kind implemented in a medium-sized city in the United States and as such there were no concrete examples from which the system could reference or prove that the system would succeed.

[2] *The Cleveland HealthLine: Transforming an Historic Corridor*. Institute for Sustainable Communities. Retrieved July 7, 2015 from http://sustainablecommunitiesleadershipacademy.org/resource_files/documents/the-cleveland-healthline.pdf

The project was met with a challenge from the Springfield Mayor, who at that time had expressed uncertainty about BRT and believed that LTD had not effectively communicated the impacts that the EmX system would have on the local communities. The Springfield Chamber of Commerce Executive Director helped in championing the project by assisting the Mayor and Springfield City Council to better understand and support the project. In retrospect, LTD acknowledged that their expertise at that time was mainly as a bus operator. They had not fully defined the role it would play as a BRT operator and what that role entailed. Today, the agency is more engaged with partners and is able to guide a more collaborative dialogue concerning city, regional or economic development priorities and the role the system will play in achieving local and regional goals. This challenge ultimately helped LTD to redefine itself and better assert its authority as a new BRT operator.

Learning from prior experience, the LTD engaged in a large public outreach effort directed at area residents during the West Eugene extension outreach. These efforts focused on educating the public about the project and gaining community support. However, as the project progressed, the LTD realized that they failed to successfully engage the local business community in participating in the process. They ultimately failed to recognize the unique needs of the business community and as a result did not effectively market the project to this stakeholder group. Opposing groups were thus able to recruit adjacent businesses to oppose the extension project. The LTD has since crafted an outreach program that is specifically geared toward the needs of the business community and has, as a result, gained more support for the project. The agency has committed to more one-on-one outreach to businesses that would be most impacted by future projects to foster greater community support and commitment[3].

North Corridor (First Coast Flyer) BRT (Jacksonville, FL).

In December 2015, the Jacksonville Transportation Authority (JTA) opened its new 9.3-mile Green Line premium BRT service. The Green Line features transit signal priority, real-time passenger information, off-board fare collection, a park-and-ride facility, and new low-floor compressed natural gas buses. The project cost was an estimated $33.32 million to construct. The project funding sources are as follow:

- Federal – FTA Small Starts: $20.2 million
- Federal – FTA Bus and Bus Facility fund : $6.4 million
- State – Florida New Starts Transit Program: $3.32 million
- Local – JTA Local Discretionary Gas and Sales Tax fund: $3.32 million

Soon after the opening of the Green Line BRT, the FTA announced that that the JTA Southeast Corridor BRT was awarded a $19.1 million Small Starts grant to fund the next corridor in the First Flyer BRT system. The federal funds cover 80 percent of the project cost. The 20 percent local match will be provided by the Florida New Starts Transit Program ($2.39 million) and the JTA Local Discretionary Gas and Sales Tax fund ($2.39 million). The 11-mile Southeast Corridor BRT is anticipated to open by December 2016. Once completed, the First Cost Flyer BRT system will cover roughly 57 miles at an estimated cost of $134 million, connecting users in the region to downtown Jacksonville. It was important for the JTA that that BRT projects developed were achievable and fundable.

[3] Crowley, M. *The Emerald Express: Overcoming Growing Pains and Opposition to Bus Rapid Transit* (Case Study: Springfield and Eugene, Oregon). Institute for Sustainable Communities. Retrieved July 9, 2015 from http://sustainablecommunitiesleadershipacademy.org/resource_file/documants/springfiled-eugene-oregon-emerald-express.pdf

5.1.3 Bus and Bus Facilities Formula Program

Description

Established under MAP-21, Section 5339 Bus and Bus Facilities Program is a new bus program which changes the program from a discretionary grant program to a formula based program. Funding is allocated to States and Territories and designated urbanized areas. This program seeks to provide capital funding to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. Funds are not available for operating assistance. Funds are available to designated recipients and states that operate or allocate funding to fixed-route bus operators. Sub-recipients include public agencies or private nonprofit organizations engaged in public transportation, including services to segments of the general public, as defined by age, disability or low income. The statutory match for Bus Program funds is 80 percent with a required 20 percent local match. Although single grants may be small, funding from the Bus and Bus Facility program has proven to be a good source of supplemental support for some BRT projects.

Example

Main Street MAX BRT (Kansas City, MI)

Operated by the Kansas City Area Transportation Authority (KCATA), the Metro Area Express (MAX) is an approximate 9-mile BRT route serving the Main Street corridor in Kansas City. The MAX operates within a combination of full-time dedicated bus lanes in the downtown area and peak hour "bus only" lanes in the Midtown area. These bus lanes make up 52 percent of the BRT route. The corridor also utilizes traffic signal priority technology at 31 intersections. At an estimated capital cost of $21 million, the project secured 80 percent federal funding with a 20 percent local funding match. The project funding sources are as follow:

- Federal – FTA New Starts: $3.4 million
- Federal – Bus and Bus Facilities (5309): $8.3 million
- Federal – Revenue Aligned Budget Authority (RABA) (Section 330): $5 million
- Local – The City and KCATA: $4 million

The local match provided by the City was used for street re-paving and traffic signal priority. The largest budget item for the Main Street MAX was associated with vehicle procurement and inspection, and stop construction and installation. Approximately $13 million or 60 percent of the project cost was related to these items. Thus the use of Bus and Bus Facility program funds was sufficient to fund a sizable portion of the overall project capital cost.

5.1.4 CMAQ – Congestion Mitigation and Air Quality Improvement Program

Description

Jointly administered by FHWA and the Federal Transit Authority (FTA), the CMAQ was implemented to support surface transportation projects and other related efforts that contribute to air quality improvements and provide congestion relief. CMAQ is a federal-aid funding program that provides a flexible funding source to State and local governments for transportation projects and programs that will contribute to attainment or maintenance of the National Ambient Air Quality Standards (NAAQS) for ozone, carbon monoxide (CO), and particulate matter. Funds generally may not be used for projects that result in the construction of new road capacity available to single-occupancy vehicles. These funds can be used for capital investments, operating assistance, travel demand management strategies, and bike and pedestrian facilities/ programs.

5.1.5 Surface Transportation Program

Description

The Surface Transportation Program (STP) provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on Federal-aid highways, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals[4].

5.1.6 TIGER Grant

Description

Transportation Investment Generating Economic Recovery (TIGER) grants are highly competitive and are awarded to fund capital investments in surface transportation infrastructure that will have significant impact on the Nation, a region, or metropolitan area. Grants are awarded to projects that will advance key transportation goals such as safety, innovation, and opportunity. Funding is provided on a competitive basis for highway, transit, freight, port, bike/pedestrian, and multimodal projects. Since the program's introduction in 2009, roughly $4.6 billion has been provided to 381 projects of which $1.31 billion has been awarded to 71 transit projects (28.5%).

The TIGER program encourages States and localities to work together to bring more innovative, cross modal proposals to the table. Priority is given to transportation projects that demonstrate strong collaboration among a broad range of participants, integration of transportation with other public services efforts, and/or projects that are a product of a robust planning process. Project sponsors at the state and local level are able to obtain funding for multi-modal, multi-jurisdictional projects that are difficult to support through traditional federal funding programs. TIGER can provide capital funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, or MPOs. Funds typically require a local match of at least 20 percent.

Example

Broad Street BRT (Richmond, VA)

The Broad Street BRT (GRTC Pulse) is a 7.6-mile BRT route that is set to begin operational service by 2017. The proposed route will utilize a mix of dedicated bus lanes (median and curb running lanes) and mixed traffic operations. Estimated ridership for the new BRT line is projected at more than 3,000 daily boardings with 500 new daily riders. The system will also utilize signal priority at intersections along the corridor and queue jumping at select locations. The project reflects a regional collaboration between Greater Richmond Transit Company (GRTC), the Virginia Department of Rail and Public Transportation (DRPT), the City of Richmond and Henrico County. Preliminary engineering of the project cost roughly $4 million of which $3.2 million was funded by the Surface Transportation Program (state flexible funds), $640,000 was funded by a DRPT grant, and $160,000 was funded by the City of Richmond.

The final design and construction phase of the project is expected to cost $49.8 million. The project partners were able to secure 50 percent Federal funding from a TIGER Grant and 50 percent non-federal funding from both state and local commitments. A breakdown of project funding for final design and construction is as follows:

- Federal – TIGER Grant: $24.9 million
- State – Commonwealth of Virginia (DRPT): $16.9 million
- Local – City of Richmond: $7.6 million
- Local – Henrico County: $400,000

GRTC is a public service company owned by the City of Richmond and Chesterfield County, and provides transit service to the City of Richmond, and areas of Chesterfield and Henrico Counties. Henrico County currently

[4] https://www.fhwa.dot.gov/map21/factsheets/stp.cfm

purchases services from GRTC and contributes local funds to operate the system based on the service operating in its jurisdiction.

Use in Region

The I-26 Corridor connects a number of jurisdictions between Summerville and downtown Charleston. The 22-mile corridor passes through three counties (Berkeley, Charleston and Dorchester) and six local municipalities (Summerville, Lincolnville, Goose Creek, City of North Charleston, Hanahan, and the City of Charleston). Development of a premium transit system that will improve regional mobility will undoubtedly involve a regional, multi-jurisdictional approach. Though challenging, the region is presented with the opportunity to develop an innovative collaborative project that would advance the region.

5.2 Local/State Funding

5.2.1 Property Taxes

Description

Typically levied by municipal governments, property taxes are assessed on the value of land and buildings. It usually serves as the principle source of revenue for local governments and is typically unrestricted in its use. Portions of local property taxes are, however, widely authorized for use by special districts and authorities including transit and school districts, and for other specified uses such as police and sanitation. Some jurisdictions require state or provincial legislation or voter approval to raise property tax rates.

Example

Silver Line BRT (Grand Rapids, MI)

The Interurban Transit Partnership (ITP) operates the public transit system, The Rapid, in the Grand Rapids metro area and surroundings. The Rapid serves six municipalities located within its service area including Grand Rapids, East Grand Rapids, Grandville, Kentwood, Walker and Wyoming.

The Silver Line BRT, which opened in 2014, is the first BRT line in Michigan. It operates along a 9.6-mile corridor connecting the Grand Rapids central business district to communities in the cities of Kentwood and Wyoming. Buses operate in dedicated lanes over 65 percent of the corridor. The project includes 18 transit stations, traffic signal priority, off-board fare collection, and 10 low-floor hybrid BRT buses. The project's total cost is estimated at $39.86 million, and was funded from the following sources:

- Federal – FTA Very Small Starts: $18.99 million
- Federal – Bus Discretionary Funds: $12.89
- State – Michigan DOT State Comprehensive Transportation Fund: $7.97 million

The Rapid transit system is funded in part by a voter-approved property tax which helps to support transit operations. In 2011 local voters (in all municipalities) approved a referendum to increase the existing property millage from 1.12 mills to a total 1.47 mills to help fund the BRT line's operating expenses.

Major project support came from local mayors, the business community, major regional employers and local advocacy groups. In addition to the Grand Rapid central business district, the Silver Line serves major destinations such as Michigan State University, Grand Rapids Community College, and the DeVos Place Convention Center and Performance Hall. The City of Grand Rapids, in anticipation of the BRT line, created a TOD zone in its zoning code for the areas around BRT stops to help provide the necessary mass of riders and destinations, with increased height limits and the ability to waive parking requirements. The city and transit agency also engaged regularly with the business community and citizens' groups to help educate these stakeholders about the project and foster community support[5].

5.2.2 Payroll / Employer Taxes

Description

Payroll taxes are typically imposed on employers based on the amount of gross payroll within a specific region and can be enacted in transit districts and used to fund both capital and operations. Specific regulations and guidelines in each state's legislation determine the types of wages and payments to which the tax can be applied as well as the organizations that can claim exemption. Usually, these taxes are administered by state revenue agencies on behalf of the transit agencies. Payroll taxes are generally easy to administer, difficult to evade, and are responsive to inflation over time. However, they may serve as a disincentive for new business to locate within the transit jurisdictional boundary, and this funding source is directly linked to the state of the economy. Thus during times of economic contraction or high rates of unemployment revenues from payroll taxes are affected[6].

Example

Lane Transit District (LTD) (Lane County, OR).

The Lane Transit District (LTD) provides public transportation in Lane County, Oregon. It serves the metro areas of Eugene and Springfield, as well as the cities of Coburg, Junction City, Creswell, Cottage Grove, Veneta and Lowell. Implemented in 1971, a funding ordinance established a payroll tax on employers within the LTD service district. A comparable self-employment tax ordinance was established in 1994. These taxes are administered by the Oregon Department of Revenue on behalf of the transit district. Originally the payroll tax rate was capped at 0.6 percent; however, in 2003 the State Legislature approved an increase in the maximum payroll tax rate to 0.7 percent and required a phased implementation of the rate change with the maximum rate being achieved in 2014.

The payroll and self-employment taxes represent the largest single contributor to LTD's revenues and accounts for roughly 70 percent of the agency's non-operating revenues[7]. Revenue from these sources covers much of the day-to-day operating expenses of the system. In 2014 the District recorded roughly $25 million collected from the employer payroll tax and $1.6 million collected from the self-employment tax. In 2009 the Legislature approved an increase in the maximum payroll tax to 0.8 percent to help fund a comprehensive transportation funding package proposed by State Governor Kulongoski, which also proposes increases in the gas tax, and vehicle licensing and registration fees. The eventual increase to 0.8 percent can only be made if the LTD board makes a finding that the economy in the district has recovered to an extent sufficient to warrant an increase in tax. It also requires that the increase be phased in over a ten-year period.

5.2.3 Sales Tax

Description

Sales taxes are the most widely used and broadly accepted source of dedicated local and regional funding for transit in the United States. They typically provide the greatest revenue yield and stability in comparison to other funding sources. Sales taxes are a broad-based revenue source that is capable of generating substantial revenue due to the large number of transactions that occur each year. Many states require the legislature to pass an enabling statute that provides local jurisdictions the authority to impose a dedicated sales tax to support transit. At the local and regional level, additional sales taxes enacted for transit typically range from 0.25 percent to one percent. While some sales taxes are perpetual others require reenactment or extension through periodic voter approval. Typically these taxes may exempt various combinations of food, clothing, and prescription drugs or

[5] http://www.reconnectingamerica.org/assets/Uploads/20121206midsizefinal.pdf
[6] http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_129.pdf

[7] Lane Transit District. 2013-2014 Comprehensive Annual Financial Report.

apply a lower rate to selected goods and services. Revenue generated from sales taxes can be used to support new transportation projects, ongoing operations, and capital maintenance.

Example

San Diego Association of Governments (SANDAG) (San Diego, CA)

In 1988, county voters enacted TransNet, a 20-year half-cent sales tax which was used to expand regional transit service and commuter rail, upgrade highway networks, improve and maintain local streets and fund regional bike and pedestrian projects. In light of the continued growth in the region and the pending sunset of the original TransNet measure, in 2004 county voters approved a 40-year TransNet Program Extension measure which extends the half-cent TransNet sales tax to fund a comprehensive program of transportation projects. The new TransNet program will consist of a blend of highway projects (HOV/Express lanes), highway widening projects, transit projects (rail and BRT), local streets and roads projects, and bike and pedestrian projects. The tax revenue collected will be evenly apportioned to transit, highway, and local street and roads projects; with dedicated amounts toward bike and pedestrian improvements. The measure was approved by voters in 2004 by a 67 percent margin. Major highway and transit projects are undertaken at the regional level and must contribute to reduce congestion and increase mobility. Local road revenues however, are appropriated annually to each of the region's 18 member jurisdictions using a formula based on population and the linear road miles within the various jurisdictions[8].

Use in Region

Berkeley, Charleston and Dorchester Counties each currently levy a transportation sales tax within their jurisdiction. In 2004 Charleston County approved a 0.5 cent transportation sales tax set to sunset in 2030. Revenue collected from the local option tax is used to fund roadways (65%), transit (18%), and greenways projects (17%). In 2008, Berkeley County passed a one cent sales and use tax for "financing the costs of highways, roads, bridges, and other transportation-related project facilities, and [related] drainage facilities." The transportation tax is set to last for seven years and the revenue generated is used to construct roadway improvements including the projects listed in the approved 2008 referendum. As of November 2014, Berkeley County residents voted on an extension of the penny sales tax which was set to expire in 2015 by a 67 percent margin. Dorchester County residents approved a one cent sales tax in 2004. The revenue collected from this levy funds a program of 22 road improvement projects which includes a mix of roadway construction and widening, intersection and sidewalk improvements, and roadway resurfacing and paving projects.

The current use of local option transportation sales taxes within the region makes the use of sales taxes a promising funding option for transit, although use of these funds in Dorchester and Berkeley counties has been primarily used for roadway projects. Having approved prior measures, the public has been exposed to its use and are likely to be more receptive to a new measure that includes transit projects. Research has also shown that communication and well developed campaign strategies are important factors that can significantly influence the success of transportation or transit sales tax initiates. The region will undoubtedly need a well define community "buy-in" strategy that focuses on educating the public as well as garnering support from residents, businesses, and local leaders for a regional transit system. The current transportation sales taxes are currently levied by individual counties in the region. A regional tax initiative could be an option to funding a transit project/program that would cross multiple jurisdictions and would require a strong collaborative effort. Citizens will have to be presented with a clearly defined regional transit initiative with a well-defined list of projects and benefits that can be gained from its implementation.

[8] SANDAG. TransNet Extension Ordinance and Expenditure Plan. SANDAG.org

5.2.4 Special Assessment Districts

Description

Special Assessment Districts is a value capture instrument which assesses an additional tax on properties located within a defined zone around a transportation project. These properties are assessed with a higher tax rate or a flat fee to fund improvements that benefit those properties as a result of the transportation investment. The revenue generated by the district can be used to directly pay for area improvements or enhancements, or can be utilized to repay bonds that may have been issued to finance the project. The amount of the tax assessed to properties are directly related to the benefits realized by each and are typically influenced by the distance of the property from the investment, and the cost of the improvement. A major challenge associated with introducing an assessment district is the effort needed to convince landowners and businesses that the tax is worth the value of the infrastructure improvement.

Examples

Downtown Denver 16th Street Mall (Denver, CO).

The Downtown Denver 16th Street Mall is a "rubber-tired" transit mall that is surrounded by a mix of residential properties, retail and high-rise offices. A special assessment district was formed around this mall area and is made up of the properties immediately adjacent to the mall. This district was created in an effort to fund the necessary maintenance costs associated with the facility. The district encompasses roughly 120 city blocks and is composed of 677 commercial parcels, 2.6 million square feet of retail space, 23 million square feet of office space, 14 hotels, 4,000 residential units and approximately 34,000 parking spaces. Assessment rates for properties within the district vary from $0.05 to $0.45 per square feet and depend on the amount of land area occupied by the property as well as its distance from the transit mall[9]. Revenue generated from this assessment cannot be utilized for capital expenses.

Dulles Corridor Metrorail Expansion (Washington, D.C.).

One of the nation's largest transit projects to utilize value capture financing is the Dulles Metrorail expansion. The Dulles Corridor Metrorail expansion, located in the Washington, DC region, entails a 23-mile extension of the existing heavy rail Metrorail system to the Dulles Airport and the Tysons Corner, Reston and Herndon areas. The estimated cost of the extension is roughly $5.2 billion and will be implemented in two phases. A special assessment district was created to help fund part of the Fairfax County local share for Phase I and II construction. Under the Code of Virginia, commercial and industrial property owners are allowed to petition the Virginia Board of Supervisors to be taxed, to raise funds for transportation improvements in the area. For the tax district to be considered at least 51 percent of property owners (measured by land area or assessed value) of the proposed district must support or approve the taxing district. In 2004, more than 64 percent of commercial and industrial property owners, (by assessed value) around Tysons Corner (a large retail shopping and employment center), petitioned to create the Dulles Rail Transportation Improvement District where all funds generated will go toward the Metrorail extension (Phase I). Commercial and industrial property owners were charged an additional $0.21 per $100 assessed value over the base property tax rate. The amount that could be raised under this Phase I special assessment was capped at $400 million. In 2009 through a similar petition process, commercial and industrial property owners in the Reston and Herndon areas created the Phase II Dulles Rail Transportation District to help fund the rail extension through Reston, Herndon, and the Dulles Airport. The Phase II special assessment is capped at $330 million[10, 11].

[9] http://www.tcrponline.org/PDFDocuments/TCRP_RPT_90v2.pdf
[10] http://www.fairfaxcounty.gov/dmb/fy2016/advertised/volume2/40110.pdf
[11] http://www.metroplanning.org/news/6384/Value-Capture-Case-Studies-Washington-DC-Metro-expansion-to-Dulles-Airport

5.2.5 Tax Increment Financing (TIF)

Description

Tax increment financing is a value capture instrument which allows jurisdictions to collect revenue in specific areas and direct that revenue toward specific area improvements. It does not involve a tax rate increase. Instead, it applies the additional tax revenue generated by the rise in property values resulting from public investments to help pay or fund the improvements that led to the increase in property value and tax returns. Tax increment funds are usually set aside from properties within a defined geographic zone, such as the area surrounding a transit station, or in a corridor. The TIF district is established for a set number of years and can involve residential, commercial or industrial uses.

At the establishment of a TIF district, the value of properties is assessed and set as the base. As the district develops, the value of properties within the district increases, which in turn, increases the amount of taxes collected. The incremental rise in tax revenue resulting from the investment in the District is then dedicated to further improvements in or around the district. As more improvements are made in the area, property values and collected taxes should again increase, thus generating more funds for further improvements in the TIF district. This cycle is maintained over the life of the district. TIF revenues allow state and local governments to fund new projects without having to tap into existing revenue sources or raising area wide taxes. It can also provide an equitable form of raising revenue from property owners that are most likely to benefit from the transit improvements undertaken. One disadvantage of TIF financing is the need for an initial investment in the district to spur an increase in property values. This may require agencies to use public revenues to fund the initial investment[12].

Example

City of Dallas TIF District (Dallas, TX)

The City of Dallas has established a 558-acre TOD Tax Increment District around eight of its Dallas Area Transit (DART) light rail stations. The District, created in 2008 and set to terminate in 2038, seeks to encourage high-density, pedestrian friendly transit oriented developments adjacent to DART stations. Potential improvements covered by the TIF include the construction of new streets, sidewalk upgrades, utilities, lighting, public landscaping, historic preservation, environmental remediation, fees associated with architectural, planning, and engineering work related to eligible TIF funded public improvements, additional costs associated with high density projects, etc. This corridor-based TIF helps to redistribute the revenues generated in "stronger" neighborhoods to help encourage development in weaker areas. This approach applied to the DART station areas helps to promote the improvements and development needed around station areas, which in turn improves transit ridership and revenues at otherwise underutilized station areas.

Use in Region

There is a need to promote more Transit Oriented Development (TOD) within the region especially around proposed station area locations to help support a premium transit service provided by a fixed guideway system. Use of TIF districts could help finance the necessary TOD investments that would be necessary at identified stations in the region.

South Carolina has TIF enabling legislation which allows the establishment of Districts to support redevelopment with up to 30 years to retire TIF debt.

[12] http://www.apta.com/mc/annual/previous/2012/presentations/Presentations/Team-Two-Innovative-Funding-Sources-for-Transit-Final-Report.pdf

5.3 Other Funding/Financing

5.3.1 Public-Private Partnership

Description

Public-Private Partnership is an innovative financing and project delivery method in which a contractual arrangement is made between a public or governmental agency and a private entity that facilitates greater participation by the private entity in the delivery and operation of an infrastructure project, facility, or service. Within the transport sector such an arrangement involves one or more aspects of the funding, financing, planning, design, construction, operation and maintenance of a transportation facility. In general, the contractual arrangement underlying a transit-related public-private partnership transfers certain risks and provides certain financial opportunities to the private sector. In exchange, public partners are able to realize or benefit from a reduction of financial risk, improved service quality, efficient deployment of new technologies, innovative or cost-effective business practices and increased management expertise[13].

Example

Eagle P3 Project (Denver, CO).

The Denver Eagle P3 is part of the Denver Regional Transit District (RTD) voter-approved FasTracks plan to expand transit across the Denver metropolitan region. In 2004, voters in the Denver region approved a 0.4 percent sales tax increase to provide the necessary funds to help implement the FasTracks program. The complete FasTracks plan includes 122 miles of commuter rail and light rail, 18 miles of BRT service, station area redevelopment, parking facility infrastructure to serve the system, and other system improvements.

The Eagle P3 project is comprised of two commuter rail corridors (23-mile East Rail Line and 11.2-mile Gold Line), an initial 6.2-mile segment of the Northeast Rail Line commuter corridor, a commuter rail maintenance facility and the procurement of 54 commuter rail cars. At an estimated total cost of $2.2 billion the project was able to secure $1.03 billion in federal funds and roughly $450 million in private financing.

The project funding breakdown is as follows:

- Federal – New Starts FFGA: $1.03 billion
- Federal – Other federal grants: $57 million
- RTD sales tax revenue: $128.1 million
- Private Activity Bonds: $396.1 million
- TIFIA loan: $280 million
- Revenue bond proceeds: $56.8 million
- Local/CDOT/other contributions: $40.3 million
- Equity: $54.3 million

Much of the support for the FasTracks plan stemmed from the great success of its predecessor, the Transportation Expansion (T-REX) Project. T-REX (1999) was a RTD and Colorado DOT initiative to improve the transportation infrastructure of the region through a program of combined light rail and highway expansion projects. The T-REX program in its size, scope, and innovation served as a model case of collaborative planning and was finished on-time and under budget.

The Eagle P3 Project is being delivered and operated under a concession agreement between RTD and a "concessionaire" that was selected through a competitive proposal process. The selected concessionaire is known as the Denver Transit Partnership (DTP), a specialty company owned by Fluor Enterprises, Uberior Investments and Laing Investments and includes other leading firms on the team. Through the agreement DTP is required to

[13] Public-Private Partnerships in Public Transportation: Policies and Principles for the Transit Industry. APTA Task Force on Public-Private Partnerships.

design-build-finance-operate-maintain (DBFOM) the commuter rail lines and commuter rail maintenance facility projects under a single contact. The RTD will retain ownership of all assets while most of the risk of designing and building the project is shifted to the DTP. The near $450 million of private financing arranged by DTP to help fund the project allows the RTD to spread out the large upfront capital costs over a 30-year period. The DTP will operate and maintain the projects it designs and builds over the agreed 30 year period.

5.3.2 Joint Development

Description

Joint development commonly refers to the coordinated development of public transportation facilities with other, non-transit development including commercial, residential, and mixed-use development. Joint development may include partnerships for public or private development associated with any mode of transit system that is being improved through new construction, renovation, or extension. It may also include intermodal facilities, intercity bus and rail facilities, transit malls, or historic transportation facilities[14]. Joint development strategies are generally not used for overall system finance, but are intended to provide a revenue stream for the transit system as well as promote appropriate growth around transit stations. A "revenue-sharing" initiative secures a stream of revenue to the transit agency that can be used for operating expenses. A "cost-sharing" agreement aims to relieve the transit agency of some cost burden of constructing, maintaining, or rehabilitating transit facilities.

5.3.3 Naming Rights

Description

Naming rights arrangements involve fees paid for the right to name a component of a transportation project, usually a transit line or station name. Although the revenue generated from naming rights is typically insufficient to fund capital investment, it can be utilized to support maintenance and operations expenses. Revenues secured through the agreement may be used for capital or operating expenses as agreed upon.

Examples

HealthLine BRT (Cleveland, OH).

The HealthLine obtained its name as a result of a Naming Rights Partnership with the Cleveland Clinic and University Hospitals; both of which are located along the Euclid corridor and are served by the premium transit line. In 2008 the Greater Cleveland Regional Transit Authority (GCRTA) entered into a naming-rights deal with both the Cleveland Clinic and University Hospitals for $6.25 million over 25 years to name the Euclid Corridor BRT line the HealthLine. The agreement provides for the marketing of the HealthLine logo on all vehicles, stations, schedules and other promotional material of the system. Use of the naming-rights deal has lent itself to the “clean and sleek” image of the system and ultimately avoids the clutter associated with traditional system advertising. The revenue generated from the agreement will cover most of the revenue forgone as a result of the loss of traditional advertising and will help with system maintenance and landscaping expenses.

Cleveland State BRT Line (Cleveland, OH).

Building upon the years of collaboration between Greater Cleveland Regional Transit Authority (GCRTA) and Cleveland State University (CSU), the educational institute secured the naming rights for a new bus rapid transit line connecting the Cleveland State University downtown campus to Cleveland’s west side communities. Through the agreement CSU will be paying $150,000 annually to the RTA and provides for CSU branding at BRT stops and stations, a total vehicle graphic package on 16 custom designed BRT buses, and other related material. CSU also has a U-Pass program through RTA that provides free rides to students on all RTA buses and trains for a charge of $25 per semester.

Flatiron Flyer BRT and A-Line Commuter Line (Denver Regional Transportation District).

[14] FTA Circular 7050. Federal Transit Administration Guidance on Joint Development (2014).

Under the agreement between the Denver Regional Transit District (RTD) and Colorado University, the RTD will receive $5 million over five years to support its service with a provision for a five-year extension should both parties agree. Revenue will be collected in the RTD Board of Directors reserve account and its use will be determined by the Board. The naming rights secured by Colorado University is for the Denver A Line commuter rail however the agreement also includes dominant advertising on the Flatiron Flyer BRT buses, exterior advertising on rail and bus vehicles, and CU's name and logo use on RTD digital assets and printed materials associated with the A Line.

Use in Region

Given the current partnerships that exist between the local transit agency and major regional employers such as MUSC and College of Charleston there is an opportunity to pursue naming rights arrangements with these active transit partners. Other large regional employers such as Charleston Southern University and Boeing, may also provide opportunity for this funding source.

6 List of Appendices

Appendix 5-A: Screen Two Build Alternatives

Appendix 5-B: Alternatives Operating Statistics

Appendix 5-C: Alignment Variation Exhibit- King Street Extension

Appendix 5-A

(Screen Two Build Alternatives)

Appendix 5-B

(Alternatives Operating Statistics)

Appendix 5-C

(Alignment Variation Exhibit- King Street Extension)

i-26ALT

I-26 Fixed Guideway Alternatives Analysis

CHAPTER VI: Screen Two – Project Justification Screening

Draft Report – February 2016

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1 Introduction

The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) initiated the I-26 Regional Fixed Guideway Transit Alternatives Analysis (i-26*ALT*) to improve transit options for residents and businesses along the I-26 Corridor. The purpose of the I-26 Alternatives Analysis is to improve transit service and enhance regional mobility along the I-26 Corridor connecting Summerville, North Charleston, and Charleston in South Carolina.

Upon the conclusion of this Alternatives Analysis and selection of a preferred alternative, the project sponsor intends to submit a request for entry into Project Development under the Federal Transit Administration (FTA's) Capital Investment Grant (CIG) Program, which provides grant funding for capital projects on a competitive basis and uses a set of Project Justification and Financial Commitment Criteria to rate projects. Projects must receive a project rating of medium or better in order to move forward in each phase of the process.

Although projects do not need to be rated in order to begin project development, this Screen Two Analysis rates each potential alternative using the FTA's Project Justification and Financial Commitment criteria, where sufficient information is available, to aid in the selection of a preferred alternative that can move forward into the Project Development phase of the CIG program and compete for federal funds. Once the preferred alternative enters into Project Development, project sponsors have two years to complete NEPA, develop preliminary engineering, and meet the required "medium" ranking or better to move forward into the next phase.

The project justification criteria are worth 50 percent of the overall score, and a project must receive an overall medium or better rating. The criteria as outlined in MAP-21 include: mobility improvements, cost effectiveness, congestion relief, environmental benefits, land use, and economic development. Since each of these criteria correspond to a project goal, this Screen Two Analysis utilizes these measures to compare each of the Screen Two Alternatives. This memorandum outlines the measures and rankings for each of the project justification criteria.

2 Screen Two Build Alternatives Overview

A total of 20 alternatives were evaluated in the Initial Alternatives Screening: Screen One Analysis. This phase of screening utilized a combination of subjective and objective analyses to identify those modes and alignments that best meet the project goals and objectives and warrant a more detailed analysis – Screen Two.

Results from the Screen One Analysis, input from the project Steering and Technical Advisory Committees, and community feedback identified 12 Build alternatives to move forward into Screen Two. A detailed description of the alternatives can be found in the Screen Two Alternatives Report.

2.1 BRT Alternatives

The following BRT alternatives are analyzed in this Screen Two Analysis. Figures A-1 through A-6 (Appendix 6-A) show the BRT Screen Two Build Alternatives.

- Alternative B-1: US 78/US 52/Meeting– BRT
- Alternative B-3: US 78/US 52/East Bay – BRT
- Alternative C-1: US 176/US 52/Meeting – BRT
- Alternative C-3: US 176/US 52/East Bay – BRT
- Alternative D-1: Dorchester Rd/US 52/Meeting – BRT
- Alternative D-3: Dorchester Rd/US 52/East Bay – BRT

2.2 LRT Alternatives

The following LRT alternatives are analyzed in this Screen Two Analysis. Figures A-1 through A-6 (Appendix 6-A) show the LRT Screen Two Build Alternatives.

- Alternative B-2: US 78/US 52/Meeting – LRT
- Alternative B-4: US 78/US 52/East Bay – LRT
- Alternative C-2: US 176/US 52/Meeting – LRT
- Alternative C-4: US 176/US 52/East Bay – LRT
- Alternative D-2: Dorchester Rd/US 52/Meeting – LRT
- Alternative D-4: Dorchester Rd /US 52/East Bay – LRT

3 Cost Effectiveness Evaluation Criteria & Rating

Cost-effectiveness is a measure of how well the funds invested in the project will improve transit based on the number of transit riders that use the system. The variables used to develop this ranking include annualized capital costs and operating & maintenance (O&M) costs, as well as the total estimated trips on the project.

3.1 Annualized Capital and O&M Costs

The Financial Commitment Memorandum provides the planning level capital construction and O&M cost estimates used to develop these rankings. Annualization factors from FTA's Standard Cost Categories as described in that document were used to estimate the annualized capital costs for the project. It is important to note that the annualized costs are planning level only and not an engineering based estimate. The following Table 3-1 shows the annualized capital construction and O&M costs used in the cost effectiveness evaluation ranking. The annualization factor tables for each alternative are provided in Appendix 6-B.

Table 3 - 1: Annualized Capital and O&M Costs (Current Year – 2015)

BRT Annualized Cost Estimates (FY 2015)	**Alt B-1: US 78/Mtg BRT**	**Alt B-3: US 78/EB BRT**	**Alt C-1: US 176/Mtg BRT**	**Alt C-3: US 176/EB BRT**	**Alt D-1: Dorch/Mtg BRT**	**Alt D-3: Dorch/EB BRT**
Annualized Project Capital Cost	$12,257,933	$12,869,651	$11,530,768	$12,145,835	$13,009,074	$13,624,141
Annual Project Operating and Maintenance Costs	$5,850,240	$6,654,480	$5,465,280	$5,645,280	$6,694,800	$6,874,800
Total Annualized Capital and Operating Cost of Project	**$18,108,173**	**$ 19,524,131**	**$16,996,048**	**$17,791,115**	**$ 19,703,874**	**$ 20,498,941**
LRT Annualized Cost Estimates (FY 2015)	**Alt B-2: US 78/Mtg LRT**	**Alt B-4: US 78/EB LRT**	**Alt C-2: US 176/Mtg LRT**	**Alt C-4: US 176/EB LRT**	**Alt D-2: Dorch/Mtg LRT**	**Alt D-4: Dorch/EB LRT**
Annualized Project Capital Cost	$83,307,534	$87,441,224	$78,633,747	$82,767,611	$87,056,711	$91,190,575
Annual Project Operating and Maintenance Costs	$13,696,390	$15,805,991	$13,259,680	$13,696,390	$15,805,991	$16,242,701
Total Annualized Capital and Operating Cost of Project	**$97,003,924**	**$ 103,247,215**	**$91,893,427**	**$96,464,001**	**$ 102,862,702**	**$ 107,433,276**

3.2 Trips on Project

As part of this Screen Two Analysis, transit ridership was forecasted for each of the alternatives using FTA's Simplified Trips-on Projects Software (STOPS). STOPS is a forecasting model developed by FTA to simplify the forecasting process and includes data from 24 fixed guideway systems that are used to calibrate the model. The Travel Demand Forecasting Memorandum in Appendix 6-C provides the results of the forecasting effort. Tables 3-2 and 3-3 provide a summary of the forecasting results for the BRT & LRT alternatives by Current Year (2015) and Horizon Year (2035). The value used in the Cost Effectiveness Rating is listed as the "Total Trips Annualized."

Table 3 - 2: Travel Demand Forecast Summary (Current Year-2015)

Trips on the Project (Current Year) BRT	Alt B-1: US 78/Mtg BRT		Alt B-3: US 78/EB BRT		Alt C-1: US 176/Mtg BRT		Alt C-3: US 176/EB BRT		ALT D-1: Dorch/Mtg BRT		Alt D-3: Dorch/EB BRT	
Modeled Trips (HBW)	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized
Non-Transit Dependent	2,467	712,963	2,473	714,697	1,396	403,444	1,392	402,288	2,099	606,611	2,112	610,368
Transit Dependent	1,034	298,826	1,133	327,437	1,088	314,432	1,154	333,506	619	178,891	755	218,195
Modeled Trips All other Purposes												
Non-Transit Dependent	2,074	599,386	2,036	588,404	1,112	321,368	1,104	319,056	2,274	657,186	2,271	656,319
Transit Dependent	1,299	375,411	1,364	394,196	1,143	330,327	1,300	375,700	673	194,497	904	261,256
Sub-Total												
Non-Transit Dependent	4,541	1,312,349	4,509	1,303,101	2,508	724,812	2,496	721,344	4,373	1,263,797	4,383	1,266,687
Transit Dependent	2,333	674,237	2,497	721,633	2,231	644,759	2,454	709,206	1,292	373,388	1,659	479,451
Total Trips	**6,874**	**1,986,586**	**7,006**	**2,024,734**	**4,739**	**1,369,571**	**4,950**	**1,430,550**	**5,665**	**1,637,185**	**6,042**	**1,746,138**
New Weekday Transit Trips	**3,772**		**3,629**		**1,801**		**1,687**		**3,793**		**3,762**	

Trips on the Project (Current Year) LRT	Alt B-2: US 78/Mtg LRT		Alt B-4: US 78/EB LRT		Alt C-2: US 176/Mtg LRT		Alt C-4: US 176/EB LRT		Alt D-2: Dorch/Mtg LRT		Alt D-4: Dorch/EB LRT	
Modeled Trips (HBW)	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized
Non-Transit Dependent	3,477	1,004,853	3,458	999,362	1,995	576,555	1,993	575,977	2,867	828,563	2,853	824,517
Transit Dependent	1,200	346,800	1,276	368,764	1,171	338,419	1,268	366,452	763	220,507	840	242,760
Modeled Trips All other Purposes		0		0		0		0		0		0
Non-Transit Dependent	3,110	898,790	3,040	878,560	1,668	482,052	1,674	483,786	3,319	959,191	3,252	939,828
Transit Dependent	1,456	420,784	1,621	468,469	1,306	377,434	1,515	437,835	1,047	302,583	1,149	332,061
Sub-Total												
Non-Transit Dependent	6,587	1,903,643	6,498	1,877,922	3,663	1,058,607	3,667	1,059,763	6,186	1,787,754	6,105	1,764,345
Transit Dependent	2,656	767,584	2,897	837,233	2,477	715,853	2,783	804,287	1,810	523,090	1,989	574,821
Total Trips	**9,243**	**2,671,227**	**9,395**	**2,715,155**	**6,140**	**1,774,460**	**6,450**	**1,864,050**	**7,996**	**2,310,844**	**8,094**	**2,339,166**
New Weekday Transit Trips	**6,293**		**6,118**		**3,396**		**3,343**		**5,919**		**5,807**	

Table 3 - 3: Travel Demand Forecast Summary (Horizon Year – 2035)

Trips on the Project (Horizon Year) BRT	Alt B-1: US 78/Mtg BRT		Alt B-3: US 78/EB BRT		Alt C-1: US 176/Mtg BRT		Alt C-3: US 176/EB BRT		ALT D-1: Dorch/Mtg BRT		Alt D-3: Dorch/EB BRT	
Modeled Trips (HBW)	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized
Non-Transit Dependent	2,731	789,259	2,732	789,548	1,626	469,914	1,614	466,446	2,353	680,017	2,370	684,930
Transit Dependent	1,197	345,933	1,274	368,186	1,259	363,851	1,284	371,076	786	227,154	872	252,008
Modeled Trips All other Purposes		0		0		0		0		0		0
Non-Transit Dependent	2,276	657,764	2,202	636,378	1,280	369,920	1,267	366,163	2,519	727,991	2,510	725,390
Transit Dependent	1,492	431,188	1,539	444,771	1,345	388,705	1,460	421,940	832	240,448	1,060	306,340
Sub-Total												
Non-Transit Dependent	5,007	1,447,023	4,934	1,425,926	2,906	839,834	2,881	832,609	4,872	1,408,008	4,880	1,410,320
Transit Dependent	2,689	777,121	2,813	812,957	2,604	752,556	2,744	793,016	1,618	467,602	1,932	558,348
Total Trips	**7,696**	**2,224,144**	**7,747**	**2,238,883**	**5,510**	**1,592,390**	**5,625**	**1,625,625**	**6,490**	**1,875,610**	**6,812**	**1,968,668**
New Weekday Transit Trips	**4,174**		**4,006**		**2,134**		**1,992**		**4,227**		**4,177**	

Trips on the Project (Horizon Year) LRT	Alt B-2: US 78/Mtg LRT		Alt B-4: US 78/EB LRT		Alt C-2: US 176/Mtg LRT		Alt C-4: US 176/EB LRT		Alt D-2: Dorch/Mtg LRT		Alt D-4: Dorch/EB LRT	
Modeled Trips (HBW)	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized	Daily	Annualized
Non-Transit Dependent	3,839	1,109,471	3,809	1,100,801	2,303	665,567	2,291	662,099	3,215	929,135	3,190	921,910
Transit Dependent	1,377	397,953	1,407	406,623	1,341	387,549	1,402	405,178	916	264,724	954	275,706
Modeled Trips All other Purposes		0		0		0		0		0		0
Non-Transit Dependent	3,390	979,710	3,308	956,012	1,883	544,187	1,882	543,898	3,653	1,055,717	3,572	1,032,308
Transit Dependent	1,674	483,786	1,765	510,085	1,508	435,812	1,659	479,451	1,221	352,869	1,289	372,521
Sub-Total		0		0		0		0		0		0
Non-Transit Dependent	7,229	2,089,181	7,117	2,056,813	4,186	1,209,754	4,173	1,205,997	6,868	1,984,852	6,762	1,954,218
Transit Dependent	3,051	881,739	3,172	916,708	2,849	823,361	3,061	884,629	2,137	617,593	2,243	648,227
Total Trips	**10,280**	**2,970,920**	**10,289**	**2,973,521**	**7,035**	**2,033,115**	**7,234**	**2,090,626**	**9,005**	**2,602,445**	**9,005**	**2,602,445**
New Weekday Transit Trips	**6,940**		**6,705**		**3,929**		**3,828**		**6,591**		**6,432**	

3.3 Cost Effectiveness Screen Two Project Justification Rating

The cost effectiveness preliminary project justification rating is the ratio of costs over trips. The values used to develop the ratings are shown in Table 3-4.

Table 3 - 4: Cost Effectivness Values Used in Rating

Cost Effectiveness (CY) BRT	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
Annualized project capital cost (2015)	$12,257,933	$12,869,651	$11,530,768	$12,145,835	$13,009,074	$13,624,141
Annual O&M Cost	$5,850,240	$6,654,480	$5,465,280	$5,645,280	$6,694,800	$6,874,800
Annual Linked Trips	1,986,586	2,024,734	1,369,571	1,430,550	1,637,185	1,746,138
Annualized capital and operating costs	$18,108,173	$19,524,131	$16,996,048	$17,791,115	$19,703,874	$20,498,941
Annualized cost per annual linked trip on the project	$9.12	$9.64	$12.41	$12.44	$12.04	$11.74
Value used in Rating	**$9.12**	**$9.64**	**$12.41**	**$12.44**	**$12.04**	**$11.74**

Cost Effectiveness (CY) LRT	Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
Annualized project capital cost (2015)	$83,307,534	$87,441,224	$78,633,747	$82,767,611	$87,056,711	$91,190,575
Annual O&M Cost	$13,696,390	$15,805,991	$13,259,680	$13,696,390	$15,805,991	$16,242,701
Annual Linked Trips	2,671,227	2,715,155	1,774,460	1,864,050	2,310,844	2,339,166
Annualized capital and operating costs	$97,003,924	$103,247,215	$91,893,427	$96,464,001	$102,862,702	$107,433,276
Annualized cost per annual linked trip on the project	$36.31	$38.03	$51.79	$51.75	$44.51	$45.93
Value used in Rating	**$36.31**	**$38.03**	**$51.79**	**$51.75**	**$44.51**	**$45.93**

Table 3-5 shows where each BRT and LRT alternative would rate using FTA's ratings. Based on the planning level analysis, the BRT "B" Alternatives operating on US 78 from Summerville to downtown Charleston have the greatest potential to receive a medium rating. The remaining BRT alternatives using US 176 and Dorchester Road are more likely to rate medium-low. All of the LRT alternatives scored low under this rating.

Table 3 - 5: Screen Two Alternatives Potential Cost Effectiveness Rating

Cost Effectiveness (BRT)	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
<4.00 (High)						
Between $4.00 and $5.99 (Medium-High)						
Between $6.00 and $9.99 (Medium)	**$9.12**	$9.64				
Between 10.00 and $14.99 (Medium-Low)			$12.41	$12.44	$12.04	$11.74
>$15.00 (Low)						

Cost Effectiveness (LRT)	Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
<4.00 (High)						
Between $4.00 and $5.99 (Medium-High)						
Between $6.00 and $9.99 (Medium)						
Between 10.00 and $14.99 (Medium-Low)						
>$15.00 (Low)	$36.31	**$38.03**	$51.79	$51.75	$44.51	$45.93

4 Mobility Improvements Evaluation Criteria and Rating

Mobility improvements are evaluated based on the total number of "linked trips" using the project. Linked trips include the complete trip on the project from origin to destination including trips that may start or end on a different route. Trips made by transit dependent persons, which are defined as persons in households that do not own a car, are given a weight of two to encourage projects that support this population. Since the project may have future mobility improvements, the current year (2015) and horizon year (2035) total linked trips are used. Each is given a weight of 0.5, as required by MAP-21 when both current year and horizon year are used. Table 4-1 shows the Mobility Improvement Criteria used to rate the alternatives' mobility improvements.

Table 4 - 1: Mobility Improvements Value Used in Rating

Mobility Improvements (BRT)	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
Annual Linked Trips on Project: (CY)	2,660,823	2,746,367	2,014,330	2,139,756	2,010,573	2,225,589
Annual Linked Trips on Project: (HY)	3,001,265	3,051,840	2,344,946	2,418,641	2,343,212	2,527,016
Value used in Rating	**2,831,044**	**2,899,104**	**2,179,638**	**2,279,199**	**2,176,893**	**2,376,303**

Mobility Improvements (LRT)	Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
Annual Linked Trips on Project: (CY)	3,438,811	3,552,388	2,490,313	2,668,337	2,833,934	2,913,987
Annual Linked Trips on Project: (HY)	3,852,659	3,890,229	2,856,476	2,975,255	3,220,038	3,250,672
Value used in Rating	**3,645,735**	**3,721,309**	**2,673,395**	**2,821,796**	**3,026,986**	**3,082,330**

Table 4-2 shows the potential mobility improvements ratings for each Screen Two Alternative based on current planning level information. All of the BRT alternatives ranked low, with the exception of the "B" alternatives which ranked medium-low. Among the LRT alternatives, all received a medium-low rating, with the "B" alternatives carrying the most passengers.

Table 4 - 2: Screen Two Alternatives Potential Mobility Improvements Rankings

Mobility Improvements (Annual Trips) (BRT)	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
>= 30 Million (High)						
15 Million - 29.9 Million (Medium-High)						
5 Million - 14.9 Million (Medium)						
2.5 Million - 4.9 Million (Medium-Low)	2,831,044	**2,899,104**				
<2.5 Million (Low)			2,179,638	2,279,199	2,176,893	2,376,303

Mobility Improvements (Annual Trips) (LRT)	Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
>= 30 Million (High)						
15 Million - 29.9 Million (Medium-High)						
5 Million - 14.9 Million (Medium)						
2.5 Million - 4.9 Million (Medium-Low)	3,645,735	**3,721,309**	2,673,395	2,821,796	3,026,986	3,082,330
<2.5 Million (Low)						

5 Congestion Relief Evaluation Criteria and Ranking

Congestion relief is measured by the number of new weekday linked transit trips resulting from implementation of the proposed project. This is considered an indirect measure of roadway congestion relief as a result of the transit project and serves as an indicator of potential cars taken off of the road. Table 5-1 shows the values used in the rating.

Table 5 - 1: Congestion Relief Values Used in Rating

Congestion Relief (BRT)	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
New Weekday Linked Transit Trips (CY)	3,772	3,629	1,801	1,687	3,793	3,762
New Weekday Linked Transit Trips (HY)	4,174	4,006	2,134	1,992	4,227	4,177
Value used in Rating	3,973	3,818	1,968	1,840	4,010	3,970

Congestion Relief (LRT)	Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
New Weekday Linked Transit Trips (CY)	6,293	6,118	3,396	3,343	5,919	5,807
New Weekday Linked Transit Trips (HY)	6,940	6,705	3,929	3,828	6,591	6,432
Value used in Rating	6,617	6,412	3,663	3,586	6,255	6,120

Table 5-2 shows the potential congestion relief rating for each Screen Two Alternative. Among the BRT alternatives, the "B" and "D" alternatives rate medium, and the "C" alternatives rate medium-low. The Dorchester BRT alignment to Line Street carried the greatest number of new trips. All of the LRT alternatives rate medium.

Table 5 - 2: Screen Two Alternatives Potential Congestion Relief Rating

Congestion Relief - new transit trips (BRT)	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
18,000 and Above (High)						
10,000 to 17,999 (Medium-High)						
2,500 to 9,999 (Medium)	3,772	3,629			**3,793**	3,762
500 to 2,499 (Medium-Low)			1,801	1,687		
0 to 499 (Low)						

Congestion Relief - new transit trips (LRT)	Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
18,000 and Above (High)						
10,000 to 17,999 (Medium-High)						
2,500 to 9,999 (Medium)	**6,293**	6,118	3,396	3,343	5,919	5,807
500 to 2,499 (Medium-Low)						
0 to 499 (Low)						

6 Environmental Benefits Evaluation Criteria and Rating

Environmental benefits are measured based on the dollar value of the anticipated direct and indirect benefits to human health, safety, energy, and the air quality environment scaled by the annualized capital and operating costs for the project. FTA provides templates with factors to develop this rating.

6.1 Vehicle Miles Traveled

The variables used in this measure include the change in the vehicle miles traveled (VMT) resulting from the implementation of the proposed project. For this planning level analysis, reductions in Automobile Annual VMT and the additional VMT as a result of project transit vehicles are used. BRT projects assume the vehicle would be a hybrid bus (diesel-electric) and light rail trains would include two cars. Automobile vehicle miles saved are estimated using the STOPS model. Project vehicle and train-car miles are based on the operating plans provided in the Screen Two Alternatives Report. The following Table 6-1 shows the anticipated change in automobile vehicle miles (positive) and additional project transit vehicle and train-car miles (negative) for the Screen Two Alternatives.

Table 6 - 1: Change in Vehicle Miles Traveled

Vehicle-Miles of Travel (VMT) BRT (Savings)	Alt B-1: US 78/Mtg BRT		Alt B-3: US 78/EB BRT		Alt C-1: US 176/Mtg BRT		Alt C-3: US 176/EB BRT		ALT D-1: Dorch/Mtg BRT		Alt D-3: Dorch/EB BRT	
Mode/Technology	***VMT***	***VMT Change***	***VMT***	***VMT Change***	***VMT***	***VMT Change***	***VMT***	***VMT Change***	***VMT***	***VMT Change***	***VMT***	***VMT Change***
Automobile Annual VMT	23,695	6,847,855	22,929	6,626,481	12,684	3,665,676	12,033	3,477,537	19,479	5,629,431	19,096	5,518,744
Hybrid Bus		-1,096,831		-1,137,759		-1,017,562		-1,058,490		-1,201,504		-1,242,432

Vehicle-Miles of Travel (VMT) LRT (Savings)	Alt B-2: US 78/Mtg LRT		Alt B-4: US 78/EB LRT		Alt C-2: US 176/Mtg LRT		Alt C-4: US 176/EB LRT		Alt D-2: Dorch/Mtg LRT		Alt D-4: Dorch/EB LRT	
Mode/Technology	***VMT***	***VMT Change***	***VMT***	***VMT Change***	***VMT***	***VMT Change***	***VMT***	***VMT Change***	***VMT***	***VMT Change***	***VMT***	***VMT Change***
Automobile Annual VMT	40,448	11,689,472	38,743	11,196,727	23,785	6,873,865	22,981	6,641,509	31,915	9,223,435	30,789	8,898,021
Light Rail/Street Car (Car Miles)		-2,193,662		-2,275,518		-2,035,123		-2,116,980		-2,403,006		-2,485,008

6.2 Air Quality Evaluation Criteria

The environmental measure for air quality includes the change in total air quality criteria pollutants: Carbon Monoxide (COU), Mono-Nitrogen Oxides (NOx), Particulate Matter (PM2.5), and Volatile Organic Compounds (VOC) as a result of the project. For the change in air quality measures, FTA uses emission rates per VMT for automobiles (cars and light trucks) and transit vehicles. Air quality measures are based on grams/VMT factors that are monetized depending on whether an area is in attainment status or non-attainment status. Because the Charleston region has attainment status, the following air quality monetization factors are used, as shown in Table 6-2. Appendix 6-D shows the Screen Two Alternative values used to rate each air quality criteria pollutant.

Table 6 - 2: Air Quality Evaluation Factors

Year	CO	NOx – Mobile	NOx – EGU	VOC	PM2.5 - Mobile	PM2.5 - EGU
	$ / KG					
Current Year	$0.08	$12.96	$18.36	$3.02	$680.40	$561.60
10-Year Horizon	$0.08	$15.66	$22.95	$3.75	$861.30	$688.50
20-Year Horizon	$0.08	$16.20	$23.76	$3.89	$896.40	$712.80

6.3 Greenhouse Gases Evaluation Criteria

To evaluate change in greenhouse gas emissions (GHG), unit rates by fuel type are factored based on a $38 midrange estimate of the social cost of carbon. The FTA factors are provided in Table 6-3. Appendix 6-E shows the Screen Two Alternative values used to evaluate greenhouse gas emissions.

Table 6 - 3: Greenhouse Gas Emission Factors

	Current Year	10-year Horizon	20-year Horizon
Mode	(g CO2e/VMT)		
Automobile	532	434	397
Bus – Diesel	3319	2854	2721
Bus – Hybrid	2655	2283	2177
Bus – CNG	2935	2524	2406
Bus - Electric	2934	2441	2303
Heavy Rail	3211	3106	3073
Light Rail and Streetcar	4779	4623	4574
Commuter Rail - Diesel (new) and DMU	7970	7970	7970
Commuter Rail - Diesel (used)	7970	7970	7970
Commuter Rail - Electric and EMU	5821	5632	5572

6.4 Energy Used Evaluation Criteria

Change in energy used is intended to capture the benefits coming from reduce reliance on foreign fuels, and as such, change in energy use is only computed for modes that use petroleum fuel. The BRT alternatives for this analysis assume Hybrid (Diesel-Electric) buses. The light rail cars are assumed to be electrified. The factors shown in Table 6-4 are monetized using a value of $0.20 per gallon of petroleum fuel based on the economic cost of dependence on imported petroleum for fuels. Appendix 6-F shows the values used in the evaluation.

Table 6 - 4: Energy Used Evaluation Factors

	Current Year	10-year Horizon	20-year Horizon
MODE	Btu/VMT		
Automobile	7,559	6,167	5,633
Bus – Diesel	41,436	35,635	33,978
Bus – Hybrid	33,149	28,508	27,182
Commuter Rail - Diesel (new) and DMU	96,138	96,138	96,138
Commuter Rail - Diesel (used)	96,138	96,138	96,138

6.5 Safety

The change in safety evaluation uses changes in vehicle miles traveled to estimate changes in disabling injuries and fatalities for automobiles and transit. It does not address pedestrian or bicyclist accidents. The safety factors provided in Table 6-5 are monetized based on US DOT guidance on the value of a statistical life and injuries, which in 2015 was $9.2 million. The value for disabling injuries for both transit and automobiles is $490,000 (5.39 percent of the US DOT value of a statistical life). Appendix 6-G shows the values used in the safety ratings.

Table 6 - 5: Change in Safety Evaluation Factors

	Current Year		10-year Horizon		20-year Horizon	
Mode	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries
	(per million VMT)					
Automobile	0.013	0.195	0.013	0.195	0.013	0.195
Bus – Diesel	0.004	1.824	0.004	1.824	0.004	1.824
Bus – Hybrid	0.004	1.824	0.004	1.824	0.004	1.824
Bus – CNG	0.004	1.824	0.004	1.824	0.004	1.824
Bus - Electric	0.004	1.458	0.004	1.458	0.004	1.458
Heavy Rail	0.007	0.155	0.007	0.155	0.007	0.155
Light Rail and Streetcar	0.009	1.696	0.009	1.696	0.009	1.696
Commuter Rail - Diesel (new) and DMU	0.012	1.746	0.012	1.746	0.012	1.746
Commuter Rail - Diesel (used)	0.012	1.746	0.012	1.746	0.012	1.746
Commuter Rail - Electric and EMU	0.012	1.746	0.012	1.746	0.012	1.746

6.6 Environmental Preliminary Justification Rating

The monetized value of the benefits resulting from changes in air quality and GHG emissions, energy use, and safety is summed and divided by the annualized capital and operating costs of the project, as discussed in the cost effectiveness measure, to develop the rating. Table 6-6 shows the values used in the ratio. Table 6-7 shows the potential rankings for the Screen Two alternatives. Among the BRT alternatives, the "B" alignments rate medium, and the remaining "C" and "D" alternatives rate medium-low. All of the LRT alternatives rate medium-low based on the planning level analysis.

Table 6 - 6: Environmental Benefits Value Used in Rating

Environmental Benefits Summary	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
Value of Environmental Benefits	$168,834.84	$46,934.77	($565,757.34)	($678,723.23)	($318,262.47)	($410,407.81)
Annualized Capital and Operating Cost of Project	$18,108,173.00	$19,524,131.00	$16,996,048.00	$17,791,115.00	$19,703,874.00	$20,498,941.00
Ratio of Environmental Benefits to Annualized Costs	**0.9%**	**0.2%**	**-3.3%**	**-3.8%**	**-1.6%**	**-2.0%**

Environmental Benefits Summary	Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
Value of Environmental Benefits	($402,083.74)	($666,803.41)	($1,440,448.95)	($1,635,171.19)	($1,403,250.79)	($1,623,222.98)
Annualized Capital and Operating Cost of Project	$97,003,924.16	$103,247,214.60	$91,893,427.16	$96,464,001.16	$102,862,701.60	$107,433,275.60
Ratio of Environmental Benefits to Annualized Costs	**-0.4%**	**-0.6%**	**-1.6%**	**-1.7%**	**-1.4%**	**-1.5%**

Table 6 - 7: Screen Two Alternatives Potential Environmental Ratings

Environmental Rating (BRT)		Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
>10%	High						
5 to 10%	Medium High						
0 to 5%	Medium	**0.9%**	**0.2%**				
0 to -10%	Medium-Low			**-3.3%**	**-3.8%**	**-1.6%**	**-2.0%**
<-10%	Low						

Environmental Rating (LRT)		Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
>10%	High						
5 to 10%	Medium High						
0 to 5%	Medium						
0 to -10%	Medium-Low	**-0.4%**	**-0.6%**	**-1.6%**	**-1.7%**	**-1.4%**	**-1.5%**
<-10%	Low						

7 Land Use Evaluation Criteria and Rating

The land use measure includes an examination of the existing corridor and station area development character; existing station area pedestrian facilities, including access for persons with disabilities; existing corridor and station area parking supply; and the proportion of existing "legally binding affordability restricted" housing within ½ mile of station areas to the proportion of "legally binding affordability restricted" housing in the counties through which the project travels.

7.1 Population, Employment and Household Criteria and Ratings

The Screen One analysis included a station area assessment and qualitative review of the land use measures. This is further refined in Screen Two Land Use and Economic Development Analysis in Appendix 6-H. Quantitative measures by station area (defined as ½ mile radius of station areas) are provided and include population densities, total employment served by the project, and the proportion of "legally binding affordability restricted" housing.

Because this project is still in the planning stages, conceptual station area locations were used to estimate the overall impact each alternative may have on this measure. During the project development phase, a station area planning exercise will further refine the station locations. These station area plans should in effect direct housing and employment to station locations which would increase the future measures. For the purpose of this analysis, current year (2010) and future year (2040) projections are used to rate corridors since all fall below the medium rating criteria.

Table 7-1 shows the quantitative employment, population and household data obtained from the BCDCOG Travel Demand Model. Table 7-2 shows the potential quantitative land use rating for those criteria that are known at this planning stage for the Current Year 2010. The values for BRT and LRT are the same, since the same station locations are assumed for both modes. Although all of the Screen Two Alternatives scored low, Table 7-3 shows updated numbers based on the 2040 BCDCOG Travel Demand Model projections. Under those estimates, the employment served by the system increases to a medium-low rating for the "B" alternatives serving East Bay & Calhoun, and the population density ratings for all alternatives increase to medium-low.

7.2 Affordable Housing Criteria and Rankings

Affordable Housing criteria are described in the Screen Two Land Use and Economic Development Memorandum in Appendix 6-H. The following provides the measures and rating from that analysis for affordable housing measures. FTA defines legally binding affordable housing as legally binding affordability restricted units to renters with incomes below 60 percent of the area median income and/or owners with incomes below the area median. For the preliminary rating review, all the corridors score well for the criteria as defined in Appendix 6-H. Data from the Land Use Analysis is provided in Table 7-4. It is important to note that this is a preliminary rating, and additional verification of affordable housing will need to be gathered during the project development phase for the preferred alternative.

Table 7-5 shows the values used in the rating, and Table 7-6 provides the potential affordable housing rating. Based on this planning level analysis, all of the corridors are anticipated to serve a higher proportion of affordable housing units as compared to the counties.

Table 7 - 1: Quantitative Land Use Analysis Values Used in Rating

Total - All Station Areas (1/2-mile radius) (2010 BCDCOG Travel Demand Model)	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
	Alt B-2: US 78/Mtg LRT	**Alt B-4: US 78/EB LRT**	**Alt C-2: US 176/Mtg EB LRT**	**Alt C-4: US 176/EB LRT**	**Alt D-2: Dorch/Mtg LRT**	**Alt D-4: Dorch/EB LRT**
Housing Units - All Types (2013 Census)	14,534	13,932	13,964	13,362	13,107	12,505
Housing Units - Legally Binding Affordability Restricted	1,225	1,126	1,382	1,279	932	829
Population	28,861	26,857	27,989	25,985	28,697	26,693
Employment at New Project Stations	28,058	33,336	23,521	28,799	18,730	24,008
Land Area (Square Miles)	13	14	11	12	11	12
Housing Unit Density (units per square mile)	1,136	1,030	1,228	1,103	1,149	1,030
Population Density (person per square mile)	2,257	1,986	2,462	2,146	2,515	2,199
Employment Density (person per square mile)	2,194	2,466	2,069	2,378	1,642	1,978
Station Area Share of Legally Binding Affordability Restricted Housing Units	8.4%	8.1%	9.9%	9.6%	7.1%	6.6%

**Note – Housing Unit data used for Current Year 2010 summary table obtained from Census 2013 ACS data. Legally Binding Affordability Restricted Housing Units obtained from the National Housing Preservation Database*

Total - All Station Areas (1/2-mile radius) (2040 BCDCOG Travel Demand Model)	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
	Alt B-2: US 78/Mtg LRT	**Alt B-4: US 78/EB LRT**	**Alt C-2: US 176/Mtg EB LRT**	**Alt C-4: US 176/EB LRT**	**Alt D-2: Dorch/Mtg LRT**	**Alt D-4: Dorch/EB LRT**
Housing Units - All Types*	16,995	16,365	15,786	15,156	16,048	15,418
Housing Units - Legally Binding Affordability Restricted						
Population	37,511	36,019	35,046	33,554	36,108	34,616
Employment at New Project Stations	36,017	42,018	29,368	35,369	23,189	29,190
Land Area (Square Miles)	13	14	11	12	11	12
Housing Unit Density (units per square mile)*	1,329	1,210	1,388	1,252	1,406	1,270
Population Density (person per square mile)	2,933	2,664	3,082	2,771	3,165	2,851
Employment Density (person per square mile)	2,816	3,108	2,583	2,921	2,032	2,404
Station Area Share of Legally Binding Affordability Restricted Housing Units						

**Note – In the absence of future housing units projections, household estimates obtained from the BCDCOG Travel Demand Model were used as a proxy for housing units in Future Year 2040 summary table*

Table 7 - 2: Screen Two Alternatives Potential Land Use Rating: Employment, Household, and Population Measures (CY 2010)

FTA Breakpoints (2010 BCDCOG Travel Demand Model)	Breakpoints	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
		Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg EB LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
Employment Served by System							
High	>220,000						
Medium - High	140,000 - 219,000						
Medium	70,000 - 139,999						
Medium -Low	40,000 - 69,999						
Low	<40,000	28,058	33,336	23,521	28,799	18,730	24,008

FTA Breakpoints (2010 BCDCOG Travel Demand Model)	Breakpoints	Alt B-1: US 78/Mtg BRT	Alt B-3: US 78/EB BRT	Alt C-1: US 176/Mtg BRT	Alt C-3: US 176/EB BRT	Alt D-1: Dorch/Mtg BRT	Alt D-3: Dorch/EB BRT
		Alt B-2: US 78/Mtg LRT	Alt B-4: US 78/EB LRT	Alt C-2: US 176/Mtg EB LRT	Alt C-4: US 176/EB LRT	Alt D-2: Dorch/Mtg LRT	Alt D-4: Dorch/EB LRT
Avg. Population Density (persons/square mile)							
High	>15,000						
Medium - High	9,600 - 15,000						
Medium	5760 - 9599						
Medium -Low	2,561 - 5,759						
Low	<2,560	2,257	1,986	2,462	2,146	2,515	2,199

Table 7 - 3: Screen Two Alternatives Potential Land Use Rating: Employment and Population Measures (Future Year 2040)

BRT Land Use Breakpoint (2040 BCDCOG Travel Demand Model)	Breakpoints	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg EB LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
Employment Served by System							
High	>220,000						
Medium - High	140,000 - 219,000						
Medium	70,000 - 139,999						
Medium -Low	40,000 - 69,999		42,018				
Low	<40,000	36,017		29,368	35,369	23,189	29,190

BRT Land Use Breakpoint (2040 BCDCOG Travel Demand Model)	Breakpoints	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg EB LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
Avg. Population Density (persons/square mile)							
High	>15,000						
Medium - High	9,600 - 15,000						
Medium	5760 - 9599						
Medium -Low	2,561 - 5,759	2,933	2,664	3,082	2,771	3,165	2,851
Low	<2,560						

Table 7 - 4: Affordable Housing Data used in Evaluation (CY)

Housing Totals for Each County in which Project Stations are Located	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg EB LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
Charleston County	***Y***	***Y***	***Y***	***Y***	***Y***	***Y***
Housing Units - All Types	171,625	171,625	171,625	171,625	171,625	171,625
Housing Units - Legally Binding Affordability Restricted	3,292	3,292	3,292	3,292	3,292	3,292
Berkeley County	***Y***	***Y***	***Y***	***Y***	***N***	***N***
Housing Units - All Types	74,281	74,281	74,281	74,281	-	-
Housing Units - Legally Binding Affordability Restricted	1,024	1,024	1,024	1,024	-	-
Dorchester County	***Y***	***Y***	***N***	***N***	***Y***	***Y***
Housing Units - All Types	55,571	55,571	-	-	55,571	55,571
Housing Units - Legally Binding Affordability Restricted	1200	1,200	-	-	1,200	1,200

**Note – Housing Unit data used for Current Year 2010 summary table obtained from Census 2013 ACS data. Legally Binding Affordability Restricted Housing Units obtained from the National Housing Preservation Database*

Table 7 - 5: Affordable Housing Values Used in Rating

Total - All Counties in which Project Stations Are Located	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg EB LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
Housing Units-All Types	301,477	301,477	245,906	245,906	227,196	227,196
Housing Units - Legally Binding Affordability Restricted	5,516	5,516	4,316	4,316	4,492	4,492
Number of Counties	3	3	2	2	2	2

Total Station Area Housing Units - Legally Binding Affordability Restricted Housing	1,225	1,126	1,382	1,279	932	829
Station-Area Share of Legally Binding Affordability Restricted Housing	8.4%	8.1%	9.9%	9.6%	7.1%	6.6%

Share of Housing Units that are Legally Binding Affordability Restricted in the Corridor compared to Share in the Counties	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg EB LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
Proportion in All Station Areas	8.4%	8.1%	9.9%	9.6%	7.1%	6.6%
Proportion in All Counties in which Project Stations are Located	1.8%	1.8%	1.8%	1.8%	2.0%	2.0%
Ratio, Proportion in All Station Areas to Proportion in All Counties in which Project Stations are Located	4.61	4.42	5.64	5.45	3.60	3.35

**Note – Housing Unit data used for Current Year 2010 summary table obtained from Census 2013 ACS data. Legally Binding Affordability Restricted Housing Units obtained from the National Housing Preservation Database*

Table 7 - 6: Screen Two Potential Affordable Housing Rating

FTA Criteria: Proportion of legally binding affordability restricted housing in the project corridor compared to the proportion in the counties through which the project travels	Criteria	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg EB LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
High	>=2.50	4.61	4.42	5.64	5.45	3.60	3.35
Medium High	2.25 to 2.49						
Medium	1.5 to 2.49						
Medium-Low	1.10 to 1.49						
Low	<1.10						

8 Economic Development

The economic development measure assesses how likely a proposed transit project is to induce additional transit-supportive development in the future based on a qualitative examination of the existing local plans and policies to support economic development proximate to the projects. Evaluation criteria look at factors such as transit supportive policies and plans, growth management plans, transit supportive zoning, and affordable housing policies. While a clearly defined project is needed to accurately assess the Economic Development impacts, the qualitative assessment in the Screen One Analysis provides an initial comparison of the corridors' likely performance. This Screen Two Analysis further refines the qualitative assessment conducted in Screen One to apply the FTA qualitative criteria to each alternative to understand how each could potentially rate, as described in the Land Use and Economic Development Analysis in Appendix 6-H, and as summarized in Table 8-1 and 8-2. All of the corridors have the potential to score well under the transit supportive plans evaluation; however, improvement is needed to demonstrate performance under these plans and policies. Additionally, the alternatives scored low with measures rating affordable housing policies and plans in place.

Table 8 - 1: Screen Two Alternatives Potential Economic Development Rankings: Transit Supportive Plans and Policies

Transit Supportive Plans and Policies	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
Growth Management:						
Concentration of development around established activity centers and regional transit	High	High	Medium-High	Medium-High	Medium-High	Medium-High
Land conservation and management	Medium	Medium	Medium-Low	Medium-Low	High	High
Transit Supportive Corridor Policies						
Plans and policies to increase corridor and station area development	Yes	Yes	Yes	Yes	Yes	Yes
Plans and policies to enhance transit-friendly character of corridor and station area development	Nexton/Ingleside/Mixson/Magnolia/Courier Square ; City of Charleston Peninsula Mobility Report; Neck Area Plan	Nexton/Ingleside/Mixson/Magnolia/Courier Square; City of Charleston Peninsula Mobility Report; Neck Area Plan	Cane Bay/Carnes Crossing/Mixson/Magnolia/Courier Square; City of Charleston Peninsula Mobility Report; Neck Area Plan	Cane Bay/Carnes Crossing/Mixson/Magnolia/Courier Square; City of Charleston Peninsula Mobility Report; Neck Area Plan	Oakbrook/Courier Square/Wescott/Magnolia; City of Charleston Peninsula Mobility Report; Neck Area Plan	Oakbrook/Courier Square/Wescott/Magnolia; City of Charleston Peninsula Mobility Report; Neck Area Plan
Plans to improve pedestrian facilities including facilities for persons with disabilities	Yes	Yes	Yes	Yes	Yes	Yes
Parking policies	City of Charleston Peninsula Mobility Report	City of Charleston Peninsula Mobility Report	City of Charleston Peninsula Mobility Report	City of Charleston Peninsula Mobility Report	City of Charleston Peninsula Mobility Report	City of Charleston Peninsula Mobility Report
Supportive Zoning Regulations Near Transit Station						
Zoning ordinances that support increased development density in transit station areas	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District
Zoning ordinances that enhance transit-oriented character of station area development and pedestrian access	Yes - PDD zoning (Mixson/Horizon Village/Ingleside)	Yes - PDD zoning (Mixson/Horizon Village/Ingleside)	Yes - PDD zoning (Mixson/Horizon Village)	Yes - PDD zoning (Mixson/Horizon Village)	No - Dorchester Rd. Overlay District (restrictive)	No - Dorchester Rd. Overlay District (restrictive)
Zoning allowances for reduced parking and traffic mitigation	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District
Tools to Implement Land Use Policies						
Outreach to government agencies and the community in support of transit supportive planning	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)
Regulatory and financial incentives to promote transit-supportive development	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District
Efforts to engage the development community in station area planning and transit-supportive development	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)

Table 8 - 2: Screen Two Alternatives: Potential Economic Development Rating: Performance and Impacts of Land Use Policies & Affordable Housing

Performance and Impacts of Land Use Policies	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
Performance of Land Use Policies						
Demonstrated cases of developments affected by transit-supportive policies	Yes - Mixson	Yes - Mixson	Yes - Mixson	Yes - Mixson		
Station area development proposals and status						
Potential impact of Transit Project on Regional Land Use						
Adaptability of station area land for development	Medium-High	Medium-High	High	High	Low	Low
Corridor economic environment	High	High	Medium-High	Medium-High	Low	Low

Tools to Maintain or increase the Share of Affordable Housing	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
Evaluation of corridor-specific affordable housing needs and supply						
Plans and polices to preserve and increase affordable housing in the region and/or corridor	Medium-Low	Medium-Low	Medium-Low	Medium-Low	Medium-Low	Medium-Low
Adopted financing tools and strategies targeted to preserving and increasing affordable housing in the region and/or corridor	Low	Low	Low	Low	Low	Low
Evidence of public sector and developer activity to preserve and increase affordable housing in the corridor						
Extent to which plans and policies account for long-term affordability and needs of the very-and extremely-low income households in the corridor	Low	Low	Low	Low	Low	Low

9 Summary

Based on the planning level analysis conducted in Screen Two of this alternatives analysis, the following Table 9-1 summarizes the overall rating for each of the six project justification criteria as well as an overall ranking for each Screen Two alternative. The cost effectiveness, mobility improvements, congestion relief and environmental benefits rating is based on the quantitative analysis describe in previous sections of this analysis. The land use rating is given a low rating based on the 2010 quantitative data on employment and population. This rating can likely be improved during project development once a preferred alternative is selective and station area planning is conducted. Additional information on parking supply in the Central Business District (Downtown Charleston) as well as verified affordable housing numbers were not available, and as such not included in these ratings. The economic development rating is qualitative and the steps taken during project development to implement transit supportive plans and policies could greatly influence how the preferred alternative is rated, and as such, all of the Screen Two alternatives are given a medium rating for this Screen Two Analysis.

Table 9 - 1: Screen Two Potential Project Justification Criteria Ratings

Screen Two BRT Alternatives	**Alt B-1: US 78/Mtg BRT**	**Alt B-3: US 78/EB BRT**	**Alt C-1: US 176/Mtg BRT**	**Alt C-3: US 176/EB BRT**	**Alt D-1: Dorch/Mtg BRT**	**Alt D-3: Dorch/EB BRT**
Cost Effectiveness	Medium	Medium	Medium-Low	Medium-Low	Medium-Low	Medium-Low
Mobility Improvements	Medium-Low	Medium-Low	Low	Low	Low	Low
Congestion Relief	Medium	Medium	Medium-Low	Medium-Low	Medium	Medium
Environmental Benefits	Medium	Medium	Medium-Low	Medium-Low	Medium-Low	Medium-Low
Land Use	Low	Low	Low	Low	Low	Low
Economic Development	Medium	Medium	Medium	Medium	Medium	Medium
Overall Ranking	**Medium**	**Medium**	**Medium-Low**	**Medium-Low**	**Medium-Low**	**Medium-Low**

Screen Two LRT Alternatives	**Alt B-2: US 78/Mtg LRT**	**Alt B-4: US 78/EB LRT**	**Alt C-2: US 176/Mtg LRT**	**Alt C-4: US 176/EB LRT**	**Alt D-2: Dorch/Mtg LRT**	**Alt D-4: Dorch/EB LRT**
Cost Effectiveness	Low	Low	Low	Low	Low	Low
Mobility Improvements	Medium-Low	Medium-Low	Medium-Low	Medium-Low	Medium-Low	Medium-Low
Congestion Relief	Medium	Medium	Medium	Medium	Medium	Medium
Environmental Benefits	Medium-Low	Medium-Low	Medium-Low	Medium-Low	Medium-Low	Medium-Low
Land Use	Low	Low	Low	Low	Low	Low
Economic Development	Medium	Medium	Medium	Medium	Medium	Medium
Overall Ranking	**Medium-Low**	**Medium-Low**	**Medium-Low**	**Medium-Low**	**Medium-Low**	**Medium-Low**

For this Screen Two Analysis, the alternatives that scored highest under the overall project justification criteria were:

1) Alternatives B-1 & B-3: US 78/US 52 BRT alternatives to Line Street or East Bay (Overall Score: 2.5/5)
2) Alternatives D-1 &D-3: Dorchester Rd/US 52 BRT alternatives to Line Street or East Bay (Overall Score: 2.2/5)
3) BRT Alternatives C-1 & C-3: US 176/US 52 and all LRT Alternatives (Overall Score: 2.0/5)

10 List of Appendices

Appendix 6-A: Screen Two Build Alternatives

Appendix 6-B: Annualization Factor Tables

Appendix 6-C: Travel Demand Forecasting Memorandum

Appendix 6-D: Air Quality Evaluation

Appendix 6-E: Greenhouse Gases Evaluation

Appendix 6-F: Energy Use Evaluation

Appendix 6-G: Safety Evaluation

Appendix 6-H: Screen Two Land Use and Economic Development Analysis

Appendix 6-A

(Screen Two Build Alternatives)

Appendix 6-B

(Annualization Factor Tables)

Appendix 6-C

(Travel Demand Forecasting Memorandum)

Appendix 6-D

(Air Quality Evaluation)

Appendix 6-E

(Greenhouse Gases Evaluation)

Appendix 6-F

(Energy Use Evaluation)

Appendix 6-G

(Safety Evaluation)

Appendix 6-H

(Screen Two Land Use and Economic Development Analysis Memorandum)

i-26ALT

I-26 Fixed Guideway Alternatives Analysis

Chapter VII: Public Engagement

Draft Report – February 2016

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Table of Contents

1 Introduction

This Alternatives Analysis transportation planning process informs the public and local decision makers with an assessment of a wide range of public transportation or multimodal alternatives to address transportation problems within the I-26 corridor; provides information for project justification and local financial commitment; and supports the selection of a preferred alternative to move forward in to the Project Development Phase of the FTA's Capital Investment Program.

The I-26 Fixed Guideway Alternatives Analysis outreach process was designed to provide opportunities for interested parties to receive information, discuss issues, and partake in the decision-making process during the study, particularly at its key milestones. The outreach conducted was focused on engaged participation by a variety of stakeholders and the public with the goal of selecting a preferred alternative for transit improvements along the study corridor. It also supports the ongoing advocacy and outreach activities set forth by the Charleston Area Transportation Study (CHATS) and the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) to promote coordinated regional transportation planning. A Public Involvement Plan (PIP) was created to guide the project's engagement efforts and defines strategies for communicating with agencies, stakeholders, and the public about the I-26 Regional Fixed Guideway Transit Alternatives Analysis (i-26*ALT*) project (Appendix 7-A).

The following provides a summary of public engagement efforts undertaken throughout the study process.

2 Public Engagement Efforts

Public engagement efforts undertaken in the Alternatives Analysis process were focused on *identifying* the various audiences/stakeholders vested and impacted by the study; *educating* these groups on the purpose and need for the project; *informing* them of findings resulting from the analysis; and actively and meaningfully *engaging* them in the decision making process.

2.1 Project Steering and Technical Advisory Committees

2.1.1 Steering Committee

A project Steering Committee, comprising of individuals representing the interests of the public they serve within the i-26*ALT* study corridor was created. This group met with the project team at key milestones in the project as needed. The Steering Committee was responsible for:

- Providing direction and guidance throughout the study process;
- Resolving obstacles and barriers that may arise during the study process;
- Acting as project champions and advocates to constituents;
- Sharing feedback; and
- Developing policy and recommendations for the Locally Preferred Alternative.

2.1.2 Technical Advisory Committee

A project Technical Advisory Committee (TAC) was created to provide technical guidance to the project team. The TAC was comprised of staff from each of the affected agencies represented in the Steering Committee as well as representatives from additional agencies/organizations as deemed necessary. The committee served to provide:

- Technical guidance;
- Review and comments on evaluation criteria, conceptual alternatives, and screening processes;
- Project updates to their respective organizations;
- Assistance in creating the stakeholder database; and
- Feedback to the consultant team on the accuracy and clarity of public presentations and informational marketing materials.

During the course of the i-26*ALT* Study four (4) joint Steering and Technical Advisory Committee meetings were held at major milestones of the project. These included a project kickoff meeting (October, 2014), presentation of preliminary *Pre-Screen* Analysis and recommendations (March, 2015), presentation of *Screen One* and *Land Use* Analyses and recommendations (July, 2015), and *Screen Two* Analysis results and recommended alternative (January, 2016). Tables 2-1 and 2-2 provide a list of the agencies/organizations represented on both the Steering and Technical Advisory Committees.

Meeting minutes for each of the joint Steering and Technical Advisory meetings held are provided in Appendix 7-B (I-IV).

Table 2 - 1: i-26ALT Steering Committee

Agency	Representative
Tri-County Regional Chamber	Ms. Teresa Hatchell; Executive Director
Charleston Metro Chamber	Ms. Mary Graham; Senior Vice President
Greater Summerville-Dorchester Chamber	Ms. Rita Berry; President/CEO
Berkeley Chamber	Ms. Elaine Morgan; CEO
Berkeley County	Mr. William W. Peagler, III; County Supervisor
Charleston County	Mr. Elliot Summey; Chairman, Charleston County Council
Dorchester County	Mr. Jason Ward; County Administrator Mr. Larry Hargett; Dorchester County Council
City of Charleston	Mr. Hernan Pena Jr.; Traffic and Transportation Director
City of Goose Creek	Mayor Michael J. Heitzler
City of Hanahan	Mr. Johnny Cribb; Administrator
City of North Charleston	Mr. Ray Anderson; Assistant to the Mayor
Town of Summerville	Mayor Bill Collins/Mayor Wiley Johnson
Town of Lincolnville	Mayor Charles Duberry
CARTA	Mr. Jeff Burns
Tri-County LINK	Mr. Eric Shuler; Operations Manager
BCDCOG	Mr. Teddie Pryor Sr.; Chairman
FHWA	Ms. Yolanda Morris; Community Planner Ms. Jessica Heckter; Community Planner and Realty Manager
SCDOT	Mr. Doug Frate; Deputy Secretary for Intermodal & Freight Programs Ms. Diane Lackey; Multimodal Planning Manager for Intermodal & Freight Programs
Charleston County Transportation Committee	Mr. Jim Armstrong
Joint Base Charleston	Mr. William Werrell, Community Planner
SC Legislative Delegation	Rep. William Crosby

Table 2 - 2: i-26ALT Technical Advisory Committee

Agency	Representative
Berkeley County	Ms. Alison Simmons; Planning Director Mr. Tom Lewis; County Engineer Mr. Marc Hehn; Deputy Supervisor for General Services
Charleston County Aviation Authority	Mr. Al Britnell; Deputy Director of Administration and Public Safety Mr. Paul Campbell; Director of Airports
City of Charleston	Mr. Christopher Morgan; Planning Division Director Mr. Jacob Lindsey; Planning Director Office of Planning and Sustainability
City of Goose Creek	Ms. Sarah Hanson; Planning and Zoning Specialist Mr. Dennis C. Harmon
City of North Charleston	Ms. Eileen Duffy; Planning and Zoning Department
Coastal Conservation League	Mr. Myles Maland; South Coast Office Director
CSX	Mr. Jim Vanderzee; Regional Development Manager- District 6
Donnelly Foundation	Mr. David Farren; Executive Director Mary Jo Harney; Executive Board Assistant
Dorchester County	Mr. Alec Brebner; Planning and Zoning Manager
Joint Base Charleston	Mr. Al Urrutia; CES/CEVP
Transdev	Ms. Ginger Stevens
Town of Summerville	Ms. Madelyn Robinson; Director of Planning and Economic Development Mr. Russ Cornette; Town Engineer
Town of Mount Pleasant	Mr. Brad Morrison; Director Transportation Department
SCDOT	Mr. David Gray; Regional Planning Manager
SC Ports Authority	Mr. Patrick Moore
Charleston County	Mr. Joel Evans, Planning Director
Charleston Metro Chamber of Commerce	Ms. Courtney Herring
FTA	Ms. Tajsha Lashore; Community Planner
FHWA	Ms. Jessica Heckter; Community Planner and Realty Manage
City of Hanahan	Mr. Johnny Cribb; City Administrator
TriCounty LINK	Mr. Eric Shuler; Operations Manager
Norfolk Southern	Mr. John Edwards Mr. Frank Macchiaverna Mr. Lee Cochran
CSX	Mr. John Dillard
Santee Cooper	Mr. Al Lopez Mr. Ben Flemming Mr. Douglas Dodson
SCE&G	Mr. Daniel Kassis Mr. Cory Touard

2.2 Community Stakeholder Interviews

At the beginning of the process, stakeholder interviews were conducted. Interviews covered a broad range of topics including existing transit, land use and economic development, transportation and infrastructure, alternative modes of transit and possible alignments, station/stop locations, regional and local needs for a successful system, and connections to areas beyond the I-26 Study Corridor. The following provides a list of the public and private stakeholders interviewed.

Table 2 - 3: Stakeholder Interview List

Organization	Representatives
Berkeley County	Frank Carson Eric Greenway Dan Davis
City of North Charleston	Ray Anderson Gwen Moultrie Eileen Duffy James Hutto Wanetta Mallette
City of Goose Creek	Jeff Molinari Sarah Hanson
City of Hanahan	John Cribb Michael Sally
City of Summerville	Madelyn Robinson
Dorchester County	Alec Brebner
Charleston County	Dan Pennick
City of Charleston	Christopher Morgan
Lowcountry Housing Trust	Michelle Mapp Debby Waid Patrick King
MeadWestvaco	John Grab Norman Brody Robert Robbins Brent Gibadlo
Joint Base Charleston	Glenn Easterby Todd Martin
College of Charleston	Stephen C. Osborne Brian McGee
Trident Health	Deb Campeau Vickie Cumming
Force Protection	Tommy Pruitt
Medical University of South Carolina	John Runyon
Trident Technical College	Bob Walker
SC Ports Authority	Barbara Melvin
BOSCH	Thomas Schanz
Boeing	Rick Muttart
Charleston Regional Development Alliance	David T. Ginn
Charleston Southern University	John Strubel

As the study progressed additional interviews were secured as needed with other stakeholders including Norfolk Southern Railways, CSX, etc. Appendix 7-C (I-II) provides summaries of each round of stakeholder interviews.

2.3 Public Meetings

Over the course of the I-26 Fixed Guideway Alternatives Analysis four (4) rounds of public meetings were held at various locations within the study corridor. Each round of public meetings consisted of three (3) meetings held in Summerville, North Charleston and Downtown Charleston. Meetings shared updates on the study's progression, completed analyses, and study results at various milestones of the project. These public meetings also provided the opportunity to receive public feedback at each stage of the study. The following lists the public meetings held:

- Round 1 – November (17, 18, & 19) 2014
  - ***Attendance: 87***
  - Focus on study introduction and study process;
  - Encouraged open dialogue with public to determine the needs and concerns of the community; and
  - Public feedback on current transit system and future transit needs

- Round 2 – April (20, 21 & 22) 2015
  - ***Attendance: 84***
  - Results of Existing Conditions Report;
  - Pre-Screening of conceptual alignments and universe of transit modes; and
  - Public feedback on current transit system and future needs.

- Round 3 – September (24, 28 & 29) 2015
  - ***Attendance: 79***
  - Results of Screen One and Land Use Analyses;
  - Recommended alternatives to advance into Screen Two Analysis; and
  - Public feedback.

- Round 4 – January (25, 26 & 28) 2016
  - ***Attendance: 138***
  - Results of Screen Two Analysis;
  - Recommended LPA to enter into FTA Project Development process; and
  - Public feedback.

A total of 388 people attended all rounds of public meetings. Meeting information/dates were communicated to the public through a press release from the BCDCOG to media outlets including newspaper, radio and television stations; an email announcement sent to the i-26*ALT* project contact database, CHATS and BCDCOG mailing lists, and community leaders; newsletter/flyer distribution at outreach events and CARTA transfer centers; social media posts (Facebook and Twitter); as well as MindMixer and project website calendar announcements. At each public meeting, project staff recorded the source from which persons learnt about the i-26*ALT* meetings in an effort to track the most effective outreach approach and to take corrective action as needed. The sources recorded from meeting attendees included television, radio and newspaper announcements, email invites from the i-26*ALT* project website, municipal and agency (BCDCOG/CARTA/Chamber) calendar posts, Facebook posts, flyers, and word-of-mouth. The most popular sources of meeting/project information originated from newspaper, television and Facebook outlets.

Public meeting formats were consistent throughout the process. Information was organized into various topics and displayed on easy to read meeting presentation boards. Boards were grouped by topic into "stations" and staffed by project team members who served as facilitators. This approach proved effective in disseminating project information in a manageable manner, and also allowed team members to engage the public on a one-on-one basis. The project team also tried to incorporate an interactive exercise at meetings to make meetings more dynamic and further engage participants.

Comment cards were distributed and collected at each public meeting. Comments or feedback collected from these cards have been transcribed and included in the decision-making process. Public Meeting summaries and comments collected are provided in Appendix 7-D (I-V) attached.

2.4 Land Use Workshops

2.4.1 Land Use Subcommittee Workshops I and II

To supplement the Screen One Analysis/Land Use Analysis, the i-26*ALT* team hosted two Land Use Subcommittee Workshops. Workshop participants comprised of members from the Technical Advisory Committee. The intent of the first workshop was to solicit input from local planning professionals regarding the current and future land use and zoning in the region that is supportive and/or prohibitive of transit oriented development. Consideration was given to the following during discussions:

- Transit Oriented Development and existing/future ordinances

- Affordable Housing/Inclusionary Zoning
- TOD incentives for developers
- Public perception of TOD and TOD densities
- Potential corridor alignments
- Station locations and typologies
- Station spacing and quantities
- Infrastructure needs/challenges
- Connections to secondary transit modes
- Vacant/Developable land
- Other potential opportunities and Obstacles for High Capacity Transit

The intent of the second workshop was to present the methodology and findings from the Land Use Analysis and Alignment Rankings to the Land Use Subcommittee for approval and subsequent recommendation to the Joint Steering & Technical Advisory Committee. Consideration was given to the following during discussions:

- Methodology for mapping exercise and Alignment Ranking Matrix
- Each alignment's adjacency to future and existing points of interest
- Each alignment's relationship with existing and future high density areas
- Prohibitive zoning overlays and restrictions
- Potential for Transit Oriented Design (TOD) overlay zones
- AICUZ zones and how they affect TOD
- Significant pockets of developable vacant land
- Environmentally and culturally sensitive areas
- Infrastructure needs/challenges
- Desirable alignments within the Charleston peninsula
- Known and anticipated future development areas
- Other potential opportunities and obstacles for High Capacity Transit

Workshop summaries and resources are provided in Appendix 7-E (I-II).

2.4.2 Developer Workshop (See Land Use Transit Talk)

The Urban Land Institute, in conjunction with the project team, hosted an invitation-based roundtable discussion for developers, ULI committee members, and other real estate professionals to review alignments/proposed station locations, typical densities, etc. with the goal of identifying alignments and areas perceived to have the greatest potential for TOD. The discussion was facilitated by TOD expert Marilee Utter, Executive Vice President, District / National Councils, ULI, who offered a unique perspective due to her work in diverse communities nationwide. The workshop was followed by a panel discussion that was open to the public and featured project team leaders and developers from the prior workshop discussion.

2.5 Transit Talks

2.5.1 Environmental and Community Organizations Transit Talk

A livability transit talk was held on April 14, 2015 and focused on bringing together a mix of environmental and community organizations throughout the study area to discuss how transit can preserve and enhance the natural and human environment along the I-26 Corridor connecting Summerville, North Charleston, and Charleston. The intent of the transit talk was to inform these organizations about the study, as well as solicit input regarding the mobility needs and concerns of these groups. There were 16 in attendance at this breakfast meeting. The groups represented included:

- Charleston Moves

- CARTA
- City of Charleston
- City of Mount Pleasant
- Dorchester County
- Coastal Conservation League
- League of Women Voters
- HungryNeck Straphangers
- Private Citizens

See Appendix 7-F (I) for summary of Environmental and Community Organizations Transit Talk.

2.5.2 Land Use Transit Talk (See Developer Workshop)

The Land Use focused transit event held on April 30, 2015 was comprised of a Developer's Workshop hosted by the Charleston Chapter of the Urban Land Institute (ULI) and a public forum held at the Charleston Museum. The Developer's Workshop provided an opportunity to engage the development community about the role of transit in the region. Marilee Utter of the Urban Land Institute served as the moderator of the event. As an expert in Transit Oriented Development (TOD), she shared her experience with TOD and the transit-land use relationship. There were 12 attendees representing the following organizations:

- Urban Land Institute
- City Volve
- Grambling Brothers
- Middle Street Partners
- SC Community Loan Fund
- Dorchester County
- The I'On Group
- CC&T Real estate
- Stone Street Capital
- The Beach Company
- Greystar
- Nexsen Pruet

Major take-aways from this workshop include:

- Major growth will occur along I-26 where land is available; primarily from outside I-526 and beyond Summerville.
- The Summerville area will become a major employment/activity center in the region, which will impact commute patterns, more particularly, create a reverse commute.
- The Park Circle and Upper Peninsula areas were identified as having TOD development opportunity.
- Major corridors identified that could support transit include:
- Old Trolley Road to Dorchester Road to Magnolia, Peninsula, and MUSC
- US 78 to Rivers Avenue, McMillan-Shipwatch and Morrison Drive.
- The Rivers Avenue corridor was the most commonly accepted corridor to support high capacity transit.
- North Charleston offers a potential opportunity for TOD zoning districts since the city has a tendency to be pro-growth.
- The group identified Rivers Avenue from Montague to Reynolds Avenue as a prime segment to implement as a first phase in implementing a fixed guideway.

See Appendix 7-F (II) for summary of Land Use Transit Talk.

2.5.3 Business Transit Talk

The business focused Transit Talk, *Transit Makes Good Business*, was held on May 5, 2015 at the Montague Terrace in North Charleston. This forum focused on how transit and business can successfully partner to improve access to jobs and boost our regional economy and competitive advantage. The goal of the transit talk was to better understand what matters most to business/employees in terms of employee mobility, congestion, parking, etc. and identify obstacles and opportunities for transit along the I-26 Corridor as an alternative. Approximately 41 people attended the event.

A panel discussion was held with representatives from business/organizations that have successfully partnered to provide transit alternatives to their employees. Panelists included:

- Perrin Lawson, Deputy Director, Charleston Area Convention & Visitors Bureau: Supporting the Tourism Industry – How Transit Serves Tourism in our Region
- Mike Graney, VP Global Business Development, Charleston Regional Development Alliance: Maintaining a Competitive Edge - Transit's Role when Industries Consider our Region
- John Runyon, Director, Business Services, Medical University of South Carolina: Leveraging Employee Parking with Transit – MUSC's Partnership with CARTA
- Raymond Smith, Director of Human Resources, Santee Cooper: Building Successful Partnerships - Santee Coopers iRide Program and Partnership with TriCounty Link
    - Major take-away from this forum included:
- Major challenges in our region are -
    - Geographic: Our region has unique geographic challenges, i.e. rivers and waterways that do not lend themselves to a traditional "hub & spoke system". We do not have a central city with surrounding suburbs, and as a result, growth tends to be linear.
    - Cultural: Transit is not part of our community culture. People are attached to their cars and do not have confidence in the transit system. In other cities, transit is more culturally accepted.
- Industrial jobs will continue to grow, and the I-26 corridor it will expand, since environmental limitations prevent growth in other directions.
- Currently, manufacturing/industrial is main industry looking at the region, but 3-5 years from now, the IT cluster/creative cluster is anticipated to grow, which will bring a workforce looking for transit alternatives. The region needs to be on top of it today to be ready for that market.
- Access to talent is the number one priority. Are there workers with skills/capacity to do the job and will the talent be attracted to this region if coming from a metropolitan area with a robust transit system?
- The corridor needs to be efficient and predictable.

Developer Workshop attendees in a lively discussion

See Appendix 7-F (III) for summary of the Business Transit Talk.

3 Community Outreach (Festivals and Events)

3.1 Transit Rider Outreach

The project team performed in-field visits to the two most heavily utilized stops in the CARTA system; the North Charleston SuperStop and the Mary Street Transfer Center in Downtown Charleston. Two visits were made at each location in November 2014 and April 2015 during an AM period (8:30 AM – 10:30 AM) and PM period (3:00 PM – 5:00 PM). Project staff members spoke to transit riders about their experiences with the current CARTA system, as well as their impressions of what worked well with the system and what needed improvement.

Staff also utilized these transit center visits as an opportunity to share I-26ALT informational flyers, newsletters, on-line engagement opportunities (twitter, Facebook, MindMixer) and advertising for upcoming project public meetings.

Comments collected at this outreach effort provided useful information in developing the CARTA Comprehensive Operational Analysis (COA). Comments ranged from route specific recommendations to systemwide suggestions. The following presents a general summary of the most common themes recorded:

Project staff speaking to riders at the Mary Street Transfer Center

- Routes need to be more frequent and reliable.
- Neighborhood routes 13, 102, 103, and 104 need to operate on Sundays.
- Routes need to operate later evening hours. Many routes stop operating too early. The Route 10 – Rivers Avenue operates until 12 midnight; however, riders are unable to connect to other routes because they are not operating at that time. Later service will also serve the many service workers who work late night shifts.
- More express service is needed from Summerville, Goose Creek, and Moncks Corner.
- The express service routes 1, 2, and 3 work well.
- West Ashley needs more service (increased frequency and longer operating time).
- CARTA needs to better advertise their service. Bus stop signage needs to be more noticeable. Stops need more shelter/bench infrastructure. System maps are difficult to understand.
- Rivers Avenue is not a pedestrian friendly corridor.
- Light rail and commuter rail might be best for the region to move people from Summerville to Charleston.
- Need buses that serve the beaches in the area.

3.2 Black Expo

The i-26*ALT* project team secured a booth at the Charleston Black Expo event on March 14, 2015. The study team focused on sharing information about the purpose of the I-26 Fixed Guideway Alternatives Analysis as well as gaining input from the community on their vision for transit in the Charleston region.

The following comments were recorded:

- Please run the Route 10 - Rivers Ave. from 10 PM – 12 PM. People are still working these times, later on Sunday night.
- Don't use current system because it does not come to my neighborhood.
- Current transit is more convenient in downtown areas.
- Need to have better signs and shelters/benches for users.

- Service need to more frequent and on time.
- Need to focus on connecting Summerville to North Charleston since North Charleston is becoming the new "Midtown" employment area for the region.

3.3 MUSC and North Charleston Earth Day

i-26*ALT* was a part of both the North Charleston and MUSC Earth Day events. Project team staff took the opportunity to not only educate the public about the I-26 Fixed Guideway Alternative Analysis Study, but also gather feedback from participants about their vision for transit in the region.

Project materials provided information on the transit technologies proposed for the corridor (Bus Rapid Transit, Light Rail Transit, Commuter Rail and Express Bus) and the various alignments that were under consideration. The public were able to comment on their preferred alignment and transit mode or suggest additional alignments or modes that should be included in the study. Comments were also collected about the current transit system.

North Charleston Earth Day event booth set-up.

General comments gathered at these events include:

- There is a need to develop better east-west circulators in Mount Pleasant and West Ashley.
- Need to introduce express service from the Goose Creek area.
- Many MUSC employees work non-typical schedules on Friday (half-day or short-workday). These workers usually drive on Friday so they can leave earlier than normal. It might be beneficial to operate express service during the midday period or offer an earlier express service trip on Friday afternoon.
- In general, CARTA needs to offer more express service and more park-and-ride locations. There needs to be an express bus directly from Summerville.
- CARTA should operate a route to Summerville and Goose Creek, even if it is every 60 minutes.
- Commuter rail service from Summerville will be great.
- The region needs a commuter rail system if it is reliable, efficient, and cost effective.
- Should provide a park-and-ride facility on James Island to serve the Harborview Community.
- West Ashley needs more or better routes especially with the elderly community in the area. Frequency on West Ashley routes need to be increased.
- Trolleys produce considerable noise pollution.
- Rivers Avenue would be the best alignment for mass transit because it is currently used throughout the day.
- Pedestrian and bike infrastructure needs to be improved.
- Roper Hospital employees benefit from the CARTA express service. CARTA and Roper Hospital need to develop a partnership.
- The MUSC community loves the express service. Express Route #2 works very well.

4 Project Newsletters

A project newsletter was created and published quarterly during the study period. Newsletters provided project updates and analyses results/summaries, and advertised upcoming meetings, engagements or project next steps.

Newsletters were posted to the i-26*ALT* website, send as an email blast to the CHATS, BCDCOG and i-26*ALT* project mailing lists, and distributed at outreach events and public meetings. Newsletters were distributed at the following events/locations:

- Charleston Black Expo
- MUSC and North Charleston Earth Day Events
- Mary Street Transfer Center
- CARTA SuperStop (North Charleston)
- College of Charleston

Project newsletter issues are provided in Appendix 7-G (I-IV).

5 Project Website

The project website www.i26alt.org was created at the beginning of the I-26 Fixed Guideway Alternatives Analysis Study. The website provides the public or interested parties with study information covering the project overview, description and purpose with supporting maps, photos and renderings; meeting calendar; project surveys; links to social media sites (Facebook and Twitter); links to other relevant plans and studies; as well as an archive of project resources including:

- Steering and Technical Advisory Committees meeting agendas, presentations, and meeting minutes;
- Public meeting presentations, meeting resources, and meeting summaries;
- Project workshops and transit talk summaries and presentation materials;
- Project newsletters; and
- Study technical documents/reports.

The following Figures 5-1 through 5-4 show the daily website activity by project phase.

Figure 5 - 1: Website Activity – October 1, 2014 to January 31, 2015

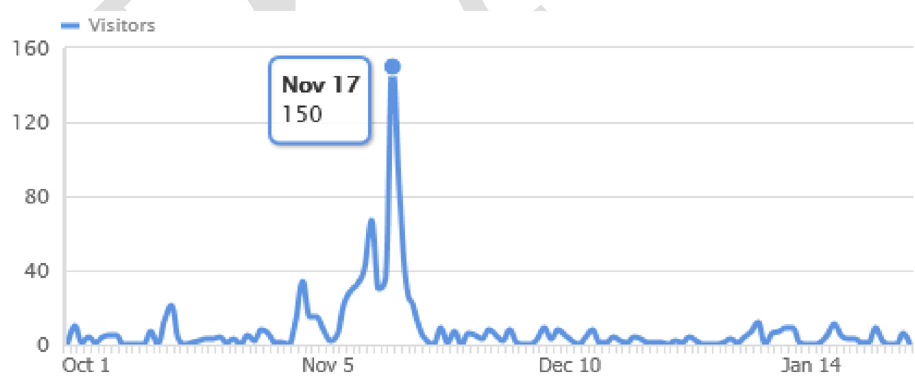


Figure 5 - 2: Website Activity – February 1, 2015 to May 31, 2015

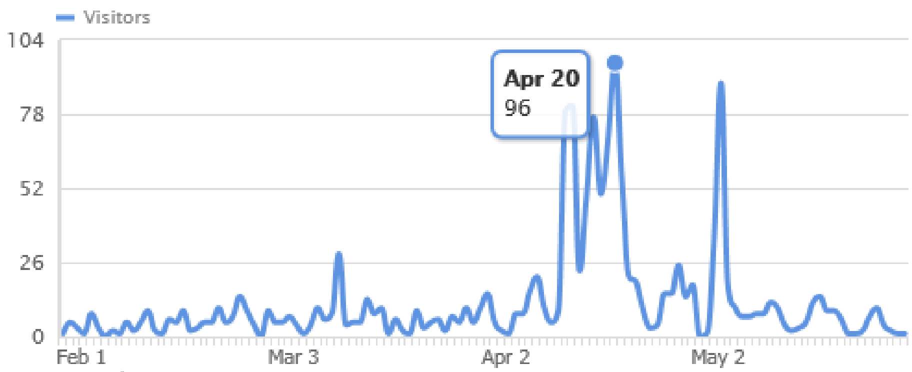


Figure 5 - 3: Website Activity – June 1, 2015 to September 30, 2015

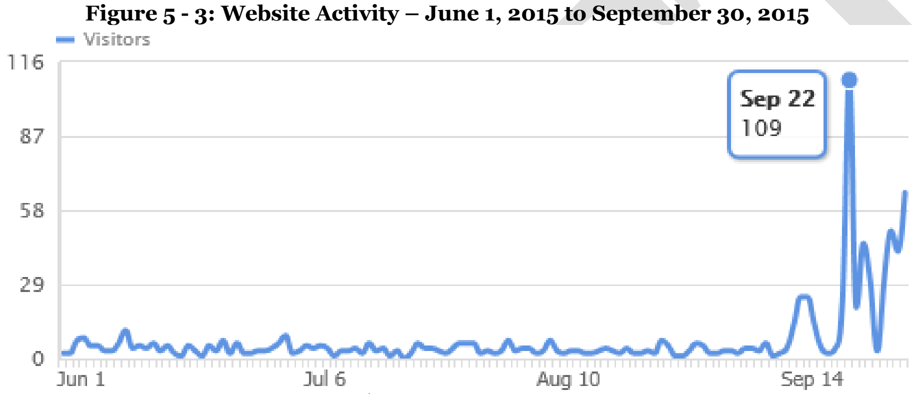
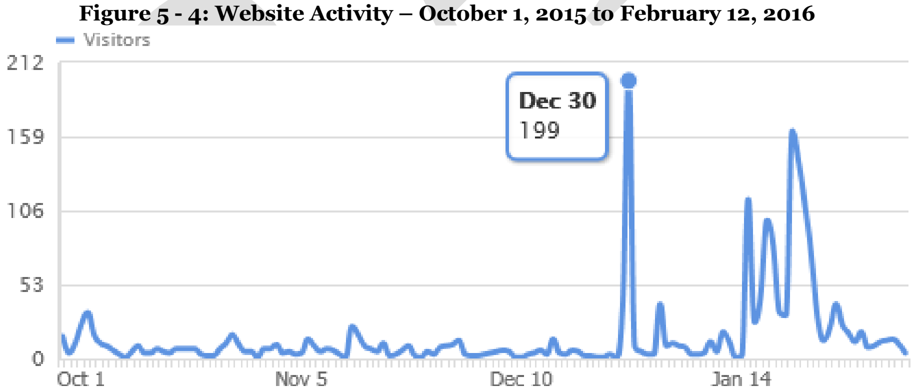


Figure 5 - 4: Website Activity – October 1, 2015 to February 12, 2016



6 Survey Efforts

During the winter 2015 (January –February) an Employer Survey was administered to better understand the behavior, attitudes, and preferences of the commuting public in the region (employees and students) and to identify the unmet travel needs of commuters. Study team partner RSG, developed and administered an online based survey to employers and universities in the I-26 corridor. A total of 63 business and organizations were contacted to partake in the survey effort of which 23 participated (Figure 6-1).

In total, 2,083 surveys were completed and 1,756 were considered valid and usable. Table 6-2 provides a summary of the survey completion rate of participating businesses/organizations. For a more in-depth look at the results of the Employer Survey see the *I-26 Fixed Guideway Alternatives Analysis: Employer Study Report* (Appendix 1-C).

Figure 6 - 1: Contact and participation list of businesses and organizations

CONTACTED BUSINESSES AND ORGANIZATIONS	PARTICIPATED IN STUDY
AT&T	
BAE Systems	
Bayview Aviation	
BCD Council of Governments	×
Berkeley County School District	
Bird William M & Co Inc	×
Blanchard Rental Svc	×
BOEING Charleston	
Charleston Area Convention and Visitors Bureau	×
Charleston County	×
Charleston County School District	
Charleston Hospitality Association	
Charleston International Airport	×
Charleston Marriott	
Charleston Place	
Charleston Southern University	
Citadel Military College of SC	×
City of Charleston	
City of North Charleston	
Coastal Center	
College of Charleston	×
Cummins Turbo Technologies	
Detyens Shipyards Inc	
Dorchester County School District 2	
Embassy Suites-Charleston	×
General Dynamics Land Systems-Force Protection	
Hill-Rom	
IFA Rotorion	
IHG Reservation Office	
Integrated Health Svc	
Joint Base Charleston	×
KapStone Charleston Kraft	×
Mahle Behr	
McKesson Corp	
Mead Westvaco Community Development and Land Management	×
Mead Westvaco Packaging Systs	×
Medical University of South Carolina	×
MWV Specialty Chemicals	×
Palmetto Lowcountry Behavioral	
Post & Courier Newspaper	
Ralph H. Johnson VA Medical Center	
Renaissance	
Robert Bosch Corp	×
Roper/ St. Francis	
SAIC	×
Salisbury by Honeywell Safety	
Sam's Club	
Scientific Research Company	×
SCRA	×
Solvay	

CONTACTED BUSINESSES AND ORGANIZATIONS	PARTICIPATED IN STUDY
South Carolina Federal CU	
South Carolina Ports Authority	×
Summerville Medical Ctr	
TorqTek USA	
Town of Summerville	×
Trident Medical Center	×
Trident Technical College	×
Verizon Wireless	
Village of Summerville	
VT Group	
Wal-Mart Centre Pointe Dr	
Wal-Mart North Charleston	
Wal-Mart Summerville	

Figure 6 - 2: Completion rates of participating businesses and organizations

BUSINESSES AND ORGANIZATIONS	# OF COMPLETED SURVEYS
Joint Base Charleston	473
College of Charleston	461
Medical University of South Carolina	147
Scientific Research Company	136
MWV Specialty Chemicals	99
Citadel Military College of SC	74
Charleston County	56
KapStone Charleston Kraft	53
SCRA	49
Charleston International Airport	36
Charleston Area Convention and Visitors Bureau	26
Bird William M & Co Inc	18
BCD Council of Governments	15
Mead Westvaco Packaging Systs	12
Embassy Suites-Charleston	9
Town of Summerville	7
South Carolina Ports Authority	6
Blanchard Rental Svc	4
SAIC	2
Mead Westvaco Community Development and Land Management	1
Robert Bosch Corp	1
Trident Medical Center	1
Trident Technical College	1
Other employer/school	69
Total	1,756

7 Speakers Bureau

Project team members were available throughout the project to speak at community meetings. Periodic updates were provided to the CHATS Policy Committee, BCDCOG Board of Directors, and CARTA Board of Directors. Additional speaking engagements and attendance included the Solvay Community Advisory Panel, *"Ride to Lunch – Lunch and Learn Conversation About Transit"* and *"Transit: Show Me the Money"* with the League of Women Voters of South Carolina and League of Women Voters of the Charleston area, *"The Truth about SC Roads"* hosted by the Charleston Metro Chamber Young Professionals, The Town of Mount Pleasant's Coffee with Mayor Page, and the Charleston Partners for Clean Air Conference.

8 Media Relations

All project public meetings, and project hosted events (Transit Talks) were announced through an official press release developed by the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) and distributed to the BCDCOG's media list. Email reminders were also sent to local television and radio stations prior to meeting/event dates.

Media outlets and organizations that have covered i-26*ALT* include:

Newspapers –

- **The Summerville Journal Scene**
  - "Future bus rapid transit system a possible traffic reducer for Lowcountry" (February, 2016) http://www.journalscene.com/article/20160203/SJ01/160209890/1059
  - "I-26 Alt garnering interest" (November, 2014) http://www.journalscene.com/article/20141121/SJ01/141129929/1059

- **Post and Courier**
  - "Bus rapid transit proposed as best alternative to I-26 traffic", (January, 2016) http://www.postandcourier.com/article/20160123/PC16/160129813
  - "Moving ahead on I-26 alternative", (September, 2015) http://www.postandcourier.com/article/20150920/PC1002/150929944/1506/moving-ahead-on-i-26-alternative
  - "Public meetings on alternative transit for I-26 scheduled" (April, 2015) http://www.postandcourier.com/article/20150417/PC16/150419420
  - "Trains or bus lanes? Million-dollar study looks for alternatives to I-26 commute"(July, 2014) http://www.postandcourier.com/article/20140706/PC16/140709678/1382

- **Moultrie News**
  - "I-26 Alt study meeting set for next week" (January, 2016) http://www.moultrienews.com/article/20160122/MN01/160129867/1014
  - "Three public input meetings for CHATS I-26 Alternatives Analysis Study announced" (November, 2014) http://www.moultrienews.com/article/20141118/MN01/141119714/1001

- **Charleston City Paper**
  - "Rapid-transit bus system from Summerville to downtown aims to ease traffic" (January, 2016) http://www.charlestoncitypaper.com/TheBattery/archives/2016/01/27/rapid-transit-bus-system-from-summerville-to-downtown-aims-to-ease-traffic

Television –

- News 2. “Bus Rapid Transit a possibility to alleviate Summerville to Charleston traffic” (January 2016) http://counton2.com/2016/01/21/bus-rapid-transit-a-possibility-to-alleviate-summerville-to-charleston-traffic/
- News 4. “$365 million plan to lighten I-26 traffic would focus on more buses” (January 2016) http://abcnews4.com/news/local/365-million-plan-to-lighten-i-26-traffic-would-focus-on-more-buses
- News 5. “Public invited to meetings on I-26 congestion outside Charleston” (September 2015) http://www.live5news.com/story/30104613/meetings-focus-on-i-26-congestion-outside-charleston
- News 10. “Bus route proposed to rum from Summerville to Charleston” (January 2016) http://www.fox10tv.com/story/31064482/bus-route-proposed-to-run-from-summerville-to-charleston
- News 19. “Final meeting scheduled to discuss alternative transit on I-26” (January, 2016) http://www.fox19.com/story/31055532/final-meeting-scheduled-to-discuss-alternative-transit-on-i-26

Organizations –

- Charleston Young Professionals
- Charleston Metro Chamber of Commerce
- Berkeley Chamber of Commerce
- Berkeley-Charleston-Dorchester Council of Governments
- Town of James Island
- City of Goose Creek
- Charleston County School District
- Coastal Conversation League
- Medical University of South Carolina
- Town of Summerville
- Dorchester County

9 On-Line/Social Media Engagement

9.1 MindMixer

On April 11, 2015, i-26*ALT* launched *Imagine an Alternative to Traveling I-26,* a new and innovative community engagement website developed by MindMixer. This online community engagement tool allows the project team to stay connected with the public throughout the process. Citizens are able to connect, communicate and collaborate with community decision makers and other residents on the I-26 Fixed Guideway Alternatives Analysis. Through the site, the project team posted various polls, surveys, and idea submittals that have gathered feedback on topics such as identifying the region's top transit priority, current transit system improvements, possible fixed guideway alignments, and preferred transit modes. The site was also utilized to advertise upcoming project meetings and to announce new project document postings and availability via www.i26alt.org.

A QR Code was created to promote the MindMixer site (i26alt.mindxmixer.com) and was used on all project handouts and outreach material.

As of February 2016, since its launch, the project's MindMixer Website has had a total of 492 participants, with 192 participants considered active. To date, the site has received 19,911 page views and 6,601 unique visitors. The site has also been shared by participants to Facebook, Twitter, Email and LinkedIn. Appendix 7-H provides a comprehensive report of the i-26*ALT* project MindMixer poll and survey results, as well as participants' comments and idea submittals.

9.2 Facebook

i-26*ALT* created a Facebook page to leverage the Internet and social media to increase the project's reach, exposure and access to the public. The page generated 144 fans and 1,965 unique people reached. Of the people reached 13% originated from Charleston; 7% from North Charleston; 2.5% from Summerville; 3% from Goose Creek; and 7% from Mt. Pleasant.

9.3 Twitter

In November 2014, i-26*ALT* joined the Twitter community (@I26ALT). Since its introduction @I26ALT has generated 235 tweets and 190 followers to date (February 2016). This social media resource was used to inform the public about project public meetings or events; cross-promoted other project resources including the project website and MindMixer site; provided information on related studies or relevant articles of interest; facilitated real-time engagement; and leveraged the on-line community through the network of followers to expand the project's reach and exposure.

TWEETS	FOLLOWING	FOLLOWERS	LIKES
235	438	190	178

APR 2015 SUMMARY

Tweets 42	Tweet impressions 7,183
Profile visits 1,208	Mentions 35
New followers 28	

On average the i-26*ALT* Twitter profile received 300-400 monthly visits, with major spikes occurring during months when public meetings were held. The profile averaged 22 mentions and 700 visits during the public meeting months of November 2014, April 2015, September 2015 and January 2016. The most productive month of activity occurred during the April 2015 round of community meetings which recorded 1,200 visits, 7,000 impressions and 35 mentions. Major followers of @I26ALT include the City of Charleston, John Tecklenburg - Major of Charleston, the City of North Charleston, Charleston Promise (neighborhood group); Upper Peninsula Initiative; ABC News 4, and a number of local community media groups.

Real-time interaction

I-26 ALT @I26ALT

Great turnout already! Still time to come out. Presentation will start in 15 minutes.

Public Meeting announcement

I-26 ALT @I26ALT

Our third round of public meetings are coming up. @SummervilleSC on 9/24, Downtown CHS 9/28, & @NorthCharleston on 9/29.

Tool to educate and inform the community

I-26 ALT @I26ALT

As Jacksonville opens one BRT phase, FTA funds another - Department of Transportation transportation.gov/fastlane/fta-f... via @AddThis

Cross-promotion between Twitter and MindMixer

I-26 ALT @I26ALT

In 2014 Charleston commuters spent an average of 41 hours delayed in traffic. Yikes. i26alt.mindmixer.com

RETWEETS 3 LIKE 1

10 List of Appendices

Appendix 7-A: i-26*ALT* Public Involvement Plan

Appendix 7-B: i-26*ALT* Joint Steering and Technical Advisory Committee Meeting Summaries

Appendix 7-C: i-26*ALT* Stakeholder Interviews

Appendix 7-D: i-26*ALT* Public Meeting Summaries and Collected Public Comments

Appendix 7-E: i-26*ALT* Land Use Workshop Summaries

Appendix 7-F: i-26*ALT* Transit Talk Series Summaries

Appendix 7-G: i-26*ALT* Project Newsletters

Appendix 7-H: MindMixer Public Engagement Summary Report

Appendix 7-A

(i-26*ALT* Public Involvement Plan)

Appendix 7-B

I. i-26*ALT* Joint Steering and Technical Advisory Committee Meeting Summary (October, 2014)
II. i-26*ALT* Joint Steering and Technical Advisory Committee Meeting Summary (March, 2015)
III. i-26*ALT* Joint Steering and Technical Advisory Committee Meeting Summary (July, 2015)
IV. i-26*ALT* Joint Steering and Technical Advisory Committee Meeting Summary (January, 2016)

Appendix 7-C

I. i-26*ALT* Stakeholder Interview Summaries (Round 1)
II. i-26*ALT* Stakeholder Interviews Summaries (Round 2)

Appendix 7-D

Appendix 7-E

I. Land Use Subcommittee Workshop I Summary
II. Land Use Subcommittee Workshop II Summary

Appendix 7-F

I. i-26*ALT* Environmental and Community Organizations Transit Talk Summary
II. i-26*ALT* Land Use Transit Talk Summary
III. i-26*ALT* Business Transit Talk Summary

Appendix 7-G

Appendix 7-H

(MindMixer Public Engagement Summary Report)

i-26ALT

I-26 Fixed Guideway Alternatives Analysis

CHAPTER VIII: Recommended Alternative

Draft Report – February 2016

DAVIS & FLOYD
FOR INFORMATION
SINCE 1954
DAVISFLOYD.COM
PROFESSIONAL ENGINEERING

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1 Overview

As a result of a 15-month study with the purpose to identify a fixed guideway transit alternative that will improve transit service and enhance regional mobility along the 22-mile I-26 Corridor connecting Summerville, North Charleston, and Charleston, the preferred alternative recommended to move forward into further project development is Alternative B-1: bus rapid transit (BRT) along the US 78/US 52 (Rivers Avenue) alignment to a terminus at Line Street.

Based on a three-tiered screening process of transit modes and potential alignments, as well as a public outreach program that included stakeholders and community members, Alternative B-1 ranked highest across all of the alternatives under consideration in terms of meeting the purpose and goals of the project.

Goal 1: Improve Mobility, Safety, Accessibility and Connectivity of the Transit System and Region

CARTA's Route 10, which operates along the B-1 alignment from Trident Health to Downtown Charleston, is the most productive route in the system, carrying approximately 25 percent of the system's riders each year. Express Route 1, which serves a park & ride at Rivers and Otranto and connects to Downtown Charleston, is the most heavily used express route in CARTA's system and carries 50 percent of the express riders per year. As a result of traffic congestion and rail traffic, both routes have suffered with on-time performance. Travel time from one end to the other on Route 10 takes over an hour. The BRT alternative is anticipated to reduce travel time to approximately half of that. CARTA's two most active stops and primary transit hubs are located along this alignment: the North Charleston SuperStop at Rivers and Cosgrove, and the Mary Street Transfer Center in Downtown Charleston. Both of these facilities are at capacity with approximately 14 buses per hour serving facilities designed to accommodate two buses at a time. Alternative B-1 proposes new transit hubs at Rivers & McMillan and Meeting & Line to accommodate the BRT service as well as connecting transit routes. Additionally, the B-1 alignment serves the North Charleston Passenger Intermodal Center, which is under development and will provide multi-modal connections to Amtrak, CARTA, and intercity bus service. This is a joint project between the City of North Charleston and CARTA and is located at Rivers & Durant. The B-1 alignment also extends transit service along US 78 to Summerville and creates new park & ride connections that do not currently exist today.

Goal 2: Provide a Cost Effective and Financially Feasible Transit Alternative

Among the bus and rail alternatives, Alternative B-1 ranked the highest in terms of cost effectiveness with annualized capital and operating costs per trip estimated to be under $10. Additionally, right-of-way availability along US 52 (Rivers Avenue) is abundant, minimizing the acquisition costs of land. Bus is compatible with the current regional transit operations, and the flexibility to circulate downtown outside of the alignment increases the viability of the system.

Goal 3: Support Local Land Use Objectives

The B-1 alignment along US 78 and US 52 serves the most employment along the corridor. With input from a land use technical sub-committee and focus groups with the Urban Land Institute and regional developers, this corridor was identified as the most receptive to future growth and transit supportive development. Several of the station area locations have been identified for redevelopment and classified as transit nodes in regional and local planning studies. Additionally, multimodal connectivity for pedestrians and bicyclists along Rivers Avenue has been identified as a limiting factor for transit usage and higher density development, which can include affordable housing. A BRT transit investment is considered a means to support and enhance multiple modes along this corridor.

Goal 4: Plan for Projected Growth in an Environmentally Sustainable Manner

The Charleston region is rich in natural, cultural, and historic resources, which make the area attractive to new business and residents alike. However, these resources also limit mobility, as investment in new infrastructure is constrained by waterways and historic buildings. An environmental focused discussion revealed a desire to include regional transit as a means to preserve these resources. Much of the B-1 alignment operates along a corridor that has been developed, predominately as suburban sprawl. Many of the development sites, particularly in the Neck Area, are grey- or brownfield sites that require some level of clean up. Additionally, Alternative B-1 has a positive cost benefit in terms of reduction in air quality emissions, energy use, and greenhouse gas emissions.

Goal 5: Respond to Community Needs and Support

In addition to providing a faster alternative to commuters with access to a vehicle, the B-1 Alternative also increases the number of riders on the transit system that have no access to a vehicle. Through an extensive public outreach program that included public meetings along the corridor, attendance at festivals and events, as well as a focus group discussion with community organization leaders, the BRT alternative was recognized as one that could be implemented at a lower cost than rail and under a faster timeline, which was considered a priority.

Goal 6: Support a Diverse Regional Economy

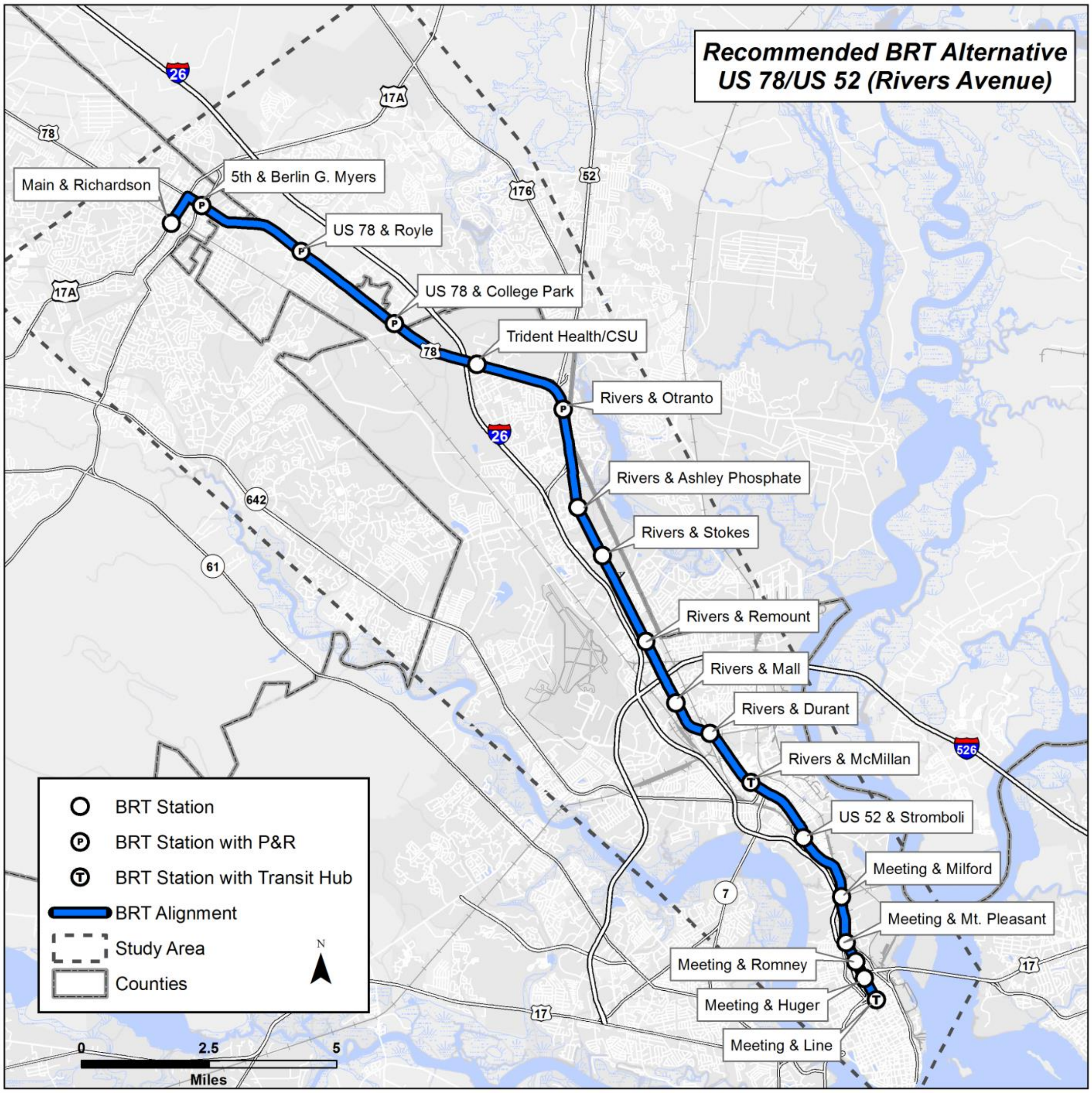
The Charleston Region has seen tremendous growth in its economy across many markets. With the addition of Boeing in North Charleston, a growing port in the City of Charleston, and major industry moving to Summerville and beyond, roadway capacity along the I-26 corridor is constrained. Additionally, other existing and emerging market sectors, such as Joint Base Charleston and an emerging technology market, as well as major medical centers and universities located along the corridor recognize the need to provide multimodal alternatives to ensure employees have access to jobs and affordable housing. Along with the local population, approximately five million visitors travel to the region per year. A business focused panel discussion and survey of employees working along the corridor revealed the need for a flexible and reliable alternative for commuters. Future and existing employment nodes are located along the B-1 alignment, and mixed use development has already been identified at several of the proposed station areas, for example stations are proposed at or near the Upper Peninsula District and Magnolia Development in Charleston, Shipwatch Square and Mixson in North Charleston, and Nexton in Summerville.

With these goals in mind and to conclude the i-26*ALT* study, this chapter provides an overview of the recommended alternative alignment and operating characteristics of the fixed guideway system. A summary of the recommended transit network as well as next steps are also provide.

2 Alignment

The recommended BRT alternative begins at Richardson and N. Main Street (US 17A) in downtown Summerville. Southbound trips travel northwest on Richardson Street, northeast on S. Cedar Street, and southeast on W. Doty Street to access N. Main Street. From N. Main Street, the alignment travels northeast and turns southeast on US 78 to North Charleston. The alignment merges south onto US 52 (Rivers Avenue) and continues southbound via Rivers Avenue, Carner Avenue, and Meeting Street into downtown Charleston where the alignment ends at Meeting Street and Line Street. From Line Street, the route turns around to continue northbound via the same alignment.

Figure 2 - 1: Recommended Alternative - BRT along US 78/US 52 (Rivers Avenue) to Line Street



3 Station Areas

The study team completed a land use analysis and through a technical sub-committee identified generalized station area locations along the corridor. During the next phase of project development, this process will be continued to further refine the locations of the station areas and respective land use and policies needed to incorporate transit oriented development and parking as appropriate. The following table shows the generalized station area locations, station type, and forecasted ridership at each in FY2015 and FY2035. Figures 3-1 and 3-2 provide an aerial of the station areas and their current forecasted employment and population for 2010 and 2040 as provided in the BCDCOG regional travel demand model.

Table 3 - 1: Recommended Alternative –Proposed Station Areas

Station	Station Type	Forecasted Ridership	
		Alt. B1 (2015)	Alt. B1 (2035)
Main St - Richardson Ave	Urban Center	551	550
E 5th St N - Berlin Pkwy	Park & Ride	806	869
US 78 - Royle Rd	Park & Ride	426	437
US 78 - College Park Rd	Park & Ride	370	409
US 78 - I 26 (Trident Health)	Activity Center	156	187
Rivers Ave - Ontario Blvd	Park & Ride	556	640
Rivers Ave - Ashley Phosphate Rd	Activity Center	257	283
Rivers Ave - Stokes Ave	Activity Center	193	196
Rivers Ave - Remount Rd	Airport	521	574
Rivers Ave - Mall Dr	Activity Center	392	441
Rivers Ave - Durant Ave	Intermodal Center	241	277
Rivers Ave - McMillan Ave	Transit Hub	630	740
US52 - Stromboli Ave	Neighborhood	176	193
Meeting St - Milford St	Neighborhood	122	192
Meeting St - Mt Pleasant St	Transit Hub	231	258
Meeting St - Romney St	Neighborhood	99	109
Meeting St - Huger St	Activity Center	191	214
Meeting St - Line St	Transit Hub	957	1,126
Total		**6,874**	**7,696**

Figure 3 - 1: Recommended Alternative Station Area Land Use (US 78 Segment)

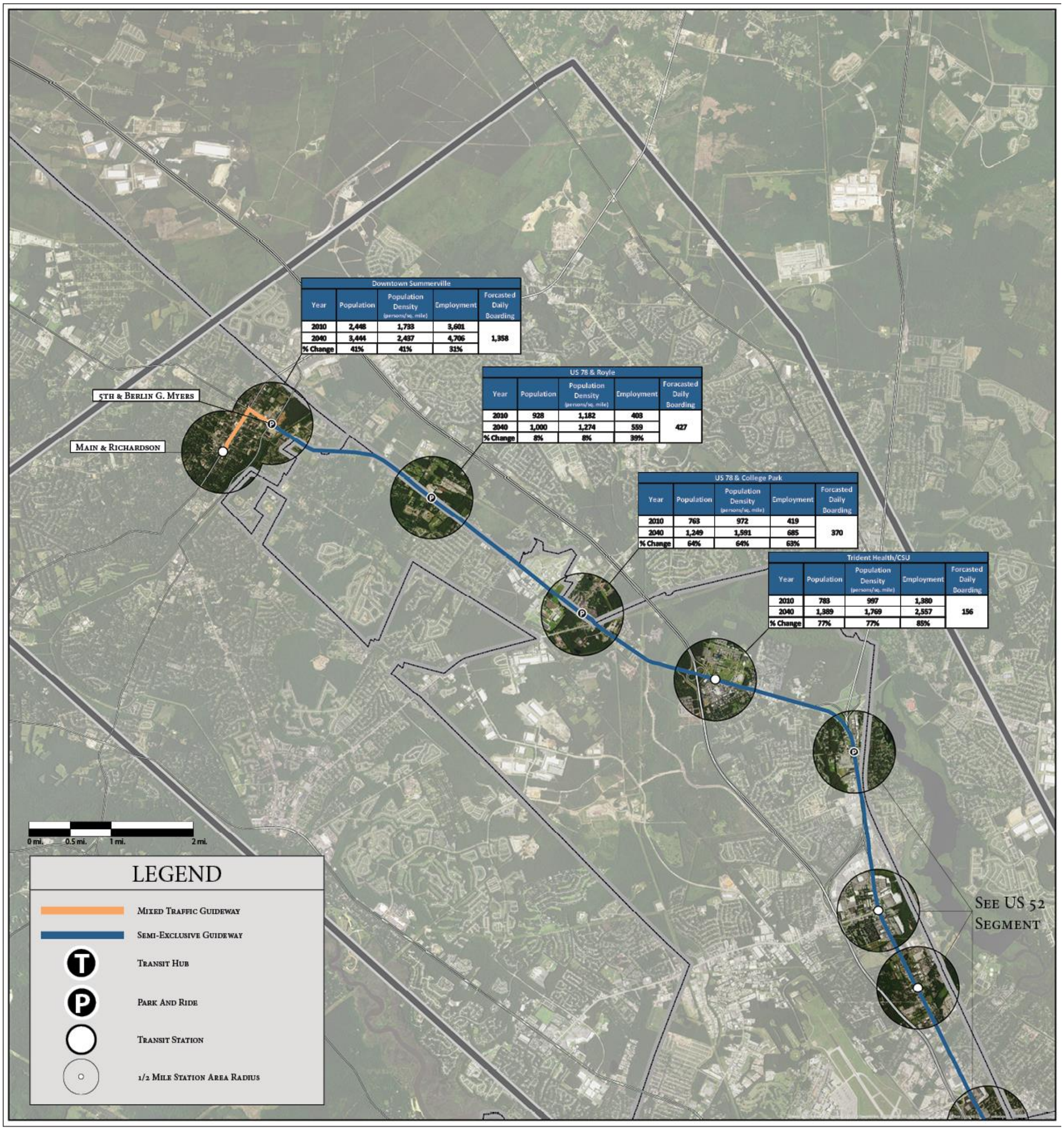
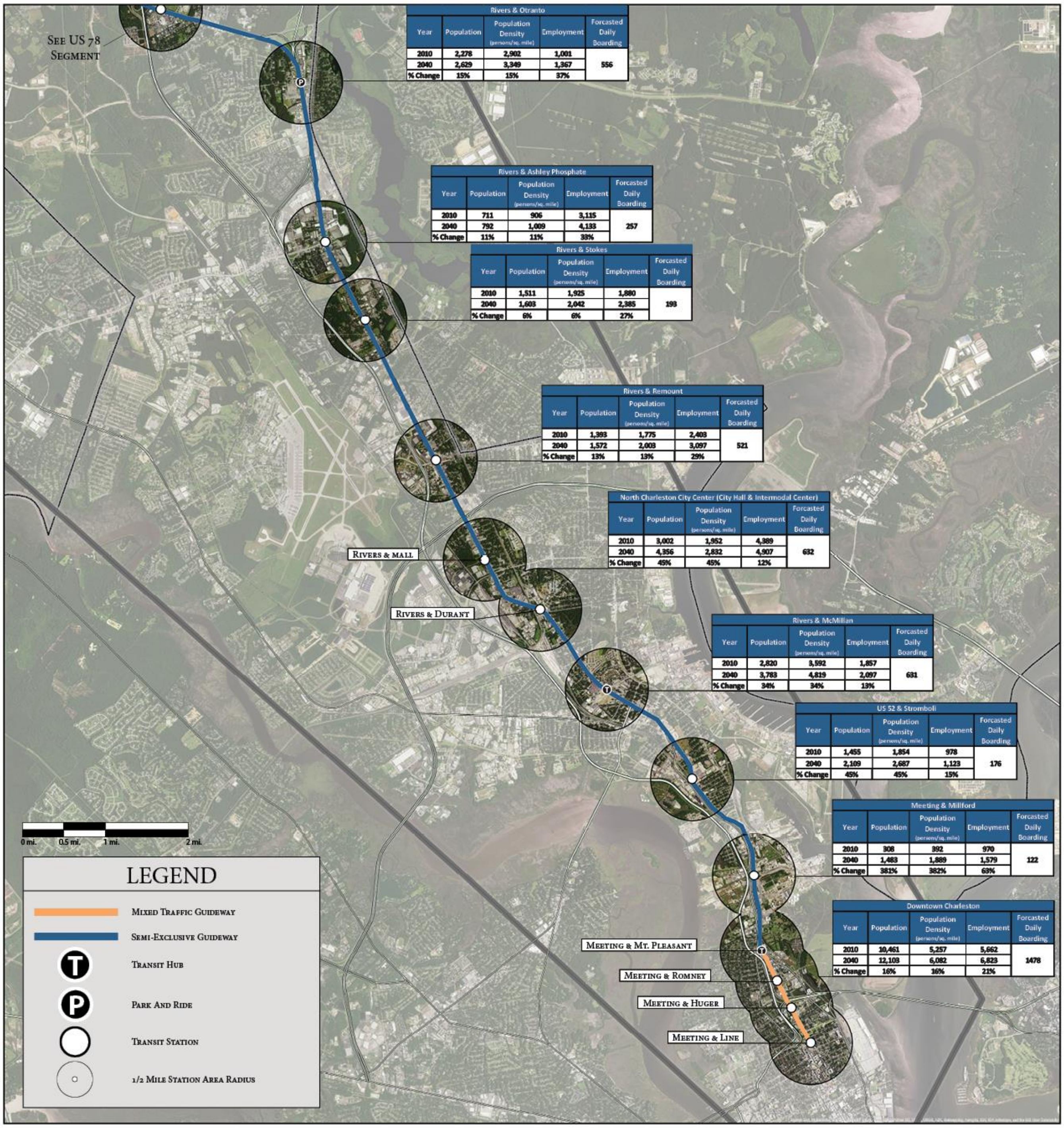


Figure 3 - 2: Recommended Alternative Station Area Land Use (US 52 Segment)



Rivers & Otranto

Year	Population	Population Density (persons/sq. mile)	Employment	Forcasted Daily Boarding
2010	2,278	2,902	1,001	556
2040	2,629	3,349	1,367	
% Change	15%	15%	37%	

Rivers & Ashley Phosphate

Year	Population	Population Density (persons/sq. mile)	Employment	Forcasted Daily Boarding
2010	711	906	3,115	257
2040	792	1,009	4,133	
% Change	11%	11%	33%	

Rivers & Stokes

Year	Population	Population Density (persons/sq. mile)	Employment	Forcasted Daily Boarding
2010	1,511	1,925	1,880	193
2040	1,603	2,042	2,385	
% Change	6%	6%	27%	

Rivers & Remount

Year	Population	Population Density (persons/sq. mile)	Employment	Forcasted Daily Boarding
2010	1,393	1,775	2,403	521
2040	1,572	2,003	3,097	
% Change	13%	13%	29%	

North Charleston City Center (City Hall & Intermodal Center)

Year	Population	Population Density (persons/sq. mile)	Employment	Forcasted Daily Boarding
2010	3,002	1,952	4,389	632
2040	4,356	2,832	4,907	
% Change	45%	45%	12%	

Rivers & McMillan

Year	Population	Population Density (persons/sq. mile)	Employment	Forcasted Daily Boarding
2010	2,820	3,592	1,857	631
2040	3,783	4,819	2,097	
% Change	34%	34%	13%	

US 52 & Stromboli

Year	Population	Population Density (persons/sq. mile)	Employment	Forcasted Daily Boarding
2010	1,455	1,854	978	176
2040	2,109	2,687	1,123	
% Change	45%	45%	15%	

Meeting & Millford

Year	Population	Population Density (persons/sq. mile)	Employment	Forcasted Daily Boarding
2010	308	392	970	122
2040	1,483	1,889	1,579	
% Change	381%	382%	63%	

Downtown Charleston

Year	Population	Population Density (persons/sq. mile)	Employment	Forcasted Daily Boarding
2010	10,461	5,257	5,662	1478
2040	12,103	6,082	6,823	
% Change	16%	16%	21%	

4 Operating Plans

The following presents the proposed service frequencies, span of service, and estimated run times for the recommended alternative. The BRT service is proposed to mimic a light rail service in terms of frequencies, and as such, peak period service is proposed at 10 minutes.

			Weekday	**Saturday**	**Sunday & Holiday**
Span of Service & Frequencies by Time Period			*4:00 AM - 1:00 AM*	*6:00 AM - 1:00 AM*	*7:00 AM- 11:00 PM*
Peak	*6 AM - 9 AM*	*4 PM - 7 PM*	10 minutes	20 minutes	30 minutes
Base	*9 AM- 4 PM*	*7 PM - 9 PM*	20 minutes	20 minutes	30 minutes
Early/Late	*4 AM-6 AM*	*9 PM - 1 AM*	30 minutes	30 minutes	30 minutes

Estimated annual revenue hours and revenue miles are anticipated to be:

- 48,752 Annual Revenue Hours
- 1,096831 Annual Revenue Miles

Operating costs are estimated at $120 per revenue hour, based on a peer review of other systems, which results in an anticipated annual operating and maintenance cost of $5,850,240. Further refinement of these costs will be completed during project development as the operating plans, alignment, and stations are further refined.

Table 4-1 shows the estimated travel time for the BRT alignment by direction. A one-way trip is anticipated to take just under one hour from one end to the other, with an average speed of 23 to 24 miles per hour. A one minute dwell time at each station is assumed.

Table 4 - 1: Recommended Alternative Travel Time

Station Segments		Southbound					Northbound				
From	To	Segment Distance	Total Distance	Segment Travel Time	Total Travel Time	Dir.	Segment Distance	Total Distance	Segment Travel Time	Total Travel Time	Dir.
Main & Richardson	5th & Berlin G Myers	1.28	1.28	0:06:15	0:06:15		0.84	23.15	0:04:30	0:58:22	
5th & Berlin G Myers	Royle Road	2.22	3.50	0:04:25	0:10:40		2.22	22.31	0:04:25	0:53:52	
Royle Road	Ladson Road	2.50	6.00	0:04:47	0:15:27		2.50	20.09	0:04:47	0:49:27	
Ladson Road	Trident Health	1.64	7.64	0:03:38	0:19:05		1.64	17.59	0:03:38	0:44:40	
Trident Health	Otranto	2.14	9.78	0:04:37	0:23:42		2.25	15.95	0:04:46	0:41:02	
Otranto	Ashley Phosphate	1.97	11.75	0:04:05	0:27:47		1.97	13.70	0:04:05	0:36:16	
Ashley Phosphate	Stokes Avenue	1.04	12.79	0:02:50	0:30:37		1.04	11.73	0:02:50	0:32:11	
Stokes Avenue	Remount	1.91	14.70	0:04:00	0:34:37		1.91	10.69	0:04:00	0:29:21	
Remount	Mall Drive	1.34	16.04	0:03:14	0:37:51		1.34	8.78	0:03:14	0:25:21	
Mall Drive	Durant	0.96	17.00	0:02:44	0:40:35		0.96	7.44	0:02:44	0:22:07	
Durant	McMillan	1.27	18.27	0:03:09	0:43:44		1.27	6.48	0:03:09	0:19:23	
McMillan	Azalea/Stromboli	1.55	19.82	0:03:31	0:47:15		1.55	5.21	0:03:31	0:16:14	
Azalea/Stromboli	Braswell/Milford	1.48	21.30	0:03:37	0:50:52		1.48	3.66	0:03:37	0:12:43	
Braswell/Milford	Mt. Pleasant	0.91	22.21	0:02:46	0:53:38		0.91	2.18	0:02:46	0:09:06	
Mt. Pleasant	Romney	0.41	22.62	0:02:05	0:55:43		0.41	1.27	0:02:05	0:06:20	
Romney	Huger	0.37	22.99	0:02:00	0:57:43		0.37	0.86	0:02:00	0:04:15	
Huger	Line Street	0.49	23.48	0:02:15	0:59:58		0.49	0.49	0:02:15	0:02:15	
Total			23.48		0:59:58			23.15		0:58:22	
				Average Speed:	*23.49*				*Average Speed:*	*23.80*	

5 Capital Assumptions

The following presents the capital assumptions used to develop planning level cost estimates. During project development and as engineering design progresses to a 30 percent level, these costs will be updated as needed.

5.1 Design Assumptions

The recommended alternative is assumed to operate predominately in its own semi-exclusive guideway, with mixed traffic operations occurring in the urbanized areas. The following presents the guideway assumptions.

Segment 1-Main & Richardson to US 78 & 165 (Berlin G Myers): This segment is assumed to operate in mixed traffic with one-way service circulating Summerville Square and in curb-side lanes to Berlin G Myers.

Segment 2-US 78 (Berlin G Myers to Otranto): This segment is assumed to operate in an at-grade semi-exclusive guideway with cross traffic and curb-side lanes.

Segment 3-US 52 (Otranto to Carner): This segment is assumed to operate in an at-grade semi-exclusive guideway in the median with cross traffic.

Segment 4-US 52 (Carner to Mt. Pleasant): This segment is assumed to be a semi-exclusive dedicated guideway.

Segment 5-US 52 (Mt. Pleasant to Line Street): This segment assumes curb-side mixed traffic operations.

5.2 Capital Cost Assumptions

Based on peer projects and local conditions, Table 5-1 presents the capital cost assumptions by category. This is followed by the planning level capital cost estimate (Table 5-2).

Table 5 - 1: Estimated Capital Unit Costs by Category

Screen Two BRT Alternatives	Unit Cost	Measure	Alt B-1: US 78/Mtg BRT
1.0 Dedicated Guideway	$4,200,000	Guideway Mile	23.12
2.0 Stations			18
Neighborhood	*$150,000*	*Station*	6
Node	*$300,000*	*Station*	6
PNR	*$1,800,000*	*Station*	6
3.0 Light Maintenance Facility	$1,000,000	Vehicle	16
4.0 Sitework	$400	Linear Ft	123,422
5.0 Systems	$150,000	Intersection	98
6.0 Real Estate & ROW	50%	Hard Costs	1
7.0 Vehicles	$800,000	Per Vehicle	16
8.0 Professional Services	50%	Hard Costs	1

Table 5 - 2: Recommended Alternative Planning Level Capital Costs (FY 2015)

BRT Estimated Capital Cost Summary (Base Year 2015)		Alternative B-1: US 78/Meeting BRT
10 GUIDEWAY & TRACK ELEMENTS (route miles)		***$97,104,000***
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	$97,104,000
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)		***$13,500,000***
20.01	Neighborhood Station	$900,000
20.02	Transit Node Station	$1,800,000
20.04	PNR Ride Station	$10,800,000
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		***$16,000,000***
30.02	Expansion of Maintenance Facility	$16,000,000
40 SITEWORK & SPECIAL CONDITIONS		***$49,368,832***
40.01	Sitework (Linear Feet)	$49,368,832
50 SYSTEMS		***$14,700,000***
50.01	Traffic Signal prioritization, crossing protection, etc.	$14,700,000
Construction Subtotal (10 - 50)		***$190,672,832***
60 ROW, LAND, EXISTING IMPROVEMENTS		***$3,050,200***
60.01	Purchase or lease of real estate	$3,050,200
70 VEHICLES (number)		***$12,800,000***
70.04	Bus	$12,800,000
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)		***$95,336,416***
80.01	Project Dev., Engineering, Project Mgmt, Construction Admin, etc.	$95,336,416
Subtotal (10 - 80)		***$301,859,448***
90 UNALLOCATED CONTINGENCY		***$57,201,850***
Total (10 - 90)		***$359,061,298***

Cost per Mile (In Millions)	***$15.5***

6 Travel Demand Forecasting

The project team prepared ridership forecasts using the Simplified Trips-On-Project Software (STOPS), a transit ridership model developed by the Federal Transit Administration to support planning of fixed guideway transit projects. STOPS was calibrated using market data obtained from a 2014-2015 survey of CARTA riders that shows the location of key transit markets and the characteristics of transit riders. STOPS also utilizes highway network information and socioeconomic forecasts from the BCDCOG regional travel demand model to provide an understanding of how existing travel conditions are likely to evolve into the future. Service plans were prepared for each short list alternative including station locations, BRT or LRT timetables, and adjustments to existing competing or complementary bus services. These service plans were processed by STOPS and used to generate estimates of future year ridership for each route and station included in each alternative. The following presents the linked trips, incremental trips, and overall transit ridership for the No-Build, Current Year – 2015, and Horizon Year – 2035.

Table 6 - 1: Recommended Alternative - Linked Transit Trips by Trip Purpose

Trip Purpose	Auto Ownership	No Build	Alt. B1 (2015)	Alt. B1 (2035)
Home-Based Work	0 Car	3,568	3,822	4,308
	1 Car	1,691	2,350	2,581
	2+ Car	939	1,938	2,117
	Subtotal	***6,197***	***8,110***	***9,006***
Home-Based Other	0 Car	4,248	4,508	5,078
	1 Car	1,082	1,472	1,594
	2+ Car	833	1,670	1,781
	Subtotal	***6,163***	***7,651***	***8,453***
Non-Home Based	0 Car	1,345	1,423	1,562
	1 Car	377	483	528
	2+ Car	334	523	563
	Subtotal	***2,056***	***2,429***	***2,653***
Total	0 Car	9,161	9,752	10,948
	1 Car	3,149	4,306	4,703
	2+ Car	2,107	4,132	4,461
	Subtotal	***14,417***	***18,189***	***20,112***

Table 6 - 2: Recommended Alternative - Incremental Linked Trips Vs. No Build

Trip Purpose	Auto Ownership	Alt. B1 (2015)	Alt. B1 (2035)
Home-Based Work	0 Car	254	287
	1 Car	659	747
	2+ Car	999	1,088
	Subtotal	***1,913***	***2,122***
Home-Based Other	0 Car	260	304
	1 Car	390	434
	2+ Car	837	894
	Subtotal	***1,488***	***1,631***
Non-Home Based	0 Car	78	90
	1 Car	106	122
	2+ Car	189	208
	Subtotal	***373***	***420***
Total	0 Car	591	681
	1 Car	1,157	1,303
	2+ Car	2,025	2,190
	Subtotal	***3,772***	***4,174***

7 Transit Network

This section describes the underlying transit network recommended for the BRT alignment.

7.1 Existing Transit Network

To develop ridership forecasts, the existing transit network (as of October 2014) was modified. Changes were limited to modifications to serve stations and elimination of redundant routes. The underlying transit network is assumed to be cost neutral. Table 7-1 shows the transit route connections by stations, followed by a description of the changes made to the existing transit system.

Table 7 - 1: Proposed Station Locations and Connecting Transit Routes

Station Location	Transit Routes Serving BRT/LRT Station
Main St & Richardson Ave	Summerville Connector (TCL)
E 5th N St & Berlin G Myers Pkwy	Summerville Connector (TCL)
US 78 & Royle Rd	-
US 78 & College Park Rd	Summerville Connector (TCL), Ladson Area Shuttle (TCL)
US 78 & I-26	Route 10, Summerville Connector (TCL), Ladson Area Shuttle (TCL)
Rivers Ave & Otranto Blvd	Routes 10, 12, Summerville Connector (TCL), Ladson Area Shuttle (TCL)
Rivers Ave & Ashley Phosphate Rd	Route 10, 12
Rivers Ave & Stokes Ave	Route 10
Rivers Ave & Remount Rd	Route 10, 13
Rivers Ave & Mall Dr	Routes 10, 104
Rivers Ave & Durant Ave	Routes 10, 13
Rivers Ave & McMillan Ave*	Routes 10, 11, 12, 13, 32, 102, 103, 104
US 52 & Stromboli Ave	Routes 10, 102
Meeting St & Milford St	Routes 10, 11, 102
Meeting St & Mt. Pleasant St	Routes 10, 11, 20, 21, 102,
Meeting St & Romney St	Route 10
Meeting St & Huger St	Routes 10, 40, 41
Meeting St & Line St	Routes 10, 20, 30, 31, 40, 41, 102, 211, 213, 301

CARTA Route Modifications

- Route 1: Service is eliminated between the North Charleston K-Mart park-and-ride and the Visitors' Center stop in Downtown Charleston. Route 1 will operate between the Meeting & Line station and the Wal-Mart park-and-ride (Folly Road) on James Island. Route will travel south on Meeting Street and West on Calhoun Street to the James Island Connector.
- Route 12: Route alignment on Northwoods Boulevard is modified to serve the Rivers & Ashley Phosphate station and operates via Ashley Phosphate Road and Rivers Avenue.
- Route 13: Route is modified to extend westbound on Remount Road to serve the Rivers & Remount station.
- Route 20: Route is adjusted to serve the proposed BRT station located at Meeting Street and Line Street. The route is modified to travel on Line Street in both directions to serve the BRT station instead of Columbus Street.
- Route 30: Inbound trips come into the Peninsula via Cannon Street and turn north on King Street and east on Line Street to serve the station. The route continues south on Meeting Street to the end of the line on Broad Street. Outbound trips travel north on Meeting Street, west on Line Street, south on King Street, and west on Spring Street to continue the existing alignment.

- Route 31: This route is modified to serve the Line Street Station. Eastbound trips come into the Peninsula via Cannon Street, and turn north on King Street and east on Line Street to the Line Street Station. Westbound trips continue east on Line Street, south on Meeting Street, west on Mary Street, north on King Street, and west on Spring Street to continue the existing alignment.
- Route 301: (See Route 31) Route modification is the same as Route 31 to serve the Meeting & Line station.
- Route 102: Southbound trips along King Street are modified to turn east on Line Street from King Street to serve the Meeting Street and Line Street Station. The route will continue south on Meeting Street, west on Mary Street and north on King Street along its existing northbound alignment.
- Route 211: DASH trolley route is modified to serve the BRT station at Meeting Street and Line Street. The route is modified to operate on Line Street instead of Spring Street. No other changes are proposed to the alignment.
- Route 213: DASH trolley route is modified to serve BRT station at Meeting Street and Line Street. Modified alignment will travel east along Cannon Street, north on King Street, east on Line Street to serve the BRT station. The route will then turn south on Meeting Street, east on Columbus Street and continue along Columbus Street to East Bay Street, Chapel Street, and John Street along its current alignment.

7.2 Transit Network Forecasted Ridership

Based on modifications to the existing transit routes as described above and as shown in Figures 7-1 through 7-3, the forecasted weekday ridership by route for the Current Year (2015) and Horizon Year (2035) are shown in following Table 7-2. If the system were in operation today, estimated weekday transit ridership is projected to grow 32 percent to 22,738 passengers per day. By 2035, this is anticipated to grow 47 percent over the No-Build to 25,255 passengers per day.

Table 7 - 2: Recommended Alternative Forecasted Weekday Boardings by Route

Route	No Build	Alt. B1 (2015)	Alt. B1 (2035)
1 James Island-North Charleston Express	518	347	385
2 Mt. Pleasant - West Ashley Express	587	614	645
3 Dorchester Road Express	419	339	403
4 NASH Express	69	51	63
10 Rivers Avenue	4,761	2,903	3,112
11 Dorchester/Airport	1,073	947	1,104
12 Upper Dorchester AFB	826	1,072	1,188
13 Remount Road	540	654	664
20 King Street/Citadel	1,175	1,495	1,614
21 Rutledge Grove	436	375	440
30 Savannah Highway	1,492	1,963	2,331
31 Folly Road	298	345	422
32 North Bridge	472	546	570
40 Mt. Pleasant	1,080	1,036	1,136
41 Coleman Boulevard	447	463	508
102 North Neck	408	410	512
103 Leeds Avenue	172	173	179
104 Montague Avenue	387	459	501
203 Medical University Shuttle	39	38	50
210 Aquarium/ CofC DASH	361	356	355
211 Meeting/King DASH	367	354	350
213 Lockwood/Calhoun DASH	152	69	82
301 St. Andrews	986	854	943
I-26 Commuter Bus	152	-	-
Fixed Guideway Route	-	6,874	7,696
Total	**17,217**	**22,738**	**25,255**

Figure 7 - 1: Recommended Alternative Transit Network Map 1

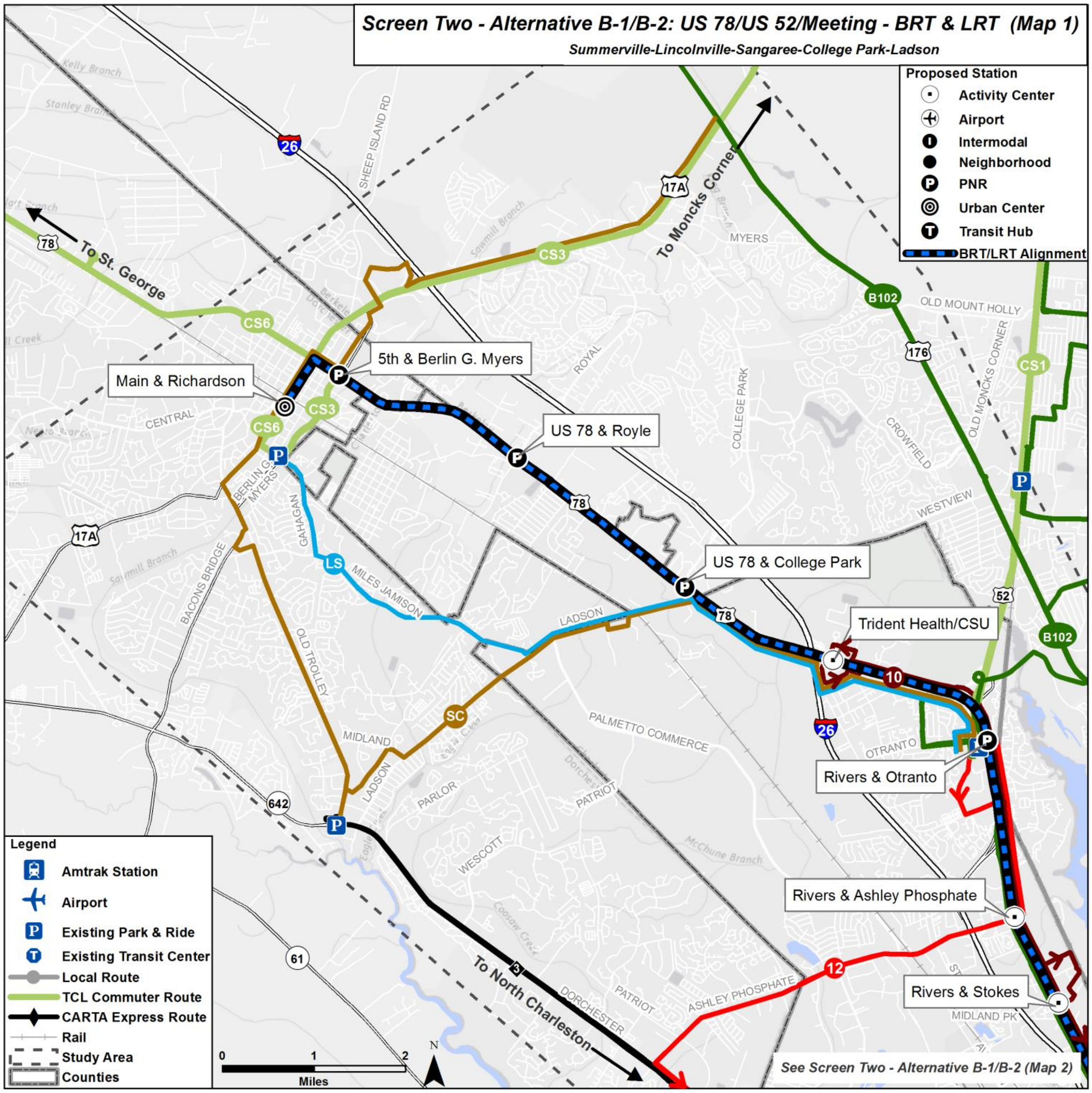


Figure 7 - 2: Recommended Alternative Transit Network Map 2

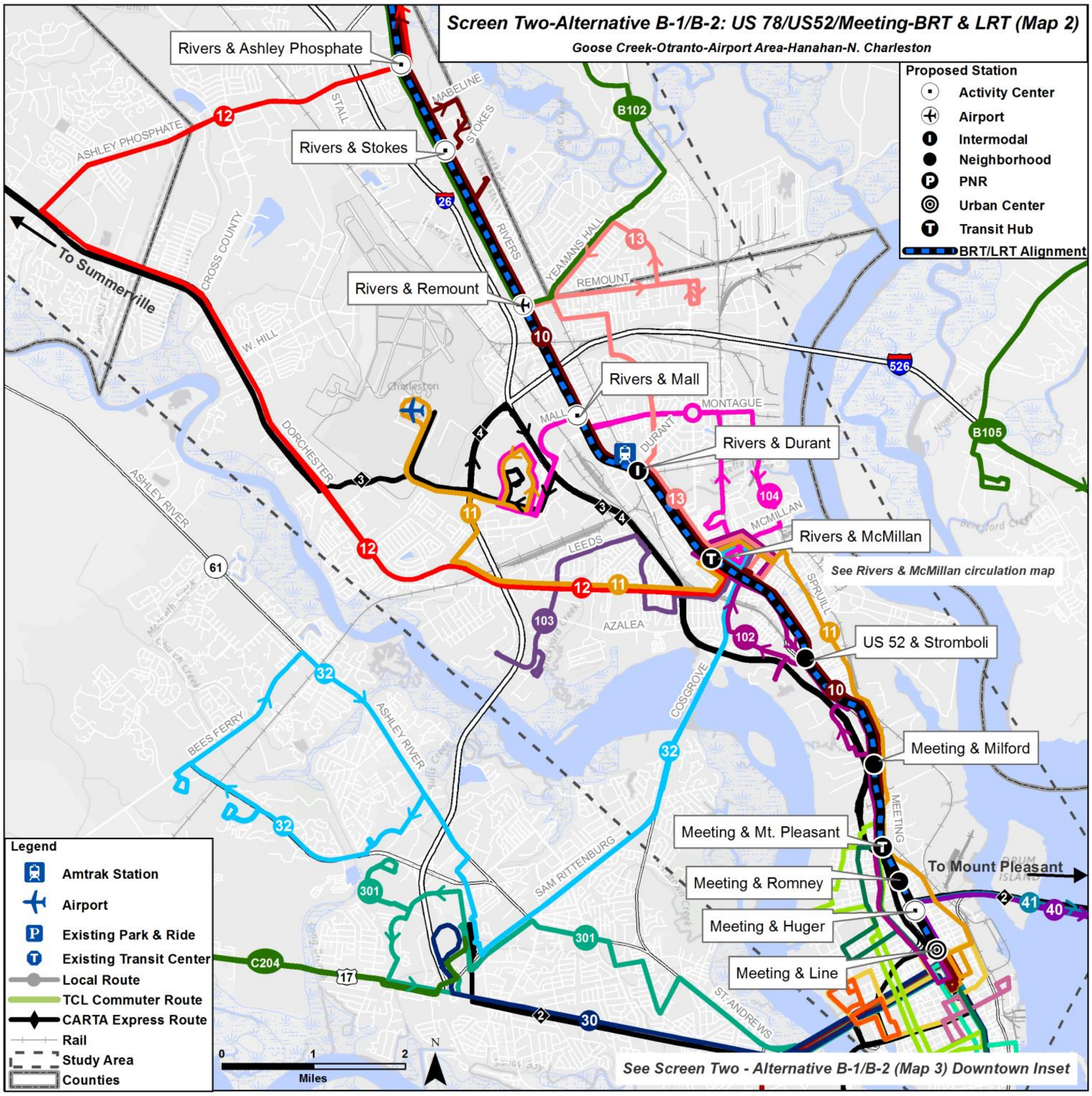
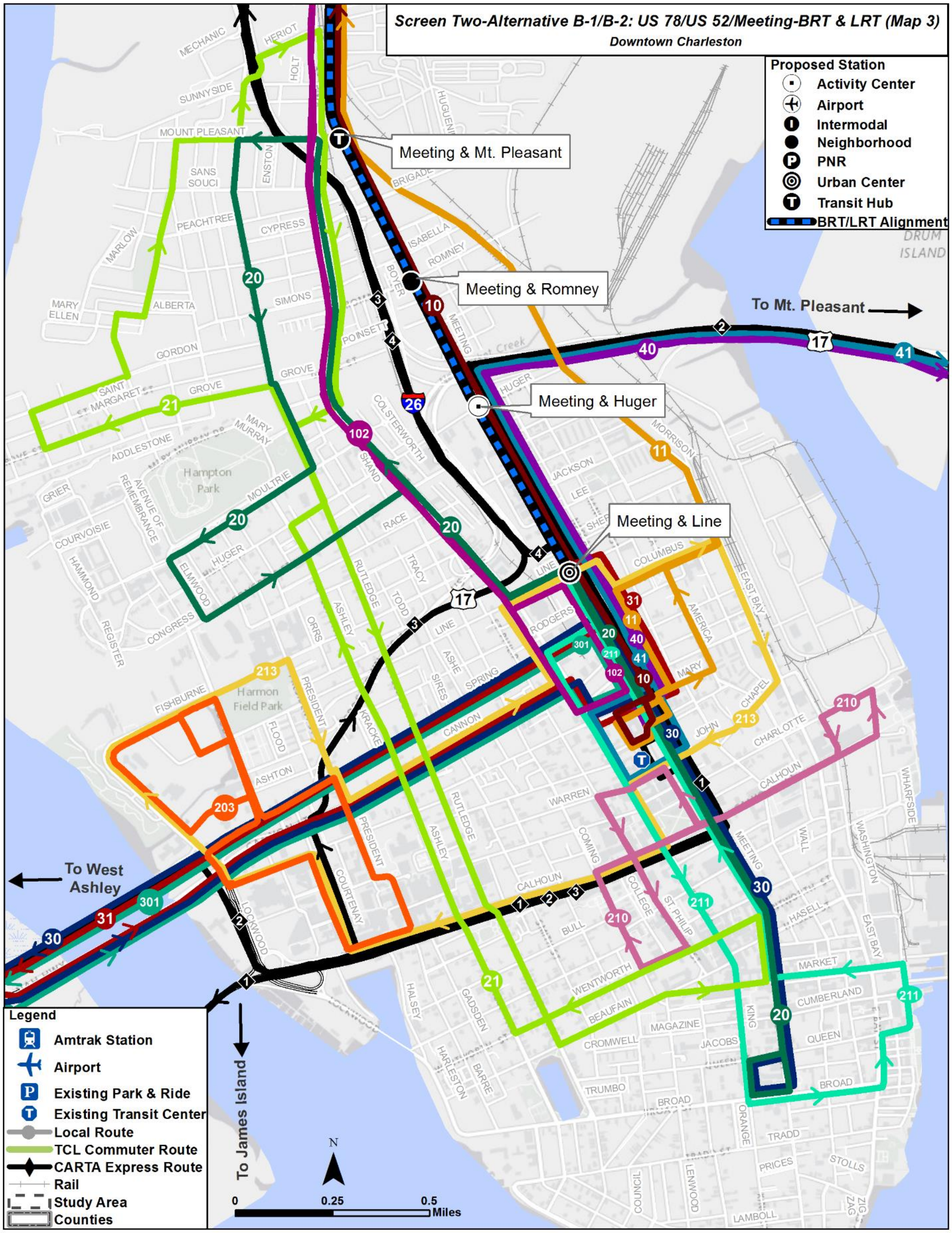


Figure 7 - 3: Recommended Alternative Transit Network - Map 3



7.3 Recommended Transit Network

Initiated in conjunction with i-26*ALT*, CARTA began the process of completing a Comprehensive Operational Analysis of the transit system to identify short-term system changes to improve efficiencies and set aside revenues for capital investment. In addition to the short range recommendations, which are anticipated to be implemented in summer 2016, a mid-range system plan for years five through ten was developed as the recommended transit network should additional revenues become available and is shown in Figure 7-4. While the mid-range plan has not been formally adopted by the CARTA Board as of this document, the recommendations are provided here for reference as future transit system needs. The Comprehensive Operational Analysis document provides further detail on the recommendations. The mid-range plan includes an increase in existing service hours by 22 percent, as well as new feeder services for an overall increase in service hours of 44 percent, as shown in Table 7-3. Figures 7-5 through 7-7 provide subarea maps of the mid-range plan route recommendations.

Figure 7 - 4: CARTA Comprehensive Operational Analysis Mid-Range Plan Recommendations

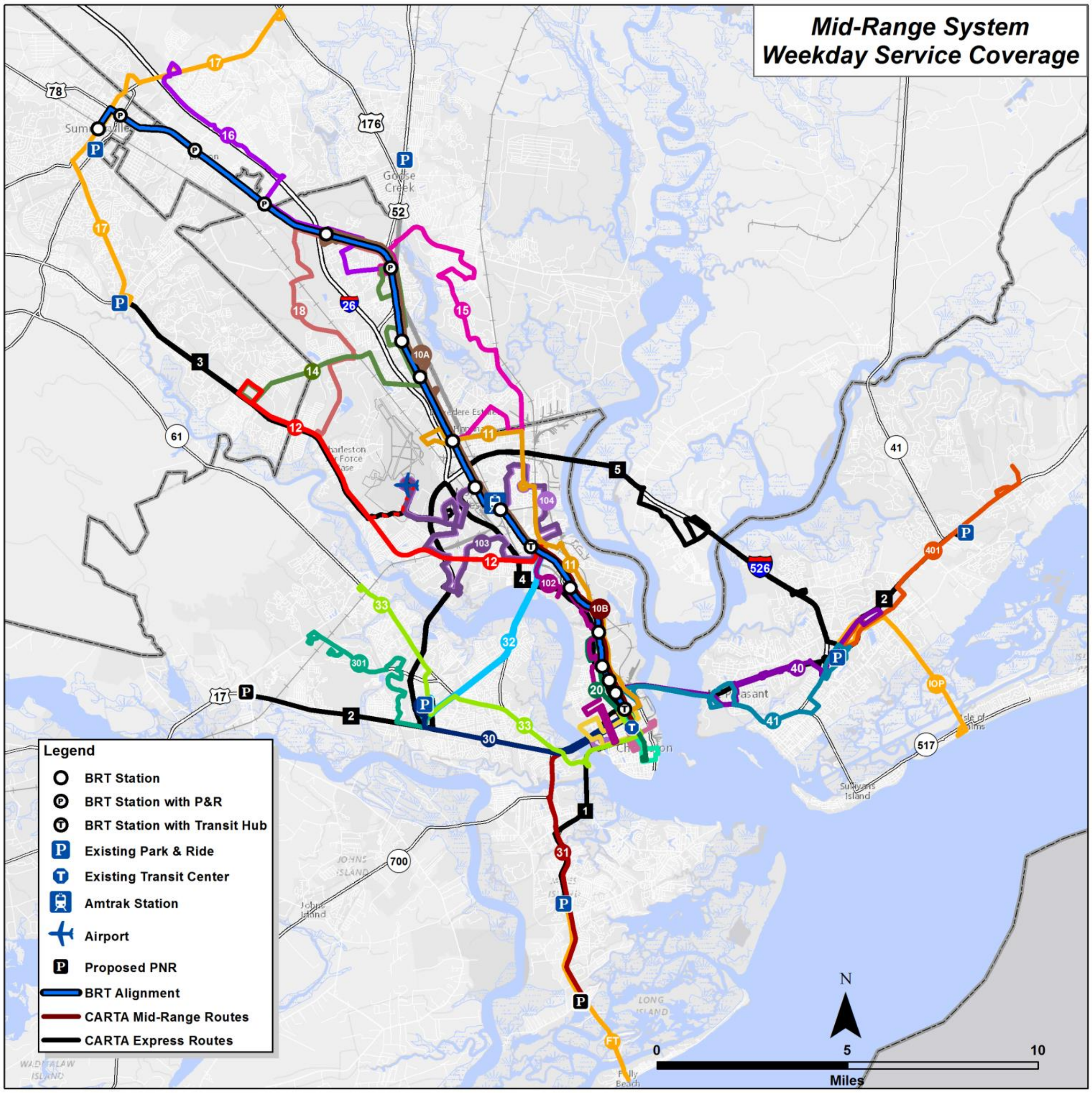


Table 7 - 3: CARTA Comprehensive Operational Analysis Mid-Range Plan Transit Network Statistics

Route #	Route Name	Short Range		Mid-Range			
Fixed Route		Annual Hours	Peak Vehicles	Annual Hours	Variance from Short Range	Peak Vehicles	Variance from Short Range
10	Rivers Avenue	34,982	10.0	28,348	-19.0%	5.0	-5.0
11	Airport/Dorchester to Downtown	14,254	3.0	19,340	35.7%	4.0	1.0
12	Upper Dorchester	10,801	2.0	19,218	77.9%	4.0	2.0
13	Remount Connector	7,294	1.5	0	-100.0%	0.0	-1.5
104	Montague Avenue	6,684	1.5	26,688	299.3%	6.0	4.5
14	Ashley Phosphate Connector	4,760	1.0	8,840	85.7%	2.0	1.0
20	Upper King Street	8,898	2.0	8,898	0.0%	2.0	0.0
30	US 17 Corridor - West Ashley to Citadel Mall	7,703	1.5	13,219	71.6%	3.0	1.5
31	Folly Road to DT Charleston	5,162	1.0	9,403	82.2%	3.0	2.0
32	Northbridge Connector	5,066	1.0	8,700	71.7%	2.0	1.0
33	Hwy. 61 - St. Andrews/Ashley River Rd.	7,906	2.0	8,387	6.1%	2.0	0.0
40	US 17 Corridor - Mount Pleasant to Towne Center	7,703	1.5	13,216	71.6%	3.0	1.5
41	Coleman Boulevard	4,191	1.0	9,063	116.3%	2.0	1.0
Neighborhood Circulators							
21	Rutledge/Grove	0	0.0	0	0.0%	0.0	0.0
102	Northern Neck	8,236	2.0	8,756	6.3%	2.0	0.0
103	Leeds Avenue	3,024	1.0	0	-100.0%	0.0	-1.0
201	North Beltline	0	0.0	0	0.0%	0.0	0.0
301	Glenn McConnell Circulator	4,300	1.0	4,300	0.0%	1.0	0.0
401	Wando Circulator	3,024	1.0	3,024	0.0%	1.0	0.0
DASH							
210	College of Charleston/Aquarium	8,210	3.0	9,584	16.7%	3.0	0.0
211	Meeting/King	12,592	3.0	13,662	8.5%	4.0	1.0
213	Lockwood/Calhoun	4,910	1.0	6,472	31.8%	2.0	1.0
Express							
1	James Island-North Charleston Express	10,332	7.0	2,457	-76.2%	1.0	-6.0
2	West Ashley - Mount Pleasant Express	7,560	4.0	10,395	37.5%	5.0	1.0
3	Dorchester Road/Summerville Express	6,237	3.0	6,521	4.5%	3.0	0.0
4	NASH Express	4,501	1.0	4,902	8.9%	1.0	0.0
Shuttle							
203	Medical Shuttle	6,568.8	4.0	6,568.8	0.0%	4.0	0.0

Mid-Range Total Existing System	Short Term	Peak Veh.	Annual Hours	Variance from Short Range	Peak Vehicles	Variance from Short Range
Total Fixed Route	125,405	29.0	173,321	38.2%	38.0	9.0
Total Neighborhood Circulator	18,584	5.0	16,080	-13.5%	4.0	-1.0
Total DASH	25,712	7.0	29,718	15.6%	9.0	2.0
Total Express	28,630	15.0	24,275	-15.2%	10.0	-5.0
Total Special	6,569	4.0	6,569	0.0%	4.0	0.0
Total All	**204,899**	**60.0**	**249,963**	22.0%	**65.0**	**5.0**
Annual Cost @ $76.01 (FY2015)	***$15,574,155***	***-$1,470,128***	***$18,999,364***	***$3,425,208***		***22.0%***

Route #	Mid-Range New Service Recommendations	Annual Hours		Peak Vehicles	
BRT Feeder Routes					
214	Meeting/Calhoun DASH (New Service w/BRT)	10,080		4.0	
15	Hanahan/Goose Creek	6,048		2.0	
16	Summerville - Nexton to Otranto	6,048		2.0	
17	Summerville - 17A & Old Trolley	6,048		2.0	
18	North Charleston - Palmetto Commerce/Cross County	6,048		2.0	
Express Service					
Route 5	I-526 Express	3,402		3.0	
Beach Trolley					
FB	Folly Beach Trolley	3,777		1.0	
IOP	Isle of Palm Trolley	3,777		1.0	

Total New Service	Annual Hours		Peak Vehicles	
Total BRT Feeders	34,272		12.0	
Total Express Routes	3,402		3.0	
Total Beach Trolley	7,555		2.0	
Total New Services	45,229		17.0	
Mid-Range New Service Annual Cost @ $76.01 (FY2015)	***$3,437,776***	***$3,437,776***		
Total Mid-Range Annual Cost @76.01 (FY2015)	***$22,437,140***	***$6,862,985***		***44.1%***

Figure 7 - 5: CARTA Comprehensive Operational Analysis Mid-Range Plan (Summerville Area)

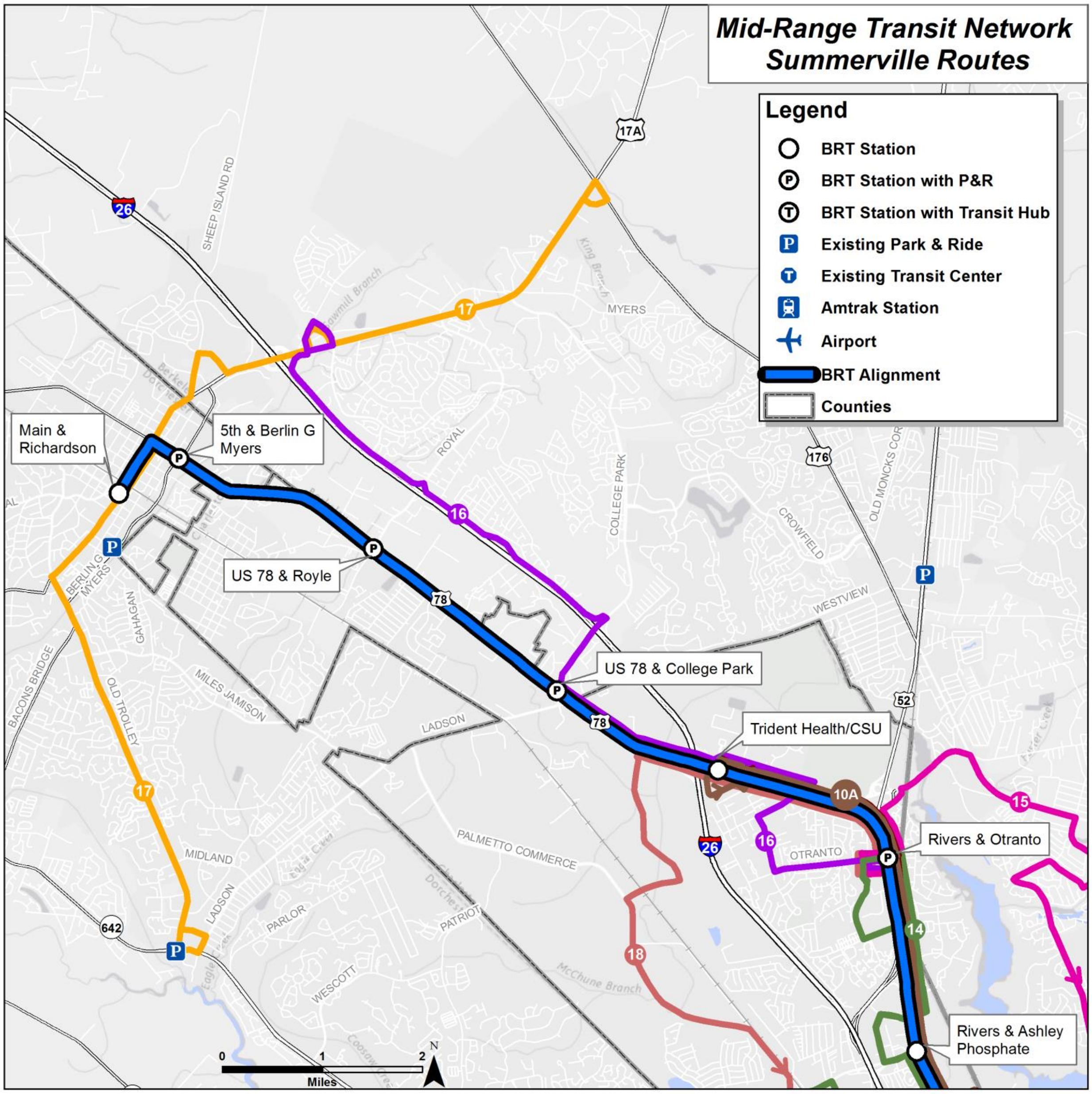


Figure 7 - 6: CARTA Comprehensive Operational Analysis Mid-Range Plan (North Charleston Area)

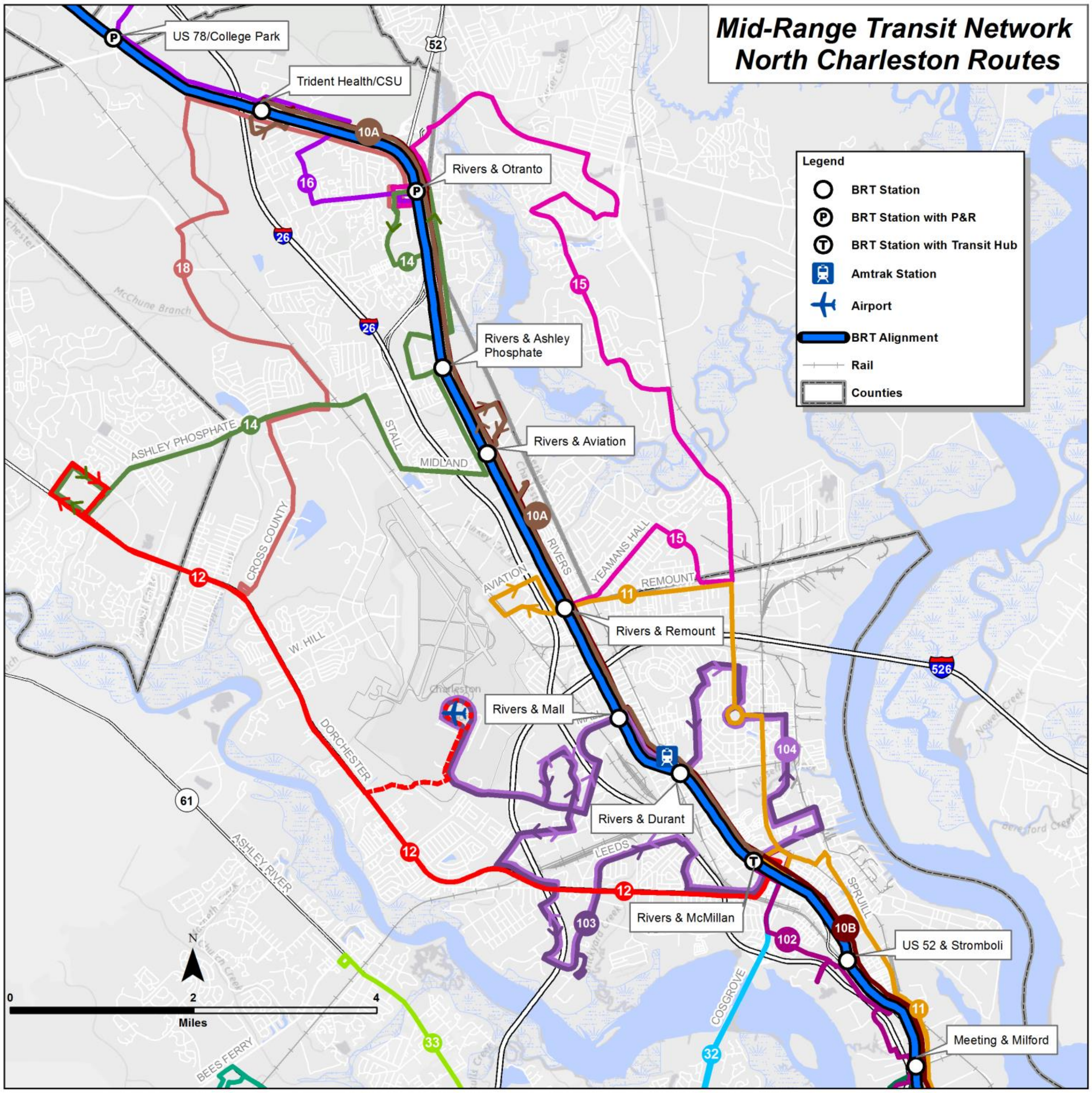
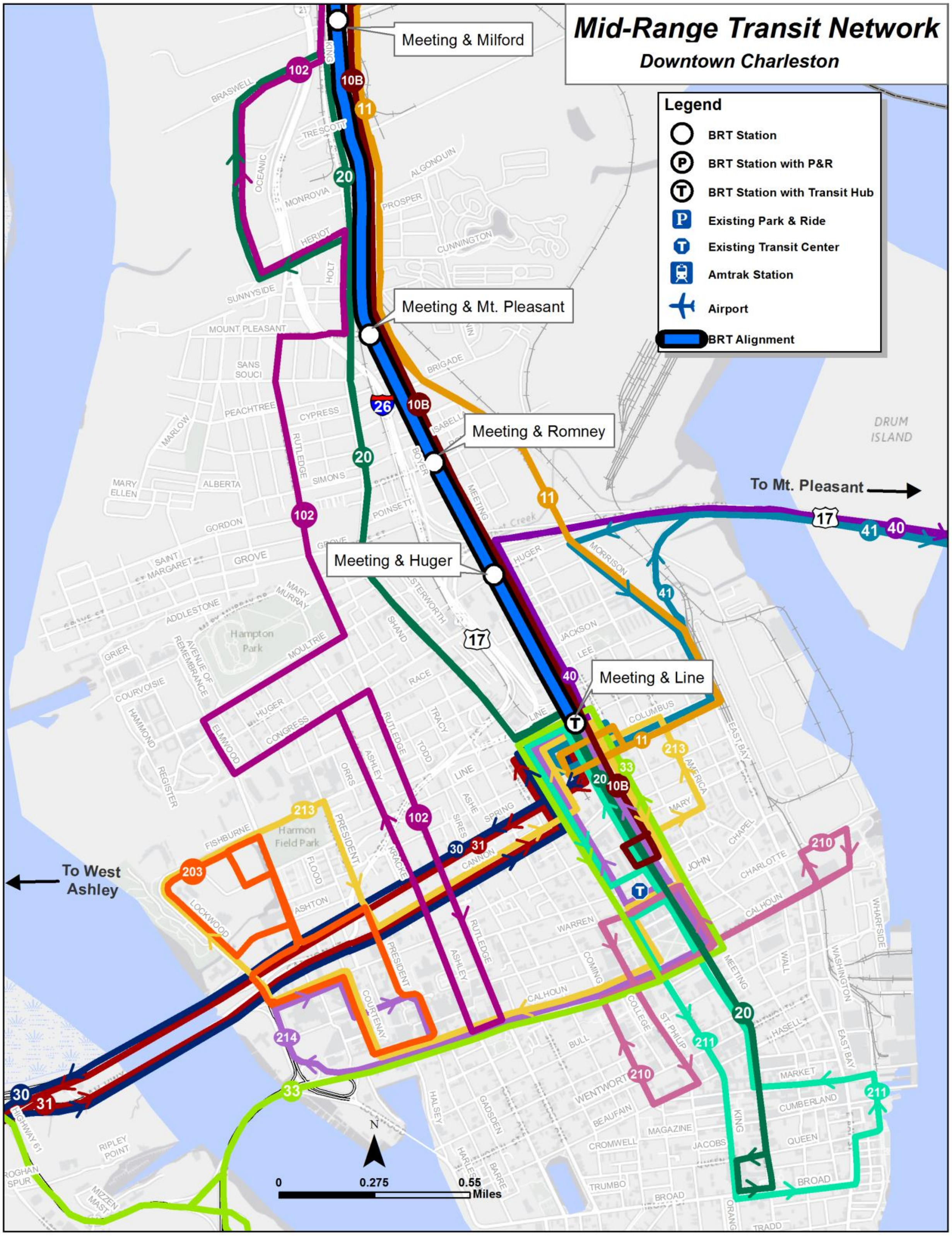


Figure 7 - 7: CARTA Comprehensive Operational Analysis Mid-Range Plan (Charleston Peninsula)



8 Next Steps

One of the primary purposes of the i-26*ALT* project was to identify a fixed guideway alternative for the I-26 Corridor that could compete for federal funds to build the project. As such, the methodologies and criteria used throughout the study process have been focused on the Federal Transit Administration's Capital Investment Grant Program, which includes a multi-phased, competitive process that project sponsors must follow to be considered for funding. The Comprehensive Operational Analysis was developed to support key requirements under the local financial commitment ratings criteria for the existing transit system. The Alternatives Analysis focuses on the project justification criteria.

Although projects do not need to be rating in order to begin project development, projects must adhere to timelines to ensure they do not linger in the program. With this in mind, i-26*ALT* has undergone a "pre-project development" planning process to ensure the region presents a project that can quickly progress through each phase. Figure 8-1 shows the federal process and steps required for the three-phase New Starts program, which is used for projects greater than $300M and can fund up to 60 percent of the capital construction costs.

Figure 8 - 1: FTA Capital Investment Program New Starts Process

Project Development

Complete **NEPA** and related environmental laws

Select Locally Preferred Alternative

Adopt LPA in Fiscally Constrained **LRTP**

Obtain **Medium Project Rating** under Project Justification Evaluation

Obtain commitment of **30% of matching funds***

Complete **30% design and engineering**

Two-Year Timeframe

Engineering

Commitment of **50% of matching funds**

Significant progress with engineering

Recommendation for Construction Grant Agreement

Three -Year Timeframe

Construction

Project sponsors can request entry into the Capital Investment Grant Program at any time as long as funding is in place to complete project development within two years. This includes completion of NEPA, 30 percent engineering and design, and other tasks required to obtain a "medium" project rating, such as station area planning and other analyses needed. The following are the key milestones for the next-steps:

- **2016:** Finalize and adopt COA and Alternative Analysis
    - CHATS/BCDCOG to select Preferred Alternative to move forward
    - CARTA to adopt COA recommendations and implement Short-Range Plan
- **2017 to 2018**: Project Development
- **2019 to 2021:** Engineering Phase (Note: Projects under $300M, and requesting less than $100M in CIG funds have 3-years to complete both project development and engineering phases –which would be 2017 to 2019)
- **2022 to 2025**: Construction and implementation

Appendix 1-A: Bridge and Culvert Inventory

Draft Report – February 2016

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1 Bridge and Culvert Inventory

The following provides an inventory of bridges and culverts located in the I-26 Corridor study area. Bridge data was collected from the Bureau of Transportation Statistics as the National Bridge Inventory (NBI) dataset. Data used to populate the NBI is provided by individual State Departments of Transportation (DOT) to the Federal Highway Administration (FHWA).

Figures 1 through 6 provide maps of the study area with indexed (numbered 1-153) bridges and culverts within the I-26 Corridor study area as a reference to identify bridge structures. Table 1 provides a list of all bridges with accompanying basic descriptive statistics.

Data Descriptions

Bridge Median: (0) No Median, (1) Open Median, (2) Closed Median, (3) Closed median with non- mountable barriers

Structure Flare (width of structure varies): (0) No Flare, (1) Yes Flare

Type of Service on/under Bridge: (1) Highway, (2) Railroad, (3) Pedestrian-bicycle, (4) Highway-railroad, (5) Highway-pedestrian, (6) Overpass structure at an interchange or second level of a multilevel interchange, (7) Third level (Interchange), (8) Forth level (Interchange), (9) Building or plaza, (0) Other

Inventory Route Total Horizontal Clearance: Measures the available clearance measured between restrictive features (curbs, rails, walls, piers or other structures limiting the roadway (surface and shoulders)

Feature Under Structure: (H) Highway, (R) Rail, (N) Feature not a highway or rail

**For more information on data definitions and elements consult the FHWA, Recording and Coding for the Structure Inventory and Appraisal of the Nation's Bridges (1995).

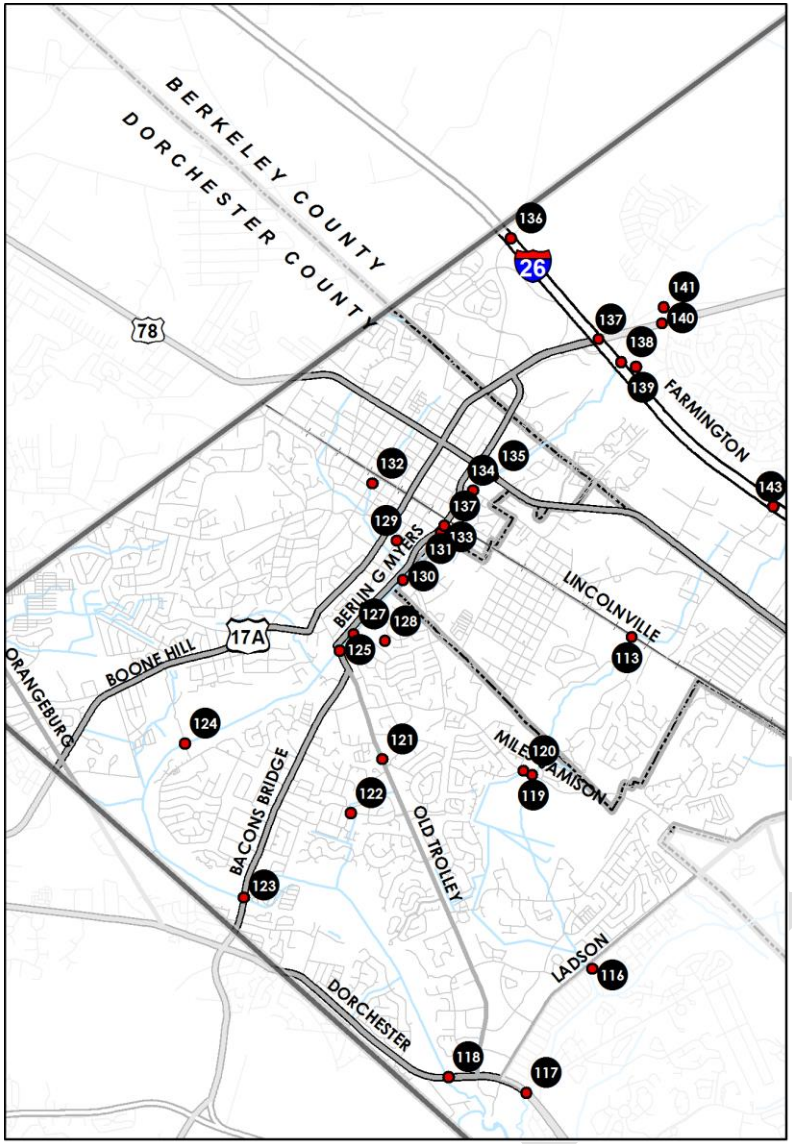

Figure 2: Summerville-Lincolnville Area

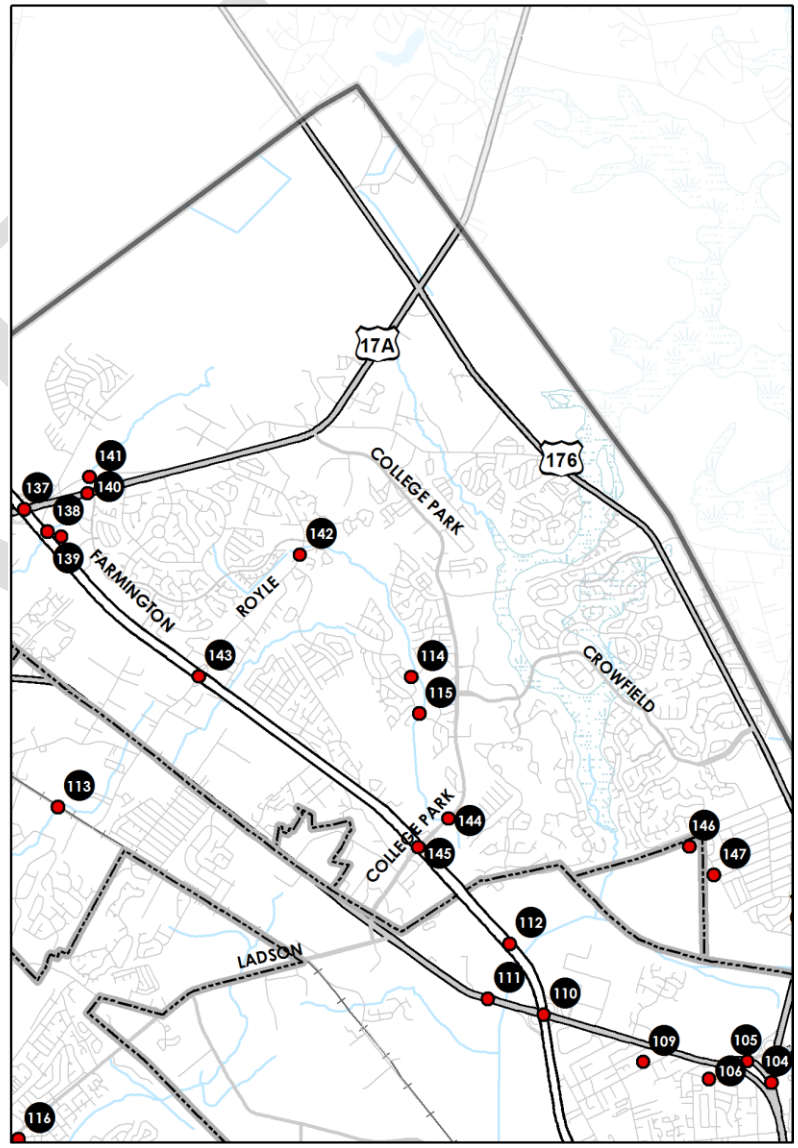

Figure 1: College Park-Sangaree Area

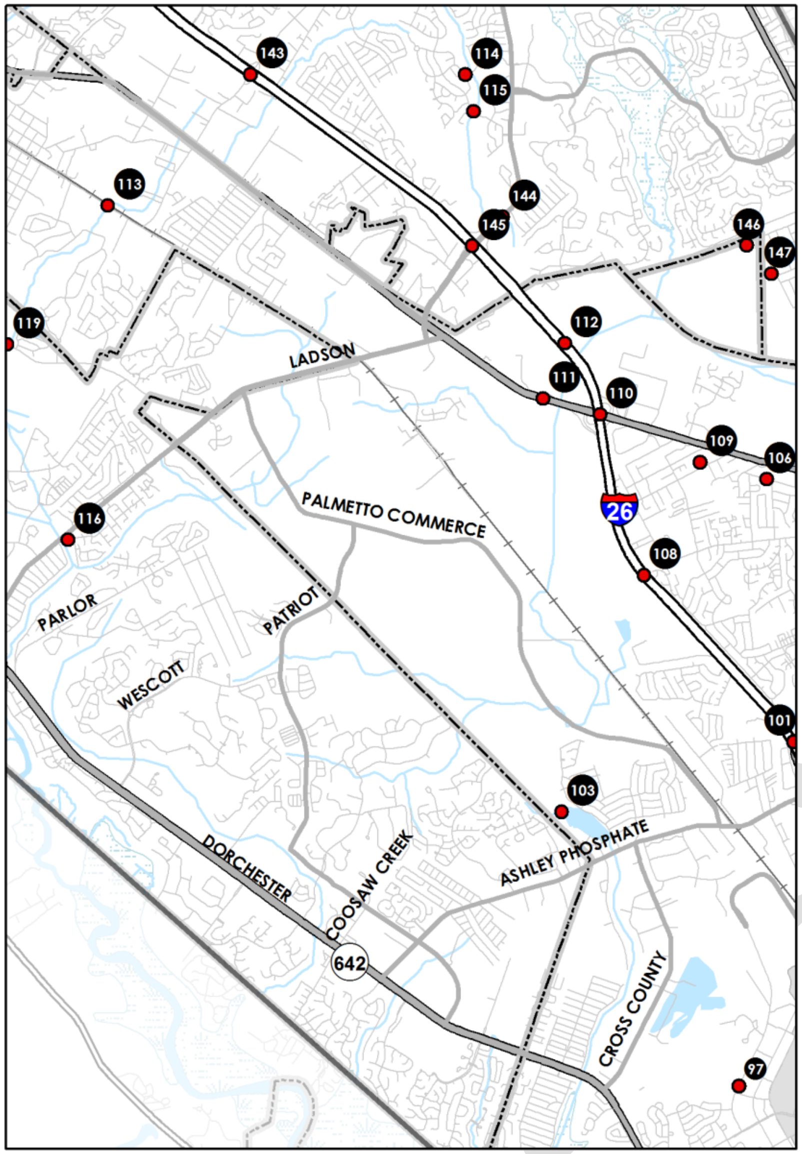

Figure 3: Ladson Area

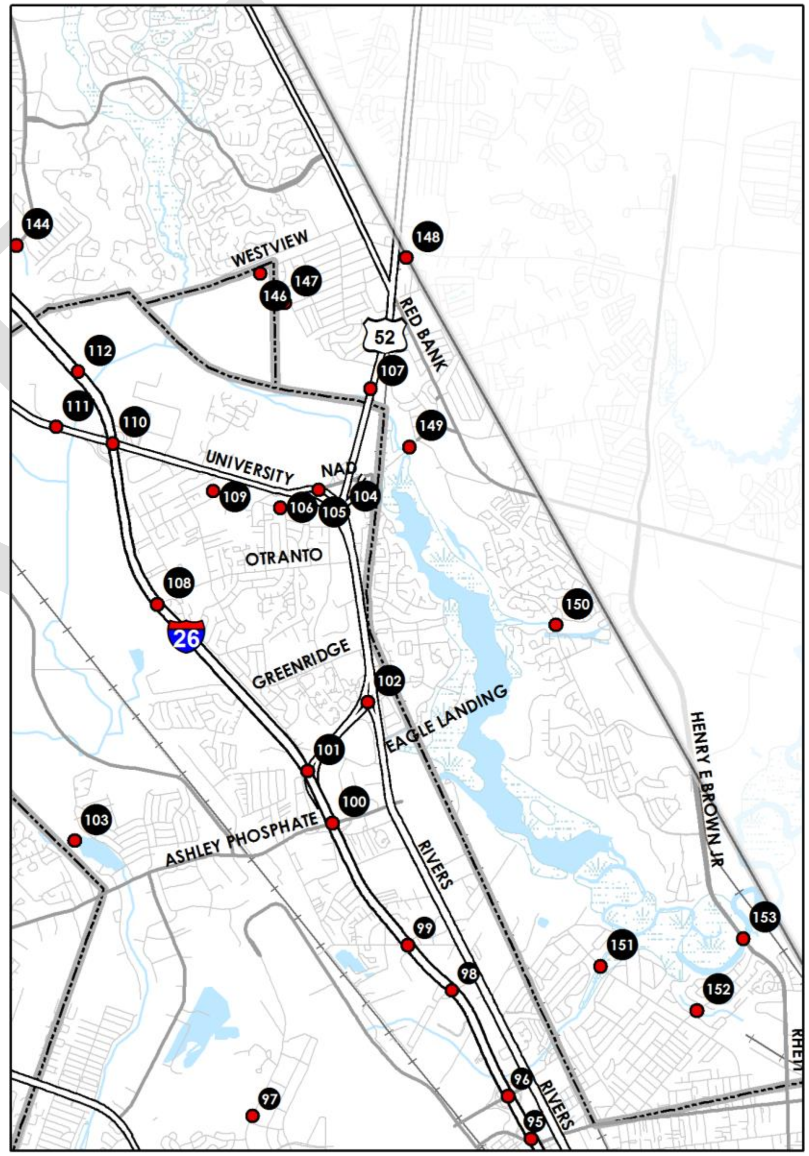

Figure 4: Otranto-Goose Creek Area

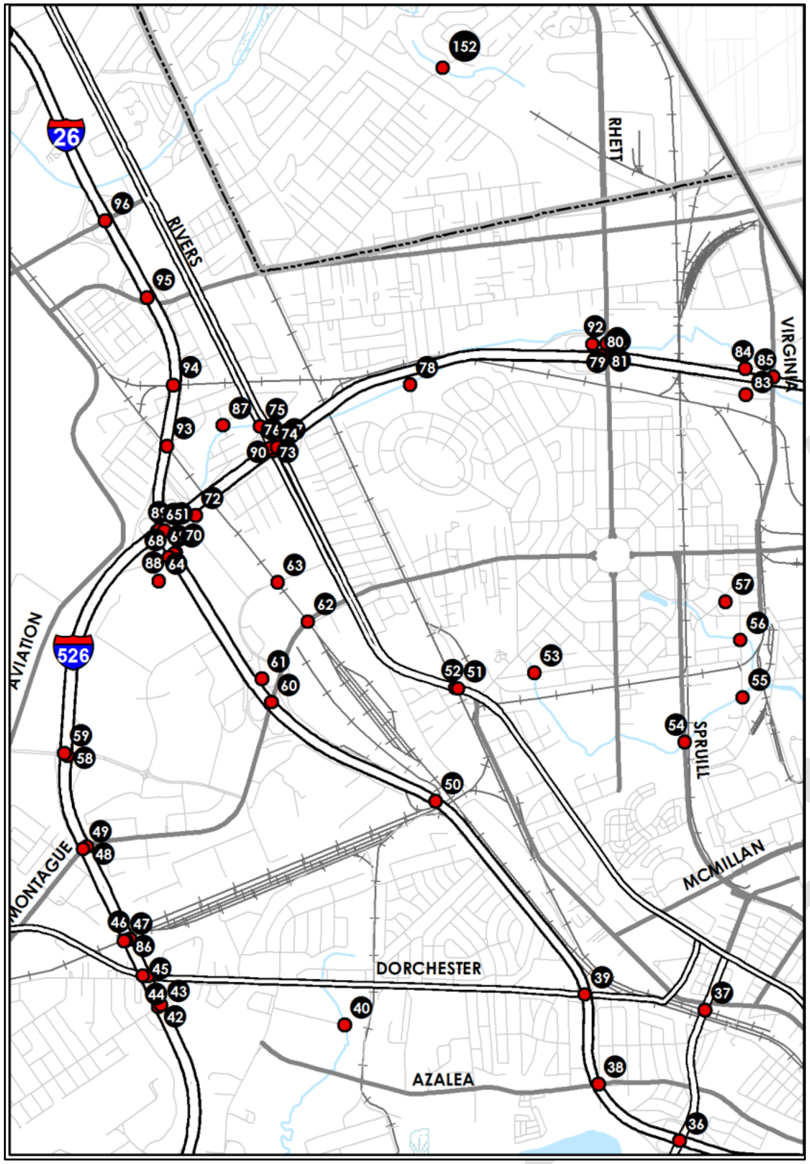

Figure 5: North Charleston Area

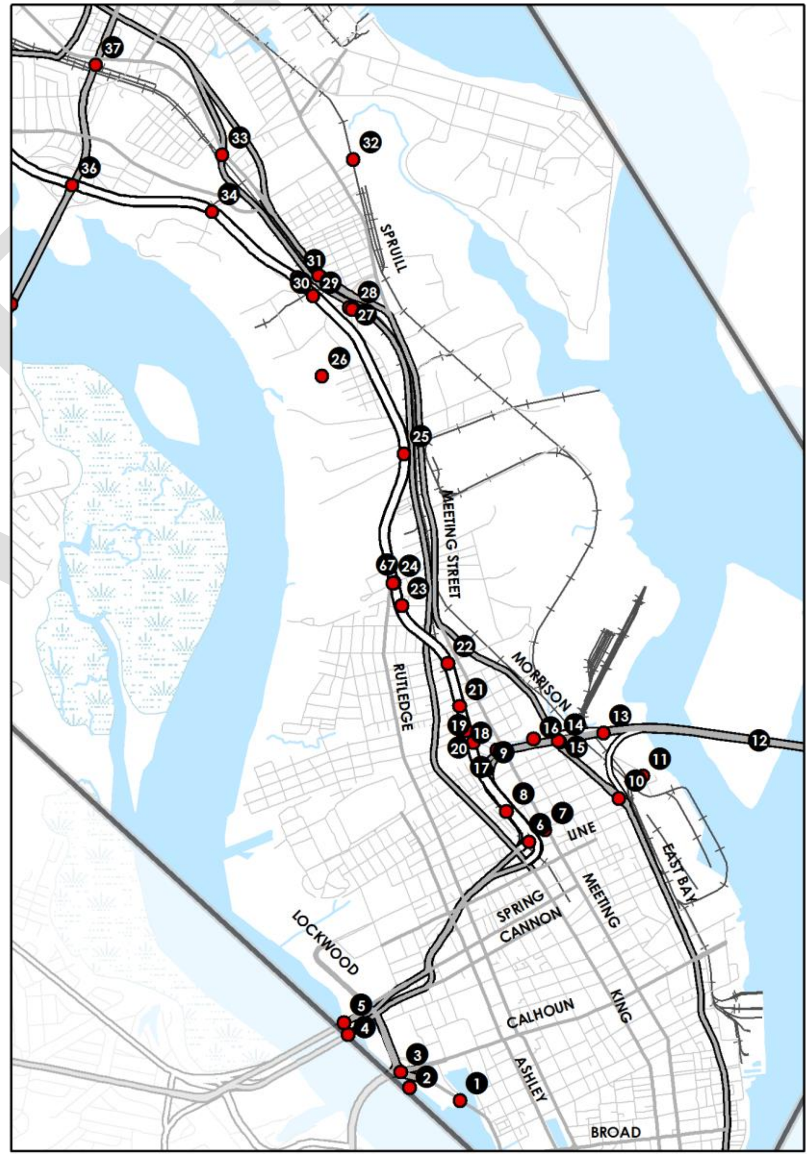

Figure 6: Charleston Peninsula

Table 1: I-26 Study Area Bridge and Culvert Inventory

Index	Route on Structure (Y/N)	Facility Carried by Structure	Apprach Roadway Width (meters)	Bridge Median	Structure Flared	Type of Service on Bridge	Type of Service Under Bridge	Inventory Route Total Horizontal Clearance (meters)	Left Curb/Sidewalk Width (meters)	Right Curb/Sidewalk Width (meters)	Bridge Roadway Width - Curb to Curb	Minimum Vertical Clearance Over Bridge Roadway (meters)	Feature Under Structure	Average Daily Truck Traffic (%)
1	Y	SC 30	13.7	0	0	1	0	12.8	1.5	0	12.8	5.49	N	4
2	Y	SC 30 RAMP	7.9	0	0	1	9	7.9	0	0	7.9	30+	N	8
3	Y	SC 30	13.7	0	0	1	0	12.8	0	0	12.8	5.49	N	4
4	Y	US 17	12.2	1	0	1	5	10.4	1.4	1.4	10.4	30+	N	4
5	Y	US 17	15.8	1	0	1	5	12.2	0.6	0.6	12.2	30+	N	4
6	Y	I-26 RAMP	10.7	0	0	1	4	10.7	0	0	10.7	30+	R	4
7	Y	US 17 BRIDGE RAMP	8.5	0	0	1	1	8.5	0	0	8.5	30+	R	4
8	Y	US 17	11	0	0	1	1	11	0	0	11	5.51	R	4
9	Y	US 17	11	0	0	1	1	11	0	0	11	5.56	H	4
10	Y	US 17 RAMP	8.5	0	0	1	4	8.5	0	3.7	8.5	30+	R	4
11	Y	PORTS AUTH-RD 2	9.8	0	0	1	5	11.5	0	0	11.5	30+	N	0
12	Y	US 17	34.1	3	0	5	5	17.1	0	3.7	34.1	30+	N	4
13	Y	US 17	34.1	3	1	1	0	17.1	0	0	34.1	30+	N	4
14	Y	US 17 RAMP	8.5	0	0	1	1	8.5	0	0	8.5	30+	H	4
15	Y	US 17	19.5	3	1	1	4	17.1	0	0	19.5	30+	H	4
16	Y	US 17 BRIDGE RAMP	8.5	0	0	1	1	8.5	0	0	8.5	30+	H	4
17	Y	TO ROMNEY ST	8.5	0	0	1	0	8.5	0	0	8.5	5.69	N	12
18	Y	I-26 RAMP	8.5	0	0	1	1	8.5	0	0	8.5	30+	H	4
19	Y	US 17 BRIDGE RAMP	8.5	0	0	1	1	8.5	0	0	8.5	30+	H	4
20	Y	US 17 BRIDGE RAMP	11	0	0	1	1	11	0	0	11	30+	H	4
21	Y	I-26 RAMP	18.3	0	0	1	1	18.3	0	0	18.3	30+	H	4
22	Y	I-26 RAMP	6.1	0	0	1	0	6.1	0	0	6.2	30+	N	12
23	Y	I-26 RAMP	6.1	0	0	1	1	6.2	0	0	6.2	30+	H	12
24	Y	I-26 RAMP	6.1	0	0	1	1	6.2	0	0	6.2	30+	H	12
25	Y	I-26	32.9	3	0	1	4	14.6	0.5	0.5	29.3	30+	H	12
26	Y	S-10-1110	9.1	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
27	Y	I-26 RAMP	6.4	0	0	1	4	6.4	0.5	0.5	6.4	30+	H	12
28	Y	I-26 RAMP	6.4	0	0	1	4	6.4	0.5	0.5	6.4	30+	H	12
29	Y	I-26	35.4	2	0	1	4	29.3	0.5	0.5	29.3	30+	R	12
30	Y	I-26 RAMP	6.7	0	0	1	1	6.6	0.5	0.5	6.6	30+	H	12

**Highlighted entries indicate culvert structures*

Index	Route on Structure (Y/N)	Facility Carried by Structure	Apprach Roadway Width (meters)	Bridge Median	Structure Flared	Type of Service on Bridge	Type of Service Under Bridge	Inventory Route Total Horizontal Clearance (meters)	Left Curb/Sidewalk Width (meters)	Right Curb/Sidewalk Width (meters)	Bridge Roadway Width - Curb to Curb	Minimum Vertical Clearance Over Bridge Roadway (meters)	Feature Under Structure	Average Daily Truck Traffic (%)
31	Y	US 52 RAMP	7.9	0	0	1	4	6.6	0.5	0.5	6.6	30+	H	4
32	Y	S-10-86	12.2	0	0	1	4	12.2	1.5	1.5	12.2	30+	R	4
33	Y	US 78	11	0	0	1	4	8.2	1.1	1.1	8.2	30+	H	3
34	Y	I-26	32.3	3	0	1	4	14.6	0.5	0.5	29.3	30+	H	12
35	Y	SC 7	27.4	2	0	1	5	21	0	0	21	30+	N	4
36	Y	I-26	17.7	3	0	6	1	17.1	0.5	0.5	34.1	30+	H	12
37	Y	SC 7	16.2	2	0	1	4	16.2	1.5	1.5	16.2	30+	H	4
38	Y	S-10-894	15.2	0	0	1	1	15.2	1.2	1.2	15.2	30+	H	2
39	Y	I-26	15.2	3	0	6	1	25.3	0.5	0.5	25.3	30+	H	12
40	Y	S-10-894	15.2	0	0	1	5	21.3	0.2	0.2	21.3	30+	N	2
41	Y	S-10-475	18.9	0	0	1	1	22.6	0	0	22.6	30+	H	2
42	Y	I-526 NBL	13.4	0	0	1	1	12.1	0	0	12.1	30+	H	12
43	Y	I-526 SBL	13.4	0	0	1	1	12.1	0	0	12.1	30+	H	12
44	Y	I-526 NBL	13.4	0	0	1	1	12.1	0	0	12.1	30+	H	12
45	Y	I-526 SBL	13.4	0	0	1	1	12.1	0	0	12.1	30+	H	12
46	Y	I-526 NBL	13.4	0	0	1	2	15.7	0	0	15.7	30+	R	12
47	Y	I-526 WB RAMP	14	0	0	1	2	7.9	0	0	7.9	30+	R	12
48	Y	I-526 EBL	13.4	0	0	1	1	12.1	0	0	12.1	30+	H	12
49	Y	I-526 WBL	13.4	0	0	1	1	12.1	0	0	12.1	30+	H	12
50	Y	I-26	14.9	3	0	1	2	24.4	0.5	5	24.4	30+	R	12
51	Y	S-10-62	17.1	0	0	1	1	17.1	1.2	1.2	17.1	30+	H	3
52	Y	US 52	26.8	1	0	1	4	26.8	1.5	1.5	26.8	30+	H	4
53	Y	S-10-60	8.5	0	0	1	5	7.3	0.2	0.2	7.3	30+	N	2
54	Y	S-10-32	14.9	0	0	1	5	14.9	1.5	0.5	14.9	30+	N	3
55	Y	S-10-379	8.5	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
56	Y	S-10-379	9.1	0	0	1	5	7.9	0.2	0.2	79	30+	N	2
57	Y	S-10-894	21	0	0	1	5	20.7	0.2	0.2	20.7	30+	N	2
58	Y	I-526 EBL	13.4	0	0	1	1	14.5	0	0	14.5	30+	H	12
59	Y	I-526 WBL	13.4	0	0	1	1	14.5	0	0	14.5	30+	H	12
60	Y	S-10-62	31.7	0	0	8	1	100+	1.2	1.2	31.7	30+	H	3

**Highlighted entries indicate culvert structures*

Index	Route on Structure (Y/N)	Facility Carried by Structure	Apprach Roadway Width (meters)	Bridge Median	Structure Flared	Type of Service on Bridge	Type of Service Under Bridge	Inventory Route Total Horizontal Clearance (meters)	Left Curb/Sidewalk Width (meters)	Right Curb/Sidewalk Width (meters)	Bridge Roadway Width - Curb to Curb	Minimum Vertical Clearance Over Bridge Roadway (meters)	Feature Under Structure	Average Daily Truck Traffic (%)
60	Y	S-10-62	31.7	0	0	8	1	100+	1.2	1.2	31.7	30+	H	3
61	Y	I-26 RAMP	9.8	0	0	1	1	9.8	0	0	9.8	30+	H	12
62	Y	S-10-62	17.1	0	0	1	2	17.1	1.2	1.2	17.1	30+	R	3
63	Y	S-10-790	10.4	0	0	1	2	7.9	0.8	0.8	7.9	30+	R	2
64	Y	I-526 RAMP	13.4	0	0	1	1	12.2	0	0	12.2	5.74	H	12
65	Y	I-526 RAMP	7.9	0	0	1	0	7.9	0	0	7.9	30+	N	12
66	Y	I-526 RAMP	11	0	0	1	0	7.9	0	0	7.9	30+	N	12
67	Y	I-26	32.9	2	0	6	1	29.3	0.5	0.5	29.3	30+	H	12
68	Y	I-526 RAMP	9.4	0	0	1	1	7.9	0	0	7.9	30+	N	12
69	Y	I-526 EBL	12.2	0	0	1	4	12.2	0	0	12.2	30+	H	12
70	Y	I-526 RAMP	10.4	0	0	1	0	7.9	0	0	7.9	30+	N	12
71	Y	I-526 RAMP	7.9	0	0	1	0	7.9	0	0	7.9	30+	N	12
72	Y	S-10-1600	10.4	0	0	1	5	10.4	0	0	10.4	30+	N	2
73	Y	I-526 RAMP	11	0	0	1	0	10.1	0	0	10.1	30+	N	12
74	Y	I-526	14.6	0	0	1	1	14.6	0	0	14.6	30+	H	12
75	Y	US 52	18.3	0	0	1	5	17.4	0.9	0	17.4	30+	N	4
76	Y	I-526	14.6	0	0	1	1	14.6	0	0	14.6	30+	H	12
77	Y	I-526 RAMP	7.6	0	0	1	0	6.7	0	0	6.7	30+	N	12
78	Y	S-10-102	10.1	0	0	1	5	7.9	0	0	7.9	30+	N	2
79	Y	I-526 RAMP	7.9	0	0	1	0	7.9	0	0	7.9	30+	N	12
80	Y	I-526 RAMP	6.7	0	0	1	0	6.7	0	0	6.7	30+	N	12
81	Y	I-526 RAMP	8.8	0	0	1	0	8.8	0	0	8.8	30+	N	12
82	Y	I-526 RAMP	7.6	0	0	1	5	7.6	0	0	7.6	30+	N	12
83	Y	I-526 RAMP	5.2	0	0	1	0	5.2	0	0	5.2	30+	N	12
84	Y	I-526 RAMP	6.7	0	0	1	0	6.7	0	0	6.7	30+	N	12
85	Y	S-10-58	12.8	0	0	1	5	30.2	0	0	30.4	30+	N	2
86	Y	I-526 SBL	13.4	0	0	1	2	12.1	0	0	12.1	30+	R	12
87	Y	S-10-2521	12.2	0	0	1	5	10.3	0	0	9.8	30+	N	2
88	Y	I-526 RAMP	7.9	0	0	1	0	7.9	0	0	7.9	30+	N	12
89	Y	I-562 WBL	12.2	0	0	1	4	12.2	0	0	12.2	30+	H	12
90	Y	I-526 RAMP	7.6	0	0	1	0	7.6	0	0	7.6	30+	N	12

**Highlighted entries indicate culvert structures*

Index	Route on Structure (Y/N)	Facility Carried by Structure	Apprach Roadway Width (meters)	Bridge Median	Structure Flared	Type of Service on Bridge	Type of Service Under Bridge	Inventory Route Total Horizontal Clearance (meters)	Left Curb/Sidewalk Width (meters)	Right Curb/Sidewalk Width (meters)	Bridge Roadway Width - Curb to Curb	Minimum Vertical Clearance Over Bridge Roadway (meters)	Feature Under Structure	Average Daily Truck Traffic (%)
91	Y	I-526 RAMP	7.9	0	0	1	0	7.9	0	0	7.9	30+	N	12
92	Y	S-10-60	29	0	0	1	5	29	0	0	29	30+	N	3
93	Y	I-26	21.3	3	0	1	4	22.6	0	0	22.5	30+	R	12
94	Y	I-26	20.1	3	0	1	4	23.7	0	0	23.7	30+	R	12
95	Y	S-10-13	25.9	0	0	6	1	25.9	1.5	1.5	25.9	30+	H	4
96	Y	S-10-1342	17.1	2	0	6	1	11.6	1.5	1.5	23.2	30+	H	4
97	Y	ARTHUR DRIVE	7.9	0	0	1	5	7.9	2.1	0.3	0	30+	N	1
98	Y	S-10-195	12.2	0	0	1	1	8.5	1.5	1.5	8.5	30+	H	2
99	Y	I-26	18.3	0	0	1	1	15.8	0	0	18.9	30+	H	12
100	Y	S-10-75	39	2	0	6	1	19.5	1.5	1.5	39	30+	H	3
101	Y	US 52 CON	19.8	0	0	6	1	19.8	0	0	19.8	30+	H	4
102	Y	US 52 CON	13.4	0	0	6	1	8.5	0.5	0.5	8.5	30+	H	4
103	Y	S-10-75	26.5	0	0	1	5	24.4	0	0	24.4	30+	N	3
104	Y	US 78	8.2	0	0	1	1	8.2	0	0	8.2	30+	H	5
105	Y	US 78	8.2	0	0	1	1	8.2	0	0	8.2	30+	H	5
106	Y	S-10-1624	7.9	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
107	Y	US 52	29.3	2	0	1	5	29.3	4.3	0	29.3	30+	N	4
108	Y	C-10-3469	11.6	0	0	1	5	8.2	0	0	8.2	30+	N	2
109	Y	S-10-43	33.2	0	0	1	1	100+	1.5	1.5	33.2	30+	H	4
110	Y	US 78	31.1	0	0	6	1	100+	1.5	1.5	31.1	30+	H	4
111	Y	US 78	19.8	0	0	1	5	19.8	1.5	1.5	19.8	30+	N	4
112	Y	I-26	26.8	1	0	1	5	13.4	0	0	26.8	30+	N	12
113	Y	S-10-881	8.5	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
114	Y	S-8-946	6.7	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
115	Y	S-8-596	6.7	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
116	Y	S-18-230	22.6	0	0	1	5	22.6	0.15	1.5	22.6	30+	N	3
117	Y	SC 642	11	0	0	1	5	11	0	0	11	30+	N	4
118	Y	SC 642	11	0	0	1	5	11	0	0	11	30+	N	4
119	Y	S-18-377	9.8	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
120	Y	S-18-377	9.8	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2

**Highlighted entries indicate culvert structures*

Index	Route on Structure (Y/N)	Facility Carried by Structure	Apprach Roadway Width (meters)	Bridge Median	Structure Flared	Type of Service on Bridge	Type of Service Under Bridge	Inventory Route Total Horizontal Clearance (meters)	Left Curb/Sidewalk Width (meters)	Right Curb/Sidewalk Width (meters)	Bridge Roadway Width - Curb to Curb	Minimum Vertical Clearance Over Bridge Roadway (meters)	Feature Under Structure	Average Daily Truck Traffic (%)
121	Y	S-18-199	8.5	0	0	1	5	22.3	1.5	1.5	22.3	30+	N	3
122	Y	S-18-564	8.5	0	0	1	5	9.6	0	0	9.6	30+	N	2
123	Y	SC 165	12.2	0	0	1	5	13.4	0	0	13.4	30+	N	3
124	Y	S-18-706	9.8	0	0	1	5	10.1	0.2	1.5	10.1	30+	N	2
125	Y	SC 165	27.4	0	0	1	5	26.8	1.4	1.4	26.9	30+	N	3
127	Y	S-18-263	10.4	0	0	1	5	10.4	0	0	10.4	30+	N	2
128	Y	S-18-418	8.5	0	0	1	5	9.6	0	0	9.6	30+	N	2
129	Y	S-18-208	8.5	0	0	1	5	8.4	0	0	8.4	30+	N	2
130	Y	S-18-224	14	0	0	1	5	23.2	0	0	23.2	30+	N	2
131	Y	S-18-195 SPUR	7.9	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
132	Y	S-18-122	7.9	0	0	1	5	8.4	0.2	0.2	8.4	30+	N	2
133	Y	S-18-65	8.5	0	0	1	5	9.6	0	0	9.6	30+	N	2
134	Y	S-18-207	8.5	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
135	Y	US 78	11	0	0	1	5	11	0	0	11	30+	N	4
136	Y	S-8-275	8.5	0	0	1	1	7.9	0.5	0.5	7.9	30+	H	6
137	Y	US 17 ALT	45.7	2	0	6	1	17.1	0	0	34.1	30+	H	4
137	Y	SC 165	25.9	0	0	1	4	25.4	0	0	25.4	30+	H	8
138	Y	S-8-1258	7.9	0	0	1	5	9.6	0.2	0.2	9.6	30+	N	6
139	Y	I-26	37.8	0	0	1	5	18.9	0	0	37.8	30+	N	12
140	Y	US 17 ALT	23.8	0	0	1	5	100+	0	0	30.4	30+	N	4
141	Y	S-8-570	7.9	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	0
142	Y	S-8-535	11.9	0	0	1	5	11.9	0	1.4	11.9	30+	N	2
143	Y	S-8-535	9.8	0	0	1	1	7.9	0.5	0.5	7.9	30+	H	2
144	Y	S-8-62	22.6	0	0	1	5	22.6	1.5	1.5	22.6	30+	N	3
145	Y	S-8-62	25.9	2	0	1	1	29.3	0	0	29.3	30+	H	3
146	Y	S-8-388	7.9	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
147	Y	S-8-478	7.9	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
148	Y	S-8-996	13.4	0	0	1	5	13.4	0	0	13.4	30+	N	2
149	Y	S-8-29	19.5	2	0	1	5	22	0	0	22	30+	N	4
150	Y	S-8-809	8.5	0	0	1	5	7.9	0.2	0.2	7.9	30+	N	2
151	Y	S-8-88	11	0	0	1	5	10.8	1.5	1.5	10.8	30+	N	2
152	Y	S-8-24	10.4	0	0	1	5	11.3	0.2	0.2	11.3	30+	N	2
153	Y	S-8-136	23.8	0	0	1	5	21.9	0	0	21.9	30+	N	3

**Highlighted entries indicate culvert structure*

Appendix 1-B: CARTA I-26 Alternatives Analysis - Passenger Ridecheck Survey Report

Draft Report – February 2016

CARTA I-26 ALTERNATIVES ANALYSIS: PASSENGER RIDECHECK SURVEY TECHNICAL MEMORANDUM

the science of insight

5.19.2015

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PREPARED FOR:
BERKELEY-CHARLESTON-DORCHESTER COUNCIL OF GOVERNMENTS

SUBMITTED BY:
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IN COOPERATION WITH:
ETC INSTITUTE

CARTA I-26 ALTERNATIVES ANALYSIS: PASSENGER RIDECHECK SURVEY TECHNICAL MEMORANDUM

PREPARED FOR:
BERKELEY-CHARLESTON-DORCHESTER COUNCIL OF GOVERNMENTS

CONTENTS

1.0 STUDY PURPOSE AND DESCRIPTION

The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) is presently conducting an analysis of potential alternative transportation options along I-26 between Charleston and Summerville. As part of this effort, formally known as the I-26 Regional Fixed Guideway Transit Alternatives Analysis (I-26ALT), BCDCOG has commissioned an origin-destination (OD) study of the travel patterns of riders on existing bus routes. Bus service in the region is provided by the Charleston Area Regional Transportation Authority (CARTA). CARTA serves approximately 15,000 riders each weekday (according to the results of this study).

Data collection for this study was done in three parts:

Boarding and alighting counts. Project staff recorded boardings and alightings at each stop on each bus route, providing estimates for daily ridership and activity at each stop.

On-to-off Survey. This low-burden survey provides an understanding of boarding and alighting patterns on certain high-ridership routes. In other words, in addition to providing boarding and alighting *counts* at each stop, on-to-off counts provide the additional information of the boarding and alighting *pair* for each surveyed rider. On-to-off surveying was conducting on four CARTA routes: 1, 10, 11, and 12.

Full OD Survey. This survey provides a comprehensive overview of transit riders, including: (a) travel patterns, (b) fare payment, (c) travel purpose, (d) means of access and egress to/from the system, (e) time of travel, and (f) socio-demographics. The data collected from this effort were expanded and weighted using the data collected from the on-to-off survey and boarding and alighting counts.

2.0 SAMPLING

The study team developed a sampling plan for weekday travel between 6:00am and 9:00pm. Counting and surveying were conducted only on weekdays. All three efforts (boarding and alighting counts, the on-to-off survey, and the OD survey) were based on sampling plans constructed around the following four time periods:

- AM Peak (6:00 a.m. – 9:29 a.m.)
- Midday (9:30 a.m. – 3:29 p.m.)
- PM Peak (3:30 p.m. – 6:29 p.m.)
- Evening (6:30 p.m. – 8:59 p.m.)

BOARDING AND ALIGHTING COUNTS

Using tablet computers, staff noted the number of riders boarding and alighting at each stop along every CARTA route. Counts were recorded for a minimum of 30% of bus trips by route, time of day, and direction.

ON-TO-OFF SURVEY SAMPLING

The four routes along the I-26 corridor with the highest ridership were selected for on-to-off sampling. The sampling plan for the On-to-off survey was designed to obtain completed surveys from a minimum of 20% of the trips on each sampled route. This ensured that the on-to-off survey database could adequately support data expansion requirements for the full survey.

FULL OD SURVEY SAMPLING

The RSG team prepared sampling plans for each of the CARTA weekday fixed routes. The sampling plans target a number of complete surveys on each route equal to 7-10% of the estimated daily ridership. Ridership estimates were based on the boarding and alighting counts and the on-to-off survey data where available.

3.0 SURVEY INSTRUMENT

The on-to-off survey involved the use of cards with unique barcodes, which allowed survey staff to record the time and location of each rider's boarding and alighting (Figure 1). By design, the on-to-off survey puts a very low burden on the respondent; this encourages a high response rate and an accurate boarding/alighting matrix.

FIGURE 1: EXAMPLE OF ON-TO-OFF SURVEY CARD

The data collected for the on-to-off survey were as follows:

- Route;
- Boarding location;
- Boarding time;
- Alighting location;
- Alighting time

The full OD survey was administered by an interviewer with a tablet computer. The full questionnaire can be seen in the appendix.

The data collected for the full OD survey including the following:

- Route
- Any other transit routes used and number of transfers
- Time of trip
- Origin
- Boarding location
- Alighting location
- Destination
- Origin and destination type (e.g. home, work)
- Access and egress modes
- Fare type
- Home address of respondent
- Gender, race, and income, and age of respondent

4.0 SURVEY ADMINISTRATION

Boarding and alighting counts took place November 12th through December 1st, 2014. On-to-off surveys were conducted throughout all times of day and took place November 13th through December 1st, 2014. OD surveys were conducted throughout all times of day and took place January 20th through February 12th, 2015. Survey Staff were trained by ETC supervisors with detailed instructions for all three data collection efforts.

The ETC Supervisory staff focused their efforts on several bus routes per week. The staff supervised a group of approximately 16-20 interviewers per day.

Counting and the two surveys were administered on weekdays (Monday-Thursday) from roughly 6:00am to 9:00pm.

4.1 | BOARDING AND ALIGHTING COUNT ADMINISTRATION

The boarding and alighting counts are conducted using a tablet computer with special software allowing a staff member to capture the number of riders who board and alight at each stop. As the bus comes to a stop, the staff member first indicates that a stop is being made. At that point, the tablet records both a time stamp and location. Once this indication has been made, the surveyor tallies the number of riders getting off and on the bus.

If the surveyor begins a trip and there are already riders on the bus from the previous trip, the number of riders is recorded. Likewise, when the bus reaches the end of a trip, the number of riders aboard is captured. These counts are necessary to balance the boarding and alighting activity for the trip.

4.2 | ON-TO-OFF SURVEY ADMINISTRATION

The on-to-off survey collects passenger boarding and alighting pairs for all fixed bus routes by utilizing plastic cards equipped with barcodes. Staff distribute the cards to all riders as they board, passing each card through a scanner as it is distributed. Riders are asked to return the card to staff when they alight, at which time the barcode is scanned again. Each time the card is scanned, the location and time are recorded.

4.3 | OD SURVEY ADMINISTRATION

Interviewers select riders at random to participate in the survey based on the sampling goals established for each route. Once an interviewer selects a rider for the survey, the interviewer does the following:

- The interviewer approaches the person selected and asks them to participate in the survey.
- If the person refuses, the interviewer ends the survey, but the refusal is recorded to help assess the overall response rate to the survey.
- If the rider agrees to participate, the interviewer asks if he/she has at least five minutes to complete the survey.

- If the rider does NOT have at least five minutes, the surveyor asks the rider to provide his/her boarding location, alighting location, name, and phone number. ETC Institute's call center the contacts the respondent within 48 hours and asks him/her to complete the survey by phone. If a respondent cannot or will not provide a phone number, then a printed copy of the survey with prepaid return postage is provided. This ensures that short trips are well represented.
- If the respondent has at least five minutes, the surveyor administers the full survey to the respondent as a face-to-face interview using a tablet computer.

4.4 | SURVEY TOTALS

Final counts for both the on-to-off and full OD surveys, along with estimated daily ridership based on the boarding and alighting counts (and on-to-off survey data where available) are presented in Table 1 for all routes.

TABLE 1: SURVEY COUNTS AND RIDERSHIP

ROUTE	OD	ON-TO-OFF	EST. RIDERSHIP
1 James Island-North Charleston Express	89	231	788
2 Mt. Pleasant - West Ashley Express	111		584
3 Dorchester Road Express	32		249
4 NASH Express	9		106
10 Rivers Avenue	383	773	3,713
11 Dorchester/Airport	185	308	1,436
12 Upper Dorchester AFB	127	243	1,142
13 Remount Road	28		302
20 King Street/Citadel	59		588
21 Rutledge Grove	5		82
30 Savannah Highway	42		522
31 Folly Road	20		238
32 North Bridge	42		599
40 Mt. Pleasant	71		649*
41 Coleman Boulevard	18		84
102 North Neck	31		205
103 Leeds Avenue	21		192
104 Montague Avenue	32		294
105 North Area Shuttle NASH	7		39
201 North Beltline	4		86
203 Medical University Shuttle	46		560
210 Aquarium/ CofC DASH	86		1,212
211 Meeting/King DASH	133		1,840
213 Lockwood/Calhoun DASH	40		541
301 St. Andrews	41		580
Total	**1662**	**1555**	**16,632**

*Updated ridership

5.0 DATA PROCESSING

5.1 | DATA CLEANING

COMPLETENESS OF DATA

Incomplete surveys were not counted toward the survey returns. For the on-to-off survey, a complete survey simply required the return of the plastic card containing a barcode at the respondent's alight stop or station. Barcodes which were distributed but not returned were considered to be incomplete surveys.

For the Full OD study, the tablet survey tool did not allow the interviewer to continue through the survey if a question was left unanswered. The only exceptions were certain demographic questions, which some respondents might have been uncomfortable answering (e.g., household income). Therefore, a completed survey was one which had every question answered except those few demographic questions. If, while interviewing a respondent, it was found the respondent could not finish the survey, that survey was marked incomplete and was not counted toward the quota goal.

REAL-TIME DATA REVIEW

To ensure that accurate and quality data were collected, completed surveys were reviewed by field supervisors upon receipt. Field supervisors then provided feedback and additional training to interviewers. Real-time review had the added benefit of calculating the number of surveys completed by time period. Additionally, it provided overall daily progress, the progress of each route, and the progress of the surveyors. This information was also used in the creation of the weekly progress reports.

REAL-TIME GEOCODING

Because a web-based tablet survey was used to conduct and administer intercept interviews, addresses and intersections collected during field interviews were instantaneously geocoded with nearly 100% accuracy because the tablets were equipped with 4G/3G service and interface with Google Maps in real-time. In addition, after addresses and intersections were geocoded, the survey software plots the locations on a map, which served as a visual aid that interviewers used to confirm accurate information was gathered.

INTERVIEWER TRACKING AND MONITORING

ETC tracked the location of their equipment and surveyors using GPS technology. Each surveyor was assigned a surveyor number and a route. Because the equipment used to administer the survey was GPS-enabled, supervisors know where each of their surveyors was located at any given time.

Field Supervisors also rode along with each surveyor periodically throughout the day to check on their accuracy and productivity.

VERIFICATION OF DATA COLLECTION

The following data cleaning steps were taken after data collection:

- Checking for valid home, origin, and destination street names, city names, and zip codes;
- Ensuring the number of household occupants was greater than or equal to the number of employed members of the household and the number of adults in the household;
- Ensuring the respondents who indicated that they were employed also reported that at least one member of their household was employed;
- Ensuring that transit route/line names and stops/stations were consistently spelled/coded
- Ensuring that transfers to/from other transit routes/lines were possible, with some leeway provided for riders who walk several blocks to reach their next route;
- Ensuring the time of day a survey was completed was reasonable given the published operating schedule for the route;
- Ensuring the origin and destination addresses are not the same;
- Ensuring that the boarding and alighting addresses are not the same;
- Ensuring the boarding and alighting addresses make sense for the route;
- Ensuring that the respondent did not list the same route twice;
- Checking to be sure the access/egress mode is appropriate given the distance of travel from the trip origin/destination to place where the respondent boarded/alighted transit; and
- Reviewing the total distance on transit compared to the total trip distance.

VISUAL INSPECTION

This step involved a visual inspection of the trip record. The key tasks that were conducted as part of this visual inspection include the following:

- Visually inspecting and examining key variables of survey trips with very short distances;
- Visually inspecting the sensibility of trips with zero transfers or three or more transfers;
- Visually inspecting the sensibility of drive access/egress trips given the distance traveled by car relative to the distance traveled by transit;
- Visually inspecting the sensibility of drive access/egress trips with more than one transfer;
- Visually inspecting sensibility of the origin-to-destination path with respect to the survey route that was used for the trip; and
- Visually inspecting the routes reported being used for the trip.

If a record passed all of the visual checks and verifications listed above, the record was classified as “useable” and tagged for inclusion in the final survey database.

5.2 | DATA WEIGHTING/EXPANSION

The RSG/ETC team recognized the importance of weighting data to the most disaggregate level possible and followed a multi-step process similar to one used on FTA-driven OD studies.

First, bus stops were assigned to segments based on geography. Survey, on-to-off, and APC records were assigned to one of two time periods: an early period (9:00am to 3:30pm) and a late period (3:30pm to 9:00pm).

ROUTES WITH ON-TO-OFF

For routes on which the team conducted an on-to-off survey, the weighting process included three main steps:

- Create a boarding/alighting matrix using the on-to-off survey dataset
- Weight surveys to proportionally reflect the on-to-off matrix by boarding and alighting segments, route, and time of day.
- Expand Full OD survey dataset to average daily ridership by route, time of day, and direction.

ROUTES WITHOUT ON-TO-OFF

For routes with no on-to-off survey, weighting was slightly simpler. Data were weighted and expanded to match average ridership for each boarding segment (not boarding-alighting pair) by route, time of day, and direction.

6.0 RIDER PROFILE

The survey collected detailed information on CARTA's diverse riding population. The demographic data presented below reflect the entire weighted sample.

6.1 | DEMOGRAPHICS

Women outnumber men in the sample 54% to 46% (Figure 2). Well over half of the respondents (65%) identified as Black/African-American with another 32% identifying as White (Figure 3). Just under 20% reported an annual household income of under $10,000, and median annual household income was in the $20,00-$30,000 range (Figure 4). Just under half (48%) of the respondents were under 35 years of age (Figure 5).

FIGURE 2: GENDER

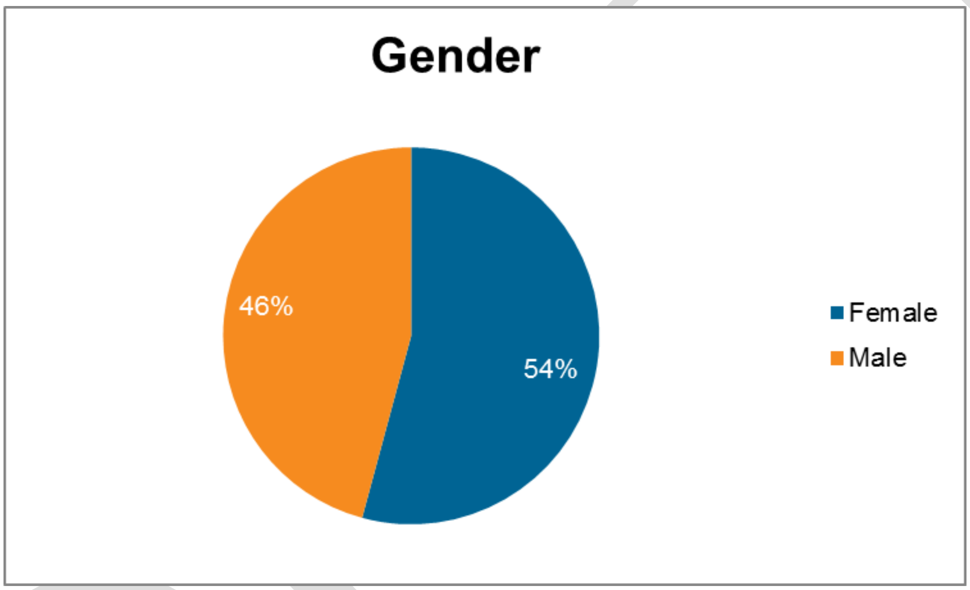


FIGURE 3: RACE

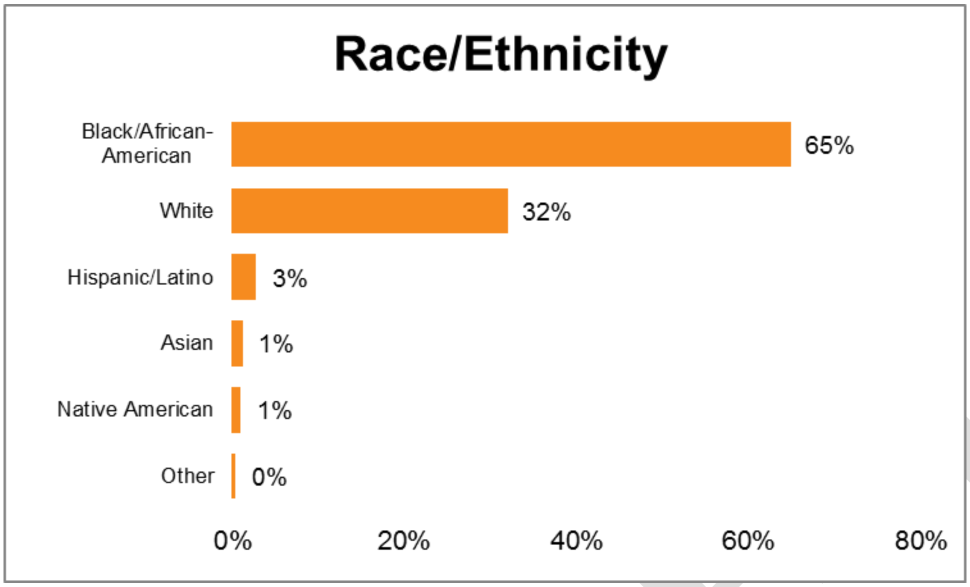


FIGURE 4: INCOME

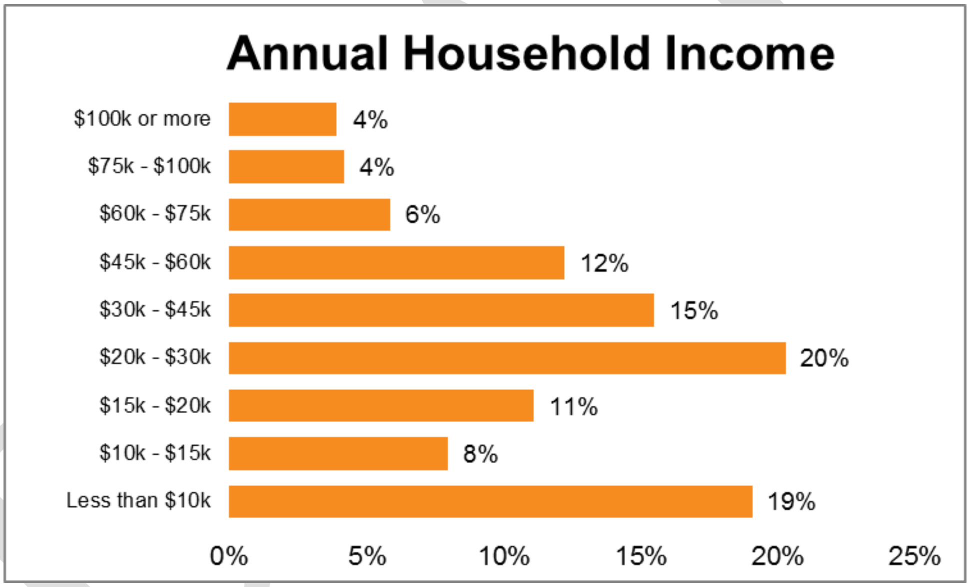
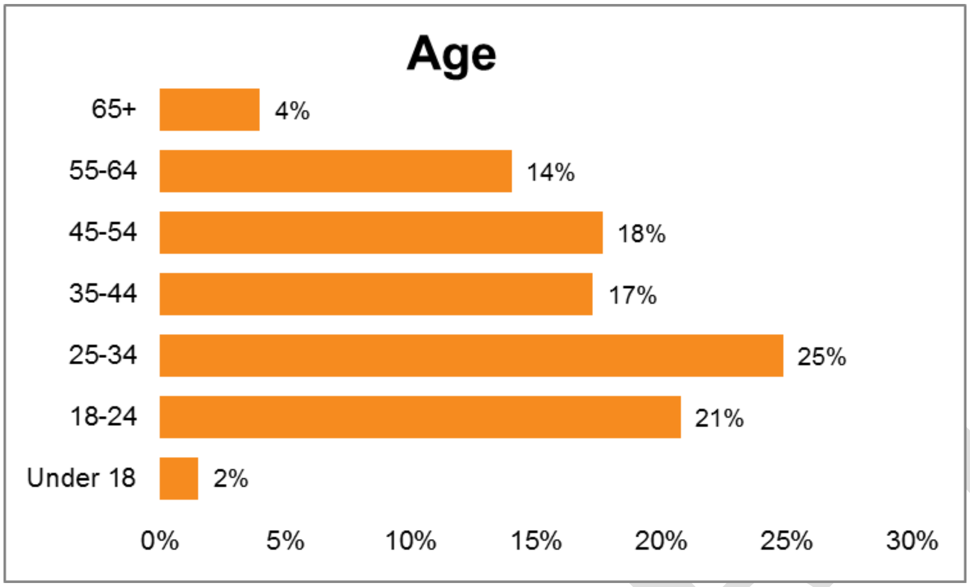


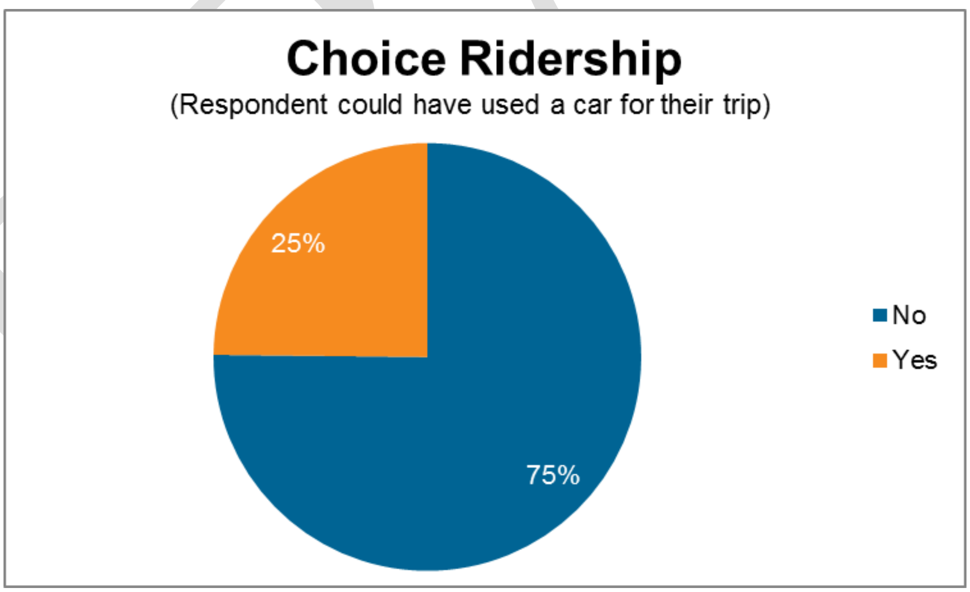
FIGURE 5: AGE



6.2 | CHOICE RIDERSHIP

Respondents were asked whether they had the option to use a car for their trip. Those who have such an option are commonly referred to as "choice" riders, while those without an automobile alternative are referred to as "captive" riders. Three quarters of the sample is composed of captive riders (Figure 6).

FIGURE 6: CHOICE RIDERSHIP



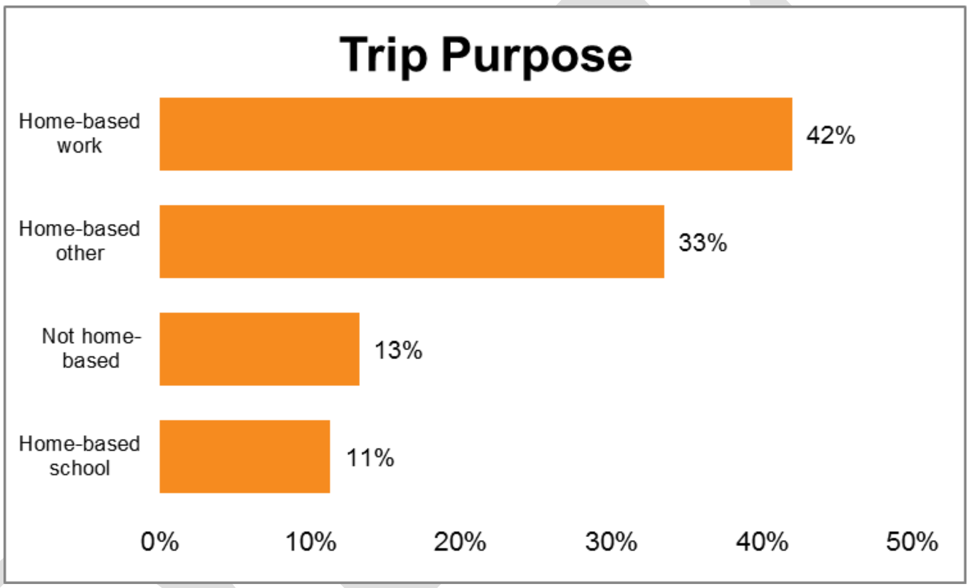
7.0 TRIP PROFILE

In addition to characteristics of the riders themselves, the survey collected data on the nature of each trip. Here, we present trip data segmented by in-corridor vs. non-corridor routes, which may be useful in anticipating ridership and farebox revenue on a future light rail system.

7.1 | TRIP PURPOSE

The most common trip type in the sample was home-based work (i.e. commute) trips. Home-based school trips (which include both K-12 and college) comprised 11% of all trips. An atypically high percentage of trips, 13%, neither originated nor terminated at the respondent's home.

FIGURE 7: TRIP PURPOSE



7.2 | FARE PAYMENT

Most riders pay a single full fare (50%), ride with a Student ID or Employee ID (23%), or pay a discounted fare (12%) (Figure 8). Among the 12% paying a discounted half, about half pay the Low Income fare (Figure 9).

FIGURE 8: FARE TYPE

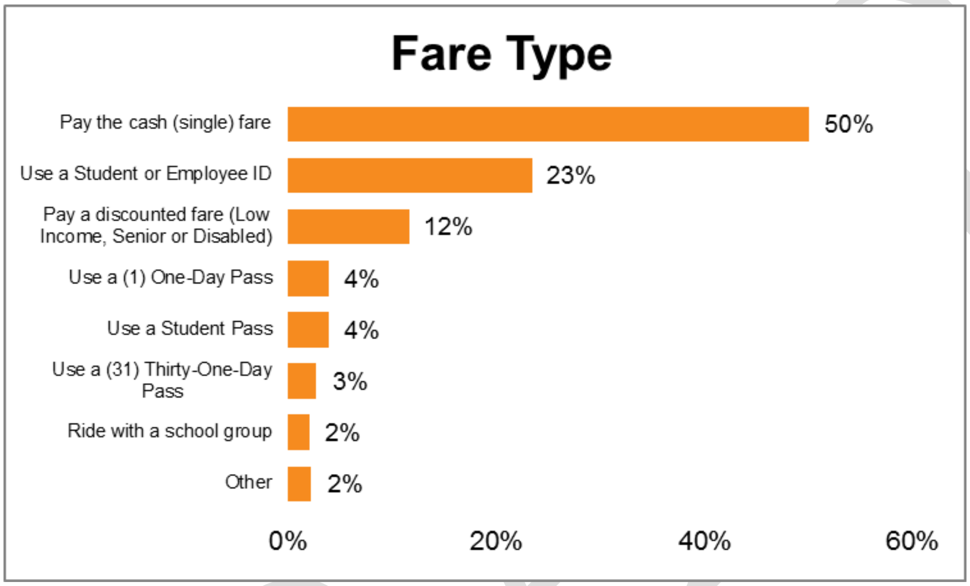
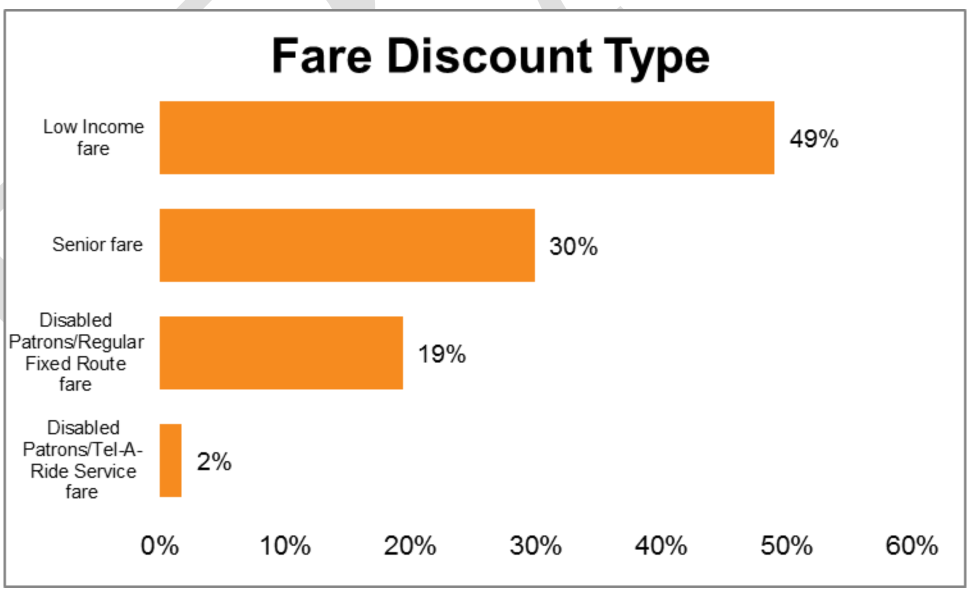


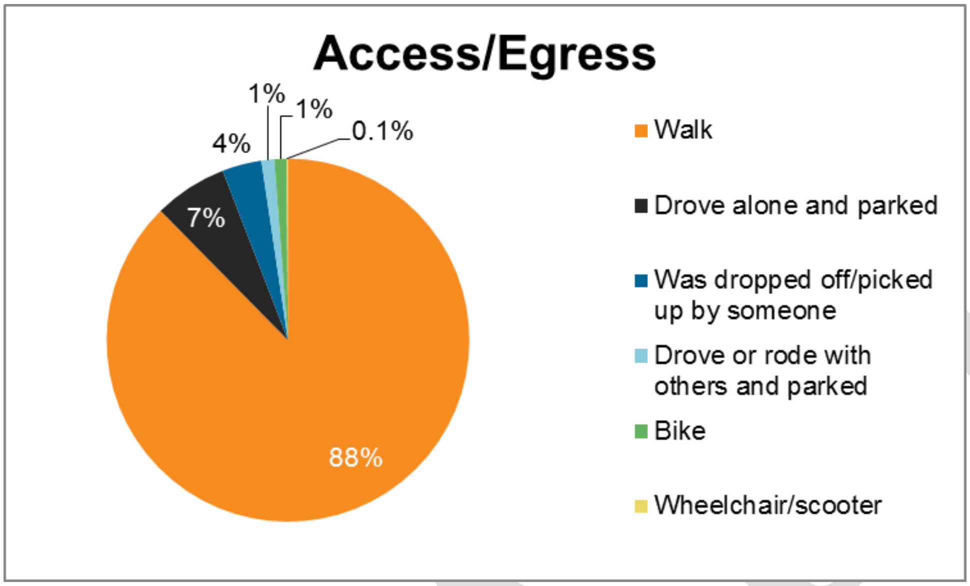
FIGURE 9: FARE DISCOUNT



7.3 | ACCESS AND EGRESS MODE

Respondents were asked how they traversed the "first and last mile" of their transit trip. Both their access and egress modes are combined in Figure 10. Walking is by far the most common way to get to and from the bus stop, with a significant number also driving. Relatively few riders bike or carpool.

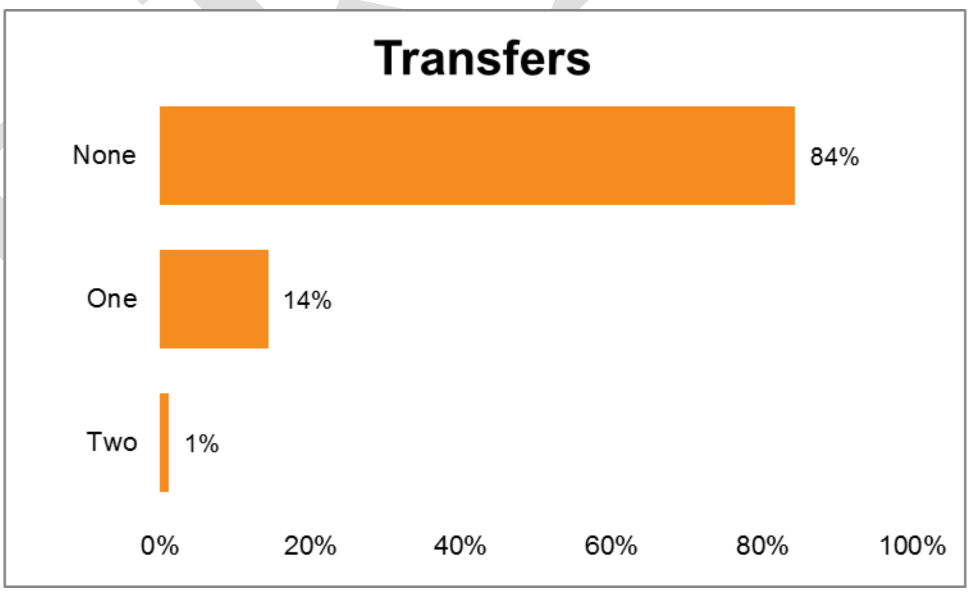
FIGURE 10: ACCESS AND EGRESS



7.4 | TRANSFERS

Survey respondents provided their entire transit path, which included any transfers. Most riders (84%) ride just a single bus, with a combined 16% making one or two transfers (Figure 11).

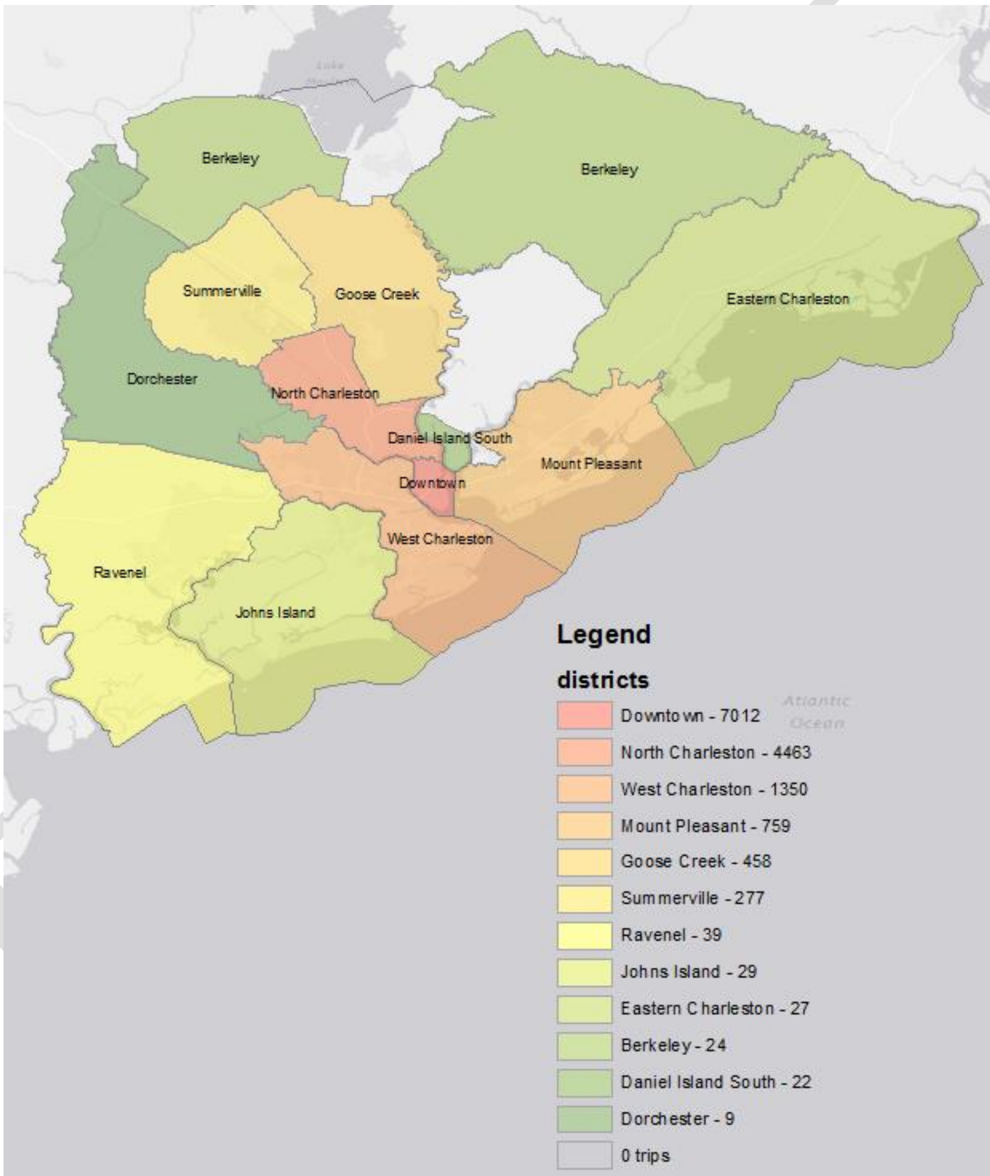
FIGURE 11: TRANSFERS



8.0 TRIP ANALYSIS

Figure 12 is map showing estimated daily origins (trip production) for several regions of the Charleston area. Downtown is by far the busiest district, with North Charleston, West Charleston, Mount Pleasant, Goose Creek, and Summerville also contributing large numbers of trips.

FIGURE 12: DAILY TRIP PRODUCTION



Appendix 1-C: I-26 Fixed Guideway Alternatives Analysis - Employer Study Report

Draft Report – February 2016

I-26 FIXED GUIDEWAY ALTERNATIVES ANALYSIS: EMPLOYER STUDY

the science of insight

5.14.2015

PREPARED FOR:
BERKELEY-CHARLESTON-DORCHESTER COUNCIL OF GOVERNMENTS

SUBMITTED BY:
RSG

IN COOPERATION WITH:
DAVIS & FLOYD

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I-26 FIXED GUIDEWAY ALTERNATIVES ANALYSIS: EMPLOYER STUDY

PREPARED FOR:
BERKELEY-CHARLESTON-DORCHESTER COUNCIL OF GOVERNMENTS

CONTENTS

1.0 EXECUTIVE SUMMARY

This report summarizes the findings of the 2015 CARTA I-26 Alternatives Analysis Employer Study. CARTA's objectives for this study were to understand the behavior, attitudes, and preference of the commuting public in the region (both employees and students) and to identify the unmet travel needs of commuters, so as to ultimately provide the most efficient service. Towards these goals, RSG fielded a study between January and February 2015 to understand residents' daily commute and non-work travel patterns, identify attitudes towards CARTA, and understand barriers to riding CARTA for non-riding segments. RSG developed an online-based survey and sent survey URLs to employers and universities in the I-26 corridor to distribute to their employees and students. The URL for each employer and university was unique, which allowed for the tracking of respondents from that particular business only.

A total of 1,756 completes were deemed usable, consisting of respondents who are using CARTA in the study area as well those who do not. Following the completion of the data collection effort, surveys were cleaned. Results indicated that compared to Former Riders (i.e., those who used to ride CARTA but no longer do) and Non-Riders, Current CARTA Riders were less likely to have a vehicle in the household, were less likely to have at least one child in the household, and less likely to be employed, but were more likely to be single, younger, and to have a lower household income. One possible explanation for these differences is that some riders may "age out" and abandon CARTA for other modes of transportation as they go through different life stages (e.g., marry, have children, graduate school and obtain secure employment with higher salary). Former and Non-Riders (i.e., those who have never taken CARTA) rated their *perception* across a variety of CARTA service attributes significantly lower than Current Riders rate their actual *experience* with the same attributes, including being able to access necessary destinations with CARTA, bus trips taking reasonable amounts of time, and the availability of CARTA service information. This suggests that CARTA might want to consider public outreach among Non-Riders to counteract some of these misperceptions that Non-Riders have.

2.0 BACKGROUND

CARTA, the Charleston Area Regional Transit Authority, provides Fixed-route, Flex Service, Express commute service, and Paratransit service throughout the Charleston Metropolitan area, including The Trolley (DASH) service in the Historic Peninsula area of the Charleston Metropolitan area. In anticipation that the region's population will approach one million residents within the next 20 years, the I-26 corridor is likely to experience congestion-related challenges. As a result, The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) initiated the I-26 Regional Fixed Guideway Transit Alternatives Analysis (I-26ALT) to identify long term transit solution for the Charleston region along the I-26 Corridor between Summerville and Charleston.

The general goal of I-26ALT is to improve transit service for today's residents of and visitors to Charleston, but also to define and construct the most effective and sustainable transit system that will serve the region's future residents. More specifically, the purpose of this 15-month study is to identify transit modes, such as bus rapid transit (BRT), light rail, or commuter rail, and alignments that will manage transportation demand, support the regional economy, and create livable communities within the study area.

As part of the I-26ALT project, an employer survey was conducted to understand the travel behavior, attitudes, and preference specifically of commuting employees and students in the region. Many of the region's employees already experience the frustration of traffic congestion and unreliable commuting times. The survey therefore intended to identify ways to ensure that the region's workforce can get to work on time and in the right frame of mind to be productive. To these goals, RSG conducted a survey of Current and Former CARTA Riders as well as Non-Riders in the region to understand differences in their demographic profiles, travel patterns, barriers to riding transit, and general attitudes towards transit.

3.0 SURVEY DESIGN

RSG closely worked with CARTA during the survey design process, and CARTA provided frequent feedback and input on the content and format of the questions. The CARTA Employer survey collected details about respondents' trips, which were used to better understand Current Riders, Former Riders and Non-Riders attitudes and perceptions, and also provided a better understanding of how and why customers are using CARTA in the Charleston Metropolitan area.

3.1 | SURVEY OUTLINE

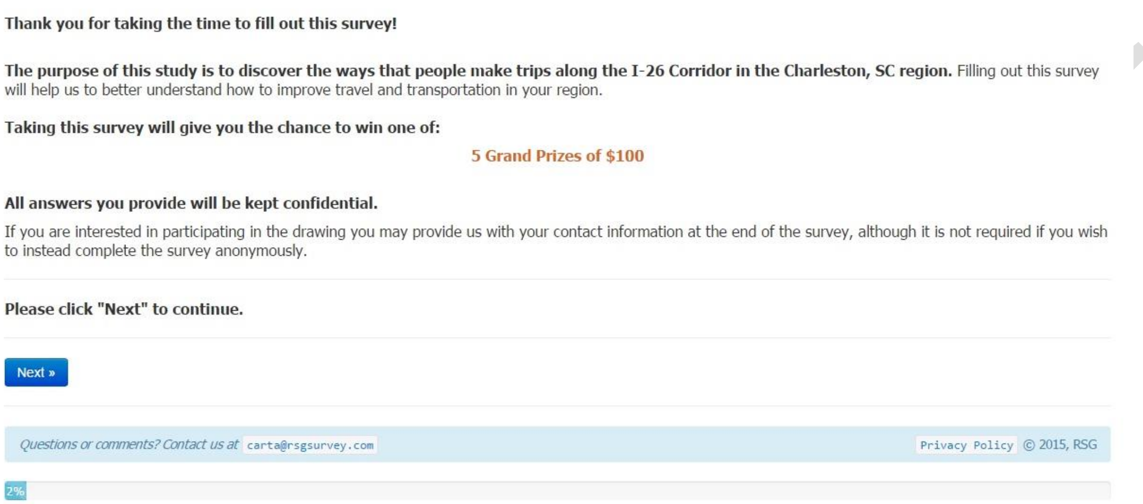
Specifically, the survey instrument included the following broad sections:

- Number of days different modes are used for commuting and non-commuting during prior week
- For the commuting trip, the following specific information:
    - Origin
    - Mode
    - Access
    - Egress
    - Time of day
    - Day of week

  - Duration
- Work incentives and telecommute frequency
- Distance from home to places of interest
- Attitudinal questions on public transit
- Barriers to CARTA use (for Non-Riders and Former Riders) or increased use (for Current Riders)
- CARTA familiarity
- Perceptions of CARTA
- Demographics

3.2 | WEB SURVEY SCREENSHOT EXAMPLES

THIS SECTION PROVIDES ILLUSTRATIONS OF SOME OF THE SURVEY QUESTIONS INCLUDED IN THE ONLINE SURVEY.


Thank you for taking the time to fill out this survey!

The purpose of this study is to discover the ways that people make trips along the I-26 Corridor in the Charleston, SC region. Filling out this survey will help us to better understand how to improve travel and transportation in your region.

Taking this survey will give you the chance to win one of:

5 Grand Prizes of $100

All answers you provide will be kept confidential.

If you are interested in participating in the drawing you may provide us with your contact information at the end of the survey, although it is not required if you wish to instead complete the survey anonymously.

Please click "Next" to continue.

Next »

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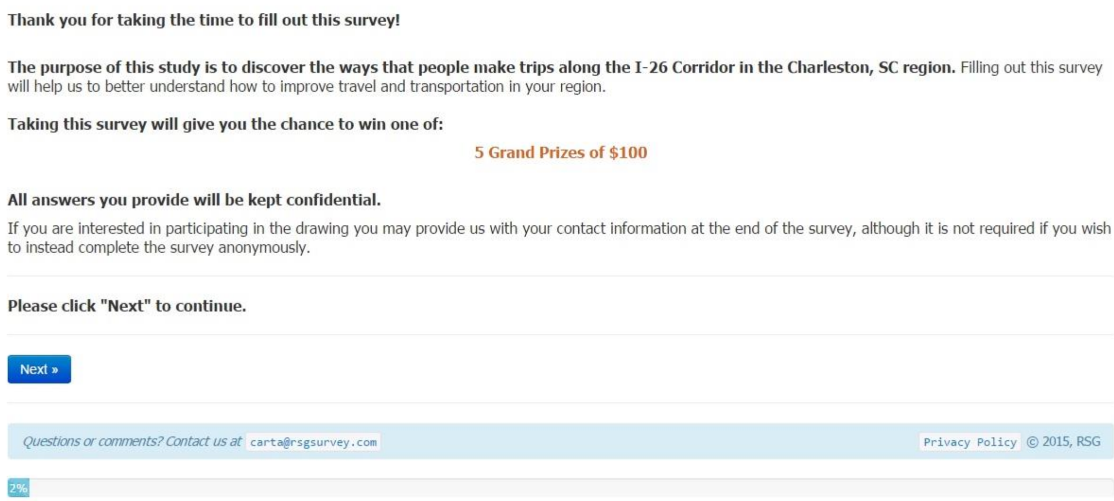
2%

Figure 1 shows the opening page that interested participants saw when they entered the survey website. This “landing page” was shown to both employees and students.



Thank you for taking the time to fill out this survey!

The purpose of this study is to discover the ways that people make trips along the I-26 Corridor in the Charleston, SC region. Filling out this survey will help us to better understand how to improve travel and transportation in your region.

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Please click "Next" to continue.

Next »

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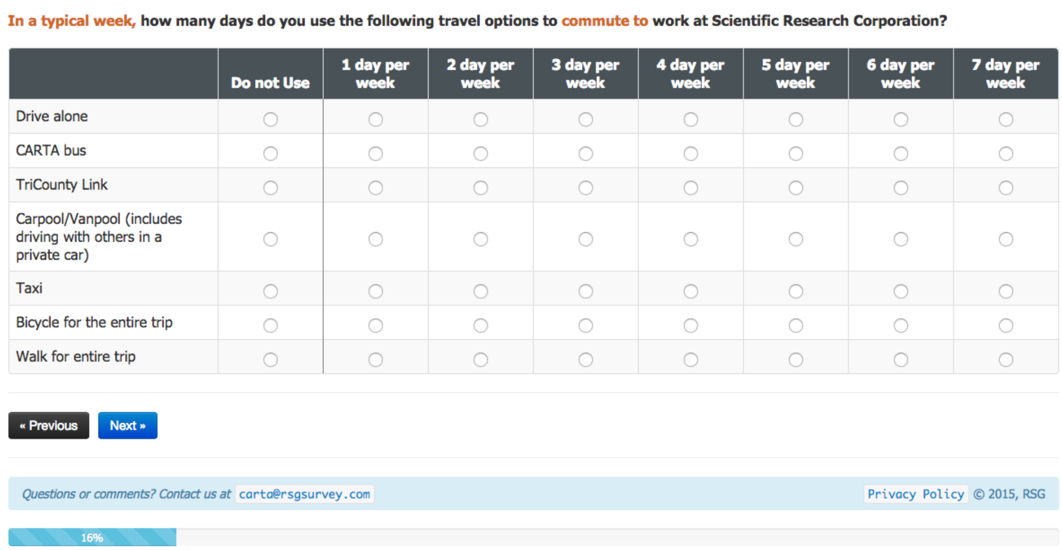
FIGURE 1: LANDING PAGE



In a typical week, how many days do you use the following travel options to commute to work at Scientific Research Corporation?

	Do not Use	1 day per week	2 day per week	3 day per week	4 day per week	5 day per week	6 day per week	7 day per week
Drive alone	○	○	○	○	○	○	○	○
CARTA bus	○	○	○	○	○	○	○	○
TriCounty Link	○	○	○	○	○	○	○	○
Carpool/Vanpool (includes driving with others in a private car)	○	○	○	○	○	○	○	○
Taxi	○	○	○	○	○	○	○	○
Bicycle for the entire trip	○	○	○	○	○	○	○	○
Walk for entire trip	○	○	○	○	○	○	○	○

« Previous Next »

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16%

Figure 2 shows a question on the number of days the respondent commuted to work or school via different types of modes. This question was repeated for non-commuting trips, as well. Both types of questions provide an overview and snapshot of the types of modes that participants typically use, and can provide insights into whether different types of modes are being used for commuting vs. non-commuting trips.

In a typical week, how many days do you use the following travel options to commute to work at Scientific Research Corporation?

	Do not Use	1 day per week	2 day per week	3 day per week	4 day per week	5 day per week	6 day per week	7 day per week
Drive alone	○	○	○	○	○	○	○	○
CARTA bus	○	○	○	○	○	○	○	○
TriCounty Link	○	○	○	○	○	○	○	○
Carpool/Vanpool (includes driving with others in a private car)	○	○	○	○	○	○	○	○
Taxi	○	○	○	○	○	○	○	○
Bicycle for the entire trip	○	○	○	○	○	○	○	○
Walk for entire trip	○	○	○	○	○	○	○	○

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16%

FIGURE 2: NUMBER OF DAYS DIFFERENT MODES WERE USED FOR COMMUTING IN A TYPICAL WEEK

Please rate how strongly you agree or disagree with the following statements about public transportation.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
There is a problem with crime or other disturbing behavior on public transportation	○	○	○	○	○
Public transportation is safe	○	○	○	○	○
Public transportation does not go where I need to go	○	○	○	○	○
I am not sure I know how to take a trip on public transportation	○	○	○	○	○
I like the idea that public transportation is good for the environment	○	○	○	○	○

« Previous   Next »

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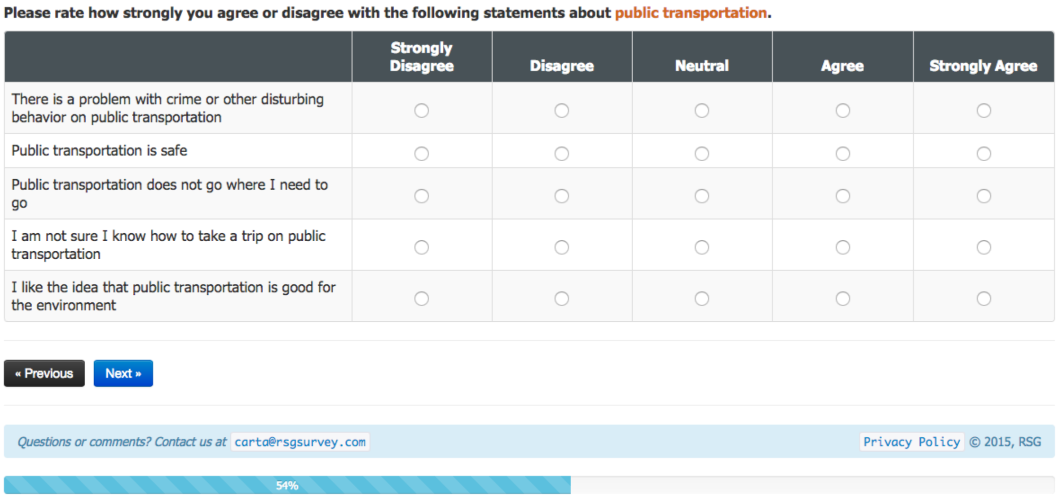
54%

Figure 3 shows attitudinal questions about public transportation. These attitudinal questions can help identify how different segments (e.g., students vs. employees) differ towards the idea of using public transportation.



Please rate how strongly you agree or disagree with the following statements about public transportation.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
There is a problem with crime or other disturbing behavior on public transportation	○	○	○	○	○
Public transportation is safe	○	○	○	○	○
Public transportation does not go where I need to go	○	○	○	○	○
I am not sure I know how to take a trip on public transportation	○	○	○	○	○
I like the idea that public transportation is good for the environment	○	○	○	○	○

« Previous Next »

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54%

FIGURE 3: ATTITUDINAL QUESTIONS ON PUBLIC TRANSIT

3.3 | LOGIC CHECKS AND SAFEGUARDS

Several safeguards were programmed into the survey. First, to ensure that only respondents who were commuting in the region took the survey, the email invitations and survey landing page clearly stated that the area of interest was the I-26 Corridor in the Charleston region. Second, given that the survey was entirely programmed online, RSG was able to include validation checks that verified, in real time, that logical and valid responses were provided. For instance, an error message appeared when respondents provided illogical answers such as indicating that there are more employed individuals in the household than the total number of individuals. Third, before the survey began, the survey confirmed that respondents did indeed work for the employer at that particular location ("Do you currently work at <employer> at the following location?: <location>").

4.0 SURVEY ADMINISTRATION

4.1 | SAMPLING PLAN

The sampling plan was designed with the goal of obtaining responses from students and employees who work or go to school in the I-26 corridor. The sampling method for this study consistent of direct emails from the respondents' employer or school, inviting them to take an online survey.

4.2 | RECRUITMENT AND FIELDING

BUSINESSES AND UNIVERSITY EMAILS

RSG contacted a variety of businesses and universities located in the study area to ask for their help in recruiting employees or students to take the survey. Targeting employees of local businesses had the advantage of reaching individuals who might not necessarily live in the I-26 Corridor, but are commuting to work. Each contacted business or university had at least 150 employees to ensure an adequate number of responses would be collected. Each location was contacted at least twice to inquire about their willingness to help with recruitment. When a business or university agreed to distribute a link to their employees and/or students, RSG sent a business-specific link to the employer that allowed for the tracking of respondents from that particular business only. Because the wording of the survey was slightly different for respondents who were completing the survey as students vs. employees, universities were given two separate links – one that was sent to students, and one that was sent to employees. Local businesses and employers that RSG contacted and were willing to help with recruitment are listed in **Error! Reference source not found.**.

CONTACTED BUSINESSES AND ORGANIZATIONS	PARTICIPATED IN STUDY
AT&T	
BAE Systems	
Bayview Aviation	
BCD Council of Governments	×
Berkeley County School District	
Bird William M & Co Inc	×
Blanchard Rental Svc	×
BOEING Charleston	
Charleston Area Convention and Visitors Bureau	×
Charleston County	×
Charleston County School District	
Charleston Hospitality Association	
Charleston International Airport	×
Charleston Marriott	
Charleston Place	
Charleston Southern University	
Citadel Military College of SC	×
City of Charleston	
City of North Charleston	
Coastal Center	
College of Charleston	×
Cummins Turbo Technologies	
Detyens Shipyards Inc	
Dorchester County School District 2	
Embassy Suites-Charleston	×
General Dynamics Land Systems-Force Protection	
Hill-Rom	
IFA Rotorion	
IHG Reservation Office	
Integrated Health Svc	
Joint Base Charleston	×
KapStone Charleston Kraft	×
Mahle Behr	
Mc Kesson Corp	
Mead Westvaco Community Development and Land Management	×
Mead Westvaco Packaging Systs	×
Medical University of South Carolina	×
MWV Specialty Chemicals	×
Palmetto Lowcountry Behavioral	
Post & Courier Newspaper	
Ralph H. Johnson VA Medical Center	
Renaissance	
Robert Bosch Corp	×
Roper/ St. Francis	
SAIC	×
Salisbury by Honeywell Safety	
Sam's Club	

CONTACTED BUSINESSES AND ORGANIZATIONS	PARTICIPATED IN STUDY
Scientific Research Company	×
SCRA	×
Solvay	
South Carolina Federal CU	
South Carolina Ports Authority	×
Summerville Medical Ctr	
TorqTek USA	
Town of Summerville	×
Trident Medical Center	×
Trident Technical College	×
Verizon Wireless	
Village of Summerville	
VT Group	
Wal-Mart Centre Pointe Dr	
Wal-Mart North Charleston	
Wal-Mart Summerville	

TABLE 1: CONTACTED AND PARTICIPATING BUSINESSES AND ORGANIZATIONS

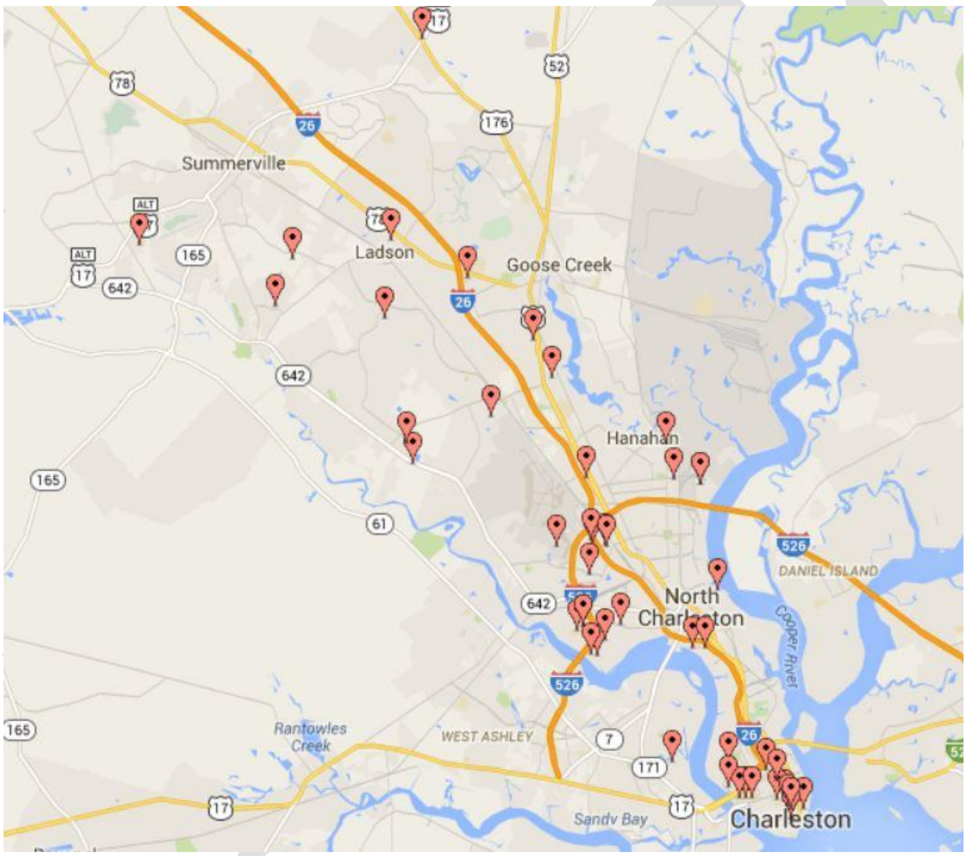


FIGURE 4: GEOGRAPHIC DISTRIBUTION OF CONTACTED BUSINESSES AND UNIVERSITIES

4.3 | RESPONSE RATES

In total, 2,083 surveys were completed and a total of 1,756 were considered valid completed surveys; the data cleaning process is described in more detail in the following section. Completion rates by business/organization are shown in **Error! Reference source not found.**.

BUSINESSES AND ORGANIZATIONS	# OF COMPLETED SURVEYS
Joint Base Charleston	473
College of Charleston	461
Medical University of South Carolina	147
Scientific Research Company	136
MWV Specialty Chemicals	99
Citadel Military College of SC	74
Charleston County	56
KapStone Charleston Kraft	53
SCRA	49
Charleston International Airport	36
Charleston Area Convention and Visitors Bureau	26
Bird William M & Co Inc	18
BCD Council of Governments	15
Mead Westvaco Packaging Systs	12
Embassy Suites-Charleston	9
Town of Summerville	7
South Carolina Ports Authority	6
Blanchard Rental Svc	4
SAIC	2
Mead Westvaco Community Development and Land Management	1
Robert Bosch Corp	1
Trident Medical Center	1
Trident Technical College	1
Other employer/school	69
Total	1,756

TABLE 2: COMPLETION RATE BY RECRUITMENT MODE

5.0 DATA CLEANING AND ANALYSES

RSG examined the data to find any respondents providing inconsistent or illogical answers and removed these respondents from the analyses. In particular, 41 respondents were excluded because they answered inconsistently on their CARTA ridership status or they were flagged on two or more of the following criteria:

- Twenty-one surveys were flagged as "speed-throughs" and discarded because the entire survey was completed in less than 7 minutes
- Two hundred and forty surveys were flagged for "straightlining" one or more survey questions. A respondent straightlines when they select the same answer for every question on the screen. This was prevalent in the attitudinal questions, and respondents received a flag for each survey page they straightlined on.
- Nine surveys were excluded for giving inconsistent information on how often they ride CARTA. Questions were asked about CARTA ridership at two points in the survey and respondents were removed if they answered that they rode CARTA at one point in the survey and answered that they never rode CARTA at another point.

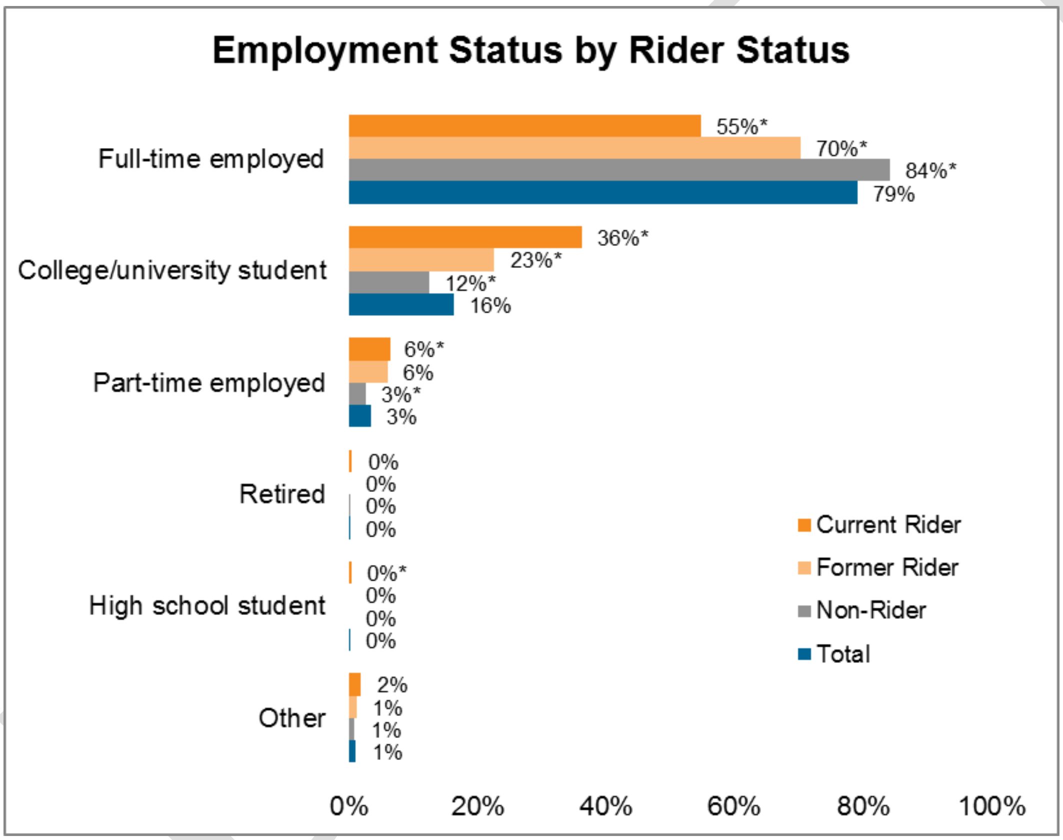
In addition, 286 records were not used because the "commuting" trip was shorter than 1 mile in length. The great majority of these very short commuting trips came from students (271), presumably from those living on campus. As a group that does not have a commute in the common sense and is therefore unlikely to take public transit for commuting in the future, these respondents were also excluded from the analyses.

6.0 RESULTS

The following section describes the results of the market analysis study. Statistical tests were run at the 95% significance level and statistically significant results are indicated with an asterisk (*). The test indicates whether a particular segment (e.g., Non-Riders) is significantly different from the group of all other segments (e.g., combined Current and Former Riders) for a particular answer option (e.g., "Full-Time Employment"). Whenever appropriate, we present data broken out by different segments as well as for a "Total" as comparison. "Total" in those instances refers to the combined result of all respondents who answered that particular question. Results that are based on questions with multiple response sets ("Select all that apply") are indicated as such.

6.1 | SAMPLE DEMOGRAPHICS

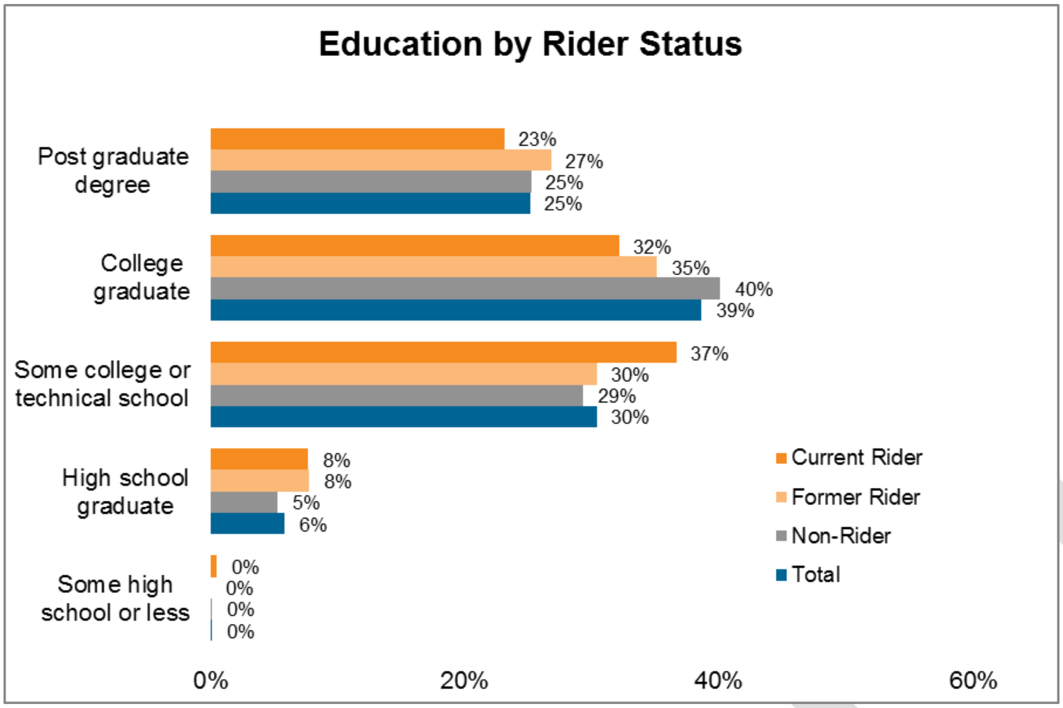
DEMOGRAPHICS BY RIDER STATUS



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 5: EMPLOYMENT BY RIDER STATUS

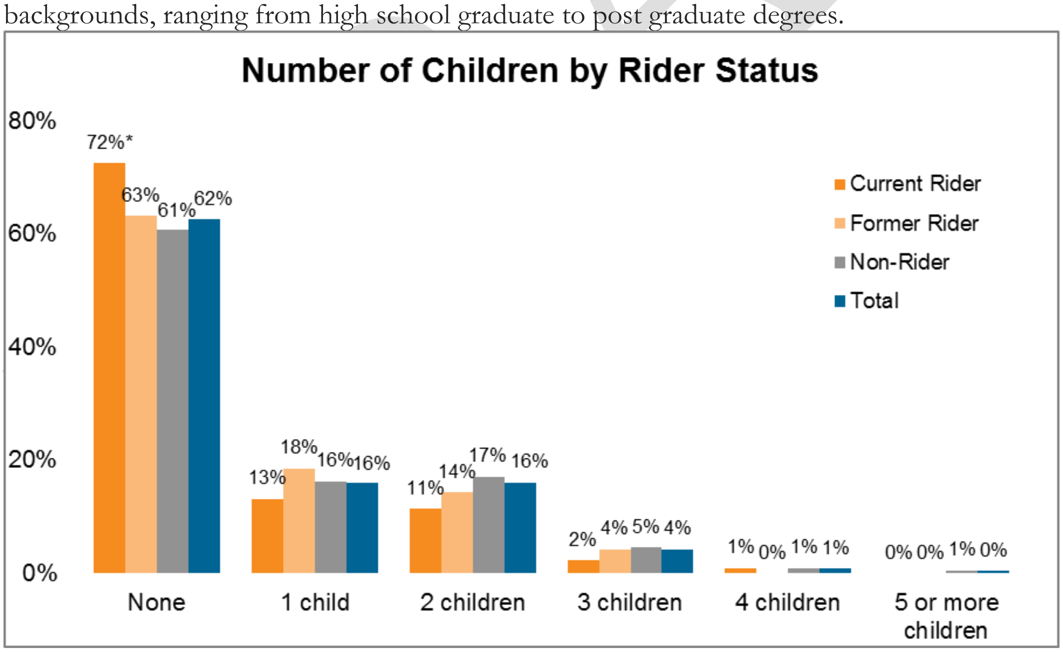
Non-Riders are more likely to be full-time employed (84%), whereas Current Riders are more likely to be college students (36%) than other types of riders.



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 6: EDUCATION BY RIDER STATUS

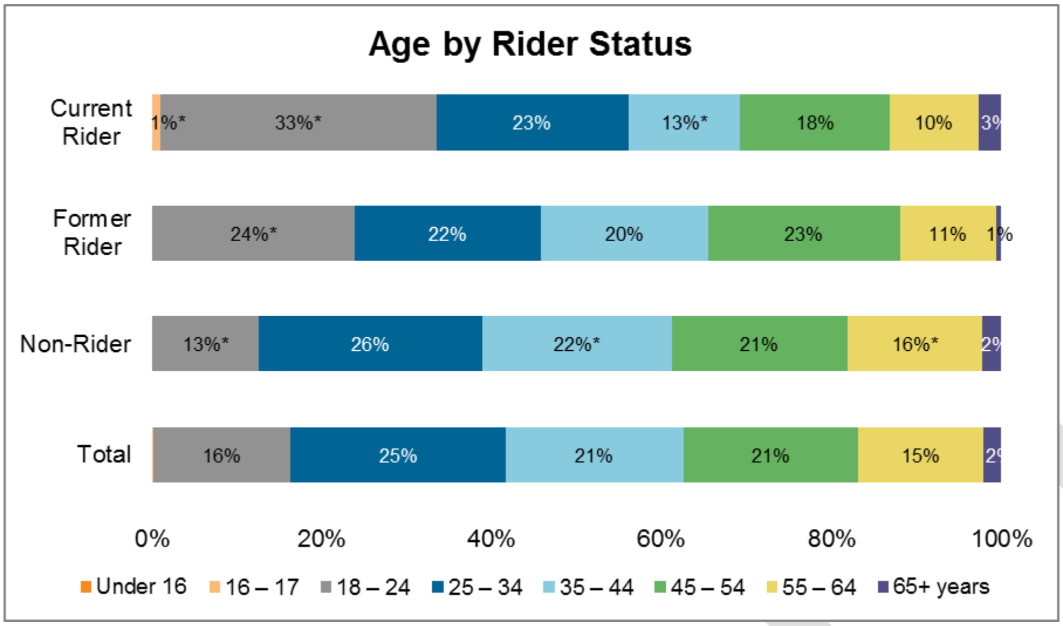
As the sample consists of employees and students only, all rider statuses have similar educational backgrounds, ranging from high school graduate to post graduate degrees.



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 7: NUMBER OF CHILDREN IN HOUSEHOLD BY RIDER STATUS

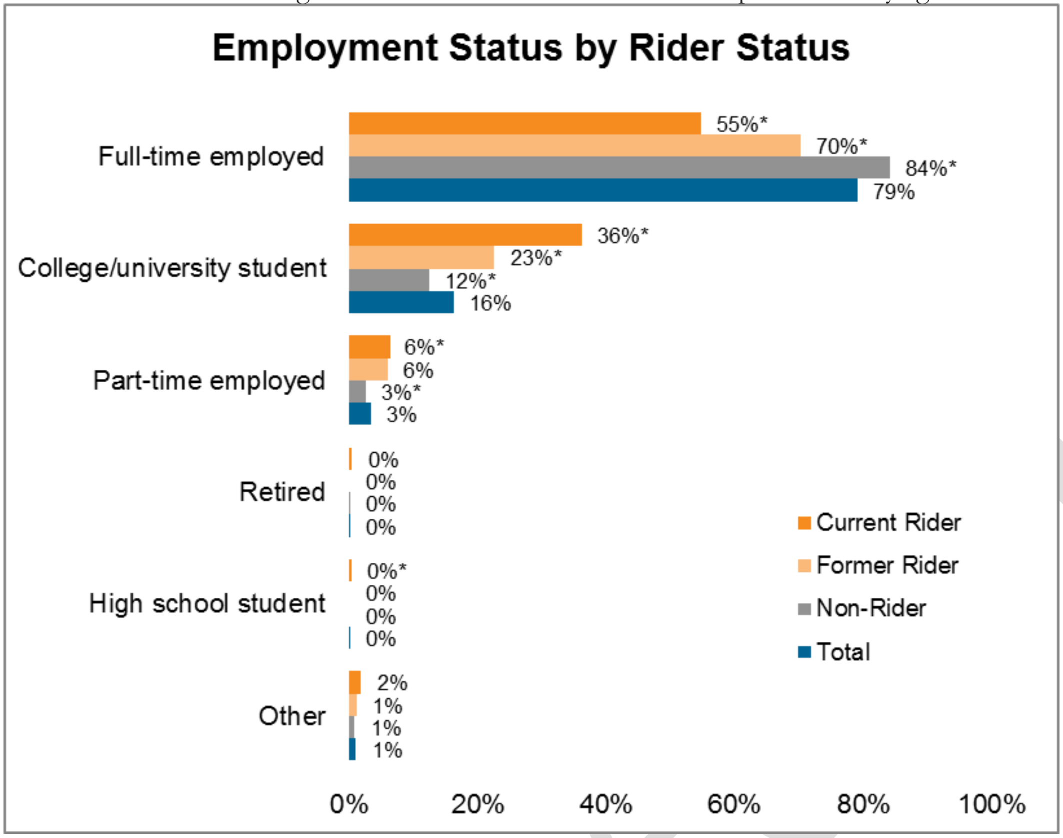
Current Riders are more likely to have no children in the household (72%) than Former and Non-Riders.



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 8: AGE BY RIDER STATUS

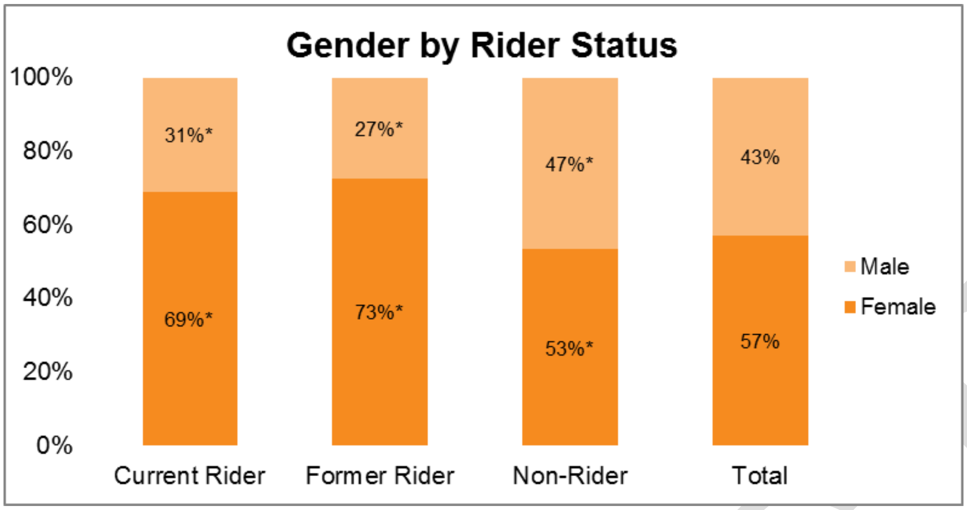
Current Riders tend to be younger, with 57% of Current Riders under the age of 35 compared to only 39% of Non-Riders, and 46% of Former Riders. This could be a function of the younger generation not being able to afford to drive or could signal a move towards transit that could persist as they age. Data from



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

Figure 5 through **Error! Reference source not found.** suggest that employed and older individuals tend to ride CARTA less. Results from

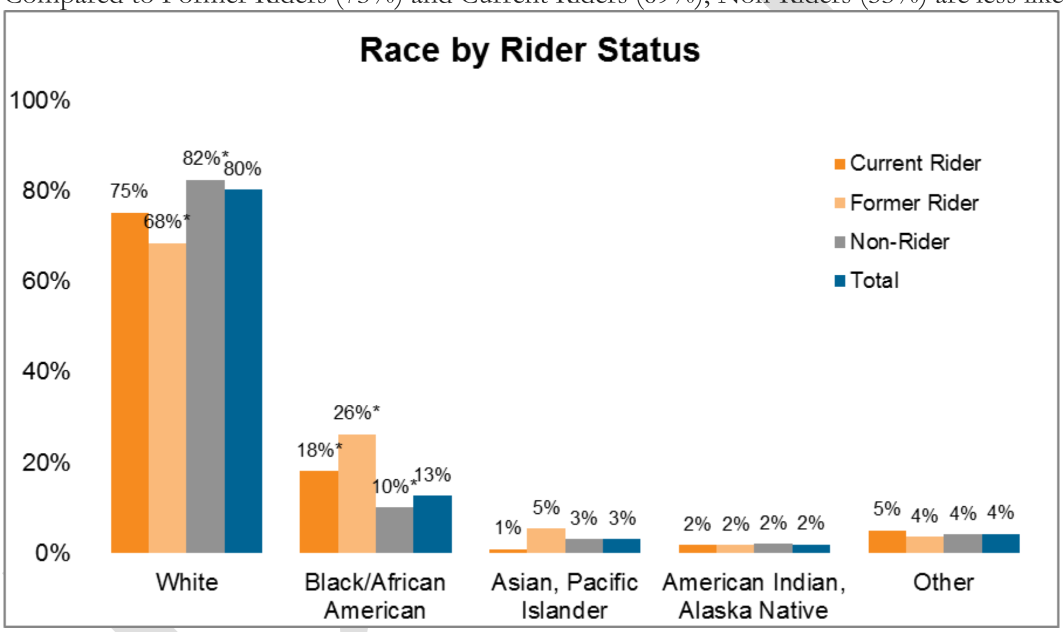
also suggest that Former Riders are more likely to have children in their household. Taken together, these results may indicate that as younger CARTA Riders become older and go through different life stages, earn higher incomes, and start to have children, they abandon CARTA for other modes of transportation that they perceive fulfilling their needs more. As an example, one Former Rider mentions under the open-ended comments the following: “There isn't enough time in my schedule to travel to bus stops and wait for a bus when I have to pick up my child on my way home from work.”



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 9: GENDER BY RIDER STATUS

Compared to Former Riders (73%) and Current Riders (69%), Non-Riders (53%) are less likely to be female.

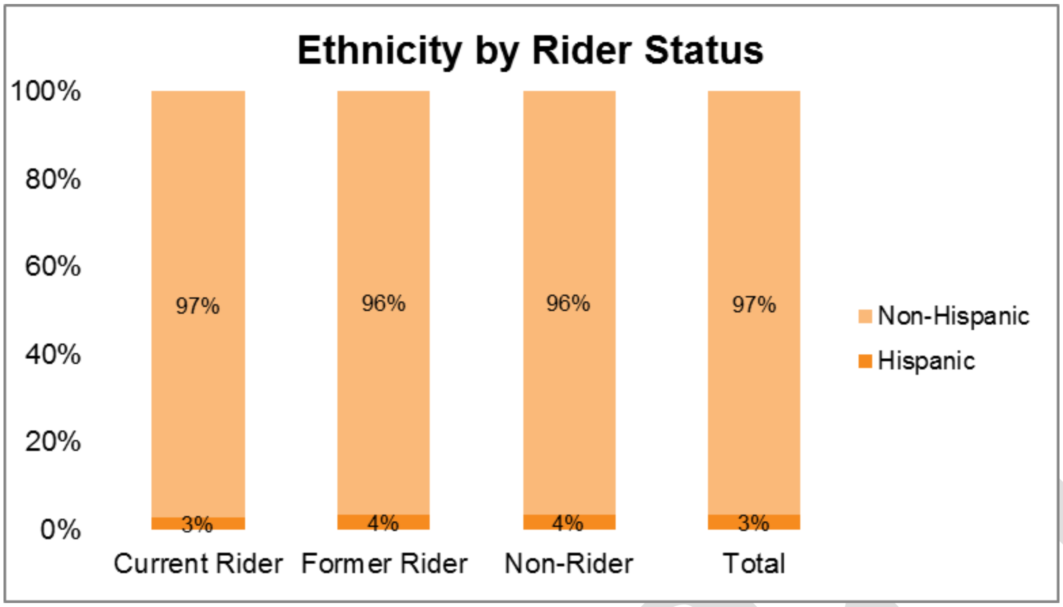


Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

Note: Bars may not add up to 100% due to multiple responses per record.

FIGURE 10: RACE BY RIDER STATUS

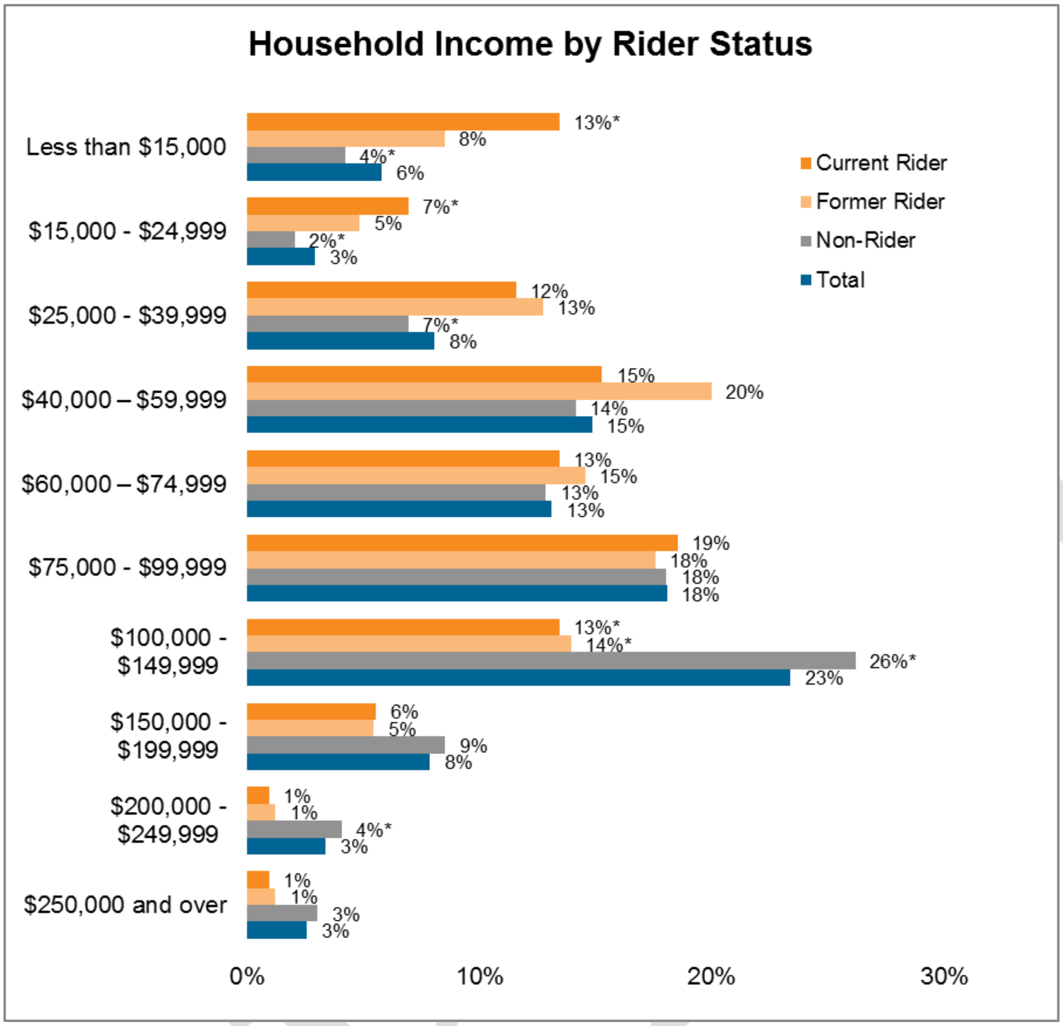
Current Riders and Former Riders showed greater racial diversity than Non-Riders, with the most frequently reported Non-White race among Current Riders being Black/African American (18%), followed by American Indian, Alaska Native (2%). Over a quarter (26%) of Former Riders reported being Black/African American.



Total sample; Unweighted; base n = 1746; total n = 1756; 10 missing; Current Rider = 221; Former Rider = 167; Non-Rider = 1358

FIGURE 11: ETHNICITY BY RIDER STATUS

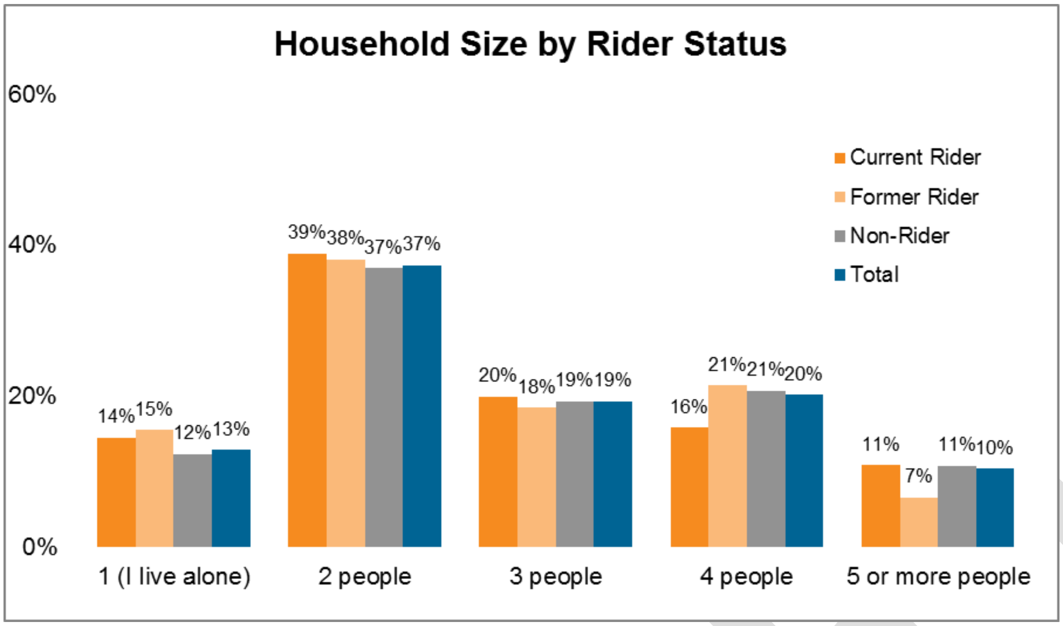
Compared to the 2010 U.S. Census Bureau data for the City of Charleston, in which 2.9% of Charleston's population is of Hispanic or Latino decent, **Error! Reference source not found.** shows that our recruiting fforts to attract respondents from the Hispanic community were successful in all forms of rider status.



Total sample; Unweighted; base n = 1710; total n = 1756; 46 missing; Current Rider = 216; Former Rider = 165; Non-Rider = 1329

FIGURE 12: HOUSEHOLD INCOME BY RIDER STATUS

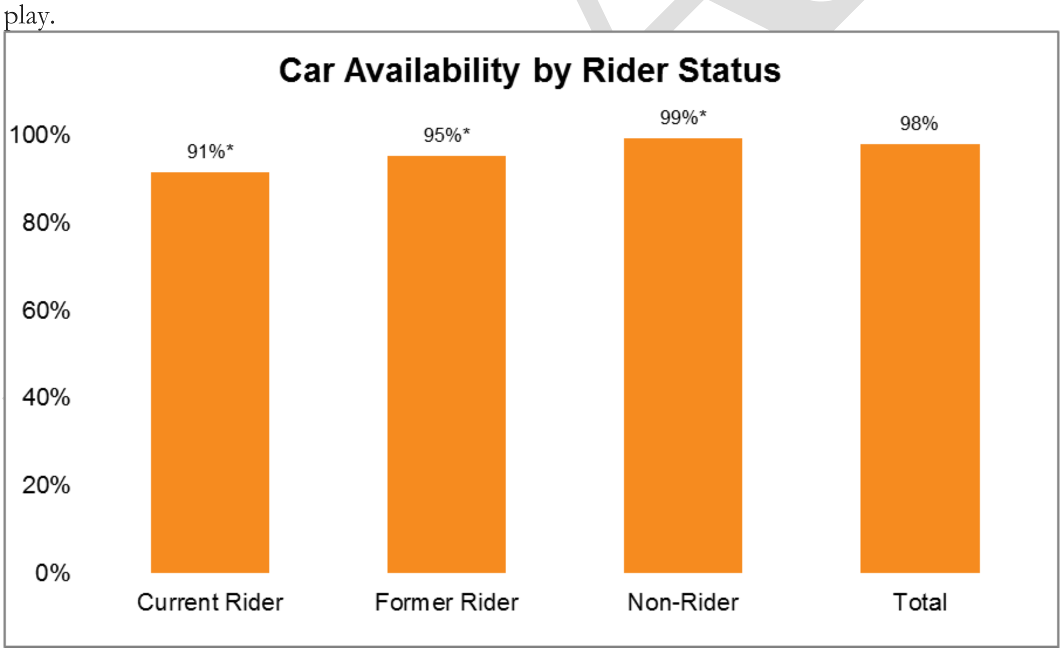
Current Riders are much more likely to have a household income of less than $25,000 (20%) compared to Non-Riders (6%). This is likely because those with lower household incomes are less likely to own a car and therefore more likely to rely on transit to get them where they need to go. While it is not significant, there is a jump in the percentage of Former Riders with an income of $40,000-$59,999 (20%). Perhaps it is around this income level that Current Riders begin transitioning to Former Riders. Finally, over a quarter of Non-Riders (26%) have a household income within the $100,000-$149,999 range.



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 13: HOUSEHOLD SIZE BY RIDER STATUS

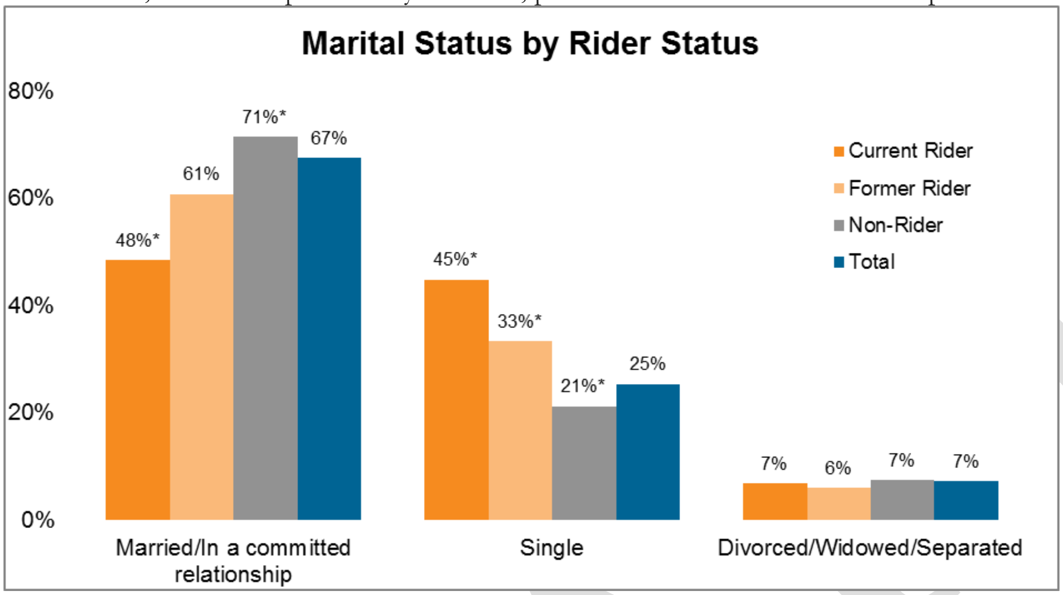
All household sizes are well represented across all rider statuses. This may be due to the combination of employees and students in the sample, where different marital statuses and living combinations come into play.



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 14: CAR AVAILABILITY BY RIDER STATUS

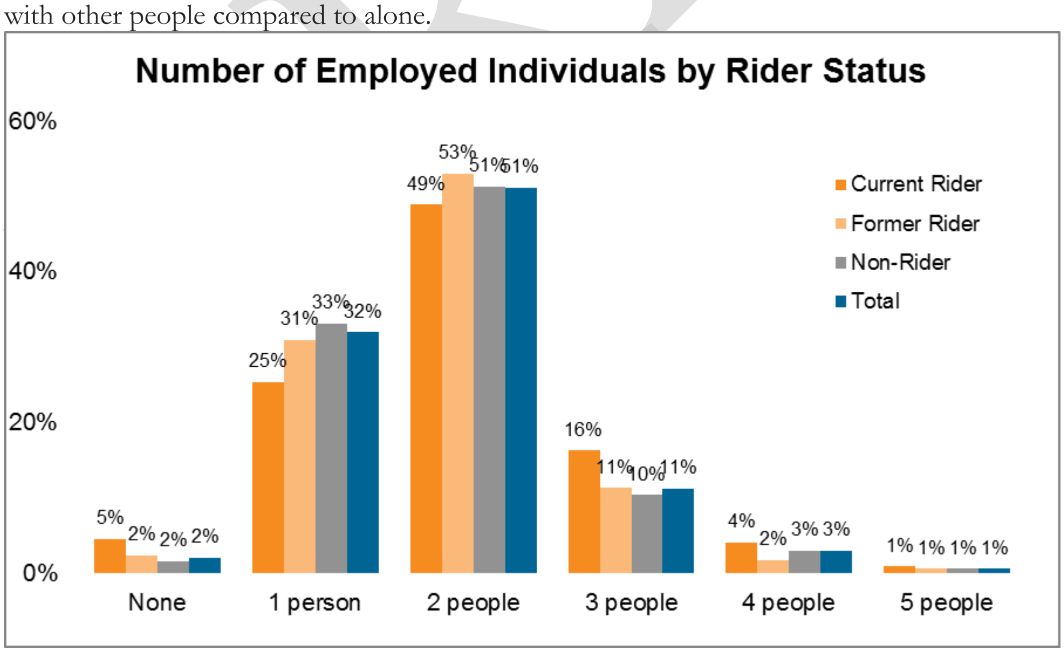
Car availability is relatively high among all segments of CARTA riders, however, Current Riders are less likely to have a vehicle available for their personal use (91%) compared to either Former Riders (95%) or Non-Riders (99%). The fact that all but 9% of Current Riders *do* have a car available for personal use suggests that some Riders, who could presumably use a car, prefer to ride CARTA for some trips.



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 15: MARITAL STATUS BY RIDER STATUS

Current Riders are much more likely to be single (45%) compared to Former Riders (33%) or Non-Riders (21%). One interpretation of these results is that individuals who are in a relationship or are married are more likely to make trips with other individuals, and that riding CARTA buses is less convenient when travelling with other people compared to alone.



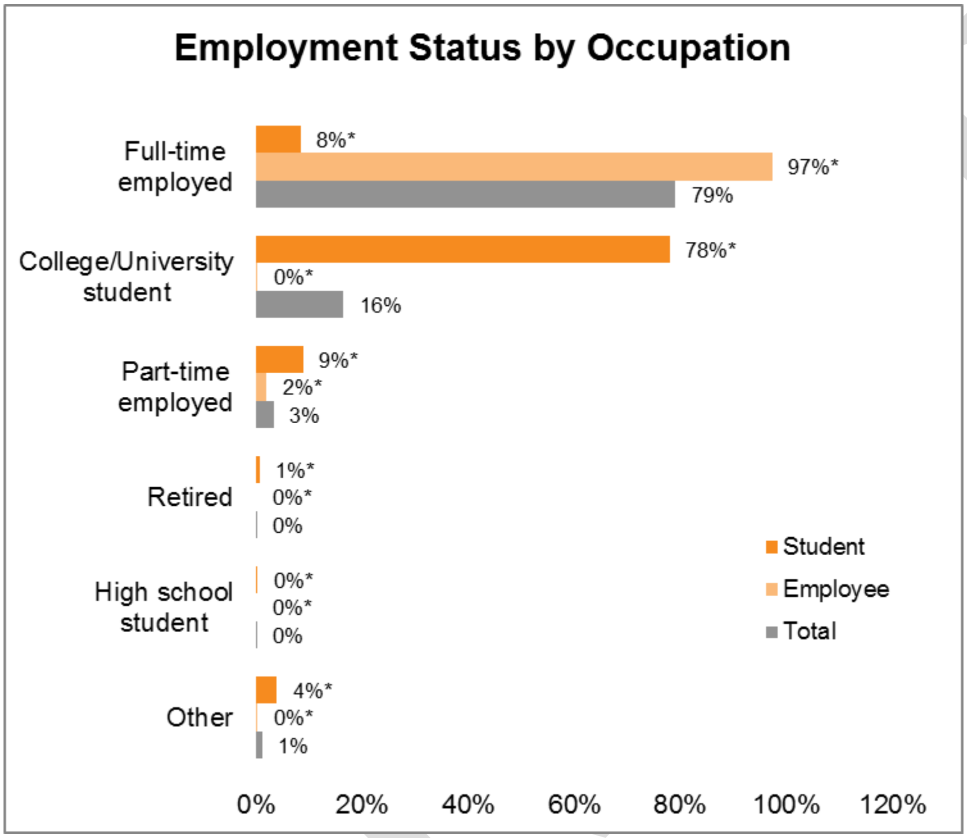
Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 16: NUMBER OF EMPLOYED INDIVIDUALS BY RIDER STATUS

The number of employed individuals in a household is consistent across rider statuses. This could be due to the sample containing only employees and students in the area.

DEMOGRAPHICS BY OCCUPATION

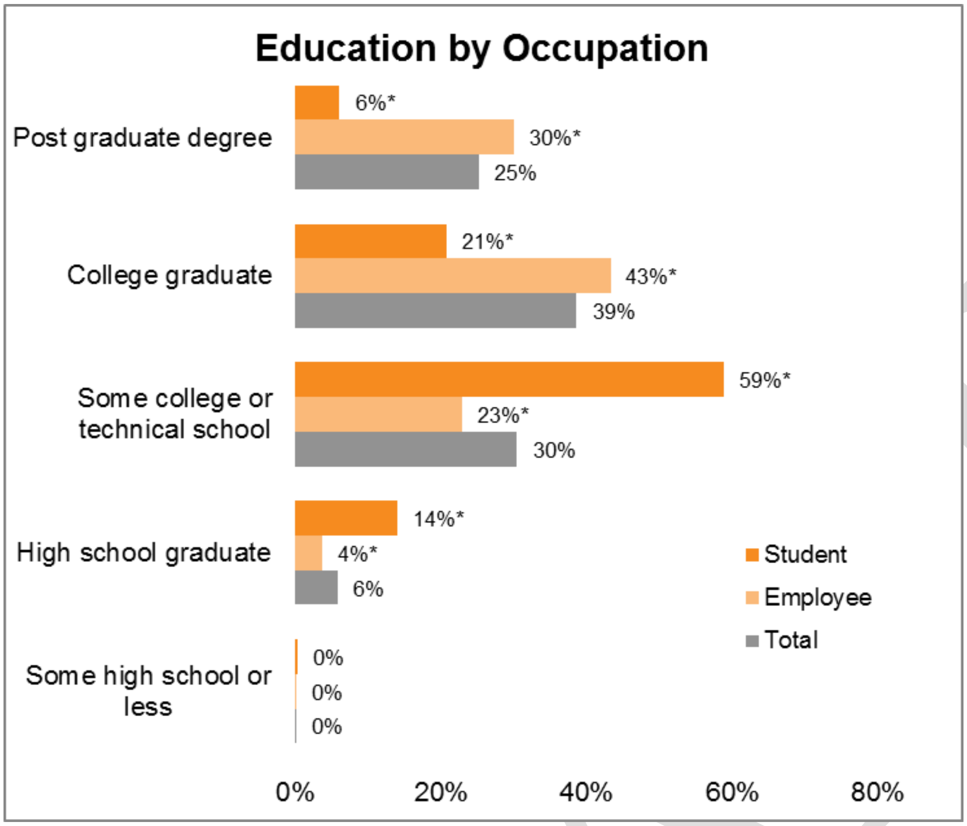
The following section presents demographic information segmented by occupation (student vs. employee).



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 17: EMPLOYMENT STATUS BY OCCUPATION

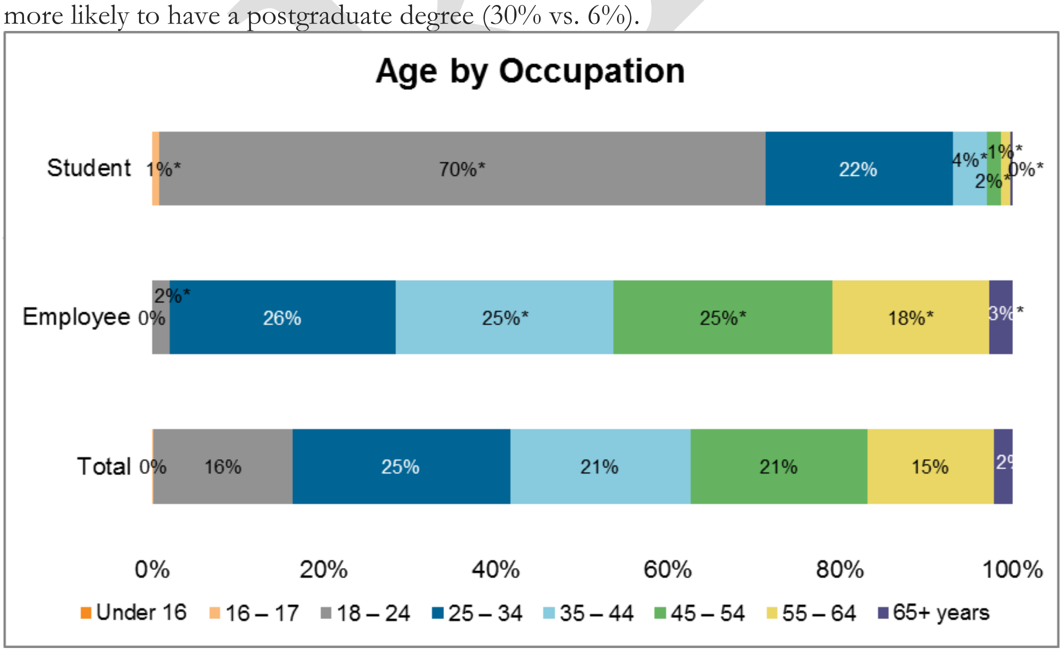
These results for employment status can largely be seen as a confirmatory data check: The great majority of Student respondents indicated that they are College/University students, whereas the great majority of Employees indicated that they were full-time employed. The fact that some Student respondents selected categories other than College/University student can be interpreted as some students holding jobs while attending university and only being able to select one answer.



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 18: EDUCATION BY OCCUPATION

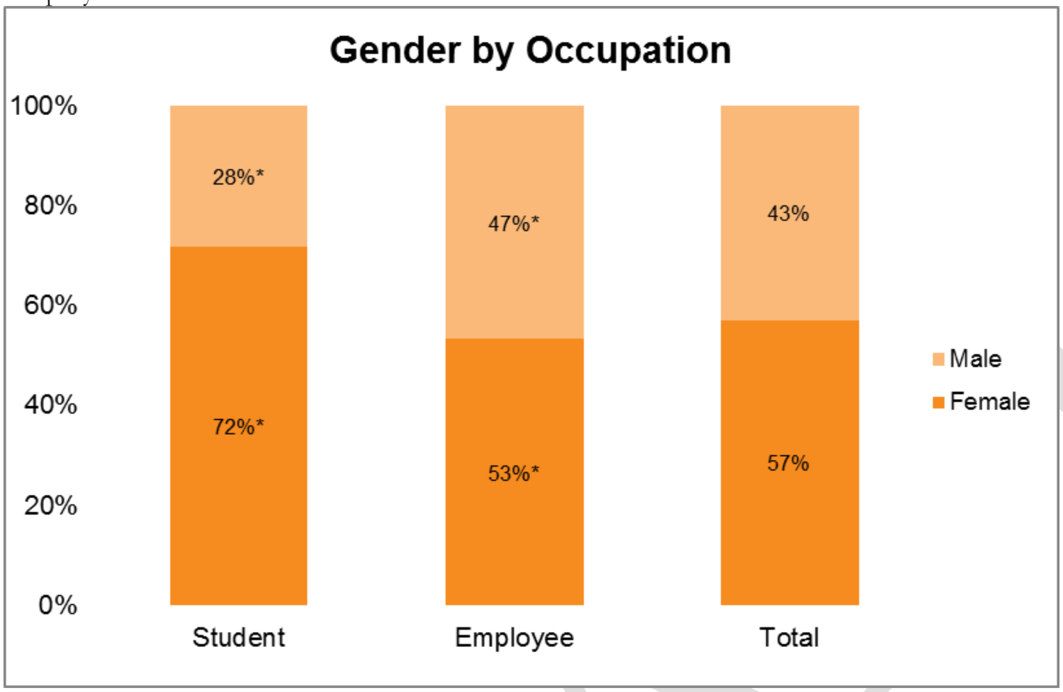
As might be expected given that many Student respondents are still working on their degree, Employees are more likely to have a postgraduate degree (30% vs. 6%).



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 19: AGE BY OCCUPATION

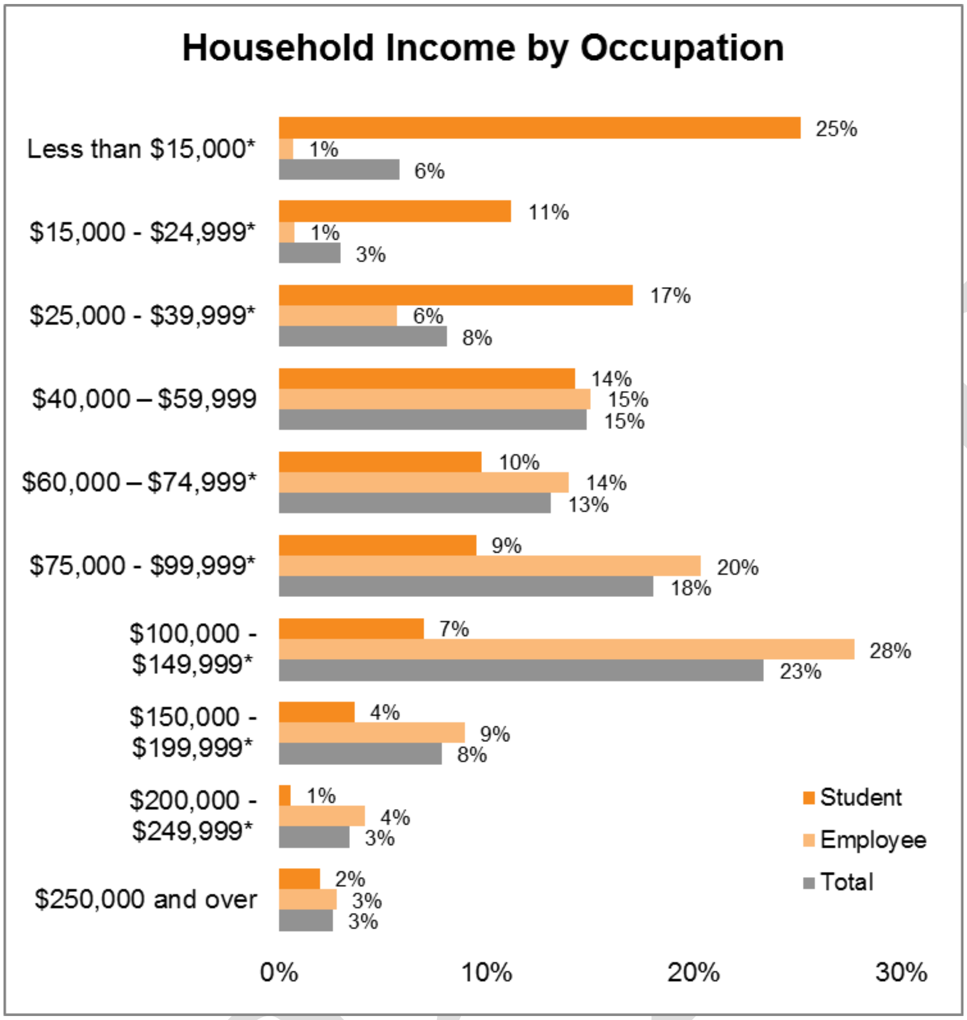
Students are more likely to be younger than Employees, with 93% under 35 compared to only 28% of Employees.



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 20: GENDER BY OCCUPATION

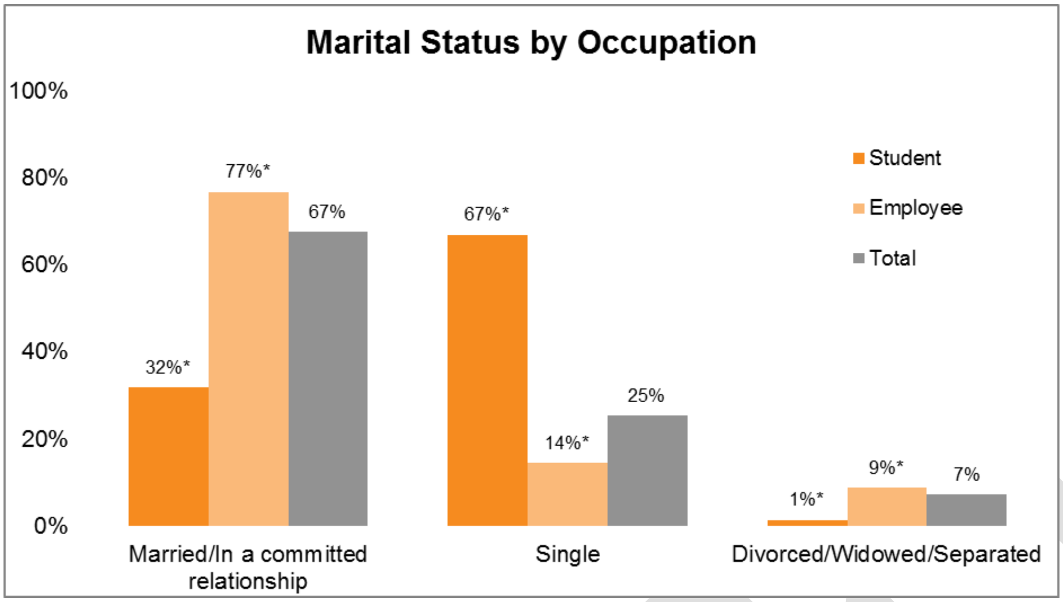
Overall more females responded to the survey than males, and Employee respondents are less likely to be female (53%) compared to Students (72%).



Total sample; Unweighted; base n = 1710; total n = 1756; 46 missing; Student = 358; Employee = 1352

FIGURE 21: HOUSEHOLD INCOME BY OCCUPATION

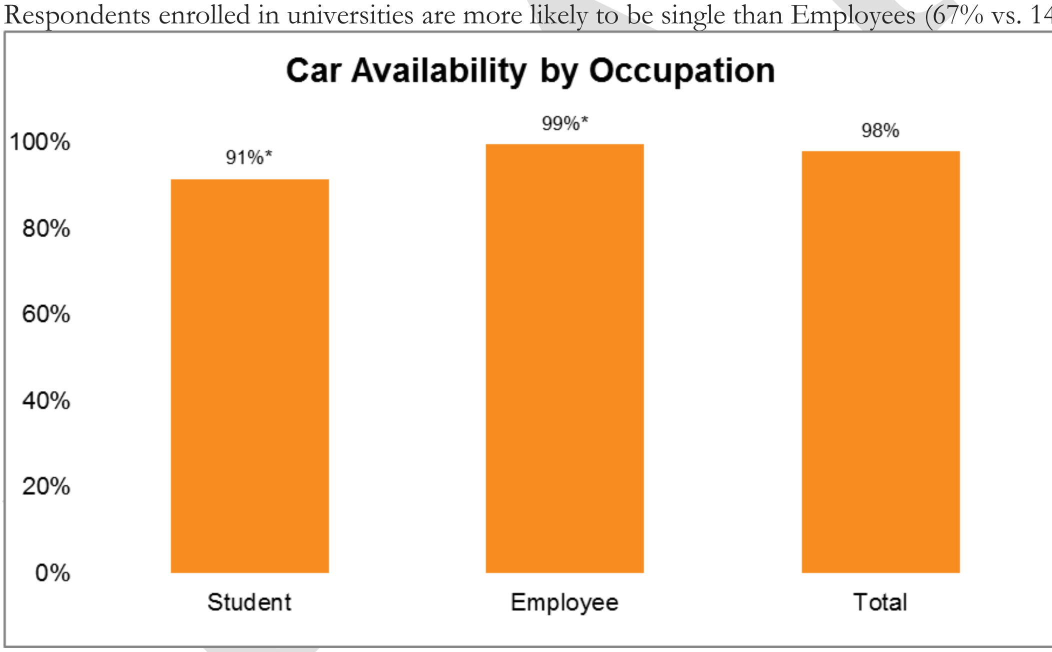
Students are much more likely to have a household income of less than $40,000 compared to Employees (53% vs. 8%).



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 22: MARITAL STATUS BY OCCUPATION

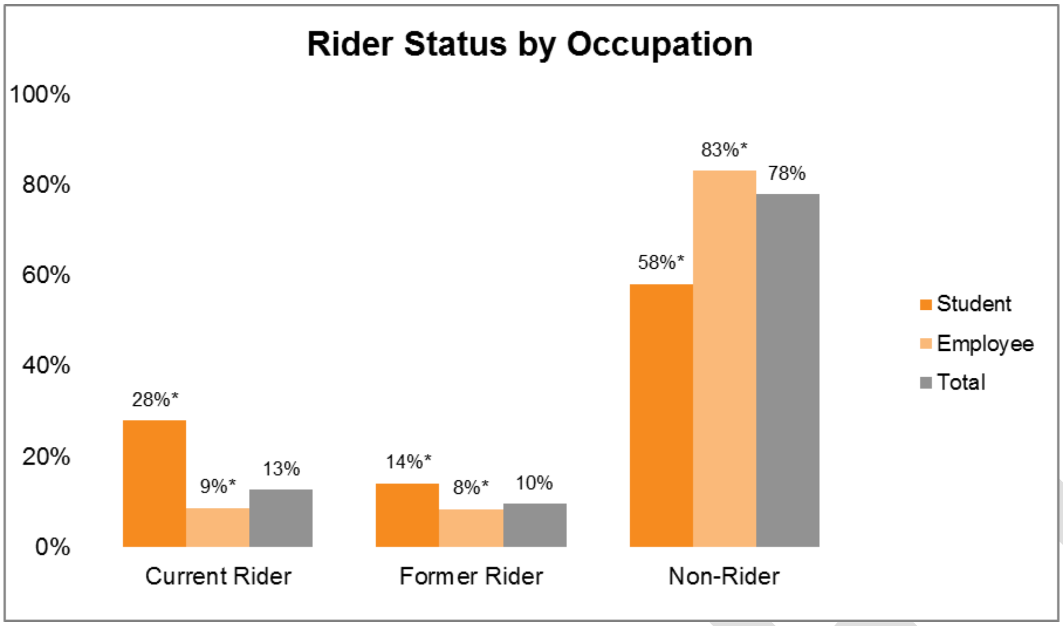
Respondents enrolled in universities are more likely to be single than Employees (67% vs. 14%).



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 23: CAR AVAILABILITY BY OCCUPATION

Compared to Employees (99%), Students (91%) are slightly less likely to own a car.



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

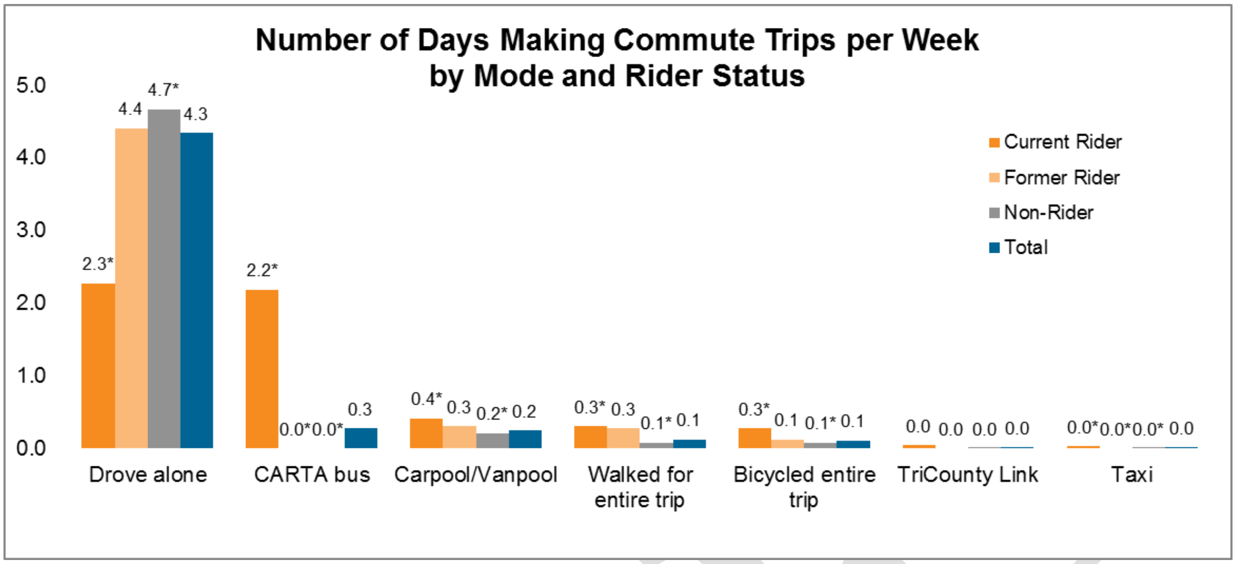
FIGURE 24: RIDER STATUS BY OCCUPATION

Students are more likely than Employees to be Current (28% vs. 9%) and Former (14% vs. 8%) CARTA Riders. Figure 19**Error! Reference source not found.** through **Error! Reference source not found.** can plain this; Students' youth, low income, and lower availability of a car could lead them to use CARTA more often.

6.2 | TRAVEL PATTERNS

Respondents were asked a variety of questions regarding how they typically commute to their work/school. Questions about respondent travel included what modes of travel they used, how frequently they made commuting and non-work trips, and how frequently they used certain modes of travel. Finally, respondents were asked to provide the full details of their typical commute to work or school. The details of this trip included the days they usually make this trip, modes used, time of departure to and from work/school, and duration of each commute.

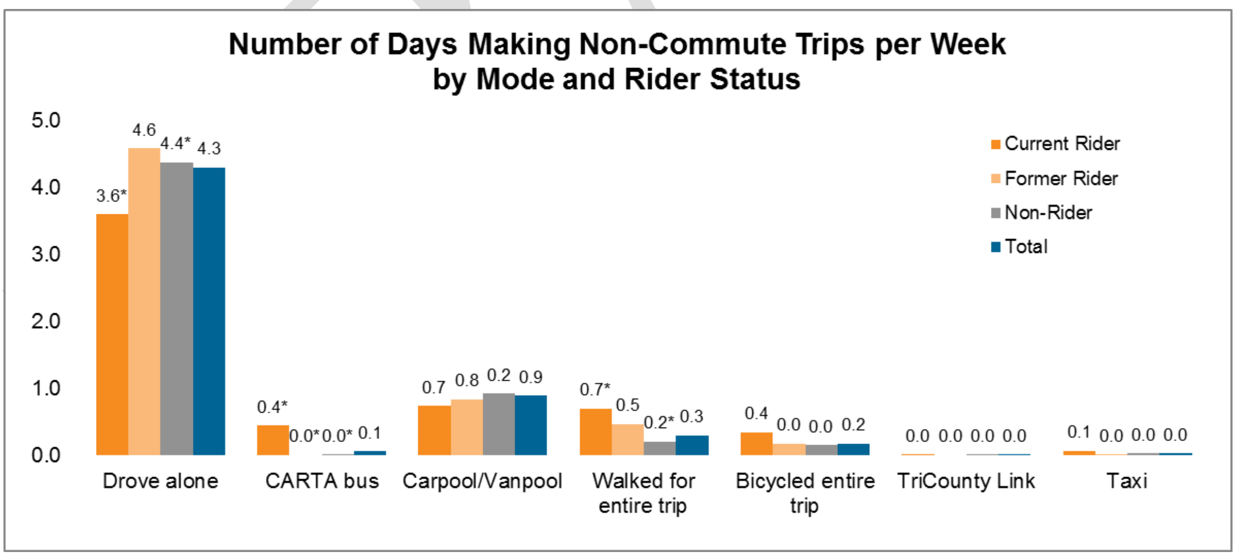
GENERAL TRAVEL BEHAVIOR



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 25: NUMBER OF DAYS MAKING COMMUTE TRIPS PER WEEK BY MODE AND RIDER STATUS

Results from this question indicate that most residents commute by driving alone in their car. Current Riders of CARTA reported using a car as frequently as they use the CARTA buses. Further, it is interesting to note that Current Riders drive about half as much as other segments. Finally, Former Riders' mode choice mirrors that of Non-Riders', suggesting that once they abandoned CARTA, their behavior is very similar to those individuals who have never been CARTA Riders.

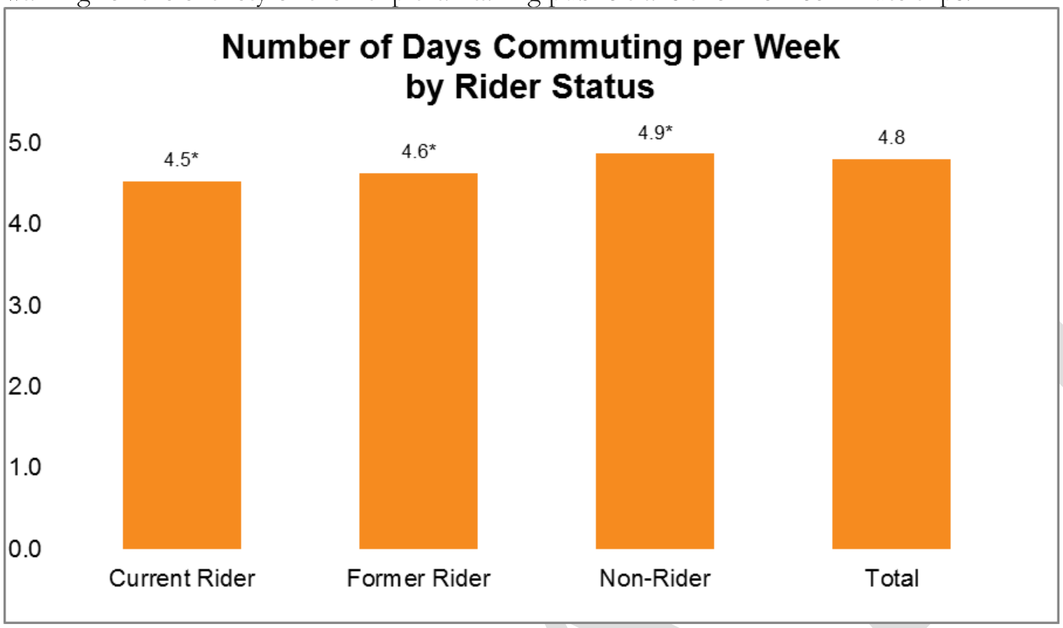


Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 26: NUMBER OF DAYS MAKING NON-COMMUTE TRIPS PER WEEK BY MODE AND RIDER STATUS

Non-commute trips show a drop in CARTA use and an increase in carpooling, walking, and cycling when compared to commute trips. As with commute trips, the most commonly used travel mode is driving alone.

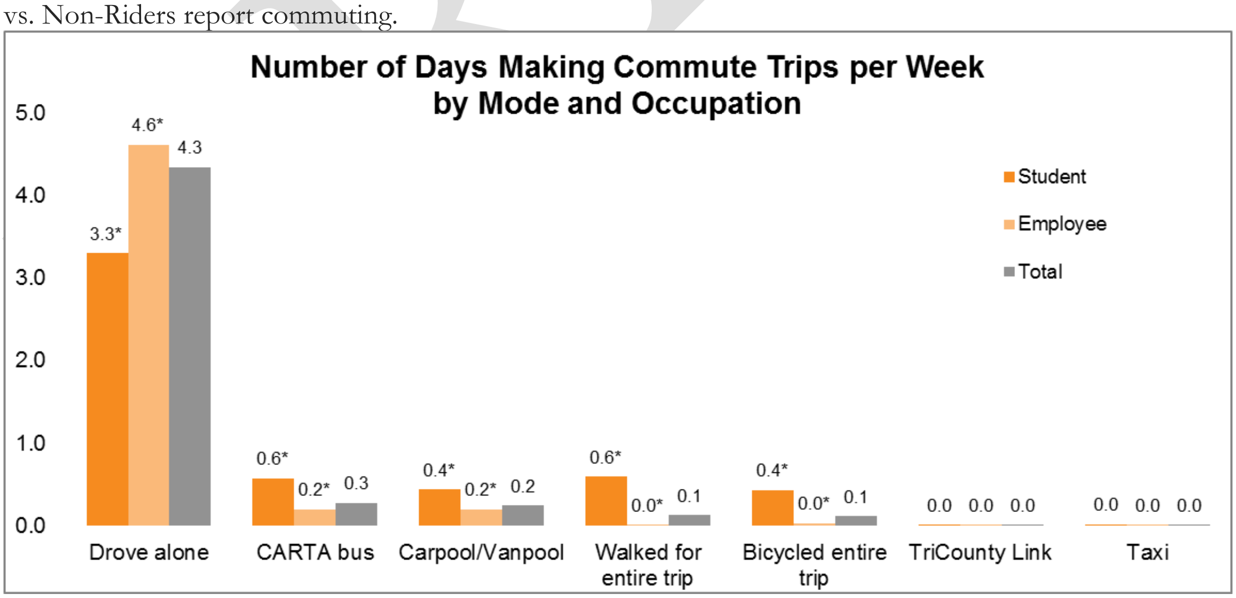
The increase in carpool/vanpool usage could be due to some of the non-commuting trips that people make (such as shopping, entertainment) entail going to a destination (shopping mall, going to the movies) with other people. CARTA is not used as frequently for non-commute trips, and in fact more respondents report walking for the entirety of their trip than taking public transit for non-commute trips.



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 27: NUMBER OF DAYS COMMUTING PER WEEK BY RIDER STATUS

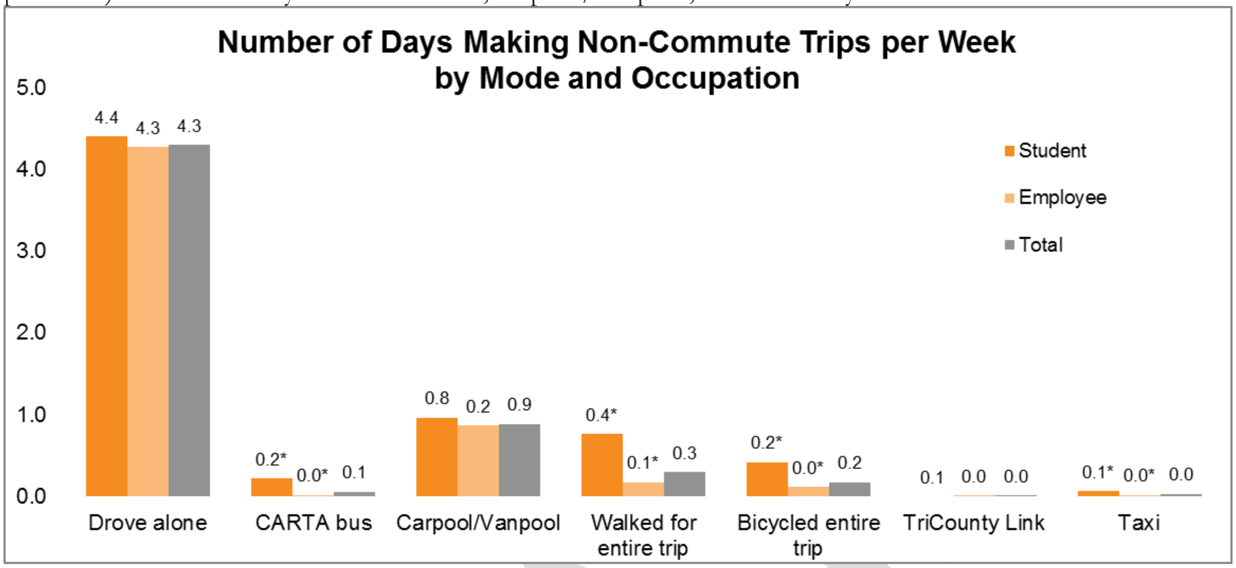
Respondents who reported making commute-type trips indicate an average of nearly 5 days per week. Overall, there is about one half of a day difference in the number of days per week that Current vs. Former vs. Non-Riders report commuting.



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 28: NUMBER OF DAYS MAKING COMMUTE TRIPS PER WEEK BY MODE AND OCCUPATION

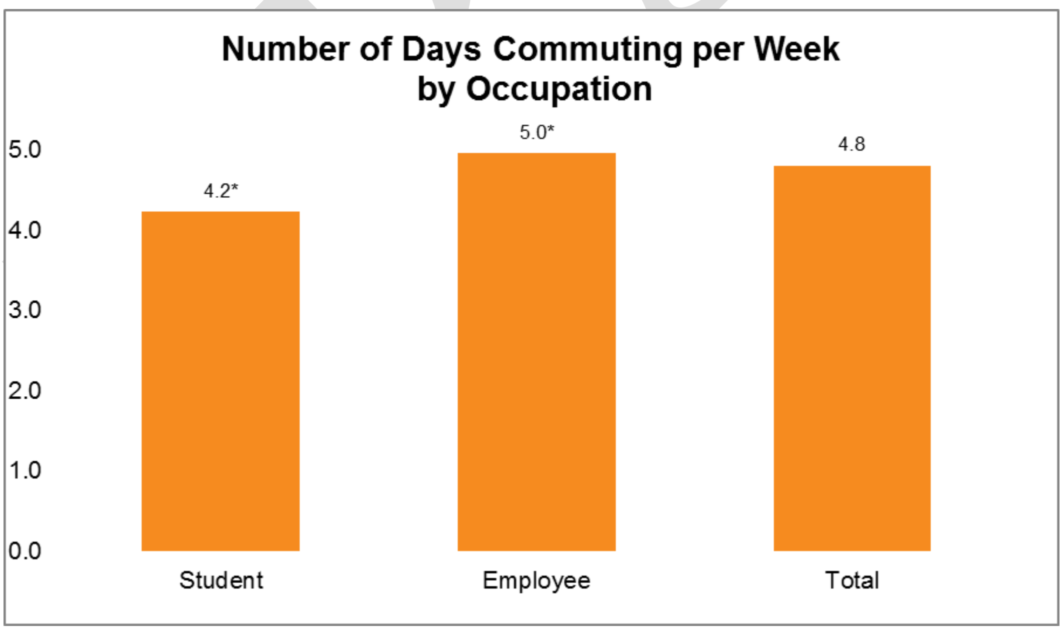
When comparing commuting days between Students and Employees, it is clear that Students are more likely to use modes other than driving alone. Students are less likely than Employees to drive alone (3.3 vs. 4.6 days per week) and more likely to take CARTA, carpool/vanpool, walk and bicycle.



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 29: NUMBER OF DAYS MAKING NON-COMMUTE TRIPS PER WEEK BY MODE AND OCCUPATION

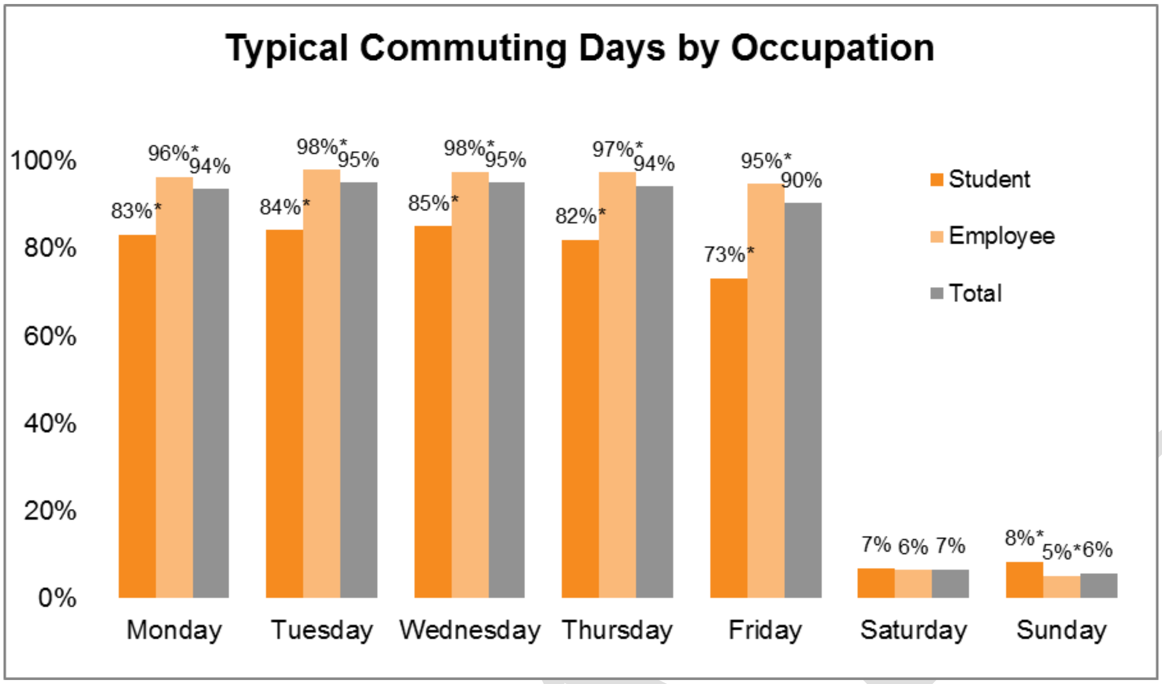
There is less heterogeneity between Students and Employees for non-commuting trips. Both segments are most likely to drive alone, followed by carpool/vanpool. Students, however, are more likely to also walk, bicycle, and take CARTA for non-commute trips.



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 30: NUMBER OF DAYS COMMUTING PER WEEK BY OCCUPATION

Students tend to commute on fewer days per week than Employees. This is likely due to differences between class schedules and full-time jobs.



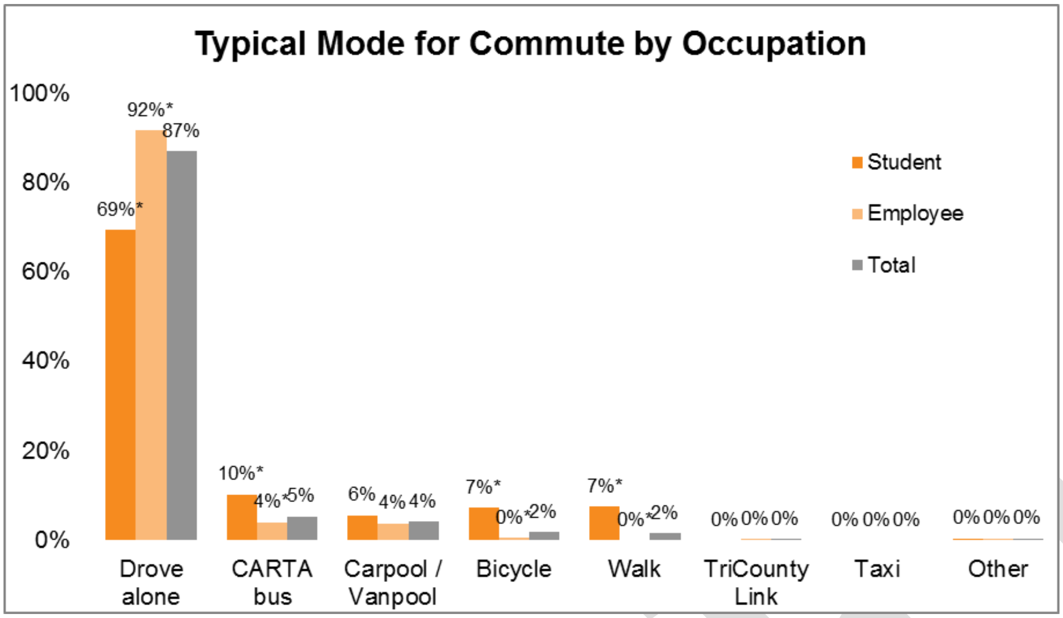
Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 31: TYPICAL COMMUTING DAYS BY OCCUPATION

Students are more likely than Employees to commute on Sundays, which could be due to the coursework required outside of class, whether it is group study or research.

OD TRIP BEHAVIOR

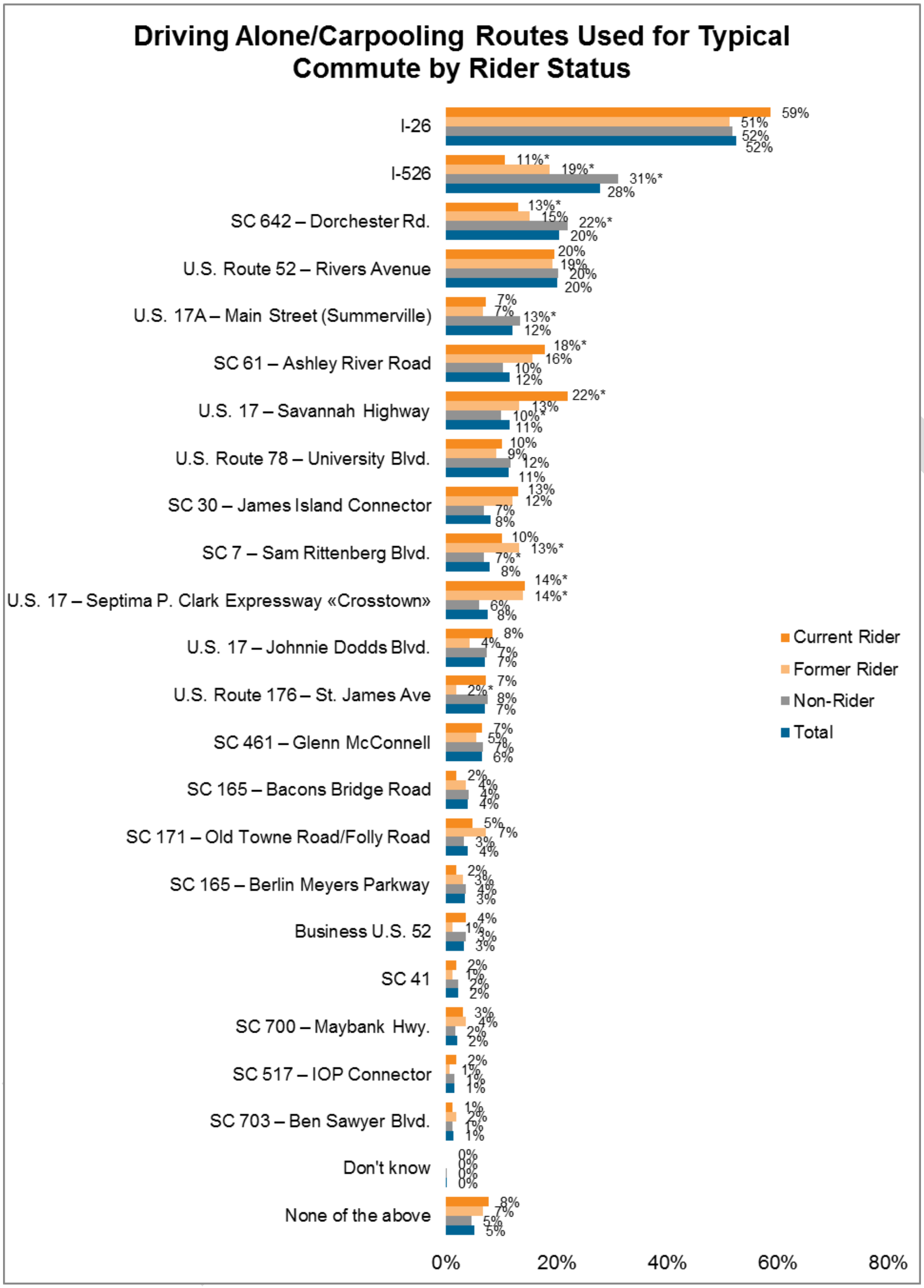
To obtain ODs for a typical commute, respondents were instructed to provide the details of a usual one-way commute to work or school.



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 32: TYPICAL MODE FOR COMMUTE BY OCCUPATION

As can be seen in **Error! Reference source not found.**, most respondents reported driving for their ommute. Work commute trips had the highest single-person vehicle use (92%) and the only other modes of transportation used were CARTA (4%) and carpool/vanpool (4%). Students traveling to school are less likely to drive alone (69%), although it is still the most often used mode of transportation. Students are more likely than Employees to use CARTA (10%), bicycle (7%), and walk (7%).

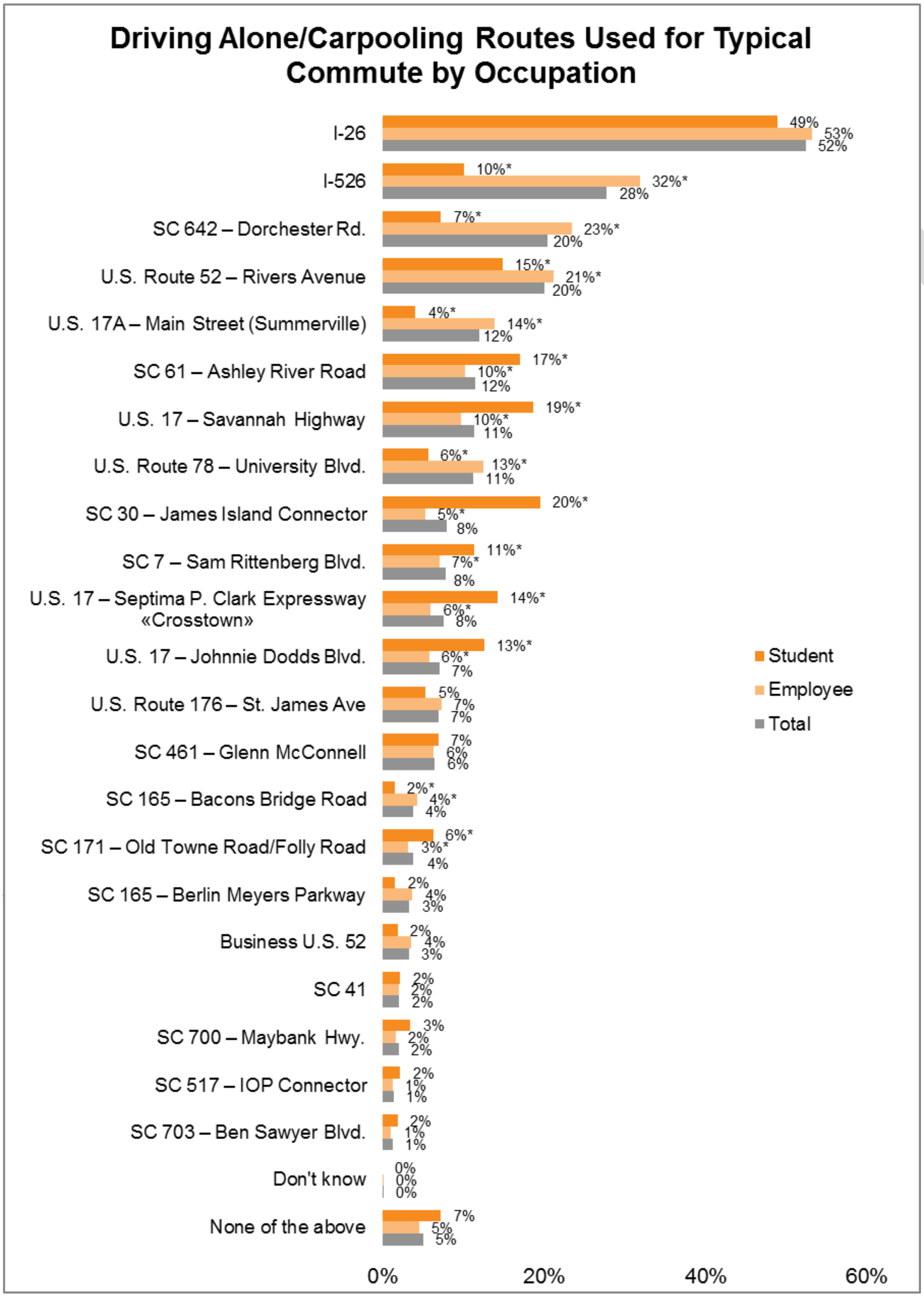


Total sample; Unweighted; base n = 1684; total n = 1756; 72 missing; Current Rider = 169; Former Rider = 166; Non-Rider = 1349

Note: Bars may not add up to 100% due to multiple responses per record.

FIGURE 33: DRIVING ALONE/CARPOOLING ROUTES USED FOR TYPICAL COMMUTE BY RIDER STATUS

While many people tend to drive on I-26, there are differences in the routes commuters take by Rider Status. Non-Riders are more likely to drive on I-526 (31%), SC 642 (22%), and US 17A (13%). Meanwhile, Current Riders are more likely to commute on lesser-used routes, such as SC 61 (18%), US 17 – Savannah Highway (22%), SC 30 (13%), and US 17 – Septima P. Clark Expressway (14%). Former Riders are spread across many different routes, indicating knowledge of typical commuting routes as well as more local and obscure routes.

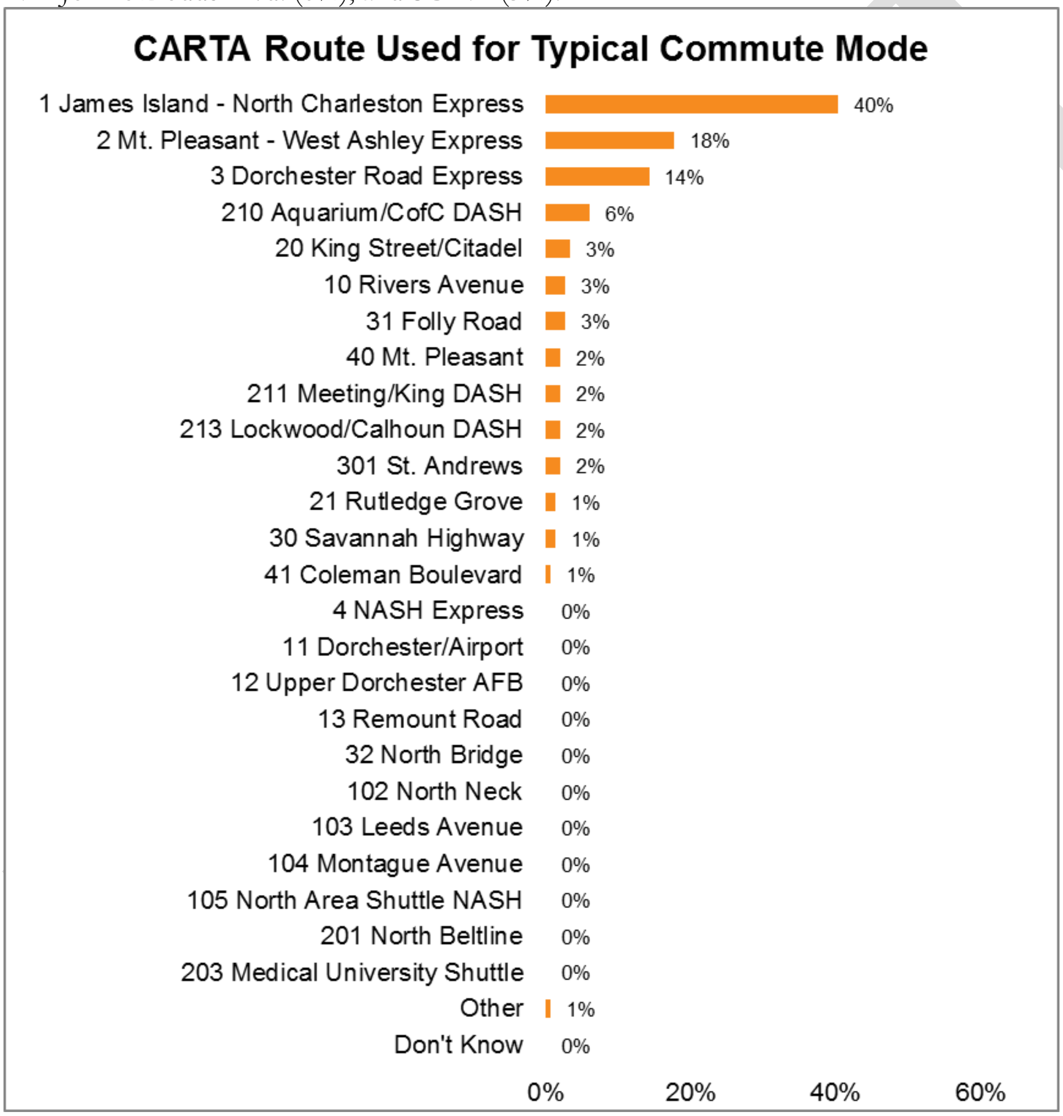


Total sample; Unweighted; base n = 1684; total n = 1756; 72 missing; Student = 317; Employee = 1367

Note: Bars may not add up to 100% due to multiple responses per record.

FIGURE 34: DRIVING ALONE/CARPOOLING ROUTES USED FOR TYPICAL COMMUTE BY RIDER STATUS

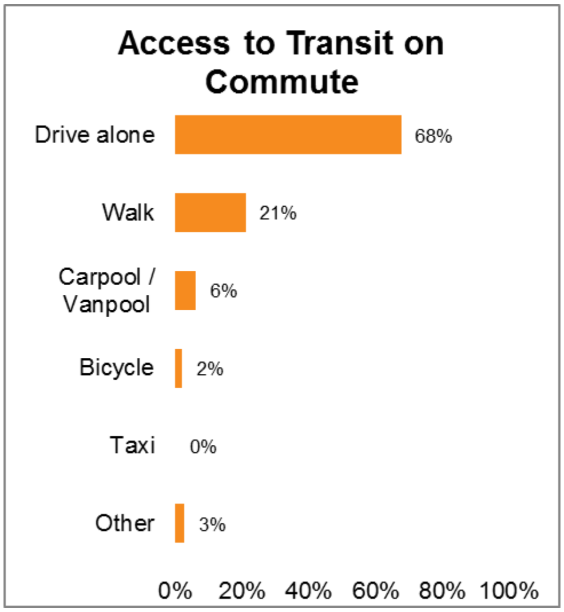
Other than I-26, Students and Employees take very different routes when driving or carpooling/vanpooling to work or school. Employees are more likely to take I-526 (32%), SC 642 (23%), US Route 52 (21%), US 17A (14%), US Route 78 (13%), and SC 165 – Bacons Bridge Road (4%) and less likely to take SC 61 (10%), US 17 – Savannah Highway (10%), SC 30 (5%), SC 7 (7%), US 17 – Septima P. Clark Expressway (6%), US 17 – Johnie Dodds Blvd. (6%), and SC 171 (3%).



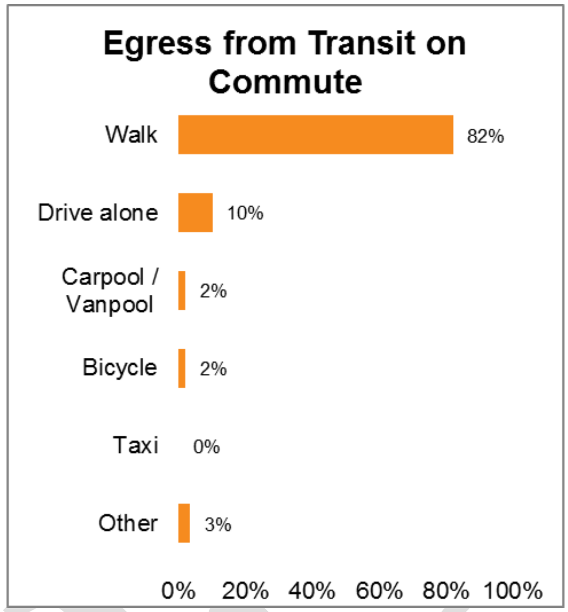
Total sample; Unweighted; base n = 146; total n = 1756; 1610 missing

FIGURE 35: CARTA ROUTE USED FOR TYPICAL COMMUTE MODE

A further breakdown of which lines were used for CARTA commute trips can be seen above, which shows that CARTA bus route 1 James Island – North Charleston Express is the most used route/line.



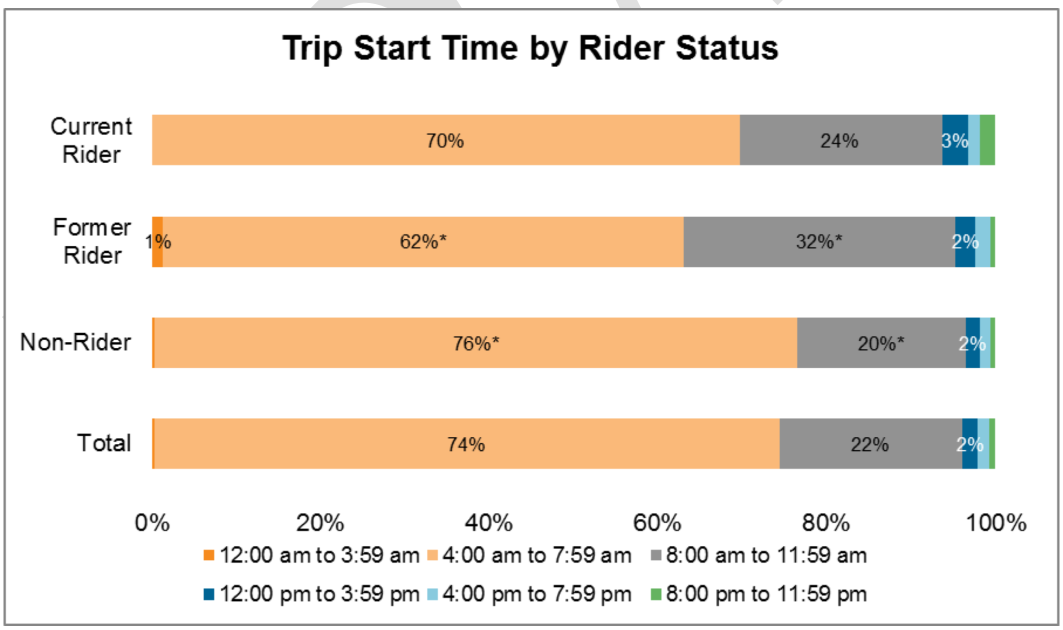
Total sample; Unweighted; base n = 146; total n = 1756; 1610 missing



Total sample; Unweighted; base n = 146; total n = 1756; 1610 missing

FIGURE 36: ACCESS AND EGRESS MODES ON COMMUTE

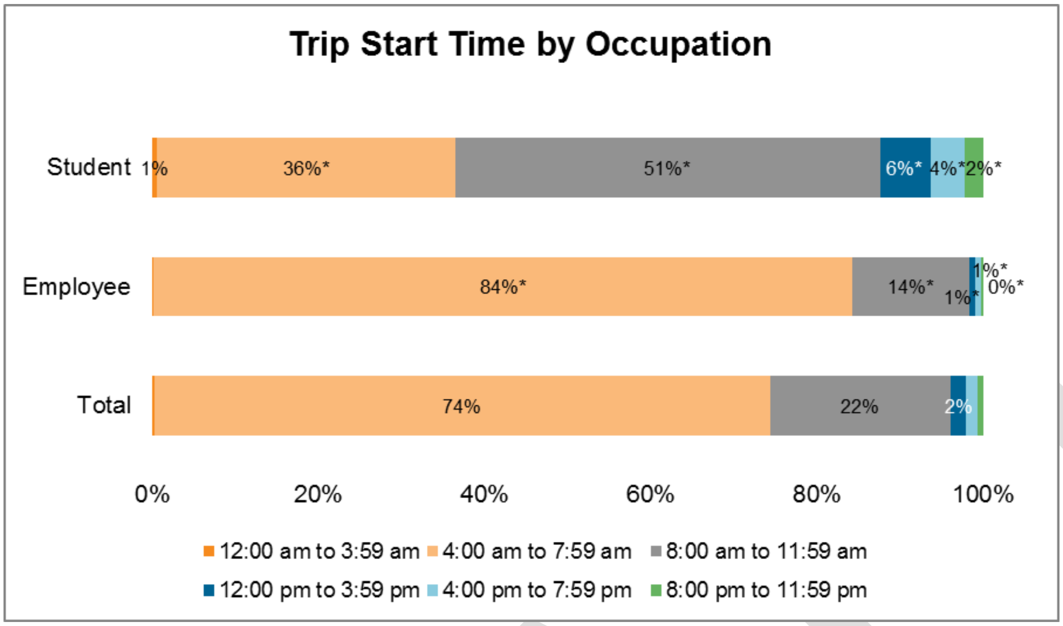
Respondents who selected CARTA for their primary mode of travel when commuting were also asked about their access and egress modes. Walking and driving were most common access and egress modes, followed by carpool/vanpool.



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 37: TRIP START TIME BY RIDER STATUS

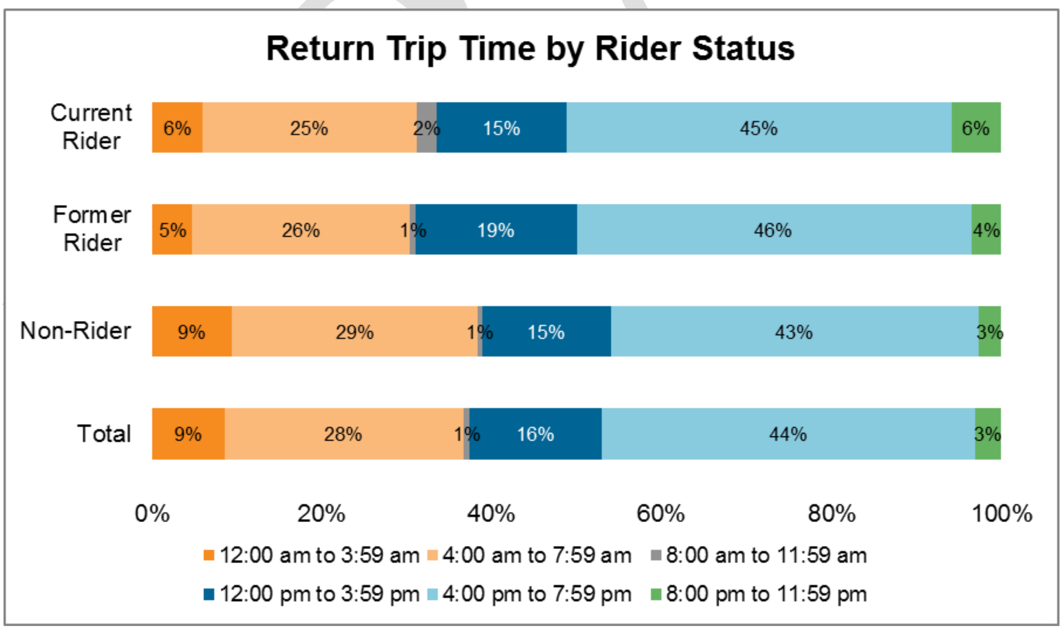
When looking at trip start times by rider status, we see that Non-Riders tend to leave earlier in the morning than Former Riders.



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 38: TRIP START TIME BY OCCUPATION

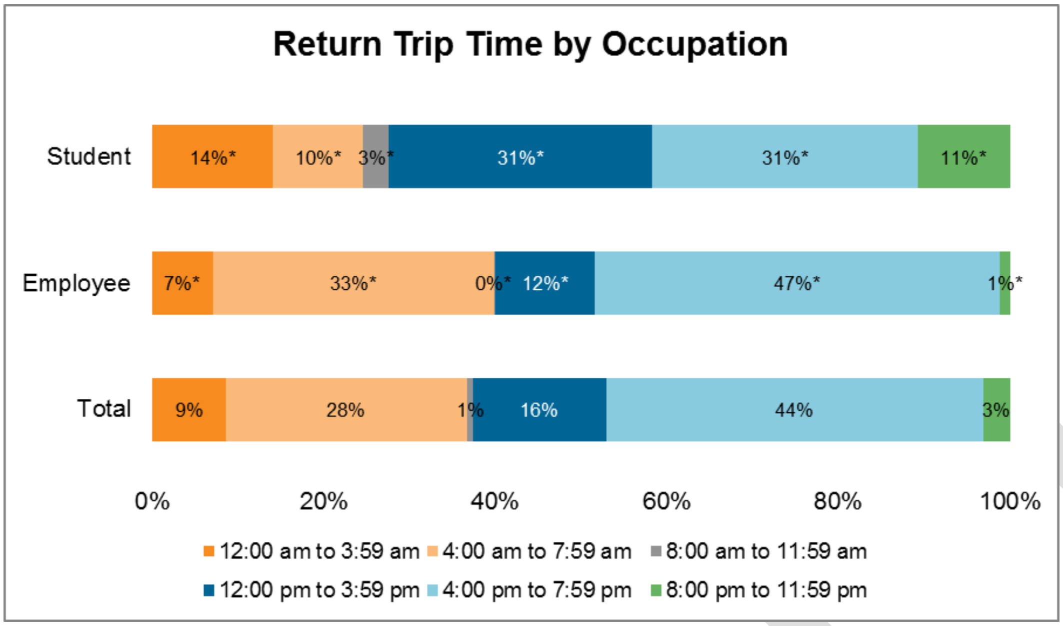
When examining trip start times by occupation, we see that most work trips start sometime in the morning, before 8:00 AM. In contrast, trips to school extend further into the morning.



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 39: RETURN TRIP TIME BY RIDER STATUS

As seen in Figure 39, all ridership types show similar trends in departure times.



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

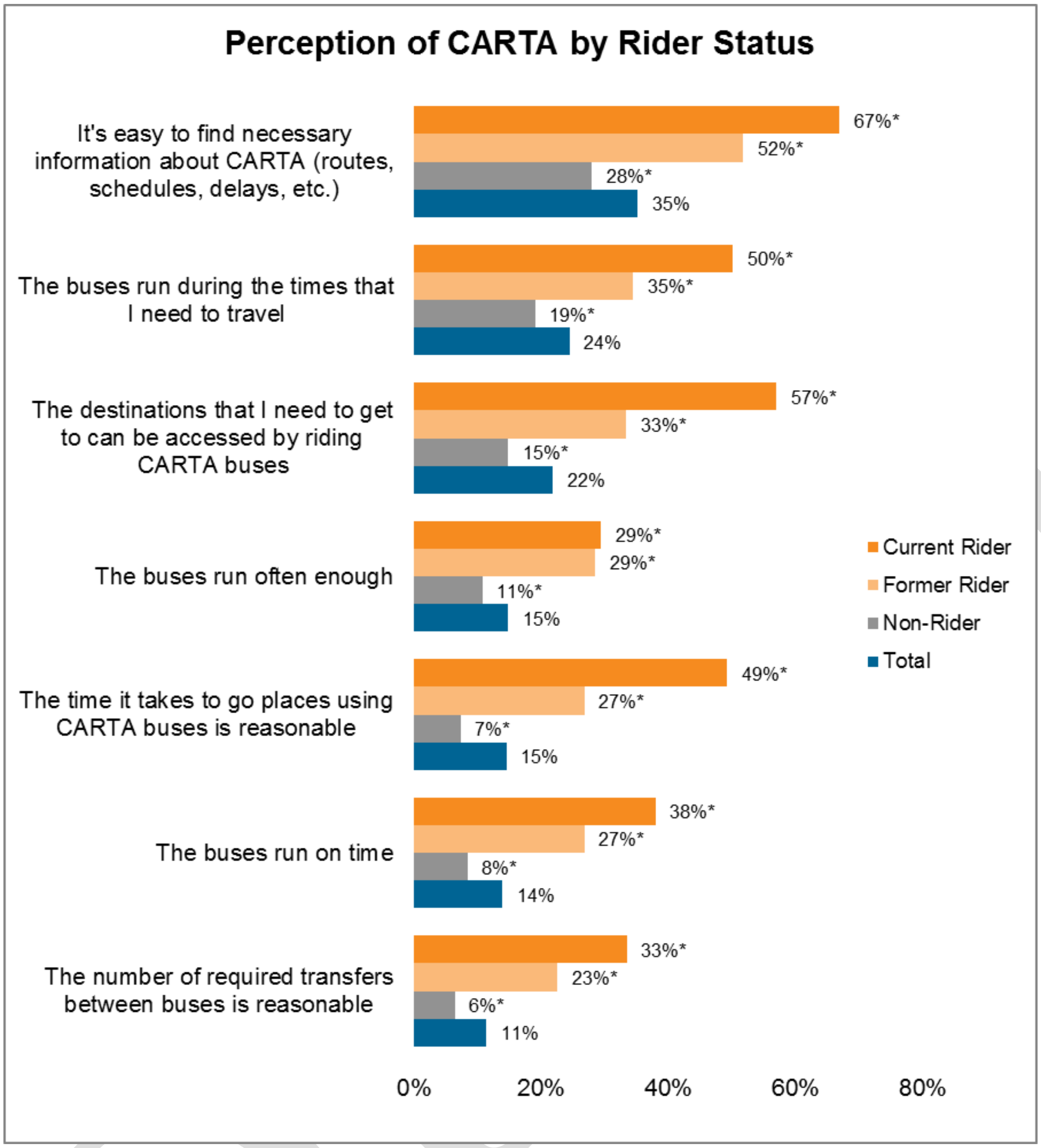
FIGURE 40: REVERSE TRIP START TIME BY OCCUPATION

Start time for return trips are slightly more varied than the trips commuting to work or school. Student schedules vary and could include activities after classes that require them to remain on campus, while around half (47%) of Employees tend to start their return trip in the evening. Understanding when people are likely to make trips can help understand how to optimize bus schedules and frequency of bus service to meet riders' needs.

6.3 | PERCEPTION OF CARTA

PERCEPTION OF CARTA BY RIDER STATUS

The following section presents perceptions about different CARTA service attributes. Given that Current Riders and Former Riders have taken CARTA buses in the past and therefore have firsthand experience with CARTA, these respondents were asked to rate their *experience* with CARTA. Meanwhile, since Non-Riders presumably have little firsthand experience with CARTA, these respondents were asked to rate their *perception* of the same service attributes. While these are fundamentally different questions, they are able to point to discrepancies between people's *assumptions* about CARTA and the actual *experience* that people report when riding CARTA buses, which might help correct misguided assumptions Non-Riders might hold. In addition, comparing Former Riders' and Current Riders' experience can help clarify why some individuals abandoned CARTA for other modes of transportation.



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 41: PERCEPTION OF CARTA BY RIDER STATUS

The three service attributes that, overall, received the highest endorsements are:

- It's easy to find necessary information about CARTA (routes, schedules, delays, etc.) (35%)
- The buses run during the times that I need to travel (24%)
- The destinations that I need to get to can be accessed by riding CARTA busses (22%)

Perhaps not surprisingly, Current Riders evaluate all service attributes more positively compared to Former and Non-Riders, whereas Non-Riders rate all attributes significantly lower. When comparing Current Riders and Non-Riders, the following statements showed the largest discrepancies between Current Riders' and Non-Riders' evaluation:

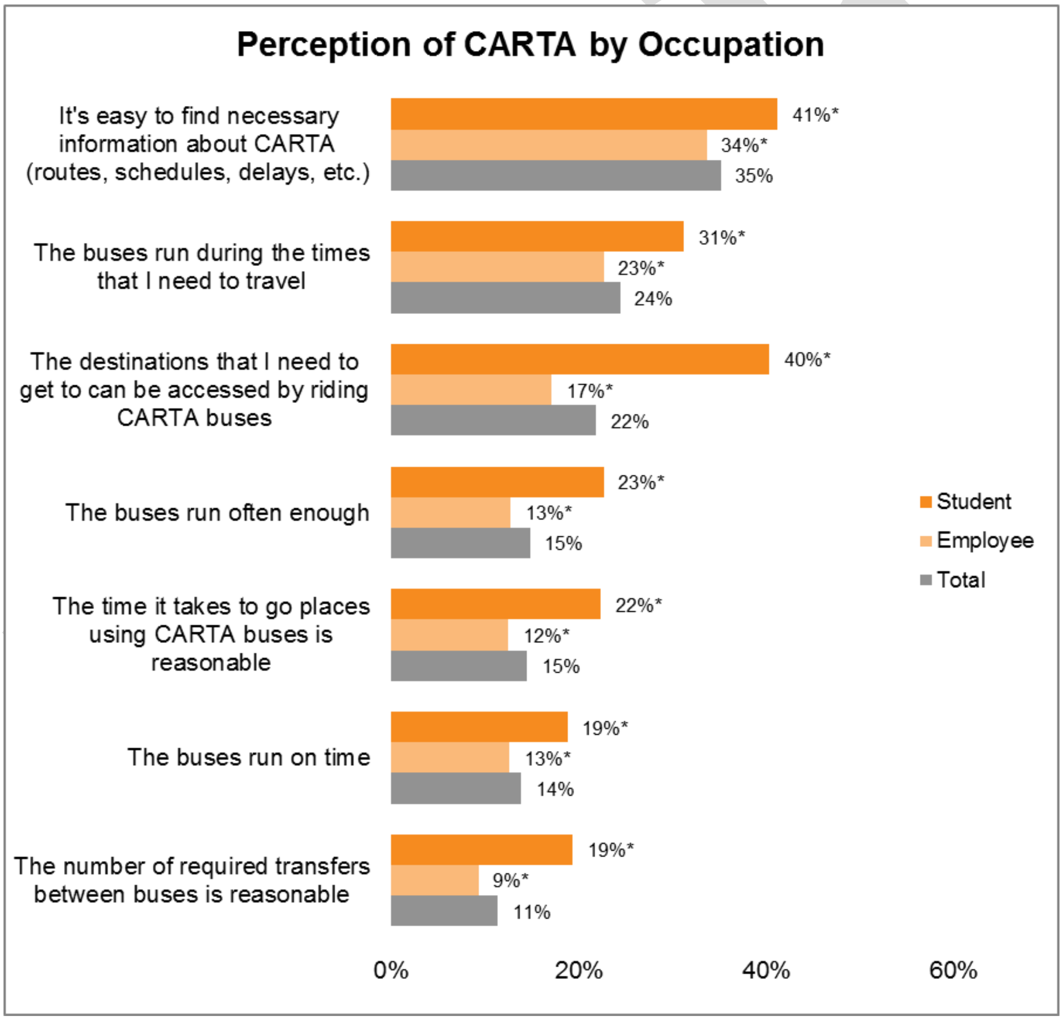
- The destinations that I need to get to can be accessed by riding CARTA buses (42% difference)

- The time it takes to go places using CARTA buses is reasonable (42% difference)
- It's easy to find necessary information about CARTA (routes, schedules, delays, etc.) (39% difference)

This suggests that CARTA might want to consider public outreach among Non-Riders that emphasizes how to obtain more information about its services, and that counteracts the misperception about increased travel times and ability to reach important destinations.

Similarly, differences in service attribute ratings between Current Riders and Former Riders might help identify areas of dissatisfaction among Former Riders that led these Formers Riders to abandon CARTA for other modes of transportation in the first place. The biggest difference in ratings between Current Riders and Former Riders are the statements "The destinations that I need to get to can be accessed by riding CARTA buses" (24% difference) and "The time it takes to go places using CARTA buses is reasonable" (23% difference). This suggests that retaining Current Riders depends on decreasing the perceived duration of trips with CARTA and increasing awareness of access points to CARTA.

PERCEPTION OF CARTA BY OCCUPATION



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 42: PERCEPTION OF CARTA BY OCCUPATION

Students tend to have a more positive perception of CARTA as they are more likely to be Current Riders than Employees. When comparing Students and Employees, the following statements showed the largest discrepancies between Students' and Employees' evaluation:

- The destinations that I need to get to can be accessed by riding CARTA buses (23%)
- The number of required transfers between buses is reasonable (10%)

Both statements suggest that CARTA should focus on accessibility – emphasizing where CARTA buses can be accessed and bringing awareness to express buses and more direct routes.

6.4 | TRANSIT ATTITUDES

Respondents were asked about their attitudes towards a variety of issues related to transportation and transit needs. Responses to these questions can help identify preferences about transit. In the following tables, results are shown by the percentage of respondents who "agree" or "strongly agree" with a particular attitudinal statement. Segments that are significantly different from the group of other segments are indicated in bold text. The color gradients in the tables correspond to the proportion of respondents who agree with each attitudinal statement, ranging from green (high proportion of respondents agree) to yellow (moderate proportion of respondents agree) to red (low proportion of respondents agree).

TRANSIT ATTITUDES BY RIDER STATUS

Attitudinal Statement	Current Rider	Former Rider	Non-Rider	Total
I like the idea that public transportation is good for the environment	**91%**	**86%**	**73%**	77%
I use a cell phone or other digital device very frequently	76%	77%	71%	73%
I like to make productive use of my time when I travel	**82%**	73%	**63%**	67%
If it would save time, I would change my form of travel	64%	**67%**	**56%**	58%
I often need to change my daily travel plans at a moment's notice	**39%**	46%	**54%**	52%
Public transportation does not go where I need to go	**28%**	52%	**55%**	51%
During the day, I often make trips to a wide variety of locations	**34%**	42%	**51%**	48%
Public transportation is safe	**75%**	**60%**	**37%**	44%
I would consider commuting to work in a carpool, vanpool or rideshare	**53%**	48%	**41%**	44%
I am not sure I know how to take a trip on public transportation	**15%**	**22%**	**45%**	39%
Riding public transportation is less stressful than driving on congested highways	**72%**	**43%**	**25%**	33%
I dislike traveling with people I do not know, and therefore don't like to use public transportation	**8%**	**18%**	**32%**	28%
There is a problem with crime or other disturbing behavior on public transportation	**8%**	18%	**23%**	20%
During bad weather, riding public transportation is more reliable	**31%**	11%	**7%**	10%
I sometimes take public transportation to avoid traffic congestion	**48%**	12%	**3%**	9%
Driving a car shows you are successful	9%	10%	8%	8%
My family and friends typically use public transportation	**14%**	7%	**3%**	5%

Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

TABLE 3: TRANSIT ATTITUDES BY RIDER STATUS

As might be expected, compared to Current Riders, Non-Riders indicated less favorable attitudes towards a wide variety of statements on public transportation. For instance, Non-Riders are much *more* likely to endorse statements such as:

- Public transportation does not go where I need to go
- I often need to change my daily travel plans at a moment's notice
- During the day, I often make trips to a wide variety of locations
- I am not sure I know how to take a trip on public transportation
- I dislike traveling with people I do not know, and therefore use public transportation less

They are also much *less* likely to endorse statements such as:

- I like the idea that public transportation is good for the environment
- I like to make productive use of my time when I travel
- If it would save time, I would change my form of travel
- I would consider commuting to work in a carpool, vanpool, or rideshare
- Public transportation is safe
- Riding public transportation is less stressful than driving on congested highways
- During bad weather, riding public transportation is more reliable
- I sometimes take public transportation to avoid traffic congestion
- My family and friends typically use public transportation

This suggests that differences in how Current Riders and Non-Riders perceive public transit is not limited to one or two areas, but that Non-Riders have a fundamentally different perception of public transportation that influences a whole range of attitudes towards transit. One of the more striking and important differences in perception and actual experience between Current/Former Riders and Non-Riders is safety. Only 37% of Non-Riders agree with the statement "Public transportation is safe," suggesting that perhaps the misperception of public transit as unsafe is an impactful deterrent to using it.

Profile of Current Riders Who Feel Unsafe (vs. Safe) Riding Public Transportation

Although more Non-Riders than Former and Current Riders state that they feel unsafe on public transportation, 25% of Current Riders do disagree with the statement "I feel safe when riding public transportation." In order to investigate the demographics and characteristics of those Current Riders who feel unsafe (vs. those who feel safe), follow-up analyses were conducted for Current Riders. Compared to those Current Riders who feel safe, Current Riders who feel unsafe are more likely to be female (80% unsafe vs. 65% safe), more likely to be single (58% unsafe vs. 40% safe), and less likely to have a car available (84% unsafe vs. 94% safe).

TRANSIT ATTITUDES BY OCCUPATION

Attitudinal Statement	Student	Employee	Total
I like the idea that public transportation is good for the environment	**83%**	**75%**	77%
I use a cell phone or other digital device very frequently	**87%**	**69%**	73%
I like to make productive use of my time when I travel	71%	65%	67%
If it would save time, I would change my form of travel	58%	58%	58%
I often need to change my daily travel plans at a moment's notice	**43%**	**54%**	52%
Public transportation does not go where I need to go	**33%**	**56%**	51%
During the day, I often make trips to a wide variety of locations	**59%**	**45%**	48%
Public transportation is safe	44%	43%	44%
I would consider commuting to work in a carpool, vanpool or rideshare	**53%**	**41%**	44%
I am not sure I know how to take a trip on public transportation	43%	38%	39%
Riding public transportation is less stressful than driving on congested highways	30%	34%	33%
I dislike traveling with people I do not know, and therefore don't like to use public transportation	30%	27%	28%
There is a problem with crime or other disturbing behavior on public transportation	23%	20%	20%
During bad weather, riding public transportation is more reliable	14%	10%	10%
I sometimes take public transportation to avoid traffic congestion	**15%**	**8%**	9%
Driving a car shows you are successful	**15%**	**6%**	8%
My family and friends typically use public transportation	**9%**	**4%**	5%

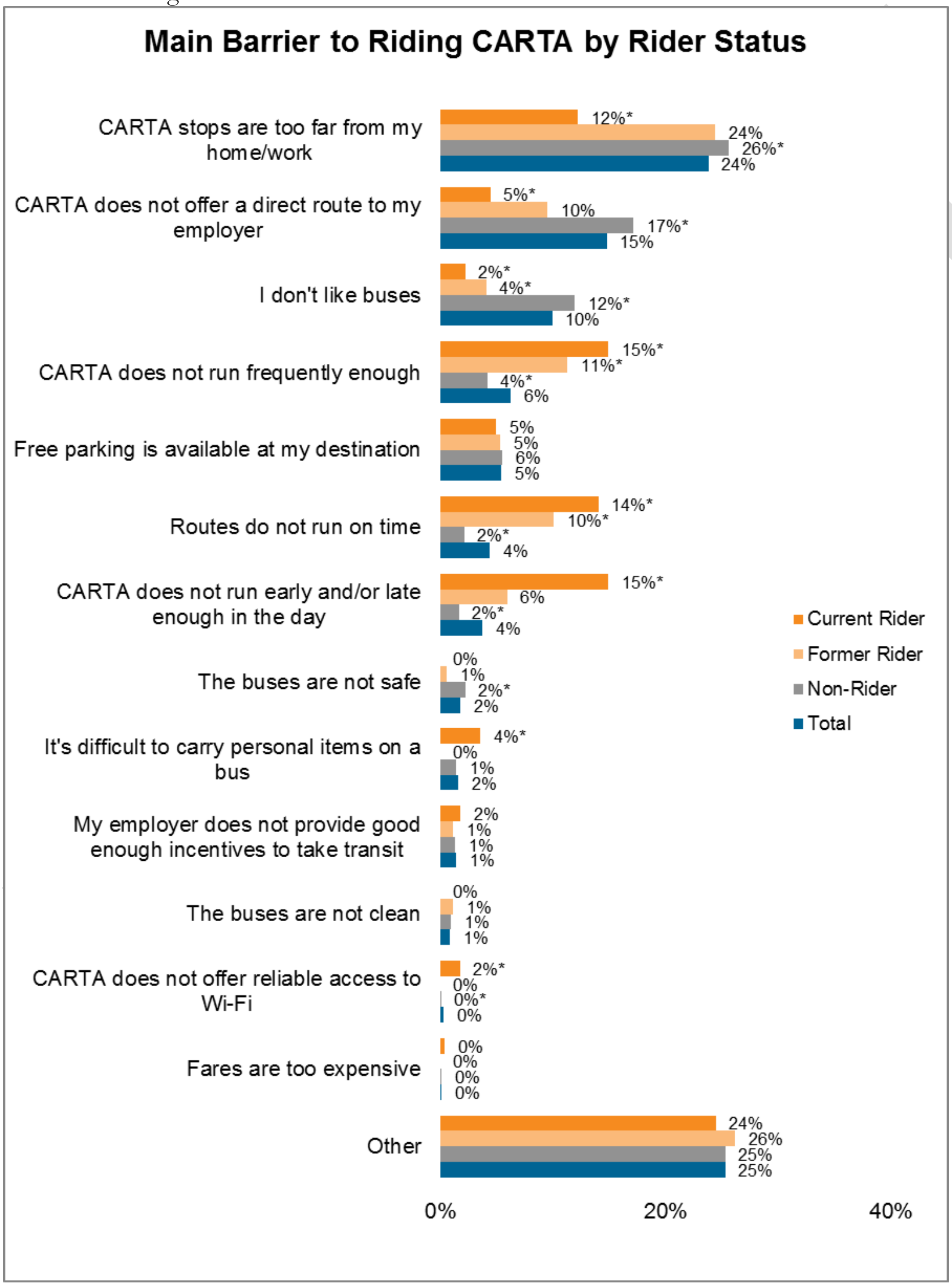
Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

TABLE 4: TRANSIT ATTITUDES BY OCCUPATION

Results of the attitudinal analyses indicate that Student and Employee respondents differ in several key areas in their attitudes toward public transportation. While Students like the environmental benefits of public transportation and enjoy using their digital devices while commuting, they are also more likely to make trips to many locations throughout the day and would consider a carpool, vanpool, or rideshare program. On the other hand, Employees are more likely to agree that they change their travel plans on a moment's notice and that public transportation does not go where they need it to go.

6.5 | BARRIERS TO USING CARTA

An important first step in increasing ridership is to understand why some people in the region chose not to ride CARTA. Respondents were asked to indicate the primary reason they did not ride CARTA as well as additional reasons why they did not ride CARTA. The answers to these questions are explored below. Since Current Riders already use CARTA, their question was phrased differently, asking what barriers prevented them from riding CARTA more often.



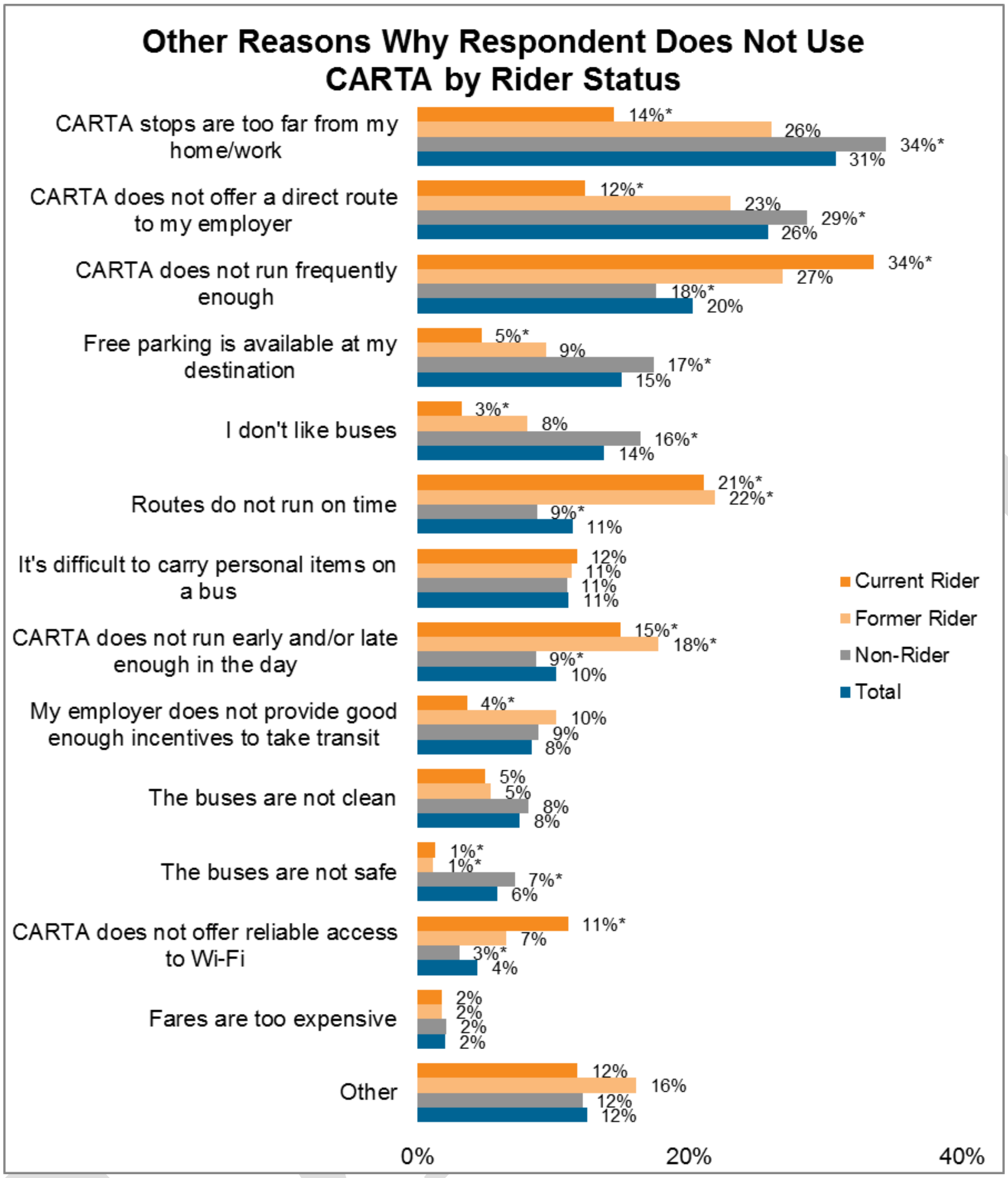
Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 43: BARRIERS TO USING CARTA BY RIDER STATUS

Independent of Rider Status, the following were named as the biggest barriers:

1. CARTA stops are too far from my home/work (24%)
2. CARTA does not offer a direct route to my employer (15%)
3. I don't like buses (10%)

Comparing Current Riders, Former Riders and Non-Riders, Current Riders tend to agree more with "CARTA does not run frequently enough," "CARTA does not run early and/or late enough in the day," and "Routes do not run on time". Former Riders agree more with the statements "CARTA stops are too far from my home/work" and "CARTA does not run frequently enough", while Non-Riders follow the same trend as the overall sample.



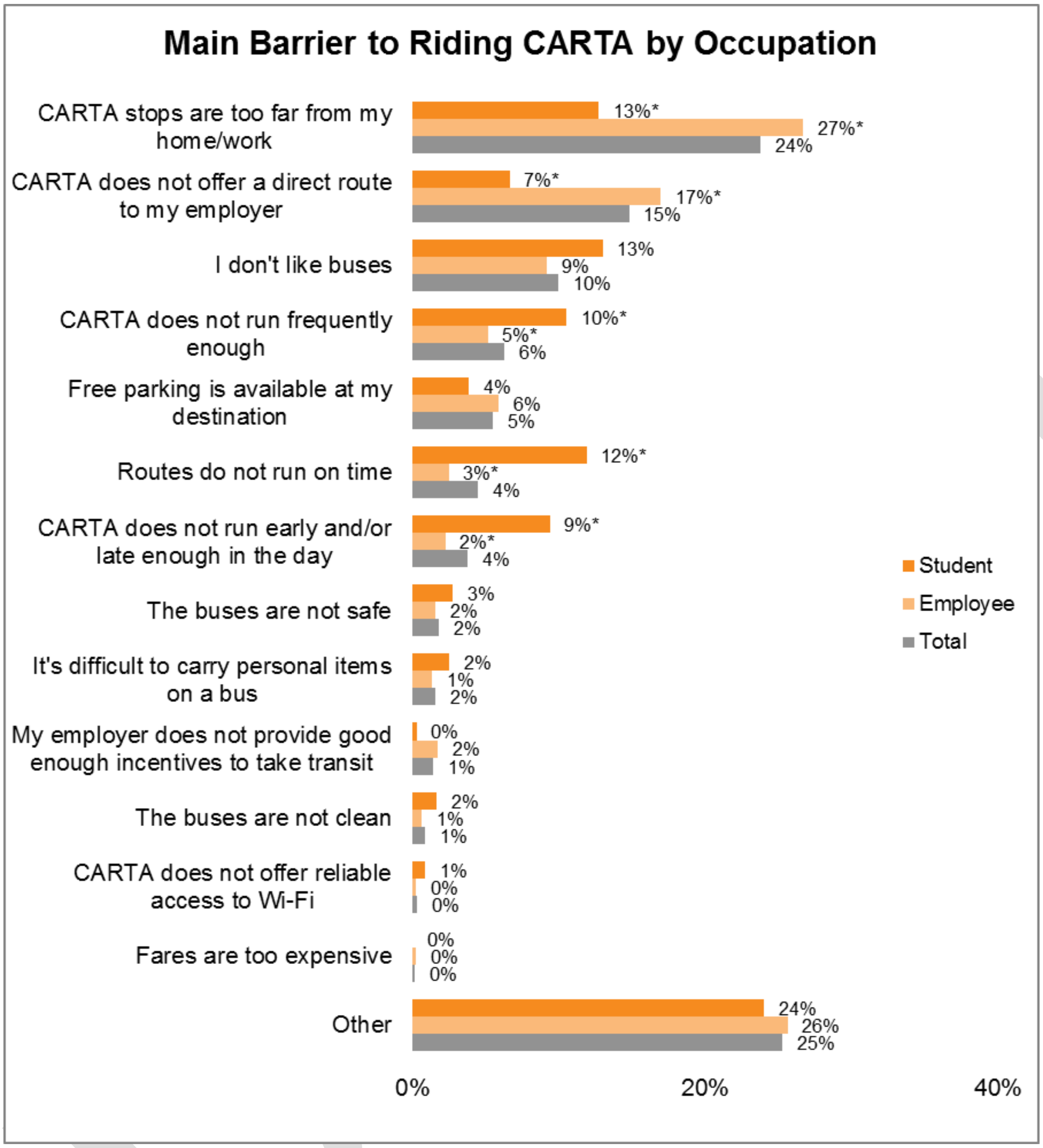
Total sample; Unweighted; base n = from 1338 to 1756; total n = 1756; 418 missing; Current Rider = 188 to 221; Former Rider = 127 to 168; Non-Rider = 1017 to 1367

Note: Bars may not add up to 100% due to multiple responses per record.

FIGURE 44: OTHER REASONS WHY RESPONDENT DOES NOT USE CARTA BY RIDER STATUS

When asked for other barriers preventing them from riding CARTA, the statements "CARTA stops are too far from my home/work" and "CARTA does not offer a direct route to my employer", which are two of the top three main barriers, appear at the top for the overall sample. This shows that inconvenient stop locations and a lack of direct routes are important points to address. Many differences exist across ridership types. While Non-Riders tend to agree with the overall sample, Current Riders are more likely to select that "CARTA does not run frequently enough" as another reason why they do not ride CARTA more often.

Current and Former Riders were more likely to select "routes don't run on time" and "CARTA does not run early and/or late enough in the day" than Non-Riders.



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 45: BARRIERS TO USING CARTA BY OCCUPATION

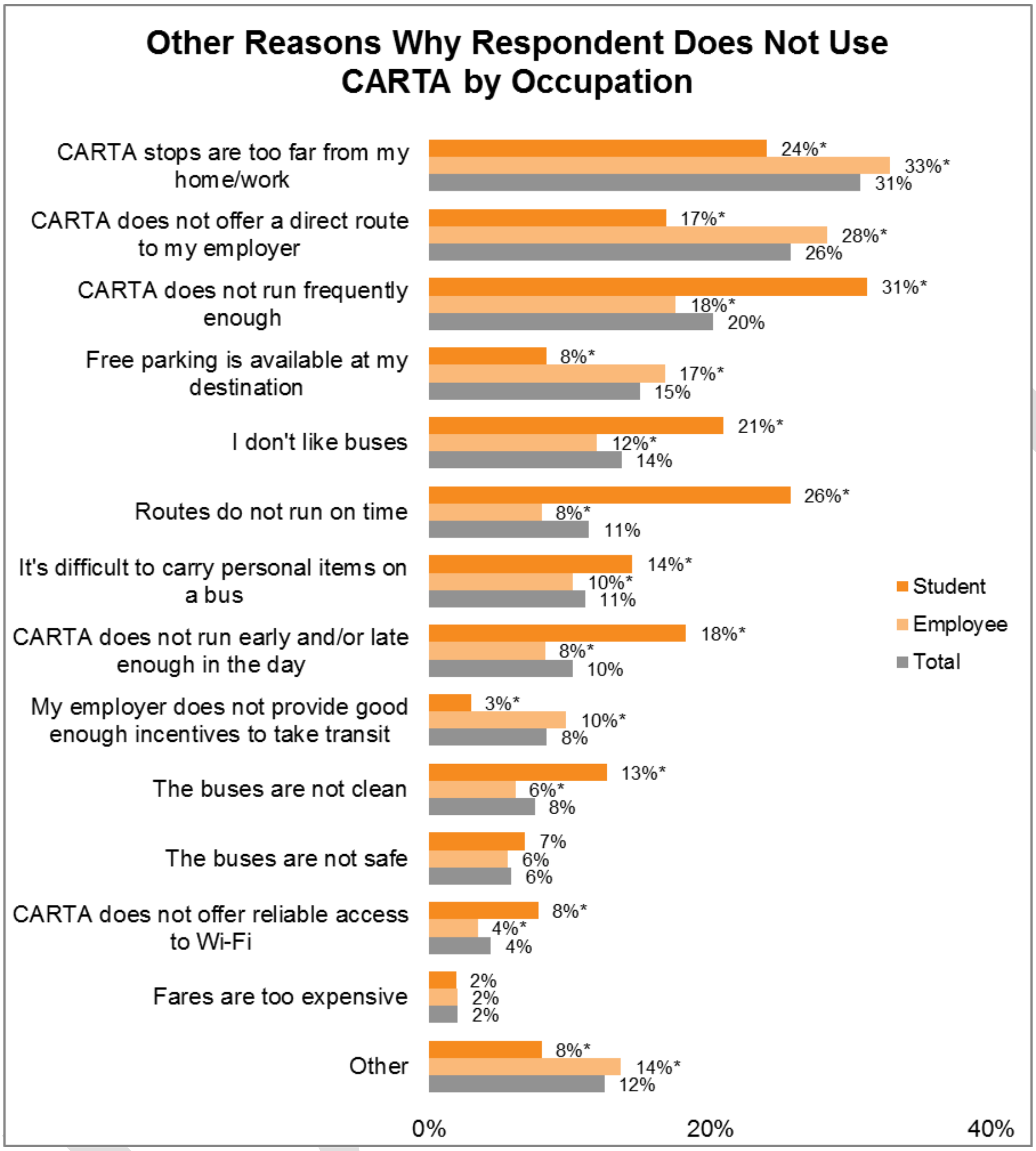
When investigating only those barriers for which Student and Employee respondents differed in their perceptions, Student respondents were more likely to endorse the following items:

- Routes do not run on time (9% difference)
- CARTA does not run early and/or late enough in the day (7% difference)
- CARTA does not run frequently enough (5% difference)

Student respondents were less likely to endorse the following items:

- CARTA stops are too far from my home/work (14% difference)

- CARTA does not offer a direct route to my employer (10% difference)



Total sample; Unweighted; base n = from 1338 to 1756; total n = 1756; 418 missing; Student = 315 to 362; Employee = 1022 to 1394

Note: Bars may not add up to 100% due to multiple responses per record.

FIGURE 46: OTHER REASONS WHY RESPONDENT DOES NOT USE CARTA BY OCCUPATION

Students were more likely than Employees to select the following statements as other barriers to riding CARTA:

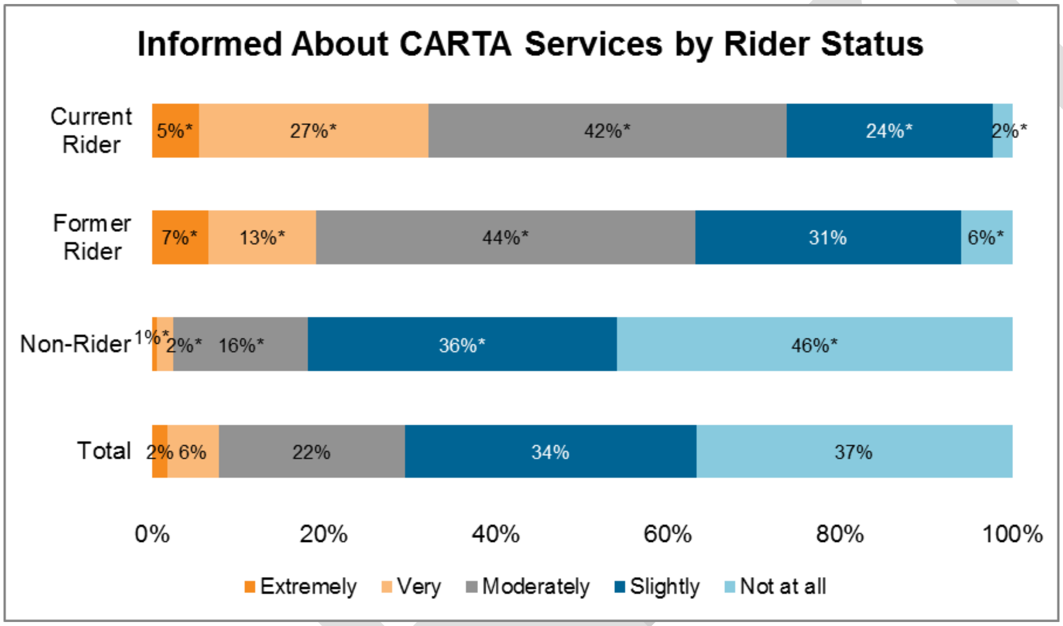
- Routes do not run on time (18% difference)
- CARTA does not run frequently enough (13% difference)
- CARTA does not run early and/or late enough in the day (10% difference)
- I don't like buses (9% difference)

- The buses are not clean (7% difference)
- It's difficult to carry personal items on a bus (4% difference)
- CARTA does not offer reliable access to Wi-Fi (4% difference)

Students were less likely to select the following statements:

- CARTA does not offer a direct route to my employer (11% difference)
- CARTA stops are too far from my home/work (9% difference)
- Free parking is available at my destination (9% difference)
- My employer does not provide good enough incentives to take transit (7% difference)

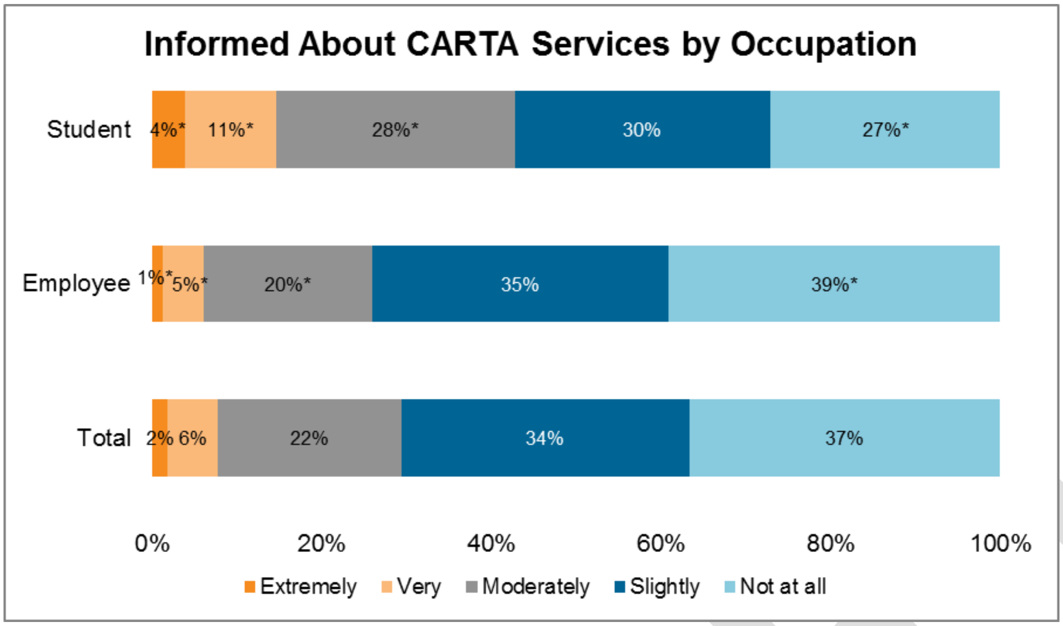
6.6 | FAMILIARITY WITH CARTA



Total sample; Unweighted; base n = 1756; Current Rider = 221; Former Rider = 168; Non-Rider = 1367

FIGURE 47: INFORMED ABOUT CARTA SERVICES BY RIDER STATUS

Not surprisingly, Current Riders are more familiar with CARTA than Former Riders, who are more familiar than Non-Riders. Whereas almost a third of Current Riders (32%) state that they are "Extremely" or "Very informed" about CARTA's service, 46% of Non-Riders state that they are "Not at all" informed or familiar with CARTA's services, perhaps suggesting that public outreach about the benefits of CARTA service may be advisable.



Total sample; Unweighted; base n = 1756; Student = 362; Employee = 1394

FIGURE 48: INFORMED ABOUT CARTA SERVICES BY OCCUPATION

Comparing how informed respondents are by occupation, we see that Students are slightly more likely to be familiar with the CARTA system, with 15% of Students reporting being either "Extremely" or "Very" familiar with the CARTA system, compared to only 6% of Employees. Thirty-seven percent of respondents reported being "Not at all" familiar with the CARTA system.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The results presented in this report point to clear differences in characteristics, perceptions, and barriers among different segments of commuters in the I-26 region. Understanding these differences can help identify strategies and service changes that may be most successful in attracting new CARTA riders, and in retaining current riders.

First, Current Riders on CARTA have generally positive perceptions of the transit service. They are happy with the destinations that can be accessed through CARTA, how easy it is to get information about CARTA, and the time it takes to travel on CARTA buses. However, Current Riders would be taking CARTA more often if the service ran more frequently, especially earlier or later in the day. Another barrier preventing Current Riders from riding more often is on-time reliability. This may be a low-hanging fruit that CARTA can address to retain Current Riders.

Second, results indicate that Former Riders and Non-Riders evaluate transit fundamentally different than Current Riders. One of the most discrepant perceptions is with regards to perceived safety of using transit such that Former and Non-Riders perceive transit to be much less safe than Current Riders. As one of the most basic human needs (e.g., Maslow's hierarchy of needs), perceived safety concerns when riding transit could act as a strong deterrent to using it. CARTA should make every effort to address these real or perceived safety concerns.

Appendix 1-D: Planning Studies Summary Matrix

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The following provides a summary of the major plans/studies that are most relevant to the I-26 Corridor study area. The plans/studies provided in Table 1 are not inclusive of all the plans reviewed and considered during the I-26 Alternatives Analysis Study process.

Table of Planning Study Summaries

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Table 1: Planning Studies Summary Table

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
1 **Charleston Metropolitan Area Commuter Rail Feasibility Study**	2006	CARTA	1,2,3,4,5,6,7	• Preliminary study conducted as a revival of 1990 *Study of Potential Commuter Rail Services in the Charleston Urban Area.* • Scoped 22-mile corridor along existing Norfolk Southern rail line passing through Summerville, Lincolnville, North Charleston, and the Neck Area into downtown Charleston. • Study found that commuter rail service could potentially be successful in the Charleston/Summerville corridor due to the special geography of the peninsula that funnels travel and development along a well-defined corridor, pre-existing rail lines, and the projected population increase in the area's suburban districts. • Recommended future actions for Implementing Commuter Rail: - Foster or build momentum for commuter-oriented transit by effectively implementing and marketing express bus service along corridor; - Strengthening partnerships with stakeholders in the region; - Preserving ROW along potential routes/alignments into the peninsula; - Identify and preserve potential station and parking lands; - Need for CARTA to incorporate commuter rail planning into its planning process to undertake further studies or analysis needed to push the planning process along; - CARTA and BCDCOG should work jointly to develop a transit component of the regional travel demand model to produce indicator statistics such as projected ridership as a means of determining the viability of the project; - Undertake a more detailed and thorough land use collection effort for the commuter rail corridor; - Land use planning efforts should support ridership within the corridor. Policies should promote increased densities and other TOD patterns; - Continue the development of the Intermodal Facility in North Charleston provided it would serve as a multi-use center which provides access to passenger rail; and - Engage the freight rail operators in talks to secure a track-sharing agreement.
2 **Charleston Metropolitan Area Commuter Rail Feasibility Study – Phase 2**	2011	CARTA	1,2,3,4,5,6,7	• Expanded scope from 2006 study to consider commuter rail along CSX rail corridor in addition to the Norfolk Southern (NS) rail line in 2 phases: I. Summerville – North Charleston – Charleston (NS line) II. Moncks Corner/Goose Creek – Charleston line (CSX line) • Study resulted in an update to the regional travel demand model (CHATS Model) to include a mode share module that generates ridership estimates. • Trends identified to support commuter rail include: - Continued high rate of growth in distribution centers and other port-related businesses along the I-26 corridor. - Addition of Boeing as a major employer to the corridor and expansion of the Clemson Restoration Institute facility. - Interest in pursuing infill development in the Charleston Neck Area will work hand-in-hand with commuter rail. - Port terminal expansion is expected to increase truck traffic along I-26. • Model generated ridership for the proposed routes (1,500-2,200 est. ridership) is comparable to ridership seen by like-size communities with commuter rail services in operation (Portland, ME – 1,400; Albuquerque, NM – 3,900; Portland, OR – 1,400; Nashville, TN – 1,000; and Austin, TX – 1,600). • Study provided passenger station considerations (infrastructure/needs), possible locations, and estimated costs to construct. Study recommends locomotive-hauled trainsets as the preferred passenger equipment. Other equipment considerations included light rail vehicles, diesel multiple units, and non-compliant DMUs. • Peer City Analysis examining commuter rail implementation and operation experience in cities similar to Charleston including Albuquerque/Santa Fe, NM; and Charlotte, NC. • Next Step recommendations include: - Land use planning for the region should identify transit supportive land use for both under-served communities and areas that are conducive to development for this purpose; - Integrated land use and transportation planning in the Charleston Neck Area;

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
				- Alternative Analysis should be conducted to examine all modes of transit along the corridor, with station siting and possible financial commitments; - Encourage and support regional participation in CARTA Express bus service since support of such services increases the likelihood for additional premium transit service in the region.
3 **Transit Consolidation Feasibility Analysis**	2013	BCDCOG	1,2,3,4,5,6,7	• Analysis of transit consolidation between CARTA and TriCounty Link service to identify more effective methods of providing transit and paratransit service by means of eliminating duplicate, competing services; distributing transit service more efficiently through consolidated planning, management, and operation of service; and stabilizing public funding levels by eliminating redundant administrative and management systems. • Analysis reveals that the two systems serve different markets, cover large geographic areas, and operate with lean staff, resources, and funds. • There are virtually no duplicative services since each operate in distinct geographic areas; therefore, there are no cost-saving opportunities in service rationalization. • The distance between the two facilities and the service area size in which they operate serve as barriers to relocate either. Consolidation of TriCounty Link and CARTA operations would require significant expansion of either facility, and if relocation was permissive, the added deadheading cost would not be cost effective. • Recommended phased approach to consolidation of two systems in the long-term.
4 **TriCounty Link Comprehensive Operational Analysis**	2014	BCDCOG	1,2,4	• Provides a Comprehensive Operation Analysis of current TriCounty Link Transit system. • The review of routes was undertaken to improve the system's service to local residents. This was done in an effort to understand the current use and performance of the TriCounty Link system as well as identify how the system is evolving over time. Recommendations from this study serve to identify corrective actions in response to changing conditions that work to strengthen services that are performing poorly and target resources to capture developing markets. • Provides near-term and future recommendations to TriCounty Transit system to maximize service in the tri-county area. Near term recommendations include: Commuter Routes - No changes to commuter routes ***#1 (Berkeley)***, ***#3 (Dorchester-Santee Cooper),*** #4 (Berkeley-Santee Cooper), Link to Lunch - Route ***#1 (Berkeley)*** should monitor last trip on route. Performance currently low and might need to be eliminated. - Eliminate commuter route ***#2 (Dorchester)*** due to duplication of service with the Dorchester Connector Shuttle and lowest performing route. - Commuter route **#5 (Berkeley-Santee Cooper)** route schedule changes suggested. - Commuter route ***#6 (Dorchester Connector)*** deviates off present route to Ridgeville to pick up proposed eliminated **#2 (Dorchester)** service. Additional stops along new route. - Eliminate ***Dorchester Connector Shuttle*** route for new **Commuter Route #7** from Summerville along I-26 terminating @ Health South CARTA connection and Ladson Area Shuttle service. Ladson Area Shuttle servicing Coastal Center and making connections to CARTA @ Health South and CARTA Park and Ride, North Charleston. - Introduce ***Link to Employment*** to replace commuter route ***#2 (Dorchester)***. Operates as employment shuttle servicing SC Works and links in Summerville. - Introduce Summerville Connector starting at Carnes Road (east of I-26) into Summerville along Trolley Road, CARTA Park and Ride, Ladson Road to US-78 servicing Health South CARTA Connection and CARTA Park and Ride, North Charleston. - Proposed Naval Nuclear Power School weekend route. Pilot project (3 months) to provide weekend transit service to students on Friday, Saturday, and Sunday. Serving the Naval school and Northwoods Mall with connections to CARTA Park and Ride, North Charleston. Routes - ***B102*** suggested service change to demand responsive. Removal from published schedule

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
				- ***D305*** suggested elimination of route due to poor ridership and duplication of commuter routes. Currently comes from Moncks Corner, into Summerville and continues on to North Charleston via US 78 connection to Health South CARTA and CARTA Park and Ride, North Charleston. Summerville Connector proposed replacement - ***C204*** Blue and Green lines. Blue line proposed changes to ends of route; extension into Kiawah Island and connects to CARTA at Citadel Mall. Green line proposed removal of duplicate service to Citadel Mall from transfer point to continued service to James Island CARTA connection. • Future recommendations focuses on defining TriCounty Link services such as changing Commuter routes to “Express” routes, or redefining services currently offered on routes that have low productivity. For example using curb-to-curb Dial-A-Ride service or Check-point service. Routes with low productivity should be changed and productive routes should be maintained.
5 **SCDOT HOV/HOT Lane Feasibility Study**	2010	SCDOT	1,2,3,4,,6,7	• Study examines the feasibility of instituting High Occupancy Vehicle (HOV) lanes or High Occupancy Toll (HOT) lanes on five corridors in South Carolina. This initial study sought to provide a preliminary assessment of the applicability of the HOV or HOT concept given the available existing traffic data and forecasts within the study areas. Of the five corridors considered, one was located in the Charleston region: I-26 from N. Main Street in Summerville (US 17A) to the Septima Clark Expressway (US 17). Following the initial corridor screening analysis, it was determined that the Charleston I-26 corridor was the only one recommended for further study in the secondary screening process. • Following the secondary screening of the I-26 Charleston Corridor it was determined that near term congestion was not sufficient to warrant either HOV or HOT lanes. Intermediate term (5-10 years) indicated that a HOV lane implementation would provide benefits to mobility along the corridor, and HOT implementation may be appropriate in the long term (20-30 years). • This corridor produced the highest (existing/future) congestion index in comparison to the other corridors considered in the state and stands to benefit from HOV or HOT implementation in the future. However, further investigation indicated that the feasibility of implementing HOV or HOT lanes at a reasonable cost is unlikely in the absence of securing significant design exceptions. • The design concepts considered in this feasibility study ruled out the preferred design concept which would provide a single barrier-separated managed lane in each direction within the median of the roadway. This concept was not deemed feasible due to the physical limitations and high costs associated with the reconstruction of bridge infrastructure at several locations along the corridor. • The retrofit design concept, which provided for retrofitted type/buffer separated concurrent single lanes along the I-26 corridor, although more feasible, also had its limitations. • A concurrent flow buffer separating general purpose lanes from dedicated HOV/HOT lanes cannot be accomplished throughout the corridor due to the physical limitations that exist along the corridor at bridge locations. • The retrofit design would result in substandard features in several locations requiring either variances or design exceptions including: substandard shoulder widths, substandard travel lane widths, ramp terminal geometries adjustments at select locations, an overpass bridge replacement due to narrow shoulders and travel lane widths, and utility and ROW impacts due to adequate clear zone requirements. As per conversations with SCDOT and FHWA, it was determined that substandard lane widths of less than 12 feet would not be appropriate. A HOT Lane financial feasibility analysis, which compared the facility’s expected revenue to its O&M costs, show a net loss on the facility through 2039 when revenue is expected to exceed fixed and variable costs of operating and maintaining the HOT lanes. • For purposes of this feasibility study, traffic projections based on continued growth and development indicate that congestion will worsen to a point needing future improvements by 2015-2020. At that time HOV/HOT lanes have the potential to serve as a viable alternative and would provide noted improvements to individual mobility. Demand for the HOV lane by 2020 is projected to be 500-800 vehicles in the peak travel direction during the peak hour, which exceeds the TRB guided minimum HOV volume of 400 vehicles per day. However, to avoid “empty lane syndrome” other transportation agencies recommend an HOV lane volume of at least 800 vehicles per day.
6 **CHATS Long Range Transportation Plan**	2008	BCDCOG	1,2,3,4,5,6,7	• Major transit recommendations include studying the potential alignment of fixed guideway service to connect major generators and attractions in the region, pursuing the preservation of rail corridor capacity for potential commuter rail service, examining critical corridors for Bus Rapid Transit (BRT) opportunities, and exploring potential water shuttle connections. • Enhance existing transit through provision of commuter services from outlying areas; continue to expand service oriented to special groups (tourists, colleges, Medical University, or key employers); expand community-based service in low-density areas

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
				(expanded demand response options or hybrid service – point or route deviated service); and use of ITS enhancements such as signal preemption for buses, passenger information technologies to inform system users. • Proceed with North Charleston Regional Intermodal Center, examine the role of Transit Oriented Development as transit hubs to support nodal land use plans, clearly define and develop stronger coordination of land use and transportation planning (Our region, our Plan), and provide transit amenities throughout the region including bus shelters, enhanced signage, and traveler information systems to enhance the attractiveness, comfort, and safety of transit system.
7 **Berkeley-Charleston-Dorchester Housing Needs Assessment**	2014	BCDCOG	1,2,3,4,5,6,7	• Major regional issues and trends in housing include: - A lack of affordable housing to the majority of residents in the region. - A lack of affordable housing located near employment centers and a lack of transportation options results in residents driving further to find housing they can afford. This in turn can increase living expenses, increase traffic congestion, place large burden on transportation infrastructure, and negatively impact economic development and quality of life. - There is a lack of diverse housing options. The region's current housing stock consists of mainly single-family detached homes, which is not compatible with future housing trends. - Regulatory barriers at all levels of government often unintentionally discourage the provision of housing that is affordable to residents and raise housing costs to individuals. • Forecasted Growth Areas (areas identified as approved for high residential and employment growth by jurisdiction) that have been identified are located away from employment centers and services. Thus, transportation costs are expected to increase for both residents and government agencies, and traffic congestion is expected increase. • Major goal identified "to increase the proportions of both owner and renter occupied housing in the region that are affordable to households earning below 120 percent MHI ($61,598) and are located in close proximity to employment centers and existing public infrastructure, as identified in Our Region, Our Plan by at least 10% by 2020." One strategy suggested to achieve this goal is to advocate for public transportation improvements through: - Coordination with public transportation providers to improve current routes and explore transportation alternatives (BRT, LRT, etc.) that would link a greater proportion of the region's population with employment centers and services; - Coordinate efforts with local transit providers CARTA and TriCounty Link to adjust bus routes and create more transportation HUBs to serve and also encourage ridership along major corridors to lower transportation costs; and - Coordinate with governmental agencies, non-profit organizations, and the business community to actively support local legislative efforts to fund new transportation opportunities.
8 **North Charleston Regional Intermodal Transportation Center (EA)**	2001	CARTA	6	• Initiated from early 1990s study for proposed transit and visitor center and fixed-rail commuter service. • Presents an assessment of the environmental benefits and consequences of the construction of the North Charleston Regional Intermodal Transportation Center. • Study provides for consolidation of various transportation facilities including replacement of the deteriorating Amtrak passenger terminal and Greyhound bus station. • Intermodal facility to include all modes of public transportation including local and regional bus service, rural transit service, intercity rail passenger service (Amtrak), proposed commuter rail service, private taxi/airport shuttle services and hotel and auto rental shuttles, and pedestrian and bicycle services. • Provide overflow parking for the Charleston International Airport, and North Charleston Convention Complex. • ** Note- The original site proposed for the North Charleston Regional Intermodal Facility (7-acre site located off W. Montague Avenue) has since been reconsidered after it became apparent that the preferred site was no longer viable for the Intermodal Center due to various construction constraints. The process for reevaluating sites were initiated once more and focused on the original 13 sites identified in the 1996 Feasibility Study. As a result of this process, a new site for the North Charleston Intermodal Facility was determined to meet all the criteria established by Amtrak and CSX for the proposed intermodal facility. The Preferred Alternative identified the existing Amtrak Station (Gaynor Avenue) as the only site with sufficient acreage and rail frontage needed to support the facility's operation. The approximate 8 acre site will include dedicated bus transfer facilities for CARTA local bus service and Southeastern Stages intercity bus service; it will accommodate Amtrak trains and provide long-term and

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
				short-term parking facilities.
9 **Partnership for Prosperity: A Master Plan for the Neck Area of Charleston and North Charleston**	2013	BCDCOG	5,6,7	• Provides a strategic Master Plan incorporating transportation, urban design, land use and economic development to support a more unified area of the cities of North Charleston and Charleston through the Charleston Neck Area. • Framework also calls for designs to be more pedestrian friendly where neighborhoods should accommodate shopping and services within a five minute walk radius, promotes community connectivity for both pedestrian and vehicular movements, emphasizes transportation options, and provides a diversity of land use. • Plan identifies corridors and catalyst areas or hubs for investments to encourage economic development and revitalization, connect local communities, and promote livable communities. • The plan identifies 8 catalyst areas. These areas are hubs where regional and local services are concentrated and regional and local transportation networks converge to create a high level of access for various purposes. These include: - *South of Mt. Pleasant Street* Located just north of downtown Charleston and the neighborhoods surrounding the Citadel and Hampton Park. Envisioned as "tech" or "knowledge community" with building sizes to range from 3-5 stories and 7-9 stories in southern area; to 1-3 stories in northern parts of catalyst area. Preliminary planning level program averages an approximate 850 residential and 1,000,000 square feet of non-residential uses could be developed. Plans for mixed use development, sidewalk improvements and addition of bicycle lanes in the short term. Intermediate term phasing plans for <u>transit stop for BRT/LRT routes on Meeting at Brigade Street and Meeting at Romney Street.</u> - *North of Mount Pleasant Street* Located to the east of I-26 this area currently transitions out of downtown Charleston to the north. Residential use transitions into commercial and light industrial use between I-26 and King Street. Catalyst area currently has railroad tracks between Meeting and King Street, the Magnolia Cemetery to the east of Meeting Street, and large scale industrial to the north of the cemetery and a number of historic structures. Envisioned with mid-rise (5-7 stories) with high density use around a transit core (Meeting Street at Mount Pleasant intersection) with access to share use path under I-26. Other areas will accommodate 3-5 stories transitioning down to 1-3 stories low rise heights especially to the north of catalyst area near open space (Magnolia Cemetery) and industrial use. Planned transit stop at Greenleaf Road. Preliminary planning level program averages an approximate 400 residential and 700,000 square feet of non-residential uses could be developed. Affordable housing options should be planned for low income senior population in the event that Joseph Floyd Manor is redeveloped. Short term plans for sidewalk improvements, bike lanes along Meeting Street, and extended share-use trail. <u>Intermediate phasing establish transit stop for BRT/LRT on Meeting at Morrison and Greenleaf Road.</u> Redesign Mt. Pleasant at Meeting Street intersection to improve safety and traffic operations. - *Stromboli Corridor* Located within Hampton Avenue and Jacksonville Road, it consists largely of industrial use and container storage areas which separate Five Mile and Windsor communities between Carner Avenue and Spruill Avenue; with residential, commercial and civic uses around area's boundaries. Envisioned primarily as low-rise (1-2 stories) to compliment residential character with 3-4 stories height at intersection of Carner and Spruill Avenues. To improve freight movement proposed extension of Misroon Avenue and improvements along Dorchester Corridor (Dorchester Road, Leeds Avenue, and Azalea Drive). Preliminary planning level program averages an approximate 300 residential and 250,000 square feet of non-residential uses could be developed. Short term phasing plan to open Stromboli Avenue between Meeting Street and Spruill Avenue as a complete street. Increase pedestrian connections, community open space, and mixed use development. Promote community center, workforce training, and other civic uses as community core. Intermediate development to extend Stromboli Avenue east of Spruill Avenue to connect to future port area development. <u>Planned transit stop at Stromboli at Meeting Street.</u>

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
				- *Shipwatch Square* Current use include small commercial use, residences once used as base housing, and civic/service uses around the McMillian and Rivers Avenue intersection. The former Naval Complex, two shopping centers and hospital facility located in this area are either closed or under demolition. Railroad tracks located along Meeting Street from McMillian Avenue to Dorchester Road with abutting light industrial use. LAMC neighborhoods Chicora/Cherokee located in southern part of catalyst area. Reynolds Avenue serves as a neighborhood center with some local commercial and office uses along the area between Rivers Avenue and Spruill Avenue. Envisioned as a revitalization area. The demolished Shipwatch Square building provides a site ready for new development with mixed use at its core. Rivers Avenue at McMillian Avenue intersection envisioned as core with mid-rise (5-7 stories transitioning into 3-5 stories) and low-rise (1-3 stories) to complement existing uses and neighborhoods. Cosgrove Avenue planned as a through route for freight movement. Preliminary planning level program averages an approximate 500 residential and 700,000 square feet of non-residential uses could be developed. Short-term phasing develop mixed use core and community open space; realign McMillian Avenue west of Rivers Avenue to make perpendicular with Meeting Street and remove McMillian east of Rivers Avenue; fill in street face along Reynolds Street; sidewalk improvements and addition of bike shared lane markings along McMillian and Dorchester Road. Intermediate phasing to include <u>transit stop for BRT/LRT at Rivers Avenue and McMillian Avenue intersection.</u> Narrow travel lanes on Rivers Avenue to create multimodal roadway with transit operating in right of way. Redevelopment of naval hospital site to mixed use. Complete Street along McMillian Avenue between Rivers and Spruill Avenues. Plan for conversion of surface parking into parking structures in central area to accommodate development density/intensity increases. <u>Planned commuter rail station south of McMillian. Relocation of Super Stop from Rivers Avenue and Cosgrove Avenue.</u> - *Olde North Charleston* Mix of residential use around Park Circle and growing industrial use along the Cooper River. Neighborhood commercial core along Montague Avenue between Jenkins and Virginia Avenues. North Charleston High School located in this area. Revitalization area that is currently transitioning. Envisioned building sizes to be low-rise (1-3 stories) and street faces to complement neighborhood scale. Continued local bus service with enhanced multi-use trail along reconfigured Virginia Avenue. Virginia Avenue important freight corridor but planned to accommodate non-auto travel in separate right of way. Preliminary planning level program averages an approximate 250 residential dwelling units and 700,000 square feet of non-residential uses could be developed. Short term plan include redesign of Virginia Avenue cross section to provide separate travel routes for local and freight traffic as well as create shared-use path for pedestrian and bike use. Develop vacant parcels along Montague Avenue to complete street face, develop GARCO parcel (north of Montague Avenue) as a continuation of existing neighborhood area as community open space. Intermediate phasing steps include expansion of retail district along Ohear and Chateau Avenues to GARCO parcel, establish <u>transit stop for BRT/LRT at Virginia and Montague Avenue intersection</u>. Long term phasing includes continued development and redevelopment of area and development of parking structure to accommodate increased development intensity. - *Amtrak Station Area* Current neighborhood district located off Rivers Avenue. Bordered to the north by Liberty Hill LAMC neighborhood, the New Urbanist Mixson development to the east and CSX railroad tracks to the west. Area includes light industrial, commercial and civic uses. Since development of the plan, the North Charleston Regional Intermodal Facility has been re-sited to the Amtrak Station location. Envisioned low-rise (1-3 stories) development to complement neighborhood and historic Amtrak station. Mid-rise (3-5 stories) to accommodate difference in elevation between Rivers and Gaynor Avenues. Area seen for redevelopment. Preliminary planning level program averages an approximate 400 residential dwelling units and 50,000

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
				square feet of non-residential uses could be developed. Short term phasing steps promote redevelopment (mixed use) around Amtrak station, provide connection to open space areas particularly the Felix Pinckney Community Center, realign Gaynor Avenue between Montague and Durant Avenues to reduce neighborhood cut-through traffic, crossing enhancements to make Rivers and Durant intersection more pedestrian friendly, sidewalk improvements, and added bike lanes on Rivers Avenue and shared lanes on Durant Avenue. Intermediate phasing provides multimodal connection to Mixson development, establish transit stop at Rivers and Durant Avenue intersection, and continued mixed use development around core intersection. - *Mall Drive Area* Regional district south of I-526 and I-26 intersection. Western portion of catalyst area framed by Montague Avenue, I-26, I-526 and international Blvd., primarily commercial district with small and big box retail, hotels and restaurants. Eastern portion between Rivers Avenue, Montague Avenue, I-526 and I-26 is a mix of civic, commercial, and light industrial uses, and includes the City of North Charleston Municipal Complex. Location for North Charleston City Hall. Charleston International Airport, Tanger Outlets, and the Coliseum envisioned as an urban center for the region with offices, retail, multi-family residential and related uses. Aviation flight path restrictions will limit building heights to moderate levels. Potential for infill of parking areas and vacant parcels to create regional center. Areas around North Charleston City Hall building envisioned as mid-rise (3-5 stories), around Tanger Outlets, low-rise (1-3 stories) and mid-rise. Along Rivers Avenue and Montague Avenue proposed low-rise (1-3 stories) transiting into neighborhoods. Proposed new circulator street that extends Mall Drive across I-26 and Rivers Avenue uniting the two sectors of the catalyst area. Preliminary planning level program averages an approximate 2,000,000 square feet of non-residential uses could be developed. Short term phasing steps include mixed use development around North Charleston City hall, realignment of Mall Drive and connection to Centre Pointe Drive with new bridge over I-526 to function as complete street parallel facility to Montague Avenue, improvements to sidewalks and addition of bike lanes along Montague Avenue, and shared lane markings on Mall Drive. Intermediate phasing steps include transit stop for BRT/LRT at Rivers Avenue and Mall Drive, mixed use development around Rivers Avenue and Montague Avenue intersection, and redesign of Rivers and Montague intersection to roundabout to improve traffic flow. Long term phase plans for commuter rail station. - *Convention Center* Located near major economic drivers Boeing and Charleston International Airport to the north and west. Has a campus-style core made up of the North Charleston Convention Center, North Charleston Coliseum, Performing Arts Center, and surrounding hotels and commercial land use. Catalyst area originally sited the new Regional Intermodal Facility in this area and its presence as a major opportunity to spur development and redevelopment in this area. With the relocation of the Intermodal Facility to the Amtrak Station catalyst area, this area is identified as an employment core. Envisions low-rise (1-3 stories) heights west of I-26 that transitions into neighborhoods. East of I-526 envisioned as (3-7 stories) to complement presence of the Coliseum. Preliminary planning level program averages an approximate 450 residential units and 2,000,000 square feet of non-residential uses could be developed. Short term phasing includes increased pedestrian facilities and bike lanes along International Blvd and Montague Avenue. Intermediate phasing includes transit stop near North Charleston Coliseum and long-term transit stop at Centre Pointe Drive between Montague Avenue and I-526. Many of the development intensities were based on the Intermodal Facility being sited in this catalyst area. • Corridor improvements to link catalyst areas include multimodal emphasis corridors along north-south corridors: - Rivers Avenue (I-526 to Meeting Street) - Spruill Avenue (E. Montague Avenue to Meeting Street) - King Street - Meeting Street

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
				West-east corridors: - West and East Montague Avenue - Dorchester Road (Rivers Avenue to Michaux Parkway) • Plans for well-developed open space improvements to include preserved open spaces, recreational trails, greenway, playgrounds, community gardens, pocket parks, neighborhood parks, community parks, squares, and gateway parks.
10 **Lowcountry Alliance for Model Communities (LAMC) Revitalization Plan**	2010	LAMC	6,7	• Produced as a Community Mitigation Plan between LAMC, The South Carolina Sate Ports Authority (SCSPA), and City of North Charleston to address and carry out activities related to the direct and indirect impacts of the SCSPA's terminal development. • Includes seven environmental justice neighborhoods in the City of North Charleston includes Accabee, Chicora/Cherokee, Five Miles, Howard Heights, Liberty Hill, Union Heights and Windsor (between Montague Avenue and Pittsburgh Avenue). • Liberty Hill area is currently a mix of residential uses with institutional, commercial, and vacant lots. Industrial use and sizable vacant tract in southern area of community. Liberty Hill separated from oak terrace Preserve by large institutional use. Future land use to concentrate commercial development along Montague Avenue and Mixson Avenue with more uniform residential use throughout area. Conversion of heavy industrial use in south of area to buffered light industrial use. Convert vacant land to residential use, with park and greenspace conserved along I-526 and Oak Terrace Preserve. • Southern LAMC Neighborhoods Area (Accabee, Chicora/Cherokee, Five Mile, Howard Heights, Union Heights and Windsor) have scattered land use with mix of residential areas (single family, multifamily and mobile homes) with pockets of commercial, institutional and industrial uses. Vacant lots scattered throughout the area. Parklands are limited to small sites. Most all LAMC areas flanked by industrial use. Connectivity of neighborhoods poor due to existing rail lines, presence of I-26, and industrial properties. Future land use provides more consistent development patterns. Primary residential areas would convert current spot commercial use to residential. Commercial and mixed use concentrated along Meeting Street, Carner Street and as a community gateway between McMillan Avenue and Cosgrove Avenue. Industrial use dominant for southernmost neighborhoods but primarily located to the east of Naval Complex, and between I-26 and King Street • Identifies strong north-south roadway connections in this area (Rivers Ave/Carner Ave, Meeting Street, Spruill Ave) but poor west-east connectivity due to existing rail corridors that divide study area neighborhoods • Port related roadway additions/improvements include: - Port Access roadway providing direct access from container terminal to I-26 (new terminal currently planned to be serviced exclusively by truck) - Access Road will be primarily elevated so trucks serving port will not have to access the local road network. - Construction of new boulevard to provide local access to port, existing federal, commercial, and industrial facilities located on the former Naval Complex. - Stromboli Avenue will be reopened and reconstructed as a five-lane boulevard connecting east to new access road. - SCDOT provided streetscape enhancements along Stromboli Avenue, Spruill Avenue and Meeting Street/Carner Avenue between Naval Base Road and Pittsburg Avenue. Operational improvements provided along Meeting Street. • Other major corridor improvements include Cosgrove, McMillan, Rivers and Spruill Avenues to enhance mobility, pedestrian safety and access, bicycle travel, and street appearance. Street improvements include wider sidewalks, more street furniture, more street trees to develop "green streets." Neighborhood streets are currently narrow and challenging to two-way traffic; however, this provides traffic calming to neighborhoods. It is not recommended to convert streets to one-way traffic. • Intersection improvements to Spruill Avenue at Stromboli Avenue, Carner Avenue at Stromboli Avenue, Spruill Avenue at Meeting Street, and Spruill Avenue at Viaduct Road. • Sidewalk system in LAMC area lacks connectivity or is in poor condition. Most residential streets lack sidewalks or usable shoulders. • Sidewalks exist on one side of the road along Reynolds Avenue, Spruill Avenue, Carner Avenue, Burton Lane, and Naval Base Road. Existing sidewalks on both sides of the road run along North Rhett Avenue, Rivers Avenue, Montague Avenue, Ohear Avenue, and a portion of Virginia Avenue. No bicycle lanes exist within the study area. • Transit in area currently provided by CARTA, which provides a critical component to the mobility of residents of the LAMC areas.

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
				The CARTA Super Stop also located in area at Rivers Avenue and Cosgrove Avenue intersection. • Proposed redevelopment includes in-fill opportunities, corridor revitalization, and model block development. Model Block development would produce approximately 200 new residential units in LAMC area. Model Block development in Liberty Hill located on East Montague between Hassel and William Avenues; Chicora/Cherokee Model Block located along Success Street between Chicora and Troy Avenues; Accabee Model Block located on Appleton Street between Accabee Road and Accabee Community Center and second Block located along Easton Street. Five Mile Windsor and Howard Heights Model Block include Stromboli Avenue and vacant land adjacent to Stromboli site and Spruill Avenue. Union Heights Model Block includes intersection of Spruill Avenue and Meeting Street and extends north into neighborhood to include blocks between Little Avenue and Kingsworth Avenue. • Transit recommendations include increased frequency of buses along routes in area; added stop locations at Spruill Avenue and Stromboli Avenue (Route #11), near Rivers Avenue and Reynolds Avenue intersection (Route #102), and near Carner Avenue and Stromboli Avenue (Route #102). • Bus stop improvements to include highly visible and uniform bus stop signage at scheduled stop locations, ensure approach sidewalks are adequate with security lighting, construct bus pull outs at key locations where boarding and alighting warrant, install shelters with benches at stops with significant boarding and alightings or around major transit generators
11 Peninsula Mobility Report	2014	City of Charleston Historic Charleston Foundation	7	• Addresses mobility issues for the Charleston Peninsula through 2025. • Major recommendations: - Bring trolley/streetcar system back to the Peninsula utilizing the railroad right-of-way along abandoned rail line (Norfolk Southern) extending from Mt. Pleasant Street to Spring Street – Phase A. Utilize Tig/M solar powered vehicles that can run on any standard rail. Should explore traffic signal prioritization for streetcar at signalized intersections - Phase B entails an extension and possible loop on Meeting or King Street down to Broad Street - Phase C would run a boulevard system to the Charleston International Airport, likely on shared lanes or dedicated lanes (alternatively). - Relocation of Visitor's Center to location near I-26 and Morrison Drive intersection - Consolidation of municipal off-street parking into a number of facilities that allow 5 minute walk to high-traffic destinations on the Peninsula. - Alternative options (transit, shuttles, shared taxi) should be made more visible at the Charleston International Airport in the short-term. - Medical Center parking could consider off Peninsula parking with shuttle service connecting to hospital facilities. - A progressive registration fee, or excise tax on additional vehicles in residential areas, dedicated residential parking could be considered if parking alternative provided. - Large vehicle restrictions in narrow downtown streets such as large delivery trucks limited to off-peak hours; tour buses accessing Visitor's Center at edge of central core allowing visitors to move through peninsula by non-motorized means (walking, bicycle, etc.). - Fees applied to oversized vehicles to operate in the Peninsula. - Utilize parking pricing as congestion pricing mechanism to encourage alternative mode use. - Pedestrian improvements include sidewalk infrastructure, all red crossing at select intersections, pedestrian crossing hardware in crosswalks, etc. - Implement bicycle improvement strategies to encourage use. Including introduction of bike-friendly traffic policies, robust bike share program, bike lanes. - Use more wayfinding resources to create navigable, interactive place for visitors encourage exploration of city at human scale. - Partnering with major employers, colleges and medical centers in mobility strategies.
12 The Upper Peninsula Planning Study	2014	City of Charleston	7	• Planning area bounded to the south by Huger Street, to the west by I-26, Milford Street to the north and Morrison Drive and Drum Island to the east. • Initiative to transition area from heavy industrial and commercial uses to modern live/work/play development through redevelopment opportunities that are sustainable and community focused

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
				• Current zoning for area is primarily below 55 feet with spot zoning for heights more than 55 feet. Area composed mainly of warehouses, followed by single family detached housing along Meeting Street corridor. • Recommended urban design permits 1-3 stories, 1-4 stories, and 1-5 stories with bonus heights up to 8 stories for uses to the west of I-26, north of Mt. Pleasant Street. South of Mount Pleasant Street recommended 1-4 stories along Meeting Street corridor and higher 1-5 stories with bonus heights up to 8 stories to the areas east of Meeting Street along Morrison Drive on former industrial sites and around highway ramp. • Primary Streets in area include north-south Meeting Street and Morrison Drive; and east-west Brigade Street, Romney Street and Huger Street. Primary Streets to include tree plants and sidewalk connectivity to community. Secondary streets within blocks to provide community circulation. • Major transit element include major transit corridor (north-south) along Meeting Street, with transit stops at Mt. Pleasant Street, Brigade Street, Romney Street and Huger Street. • Include plan for area parking structures to accommodate higher densities. Structures located off Mt. Pleasant Street and Meeting Street, Romney Street at Morrison Drive, and off Morrison Drive at Cool Blow Street.
13 I-26 Widening and Sheep Island Parkway and Interchange (EA) *Project located outside Study Area	2011	Berkeley County	*1,*2	• Proposed Jedburg Road interchange improvement and widening of I-26 from Jedburg Road to connect to existing six-lane section of I-26 west of US 17A interchange. • Proposed Sheep Island Parkway extension and construction of new I-26 interchange approximately one mile west of US 17A. • Widening of I-26 will increase capacity along segment of I-26 which feeds into Corridor. • New Sheep Island Parkway interchange will impact access to the new Nexton development located in Sub Area 2 of the study area. • Improvements to interstate facility/interchange and new interchange are proposed to accommodate proposed residential development in area as well as industrial and commercial growth being promoted by Berkeley, Charleston and Dorchester Counties. Current and future land use surrounding this project study area includes commercial, warehouse, and manufacturing parks. • Improvements include partial frontage road paralleling I-26 from US 17A to Jedburg Road to improve movement of commercial and passenger vehicles.
14 Our Region Our Plan	2012	BCDCOG	1,2,3,4,5,6,7	• Provides a blueprint of the growth of the tri-county region, which builds upon local plans to guide development and focus growth towards the region's centers, prioritizes infrastructure investments such as transit, and identifies future lands for preservations and protection. • Plan promotes nodal development into community centers of varying sizes, which include villages (< 500 residents), small towns (< 5,000 residents), large towns (< 15,000 residents), small cities (< 50,000 residents), large cities (> 50,000 residents), and transit nodes (< 15,000 residents). • The more intense development nodes of 15,000 or more residents are envisioned along the I-26 corridor and include Charleston, North Charleston, Hanahan, Summerville and Goose Creek nodes which are located within the I-26 study area. • The region's growth development goals encourage compact, mixed use development through redevelopment, adaptive reuse and infill development patterns where appropriate; a mix of housing types that provide affordable housing options to residents; and a jobs-housing balance that discourages commuting trips and enhances quality of life. • Plan's mobility and transportation infrastructure goals seek to build a robust transportation system offering mode choice. • Promotes the development of an effective freight system that is compatible with planned mobility and place making goals of region. • Promotes the development of an integrated transportation system that maximizes the use of existing transportation infrastructure. • Region's residents expressed support of bikeways, greenways, waterways and pedestrian infrastructure. • Suggests the linear distribution of population and employment along Charleston peninsula lends itself to a high capacity transit line. • Envisions regional rapid transit corridor (commuter rail or light rail) connecting Ridgeville to downtown Charleston along I-26

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
				Corridor; transit rapid corridor (express bus or bus rapid transit) connecting Moncks Corner to North Charleston along US 52 alignment, Moncks Corner to east Edisto development via Summerville, Ravenel, West Ashley/Mount Pleasant/Folly Beach to downtown Charleston and North Charleston along Folly Road, US 17 and I-526 corridors; ferry service around the Peninsula, and along the Ashley and Cooper Rivers joining the Peninsula with Hanahan and the Charleston International Airport; Amtrak service connections in North Charleston; and a regional network of greenways connecting nodal development. Envisioned rapid transit corridor within study area linking Ridgeville to downtown Charleston should include greenway element which ties into regional greenway network. • Promote alternative modes of travel through expansion of CARTA and TriCounty Link local bus routes and expand on-demand transit services that provide a more integrated and holistic regional system. • Seeks to reduce reliance on carbon-based fuels and promote use of alternative modes through implementing a regional transit system, incentivizing car-pooling and ride share, promoting the use of ride-share parking lots, encouraging major employers to implement carpooling and ride share programs, and competitively pricing parking fees in employment and tourist destinations. • Encourages cooperative and coordinated efforts among local jurisdictions to achieve regional vision which includes aligned investment decisions and revenue sources, linking transportation and development patterns, and sharing and leveraging investments that serve a regional vision.
15 Berkeley County Comprehensive Plan	2010	BCDCOG		• Transit in county overseen by TriCounty Link. • Supports commuter rail study along US 52. • Large area of county has rich wetlands and protected lands with development concentrated to the western portions of the county along Goose Creek, and Hanahan. • Promotes development in Principal Growth Areas (PGA) which includes larger incorporated towns, and limited existing rural areas already experiencing transitional development • PGA supports regional nodal development with emphasis in infill and redevelopment of land in PGA and development of mixed use development which promotes live/work/play communities that support transit service.
16 North Charleston Comprehensive Plan	2008			• Plan supports coordinated transportation land use planning, promotes expansion of multi-use, bicycle and pedestrian network, supports context sensitive roadway design to ensure compatibility between transportation facilities and surrounding neighborhoods and activity centers, encourages street connectivity, supports regional efforts that would provide regional mass transit (LRT/BRT/Commuter Rail). • Develop Travel Demand Management programs to reduce traffic including carpooling and high occupancy vehicles • Transportation Improvement Program includes Palmetto Commerce Parkway Phase III, Future Drive Loop, Northside Drive Extension, and the Port Terminal Access Road (CHATS LRTP).
17 Charleston County Comprehensive Plan	2014			• Major transportation recommendations arising from Plan include: - Adopt complete streets policies for public owned and maintained streets incorporating aesthetics as well as alternative modes of transportation like bike lanes, sidewalks and mass transit into transportation system. - Preservation of future transportation corridors and other right-of-way to reduce future acquisition costs. - Coordinate transportation infrastructure to be in place prior to or concurrent with additional development. - Coordinate transportation and growth management and land use strategies. - Support initiatives and plans to expand and enhance public transportation networks in both urban and suburban areas, as well as benefit residents by possibly decreasing transportation costs and providing more transportation options. - Support comprehensive trail plan, recognizing municipal bike and trail plans. - Encourage bike and pedestrian access on all public roads and bridges. - Coordinate potential extension of the Glenn McConnell Parkway with the City of Charleston, Dorchester County, Town of Summerville and SCDOT.
18 Summerville Comprehensive Plan	2009	BCDCOG	1,3	• Summerville identified within Dorchester County Future Land Use plan to be a major work/live town, with two major employment corridors/centers along US 78 between Jedburg to the north and New Town Summerville; and Ladson Road at US 78 and along Palmetto Commerce Parkway. • Transportation improvements include completion of Berlin G. Myers Parkway, and widening of Bacons Bridge Road, US 78,

STUDY	YEAR	AGENCY	SUB AREAS	MAJOR RECOMMENDATIONS/NOTES
				Dorchester Road and Miles Jamison Road. • Encourages partnership with CARTA, TriCounty Link and Dorchester to support express transit, Park and Ride facilities, and commuter rail service within Summerville and the region. • Land Use policies will encourage transit supportive densities and transportation planning will support transit facilities to improve mass transit services. • Identified priority investment areas to improve major roadways and increase connectivity of Summerville including Dorchester Road, Old Trolley Road, Ladson Road, Bacons Bridge Road, Berlin G Myers Parkway, N. Main Street, and US 78. Priority investment areas also include commercial nodes/centers to include nodes at Bacons Bridge Road and Dorchester Road; Old Trolley Road and Dorchester Road; N. Main Street at Central Ave and Richardson Avenue; Richardson Avenue at US 78 and N. Main Street at US 78. • Transit planning element planned for potential commuter rail, with potential stations along rail line at Berlin G. Myers, Richardson Avenue and US 78, and at Fifth Street North (US 78) and Mallard Road.
19 **Charleston Area Regional Transportation Authority 2015-2019 Strategic Plan**	2014	CARTA		• Vehicle replacement/expansion program. • Intermodal Facility (North Charleston) • Capital Improvements to include: - Bus Shelter Installation - Real time electronic passenger information sign - Fare vending machines

Appendix 1-E: Major Rd. Segment V/C and Flow Tables

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1 Major Road Segment Traffic V/C and Flow Tables

The following tables provide the 2035 AM, PM, and Daily Total flows and Volume-over-Capacity (V/C) ratios for select segments along the major roadways identified in the study area. Tables are organized by Sub Areas (1-7). The I-26 Corridor traffic statistics are provided in a separate table to provide continuity of data along the extent of the corridor for both east and west bound traffic.

Table 1: Inventory of Major North-South Roadways in Study Area

Major North-South Roadways	Classification	# Lanes	Connects (Area)	to (Area)	Subareas
US 17	PA	6-8	West Ashley/N. Chs	Mt. Pleasant	7
US 17 Alternate	PA & MA	2,5,6D	Summerville	Moncks Corner	1,2
SC 7 (Cosgrove Ave)	PA	4	West Ashley	North Charleston	6
SC 165 (Berlin G Myers Parkway/Bacon Bridge Rd)	PA & MA	2,4,5	US 17 in Ravenel	US 17 Alt in Summerville	1
Orangeburg Road (S-22)	MA	2	US 78	Dorchester Rd	1
College Park Road (S-62)	MA & C	2,5	Ladson	US 17 Alt in Sangaree	1,2
Old Trolley Road (S-199)	MA	5	Bacons Bridge Rd	Dorchester Rd	1
Palmetto Commerce Parkway	N/A	4D	Ladson Rd	Ashley Phosphate Road	3
Patriot Boulevard	N/A	2,2D,4D,5	Dorchester Road	Palmetto Commerce Pkwy	3
Cross County Road (S-2028)	C	3	Dorchester Road	Ashley Phosphate Road	5
North Rhett Avenue/Henry E Brown Jr Boulevard (S-60/S-136)	MA & C	4,4D,5	North Charleston/Hanahan	Goose Creek	4,6
Virginia Avenue (S-58)	PA & C	2,4D,5	Remount Road	McMillan Avenue	6
Spruill Avenue (S-32)	PA & MA	3	Charleston	North Charleston	6,7
Meeting Street (S-107)	PA & MA	2,4	Chs peninsula southern edge	US 52	7
King Street (S-104)	PA & C	1-SB,2-SB,2	Chs peninsula southern edge	US 78	7
Rutledge Avenue (S-46)	MA	2-SB, 2	Chs peninsula southern edge	I-26	7
Ashley Avenue (S-103)	MA & C	2-NB, 2	Provides northbound access in Chs peninsula		7
Lockwood Drive/Boulevard (S-1194)	PA & MA & C	4,4D	Access to US 17 and James Island Expressway		7

*PA=Principal Arterial, MA=Minor Arterial, C=Collector, N/A=Not Applicable

Table 2: Inventory of Major East-West Roadways in Study Area

Major East-West Roadways	Classification	# Lanes	Connects (Area)	to (Area)	Subareas
Interstate 26	Interstate	6-8	TN, NC, Columbia	Chs	1-7
Interstate 526	Interstate	4	West Ashley/N. Chs	DI/Mt Pleasant	5,6
US 52	PA	2,4,5,6D,7,8D	Moncks Corner, Goose Creek	N. Chs, Chs	2,4,6,7
US 52 Spur (Morrison Dr / East Bay St)	PA & MA	2,3,4,5	provides access to port terminals		7
US 78	PA & MA	2,5,6D,8D	Summerville	N. Chs, Chs	1,3,4,6,7
US 176 (State Rd / St. James Ave)	MA	2,5,7	Hendersonville,NC, Spartanburg	Columbia, Goose Creek	2,4
SC 642 (Dorchester Rd)	PA	4D,5	Summerville	North Charleston	1,3,5,6
Crowfield Boulevard (S-1093)	MA	2,4D	College Park Road	US 176	2
Ladson Road (S-230/S-76)	MA	5	Dorchester Road	US 78	1,3
Red Bank Road (S-37/S-29)	PA & MA	2,5,7	Access to Charleston Naval Weapons Station		4
N.A.D. Road/Goose Creek Road/Old State Road (S-29)	PA	4D	US 78/US 52	Red Bank Road	4
Ashley Phosphate Road (S-75)	MA	7	Dorchester Road	US 52	3,3/5,4
Aviation Avenue (S-1342)	PA	4,4D	South Aviation Avenue	US 52	5,6
Remount Road (S-13)	PA & C	3,4D,5	South Aviation Avenue	Virginia Avenue	6
East/West Montague Avenue (S-62)	MA & C	2,2D,4,4D,5	Dorchester Road	Virginia Avenue	5,6
McMillan Avenue (S-48)	PA	4,4D	Meeting Street	North Hobson/Cooper River	6
Reynolds Avenue (S-31)	PA	2	Meeting Street	Kephart Street	6
Naval Base Road/Viaduct Road (S-86)	PA	3	Spruill Avenue	Hobson Avenue	6
Azalea Drive (S-894)	C	2,4	Leeds Avenue	King St Ext (US 78)	5,6
Line Street	State Maintained	1-EB,2-EB,2	Horizon Street	Aiken Street	7
Spring Street (S-3)	MA	2-WB	Access from US 52 to US 78 and US 17.		7
Cannon Street (S-1037)	MA	2-EB	Access from US 17 to US 78.		7
Calhoun Street (S-404)	PA	2,4	James Island Expressway	US 52 Spur	7
Broad Street (S-1015)	MA	2,3	Lockwood Boulevard	US 52 Spur	7

*PA=Principal Arterial, MA=Minor Arterial, C=Collector, N/A=Not Applicable

Table 3: I-26 Corridor V/C and Traffic Flow Data (2035)

Corridor	Sub Area	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
		From	To						
I-26 (EB)	1,2	Berkley	US 17A	0.5661	0.8697	0.73	5300.18	8260.54	29035.3
I-26 (WB)		US 17A	Berkley	0.8411	0.7467	0.79	8158.77	7161.65	31396.73
I-26 (EB)	1,2	US 17A	College Park	0.4621	0.8028	0.66	6912.18	11748.69	41116.37
I-26 (WB)		College Park	US 17A	0.6974	0.6231	0.65	10270.04	9243.86	40595.94
I-26 (EB)	2,3,4	College Park	US 78	0.494	0.9621	0.78	7493.86	13923.43	48814.32
I-26 (WB)		US 78	College Park	0.9414	0.6937	0.78	13472.99	10337.49	48683.98
I-26 (EB)	3,4	US 78	Ashley Phosphate	0.5513	1.0811	0.92	8601.65	15834.13	57772.68
I-26 (WB)		Ashley Phosphate	US 78	1.0743	0.7792	0.94	15492.33	11861.15	59019.83
I-26 (EB)	4,5,6	Ashley Phosphate	Aviation	0.6607	1.1366	1.02	13548.45	22178.82	85292.16
I-26 (WB)		Aviation	Ashley Phosphate	1.0702	0.8252	0.96	20458.5	16578.63	80069.79
I-26 (EB)	5,6	Aviation	Remount	0.7245	1.1667	1.08	14693.72	22771.31	90629.29
I-26 (WB)		Remount	Aviation	1.0281	0.8548	0.96	19411.4	16637.39	79942.45
I-26 (EB)	5,6	Remount	I-526	0.5992	0.9686	0.88	15125.89	23518.47	92369.89
I-26 (WB)		I-526	Remount	0.8676	0.725	0.8	20413.19	17568.07	83993.34
I-26 (EB)	5	I-526	Montague	0.5874	0.9912	0.83	8541.43	13784.67	51866.54
I-26 (WB)		Montague	I-526	0.9779	0.7977	0.83	13361.4	11323.25	52308.76
I-26 (EB)	5,6	Montague	Dorchester	0.6849	0.9096	0.79	9746.33	12734.01	49462.16
I-26 (WB)		Dorchester	Montague	0.8623	0.8728	0.82	12001.8	12381.84	51652.98
I-26 (EB)	6	Dorchester	Cosgrove	0.665	0.877	0.76	9490.44	12312.08	47617.07
I-26 (WB)		Cosgrove	Dorchester	0.8319	0.8499	0.77	11498.08	11930.15	48493.34
I-26 (EB)	6,7	Cosgrove	Meeting St Ex	0.7273	0.9732	0.87	9850.77	12915.89	51232.13
I-26 (WB)		Meeting St Ex	Cosgrove	0.8691	0.8544	0.79	11222.99	11252.32	46408.53
I-26 (EB)	7	Meeting St Ex	Morrison Dr Ex	0.9193	1.1621	1.04	11018.37	13835.57	54788.27
I-26 (WB)		Morrison Dr Ex	Meeting St Ex	1.0042	1.0069	0.96	11768.18	11989.37	50314.74
I-26 (EB)	7	Morrison Drive Ex	US 17	0.7071	0.8595	0.8	8547.55	10369.95	42327.66
I-26 (WB)		US 17	Morrison Drive Ex	0.7544	0.7885	0.77	9010.77	9540.22	40481.25

Table 4: V/C and Traffic Flow Data – SUB AREA 1 (2035)

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
College Park Road (S-62)	I-26	Wimberly	1.2449	1.5043	1.11	8876.68	10745.95	40697.42
	Wimbley	US 78	1.2333	1.4906	1.1	8825.37	10668.42	40430.81
	US 78	Ladson	1.5663	1.618	1.39	5197.51	5738.18	23514.12
Old Trolley Road (S-199)	Bacons Bridge	Miles Jamison	0.8964	1.0206	0.8	6840.48	7763.01	29384.41
	Miles Jamison	Summercourt	0.8277	0.9516	0.76	6293.25	7279.48	27694.13
	Summercourt	Crestview	0.9344	1.1314	0.88	7251.12	8437.6	32128.72
	Crestview	Savannah	1.0556	1.2186	0.82	7043.23	8209.81	30192.07
	Savannah Round	Midland	1.1159	1.2407	0.8	6979.75	8051.08	29449.18
	Midland	Travelers	0.5347	0.5898	0.47	3716.47	4232.04	17063.93
	Travelers	Dorchester	0.6054	0.6718	0.55	4317.53	4927.51	19956.31
SC 642 (Dorchester Road)	Bacons Bridge	Shady	0.8672	0.979	0.84	8135.67	9538.13	39239.89
	Shady	Old Trolley	0.9316	1.0082	0.82	7937.33	9299.89	38206.82
	Old Trolley	Ladson	1.5383	1.6527	1.33	10781.8	12408.52	50732.48
Ladson Road (S-230/S-76)	US 78	College Park	1.14	1.1516	1.04	7463.16	8752.62	36626.69
	College Park	Lincolnville	1.7596	1.8818	1.71	12660.68	14490.8	60140.81
	Lincolnville	Hamburg	1.7326	1.9239	1.68	12810.71	14553.65	59104.66
	Hamburg	Palmetto Commerce	1.6395	1.7339	1.5	11570.9	13047.8	52629.21
	Palmetto Commerce	Jamison Road	2.1548	2.2184	1.46	11750	13521.41	51369.83
	Jamison	Limehouse	1.7417	1.8342	1.19	8880.46	10331.24	38734.67
	Limehouse	Summer	1.6435	1.7478	1.09	8290.69	9747.61	35183.77
	Summer	Oakmont	1.4041	1.5525	1	4772.07	9062.56	32489.53
	Oakmont	Midland	1.3077	1.4712	0.97	7429.04	8814.02	31581.4
	Midland	Dorchester	0.6477	0.6836	0.52	3780.8	4354.41	17003.53
US 78	Maple	Bryan	1.0605	1.3432	1.22	4250.27	5114.29	22203.62
	Bryan	Palmetto	0.9635	1.1718	1.14	3813.17	4530.97	20122.23
	Palmetto	Cedar	1.0009	1.1278	1.21	4037.62	4535.96	21469.72
	Cedar	US 17A	0.9965	1.213	1.13	3806.17	4466.1	19927.98
	US 17A	Gum	0.4081	0.4247	0.49	1469.58	1722.4	8689.25
	Gum	Berlin G. Myers	0.4463	0.4823	0.52	1543.28	1842.79	9150.11

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
	Berlin G. Myers	South Pointe	0.7116	0.8376	0.67	2612.33	3160.21	11821.15
	South Pointe	Bellwright	0.6832	0.8193	0.66	2582.26	3131.02	11602.97
	Bellwright	Von Ohsen	0.9311	1.0786	0.83	3222.91	3865.09	14599.34
	Von Ohsen	Heaton	0.921	0.9889	0.76	2887.75	3336.57	13531.64
	Heaton	Perimeter	1.1436	1.2043	0.97	4010.9	4482.78	18030.89
	Perimeter	College Park	0.5286	0.5598	0.45	4043.65	4522.73	18181.54
	College Park	Ladson	0.5238	0.7115	0.51	3868.22	5182.95	20618.8

Table 4 continued

Table 5: V/C and Traffic Flow Data – SUB AREA 2 (2035)

Corridor	Segment From	Segment To	AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
US 17 Alternate	Varns	US 176	0.6935	0.8058	0.62	5447.56	6487.72	24313.44
	US 176	Myers	0.6347	0.7351	0.6	4760.89	5792.25	22811.22
	Myers	College Park	1.0907	1.2379	0.97	7976	9597.17	36980.55
	College Park	Royle	0.8278	0.9974	0.68	5908.48	7333.06	25803.49
	Royle	Beauregard	0.8048	0.9283	0.63	5454.78	6720.12	23912.08
	Beauregard	Farmington	0.9701	1.2065	0.78	6667.72	8236.96	29877.5
	Farmington	I-26 Ramp	0.9863	1.2701	0.84	6842.36	8919.05	32017.23
College Park Road (S-62)	US 17A	Remi	0.9757	0.9675	1.01	3071.08	3271.34	15362.13
	Remi	Crowfield	2.0456	1.9501	1.67	5249.57	5660.27	25359.3
	Crowfield	George McCrackin	1.2966	1.3289	1.11	8638	9567.93	40481.07
	George McCrakin	Gailmoor	1.6386	1.683	1.3	10265.91	11341.87	47546
	Gailmoor	I-26	1.8023	1.8651	1.44	11395.28	7369.66	52892.7
US 176 (State Road/St. James)	Alexander	US 17A	1.5582	1.5642	1.1	4900.52	5671.63	22466.16
	US 17A	Myers	0.8398	0.8584	0.56	4802	5566.08	20654.64
	Myers	Devon	1.0893	1.1164	0.74	6272.5	7288.07	27038.62
	Devon Road	Davenport	1.3957	1.4099	0.9	7641.8	8837.51	32993.55
	Davenport	Vixen	1.1986	1.2282	0.75	6517.15	7673.6	27464.62
	Vixen	Cherry Hill	1.3818	1.4535	0.97	8010.09	9573.97	35394.08
	Cherry Hill	Old Moncks Corner	1.3907	1.4183	0.96	8080.3	9372.64	34972.54
Crowfield Boulevard (S-1093)	College Park	Centennial	1.2111	1.3914	1.13	3939.19	4504.53	17718.96
	Centennial	Bridgecreek	0.7858	0.8923	0.68	2416.94	2805.38	10716.6
	Bridgecreek	US 176/St. James	0.477	0.5085	0.37	3542.6	3894.47	14933.82

Table 6: V/C and Traffic Flow Data – SUB AREA 3 (2035)

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
Palmetto Commerce Parkway	Ladson	Carolina Commerce	1.1615	1.2597	0.64	7443.21	8911.63	28925.97
	Carolina Commerce	Patriots	1.1339	1.2624	0.64	7409.19	9024.34	29002.69
	Patriots	*Link (1)*	1.0921	1.2572	0.62	7066.62	8684.15	28161.59
	Link (1)	*Link (2)*	0.7943	0.9714	0.44	5377.16	6828.92	19813.77
	Link (2)	Ashley Phosphate	0.8339	1.0079	0.42	5510.93	6993.46	19118.4
Patriot Boulevard	Palmetto Commerce	Link	1.5857	1.759	1.39	4562.11	4947.48	19163.72
	Link	Meeting Oaks	1.2168	1.103	0.78	3680.97	4291.24	16136.16
	Meeting Oaks	Westcott	0.6967	0.7316	0.62	2586.96	2778.33	12788.81
	Westcott	Sunshine	1.0649	1.2317	0.71	3551.51	3896.84	14311.05
	Sunshine	Appian	0.5813	0.7016	0.35	1742.52	2068.88	6975.25
	Appian	Ashley Phosphate	1.284	1.2921	0.84	5647.71	6490.24	24752.88
	Ashley Phosphate	Dorchester	0.5201	0.5693	0.36	2373.55	2827.6	10458.01
US 78	Ladson	Koa	1.4792	1.5476	1.38	10983.37	12550.9	55512.66
	Koa	Shipley	1.0364	1.058	1.02	7914.65	8874.5	40970.87
	Shipley	I-26	1.3343	1.4325	1.4	11225.62	12739.37	55954.2
SC 642 (Dorchester Road)	Ladson	Parlor/Old Fort Ext	1.25	1.3469	1.15	9172.96	10356.77	43774.15
	Parlor/Old Fort Ext	Beacon Hill	1.1653	1.2494	1.06	8497.09	9556.89	40648.37
	Beacon Hill	Wescott	0.9982	1.0702	0.91	8497.09	9556.89	40648.37
	Wescott	Kensington	0.9571	1.0493	0.95	8630.37	9725.54	42269.28
	Kensington	Appian Way	1.1097	1.1427	0.95	8772.25	9743.79	42399.13
	Appian Way	Ashley Phosphate	1.0485	1.045	0.86	8000.84	8710.38	38212.04
	Ashley Phosphate	Indigo Fields	1.0647	1.0792	0.87	8453.85	9450.94	38698
	Indigo Fields	Patriot	0.9157	0.9293	0.73	6766.17	7784.11	32542.08
	Patriot	Ruff	1.202	1.2589	0.95	8934.59	10432.19	42287.78

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
Ladson Road (S-230/S-76)	US 78	College Park	1.14	1.1516	1.04	7463.16	8752.62	36626.69
	College Park	Lincolnville	1.7596	1.8818	1.71	12660.68	14490.8	60140.81
	Lincolnville	Hamburg	1.7326	1.9239	1.68	12810.71	14553.65	59104.66
	Hamburg	Palmetto Commerce	1.6395	1.7339	1.5	11570.9	13047.8	52629.21
	Palmetto Commerce	Jamison	2.1548	2.2184	1.46	11750	13521.41	51369.83
	Jamison	Limehouse	1.7417	1.8342	1.19	8880.46	10331.24	38734.67
	Limehouse	Summer	1.6435	1.7478	1.09	8290.69	9747.61	35183.77
	Summer	Oakmont	1.4041	1.5525	1	4772.07	9062.56	32489.53
	Oakmont	Midland	1.3077	1.4712	0.97	7429.04	8814.02	31581.4
	Midland	Dorchester	0.6477	0.6836	0.52	3780.8	4354.41	17003.53
Ashley Phosphate Road (S-75)	Dorchester	Patriot	0.4081	0.4582	0.36	4599.49	5087.82	20797.39
	Patriot	Tanglewood	0.7476	0.7719	0.58	7272.25	8092.98	33135.17
	Tanglewood	Windsor Hill	0.7719	0.8173	0.64	7921.38	8907.38	36467.71
	Windsor Hill	Hunters Ridge	0.8775	0.9135	0.69	8489.06	9522.71	39398.57
	Hunters Ridge	Peppermill	0.8775	0.9135	0.69	8489.06	9522.71	39398.57
	Peppermill	Cross County	1.0153	1.0543	0.82	9745.73	11017.17	47065.76
	Cross County	Palmetto Commerce	1.052	1.1432	1.03	12051.4	13547.69	58947.84
	Palmetto Commerce	Stall	1.5162	1.7356	1.25	15313.84	18183.64	71733.78
	Stall	I-26	1.3493	1.5697	1.32	14912.69	17249	75453.76

Table 6 continued

Table 7: V/C and Traffic Flow Data – SUB AREA 4 (2035)

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
North Rhett Avenue/Henry E Brown Jr Boulevard (S-60/S-136)	Williams	Tanner Ford	1.3609	1.4342	0.95	9614.34	11369.9	42733.27
	Tanner Ford	Yeamans Hall	1.9021	1.9176	1.21	12627.87	14524.16	54737.39
US 52	US 176	Rivers	1.5268	1.4535	1.26	10776.08	11915.83	52389.36
US 78	I-26	Elms Plantation	1.1243	1.3342	1.21	9846.54	11673.34	48699.75
	Elms Plantation	Elms Center	1.1291	1.2614	1.12	9278.48	10723.53	45014.48
	Elms Center	Fernwood	0.8817	0.9599	0.84	7160.94	8191.88	33511.65
	Fernwood	NAD	0.8882	1.0229	0.84	7484	8684.96	33817.7
	NAD	Rivers	0.6322	0.3609	0.36	1560.5	918.41	4360.48
US 52/US 78/Rivers Ave	NAD	US 78	1.2539	0.8544	0.47	8350.82	5950.87	29406.01
	US 78	Otranto	1.4966	1.5546	1.1	14583.19	17296.59	68515.02
	Otranto	Link	1.6638	1.7204	1.26	16440.8	19300.95	78928.37
	Link	Greenridge	1.6638	1.0928	1.25	11102.25	7673.5	39097.25
	Greenridge	US 52 Conn.	1.5989	1.1178	1.24	11439.65	8369.24	41579.28
	US 52 Conn.	Eagle Landing	0.996	1.1511	0.7	94.68.07	10880.91	43739.53
	Eagle Landing	Easy	0.9001	1.2255	0.89	10675.34	13780.77	55841.04
	Easy	Ashley Phosphate	0.9071	1.267	0.96	11465.91	14851.28	60191.82
	Ashley Phosphate	Hayne	1.0027	1.0332	0.72	10066.72	12260.74	46102.06
	Hayne	Midland Park	0.8574	0.9406	0.68	9523.4	11728.51	43818.61
	Midland Park	Tipson	0.8812	0.929	0.68	9423.56	11452.56	43632.06
	Tipson	Eagle	0.874	0.9241	0.68	9421.05	11461.34	43547.02
	Eagle	Hanahan	0.973	1.0418	0.74	10316.46	12657.87	47298.75
US 176 (St. James Avenue)	Old Moncks Corner	Central	1.0846	1.0988	0.73	9413.86	10740.2	40316.57
	Central	Liberty Hill	1.2678	1.2981	0.9	11179.57	12906.79	49180.91
	Liberty Hill	US 52	1.2506	1.2611	0.85	10627.91	12268.68	46845.35

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
Red Bank Road (S-37/S-29)	US 52	Middleton	1.3184	1.4716	0.8	7223.77	8901.22	29208.96
	Middleton	Old Black River	1.2809	1.4383	0.78	7080.02	8758.06	28680.92
	Old Black River	Howe Hall	0.8726	0.9213	0.59	5052.09	6007.86	21657.18
	Howe Hall	Snake	0.7177	0.8074	0.59	7809.05	9263.57	34016.48
	Snake	Harbour Lake	0.7679	0.8182	0.61	8136.7	9482.14	34759.74
N.A.D. Road/Goose Creek Road/Old State Road (S-29)	US 78	US 52	0.8613	0.8597	0.72	5586.21	6226.89	25569.4
	US 52	Snake	1.2812	1.4458	0.89	7178.84	8706.58	31630.53
	Snake	US 176	1.0547	1.1853	0.65	5651.7	692465	23172.03
Ashley Phosphate Road (S-75)	I-26	Northwoods	1.3404	1.5429	1.16	13745.65	16340.42	66781.65
	Northwoods	Rivers Avenue	1.1867	1.0076	0.83	10106.94	11426.28	47799.29

Table 7 continued

Table 8: V/C and Traffic Flow Data – SUB AREA 5 (2035)

Corridor	Segment From	Segment To	AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
Ashley Phosphate Road (S-75)	Dorchester	Patriot	0.4081	0.4582	0.36	4599.49	5087.82	20797.39
	Patriot	Tanglewood	0.7476	0.7719	0.58	7272.25	8092.98	33135.17
	Tanglewood	Windsor Hill	0.7719	0.8173	0.64	7921.38	8907.38	36467.71
	Windsor Hill	Hunters Ridge	0.8775	0.9135	0.69	8489.06	9522.71	39398.57
	Hunters Ridge	Peppermill	0.8775	0.9135	0.69	8489.06	9522.71	39398.57
	Peppermill	Cross County	1.0153	1.0543	0.82	9745.73	11017.17	47065.76
	Cross County	Palmetto Commerce	1.052	1.1432	1.03	12051.4	13547.69	58947.84
	Palmetto Commerce	Stall	1.5162	1.7356	1.25	15313.84	18183.64	71733.78
	Stall	I-26	1.3493	1.5697	1.32	14912.69	17249	75453.76
S. Aviation Avenue (S-1342)	Midland Park	Alston	1.1455	1.2249	0.79	2357.72	2877.48	10397.58
	Alston	Aviation	0.8654	0.9479	0.57	2049.11	2568.93	7584.54
	Aviation	I-26	0.2782	0.366	0.18	1939.68	3497.25	7273.89
	Aviation	Remount	0.6772	0.8905	0.26	1275.44	1394.3	3407.7
	Remount	Link	0.9279	1.0538	0.65	2210.51	2633.8	8640.34
	Link	Airframe	0.8491	0.94	0.38	1441.19	1733.12	5046.12
	Airframe	International	0.4245	0.47	0.19	1441.19	1733.12	5046.12
West Montague Avenue (S-62)	I-26	Thomasina Gilliard	1.4892	2.3429	1.34	9942.73	13907.24	48956.24
	Thomasina Gilliard	International	1.1608	1.3663	0.91	7678.19	9205.27	33205.12
	International	Calvin	0.5365	0.5142	0.37	3496.24	3844.92	13470.8
	Calvin	I-26	1.027	1.0162	0.69	5790.73	7019.17	25361.96
	I-26	Seiberling	0.7059	0.6705	0.39	3564.18	4097.69	14113.54
	Seiberling	Dorchester	0.7234	0.6692	0.37	3527.42	4001.07	13632.19
East Montague Avenue (S-62)	I-26	Mall Dr	0.672	0.9904	0.6	5708.22	7465.04	26018.29
	Mall Dr	Rich	0.659	0.8427	0.4	4040.12	5464.16	17055.08
Azalea Drive (S-894)	Leeds	Industrial	0.7965	0.885	0.67	3807.66	4910.84	18279.37
	Industrial	Rourk	0.8674	0.9497	0.66	3967.59	5104.2	18084
	Rourk	Woodlawn	0.9135	0.9561	0.67	4051.73	5167.18	18336.96
	Woodlawn	I-26	0.8999	0.9566	0.72	4258.1	5308.18	19614.37

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
Cross County Road (S-2028)	Ashley Phosphate	Capital	2.0613	2.1539	1.65	4571.23	5367.71	22851.99
	Capital	Dorchester	1.3707	1.4372	1.01	3022.53	3562.35	14025.24
SC 642 (Dorchester Road)	Ruff	Cross County	1.4957	1.5341	1.11	8997.1	10476.14	42474.51
	Cross County	Maryland	1.4181	1.5485	1.19	9506.41	11392.19	45640.59
	Maryland	Hill Blvd	1.4464	1.5758	1.2	9548.75	11459.67	45873.49
	Hill Blvd	Whitwil	1.3045	1.4267	1.11	8807.02	10488.79	42386.8
	Whitwil	*Link*	1.2624	1.3685	1.02	9572	11400.59	45567.48
	Link	Michaux	1.3101	1.4129	1.04	9828.34	11691.04	46570.73
	Michaux	Andrews	0.9936	1.111	0.8	6671.04	8165.59	30705.92
	Andrews	Gwinnett	1.096	1.197	0.82	6983.76	8499.98	31315.94
	Gwinnett	W. Montague	1.0053	1.0892	0.74	6412.01	7797.61	28237.82
	W. Montague	Larchmont	0.9562	1.0698	0.74	6251.06	7762.83	28223.17
	Larchmont	W. Montague	1.2469	1.3435	0.9	7672.86	9354.51	34450.19
	W. Montague	I-526	0.8652	1.0123	0.75	6092.17	7465.22	28735.86
	I-526	Paramount	0.8595	1.0472	0.7	5768.97	7207.46	24708.04
	Paramount	Oscar Johnson	0.9145	1.1033	0.73	6048.83	7540.65	26004.09
	Oscar Johnson	Leeds	0.8562	1.0451	0.69	5771.62	7214.08	24610.25
	Leeds	Industrial	0.3523	0.4167	0.33	2610.52	2978.19	11824.07
	Industrial	Ranger	0.3949	0.462	0.36	2858.05	3240.9	12741.25
	Ranger	Bonds	0.4387	0.5255	0.38	3069.94	3496.03	13439.83
	Bonds	Madden	0.4719	0.5684	0.43	3453.2	3934.87	15118.95
	Madden	Woodlawn	0.4382	0.5467	0.41	3302.9	3788.41	14534.44
	Woodlawn	I-26	0.5402	0.6371	0.5	3970.65	4516.2	17560.25
	I-26	Ramp	0.8417	1.0931	0.82	3021.66	3662.32	14583.36
	Ramp	Kent	0.6493	0.7815	0.72	2541.77	2915.65	12804.96

Table 8 continued

Table 9: V/C and Traffic Flow Data – SUB AREA 6 (2035)

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
SC 7 (Cosgrove Avenue)	Spruill	Osceola	0.5019	0.6859	0.54	4915.81	5889.25	24264.72
	Osceola	Rivers	0.5255	0.7224	0.59	5242.78	6313.45	26114.75
	Rivers	Commanche	0.5515	0.6174	0.61	5311.57	5800.22	27178.2
	Commanche	King	0.5895	0.6338	0.64	5548.92	6039.42	28416.58
	King	Accabee	0.669	0.7689	0.65	5961.31	7130.72	28868.42
	Accabee	Azalea	0.6125	0.7051	0.61	5490.82	6581.33	27008.66
North Rhett Avenue (S-60/S-136)	Yeamans Hall	Bankton	1.6452	1.6791	1.06	10941.26	12641.21	47755.66
	Bankton	Commerce	2.1899	2.235	1.41	10941.26	12641.21	47755.66
	Commerce	Remount	2.372	2.4235	1.56	12103.65	14016.81	52810.22
	Remount	Sumner	2.128	2.2515	1.62	12970.4	15122.05	59198.67
	Sumner	I-526	2.1678	2.312	1.64	13273.24	15583.31	60002.29
	I-526	Braddock	1.223	1.3905	0.8	7110.08	8662.61	29473.87
	Braddock	North	0.8917	0.9762	0.63	5242.56	6346.37	22916.07
	North	Park Circle	0.8796	0.9474	0.61	5056.58	6209.86	22151.53
	Park Circle	Chesterfield	0.5536	0.4899	0.26	971.76	1099.14	3602.48
	Chesterfield	Bexley	0.5709	0.4534	0.23	943.19	1006.29	3144.43
	Bexley	Helm	0.2074	0.3137	0.19	525.09	727.3	2642.31
Virginia Avenue (S-58)	Remount	Mill	0.10681	1.1063	0.84	2864.7	3281	12395.84
	Mill	I-526	0.7721	0.8713	0.75	2504.49	2940.18	11040.35
	I-526	E. Montague	0.3988	0.4436	0.4	2613.92	3038.49	11658.73
	E. Montague	Avenue C	0.4118	0.4926	0.41	2697.28	3238.07	12000.23
US 78 (King Street Ex)	Carner/Rivers	Azalea	0.3293	0.472	0.21	934.99	1269.16	3536.28
	Azalea	Hackermann	0.7161	0.8801	0.56	2286.61	2758.19	9528.94
	Hackemann	Summerville	0.675	0.8387	0.54	2210.41	2660.67	9138.36
US 52 (Carner Avenue)	Rivers	Clements	0.4271	0.4134	0.14	801.99	1403.35	2524.8
	Clements	Meeting	0.4156	0.4015	0.14	778.21	1376.34	2457.13

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
Spruill Avenue (S-32)	E. Montague	Buist	0.2467	0.6041	0.18	1553.15	2340.26	6106.13
	Buist	Bexley	0.6008	0.9293	0.5	4002.33	5359.18	18445.35
	Bexley	McMillan	0.84	1.0329	0.66	5648.55	6929.76	24231.02
	McMillan	Cosgrove	1.0725	1.3637	0.85	6601.6	8269.98	28927.9
	Cosgrove	Reynolds	0.7309	0.7349	0.47	4050.98	4476.87	15853.88
	Reynolds	Baxter	0.4905	0.4869	0.28	2967.9	3418.84	10760.69
	Baxter	Norwood	0.9403	0.6645	0.44	4290.45	4955.68	16949.57
	Norwood	Viaduct	0.6244	0.6473	0.42	4091.39	4744.38	15986.4
	Viaduct	Stromboli	0.6972	0.7337	0.49	4360.91	5068.05	17166.3
	Stromboli	Riverview	0.6746	0.7226	0.49	4358.57	5004.38	17321.67
US 52/US 78/Rivers	Hanahan	Aichele	1.0305	1.0867	0.72	10312.29	12719.1	46011.15
	Aichele	Aviation	1.0696	1.1406	0.78	11130.08	13667.1	50181.41
	Aviation	Gumwood	0.8127	0.9494	0.55	8641.55	.10819.26	34954.54
	Gumwood	Remount	0.7971	0.9332	0.55	8768.45	10912.97	35303.76
	Remount	Sabal	0.8478	0.7954	0.58	8606.02	10614.05	36918.7
	Sabal	I-526	0.8437	0.804	0.59	8789.41	10932.18	37913.57
	I-526	Mall Dr	0.4775	0.5912	0.3	4727.14	6432.92	20230.33
	Mall Dr	E. Montague	0.3629	0.5063	0.25	3829.17	5431.72	16665.64
	E. Montague	Piggly Wiggly	0.2661	0.3477	0.21	3189.78	4308.74	14277.22
	Piggly Wiggly	Durant	0.3387	0.4696	0.28	2839.66	3931.89	12446.36
	Durant	Columbia	0.3623	0.4409	0.25	2477.34	3210.64	9576.48
	Columbia	Helm	0.3598	0.4369	0.24	2388.35	3108.32	9106.17
	Helm	Whipper Barony	0.3725	0.4719	0.24	2361.68	3182.18	9106.71
	Whipper Barony	McMillan	0.3175	0.4035	0.18	1947.59	2734.57	7058.83
	McMillan	Commander	0.3597	0.4096	0.22	2113.85	2841.79	8453.81
	Commander	Cosgrove	0.3761	0.3943	0.23	2332.91	2960.09	8704.25
	Cosgrove	Reynolds	0.3184	0.3857	0.13	1499.14	2453.02	5110.84
	Reynolds	Carner	0.3266	0.3875	0.14	1553.51	0.3875	5404.28
	Carner	Meeting	0.1288	0.1961	0.08	751.52	1077.14	2879.47

Table 9 continued

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
US 52 (Meeting Street)	Rivers	Macon	0.3798	0.4652	0.23	791.52	1141.06	3123.47
	Macon	Helm	0.2427	0.3134	0.11	478.47	757.88	1549.59
	Helm	McMillan	0.3077	0.4283	0.24	800.14	1100.81	3242.83
	McMillan	Dorchester	0.3074	0.4276	0.24	799.16	1098.95	3236.38
	Dorchester	Cosgrove	0.7336	0.7992	0.86	2251.38	2459.06	11674.88
	Cosgrove	Reynolds	0.4051	0.4172	0.3	888.09	1245.17	4128.82
	Reynolds	King	0.3468	0.3593	0.25	784.7	1028.54	3351.11
	King	Carner	0.2276	0.2263	0.15	487.45	613.98	2090.65
SC 642 (Dorchester Road)	Kent	Meeting	0.6058	0.7072	0.66	2340.99	2655.97	11686.18
	Meeting	Admiral	0.2518	0.3361	0.2	829.15	1158.67	3584
	Admiral	Rivers	0.1821	0.3474	0.13	590.85	1027.95	2279.93
Aviation Avenue (S-1342)	I-26	Rivers	0.9238	1.1657	0.79	6042.59	8781.34	31656.18
Remount Road (S-13)	Aviation Ave	Core Rd	0.4795	0.7067	0.47	1924.29	2251.95	8234.82
	Core	I-26 Ramp	0.8559	0.9106	0.74	2894.84	3405.98	13106.32
	I-26 Ramp	I-26	0.7713	0.9569	0.89	4828.33	5644.21	24196.06
	I-26	Rivers	1.2231	1.4288	1.39	7259.88	7941.43	37733.68
	Rivers	Craig Rd	0.9872	1.0851	0.98	7722.41	8678.29	37345.76
	Craig	Yeamans Hall	0.9689	1.0525	0.94	7496.81	8430.14	36040.88
	Yeamans Hall	Dickson	0.5458	0.6201	0.58	4615.78	5252.99	22307.31
	Dickson	Attaway	0.496	0.5588	0.52	4156.06	4766.7	19827.74
	Attaway	Buskirk	0.5136	0.6101	0.51	4179.6	4902.43	19462.52
	Buskirk	Murray	0.4412	0.5065	0.45	3627.22	4264.98	17044.32
	Murray	Rhett	0.5654	0.6223	0.51	4224.63	4931.52	19329.85
	Rhett	Perimeter	0.9098	0.9141	0.73	6095.63	6826.35	28041.88
	Perimeter	Virginia	0.8262	0.8295	0.72	5796.92	6419.42	27491.69

Table 9 continued

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
East Montague Avenue (S-62)	Rich	Piedmont	0.659	0.8427	0.4	4040.12	5464.16	17055.08
	Piedmont	Hassell	0.5979	0.6712	0.39	3450.62	4180.23	14316.57
	Hassell	Mixson	0.5481	0.623	0.32	2889.29	3724.04	11775.78
	Mixson	Churchhill	0.3337	0.2121	0.17	1631.95	1574.47	6205.2
	Churchhill	Park Circle	0.3102	0.2035	0.15	1497.39	1427.15	5571.01
	Park Circle	Spruill	0.3926	0.9178	0.3	122.86	2309.87	6550.7
	Spruill	Jenkins	0.3757	0.1623	0.14	1208.13	762.27	0.14
McMillan Avenue (S-48)	Meeting	Rivers	0.0003	0.0004	0	0.98	1.86	6.45
	Rivers	Spruill	0.0755	0.1574	0.06	539.18	995.02	2246.07
	Spruill	Avenue E	0.169	0.2351	0.13	984.22	1416.83	4526.29
	Avenue E	Noisette	0.1338	0.1429	0.11	833.23	1040.38	3798.88
Reynolds Avenue (S-31)	Meeting	Rivers	0.0097	0.1263	0.02	28	256.32	320.58
	Rivers	Spruill	0.0392	0.1855	0.06	103.75	320.08	745.66
	Spruill	Hobson	0.3871	0.4256	0.33	899.09	1049.59	4478.68
Naval Base Road/Viaduct Road (S-	Spruill	Hobson	0.0867	0.1118	0.08	548.39	784.03	2765.48
Azalea Drive (S-894)	Rourk	Woodlawn	0.9135	0.9561	0.67	4051.73	5167.18	18336.96
	Woodlawn	I-26	0.8999	0.9566	0.72	4258.1	5308.18	19614.37
	I-26	Kent	0.8999	0.9566	0.72	4258.1	5308.18	19614.37
	Kent	Cosgrove	0.9224	0.9787	0.74	4408.98	5486.69	20002.18
	Cosgrove	Meridian	0.3734	0.4044	0.34	1949.9	2248.32	9363.31
	Meridian	Elegans	0.7468	0.8087	0.69	1949.9	2248.32	9363.31
	Elegans	Baker Hospital	0.7227	0.794	0.65	1885.42	2185.65	8896.7
	Baker Hospital	King	0.5296	0.6535	0.51	1486.16	1885.44	6972.41

Table 9 continued

Table 10: V/C and Traffic Flow Data – SUB AREA 7 (2035)

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
Spruill Avenue (S-32)	Riverview	Groveland	0.6746	0.7226	0.49	4358.57	5004.38	17321.67
	Groveland	Irving	0.6918	0.7436	0.51	4493.29	5161.88	17943.4
	Irving	Meeting	0.3913	0.3443	0.16	1733.02	2341.44	5783.98
Meeting Street (S-107)	Morrison	Brigade	0.4419	0.5794	0.41	1497.55	1995.2	6892.3
	Brigade	Romney	0.3478	0.4934	0.23	791.44	1123.43	3788.05
	Romney	*US 17	0.5463	0.6536	0.4	1444.75	1934.25	7105.98
	US 17	Hager	1.1471	1.7434	1.09	4125.89	5124.38	19249.57
	Hager	Harris	0.8256	1.3055	0.68	2384.69	3285.11	11987.68
	Harris	*Sheppard	0.8175	1.2928	0.67	2263.3	3166.23	11826.85
	*Sheppard	*Spring	1.4659	1.1837	0.99	7029.22	7036.95	32382.76
	*Spring	*Mary	1.0922	0.9029	0.88	5754.5	6297.42	28818.82
	*Mary	*Calhoun	1.1345	0.9229	0.89	5843.65	6746.15	29209.04
	*Calhoun	* Wentworth	0.9725	1.1909	0.84	5572.83	7228.15	28551.49
	Wentworth	Hayne	0.7932	1.1781	0.73	4946.64	6716.52	24640.03
	Hayne	*Broad	0.6097	0.9655	0.59	4024.15	5485.75	19845.66
King Street (S-104)	*Carolina	*Line	1.0487	1.187	0.64	1367.37	1664.68	5477.01
	*Line	*Spring	1.3173	1.0904	0.77	1533.97	1634.89	6587.06
	Spring	Cannon	0.8834	0.9444	0.67	1440.99	1491.05	5774.22
	*Cannon	*Mary	1.0197	0.8026	0.6	1211.84	1353.68	5108.25
	*Mary	* Calhoun	0.8392	0.701	0.51	1084.5	1220.31	4361.06
	* Calhoun	*Beaufain	0.7987	0.7838	0.45	811.52	818.82	3856.08
	*Beaufain	*Market	1.2698	0.9746	0.55	1164.82	923.27	4683.2
	*Market	*Queen	0.8128	0.929	0.47	776.04	888.83	4064.55
	*Queen	*Broad	0.3212	0.3967	0.32	2227.58	2816.74	10937.37

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
Rutledge Avenue (S-46)	Heriot	Mount Pleasant	0.5882	0.7611	0.45	1971.96	2404.03	7219.32
	Mount Pleasant	San Souci	0.4727	0.6747	0.37	1524.23	1980.36	5990.78
	San Souci	Cypress	0.4727	0.6747	0.37	1524.23	1980.36	5990.78
	*Cypress	*Grove	0.5063	0.8729	0.47	1710.59	2406.99	7587.14
	Grove	Cleavland	0.5743	0.8357	0.48	1833.33	2582.76	7686.31
	*Cleavland	*Sumter	0.6717	0.8471	0.59	2130.39	2622.51	9552.52
	*Sumter	*US 17	0.6991	0.9353	0.6	2258.07	2760.01	9684.39
	*US 17	*Spring	1.3276	1.2128	0.65	1331.25	1248.6	5808
	Spring	Cannon	1.2335	0.9459	0.57	1237.19	997.87	5146.19
	*Cannon	*Radcliffe	1.6831	1.2477	0.7	1641.84	1270.03	6321.6
	*Radcliffe	*Calhoun	1.2604	1.1173	0.59	1240.32	1128.04	5292.37
	*Calhoun	*Beaufain	0.3606	0.4043	0.28	507.53	685.31	2555.34
	Beaufain	Queen	0.5088	0.5911	0.46	671.67	860.58	4140.69
	*Queen	*Broad	0.1173	0.5609	0.16	204.28	582.45	1467.01
Ashley Avenue (S-103)	Moultrie	*US 17	0.1121	0.2139	0.1	208.7	393.25	883.32
	*US 17	Spring	1.0983	1.5342	0.87	1346.71	1814.16	7799.67
	Spring	Cannon	1.2158	1.7479	0.96	143.9	2031.57	8650.43
	*Cannon	*Calhoun	1.1355	1.7327	1.04	1522.19	2197.25	9533.45
	*Calhoun	*Beaufain	0.6778	0.6975	0.67	929.28	1209.23	5477.01
	*Beaufain	*Broad	0.3922	0.4316	0.34	497.93	686.77	2775.37
Lockwood Drive/Boulevard (S-1194)	Barre	Beaufain	1.288	0.9812	0.68	3025.64	3983.18	14709.15
	Beaufain	Wentworth	0.8985	1.0394	0.71	4234.55	5284.25	20566.37
	Wentworth	Calhoun	1.0701	1.0415	0.74	6264.26	7440.94	28441.64
	Calhoun	Bee	1.2803	1.4587	1.19	9493.53	11027.68	45344.39
	Bee	Cannon	1.2166	1.5493	1.09	8371.97	10868.18	41528.95
	Cannon	Spring	0.8403	1.1889	0.99	6966.59	9689.52	37966.59
	Spring	Fishburne	0.3756	0.5721	0.32	0.3756	0.5721	0.32

Table 10 continued

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
US 52	Carner	Irving	0.2686	0.2751	0.1	959.51	1813.96	3320.64
	Irving	Spruill	0.467	0.4469	0.23	1909.37	2877.78	7478.85
	Spruill	Pittsburgh	0.8769	0.805	0.39	3552.9	5121.42	12838.52
	Pittsburgh	Herbert	0.7359	0.6758	0.32	3476.18	5038.28	12399.98
	Herbert	Greenleaf	0.6731	0.6588	0.31	3114.21	4703.39	11139.06
	Greenleaf	Cunnington	0.6615	0.663	0.31	3093.39	4690.07	11100.5
	Cunnington	Morrison	0.6938	0.6982	0.36	3382.57	4875.12	12632.4
US 52 Spur (Morrison Drive)	Meeting	Brigade	0.9818	1.0171	0.55	4871.82	6130.65	18710.06
	Brigade	Romney	0.9362	0.9594	0.51	4600.65	5781.44	17389.89
	Romney	US 17	0.9419	0.9536	0.51	4584.9	5783.7	17247.11
	US 17	Johnson	1.1072	0.813	0.55	4975.07	5578.32	18607.84
	Johnson	East Bay	1.1083	0.8248	0.55	4994.37	5597.84	18688.89
US 52 Spur (East Bay Street)	Morrison	Columbus	1.1514	1.7349	0.92	6668.06	8581.89	28754.48
	*Columbus	*Calhoun	1.1643	1.6418	0.89	6453.79	8362.56	28000.88
	*Calhoun	*Society	0.7356	0.8187	0.61	4212.79	4776.12	19955.11
	*Society	*Market	0.9631	1.0787	0.81	2715.43	3246.85	13677.36
	*Market	*Queen	0.9281	0.9661	0.69	2504	3014.81	11591.64
	*Queen	*Broad	0.5533	0.6834	0.44	1614.82	1884.79	7314.75
US 78	Hackermann	Discher	0.675	0.8387	0.54	2210.41	2660.67	9138.36
	Discher	Milford	0.649	0.816	0.53	2167.69	2615.46	8964.22
	Milford	Trescott	0.6184	0.8115	0.52	2035.54	2555.65	8801.93
	Trescott	Heriot	0.6438	0.8155	0.6	2285.16	2699.59	10151.56
	Heriot	Mount Pleasant	0.6503	0.8156	0.58	2089.21	2424.84	9154.68
	Mount Pleasant	San Sousi	0.6453	0.837	0.65	1973.46	2508.88	9401.19
	San Sousi	Brigade	0.6499	0.839	0.66	2024.72	2526.56	9608.63
	Brigade	Romney	0.5833	0.7856	0.45	1621.22	1985.4	6476.77
	Romney	Poinsett	0.6344	0.8665	0.51	1824.46	2344.61	7305.54
	Poinsett	Grove	0.6526	0.9035	0.53	1902.84	2444.92	7723.83
	*Grove	*Congress	0.5426	0.808	0.36	1238.41	1611.55	5171.52
	*Congress	*Carolina	0.2981	0.4316	0.22	734.56	1033.29	3177.38

Table 10 continued

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
Line Street	Meeting	King	0.051	0.069	0.07	83.18	109.53	411.89
	King	St Philip	0.2685	0.4938	0.1	192.78	346.85	713.87
Spring Street (S-3)	Meeting	King	0.6636	0.7404	0.44	957.51	1147.86	3907.32
	King	St Philip	0.5131	0.4224	0.26	546.45	472.55	2486.76
	St Philip	Coming	0.7105	1.311	0.55	671.31	1187.64	4647.52
	Coming	Rutledge	0.7216	1.2913	0.52	696.41	1190.39	4396.34
	Rutledge	Ashley	0.7725	1.2515	0.52	736.87	1154.33	4366.82
	Ashley	President	0.9655	1.4994	0.64	924.16	1392.33	5371.24
	President	Courtney	0.8924	1.1715	1.02	6836.32	8816.68	34295.4
	Courtney	Hagood	1.0861	1.4106	1.32	6190.06	7898.15	32443.57
	Hagood	Lockwood	0.6344	0.7564	0.82	3980.71	4694.81	20198.13
Cannon Street (S-1037)	King	Saint Philip	0.5131	0.4224	0.26	546.45	472.55	2486.76
	Saint Philip	Coming	0.9513	0.791	0.48	984.04	848.08	4572.53
	Coming	Smith	1.1818	1.0226	0.6	1228.07	1098.07	5633.65
	Smith	Rutledge	1.0877	1.0423	0.59	1140.72	1118.17	5574.56
	Rutledge	Ashley	1.4174	1.2451	0.67	1447.85	1304.44	6348.5
	Ashley	President	1.3182	1.1317	0.58	1339.27	1179.53	5461.7
	President	Courtney	1.2496	1.0236	0.59	1366.24	1.0236	5578.48
Calhoun Street (S-404)	East Bay	Alexander	0.2956	0.6222	0.26	1873.81	2945.82	7969.4
	Alexander	Meeting	0.3406	0.6801	0.32	2214.58	3375.38	9818.04
	Meeting	King	0.5764	0.7354	0.53	3411.92	4369.21	16615.58
	King	Saint Philip	0.5883	0.6628	0.56	3358.71	3996.77	16041.27
	Saint Philip	Coming	0.6143	0.8502	0.68	3708.82	4573.77	19576.18
	Coming	Pitt	0.6312	0.7124	0.61	3408.17	4264.58	17596.29
	Pitt	Smith	0.6361	0.7337	0.63	3476.75	4377.64	18036.58
	Smith	Rutledge	0.6107	0.7246	0.64	3455.54	4335.98	18329.67
	Rutledge	Ashley	0.803	0.9646	0.72	4179.75	4660.26	20526.11
	Ashley	Jonathan Lucas	1.4404	1.485	1.62	4788.28	5145.4	27299.19
	Jonathan Lucas	Halsey	1.8772	1.984	1.7	5528.71	6250.42	28638.99
	Halsey	Courtenay	1.916	2.2273	1.77	5747.62	6755.65	29797.74

Table 10 continued

Corridor	Segment		AM Peak VOC	PM Peak VOC	Daily VOC	AM Peak Flow	PM Peak Flow	Daily Total Flow
	From	To						
Broad Street (S-1015)	East Bay	State	0.4028	0.3159	0.24	879.45	942.95	4015.96
	State	Church	0.5078	0.4017	0.32	1133.05	1256.15	5289.71
	Church	Meeting	0.5952	0.4846	0.41	1380.98	1581.9	6769.12
	Meeting	Court House Sq	0.8449	0.8146	0.66	2177.43	2698.08	10804.89
	Court House Sq	King	0.9879	0.9626	0.77	2540.76	3139	12635.11
	King	Logan	0.9902	1.164	0.81	2639.26	3315.01	13249.34
	Logan	Rutledge	0.9494	1.1449	0.8	2604.88	3242.74	13121.83
	Rutledge	Ashley	1.8516	1.545	0.92	2970.87	3967.79	14906.6
	Ashley	Barre	1.7347	1.2951	0.87	2870.38	3821.58	14003.22

*For multiple congruent roadway links with little varience in V/C and flow levels, segments are gouped and the link with the highest V/C and flow levels are indicated

Table 10 continued

Appendix 3-A: Peer System Review

Draft Report – February 2016

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Table of Contents

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1 Introduction

The I-26 Alternatives Analysis seeks to determine the best local option to improve transit service and enhance regional mobility along the I-26 Corridor connecting Summerville, North Charleston, and Charleston, South Carolina. In an effort to better understand the various transit modes under consideration (Bus Rapid Transit, Light Rail Transit, Commuter Rail, and Hybrid Rail), the following case studies are presented from various systems around the United States. The "peer systems" reviewed are intended to give insight into the overall project experience including the unique planning environment, system operations, infrastructure needs, project challenges, and lessons learned.

2 Bus Rapid Transit (BRT)

The following presents the three bus rapid transit peer systems considered for review. An overview of each system's service area and operating characteristics, based on 2013 NTD reported data, are as follows:

Table 2 - 1: BRT Peer Systems Service Area and Operating Characteristics

City	Cleveland, Ohio	Kansas City, MO	Eugene, OR
Name	Healthline - Euclid Avenue	Metro Area Express - MAX	Emerald Express - EmX
UZA Pop	1,780,673	1,519,417	247,421
Service Area Pop	1,412,140	748,415	297,500
Service Area Square Miles	458	332	482
Pop Density	3,083	2,254	617
Corridor Length (Miles)	7	9	7.8
Number of Stations	58	44	4
Peak Vehicles	16	11	8
Total Vehicles	21	15	11
Passenger Trips	4,854,519	1,591,117	2,707,309
Average Wkday Ridership	13,248	5,115	9,041
Revenue Miles	648,031	512,874	423,727
Revenue Hours	69,280	44,395	35,502
Operating Expenses	$6,211,010	$4,940,806	$5,583,993
Fare Revenues	$5,050,510	$689,792	$1,660,015

A more detailed review of each case is presented in Sections 2.1 – 2.3.

2.1 HealthLine (Euclid Avenue Corridor) – Cleveland, OH

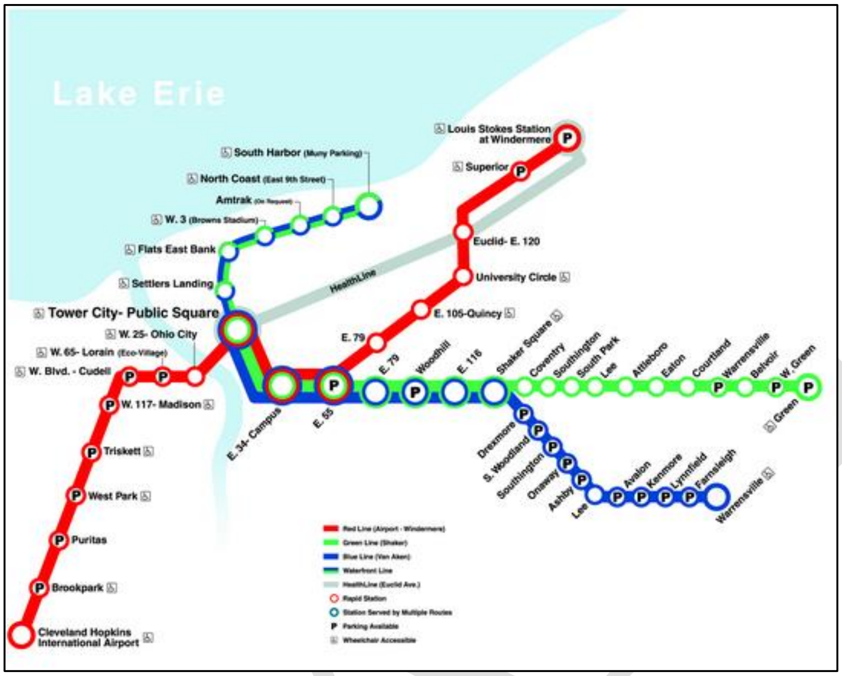
System Overview

Today, the Greater Cleveland area, with a population of 1.8 million people, is served by a vast transit network comprised of heavy rail, light rail, bus rapid transit, local bus, and demand response services operated by the Greater Cleveland Regional Transportation Authority (GCRTA). GCRTA's 458 square mile service area has a population of 1.4 million people and a population density of 3,083. (NTD 2013)

Background

Faced with a region experiencing economic hardship and declining population trends during the 1980's and 1990's, authorities initiated the *Dual Hub Corridor Alternatives Analysis* and subsequent Draft Environmental Impact Statement (DEIS) in 1985 to help guide the development of public transit in the region in an effort to better serve the local residents as well as support and advance the commercial and economic development of the area. This initial plan called for a proposed coordinated network of community circulators, park-and-ride facilities, transit centers, commuter rail and rapid transit extensions to better serve the population and jobs located on the outskirts of the urban core. The Euclid Avenue Corridor was identified at that time as a high priority transit investment corridor, and the plan proposed a new rail line connecting the region's largest economic areas of Downtown Cleveland and University Circle along the corridor. [1]

Figure 2 - 1: ***Cleveland HealthLine BRT (Grey Line)***



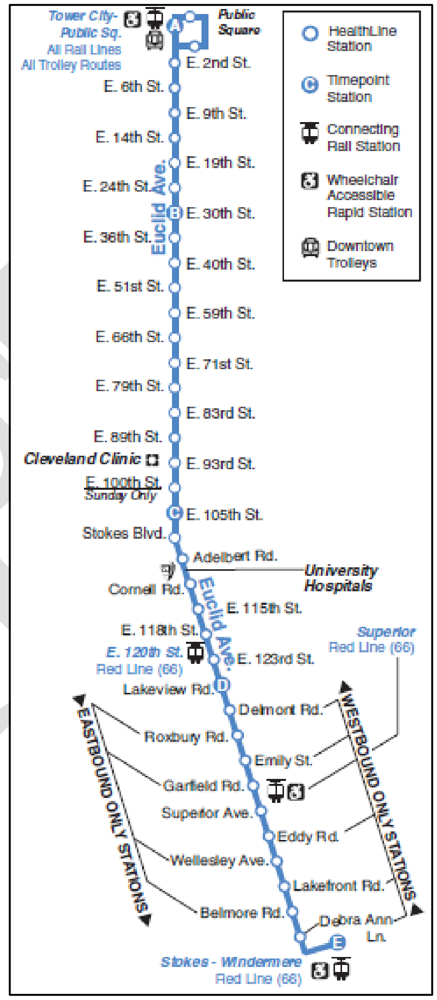
Source: Greater Cleveland RTA

By 1996, GCRTA had to re-evaluate the plan seeing that the proposed corridor rail line was not practical; estimated costs stood at near $800 million for the 4-5 mile rail corridor, and the region's population was still on the decline [2]. GCRTA reassessed the existing bus system and proposed a major restructuring of the local bus network based on a comprehensive operational analysis done at the time. However, the recommended changes again were less than ideal in providing a premium transit service to its citizens. At this time, GCRTA took an interest in and began exploring bus rapid transit technologies as a possible alternative that would provide and support a premium transit service. Already identified as a major transit investment corridor, Euclid Avenue was also served by a standard fixed bus route (Route 6) which was the most popular or heavily utilized route of the GCRTA system. This corridor bus route had an average weekday ridership of 15,000 to 18,000. This made the Euclid Avenue Corridor a prime candidate for implementing BRT service since it had the potential to deliver the "maximum level of mobility benefits" to the city's transit riders in a cost effective manner [2][4].

In 1996, the Federal Transit Authority (FTA) approved GCRTA's request to enter the Euclid Corridor Transportation Project into preliminary engineering. GCRTA completed the NEPA process, and FTA issued a Finding of No Significant Impact on the project in 2001. In 2002, GCRTA entered the project into final design with FTA approval, and in 2004, GCRTA secured a New Starts Grant from the FTA of $82 million to implement its premier transit project – the Euclid Corridor Transportation Project. Construction of the project occurred between 2004 and 2008.

Operation

The Cleveland HealthLine BRT operates along an approximate seven-mile corridor on Euclid Avenue connecting the two largest regional economic areas of downtown Cleveland and University Circle - home to regional employers such as the Cleveland Clinic and University Hospital. The route operates 24 hours a day, every day of the week. Weekday service has peak period headways of seven minutes, off peak headways of 10-15 minutes, and 30 minute headways during late night service. Weekend service has 15 minute headways during peak and off peak periods, and 30 minute headways during the late night hours of operation. Riders of the HealthLine are able to connect to local bus service at select stations along the BRT route. Connections to the system's light rail, trolley and heavy rail services can be made at the Downtown Cleveland multi-modal transit center. The HealthLine serves 40 BRT stations instead of 100 local bus stops that were previously served along the corridor.



The HealthLine operates in dedicated bus lanes along most of its alignment with platform-level boarding at central median or curb-side stations. Vehicles utilize signal priority technology to help improve travel speeds along the route. Prior to the HealthLine, the average bus speed experienced in the corridor was roughly nine miles per hour. BRT buses achieve an average corridor speed of 12.5 mph and 13.5 mph in dedicated bus lanes. Average ridership has increased by 60% (in the first 2 years of operation) and average travel time savings achieved along the corridor is approximately 12 minutes [6]. A rider pays a fare of $2.25 for a one-way trip on the HealthLine.

Figure 2 - 2: *HealthLine BRT operating in dedicated bus lane*

Source: Greater Cleveland RTA

The following provides operating data and performance measure statistics for the HealthLine BRT system for 2013.

Operating Data (NTD)- BRT	
Passenger Trips	4,854,519
Passenger Miles	12,837,586
Average Weekday Ridership	13,248
Revenue Miles	648,031
Revenue Hours	69,280
Operating Expenses	$6,211,010
Fare Revenues	$5,050,510

Performance Measures- BRT	
Passengers per Hour	70
Passengers per Mile	7
Average Trip Length (miles)	2.6
Cost per Passenger	$1.28
Cost per Hour	$89.65
Cost per Mile	$9.58
Farebox Recovery	81%
Subsidy	$0.24

Source: 2013 NTD

Vehicles

The HealthLine has a 21-vehicle fleet of 63-foot hybrid-electric Rapid Transit Vehicles. These articulated light rail vehicles have 2-3 doors on both sides of the vehicle, which allow multiple door boardings. Vehicles have a seating capacity of 47 and standing capacity of 53 passengers. Riders benefit from onboard text displays and audio/visual announcement systems. It was important for the buses to have a strong community identity, and as such, the naming rights for the system were sold to the Cleveland Clinic and University Hospital. With engaged partners and clear and distinct system branding, the HealthLine has experienced strong community ownership and support.

Figure 2 - 3: ***HealthLIne BRT hybrid electric rapid transit vehicle***

Source: Greater Cleveland RTA

Figure 2 - 4: *HealthLine BRT bus operating in dedicated bus lane serving a median station*

Source: Greater Cleveland RTA

Stations

The HealthLine serves 40 median or curb-side BRT stations. Low-floor BRT buses are able to easily access on-street stations, and riders can quickly board or disembark the vehicle. Station styles are similar to each other in an effort to maintain system cohesion, but may vary in size. Transit stations have ticket machines allowing off-board ticketing, raised platforms for level boarding, real time information displays, emergency phones, enhanced lighting and seating.

Figure 2 - 5: *HealthLine stations built in the existing right of way along the Euclid Corridor are modeled to convey a sense of permanence*

Source: www.metropolismag.com

Project Cost/Funding

The Euclid Corridor Transportation Project was designed to improve transit service as well as increase the development and redevelopment potential along Euclid Avenue. The corridor project included the implementation of a BRT line as well as establishment of a downtown transit zone with infrastructure improvements (sidewalks, bike lanes, streetscape, upgraded sewer and water lines, and installation of fiber optic lines), an East Side Transit Center with customer amenity improvements (waiting areas and bike racks), traffic signal technology enhancements, and peak hour parking restrictions. Roughly 25 percent of the project cost included BRT vehicles, stations, and platforms, and 75 percent of costs were attributed to infrastructure and street-level improvements [2].

Funding for the Euclid Corridor Project came from a number of sources totaling $168.4 million ($24.06M/Mile). These sources include [4] [5] [6]:

- FTA New Starts - $82.2 million (48.8%)
- State of Ohio - $50 million (29.7%)
- GCRTA - $17.6 million (10.5%)
- City of Cleveland - $8 million (4.8%)
- NOACA (Congestion Mitigation and Air Quality funds) - $10 million (5.9%)
- FTA Rail Modernization - $0.6 million (0.4%)

The project also utilized a very creative funding approach when the Cleveland Clinic and University Hospital purchased the naming rights of the route. The business partners agreed on the "HealthLine" and are paying approximately $6.25 million over 25 years for the name. Funds from the naming rights agreement are dedicated to maintaining the bus stations [4].

Project Takeaway

Development and implementation of the HealthLine were done as part of a corridor transportation project. This approach provided a more robust corridor for the BRT system to operate in and also created a climate more appealing to investors. In the first four years of the corridor's operations, it had leveraged roughly $5.8 billion in new Transit Oriented Development. By investing 75 percent of project cost in infrastructure and street upgrades along the corridor and 25 percent of the project budget toward vehicles, stations, and platforms, the Euclid Corridor Transportation Project was able to leverage $29 of new investment per dollar invested in public infrastructure and roughly $118 of new investment per dollar invested in transit. The HealthLine generated increased private development interest in the corridor, and as such, coordinated EPA investment in brownfields and HUD investment in economic development and housing were more successful. TOD development and revitalization investment have also been made by major regional employers and system partners; Cleveland State University ($180 million master plan) and University Hospitals ($500 million expansion project) [2].

Sources:

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4. *Bus Rapid Transit Case Studies*. Community Planning Workshop, 2009. Retrieved July 8, 2015 from http://ppms.otrec.us/media/project_files/09264_Parker_BRT_CaseStudies-1.pdf

5. *The Cleveland HealthLine: Transforming an Historic Corridor*. Institute for Sustainable Communities. Retrieved July 7, 2015 from http://sustainablecommunitiesleadershipacademy.org/resource_files/documents/the-cleveland-healthline.pdf

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2.2 Metro Area Express (MAX) – Kansas City, MO

System Overview

The Kansas City Area Transportation Authority (ATA) is a bi-state agency created by a compact between the States of Missouri and Kansas, and approved by the United States Congress. The compact was authorized by legislation passed in both states in 1965. The compact gives the ATA responsibility for planning, construction, owning and operating passenger transportation systems and facilities within the seven-county Kansas City metropolitan area.

ATA operates the Metro bus service, the Metro Area Express (MAX) Bus Rapid Transit service, MetroFlex demand-response routes, Share-A-Fare paratransit service for the elderly and persons with disabilities, and AdVANtage vanpool service. ATA has a 332 square mile service area with a population of 748,415 people and a population density of 2,254.

Background

The Metro Area Express (MAX) is Kansas City's first Bus Rapid Transit (BRT) line. The MAX– Main Street (Orange Line) – operates along the city's central corridor. Plans to develop a regional transit system that supported sustainable growth and promoted a diverse regional economy had been on-going since the early 1970's. Between 1970 and 2001, multiple Alternatives Analysis Studies and Major Investment Studies had been undertaken by transportation/transit authorities. Transit planning for the region's central corridor was also very active, and as early as 1995, light rail transit was identified as the preferred alternative, which guided decisions on transit improvements throughout the corridor.

In keeping with this vision, the 1997 *FOCUS Kansas City Comprehensive Plan* clearly identified and supported a fixed guideway transit system as an integral component to achieve the region's mixed use center development concept. While both light rail and dedicated bus transit systems were identified to serve these development centers or nodes, preference was given to light rail technology. In 2001, the City of Kansas City and Kansas City Area Transportation Authority (KCATA) completed the *Central Business Corridor Transit Plan* which focused on developing a fixed guideway system along both the Main Street and Troost Avenue Corridors in the city's core. Again the preferred mode identified and developed in both corridors was light rail transit; bus rapid transit was preferred if rail was found to be financially infeasible [1]. A ballot initiative to establish a half-cent sales tax to fund the proposed LRT system at a cost of approximately $793 million, which included the central corridor projects, was defeated by voters in 2001 [2]. Following the ballot defeat, KCATA, in keeping with the *Central Business Corridor Transit Plan*, turned their attention to develop BRT options along the central corridors.

Operation

The MAX line operates along a nine-mile corridor with six miles directly serving Main Street in the central city. The corridor traverses the major regional employment center, has many civic and cultural amenities, supports major commercial and retail uses, and serves a very diverse community. Prior to the implementation of the MAX, the Main Street Corridor was a six-lane urban arterial with all lanes being used for travel during peak periods and curb lanes being used for parking during the off-peak. Two local bus routes served the corridor and both experienced relatively slow transit service and declining transit ridership of roughly 3,300 daily riders as of 2004 [2]. These corridor characteristics made BRT a viable option. Following the defeat of the 2001 ballot initiative, planning for the Main Street BRT line commenced in 2002. The project progressed into design/engineering in 2003, and construction of the line occurred between 2004 and 2005. The MAX line became operational in July 2005. Since opening in 2005, daily ridership along the corridor increased to roughly 6,000 riders as of 2008 [2].

The MAX operates daily with weekday service operating between the hours of 4:00 AM and 1:00 AM, with 10-minute peak and 15- to 30-minute off-peak headways. Saturday service runs from 5:00 AM to 1:00 AM, with peak headways of 15 minutes and off-peak headways of 30 minutes. Sunday service runs from 5:30 AM to 12:30 AM with 30-minute headways throughout the day. KCATA conducted a Comprehensive Service Analysis (CSA) of its transit system in 2012. This CSA recommended consolidation of local bus routes that operated along the major BRT corridors into the BRT line [3]. Local bus lines, therefore, connect to the BRT line but do not compete with the service along the same alignment. The MAX line is paired with the local bus service allowing riders to transfer to other system routes at select station stops.

The MAX operates within a combination of full-time dedicated bus lanes in the downtown area and peak hour "bus only" lanes in the Midtown area. These bus lanes make up 52 percent of the BRT route. The corridor utilizes traffic signal priority technology at 31 intersections. The line serves 22 stations in each direction. North of the Plaza/Library stop, the route serves only the BRT station stops. The southern section of the line operates more like a local bus route serving more frequent stops in addition to the BRT stations. A one-way trip on the MAX costs $1.50.

The following provides operating data and performance measure statistics for the MetroArea Express (MAX) BRT system in 2013.

Operating Data (NTD)- BRT	
Passenger Trips	1,591,117
Passenger Miles	4,311,927
Average Weekday Ridership	5,115
Revenue Miles	512,874
Revenue Hours	44,395
Operating Expenses	$4,940,806
Fare Revenues	$689,792
Performance Measures- BRT	
Passengers per Hour	36
Passengers per Mile	3
Average Trip Length (miles)	2.7
Cost per Passenger	$3.51
Cost per Hour	$125.78
Cost per Mile	$10.89
Farebox Recovery	12%
Subsidy	$3.08

Source: 2013 NTD

Vehicles

The MAX has a fleet of 14 diesel vehicles with unique MAX branding. The fleet has added five hybrid electric vehicles to its fleet since introducing its MAX – Troost Corridor (Green Line). Each of the 42' low-floor vehicles are BRT styled with wider doors and windows compared to standard buses.

Figure 2 - 6: MAX BRT vehicle with distinct MAX branding.

Source: Kansas City Area Transportation Authority (www.kcata.org)

Buses have a seating capacity of 39 passengers and accommodate a maximum of 50 riders with standees. Buses are outfitted with traffic signal priority (TSP) technology and radio/GPS systems to provide real time information at stations. Vehicle radio/GPS systems were funded separately. Buses were acquired at a unit price of $323,000 (2004 price) [5].

Figure 2 - 7: ***Seating inside MAX BRT vehicle (left), and low-floor vehicle allowing easier boarding and embarking (right)***

Source: Kansas City Area Transportation Authority (www.kcata.org)

Stations

The MAX – Main Street (Orange Line) serves 44 stations. It was important that “stations” were simple and affordable, modeled to transfer a sense of permanence, integrated new technology, maintained standard elements that were consistent from one station to the next, and promoted the BRT identity through its distinct branding. Stations were built within the existing corridor right-of-way and integrated real-time arrival information and automated audio/visual service announcement technology. Stations are spaced at ½ to ¼ miles apart at major cross streets.

Figure 2 - 8: ***MAX curbside transit station with distinct branding elements***

Source: Kansas City Area Transportation Authority (www.kcata.org)

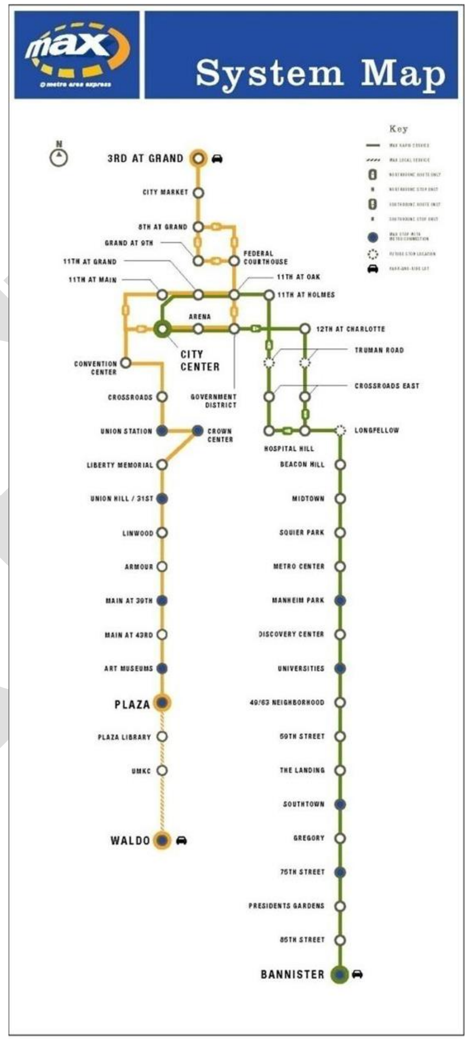
Project Cost/Funding

The MAX – Main Street BRT line had a capital cost of approximately $21 million ($2.3M per mile), with 80 percent of funds coming from federal sources ($16.8 million) and 20 percent from local sources ($4.2 million). The budget breakdown includes [2] [5]:

- Planning, Design and Engineering - $2.9 million
- Vehicles and Inspection - $4.3 million
- Street Paving Construction - $2.3 million
- Traffic Signal and Signal Priority - $1.8 million
- Stop Construction and Installation - $8.5 million
- Administration, Easement, Utility and Legal Costs - $0.7 million

System Expansion

Given the success of the MAX – Main Street line, KCATA has proceeded with a second 13-mile BRT line, the MAX – Troost Corridor (Green Line). Planning started for the Troost Corridor in 2006, and it was opened for operation in 2011. Built at a cost of $30 million, the new BRT line operates along the system's highest ridership route. This project was funded at 80 percent federal (Very Small Start Funds) and 20 percent local sources. In fact the region's rapid transit system plan has been updated to reflect a robust regional BRT based system serving the metro's major high ridership corridors and strong integrated service with the region's local bus network.



Project Takeaway

Having pushed for light rail transit in the region for many years with no progress, the KCATA recognized that they had to shift their focus to deliver a system that was achievable, would improve regional mobility, increase ridership, and could be quickly implemented at a relatively low cost. After implementing the first MAX – Main Street (Orange Line), KCATA was able to increase ridership, attract choice riders, and gain a strong and positive community response to the service. The BRT system was able to be implemented within a short timeframe (3-4 years), using existing funding sources.

KCATA staff also identified the following as project "lessons learned" [2]:

- Plan to operate more buses. The MAX line faced challenges associated with a small fleet.
- Make fewer station compromises including placing greater emphasis on far-side stations, provide more dedicated bus lanes or operate on peak time "bus only" lanes for more hours, and maintain relatively consistent station spacing (no added stations).
- Negotiate more transit signal priority along the corridor and apply transit signal priority (TSP) at more intersections.
- Expand the sidewalk improvements to increase access to the service and surrounding land uses.
- Place more emphasis on improving the service ride quality and pavement improvements.

Sources:

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2.3 Emerald Express (EmX) Green Line – Eugene, OR

System Overview

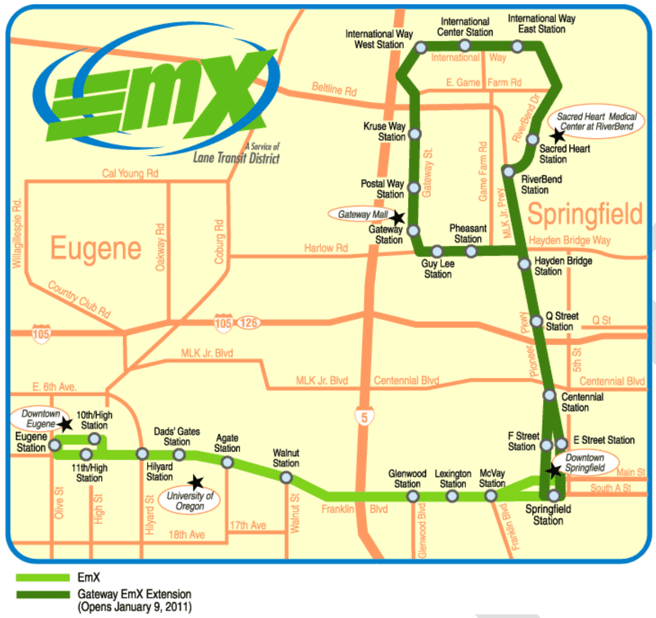
The City of Eugene, Oregon has a population of 247,421 people. Transit service is provided by Lane Transit District (LTD), which provided 11.6 million passenger trips on fixed route, bus rapid transit, and demand response service in 2013. LTD's service area is 482 square miles. With a population of 297,500, the service area's population density is 617 persons per square mile.

Background

As part of an update to the regional transportation plan during the mid-1990's, the Lane Transit District (LTD) was committed improving service to new population growth in the region given the existing bus transit system. Prior to this, the region had undertaken a study to analyze urban rail options and its feasibility in the region. However, findings from that study concluded that the region was too small, i.e. densities were too low to support a light rail option. While the existing standard bus system was seeing success and experiencing increased ridership, LTD was not able to attract more choice riders to the bus service. The system needed to be reimagined. As such authorities turned their attention to bus rapid transit (BRT) technologies, particularly from the Curitiba, Brazil system model, as a possible alternative. BRT was highlighted for its increased ridership and offered a level of service comparable to light rail at a fraction of the cost required to implement LRT. At this time, the Federal Transit Administration (FTA) also showed interest in BRT technology and in developing a pilot system in the United States [1].

By 1996, as the region was completing its update to the transportation plan, BRT had been identified as the preferred transit mode to provide enhanced transit service at a manageable cost in the Eugene-Springfield region. Other options considered included enhanced conventional bus service and light rail/streetcars. The updated regional plan included a policy for implementing BRT as well as a proposed 61-mile regional BRT system. The LTD undertook a broad public outreach effort to present the transportation plan update and introduce the BRT concept. The major strategy used for the outreach effort involved clear renderings of a BRT line and a strong visual approach to educate the public about Bus Rapid Transit and the proposed BRT plan. This approach proved effective in gaining community support and obtaining quality public feedback in the design process. The public identified the need for the system to operate in the medians for the service to be most effective [1].

Figure 2 - 9: ***EmX System Map - Franklin Corridor and Gateway Extension***



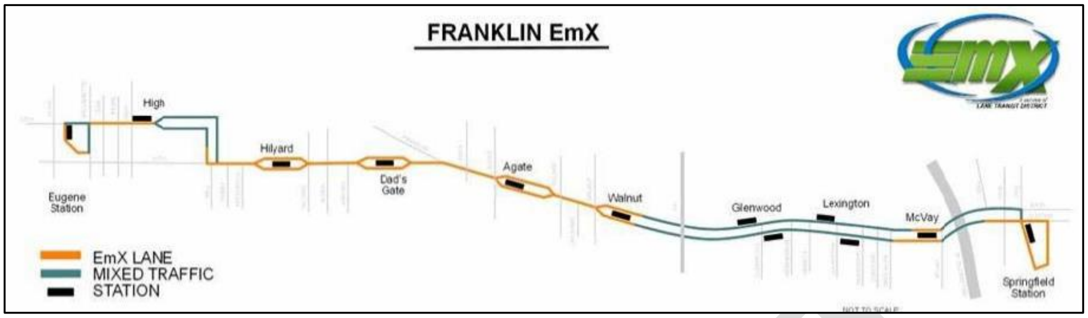
Source: Institute for Sustainable Communities

During this time, there was also marked public opposition to the proposed BRT system on the grounds that it would be too expensive to implement and it would not be able to generate the high ridership level anticipated. Vocal grassroots opposition came from a group called *the Friends of Eugene*. The business community, however, took a more neutral stance on the project. In 2001, regional partners including the City of Eugene, the City of Springfield, Lane County, and LTD, approved a regional plan with BRT as a key element. The plan called for a full build-out of 60 miles of BRT corridors over 20 years. Between 1999 and 2002, LDT worked on determining where the first part of the system should be built. Initial project consideration included an 11.5-mile corridor between Eugene and Springfield. However, as LTD began to understand the scale of planning and the level of funding required to successfully implement a corridor of that magnitude, the initial BRT corridor was reconsidered. The project was re-scoped to implement a shorter BRT corridor between downtown Eugene and downtown Springfield.

Operation

The first planned BRT corridor, the Emerald Express (EmX) line, operates on four miles along the Franklin Corridor linking downtown Eugene to downtown Springfield. Following the BRT concept development initiated in 1996, a Major Investment Study for the corridor was conducted between 1997 and 1999. The project's Draft Environmental Assessment was completed in 2000, and the project moved into engineering by 2001. Construction of the line began in 2004, and the line was opened for operation in 2007. The route operates with 60 percent dedicated lanes and forms the foundation corridor from which future BRT lines could connect. The remaining 40 percent of the route operates in mixed traffic and utilizes curbside bus lanes with queue jumping and signal priority technology [2] [3]. Designated bus lanes are for buses only and unauthorized vehicles are penalized for operating or parking in the lanes.

Figure 2 - 10: ***EmX lane operations between dedicated EmX lanes and mixed traffic lanes***



Source: Lane Transit District

Dedicated lane configurations can take the form of:

- Median (one-way) lanes, curb separated
- Median (bi-directional) lanes, curb separated or no barrier
- Curb side (one-way) lanes, no barrier
- Curb side (bi-directional) lanes, no barrier

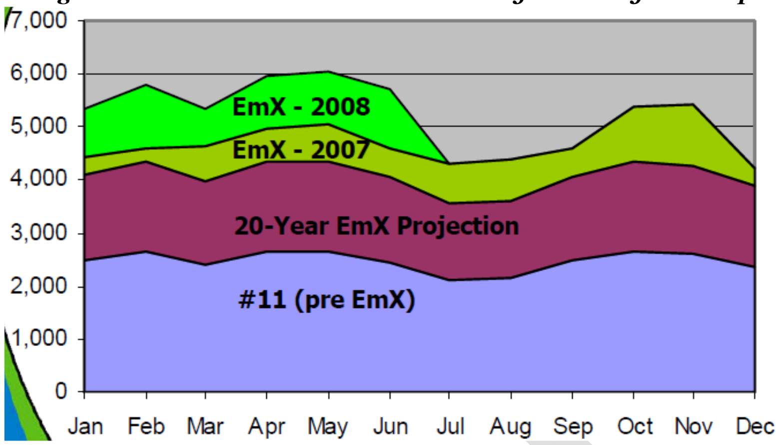
Figure 2 - 11: ***EmX vehicle operating on dedicated curb-guided bus lanes with grassed median strip (left), and median bi-directional lane (right)***

Source: www.cctmaryland.com (top), www.flickr.com (bottom)

The EmX Green Line operates on weekdays and Saturday from 5:30 AM to 11:00 PM with a 10- to 15-minute headway. Sunday service runs from 8:00 AM to 8:00 PM with 15- to 20-minute headways. A rider pays a single cash fare of $1.75 to use the service. Prior to the introduction of the EmX Green Line, the Franklin Corridor between downtown Eugene and downtown Springfield was served by a standard local bus (Route 11) with continued service beyond the Springfield station stop. Route 11 had a typical weekday ridership of 2,667 in the fall/spring of 2006. The EmX replaced the Route 11 service between the downtown Eugene and Springfield segment. However, Route 11 has been modified to operate beyond the Springfield station, connecting riders to the BRT corridor. An on-board passenger survey conducted on Route 11 in 2006 concluded that most riders boarded or disembarked at the Eugene or Springfield station, the majority of riders accessed the service five or more days per week for primarily school or work trips, most passengers were satisfied with the alignment that the bus served, and passengers desired better stop/shelter quality [2] [3]. These major route characteristics further supported the choice to implement BRT along this main corridor.

Ridership on the Franklin Corridor EmX line increased over the levels seen by the pre-existing route in its first year of operation, 2007. These levels also exceeded the 20-year EmX ridership projections that were made during initial project planning and development [4].

Figure 2 - 12: ***Franklin Corridor EmX average weekday ridership***



Source: Lane Transit District [4]

The following provides operating data and performance measure statistics for the EmX BRT system in 2013.

Operating Data (NTD)- BRT	
Passenger Trips	2,707,309
Passenger Miles	7,840,004
Average Weekday Ridership	9,041
Revenue Miles	423,727
Revenue Hours	35,502
Operating Expenses	$5,583,993
Fare Revenues	$1,660,015
Performance Measures- BRT	
Passengers per Hour	76
Passengers per Mile	6
Average Trip Length (miles)	2.9
Cost per Passenger	$2.06
Cost per Hour	$157.29
Cost per Mile	$13.18
Farebox Recovery	30%
Subsidy	$1.45

Source: 2013 NTD

Stations

The four-mile BRT corridor serves eight stations/enhanced shelters in addition to the Eugene and Springfield stations. Enhanced shelters are located at ½ mile intervals along the corridor. Station amenities include enhanced lighting, information displays, bike racks and real-time vehicle information displays. Bus lanes are approximately 10 feet in width and are separated by an 18 inch curb along certain segments. Bus lanes have a maximum operating speed of 45 mph. Segments of the busway have grassed median strips which absorb fluid leaks and some vehicle noise. Median and curb-side stations are built at-grade allowing easy access to users, improves travel times and ease of use. The Eugene and Springfield BRT terminus stations provide bus bays for both EmX and standard bus transit service. The articulated EmX vehicles require two standard bays due to the vehicle's length.

Figure 2 - 13: ***EmX buses serving a median station allowing left-side boarding for east and westbound vehicles.***

Source: www.usa.streetblog.org

Figure 2 - 14: ***EmX curb-side station (top) and single-sided median station (bottom)***

Source: Lane Transit District [4]

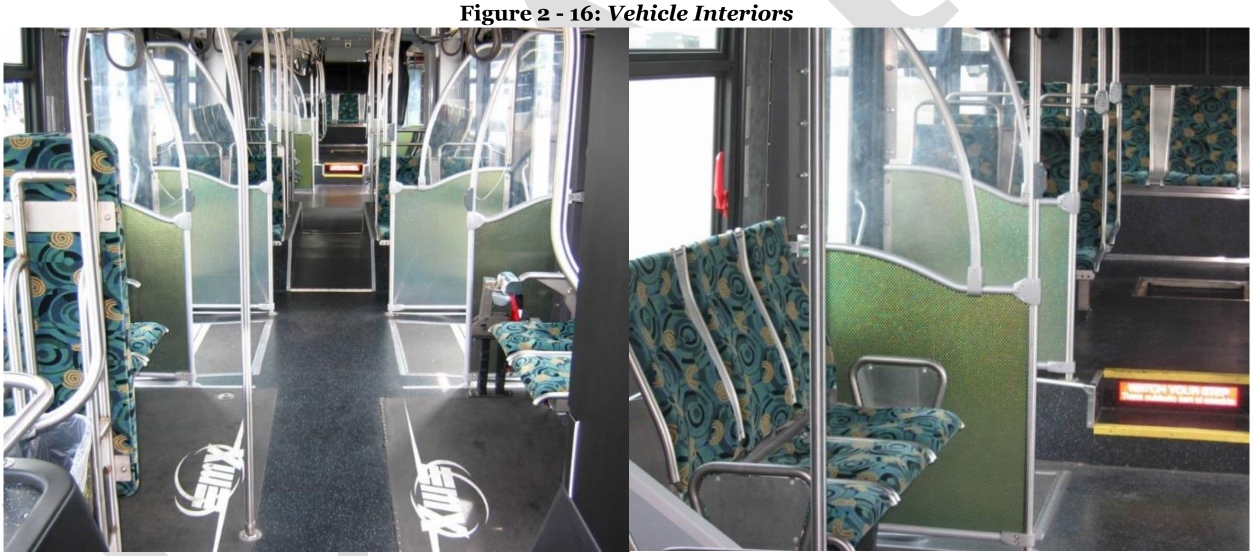
Vehicles

LTD acquired six 63-foot New Flyer (DE60LFA) articulated buses for its BRT operations. Buses are produced by a local manufacturer, operate on pavement with rubber tires, and are equipped with doors on both sides allowing multi-side boardings/embarking. These vehicles are hybrid-electric buses, which allow for better fuel economy, provide longer brake life, and reduce maintenance costs [3].

Figure 2 - 15: ***EmX Articulated Bus***

Source: www.ltd.org

Figure 2 - 16: ***Vehicle Interiors***



Source: Lane Transit District [4]

System Cost/Funding

The capital cost for the EmX Franklin Corridor line was an approximate $25 million ($6.25 M per mile), with $12 million in system construction costs and $6 million in planning and design. The following provides a capital cost summary of the EmX line.

Table 2 - 1:EmX Capital Cost Apportionment (Budgeted and Actual)

	Original Budget	Actual Cost
Design/Consulting Services	$2,445,474	$2,619,500
Property Acquisition	$1,350,000	$1,006,450
Construction Costs	$12,797,246	$12,469,480
Miscellaneous Costs/Utilities	$476,000	$517,170
Plan Review/ Permits/Inspections	$250,000	$545,610
Construction Support Costs	$1,300,000	$1,463,840
Project Contingency	$930,936	$0
Total Scope	**$19,549,656**	**$18,662,050**
Vehicles	**$5,500,000**	**$5,932,070**
Total	**$25,049,656**	**$24,554,120**

Source: The EmX Franklin Corridor – BRT Project Evaluation. *National BRT Institute (2009)*

The original budget anticipated the acquisition of five New Flyer vehicles at a cost of roughly $980,000 each. However, six new vehicles were procured for exclusive use on the BRT line (not to be used on another route) and as such were included in the project's capital cost. The proposed real time passenger information system was not implemented at the start-up of the project because of the high cost in purchasing the system's hardware, communication, and software. Equipment was acquired at a later time when funds became available. Funding for the EmX BRT project came from both Federal (80%) and Local (20%) funding sources in the amounts of:

- Federal - $20 million
  - Section 5309 New Starts - $13.3 million
  - Formula Funds - $6.7 million
- Local - $5 million

System Expansion

The second BRT corridor "Gateway Extension" opened for operation in 2011. The 3.8-mile extension along the Pioneer Parkway was constructed at a cost of $41 million ($5.26M per mile). This extension project was the first project in the country to utilize FTA Small Starts funding. The LTD partnered with FTA while the first corridor was under progress to develop the Small Start concept. As the Gateway corridor project proceeded, the LTD helped the FTA to streamline and simplify the Small Starts process. The LTD was able to secure 80 percent federal support (the largest match allowed), 13 percent through a statewide transportation infrastructure funding program, and seven percent from the LTD [1] [4].

The EmX third corridor, West Eugene EmX, expansion is currently under construction with an anticipated completion in 2017. Funding for the latest corridor totals $94.4 million (www.ltd.org) and is secured from the following sources:

- Federal: $75 million
- Oregon Lottery Bonds: $17.8 million
- State (ConnectOregon): $1.6 million to build two new bike-pedestrian bridges

It is interesting to note that corridors II and III were under development while the first corridor was being constructed. The partner cities of Eugene and Springfield had identified BRT as their preferred alternative even at a time when the BRT system benefits were still unknown. This reflected the strong long-term vision and commitment that regional partners had to the regional transit system [3].

Project Takeaway

The EmX BRT line was the first of its kind implemented in a medium-sized city in the United States and as such there was no concrete examples from which the system could reference or prove that the system would succeed. The first technical challenge encountered in developing the line was updating or aligning State traffic engineering and congestion standards with LTD's standards. The State's standards were not designed for the transit infrastructure needed for a BRT system. Working with the City of Eugene's traffic engineer, who had shown high interest in the project, LTD tackled these technical details and others, such as signal priority and new lane configurations. This partnership helped to push the project forward. The project was also met with a challenge from the Springfield Mayor, who at that time had expressed uncertainty about BRT and believed that LTD had not effectively communicated the impacts that the EmX system would have on the local communities. The Springfield Chamber of Commerce Executive Director assisted the Mayor and Eugene City Council to better understand and support the project. In retrospect, LTD acknowledged that their expertise at that time was mainly as a bus operator. They had not fully defined the role it would play as a BRT operator and what that role entailed. Today the agency is more engaged with partners and is able to guide a more collaborative dialogue concerning city, regional or economic development priorities and the role the system will play in achieving local and regional goals. This challenge ultimately helped LTD to redefine itself and better assert its authority as a new BRT operator [1].

Sources:

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3 Light Rail Transit (LRT)

The following presents the three light rail transit peer systems considered for review. An overview of each system's service area and operating characteristics, based on 2013 NTD reported data, are as follows:

Table 3 - 1: LRT Peer Systems Service Area and Operating Characteristics

City	Charlotte, NC	Norfolk, VA	Cleveland, OH
Name	LYNX	The Tide	The Rapid
UZA Pop	1,249,442	1,439,666	1,780,673
Service Area Pop	1,098,944	1,439,666	1,412,140
Service Area Square Miles	688	515	458
Pop Density	1,597	2,795	3,083
Directional Miles	18.6	14.8	30.4
Number of Stations	19	11	34
Peak Vehicles	14	7	14
Total Vehicles	20	9	48
Passenger Trips	4,919,307	1,762,284	2,897,940
Average Wkday Ridership	15,546	5,531	7,908
Revenue Miles	859,632	373,045	785,351
Revenue Hours	54,738	29,978	52,645
Operating Expenses	$13,084,582	$12,347,424	$11,714,024
Fare Revenues	$4,358,896	$687,892	$3,014,938

A more detailed review of each case is presented in sections 3.1 – 3.3.

3.1 LYNX Blue Line – Charlotte, NC

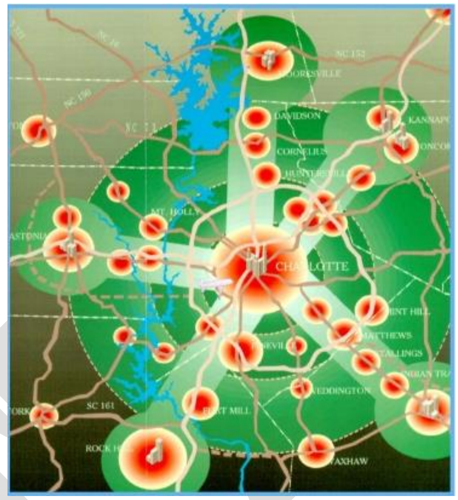
System Overview

The Charlotte Area Transit System (CATS) is the largest transit system between Atlanta, GA and Washington, DC with over 70 local, express and regional bus routes, a light rail line, services for the disabled, and vanpools serving more than 23,000,000 trips each year. Managed by the Public Transit Department, a department within the City of Charlotte, CATS maintains a dual focus, managing and continually improving day-to-day operations of the region's transit services within a six-county area while advancing planning for a regional rapid transit system integrated with land-use plans that includes light rail, commuter rail, bus rapid transit, and expanded bus services. (charmeck.org).

Background

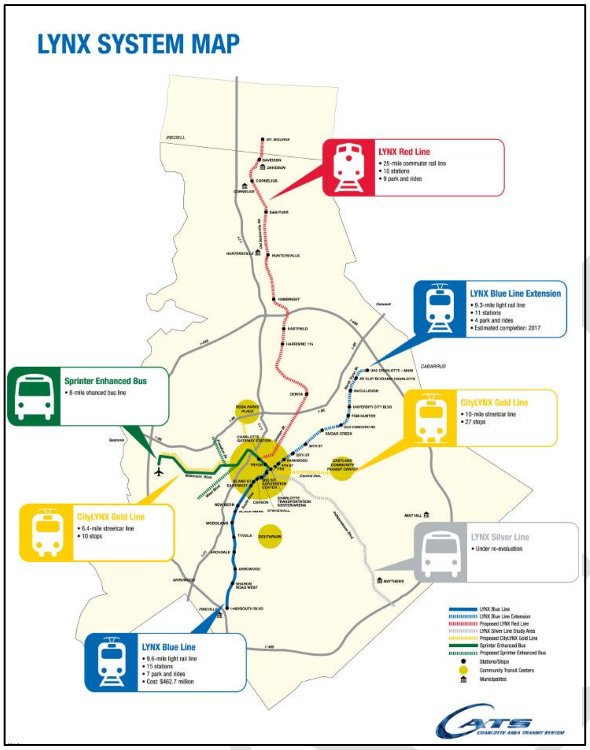
In 1994, Charlotte provided a regional vision through a development framework that focused regional growth in centers along five radial corridors in their *Centers, Corridors, and Wedges Vision Plan*. To achieve this vision the plan provided regional long-term growth management strategies and general guidance to link transportation and land use. Building upon this plan, the City of Charlotte and Mecklenburg County adopted the *2025 Integrated Land Use and Transit Plan* in 1998. Development of the *2025 Integrated Land Use and Transit Plan* involved an extensive public outreach effort, which tested a series of transit/land use alternatives and their feasibility along each of the five growth corridors. Through this process, community consensus was built around a phased implementation of various transit technologies along the five corridors that developed a robust regional transit network and land use measures that supported the region's vision for sustainable growth. The Plan also addressed expansion of the existing transit system to better serve the rapid transit corridors and provide more transit choices to meet the region's mobility goals [1][2].

Capitalizing on the momentum of the community support for the *2025 Integrated Land Use and Transit Plan,* a half-cent sales tax to support a multi-year transit plan and provide a dedicated revenue source over 20 years was placed on the local ballot. In 1998, Mecklenburg County voters approved the tax referendum by a 58 percent margin [3]. Immediately following passage of the referendum, authorities initiated the first of the five-corridor Major Investment Studies (MIS) for the South Corridor in 1999 to determine the corridor's Locally Preferred Alternative. By 2000, detailed planning for all five corridors was underway. Upon completion of the Major Investment Studies, which identified the Locally Preferred Option for each of the rapid transit corridors and their alignments, the Metropolitan Transit Commission (MTC) adopted the *2025 Transit Corridor System Plan* in 2002. Plan recommendations for the regional system included a combination of light rail transit (LRT), bus rapid transit (BRT), streetcar, commuter rail, and extensive bus systems. In 2006, an update to this plan was adopted, the *2030 Transit Corridor System Plan*. Figure 2-5 provides the proposed 2030 LYNX system map with the region's rapid transit corridors and the transit technologies planned for each. The recommended 2030 system plan includes [4]:



- South Corridor (LYNX Blue Line): 9.6-mile light rail line (completed)
- Northeast Corridor (LYNX Blue Line Extension): 9.3-mile light rail line (estimated 2017 completion)
- North Corridor (LYNX Red Line): 25-mile commuter rail line (proposed)
- Southeast Corridor (LYNX Silver Line): 13.5-mile bus rapid transit line (proposed)
- Center City (CityLYNX Gold Line): 10-mile streetcar line (completed)
- West Corridor (CityLYNX Gold Line): 6.4-mile streetcar line (proposed)
- West Corridor (LYNX Sprinter Enhanced Bus): 8-mile enhanced bus line (green line operational)

Figure 3 - 1: ***Transit Corridor/LYNX System Map***



Source: Charlotte Area Transit System (CATS)

The LYNX Blue Line

The LYNX Blue Line is the Locally Preferred Alternative (LPA) resulting from the South Corridor Major Investment Study (MIS). Initiated in 1999, the MIS for the South Corridor looked at both light rail and bus service alternatives. In 1999, the light rail transit (LRT) locally preferred option was chosen, and the FTA approved the South Corridor to move into preliminary engineering in August of 2000. A draft Environmental Impact Statement (EIS) was published in 2002, and the Final EIS was published in April 2003. In May 2003, a Record of Decision was issued, and the Federal Transit Administration (FTA) approved the project's entry into final design in August 2003. Two years later in May 2005, FTA entered into a Federal Funding Grant Agreement (FFGA) providing a federal commitment of $192.94 million in New Starts funds [5].

The resulting 9.6-mile LYNX Blue Line was constructed by the Charlotte Area Transit System (CATS) in cooperation with the City of Charlotte. Construction of the line began in 2005, and the line began service in 2007. The LRT line extends from the city's central business district in Uptown Charlotte, south to Interstate 485 in south Mecklenburg County near the South Carolina State Line. The 3.7-mile segment of the system between Uptown Charlotte and the Scaleybark station operates on an abandoned Norfolk Southern Railway right-of-way owned by the City of Charlotte. The 5.9-mile segment south of the Scaleybark station operates on rail tracks generally paralleling the Norfolk Southern right-of-way [5] [6].

The LYNX LRT operates on weekdays between 5:30 AM and 1:30 AM with seven-minute peak and 15- to 20-minute off-peak and late night frequencies. Saturday service operates from 6:00 AM to 1:30 AM and Sunday service runs from 7:00 AM to 12 midnight. Weekend frequencies are 20 minutes during peak and off-peak periods and 30 minutes for late night service. A user pays a single cash fare of $2.20 to use the rail system.

Figure 3 - 2: *LYNX Blue Line*

Source: Charlotte Area Transit System (CATS)

The following provides operating data and performance measure statistics for the LYNX LRT system.

Operating Data (NTD)- LRT	
Passenger Trips	4,919,307
Passenger Miles	24,658,256
Average Weekday Ridership	15,546
Revenue Miles	859,632
Revenue Hours	54,738
Operating Expenses	$13,084,582
Fare Revenues	$4,358,896

Performance Measures- LRT	
Passengers per Hour	90
Passengers per Mile	6
Average Trip Length (miles)	5.0
Cost per Passenger	$2.66
Cost per Hour	$239.04
Cost per Mile	$15.22
Farebox Recovery	33%
Subsidy	$1.77

Source: 2013 NTD

Vehicles

The LYNX system initial opening stock of light rail vehicles consisted of 16 articulated Avanto Model S70 vehicles from Siemens. An additional four vehicles were obtained in 2010. Vehicles have a maximum operating speed of 55 mph (maximum speed of 65 mph), and a maximum seated capacity of 68 (160-170 standing capacity).

Figure 3 - 3: ***LYNX light rail vehicle operating near abutting development***

Source: *CATS 2030 Transit Vision*. Retrieved from www.charmeck.org

Stations

The LYNX Blue Line serves 15 stations along its alignment. Seven of these stations have park-and-ride facilities providing a total of 3,200 parking spaces.

Figure 3 - 4: ***LYNX station platform at suburban station (left), and urban station stop***

Source: www.charmeck.org (left), J. Cox (right)

Project Cost and Funding:

The LYNX project funding came from a mix of federal, state and local sources in the amounts of:

- Federal Funds
- \- FTA New Starts: $192.9 million (37.6%)
- \- Section 5307 Funds: $ 6.4 million (1.5%)
- State Funds - $115.7 million (26.7%)

- Local Funds - $147.7 million (½ cent voter approved transit tax) (34.1%)

Following an intense public outreach process held in 1998 to gain community input in the South Corridor MIS, a half-cent sales and use tax for transportation was placed on the ballot. The referendum was passed by voters with a 58 percent to 42 percent margin. This measure was integral in securing the local funds contribution to the project.

System Expansion

The Northeast Corridor Blue Line Extension is an extension of the original LYNX Blue Line rail service. This planned extension is a 9.3 mile alignment that extends northeast to the UNC Charlotte campus. This new LRT line runs in an exclusive right-of-way and will serve 11 new stations. The Northeast Corridor project is currently under construction and is anticipated to begin service in 2017. The project's budgeted cost is an estimated $1.6 billion [7].

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3.2 The Tide – Norfolk, VA

System Overview

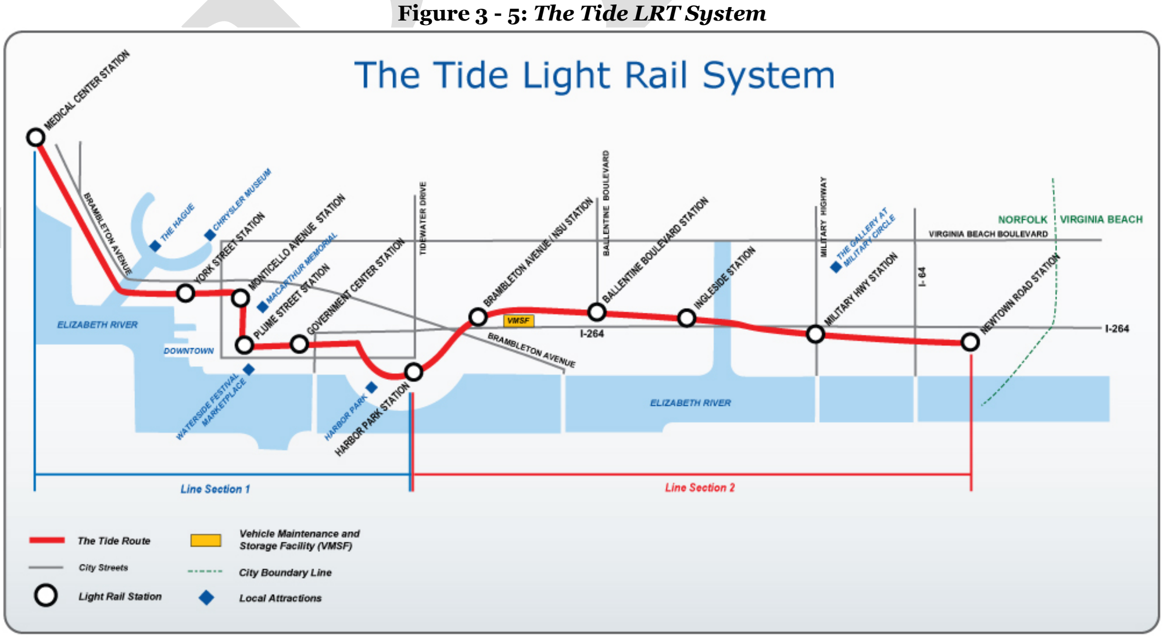
Hampton Roads Transit provides fixed route, light rail, ferry, ridesharing and demand response transit service to the 1.4 million people that live in HRT's six-city service area. The 515 square mile service area has a population density of 2,795.

Background

Hampton Road Transit (HRT) was established in 1999 and resulted from the merger of Pentran (Peninsula Transportation District Commission) and TRT (Tidewater Regional Transit). Serving as the operating entity of the Transportation District Commission of Hampton Roads, HRT serves the cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth and Virginia Beach. HRT provides a number of transit options including standard bus, light rail, regional and local commuter express bus, ferry, and paratransit services.

The Hampton Roads region had engaged in a number of planning studies in the 1980's, which examined the feasibility of providing additional transit service in several corridors in the region. As early as 1986, the *Study of the Cost Effectiveness of Resorting Rail Passenger Service* found that LRT was a feasible alternative, particularly in the Norfolk-Virginia Beach Corridor. Most of these studies and the regional attention placed on the Norfolk-Virginia Beach corridor stemmed from the unused Norfolk Southern Railway (NS) line that existed between the two cities. The line, one time facilitating interurban rail service between the two cities, ended passenger service during the 1950's. Overall line activity was very low as the railway diverted its operation to the more heavily utilized north-south freight rail corridor. Norfolk Southern proposed abandoning the line during the 1990's and formally applied to abandon the line in 2007 [2] [3]. Seeing this as a key resource and opportunity to develop a regional rapid transit system, in 1995, a Major Investment Study (MIS) was conducted to evaluate transportation/transit improvements in the 30-mile corridor extending from the City of Virginia Beach to the City of Norfolk. The study evaluated standard bus, highway and light rail alternatives. Ultimately, in 1996, the MIS identified an 18.3-mile light rail transit system between Downtown Norfolk and Virginia Beach, primarily along the existing Norfolk Southern Railway right-of-way, as the selected locally preferred alternative. [1]

Figure 3 - 5: *The Tide LRT System*



Source: Virginia DOT

In 1997, FTA approved the Norfolk-Virginia Beach Light Rail Transit East-West Corridor Project, an 18-mile LRT system between the cities of Norfolk and Virginia Beach, to move into preliminary engineering [2]. A Draft Environmental Impact Statement (DEIS) was completed in 1999. However, in 1999, a referendum to construct and operate light rail service in Virginia Beach along the NS rail right-of-way was rejected by the citizens of Virginia Beach by a 56 percent margin, and the city pulled out of the project [4]. The City of Norfolk continued with the light rail project and redefined the rail alignment to operate along a corridor within the city's limit.

In 2002, the FTA approved the modified 7.4-mile LRT project into preliminary engineering. A supplemental Draft EIS was completed and submitted in 2003. The FTA issued a Record of Decision (ROD) in 2006 and identified project scope and budget enhancements that needed to be addressed to improve the reliability of the project cost estimates and ensure that the project met FTA design standards. The Norfolk LRT project was approved into final design in 2006, and HRT and FTA entered into a Federal Funding Grant Agreement in 2007 [4].

Having initially opted out of the original LRT system in 1999, the city of Virginia Beach has reconsidered light rail transit in their city. In 2010, the City of Virginia Beach purchased the 10.6-mile abandoned Norfolk Southern rail right-of-way within its jurisdiction for approximately $40 million to extend the Tide LRT system from the City of Norfolk to Virginia Beach. The City of Virginia Beach contributed $15 million, the state $20 million, and Hampton Roads Transit paid $5 million toward this land acquisition (www.vbgov.com). The Virginia Beach Transit Extension Study and Draft Environmental Impact Study is currently underway.

Operation

The Tide LRT system operates over 7.4 miles from the Eastern Virginia Medical Center, through the central business district in the City of Norfolk to Newtown Road at the Norfolk-Virginia Beach border. The Tide operates from 6:00 AM to 11:00 PM on weekdays (12:00 AM on Fridays) with 10-minute peak, 15-minute non-peak, and 30-minute late night headways. Saturday service runs from 6:00 AM to 12:00 AM with 15-minute peak and 30-minute non-peak frequencies. Sunday service operates from 11:00 AM to 9:00 PM with 15-minute headways [5]. A single fare on the Tide costs $1.75.

Figure 3 - 6: ***The Tide Light Rail Vehicle (LRV) operating on embedded tracks with overhead wires***

Source: Hampton Roads Transit (www.gohrrt.com)

Most of the Tide's route alignment east of the Norfolk central business district operates on newly laid track along the former Norfolk Southern Railway right-of-way and parallels Interstate 264. The line located to the west of the Harbor Park Station is constructed along an entirely new right-of-way. The rail operates in mixed traffic, along city streets in downtown Norfolk, which reduces operating speeds and increases traffic coordination and safety plans.

The following provides operating data and performance measure statistics for the Tide LRT system in 2013.

Operating Data (NTD)- LRT	
Passenger Trips	1,762,284
Passenger Miles	7,004,670
Average Weekday Ridership	5,531
Revenue Miles	373,045
Revenue Hours	29,978
Operating Expenses	$12,374,424
Fare Revenues	$687,892
Performance Measures- LRT	
Passengers per Hour	59
Passengers per Mile	5
Average Trip Length (miles)	4.0
Cost per Passenger	$7.02
Cost per Hour	$412.78
Cost per Mile	$33.17
Farebox Recovery	6%
Subsidy	$6.63

Source: 2013 NTD

Stations

The Tide LRT system serves 11 light rail stations and four park-and-ride facilities located at select stations. Light rail riders are able to connect to local bus service at eight of these stations. Stations are equipped with ticket vending machines, seating, and covered shelters.

Figure 3 - 7: ***York Street/Freemason station in urban area with walk-up side access***

Vehicles

The Tide currently has a fleet of nine low-floor light rail vehicles powered by an overhead electric system. The Model S70 is manufactured by Siemens Transportation Systems. Vehicles have a maximum operating speed of 55 mph (maximum allowable speed of 66 mph) and a seated capacity of 68 passengers (total capacity of 160-180). Each vehicle has a total of eight doors (four on each side), which allows dual side boardings.

Figure 3 - 8: *Light Rail Vehicle operating in downtown Norfolk*

Source: Hampton Road Transit. Retrieved from www.gohrt.com

Project Cost/Funding

The revised capital cost estimate prepared for the shortened 7.4-mile rail segment within the City of Norfolk and included in the Federal Funding Grant Agreement signed by FTA and HRT in 2007, provided a baseline project cost of $232.1 million to implement the LRT system. Funding contributions at that time were identified as follows [5]:

- Federal
  - $127.89 million (FTA New Starts)
  - $ 39.2 million (Section 5307 Funds)
- City of Norfolk - $33.1 million
- State - $31.9 million

During the course of the project, capital costs and funding for the Tide project had to be revised in 2008 at an amount of $288 million, and again in 2010 at $338 million. The project was originally scheduled to be completed in 2010; however, with cost overruns and unforeseen project obstacles, the Tide was completed and opened for service in 2011 at a cost of $318 million or $42.9 million per mile.

Project Takeaway

Given the opportunity to secure and utilize the unused Norfolk Southern Railway line to develop a foundation rapid transit corridor for the region, HRT and community stakeholders took action in planning and designing a community supported option. Prior to Norfolk Southern Railway formally abandoning its rail line, HRT and the City of Norfolk were working under a Memorandum of Understanding with the rail provider to acquire the right-of-way following abandonment. This early engagement and partnership with the rail provider not only helped in securing the needed rail right-of-way but also lent some confidence to the planning process.

In 2008, soon after the project progressed into the construction phase, it fell under public scrutiny when the Tide project cost-to-complete had to be adjusted to $288 million. In 2009 a second adjustment was made and the cost-to-complete was quoted at $338 million. The *Hampton Roads Transit – Norfolk Light Rail Special Review* (2010) was undertaken to provide some transparency in the HRT/LRT budget and overall project management and operation. Major findings from this review indicated that the original budgeted project cost agreed on of $232 million was understated and came as a result of two major cost reduction exercises. These cost reduction exercises were undertaken to make the cost effectiveness of the project more acceptable for the FTA cost evaluation criteria. In essence, the initial project cost presented was grossly understated and never reflected a true estimate of implementing the system.

Sources:

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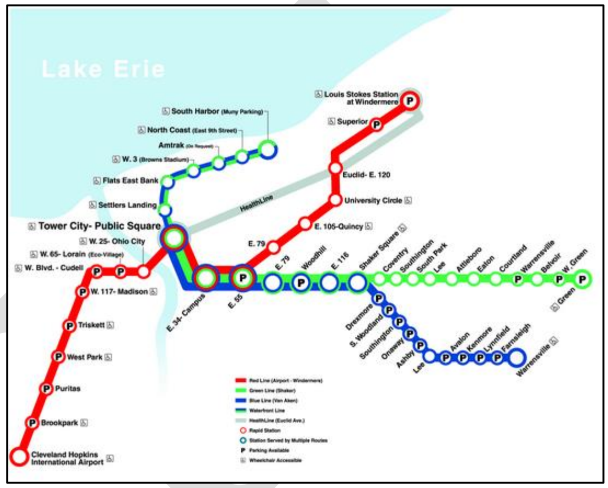
3.3 The Rapid (Green and Blue Lines) – Cleveland, OH

System Overview

The Greater Cleveland Regional Transit Authority (GCRTA) is the public transit agency for Cleveland, Ohio and the surrounding suburbs of Cuyahoga County, with a service area of 1.4 million people and a population density of 3,083.

GCRTA operates three light rail lines; the Green, Blue and Waterfront lines. Dating back to the early streetcar era, these light rail lines were built between 1913 and 1920. The original rail lines, originating from the Shaker Heights community, connect the suburban neighborhoods to downtown Cleveland along a private right-of-way [1]. In 1980, GCRTA took over operation of the lines and the system underwent a large renovation project. The Rapid serves 35 stations and riders are able to connect to heavy rail, trolley, local bus, and bus rapid transit services. The rail operates from 4:00 AM to 1:00 AM on weekdays and weekends with 10-to 20- minute headways on weekdays and Saturday, and 15- to 30- minute headways on Sunday. A rider pays $2.25 for a one way trip on the system.



rail mile park- stop cost the

Ridership on the Rapid was roughly 8,900 in 2010 (RTA). GCRTA is currently working on numerous rapid transit system rail station upgrades. These station investments are being used to spur new development or redevelopment investment along the transit corridors. GCRTA has also been working on the Blue Line Corridor Extension Study, which is an alternatives analysis for an extension of the light Blue Line. The study was initiated in 2009 to determine the Locally Preferred Alternative (LPA). In 2012, the LPA identified included a 0.3 extension of the Blue Line, construction of additional bus stations, and-ride facilities, an intermodal transit center at the Shaker Heights and added direct bus service. This baseline alternative is proposed at a of $36.3 million. GCRTA submitted the LPA to the Federal Transit Authority (FTA) for approval in 2012. In 2013, the project moved into NEPA process [2].

The following provides operating data and performance measure statistics for the Rapid LRT system in 2013.

Operating Data (NTD)- LRT	
Passenger Trips	2,897,940
Passenger Miles	17,332,817
Average Weekday Ridership	7,908
Revenue Miles	785,351
Revenue Hours	52,645
Operating Expenses	$11,714,024
Fare Revenues	$3,014,938
Performance Measures- LRT	
Passengers per Hour	55
Passengers per Mile	4
Average Trip Length (miles)	6.0
Cost per Passenger	$4.04
Cost per Hour	$222.51
Cost per Mile	$14.92
Farebox Recovery	26%
Subsidy	$3.00

Source: 2013 NTD

Sources:

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4 Commuter Rail Transit (CR)

The following presents the three commuter rail peer systems considered for review. An overview of each system's service area and operating characteristics, based on 2013 NTD reported data, are as follows:

Table 4 - 1: Commuter Rail Peer Systems Service Area and Operating Characteristics

City	Albuquerque, NM	Nashville, TN	Newington, CT
Name	**Rail Runner**	**MusicCity Star**	**CDOT**
UZA Pop	741,318	969,587	924,859
Service Area Pop	929,543	1,583,115	375,000
Service Area Square Miles	915	4,750	171
Pop Density	1,016	333	2,193
Directional Miles	193.1	62.8	101.2
Number of Stations	14	6	9
Peak Vehicles	25	7	28
Total Vehicles	31	15	47
Passenger Trips	1,089,500	252,220	871,468
Average Wkday Ridership	3,681	997	3,206
Revenue Miles	1,398,319	199,994	1,467,607
Revenue Hours	36,064	6,693	30,279
Operating Expenses	$27,085,705	$4,180,458	$26,817,631
Fare Revenues	$3,002,928	$756,329	$2,219,842

A more detailed review of the New Mexico Rail Runner Express and MusicCity Star systems are presented in sections 4.1 – 4.2.

4.1 New Mexico Rail Runner Express – Albuquerque, NM

System Overview

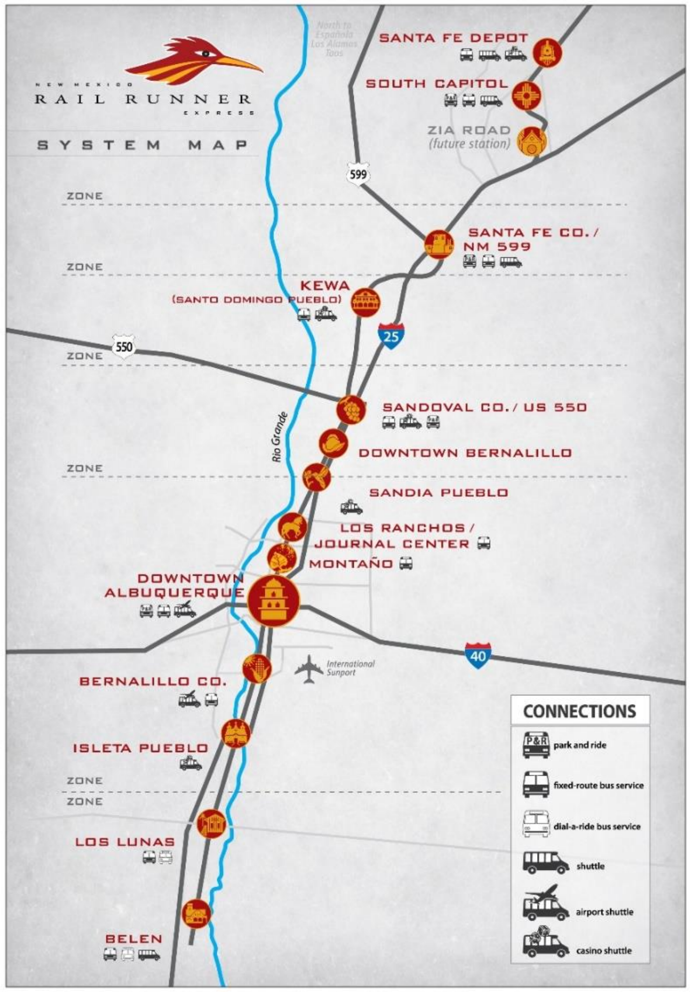
The Rio Metro Regional Transit District is the primary regional transit provider for Bernalillo, Sandoval and Valencia counties, offering transit service between municipalities and across county lines. Rio Metro manages the New Mexico Rail Runner Express commuter rail and operates and/or funds select bus routes in the three-county area. Rio Metro's services also provide links to other statewide destinations and transportation markets including Santa Fe, Taos, and Socorro. The agency's top priority is providing service that enables customers to access regional destinations, a critical transportation need since tens of thousands of trips occur each day between different towns, cities, Tribal areas, and counties in the service area. With a UZA population of 741,318 in Albuquerque, New Mexico and a service area population of 741,318; RMRTD serves a 915 square mile area with a population density of 1,016.

Background

The New Mexico Rail Runner Express (Rail Runner) is New Mexico's first commuter rail service, which connects Belen, the metropolitan area of Albuquerque, and the state capital of Santa Fe, New Mexico. Although plans for commuter rail had been proposed for some time, it was not until 2003 under the direction of the then Governor of New Mexico, Bill Richardson, that a more solid commuter rail plan began to take shape [1]. The Governor created the Governor Richardson's Investment Partnership (GRIP) in 2003; a transportation improvement bill passed by the State House Legislature which created a transportation package totaling near $1.6 billion [2] [3]. As a result of this bill, the Road Runner Express was able to secure direct state funding for capital and operation support for the commuter system. Prior to the approval of GRIP, the Governor's Office provided the New Mexico Department of

Transportation (NMDOT) and Mid-Region Council of Governments (MRCOG) with grants totaling $1 million to start planning a commuter rail service in the region, which reflected his strong commitment to the project [3].

By 2005, the MRCOG and NMDOT had conducted and completed the *Albuquerque-Santa Fe Alternatives Analysis* which looked at transportation options for travel between Albuquerque and Santa Fe in an effort to address the projected congestion or high travel demand along the I-25 corridor. This Alternatives Analysis considered alternatives such as adding more lanes to I-25, enhanced bus service, and the use of existing railroad tracks to provide commuter rail service along the corridor. The study ultimately identified commuter rail service, which utilized both existing and new railroad tracks as the locally preferred alternative for the Albuquerque-Santa Fe corridor [1] [2]. MRCOG and NMDOT developed a two-phase implementation plan for the system. Phase I provided commuter rail operations extending from Belen to Bernalillo (north of Albuquerque) along existing rail tracks, and Phase II extended the rail service north of Bernalillo to Santa Fe which required rail construction along a new rail right-of-way.



The NMDOT was instrumental in not only applying state funds from the state transportation investment bill to the various elements of the project, but it was also instrumental in the rail negotiations with BNSF Railway to acquire the rail line to implement the project. Ultimately, the state decided to purchase the underutilized BNSF Railway freight line instead of purchasing capacity to operate over the freight line. Through a series of negotiations over two years (2005- 2007), the state was able to purchase the rail line from Belen to the Colorado State line for $75 million [2]. By purchasing the rail line, the state has increased flexibility of its use. The state controls the operations and sets priorities over the line with BNSF freight trains operating as a tenant to the state [3].

Operation

Rail Runner service from Belen, through Albuquerque to Bernalillo (Phase I) covered 51 miles and began initial service in 2006, with full service by 2007. Phase II extended the Road Runner service 48 miles north of Bernalillo along the state acquired BNSF track, newly constructed rail right-of-way, and reconstructed Santa Fe Southern Railway line, to the terminal at the Santa Fe rail yard. This second project phase was completed in 2008. The rail line purchased from BNSF Railway north of Santa Fe is being held to preserve the line. At present, no commuter service is offered on this rail segment.

The Rail Runner Express operates on rail tracks that are shared with BNSF, although they are owned by the NMDOT. Freight traffic operations on the track are conducted at times when the commuter rail is not in use. Weekday commuter service is provided from 4:30 AM to 10:30 PM. Service runs either along the full line from Belen to Santa Fe or along the Belen-Albuquerque and Albuquerque-Santa Fe segments. Six northbound trips are provided during the morning period (three originating from both Belen and Albuquerque), and five during the afternoon period. The Rail Runner provides four southbound morning trips (2 originating from Santa Fe and 2 originating from Albuquerque) and seven afternoon/evening trips (6 originating from Santa Fe and one originating from Albuquerque).

Operating over a 100-mile corridor, the commuter rail serves the counties of Sandoval, Bernalillo, and Valencia, and the City of Santa Fe. The line is broken into six transit zones, and fares are assessed based on the number of zones through which riders travel. Fares range from $2 for a one-way trip in a single zone, to $10 for a trip over the line's six zones. Commuters are able to connect to more than 60 bus routes serving the three-county region. Since opening Phase I of the project, FY2007 annual ridership was 485,150 riders with an average weekday ridership of 1,816. Following the opening of Phase II with service to Santa Fee, first year ridership (FY2009) was 1.1 million with an average weekday ridership of 3,420 (NMDOT).

The following provides operating data and performance measure statistics for the Rail Runner commuter rail system for 2013.

Operating Data (NTD)- CR	
Passenger Trips	1,089,500
Passenger Miles	48,413,122
Average Weekday Ridership	3,681
Revenue Miles	1,398,319
Revenue Hours	36,064
Operating Expenses	$27,085,705
Fare Revenues	$3,002,928
Performance Measures- CR	
Passengers per Hour	30
Passengers per Mile	1
Average Trip Length (miles)	44.4
Cost per Passenger	$24.86
Cost per Hour	$751.05
Cost per Mile	$19.37
Farebox Recovery	11%
Subsidy	$22.10

Source: 2013 NTD

Stations

There are 14 rail stations located along the Rail Runner, with park-and-ride facilities located at four stations. Connections to fixed and express bus routes, local trolley and dial-a-ride service exists at a number of the rail stations. The Downtown Albuquerque station serves as an intermodal transfer location allowing riders to transfer to local bus, trolley, express bus, Amtrak, and Greyhound services.

Figure 4 - 1: Isleta Pueblo Rail Station

Source: www.riometro.org

Vehicles

The Rail Runner vehicle stock includes nine Motive Power diesel-electric locomotives that operate on diesel fuel. Passenger cars include 13 Bombardier BiLevel Coaches and nine Bombardier BiLevel Cab-cars. Coach cars and cab cars have seating capacities of 151 and 141 respectively. Each has additional standing room of 60. Vehicles operate in a push-pull configuration, with the locomotive located on the south end. This allows vehicles to change direction easily at the end of line. When vehicles are not in use they are housed at the Downtown Albuquerque rail yard.

Figure 4 - 2: *NM Rail Runner Diesel Electric Locomotive with Bombardier Bi-Level Coaches*

Sources: us.bombardier.com

Project Cost and Funding

State and project managers chose not to seek federal funding assistance for the initial capital cost of the system. Instead, the Rail Runner startup line was covered by a mix of state and local funds. Capital cost for Phase I amounted to $135 million and Phase II costs were approximately $250 million. Overall, approximately 20 percent of the project's capital cost covered rail track and right-of-way purchase, and 80 percent of capital costs covered vehicle procurement, station construction, track and signal infrastructure, and system facilities. Early operational costs for the system were covered in part by funds from the Congestion Mitigation and Air Quality Improvement Program [6] [7] [8].

In 2008, a referendum was passed by the citizens in Sandoval, Bernalillo, and Valencia counties. Local voters approved a 0.125 percent increase in gross receipts tax, with a dedicated 50-50 split between transit and other surface transportation projects within the counties. A similar tax increase was approved by residents in Santa Fe, Los Alamos, Rio Arriba and Taos counties, where half of the tax revenue raised by the 0.125 percent gross tax is pledged to commuter rail service, and the remaining funds are kept by the counties for local bus and van projects. These two separate gross receipts taxes for regional transit cover a large portion of the system's operational budget. In 2009, collection of the tax revenue began, and Rio Metro RTD assumed responsibility from the MRCOG to operate the New Mexico Rail Runner [6][7].

Project Feedback

Following the BNSF rail merger in 1995, the railway focused its freight operations along its east-west transcontinental route through New Mexico. With this change in operation, freight movement along the north-south corridor was very low. This underutilized freight corridor joining Santa Fe and Albuquerque provided an ideal opportunity to implement a commuter rail service at a reasonable cost. Through a strong state partnership, the NMDOT was able to negotiate the purchase of the BNSF rail asset with the BNSF freight rail operations remaining as a tenant of the state. State involvement was also beneficial in performing the necessary rail studies, acquiring system vehicles, and carrying out public involvement activities [3]. Since authorities did not pursue federal funds to implement the startup line but instead utilized state and local funds, the project was able to be implemented relatively quickly.

Sources:

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7. Coussan, P. and Hicks, M. *Coping with Transportation Funding Deficits: A Survey of the States*. Economic Development and Transportation Association County Commissioners of Georgia, 2009. Retrieved July 14, 2015 from http://www.accg.org/library/ACCG%20Transportation%20Funding%20Survey%20of%20the%20States_Fall%2020009amended.pdf

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4.2 MusicCity STAR – Nashville, TN

System Overview

The Regional Transportation Authority (RTA) operates nine regional bus routes between downtown Nashville and the following cities: Brentwood, Clarksville, Franklin, Gallatin, Hendersonville, Joelton, La Vergne, Murfreesboro, Smyrna, Springfield, Spring Hill, and Thompson's Station. RTA works closely with the Metropolitan Transit Authority (www.nashvillemta.org) linking riders with 46 routes provided throughout Davidson County. In addition, RTA's rideshare program organizes vanpools and carpools for commuters throughout Middle Tennessee.

The RTA also oversees the Music City Star regional rail. The first segment of the regional rail connects Davidson and Wilson counties. The East Corridor utilizes a 32-mile section of track belonging to the Nashville & Eastern Railroad Authority. Tracks, signals and bridges were upgraded and replaced and various grade crossings have been improved. There are six stations: Riverfront, Donelson, Hermitage, Mt. Juliet, Martha and Lebanon. Three trains provide weekday morning and evening service each peak period. (musiccitystar.org) RTA's service area covers 4,750 square miles with 1.5 million people, for a population density of 333 persons per square mile. (NTD 2013)

Background

The Nashville region began to explore commuter rail as a possible transit option in the early 1990's. In 1990, the *Nashville Transitional Analysis* was undertaken to explore the concept of light rail, commuter rail, and express bus as alternative modes of transportation in Middle Tennessee, which includes the five county area surrounding and including the Nashville metro area. Of the alternatives considered in the analysis, it was determined that a commuter rail system would be the most cost-effective alternative to develop a regional system. In 1996, the Metropolitan Transit Authority (MTA) and the Regional Transit Authority (RTA) initiated a study to investigate the potential of commuter rail in the Nashville region. The study identified six potential corridors for further evaluation. In 1998, another study was conducted to obtain the capital costs for the three most promising commuter rail corridors. As a result of this 1998 study and input from the Nashville Area Commuter Rail Task Force, which included the Nashville Chamber, area business leaders, the Nashville Area MPO, MTA, RTA, Tennessee DOT, CSX Rail and the Nashville and Eastern Rail Authority, the East Corridor commuter rail from Nashville to Lebanon was identified as the first corridor for implementation in the Nashville Area Commuter Rail System. The East Corridor project was placed in the region's fiscally constrained long-range transportation plan in 1999. The MTA and RTA received approval from the Federal Transit Authority (FTA) to enter the project into preliminary engineering that same year. In 2000, the East Corridor Project Environmental Impact Study (EIS) was completed and submitted to FTA for approval [1] [2] [3].

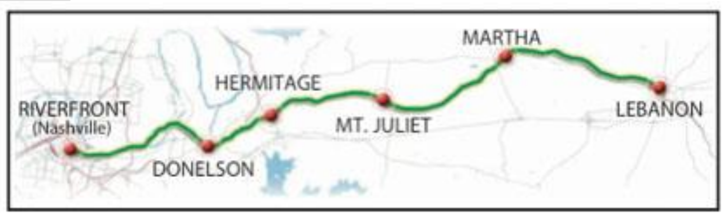
Figure 4 - 3: ***Middle Tennessee Planned Transit Network***

Source: Regional Transportation Authority of Middle Tennessee (RTA)

The Nashville East Corridor Commuter Rail Project proposed the implementation of a 32-mile commuter rail line between downtown Nashville and the City of Lebanon in Wilson County. The rail line would serve six stations, and would operate on an existing rail line owned by the Nashville and Eastern Railroad Authority – a governmental entity. Construction of the system began in 2004, and the MusicCity Star began service in 2006 [2] [4].

Operation

The MusicCity Star commuter rail line provides service along a 32-mile corridor, which connects the cities of Lebanon, Juliet and Nashville, Tennessee. The MusicCity Star shares a single track with the Nashville and Eastern Railway Authority – a public entity responsible for freight rail operations. To accommodate both freight and passenger operations on the line, a passing side track segment was added in Donelson to reduce freight-passenger rail conflicts [4]. Track usage and maintenance of way agreements are held with the publically owned Nashville and Eastern Railway Authority, and is included as part of the system's local share contribution. The willingness of the Nashville and Eastern Railway Authority to work with the RTA was a major factor in getting the commuter line up and running and doing it in a cost effective manner. Use of the rail line for passenger service was also ideal since the corridor was not experiencing heavy freight rail traffic [4].



The MusicCity Star operates three AM peak trips and three PM peak period trips during its weekday service schedule. An additional night time trip is offered on Fridays. The system does not operate on the weekend. Riders pay a single fare of $5 to ride the system.

The following provides operating data and performance measure statistics for the MusicCity Star commuter rail system in 2013.

Operating Data (NTD)- CR	
Passenger Trips	252,220
Passenger Miles	3,917,486
Average Weekday Ridership	997
Revenue Miles	199,994
Revenue Hours	6,693
Operating Expenses	$4,180,458
Fare Revenues	$756,329

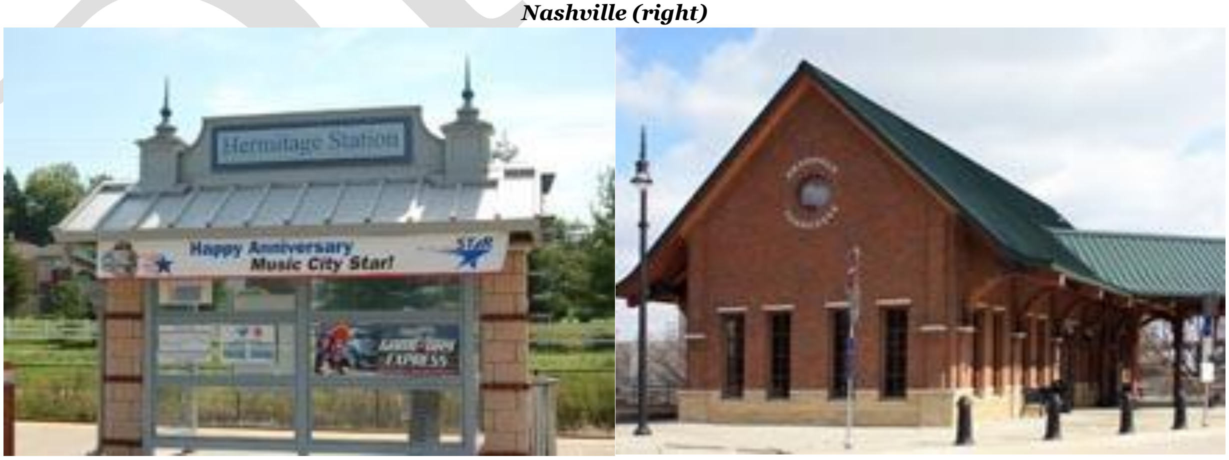
Performance Measures- CR	
Passengers per Hour	38
Passengers per Mile	1
Average Trip Length (miles)	15.5
Cost per Passenger	$16.57
Cost per Hour	$624.60
Cost per Mile	$20.90
Farebox Recovery	18%
Subsidy	$13.58

Source: 2013 NTD

Vehicles and Stations

To control initial capital costs, RTA sought rehabilitated train cars and locomotives for the MusicCity Star. The Authority negotiated an agreement on 11 used double decked coach cars from the Chicago METRA train system to reduce cost. The system also purchased three used F40 locomotives from Amtrak [5]. These trains can reach an operating speed of 59 miles per hour along the systems upgraded tracks. To accommodate the new rail service and vehicles, track rehabilitation had to be done along 50 percent of the line to raise the track to a level two standard. This involved replacing any rail that could not be control-cooled. Other improvements included replacing damaged rail ties, track beds and the addition of a passing side line. Stations also follow a cost effective model where suburban stations are primarily large concrete pads, with a simple shelter structure and parking lot facility. The Nashville Riverfront Station, however, was fully developed to serve as a full station offering customer service assistance, ticketing services, public restrooms, waiting areas, and connection to local bus service. The City of Nashville contributed $2 million for the construction of the Riverfront Station.

Figure 4 - 4: ***Hermitage Station with its simple shelter structure (left), the Riverfront station located in Downtown Nashville (right)***



Source: Regional Transportation Authority of Middle Tennessee (RTA)

Project Cost and Funding

The commuter rail system budgeted cost was appropriated as follows:

- Project Management - $4.3 million
- Railroad Rehabilitation - $23.1 million
- Station Design - $1.1 million
- Station Construction - $11.3 million
- Vehicle Acquisition - $0.675 million

Project funding came from a mix of federal, state, and local sources as follow:

- FTA New Starts - $24 million
- FHWA High Priority Project Fund - $7.4 million
- Section 115 Funds (STP) - $1 million
- State DOT - $2.6 million
- Nashville and Eastern Rail Authority - $2.5 million
- Nashville, Davidson County - $1.6 million
- City of Juliet, City of Lebanon and Wilson County - $0.6 million

The RTA received federal grants which covered 80 percent of the project's cost with a 20 percent local match coming from the Tennessee DOT and local municipalities. The City of Nashville contributed $2 million to build the Riverfront Station in downtown Nashville [4].

Project Feedback

The MusicCity Star commuter line was the first rail line to be implemented in the Middle Tennessee transit system because of the ease with which it could be implemented. The state owned rail right-of-way provided a low cost option to implement commuter rail service. The northeastern Hendersonville-Gallatin commuter corridor was the most productive of the transit corridors studied, but was not considered as the initial commuter rail corridor for implementation because of the high cost to acquire rail right-of-way from the CSX held line serving this corridor. This corridor was also limited because the existing CSX rail line experiences a choke point where the line crosses the Cumberland River. A major bridge construction project would have to be considered at this location to provide the necessary capacity to operate both rail and passenger service. The southern corridor through Smyrna and Mufreesboro also had high ridership potential, but implementation was a challenge since the current track is under private ownership [4].

An unanticipated challenge resulting from the current commuter rail service was evident in the City of Juliet. Some residents challenged the noise produced from train whistles as the MusicCity Star serves the Juliet station and traverses each of the town's five at-grade crossings. There was also increased safety concerns as residents improperly stopped on the rail tracks during periods of rail operation.

Sources:

1. American Railway Engineering and Maintenance. Retrieved July 10, 2015 from https://www.arema.org/files/library/2004_Conference_Proceedings/00036.pdf

2. Angela Cotey. (2007). *Nashville's Music City Star: Commuter rail on a budget*. Progressive Railroading. Retrieved July 14, 2015 from http://www.progressiverailroading.com/passenger_rail/article/Nashvilles-Music-City-Star-Commuter-rail-on-a-budget--13215

3. East Corridor Commuter Rail Project. (1999). FTA. Retrieved July 10, 2015 from http://www.fta.dot.gov/printer_friendly/12304_2936.html

4. Nashville MusicCity Star. Project Fact Sheet. Retrieved July 13, 2015 from http://www.incog.org/transportation/strategies/factsheets.pdf

5. Bogren, S. *Nashville's Newest Star*. The Community Transportation Association of America, 2006. Retrieved July 15, 2015 from http://web1.ctaa.org/webmodules/webarticles/articlefiles/Nashville.pdf

5 Hybrid Rail Transit (YR)

The following presents the three hybrid rail peer systems considered for review. An overview of each system's service area and operating characteristics, based on 2013 NTD reported data, are as follows:

Table 5 - 1: Hybrid Rail Peer Systems Service Area and Operating Characteristics

City	Denton County, TX	Oceanside, CA	Austin, TX
Name	The A-train	Sprinter	The Red Line
UZA Pop	366,174	2,956,746	1,362,416
Service Area Pop	234,552	896,787	1,046,404
Service Area Square Miles	157	403	529
Pop Density	1,494	2,225	1,978
Directional Miles	42.6	44	64.2
Number of Stations	5	15	9
Peak Vehicles	8	6	4
Total Vehicles	15	12	6
Passenger Trips	510,738	2,000,888	834,699
Average Wkday Ridership	1,883	8,146	2,962
Revenue Miles	598,073	530,642	279,358
Revenue Hours	22,250	24,179	11,557
Operating Expenses	$11,319,050	$14,725,284	$13,712,449
Fare Revenues	$729,394	$2,280,064	$358,278

A more detailed review of the three systems is presented in sections 5.1 – 5.3. Additionally, a short synopsis of the Eagle P3 corridor currently under construction in Denver Colorado is highlighted in Section 5.4.

5.1 A-train – Denton County, TX

System Overview

The Denton County Transportation Authority (DCTA) offers a range of transit services in the greater Lewisville and Denton areas in Texas. Service includes local bus service in Denton, Lewisville, and Highland Village, campus shuttle service to the University of North Texas and North Central Texas College campuses, commuter rail service to Downtown Dallas, and paratransit services. The service area population for DCTA is 234,552 people over 157 square miles for a population density of 1,494.

Background

An Alternatives Analysis Study was conducted between 2004 and 2005 to determine the most cost effective mobility solution for Denton County. The study identified a rail alternative that served the major area employers including the health facilities and local colleges and universities. In 2005, DCTA approved the Locally Preferred Alternative, which recommended the construction of a passenger rail service along an existing rail corridor. In 2008, the DCTA approved the Final Environmental Impact Study and the line moved into the construction phase. The A-train began operating in 2011.

Operation

The A-train rail service operates along a 21-mile rail line serving five rail stations; two stations are located in Denton and three are located in Louisville. The rail operates on weekdays between 4:30 AM and 10:00 PM; Friday service operates until 12:00 midnight. Saturday service operates from 7:30 AM to 1:00 AM. The A-train does not operate on Sunday. A one way trip on this system costs $3.

The following provides operating data and performance measure statistics for the A-train rail system.

Operating Data (NTD)- YR	
Passenger Trips	510,738
Passenger Miles	7,637,399
Average Weekday Ridership	1,883
Revenue Miles	598,073
Revenue Hours	22,250
Operating Expenses	$11,319,050
Fare Revenues	$729,394
Performance Measures- Hybrid	
Passengers per Hour	23
Passengers per Mile	1
Average Trip Length (miles)	15.0
Cost per Passenger	$22.16
Cost per Hour	$508.72
Cost per Mile	$18.93
Farebox Recovery	6%
Subsidy	$20.73

Source: 2013 NTD

Vehicles

At the opening of the system in 2011, the A-train system utilized a 10-vehicle fleet of Budd Rail Diesel Cars which were leased from Trinity Rail Express – a commuter rail line in the Dallas-Fort Worth area. These diesel multiple units (DMUs) were used for the A-train's first year of service until the DCTA's purpose built fleet order was delivered. In 2012, the new rail vehicle order was fulfilled, and the A-train introduced their new 11-vehicle fleet of Stadler GTW 2/6 DMU's. A diesel multiple unit is a multiple-unit train that is powered by an on-board diesel engine versus a separate locomotive.

Figure 5 - 1: The A-train operating the Budd Rail Diesel Car (top), and the Stadler DMU (bottom)

Source: Thomas Gilmore (top), www.thinkdenton.com (bottom)

Project Cost/Funding

The A-train was implemented at a cost of $312.4 million. Federal funds were not utilized on this project. The Texas Department of Transportation funded $250 million to DCTA, and DCTA provided the 20 percent match. Project costs were appropriated as follows:

- Design and Project Management - $24.6 million
- Line Construction - $135.1 million
- Station Construction - $27.2 million
- Vehicles – $77.8
- Rail operation OMF – $26.5
- Signals/communication – $18.2
- Ancillaries - $3 million

Source:

1. Denton County Transportation Authority. Arizona Transit Association (2013). Presentation Material. Retrieved July 9, 2015 from http://www.azta.org/images/uploads/handouts/DCTA_(Leggett).pdf

5.2 Capital MetroRail Red Line – Austin, TX

System Overview

Capital Metro (CMTA) is Austin's regional transportation provider with 50 Metro routes, two MetroRapid routes, eight Express routes and 19 UT shuttle routes. There are 3,000 bus stops throughout Central Texas. MetroRail passenger rail service is provided between the City of Leander and downtown Austin, with nine MetroRail stations located along the 32-mile line. Other transit services provided include MetroAccess service for passengers with disabilities, vanpool coordination through RideShare service, freight rail service, and seven MetroBike shelters at MetroRail and MetroRapid stations.

Austin's UZA population in 2013 was 1.3 million, and CMTA's service area population was 1.0 million. With a service area size of 529 square miles, the service area has a population density of 1,978 persons per square mile.

Capital Metro's fixed route bus service provides 34.1 million passenger trips. In 2013, CMTA operated 1.04 million revenue hours and 12.8 million revenue miles of fixed route service.

Background

Passenger rail options were first explored in the Austin area during the 1980's in an effort to enhance the public and community transportation services that existed in the region. During that time, a preliminary assessment was conducted which looked at introducing connective rail service within Austin, a commuter line to the north of the city, and extended commuter service south of Austin towards San Antonio. By 2000, a 52-mile light rail proposal operating within the city of Austin emerged and was presented to Austin voters. The light rail project was estimated at $1.9 billion, required right-of-way acquisitions, and a sales tax increase [1]. The rail measure was rejected because the system did not serve the region at large and there was concern over the stability of the system since communities throughout the region could opt-in or opt-out of the system provided by Capital Metro – the regional public transportation provider. In 2004, a 32-mile hybrid commuter/light rail line linking Downtown Austin to Leander to the north was placed before voters. Presented as a scaled back system of its predecessor, the proposed rail would use existing freight rail tracks that had been acquired by Capital Metro. The measure passed by a 60 percent margin. At that time, the cities of Austin and Leander had dedicated one cent of their sales tax to Capital Metro to support rail transit as well as the local bus services. Success of this measure was credited to the greater regional scope of the proposed MetroRail Red Line project, the attention paid to both rail and local bus services, the lower initial capital costs of the project and the multi-jurisdictional commitment to the project expressed by both Austin and Leander [2].

Operation

As a hybrid service, the Capital MetroRail line operates at commuter times during AM peak (5:30 AM -9:30 AM) and PM peak and evening (3:30 PM-8:00 PM) periods. As the line enters the more urban area in and around Downtown Austin, the system operates along city streets with service more closely modeled to light rail. The 32-mile rail corridor serves nine stations. Riders are able to connect to local bus service at all stations and regional express bus service at select rail stations. A one-way trip on the Red Line is $3.50.

The following provides operating data and performance measure statistics for the Capital MetroRail Red Line rail system.

Operating Data (NTD)- YR	
Passenger Trips	834,699
Passenger Miles	13,281,938
Average Weekday Ridership	2,962
Revenue Miles	279,358
Revenue Hours	11,557
Operating Expenses	$13,712,449
Fare Revenues	$3,358,278
Performance Measures- Hybrid	
Passengers per Hour	72
Passengers per Mile	3
Average Trip Length (miles)	15.9
Cost per Passenger	$16.43
Cost per Hour	$1,186.51
Cost per Mile	$49.09
Farebox Recovery	24%
Subsidy	$12.40

Source: 2013 NTD

Vehicles

Capital Metro selected a stock of six self-propelled diesel rail cars or Diesel Multiple Units (DMUs) built by Stadler, a Switzerland based railcar manufacturer. Each rail car was acquired at a cost of $5.75 million [1]. Vehicles consist of two end cars separated by one power car in the middle. The end cars face in opposing directions allowing vehicles to easily change their travel direction. As a self-propelled rail vehicle, cars can operate without the use of electrified overhead wires like light rail vehicles. Electrification of a rail system requires large investments in infrastructure. DMUs reach an operating speed of 60 mph or maximum speed of 75 mph, and carry up to 198 passengers. The urban-rural environment over which the system operates made the use of DMUs more attractive because of its flexibility of use and the lower infrastructural investment needed. The MetroRail Red Line operates on single rail lines with passing tracks built in select segments. Both passenger rail and freight rail operations are facilitated on the system's rail tracks. Freight rail operations are conducted when the Red Line is not in service [1] [2].

Figure 5 - 2: ***Capital MetroRail operating in downtown Austin along urban streets***

Figure 5 - 3: ***MetroRail DMU railcar operating along a rural segment of the rail alignment***

The MetroRail Red Line was implemented at a total cost of $90 million. The suburban city of Leander has seen great gains from the system. The town has engaged in more transit oriented development and the local economy has seen new employers relocating to the region. In an effort to expand the service and extend rapid transit benefit to communities in the region, Capital Metro approved a policy that would allow a pay per service concept to local communities to invest in passenger rail without necessarily dedicating a penny sales tax like Austin and Leander.

Sources:

1. Austin Capital MetroRail. Fact Sheet. Retrieved from http://www.incog.org/transportation/strategies/factsheets.pdf

2. Bogren, S. Capital MetroRail's Red Line: Austin's Initial Foray into Rail. The Community Transportation Association of America. Retrieved July 9, 2015 from http://web1.ctaa.org/webmodules/webarticles/articlefiles/Austin_Red_Line.pdf

5.3 Sprinter – Oceanside, CA

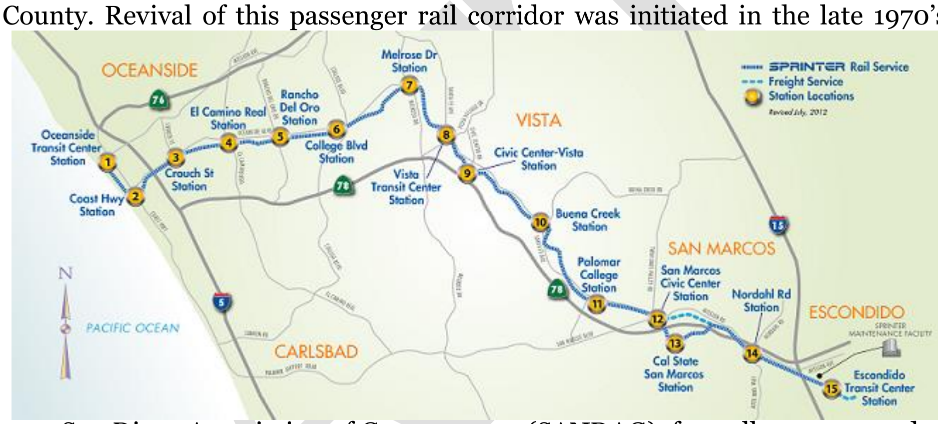
System Overview

The North County Transit District (NCTD) offers services that are a vital part of San Diego's regional transportation network. NCTD moves more than 12 million passengers annually by providing public transportation for North San Diego County. The family of transit services includes: COASTER commuter rail service; SPRINTER light rail; BREEZE bus system; FLEX rural and on-demand service; and LIFT paratransit.

NCTD's has a UZA population of 2.9 million people. The service area population; however, is 895,787 people over 403 square miles, for a population density of 2,225 persons per square mile.

Background

Opened for service in 2008, the Sprinter provides "hybrid" rail service between Oceanside, Vista, San Marcos and Escondido in San Diego's North County. Revival of this passenger rail corridor was initiated in the late 1970's when the regional transit provider, North County Transit District (NCTD), voted to study an Oceanside-Escondido train service. Early service ideas surrounded a diesel-powered train that did not use locomotives, or rail diesel cars. These "hybrid" rail cars were popular at the time on the East Coast, Canada and Europe [1].



In 1987, the regional planning agency, San Diego Association of Governments (SANDAG), formally recommended buying the Santa Fe Railway right-of-way and proposed the rail bus concept as a regional transit option. In 1990, the system was adopted and a half-cent sales tax (TransNet) was approved by county voters to fund transportation projects, which provided a local funding source to implement the rail project. In 1992, Santa Fe Railway sold 330 miles of its rail tracks in Southern California for $500 million. San Diego contributed $90.5 million for 82 miles of tracks that where shared between San Diego Metropolitan Transit District and North County Transit District.

The following provides operating data and performance measure statistics for the Sprinter rail system.

Operating Data (NTD)- YR	
Passenger Trips	2,000,888
Passenger Miles	18,103,048
Average Weekday Ridership	8,146
Revenue Miles	530,642
Revenue Hours	24,179
Operating Expenses	$14,725,284
Fare Revenues	$2,280,064

Performance Measures- Hybrid	
Passengers per Hour	83
Passengers per Mile	4
Average Trip Length (miles)	9.0
Cost per Passenger	$7.36
Cost per Hour	$609.01
Cost per Mile	$27.75
Farebox Recovery	15%
Subsidy	$6.22

Source: 2013 NTD

Vehicles

Once the rail right-of-way was acquired, NCTD considered the rolling stock needed for the rail service. Officials considered the use of diesel multiple unit (DMU) vehicles over the use of faster light rail vehicles. Although the vehicle cost for the DMUs were higher than the light rail vehicles, the overall infrastructure costs required to operate light rail was more expensive because the system would have to be electrified. An electrified light rail system would have provided an added speed benefit over the heavier DMUs. However, the grade and curves of the proposed rail alignment would limit the speeds that the high performance light rail vehicles could offer.

Figure 5 - 4: ***Sprinter DMU vehicle operating on elevated track***

Source: NCDT

The Sprinter initial stock of 12 Desiro model DMU's was obtained from Siemens in 2004 for $53 million. Using the German made DMUs as the system's rolling stock set the project back since they were not certified for use in the United States. Upgrades to the equipment to meet American standards increased costs and delayed the project. Vehicles are 135 feet long with a seating capacity of 136 and accommodate 90 standees. Two trains can be coupled and are capable of carrying up to 450 passengers. Updated Desiro DMU vehicles are environmentally friendly and meet state and federal emissions and regulatory standards. Vehicles operate at speeds up to 55 mph.

Stations

The Sprinter rail system serves 15 stations along the 22-mile line. All stations have parking available to users. Planning for the Oceanside and Escondido transit centers at the end-of-line includes mixed use development and affordable housing options. The Oceanside station serves as a multimodal center with connections to Greyhound, Amtrak, express bus, local bus, and commuter rail service. The Escondido station serves Greyhound and local bus routes. Station investment along the corridor has spurred redevelopment opportunities, which apply successful Transit Oriented Development (TOD) principles.

Project Cost/Funding

The NCTD received a full federal funding grant agreement from FTA in 2003 for $152 million with state and local match funds covering the balance of the proposed $351.5 million project cost. By the completion of the Sprinter system, project costs were estimated at $482 million. The Sprinter rail operates on the same line as freight traffic. The rail agreement held between BNSF and NCTD at the time of the rail acquisition require that freight and passenger services operate at different hours and are coordinated so the two are never on the line at the same time. The system operates on single tracks and can only support 30-minute service frequencies. There are three 3.5 mile passing segments built along the corridor to minimize train conflicts. Double tracking of the corridor is being pursued to improve rail capacity and operations. However, it will come at a high capital cost, which includes new tracks, numerous bridge construction or expansion projects and signal relocation.

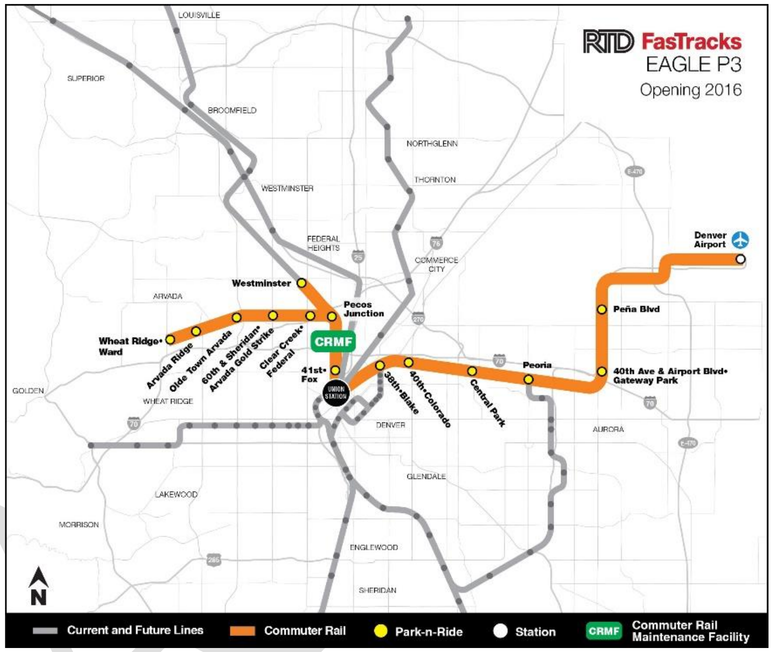
Source:

1. Holle, G. *SPRINTER: Rails to the Heart of San Diego's North County.* Retrieved July 15, 2015 from http://web1.ctaa.org/webmodules/web articles/articlefiles/North_County_SPRINTER.pdf

6 Innovative Project Financing: Eagle Commuter Rail – Denver, CO

Background

The Denver Regional Transportation District (RTD) is planning the East and Gold Line Enterprise (Eagle) Commuter Rail Project. The Eagle P3 project is a part of the 2004 voter-approved FasTracks plan to expand transit across the Denver region. This public-private partnership (P3) encompasses two commuter rail lines (East Rail Line and Gold Line), a commuter rail maintenance facility and the initial segment of the Northeast Rail Line. The proposed rail will operate on all newly laid tracks. The line will be constructed along existing roadways and parallel to existing rail lines.



The 36 miles of new commuter lines are scheduled to open in 2016. The Eagle P3 project has a $2.2 billion capital cost. In 2011, Eagle P3 received a $1.03 billion Full Funding Grant Agreement from the Federal Transit Administration. Other project funding sources include:

- Private Activity Bonds - $396.1 million
- TIFIA loan - $280 million
- Other federal grants - $62.1 million
- RTD sales tax revenue - $114.3 million
- Revenue bond proceeds - $48.2 million
- Local/COT/other contributions - $40.3 million
- Equity and other sources - $91.7

The new Eagle commuter rail system will utilize 28 FRA compliant married-pair (two vehicles attached at once) electric multiple units (EMUs) as designed and manufactured by Hyundai Roetm USA using the SEPTA Silverliner 'V' vehicle as a base. These vehicles adhere to the Buy America law, with 60 percent of the vehicle being made in the United States.

RTD's new commuter rail vehicle operating on a test track at the Hyundai Rotem plant (left), interior of the commuter rail car (right)

Source: RTD

Public-Private Partnership (P3)

Procurement of the Eagle P3 project is the first of its type in the United States to be successfully executed as a 100 percent public-private partnership. The implementation approach combines Design-Build (D-B), Financing, and Operations and Maintenance (DBFOM) within the P3 model. The DBFOM approach reassigns the responsibilities for designing, building, financing and operating (a project) from a public owner to private sector partners. In most cases, future revenues of the project are leveraged to issue bonds or other debt that provide funds for capital and project development costs. Through this approach, projects are implemented very competitively and usually benefit from being completed under budget and before schedule.

Source:

1. FasTracks Eagle P3 Fact Sheet. Regional Transit District. Retrieved July 9, 2015 from http://www.rtd-fastracks.com/media/uploads/ep3/EP3_Fact_Sheet_rev_Jun_15.pdf
2. FasTracks Regional Transportation District of Denver. Retrieved July 20, 2015 from http://www.rtd-fastracks.com/

Appendix 3-B: Land Use Analysis

Draft Report – February 2016

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1 Introduction

A comprehensive land use analysis is essential to the planning process of any high capacity transit system. Existing densities and intensities must support the ridership of the proposed system, and the economic development catalyzed by a high capacity system must be compatible with existing uses and sensitive to local cultural and environmental factors.

While fixed guideway systems offer great potential for catalytic investment due to the added value of secure long-term transit access, plans for fixed guideway systems must be especially considerate of land use factors because significant adjustments to fixed guideways to correct for missed or unanticipated opportunities require substantial resources after the system's initial establishment.

Following FTA's New and Small Starts Methodology, the I-26 Regional Fixed Guideway Alternatives Analysis is currently in the Pre-Project Development Phase for a high capacity fixed guideway system to connect the Charleston Peninsula with North Charleston and Summerville along the I-26 corridor. During the initial outreach process, a study area was delineated, and land use, economic development, and mobility were identified as important issues for stakeholders in the region. A pre-screening analysis identified twenty alignment and mode combinations to be considered during the Pre-Project Development Phase. At the end of the alternatives analysis process a Locally Preferred Alternative (LPA) would be recommended for progression into the Project Development Phase.

The purpose of the Land Use Analysis is to further refine and rank the twenty alignments identified in the Pre-Screening Analysis based on guidelines established by FTA as important to supporting both a high capacity transit system and local land use objectives. Criteria were derived and adapted from the FTA document *New and Small Starts Evaluation and Rating Process Final Policy Guidance* released in August 2013, and include an inventory and analysis of existing development patterns, existing and proposed activity and transit nodes, existing and proposed land uses, current zoning, environmental and cultural factors, and growth policy.

It is important to note that some of the more specific criteria such as available parking ratios, individual station area analyses, and pedestrian and ADA accessibility will be factored in during the Project Development Phase when detailed analysis can focus on the LPA and its corresponding station areas. Additionally, while twenty alignments are identified in this phase throughout the project documents, the Land Use Analysis considers strictly the routes and their adjacent land uses and transit-oriented development potential. As a result, only nine alignment alternatives—most with multiple mode options—were passed through the Land Use Analysis Matrix. These nine alternatives represent all twenty alignment options, independent of mode.

This document provides an overview of the Land Use Analysis process and concludes with recommendations for next steps.

2 Land Use Planning Summary and Maps

The Land Use Analysis began with the production of a series of corridor maps to summarize, identify, and analyze High Capacity Transit (HCT) opportunities and potential station areas throughout the corridor. Opportunities were identified based on FTA Land Use criteria as well as local goals and objectives. Maps were used in discussions with stakeholders, land use workshops, and public meetings to facilitate discussion and critical analysis of the corridor alignments. The following is a description of the various maps created and utilized in the Land Use Analysis.

A. *A Synthesis of Comprehensive Plans (Figure 2-1)* – The identified study area spans 3 counties and multiple municipalities; therefore, it is essential to consider all jurisdictions and their ongoing planning efforts to determine the most suitable alternative for regional transit. The synthesis map overlays proposed and existing transit routes, employment nodes, commercial nodes, industrial nodes, town centers, activity centers, station locations, neighborhood centers, gateways, catalyst areas, and other significant areas of activity (existing and proposed) from nine regional planning studies conducted by various local governments and planning agencies. The goal of this map is to identify systemic transit and future growth patterns.

B. *Land Use Typologies (Figures 2-2 & 2-3)* – To simplify the synthesis map and create a more cohesive vision for the region, the project team determined that important nodes and other points of interest from the various planning studies could be categorized into four distinct station typologies with categories based partially on FTA guidelines and partially on comparable transit studies. Each identified place was assigned a typology based on its description in the corresponding planning study, and a more concise and comprehensive graphic was created to highlight existing and proposed urban cores, major activity centers, transit nodes, and special use districts. Where duplicate nodes and/or activity centers appeared in close proximity in multiple studies, a single designation was placed at the most significant and immediately adjacent intersection.

As outlined below, the four designations include Urban Core, Major Activity Center, Transit Node, and Special Use District.

(1) Urban Core *(Core (Urban center))*

Station Area Characteristics: Primary and/or significant center of economic and cultural activities, regional-scaled destination.
Housing Mix: High-rise and mid-rise apartments and condos.
Retail Characteristics: Regional-serving destination retail, need for local-serving retail.
Mode Supported: All
Peak Transit Frequency: <5 minutes
Station Area Total Units Target: 8,000 - 30,000
Station Area Unit Target Density (du/acre): 16 - 60
Station Area Total Jobs Target: 40,000 - 150,000

(2) Major Activity Center *(Center (Regional employment or destination draw))*

Station Area Characteristics: Significant center of economic and cultural activities, regional-scaled destination.
Housing Mix: Mid-rise, low-rise, some high-rise and townhomes.
Retail Characteristics: Regional-serving destination retail, need for local-serving and community-serving retail.
Mode Supported: All

Peak Transit Frequency: 5-15 minutes
Station Area Total Units Target: 2,500 - 15,000
Station Area Unit Target Density (du/acre): 5 - 30
Station Area Total Jobs Target: 5,000 - 50,000

(3) Transit Node *(Village, Smaller centers within the urban area)*

Station Area Characteristics: Local center of economic and community activity.
Housing Mix: Mid-rise, low-rise, townhomes, and small-lot single family.
Retail Characteristics: Community-serving and destination retail opportunity; need for local-serving retail.
Mode Supported: Commuter rail, local/regional bus hub, and LRT
Peak Transit Frequency: 5 - 30 minutes
Station Area Total Units Target: 1,500 - 7,500
Station Area Unit Target Density (du/acre): 3 - 20
Station Area Total Jobs Target: 0 - 7,500

(4) Special Use District *(Destination (Significant attraction with a large, singular user base i.e. Airport, Coliseum, etc.))*

Station Area Characteristics: Local focus of economic and community activity without distinct center.
Housing Mix: Limited residential potential, mid-rise and high-rise if appropriate.
Retail Characteristics: Potential for community-serving and regional-serving retail but need to balance demands for access.
Mode Supported: LRT/streetcar, BRT, potential heavy rail
Peak Transit Frequency: 15 - 30 minutes
Station Area Total Units Target: 2,000 - 5,000
Station Area Unit Target Density (du/acre): 4 - 10
Station Area Total Jobs Target: 7,500 - 50,000

To help facilitate an understanding of how each of these typologies translates into an actual place, additional graphics were created that highlight 1-2 local examples of places most characteristic of each typology. For each example, an aerial map identifies the anticipated center of activity and delineates ¼ mile radius and ½ mile radius areas around each center point. Photographs of existing conditions at each location and renderings of proposed developments are also included to showcase the corresponding urban fabric indicative of each typology. During the Project Development Phase, a more detailed station area analysis will be conducted for potential station area locations along the LPA. Each identified station location will be classified into its corresponding typology, and ¼ mile radius and ½ radius areas will be analyzed for existing development patterns, pedestrian connectivity, parking capacity, affordable housing, and other potential Transit Oriented Design (TOD) factors.

C. *Existing Land Use (Figure 2-4)* – To help visualize how each alignment corresponds with existing land use, a map was created to identify general land use patterns for the entire corridor. Using data from local municipalities, local knowledge, and aerial imagery analysis, uses are grouped and mapped using the following color-coded categories: aeronautical designations, multi-family residential, medium density single-family residential, low density single-family residential, mobile homes, planned unit developments, rural / conservation / HOA / parks, light industrial, heavy industrial, commercial, vacant, and institutional. The potential alignments, urban cores, transit nodes, activity centers, and special use districts are overlaid on the land use designations to better analyze where existing land use and developable vacant land have the potential to support high capacity transit and TOD.

D. *Current Zoning (Figure 2-5)* – In addition to existing land use, current zoning is an important consideration in planning for high capacity transit. Along with offering important information about future uses envisioned and permitted within the municipalities, zoning regulations often directly determine the following characteristics included in FTA's land use criteria for TOD supportive areas:

i) Short building setbacks

ii) Human scale, active facades

iii) Entrances oriented towards streets, sidewalks and other public areas

iv) Street furniture, trees, crosswalks and other pedestrian amenities

v) Roads narrow enough to cross with low to moderate traffic speeds

vi) Development continuous with absence of large tracts of land or vacant uses

vii) Fine-grained mix of uses

Indeed, all municipalities have methods for changing zoning; therefore, adjustments will likely be made along the corridor to potentially include a TOD overlay; however, it is important to consider how the development of a fixed guideway system fits within the existing zoning ordinances. Because every municipality has its own set of zoning designations, the categories were simplified and color-coded based on the following designations: Commercial, Light Industrial, Heavy Industrial, Low Density Residential, Medium Density Residential, High Density Residential, Mobile Home, Park / Conservation / HOA, PUD / MU, and Vacant. The potential alignments, urban cores, transit nodes, activity centers, and special use districts are overlaid on the generalized zoning designations to highlight where existing zoning provides opportunities and constraints for high capacity transit and TOD.

E. *Zoning Overlay Districts and AICUZ Delineations (Figure 2-6)* – In addition to standard zoning designations, several municipalities within the corridor have further restrictive overlay zones that have greater implications for the potential for TOD. All overlays shown on this map have increased setbacks from rights-of-way and increased separation of uses through buffering and setbacks. Because these overlays are in addition to standard zoning designations, they create additionally restrictive regulations and are often more difficult to change via a standard rezoning process. Furthermore, the approval and enforcement of these overlays indicates a particular vision for those areas that is not conducive to TOD characteristics.

This map also incorporates the Air Installation Compatible Use Zone (AICUZ) as established by the Charleston Air Force Base (AFB). As described by the AFB:

> "The purpose of the long-standing AICUZ program is to promote compatible land development in areas subject to aircraft noise and accident potential. As the cities of North Charleston, Charleston, and Hanahan prepare and modify land use development plans, recommendations from this updated AICUZ Study should be included in the planning process to prevent incompatible land use that could compromise the ability of Charleston

AFB to fulfill its mission. Accident potential and aircraft noise should be major considerations in the planning process."[1]

See Appendix I for the delineation of the AICUZ components as provided by the AFB and a table of land use recommendations. Because any residential development—other than single-family residential in Accident Potential Zone II—is identified as "not compatible and should be prohibited"[2] within all AICUZ designations, these areas are identified as not ideal for high-density TOD. The potential alignments, urban cores, transit nodes, activity centers, and special use districts are overlaid on the prohibitive zoning and AICUZ areas to see which alignments have significant portions running through these regions.

F. *Community Goals (Figure 2-7)* – In order to address existing densities, community goals, and specific populations that tend to have implications for transit feasibility, a series of maps was compiled to highlight a variety of demographics. The following maps are incorporated into a Community Goals board used to analyze transit supportive densities:

viii) Modal Suitability based on the greater of the 2010 TAZ Population and Employment densities

ix) Modal Suitability based on the greater of the 2035 TAZ Population and Employment densities

x) Employment Densities from 2010 TAZ

xi) Employment Densities from 2035 TAZ

xii) Household Densities from 2010 TAZ

xiii) Household Densities from 2035 TAZ

xiv) Youth Population by percentage based on census data

xv) College Aged Population by percentage based on census data

xvi) Senior Population by percentage based on census data

xvii) Population Between Age 16-64 with a Disability by percentage based on census data

xviii) Minority Population by percentage based on census data

xix) Limited English Proficiency by percentage based on census data

xx) Households with Below Poverty Income by percentage based on census data

xxi) Households with No Vehicle Access by percentage based on census data

G. *Environmental, Cultural, and Historic Resources (Figure 2-8)*– This map includes an inventory of conservation lands, protected lands and easements, wetlands, marshes, and identified historic and cultural districts, landmarks, and resources. The potential alignments, urban cores, transit nodes, activity centers, and special use districts are overlaid on these highlighted areas to determine the potential impacts that each alignment could have on environmentally and culturally sensitive resources.

[1] *Air Installation Compatible Use Zone Study*. Charleston Air Force Base, South Carolina. 2004. (http://www.charleston.af.mil/shared/media/document/AFD-131009-036.pdf)

[2] Ibid.

3 Land Use Meetings and Workshops

The following meetings hosted by the project team were integral to the Land Use Analysis. Please see Appendices II through VI for complete meeting agendas, handouts, and summaries. A brief description of each meeting is provided below.

a) **Joint Steering & Technical Advisory Committee Meeting (March 16, 2015):** A meeting of the technical advisory committee focused on presenting existing study area conditions, identifying evaluation criteria, and defining corridors and alignments. The Land Use Analysis was introduced to the Committee as a next step, and members interested in joining the Land Use Subcommittee were identified.

b) **Land Use Subcommittee Workshop 1 (April 9, 2015):** The intent of the workshop was to solicit input from local planning professionals regarding the current and future land use and zoning in the region that is supportive and/or prohibitive of transit oriented development. Consideration was given to the following during discussions:

- Transit Oriented Development and existing/future ordinances
- Affordable Housing/Inclusionary Zoning
- TOD incentives for developers
- Public perception of TOD and TOD densities
- Potential corridor alignments
- Station locations and typologies
- Station spacing and quantities
- Infrastructure needs/challenges
- Connections to secondary transit modes
- Vacant/Developable land
- Other potential opportunities and Obstacles for High Capacity Transit

The maps outlined in Section 2 of this document were presented to the Committee, and they were invited to comment on suggested revisions and additions to the maps prior to subjecting each alignment to the ranking matrix. Questions for consideration (See Appendix III) were distributed prior to the meeting to help direct discussion and clearly define project goals.

c) **Developer Workshop (April 30, 2015):** The Urban Land Institute, in conjunction with the project team, hosted an invitation-based roundtable discussion for developers, ULI committee members, and other real estate professionals to review alignments/proposed station locations, typical densities, etc. with the goal of identifying alignments and areas perceived to have the greatest potential for TOD. The discussion was facilitated by TOD expert Marilee Utter, Executive Vice President, District / National Councils, ULI, who offered a unique perspective due to her work in diverse communities nationwide. The workshop was followed by a panel discussion that was open to the public and featured project team leaders and developers from the morning's discussion.

d) **Land Use Subcommittee Workshop 2 (June 24, 2015):** The intent of the workshop was to present the methodology and findings from the Land Use Analysis and Alignment Rankings to the Land Use Subcommittee for approval and subsequent recommendation to the Joint Steering & Technical Advisory Committee. Consideration was given to the following during discussions:

- Methodology for mapping exercise and Alignment Ranking Matrix
- Each alignment's adjacency to future and existing points of interest

- Each alignment's relationship with existing and future high density areas
- Prohibitive zoning overlays and restrictions
- Potential for Transit Oriented Design (TOD) overlay zones
- AICUZ zones and how they affect TOD
- Significant pockets of developable vacant land
- Environmentally and culturally sensitive areas
- Infrastructure needs/challenges
- Desirable alignments within the Charleston peninsula
- Known and anticipated future development areas
- Other potential opportunities and obstacles for High Capacity Transit

General consensus was that the proposed rankings accurately reflect the land use goals of the region.

4 Public Meetings

The April 2015 public meetings (See Appendix VI) presented the majority of the land use maps outlined in Section 2 of this document to the public to facilitate discussion and gain input from community members on relevant existing and future land use issues and how these relate to each of the proposed conceptual alignments. Attendees were asked to choose their favorite alignment based on land use and other relevant issues.

5 Affordable Housing

While we lack that data to calculate legally binding affordable housing, we have included a summary of housing affordability for the tri-county region (See Appendix VII). Significantly, the study corridor includes the only region categorized as being affordable to households making less than 50% MHI as well as regions where the average home price is considered affordable by each MHI group. Though not legally binding, the current existence of affordable housing helps support the goals of high capacity transit through increased mobility and ridership.

6 Alignment Rankings

The twenty conceptual alignments—reduced to nine when mode is not considered—were evaluated and ranked based on land use criteria established according to local goals and FTA guidance. The criteria and methodology for the ratings are outlined below.

- **Station / Node / Activity Center Access:** One point was given for every identified Transit Node, Major Activity Center, Special Use District and Existing Park & Ride within ¼ mile of the primary alignment. One half point was given for every additional identified Transit Node, Major Activity Center, Special Use District and Existing Park & Ride within ½ mile of the primary alignment.

  Additional points were given for providing access to high density areas identified in both the 2010 and 2035 TAZ reports. Based upon modal suitability criteria, the greater the suitability for transit, the more points were awarded (for example, an area suited for 30 minute Express Bus was given 1 point and an area suited for 15 minute Express Bus was given 2). Points were tallied and each alignment was categorized as high, medium, or low based on its total number of points.

- **Avoidance of Significant Prohibitive Zoning:** The percentage of each primary alignment that falls within an overlay or other zoning district that would not support TOD principles (significant building setbacks, deep buffers, low density uses, etc.) was calculated. Each alignment was categorized as having high, medium, or low potential for TOD based on this percentage.

- **Avoidance of AICUZ (Air Installation Compatible Use Zone):** Because all alignments cross at least one AICUZ, and development—particularly of a high density nature—is strongly discouraged in these zones, it was important to determine the proportion of the route that would not be recommended for TOD due to these constraints. Unlike the zoning designations above, AICUZ cannot be changed through a public process; therefore, the percentages for each category (high, medium, low) were established to more stringent standards that the previous category.

- **Adjacency to Developable Vacant Land:** Based on the Existing Land Use maps, alignments were ranked on the availability of adjacent vacant land to support TOD, park-and-rides, and other infrastructure and associated development.

- **Avoidance of Environmentally Sensitive / Cultural Resource Areas:** Because most alignments either cross or border several wetlands and conservation lands, and because we have not done a detailed environmental impact analysis for every alignment, the rankings for this category are fairly close. I-26 stood out as a low impact option due to the existing Interstate infrastructure and the avoidance of significant wetlands. Dorchester Road stood out as a high impact option because it runs within the Ashley River Historic District for a significant portion of its length.

- **Connectivity to Relevant Growth Areas Outside of the Corridor or Those Not Considered in 2035 TAZ Projections:** Due to the speculative nature of this category, it was not included in the ranking; however, it is beneficial to consider how each corridor will tie into recently announced plans for expansion including proposed and ongoing residential development, the Berkeley County Volvo facility, and industrial development anticipated along the I-26 Corridor near Orangeburg. See Appendix VIII for a map of significant known developments planned for areas directly adjacent to the study corridor.

For each category, those alignments scoring high were mapped in green, those scoring medium were mapped in yellow, and those scoring low were mapped in red and overlaid on a map displaying the relevant data category (See maps in Appendix IX). These maps were displayed during the Land Use Subcommittee Workshop to facilitate discussions and clarify ranking designations.

Based on the criteria outlined above, the Overall Land Use Rankings are as follows:

1. US 52 / US 176 (C-2)
2. US 52 / US 78 (C-1)

   CSX Rail / BRT via US 176 (F-2)

   CSX Rail / BRT via US 78 (F-1)

5. Norfolk Southern Rail Line (E)
6. I-26 (A)

   SCE&G Utility Corridor (D-1)

   Dorchester Road (B)

9. Santee Cooper Utility Corridor (D-2)

7 Next Steps

As the twenty conceptual alignments progress through the *Screen One* and *Screen Two* analyses, the findings of this Land Use Analysis should be considered along with other relevant criteria to determine each alternative's ability to score well based upon the established FTA evaluation process. Once an LPA is identified and the project moves forward into Project Development, a more thorough land use analysis should build upon the research outlined herein to determine individual station development goals and locations. Because supportive land use is critical to the success of a high capacity fixed guideway system, the land use data should be continually updated as new information arises regarding growth, development, and population projections.

8 List of Appendices

Appendix I: Excerpts from *Air Installation Compatible Use Zone Study*. Charleston Air Force Base, South Carolina (2004)

Appendix II: Documents from Joint Steering & Technical Advisory Committee Meeting

Appendix III: Documents from Land Use Subcommittee Workshop 1

Appendix IV: Documents from Developer Workshop

Appendix V: Documents from Land Use Subcommittee Workshop 2

Appendix VI: Documents from Public Meetings April 20-22, 2015

Appendix VII: Affordable Housing Summary

Appendix VIII: Proposed Development Beyond Corridor

Appendix IX: Alignment Ranking Maps

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Figures

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Figure 2 - 1: A Synthesis of Comprehensive Plans

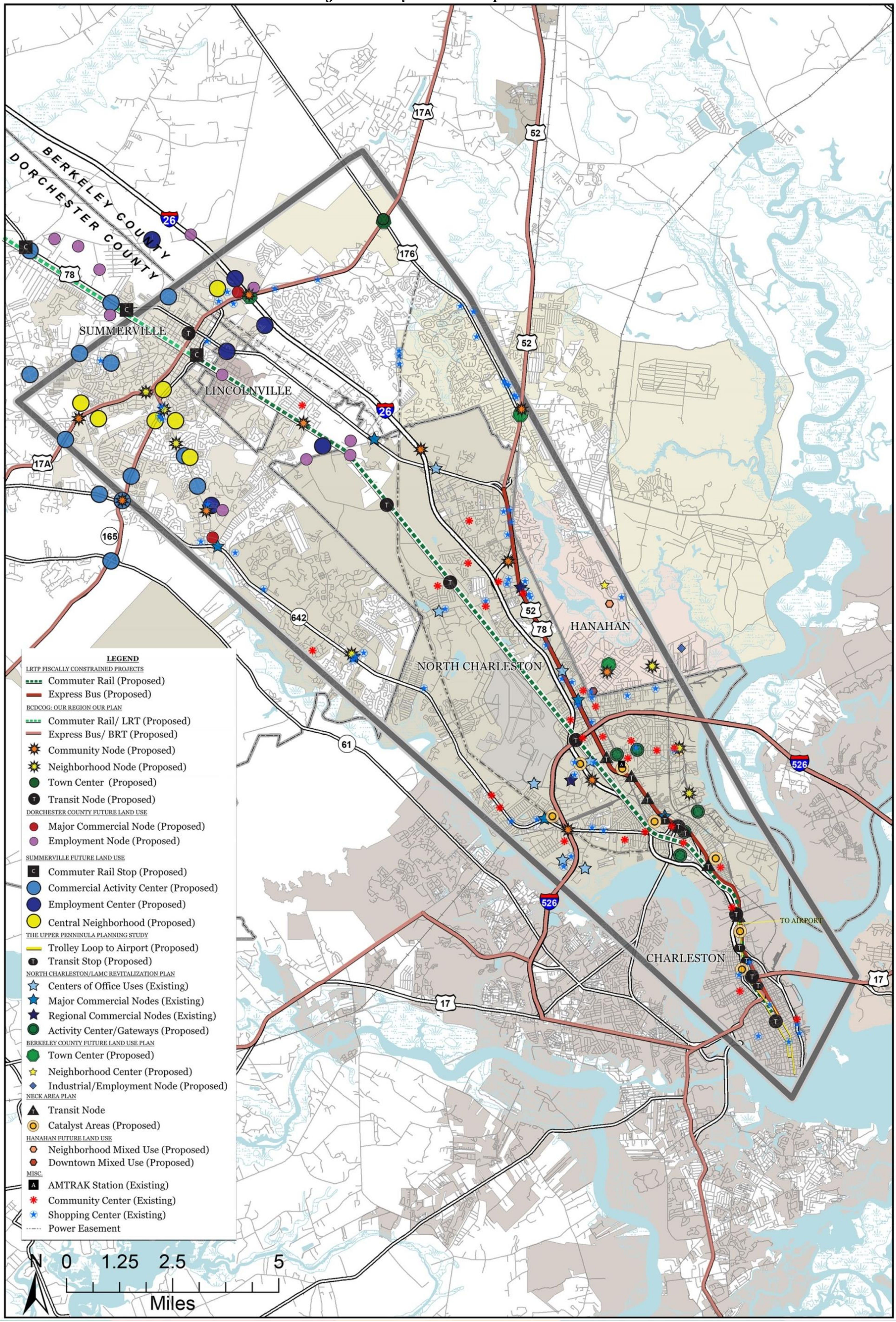


Figure 2 - 2: Station Typology Map

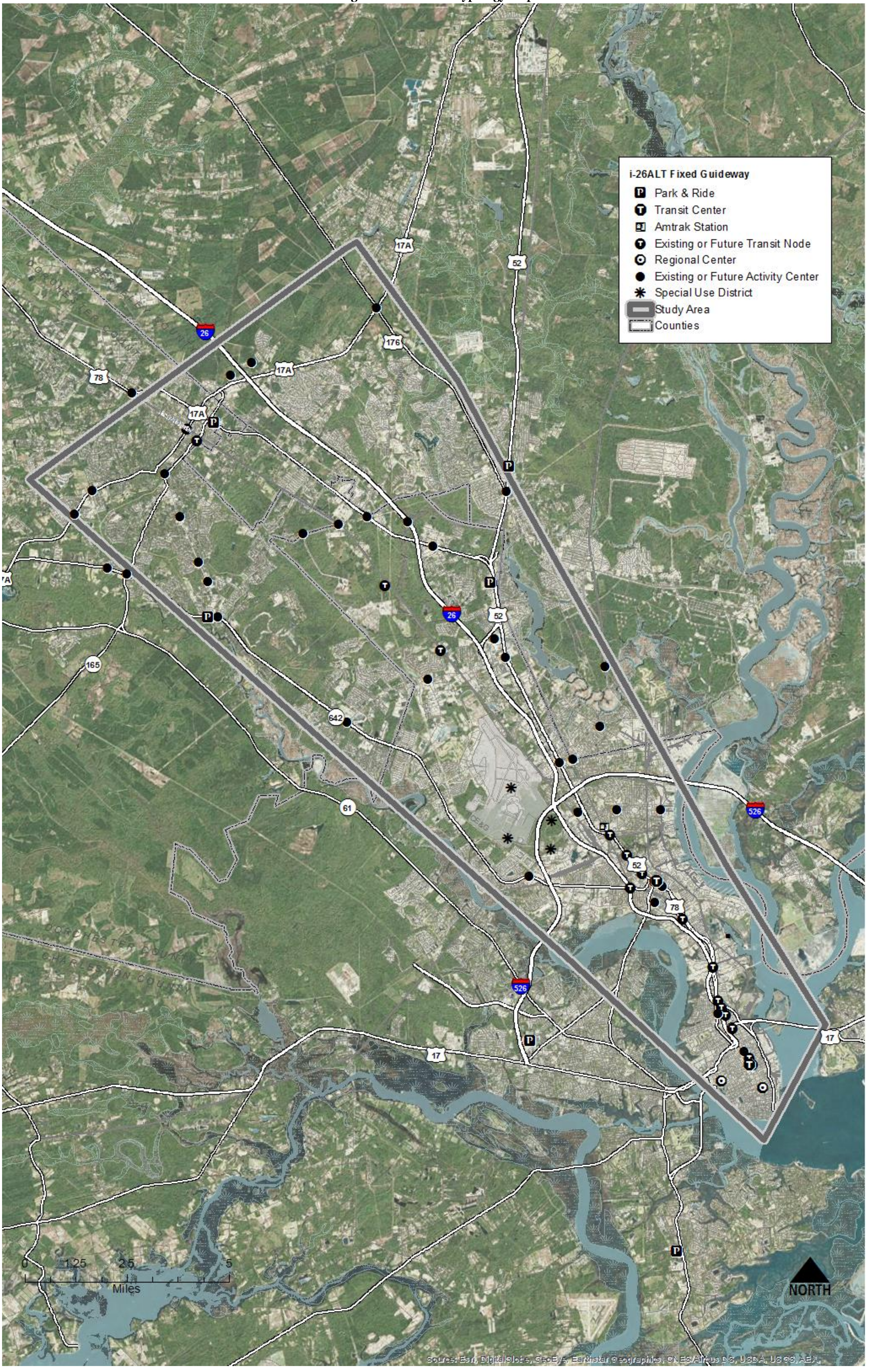
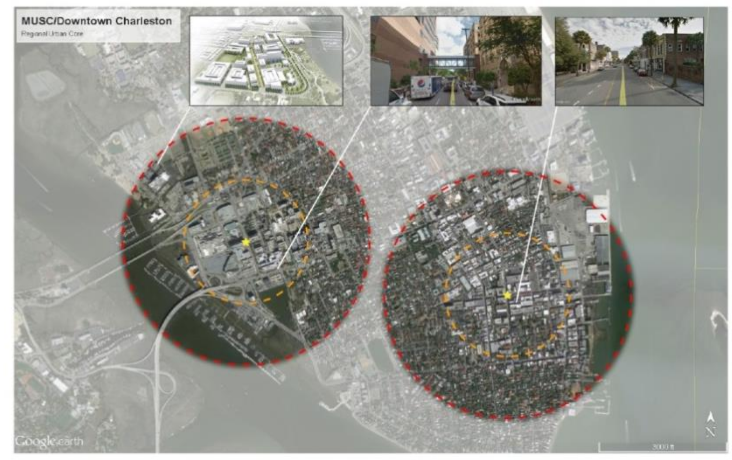


Figure 2 - 3: Station Typologies

Urban Core

Station Area Characteristics: Primary and/or significant center of economic and cultural activities, regional-scaled destination.
Housing Mix: High-rise and mid-rise apartments and condos.
Retail Characteristics: Regional-serving destination retail, need for local-serving retail.
Mode Supported: All
Peak Transit Frequency: <5 minutes
Station Area Total Units Target: 8,000 - 30,000
Station Area Unit Target Density (du/acre): 16 - 60
Net Project Density (du/acre): 75 - 300
Station Area Total Jobs Target: 40,000 - 150,000

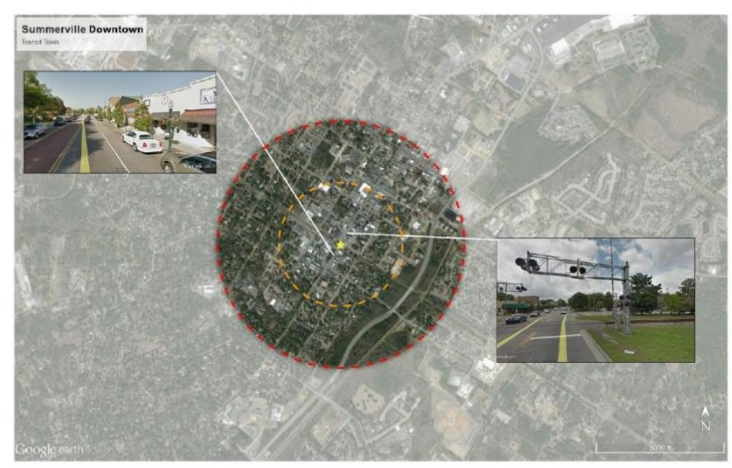


Major Activity Center

Station Area Characteristics: Significant center of economic and cultural activities, regional-scaled destination.
Housing Mix: Mid-rise, low-rise, some high-rise and townhomes.
Retail Characteristics: Regional-serving destination retail, need for local-serving and community-serving retail.
Mode Supported: All
Peak Transit Frequency: 5-15 minutes
Station Area Total Units Target: 2,500 - 15,000 (Varies)
Station Area Unit Target Density (du/acre): 5 - 30 (Varies)
Net Project Density (du/acre): 35 - 100
Station Area Total Jobs Target: 5,000 - 50,000

Transit Node

Station Area Characteristics: Local center of economic and community activities.
Housing Mix: Mid-rise, low-rise, townhomes, and small-lot single family.
Retail Characteristics: Community-serving and destination retail opportunity; need for local-serving retail.
Mode Supported: Commuter rail, local/regional bus hub, and LRT
Peak Transit Frequency: 5 - 30 minutes
Station Area Total Units Target: 1,500 - 7,500 (Varies)
Station Area Unit Target Density (du/acre): 3 - 20 (Varies)
Net Project Density (du/acre): 20 - 100 (Varies)
Station Area Total Jobs Target: 0 - 7,500



Special Use District

Station Area Characteristics: Local focus of economic and community activity without distinct center.
Housing Mix: Limited residential potential, mid-rise and high-rise if appropriate.
Retail Characteristics: Potential for community-serving and regional-serving retail but need to balance demands for access.
Mode Supported: LRT/streetcar, BRT, potential heavy rail
Peak Transit Frequency: 15 - 30 minutes
Station Area Total Units Target: 2,000 - 5,000
Station Area Unit Target Density (du/acre): 4 - 10
Net Project Density (du/acre): 90 - 156
Station Area Total Jobs Target: 7,500 - 50,000

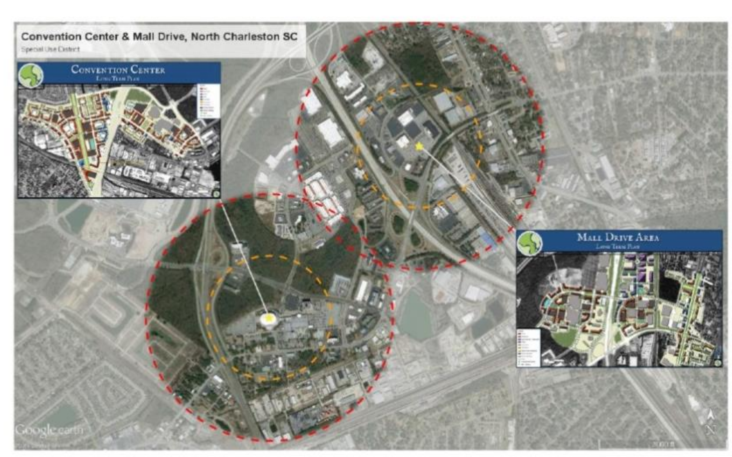


Figure 2 - 4: Existing Land Use

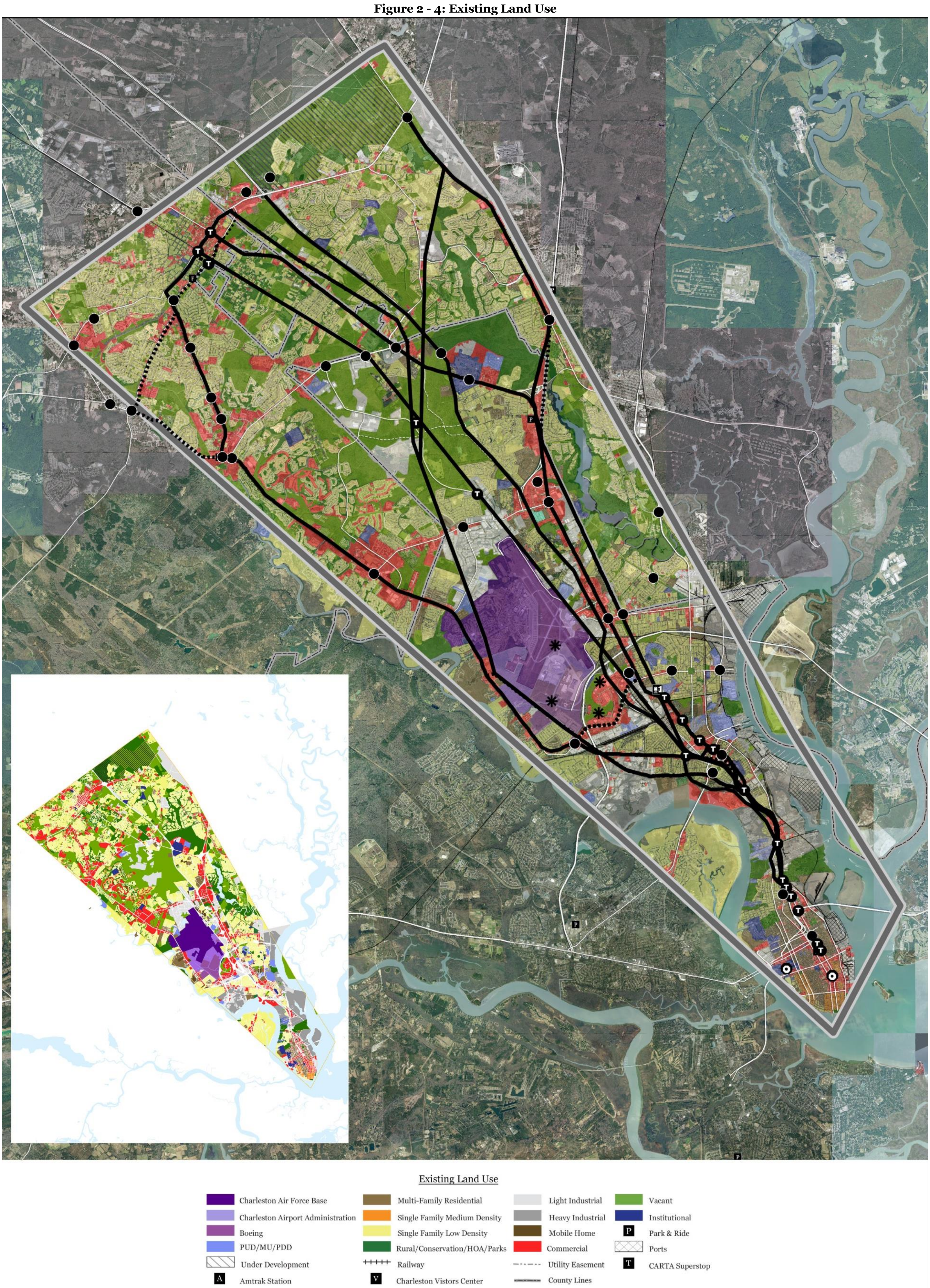


Figure 2 - 5: Current Zoning

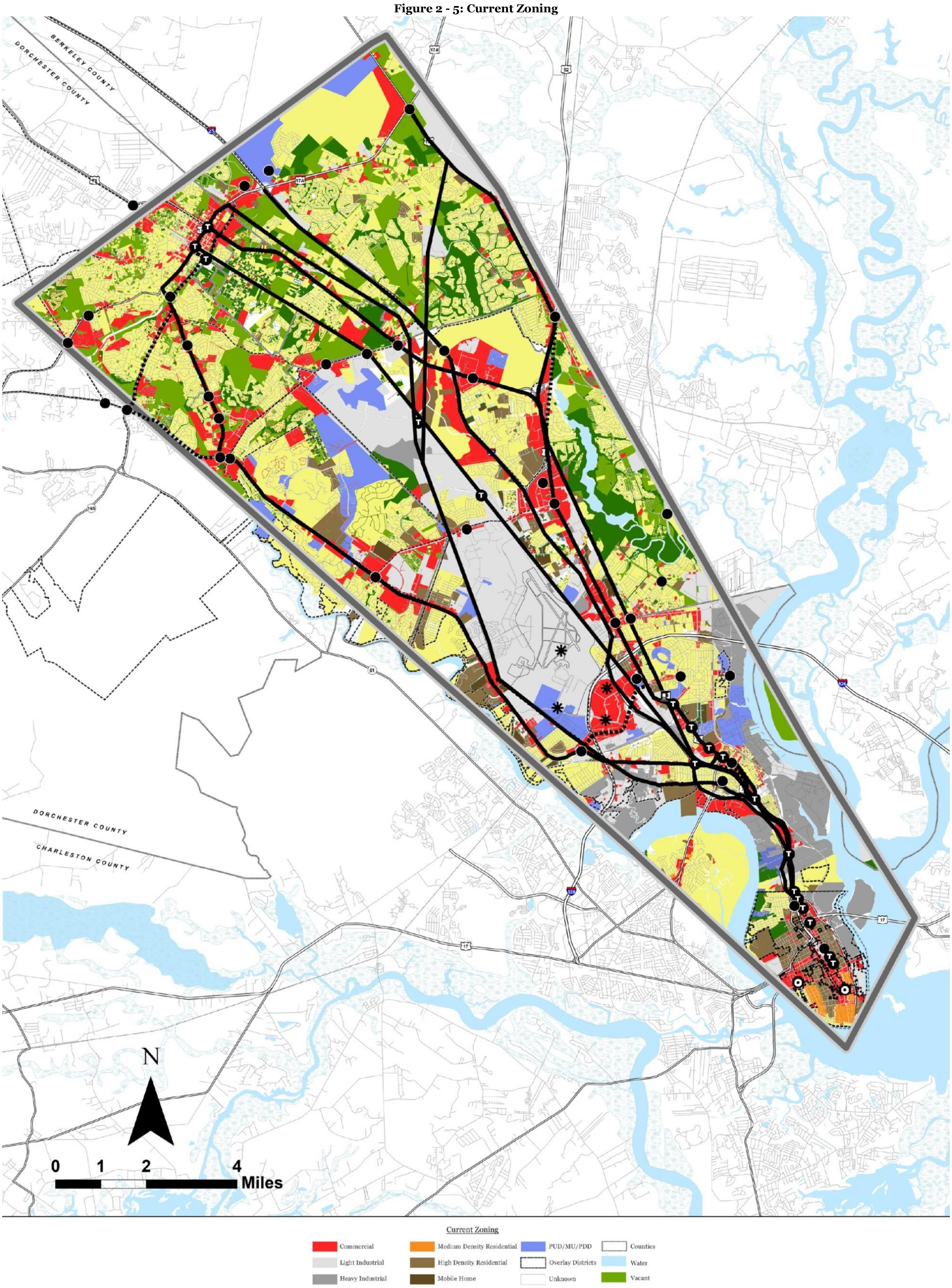


Figure 2 - 6: Zoning Overlay Districts and AICUZ Delineations

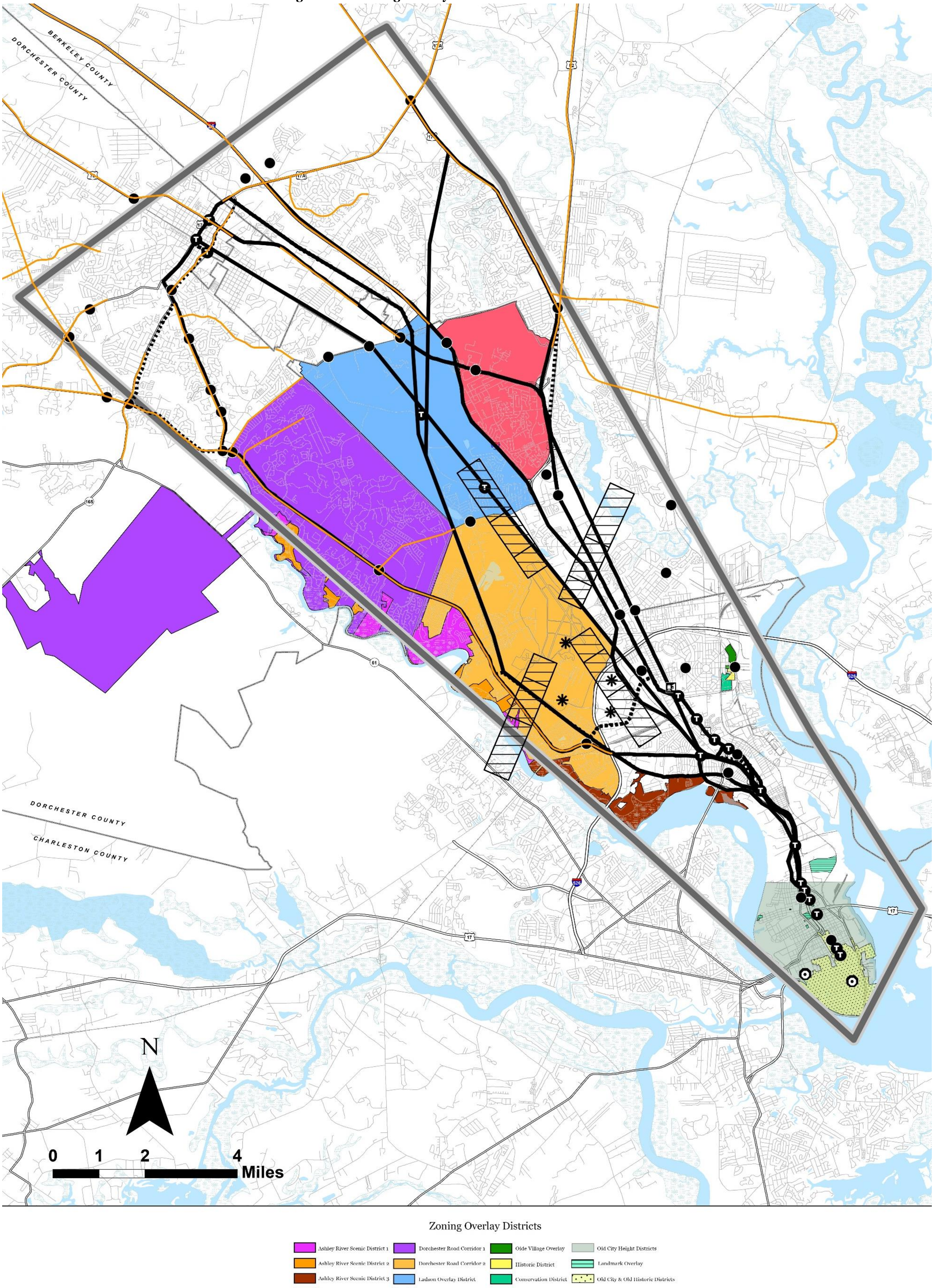


Figure 2 - 7: Community Goals

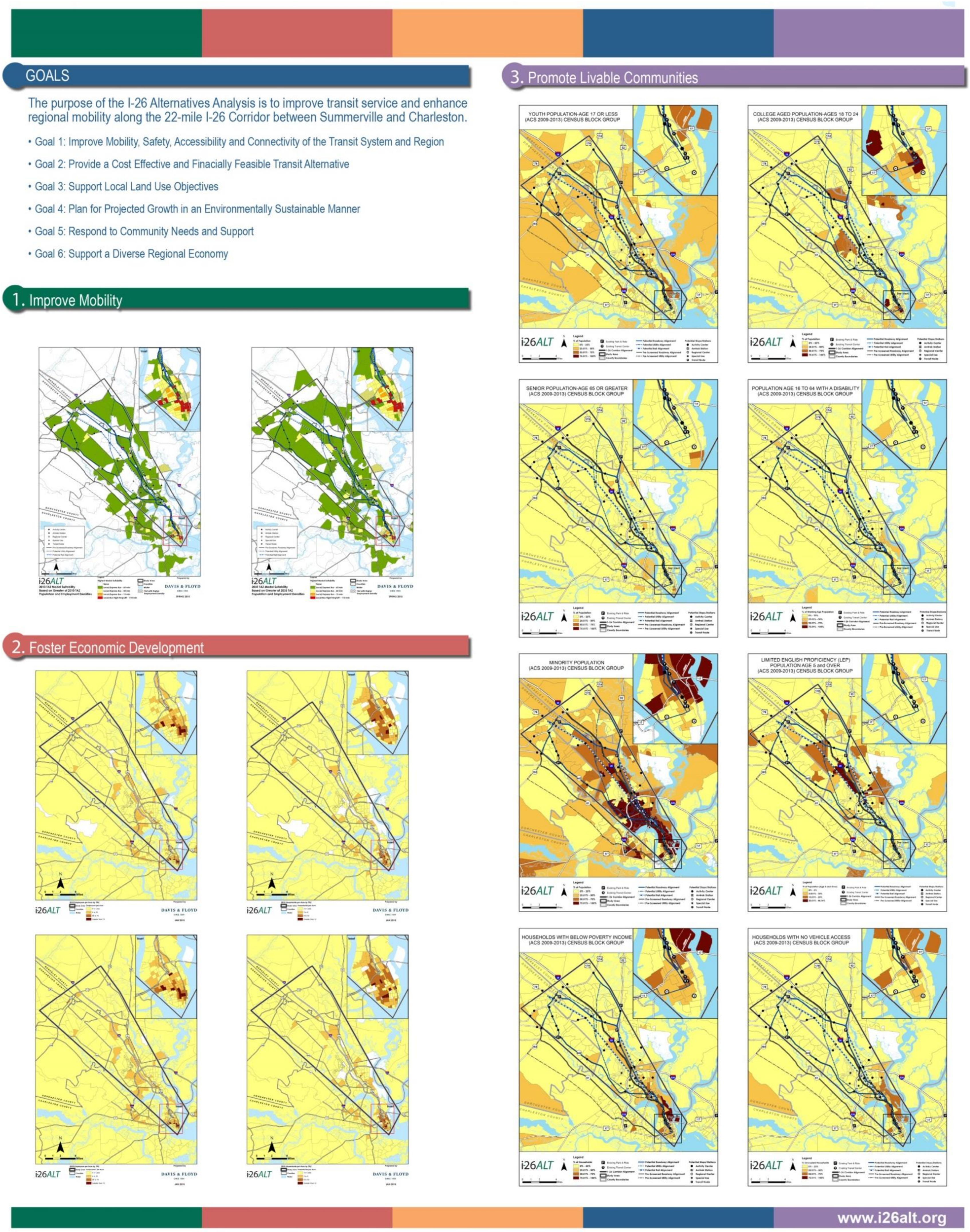


Figure 2 - 8: Environmental, Cultural and Historic Resources

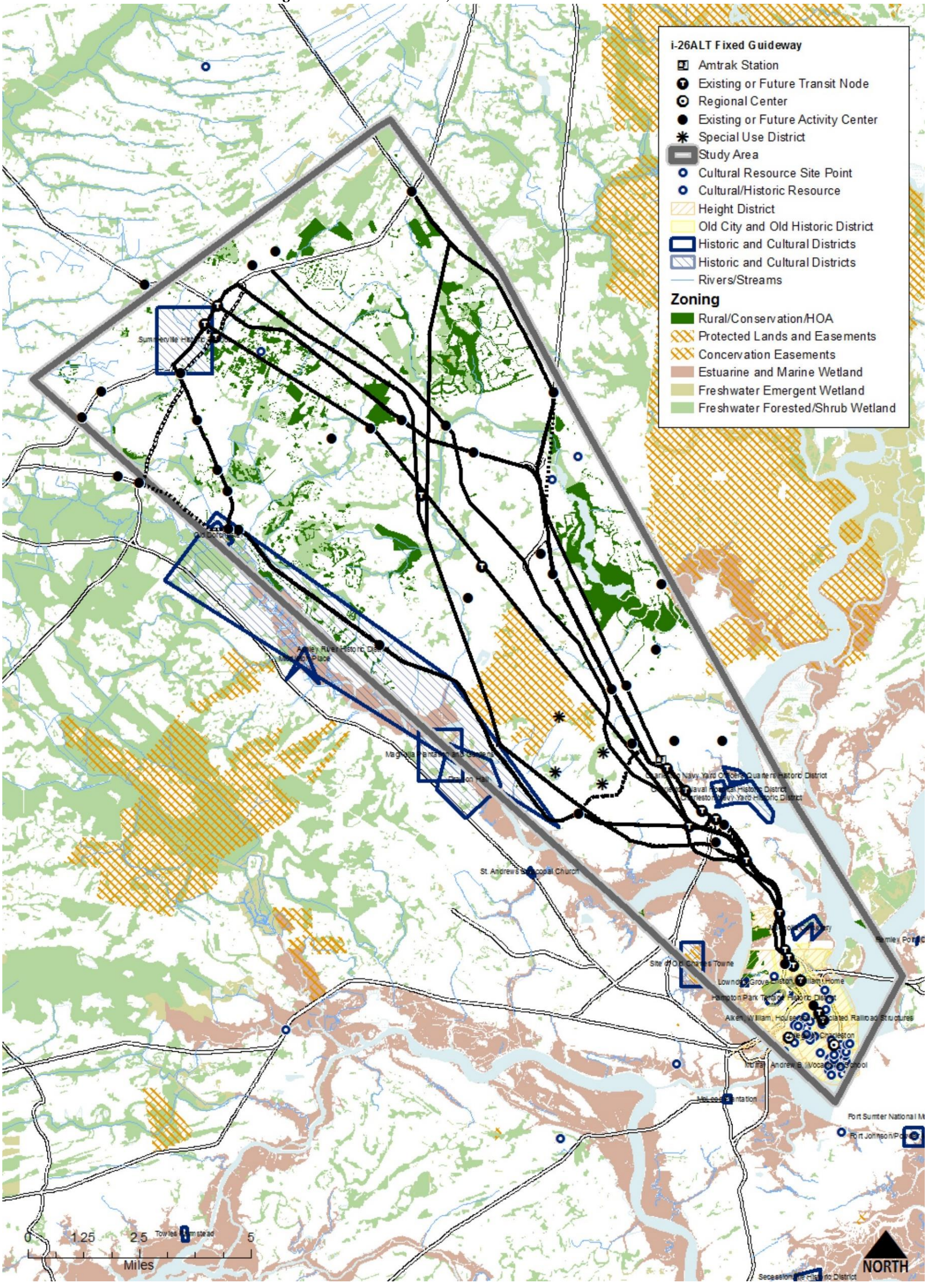


Figure 2 - 9: Alignment Ranking Matrix

i-26ALT

	Mode	Alignment	*Activity / Node Access Score*	*Adjacency to 2035 High Density Areas Outside of Peninsula*	*Composite Activity / Node / Density Score*	Station / Node / Activity Center Access Ranking	Avoidance of Significant Prohibitive Zoning / Overlays along Alignment	Avoidance of AICUZ (Air Installation Compatible Use Zone)	Adjacency to Developable Vacant Land	Avoidance of Environmentally Sensitive / Cultural Resource Areas	Composite Land Use Score	Rank (1=Most Suitable)	*Adjacency to Projected Growth Areas Outside of the Corridor?*
A	BRT	I-26	*14.5*	*4*	*18.5*	Low	Medium	Medium	High	High	11	6	*Y*
B	BRT / LRT	Dorchester Road	*21*	*7*	*28*	High	Low	High	Low	Low	9	8	*N*
C-1	BRT / LRT	US 52 / US 78	*23*	*12*	*35*	High +	Medium	High	Medium	Medium	13	2	*N*
C-2	BRT / LRT	US 52/ US 176	*19*	*8*	*27*	High	High	High	High	Medium	14	1	*Y*
D-1	BRT / LRT	SCE&G Utility Corridor	*13.5*	*5*	*18.5*	Low	Medium	High	High	Medium	11	6	*N*
D-2	BRT / LRT	Santee Cooper Utility Corridor	*11*	*2*	*13*	Low	Low	High	High	Medium	10	9	*Y*
E	BRT / DMU / CR	Norfolk Southern Rail Line	*18*	*6*	*24*	Medium	High	Medium	High	Medium	12	5	*N*
F-1	BRT / DMU / CR	CSX Rail Line/Bus via US 78	*21.5*	*8*	*29.5*	High	High	High	Medium	Medium	13	2	*N*
F-2	BRT / DMU / CR	CSX Rail Line/Bus via US 176	*18.5*	*4*	*22.5*	Medium	High	High	High	Medium	13	2	*Y*

High > 25	High 0% - 33.33% affected by TOD prohibitive zoning overlays	High <5% of alignment falls within AICUZ
Medium 20-25	Medium 33.34% - 50% affected by TOD prohibitive zoning overlays	Medium 5% - 19.99% of alignment falls within AICUZ
Low < 20	Low >50% affected by TOD prohibitive zoning overlays	Low >20% of alignment falls within AICUZ

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Appendix I

(Air Installation Compatible Use Zone Study - Excerpts)

Appendix II

(Joint Steering and Technical Advisory Committee Documents)

Appendix III

(Subcommittee Workshop 1)

Appendix IV

(Developer Workshop)

Appendix V

(Subcommittee Workshop 2)

Appendix VI

(Public Meetings – April 2015)

Appendix VII

(Affordable Housing Document)

Appendix VIII

(Proposed Development Beyond Corridor)

Appendix IX

(Alignment Ranking Maps)

Appendix 3-C: Freight Railroad Policies

Final Report – February 2016

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CSX Passenger Train Access Principles

America's freight railroads are critical to the nation's economy, providing safe, efficient, economical and environmentally beneficial freight service that is so vital to our communities, our businesses and industries and our way of life.

CSX recognizes the important benefits that passenger rail service can provide to the public, including reducing traffic congestion and avoiding expensive highway construction. At the same time, CSX has a responsibility to all of its stakeholders, including rail freight rail shippers, to preserve and protect the substantial public benefits it delivers through freight rail transportation.

The rail industry has been investing billions of dollars every year in privately-owned freight rail infrastructure. These investments resulted in significant improvements in service for the nation's shippers and considerable benefits to the overall US economy. As a result the industry has entered a "rail renaissance" characterized by new demand from shippers and public policy interest in moving more goods by rail.

Future agreements for passenger access to freight rail lines must therefore balance the nation's desire for additional rail passenger services with railroads' critical role in carrying freight that otherwise would be diverted onto an already crowded and often underfunded highway network.

Based on this expectation, CSX established the following protocols for working with public agencies interested in conducting feasibility studies and implementing passenger rail:

Studies

- CSX will consider reasonable proposals for new or expanded passenger rail service that are viable financially and operationally and do not adversely impact freight operations.
- Studies will be conducted by CSX, or consultants approved by CSX, and will be paid for by the requesting planning agency. A primary goal of the studies will be to preserve freight rail capacity while striving to accommodate any new proposed passenger service.

Feasible separation of freight and passenger operation

- Many freight corridors are already at capacity and require expansions to handle future freight growth. CSX cannot consider proposals for shared use of such corridors, or sell property along such corridors that would compromise CSX's ability to serve current or future customer needs. We will encourage planning agencies to consider a separate right of way for new or expanded services in such corridors.
- One way to achieve such separation is to move the majority of freight trains out of urban corridors. CSX will consider publicly funded relocations of freight operations if they preserve CSX's customer service, competitive position, and access to current and future freight customers.

Where separation or relocation is not feasible but freight operations can be protected, passenger trains may, in some cases, share CSX's tracks, provided certain principles for shared use operations are properly addressed:

Safety

- Adding passenger service must not compromise safety. Planning Agencies must meet and fund any required safety infrastructure.

Capacity

- Any addition or expansion of passenger rail service on the freight rail network must ensure that the capacity utilized for the new service is fully replaced at no cost to CSX. This capacity must allow CSX to safely and efficiently handle all current and future freight demand, not just enough to address current conditions or to cover a few years
- CSX's ability to locate new freight customers along the right of way must also be preserved. Service to freight customers must be protected and should not be compromised or limited by new passenger rail service.
- CSX will not participate in so-called Service Outcome Agreements.

Compensation

- CSX must be fully compensated for its costs in planning and hosting passenger rail service. The compensation should be sufficient to support future reinvestments in infrastructure to continue providing safe, efficient and environmentally-friendly freight service. CSX and its freight rail customers should not be asked to subsidize passenger service.

Liability

- CSX must be fully protected from any liability arising from the presence of passenger rail service on its freight lines. Any additional service introduces an element of risk and liability that is not related to CSX's core business as a freight rail carrier, and CSX should not be asked to assume such risk.
- Planning agencies should be prepared to carry and provide evidence of insurance covering liability exposure of at least $200 million, the current limit of liability under federal law for passenger rail claims.

Higher Speed Rail and High Speed Rail

- Higher Speed Rail refers to trains traveling at maximum speeds higher than 79 MPH. CSX requires that any passenger train operating at speeds above 90MPH, including High Speed Rail (defined as trains traveling at speeds higher than 125MPH) be on its own dedicated tracks and right of way, separated by at least 30 ft. from freight rail service . These standards are subject to change as new information and research becomes available consistent with CSX's core value to provide safe rail services to the communities where trains operate.

GENERAL PRINCIPLES GUIDING
NORFOLK SOUTHERN'S EVALUATION OF
INTERCITY AND COMMUTER PASSENGER RAIL PROPOSALS

The following principles are a guide for planners of intercity and commuter rail proposals when working with Norfolk Southern. Of course, each proposal necessarily is unique, and NS' application of the principles to particular proposals will often be unique as well.

<u>Safety is our paramount concern</u>. Design, maintenance practices, and operating patterns always will emphasize safety.

<u>An operational feasibility study is necessary to fully understand all potential impacts</u>.

- The proposed passenger operation must create "transparency" in the affected rail system. Transparency is the capacity for passenger trains and freight trains to operate without delay, however minimal, to each other, while still allowing for route maintenance.
    - Passenger projects are meant to be successful, so the study will focus on the proposal's full-build scenario versus any interim plan. Along the same lines, freight volumes will grow, so any study will anticipate future freight levels.
    - Freight operations are long distance and customer-driven, which precludes "passenger only" operating windows and temporal separation such as night-time-only freight operations.
    - Passenger projects might cause "network effects" on the NS system that are broader than the project area. Often, the studied geographic scope will have to be larger than the passenger project area in order to identify and address these effects.
    - Project costs associated with compliance with Federal Railroad Administration regulations are the responsibility of the project sponsor.
- The rail environment changes. Conditions attached to various forms of funding differ. Therefore, until funding is available, any passenger study is necessarily hypothetical.
    - A completed operational feasibility study by NS is a prerequisite to progress a project. NS will support only passenger project requests that have been fully studied and modeled.
    - As the transportation industry is dynamic, any proposal that does not secure funding cannot be shelved for future use – each proposal is unique, requiring its own up-to-date study.
    - Sometimes public funding comes with special conditions and requirements (including so-called "service outcome requirements"), which represent additional costs. Just as NS does not customarily agree to similar guarantees with our freight customers, the public sponsor will be responsible for any passenger guarantees.
    - It is possible that public funding may be taxable to Norfolk Southern, so the public sponsor must indemnify Norfolk Southern for any income taxes paid or incurred as a result of the receipt of public funding.

- NS will coordinate the operational feasibility study. The cost of the study (including NS' time) is the responsibility by the sponsoring public agency. For planning purposes, NS can estimate study costs in advance. Studies are detailed and specific and take a year, and often longer, to complete.

<u>NS will receive fair compensation for use of its transportation corridors</u>.

- NS' corridors consist of track and right-of-way that might, or might not, be fully utilized at any given time. As rail traffic flows change over time, this capacity, and the flexibility and potential it represents, is a key NS asset.
- Amtrak has certain statutory intercity passenger service access rights and therefore is not a good example to use in determining the fair and commercial price for use of NS assets.
- In determining a fair price for use of assets, NS will factor in any new equipment (including Positive Train Control) and costs, as well as additional property and other taxes, that would not be incurred absent passenger service.

<u>New and expanded passenger operations require adequate liability protection</u>.

- Passenger operators must compensate or indemnify NS for additional risk created by passenger projects, and any such indemnification needs to be backed up by an adequate level of insurance.
- Liability issues can create major hurdles. Often, sovereign immunity issues must be overcome. The cost to the passenger carrier for insurance and indemnification is substantial, as borne out by our experience with commuter authorities.

<u>Special considerations are necessary for high speed rail service and corridors</u>.

- Norfolk Southern is pleased to assist states planning for dedicated HSR and will work with planners to insulate those corridors from interference with and from NS freight corridors.
- Passenger trains operating in excess of 79 mph require their own dedicated tracks. Passenger trains operating in excess of 90 mph require their own private right-of-way.
- Where higher-speed trains share tracks with conventional freight trains, they will be able to reach 79 mph maximum. Where shared track is concerned, higher-speed trains must meet the same safety standards as conventional trains.

<u>Special considerations are necessary for light rail service</u>.

- Light rail service involves use of equipment that is not appropriate for use on NS tracks. Physical separation is required.
- Proposals for operating "non-compliant" passenger equipment (equipment that does not meet Federal Railway Administration standards) are not viable.
- Light-rail and non-compliant project sponsors should approach NS early in the process, and so that NS can advise if any of the project elements are compatible with freight trains and track.

NORFOLK SOUTHERN

SUBJECT: Norfolk Southern Passenger Station Requirements

In Norfolk Southern Railway Company's (NSR) policy statement dated June 15, 2005, Norfolk Southern set forth the conditions for permitting new or additional passenger rail service on our tracks. In that paper, NSR identified the principles intended to protect NSR-owned or dispatched rail lines and right of way. This policy stipulates that passenger operations must be "transparent" to our freight operations, and delay to freight trains by passenger trains, however minimal, is unacceptable. New services must pay fully allocated costs for access to the existing freight corridor, and there must be adequate liability protection as defined by NSR.

In the situation where a passenger/commuter service is proposed for sharing NSR tracks or Branch lines, a complete in-depth train capacity study must be undertaken at the expense of the passenger/commuter entity to assess passenger service impacts to the existing and future freight operations. Impacts to NSR freight business must be fully mitigated and that may involve constructing additional tracks, upgraded signal systems or other infrastructure improvements as specified by NSR.

In the situation where a passenger/commuter service is proposed for sharing only NSR ROW and not including NSR tracks, the adjacent passenger tracks must be separated by a minimum of 26 foot track centers to the NSR track and a barrier fence shall be installed between the two rail lines.

The NSR Standard platform clearance criteria for NSR territory for approved joint use tracks will be a low level platform located 5'-4" from centerline of track, and 0'-8" above top of rail.

Accordingly, any new passenger/commuter service using NSR tracks shall be limited to Gallery type passenger cars that are used by METRA (Chicago) and VRE (Washington, DC) that have on-board lift ramps to accommodate level board loading requirements established by the ADA.

NSR will only consider the use of High passenger platforms when the passenger/commuter service is prepared to construct dedicated station tracks.

In the event that proposed station parking lots and parking garages are located across the tracks from a station platform, overhead bridges or under grade tunnels will be required. Pedestrian crossing at grade will not be permitted. This requirement is intended to ensure the maximum amount of safety for passengers and station patrons, especially along our busiest main line corridors.

In the event that the Federal government mandates station designs different than noted above, the passenger service will incur all costs to incorporate station infrastructure changes. NSR will expect that the freight operations, capacity, and maintenance obligations not be hindered due to such future mandates.

In the past, passenger facilities, including stations, were approved on a case-by-case basis, as we had no standard design criteria. In those instances, we provided guidelines, but made explicitly clear that NSR reserved the right to require more restrictive guidelines, as we deemed necessary. As requests for passenger service on our lines increase, we believe that it is practical to set forth our facility design requirements for constructing new passenger stations or to rehabilitate existing ones. In setting these standards, our paramount concern is safety, and we will not approve any design that increases risk to passengers and railroad employees, or subject NSR to additional liability exposure.

This memorandum is intended to outline our requirements for constructing new stations or rehabilitating existing ones on our lines.

Station Requirements

The following requirements should be followed in designing stations:

- Stations should have dual track access with ingress and egress under or over the right-of-way. At-grade pedestrian crossings are not permitted.
- Full-length high-level platforms may only be placed adjacent to tracks used exclusively by passenger trains. ***High platforms are not allowed adjacent to freight tracks.***
- Mini-high-level platforms may be constructed with the platform edge no closer than 8'-6" from the centerline of the adjacent track, if the track is shared with freight trains. Any considerations needed for gap reduction between the passenger car vestibule and platform edge shall be addressed with manually or mechanical means that does not reduce the minimum 8'-6" horizontal clearance requirement.

Single track -

Single-track platforms may be permitted in single-track territory subject to the requirements set forth herein with the stipulation that, in the event that the line is double-tracked the passenger/commuter authority or station owner will bear the full cost of construction for dual track access.

Multiple tracks - Side Platforms:

1. Platforms will be adjacent to each outside main line.
2. Pedestrian designated walkways to crossing tracks must be ADA compliant overpass or underpass (ramp or elevator equipped).
3. Track side platforms shall **NOT** be located near public at-grade crossings as this may encourage passenger/commuter station patrons to cross tracks other than at the designated overpass or underpass.

Center Track Fences -

In the situation where underpass and/or overpass facilities are provided for approved dual track platforms and a patron trespass potential across the tracks is foreseen or occurs on a repeated bases, NSR will require the passenger service operators or stations owners to fund the installation and maintenance costs of center track fencing or other type of station fencing.

In the situation where the installation of any needed fencing including center track fences are required (at locations determined by NSR), any costs associated with altering track centers to better facilitate efficient movement of wide and standard sized freight car movements, shall be borne by the passenger/commuter operators or station owners.

Multiple Tracks - Center Platform:

1. Center track platforms may be workable provided that alternate footpaths are sealed off so that patrons only use the designated overpass or underpass access.

Low Platforms - General Guidelines

1. Dimensions for center, low platforms –
   a. 22’-0” minimum width (track centers for tangent track would be 32’-8”)
   b. 26’-0” desirable width (track centers for tangent track would be 36’-8”)
   c. 32’-0” extremely desirable width (track centers for tangent track would be 42’-8”)

2. Dimensions for side, low platforms –
   a. 12’-0” minimum width
   b. 16’-0” desirable width

3. Clearances for low platforms –
   a. 5’-4” center of track to face of platform (minimum)
   b. 0’-8” height of platform above top of rail (maximum)

Canopies –

Gutterless canopies shall be used and shall slope away from track. Side clearance shall be 9’-0” (minimum) on tangent track.

Horizontal Clearance Adjustments –

Adjustments to the minimum horizontal clearance will be made for any portion of the platform that is not located in tangent track. The adjustment for curvature shall be made as outlined below, and shall not be the larger measurement, but rather a cumulative adjustment;

1. Side clearance shall be increase 1-1/2” per degree of curvature in curved track.
2. At a height of 16’2” above top of rail, the side clearance shall be increased 3.5 inches per inch of super elevation where the cars lean into the canopy (canopy on inside of curve)

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Appendix 5-A: Screen Two Build Alternatives

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Figure A - 1

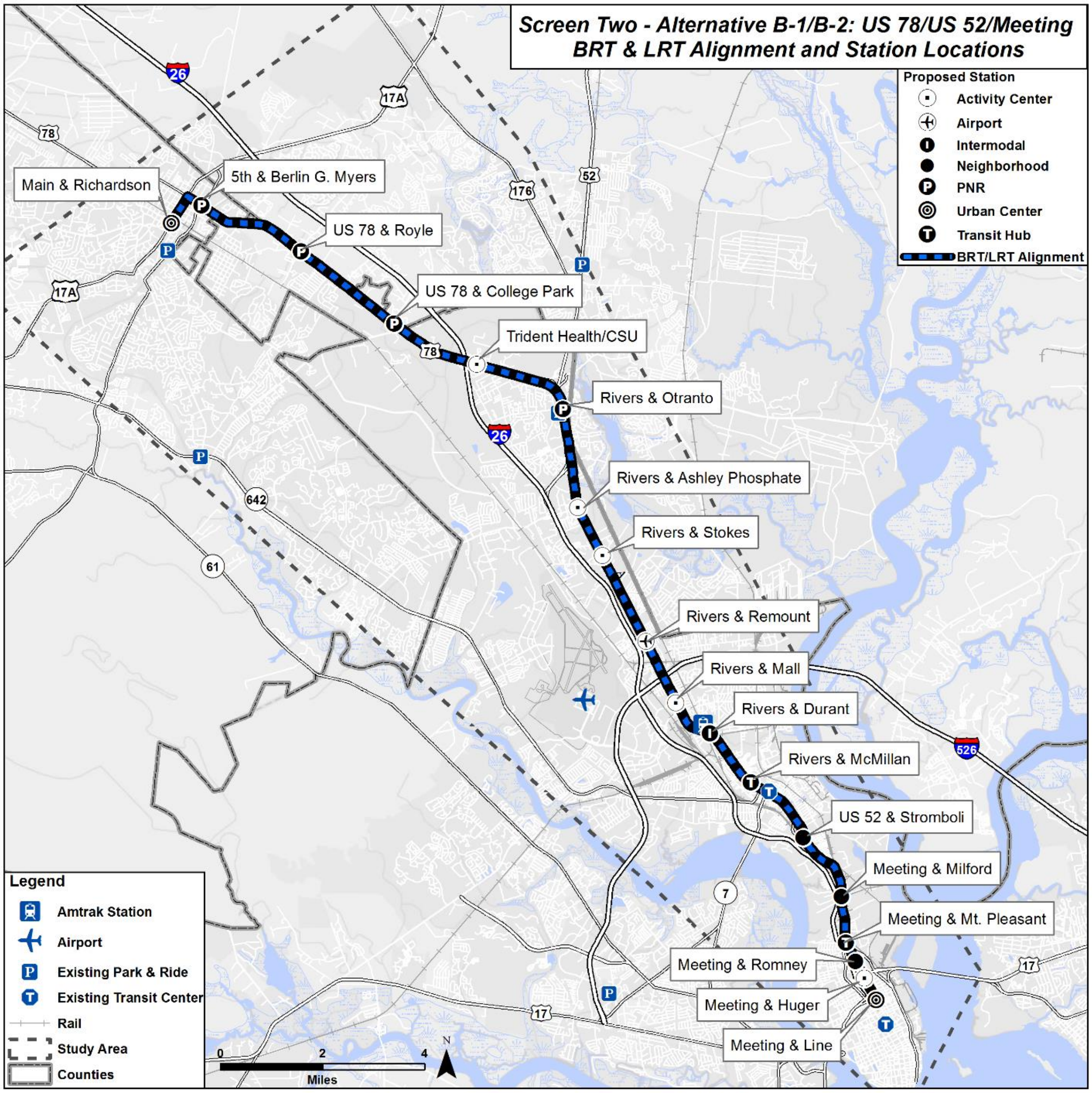

Screen Two - Alternative B-1/B-2: US 78/US 52/Meeting
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
Main & Richardson
5th & Berlin G. Myers
US 78 & Royle
US 78 & College Park
Trident Health/CSU
Rivers & Otranto
Rivers & Ashley Phosphate
Rivers & Stokes
Rivers & Remount
Rivers & Mall
Rivers & Durant
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
Meeting & Romney
Meeting & Huger
Meeting & Line
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
0
2
4
Miles
N

Figure A - 2

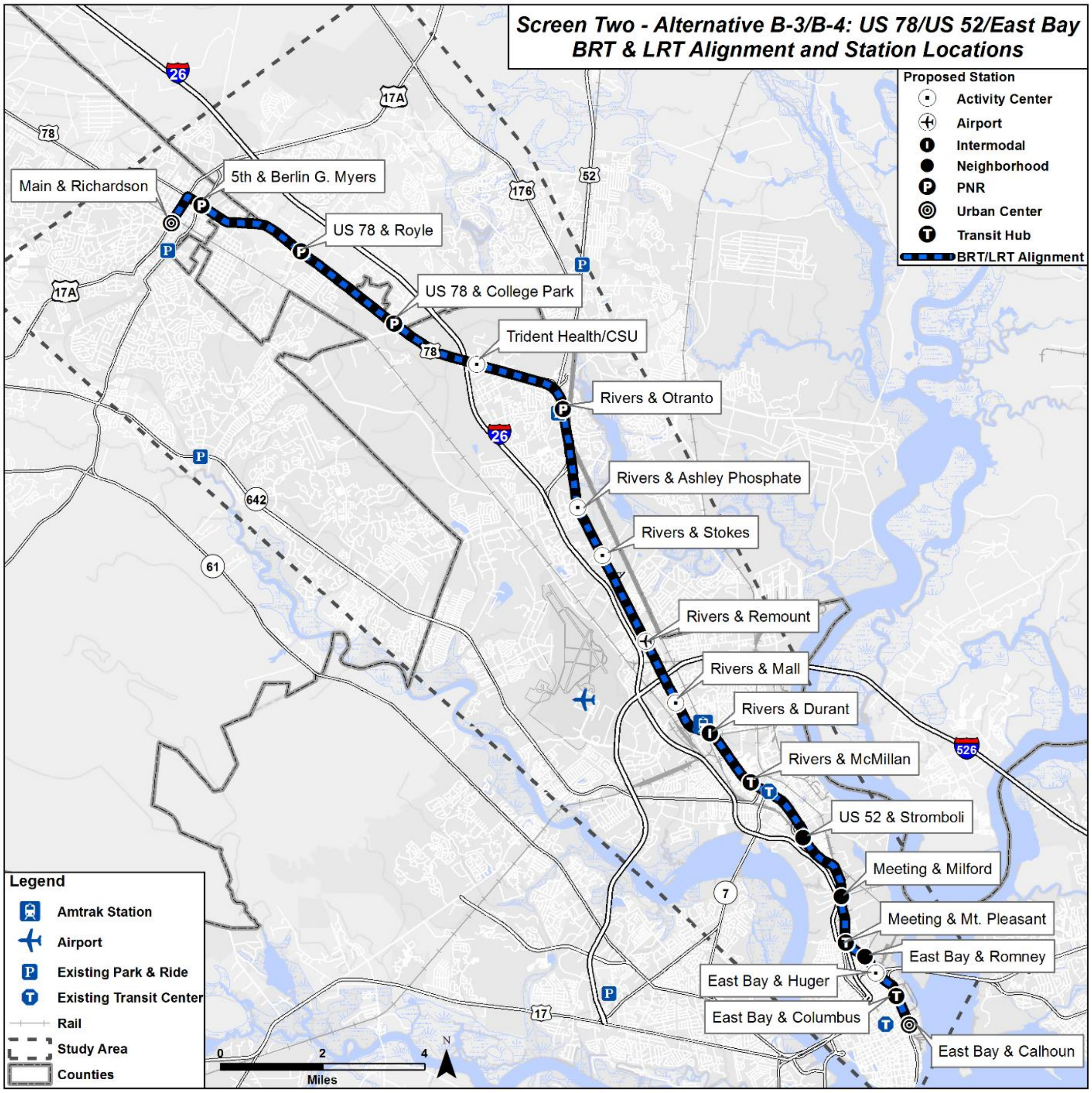
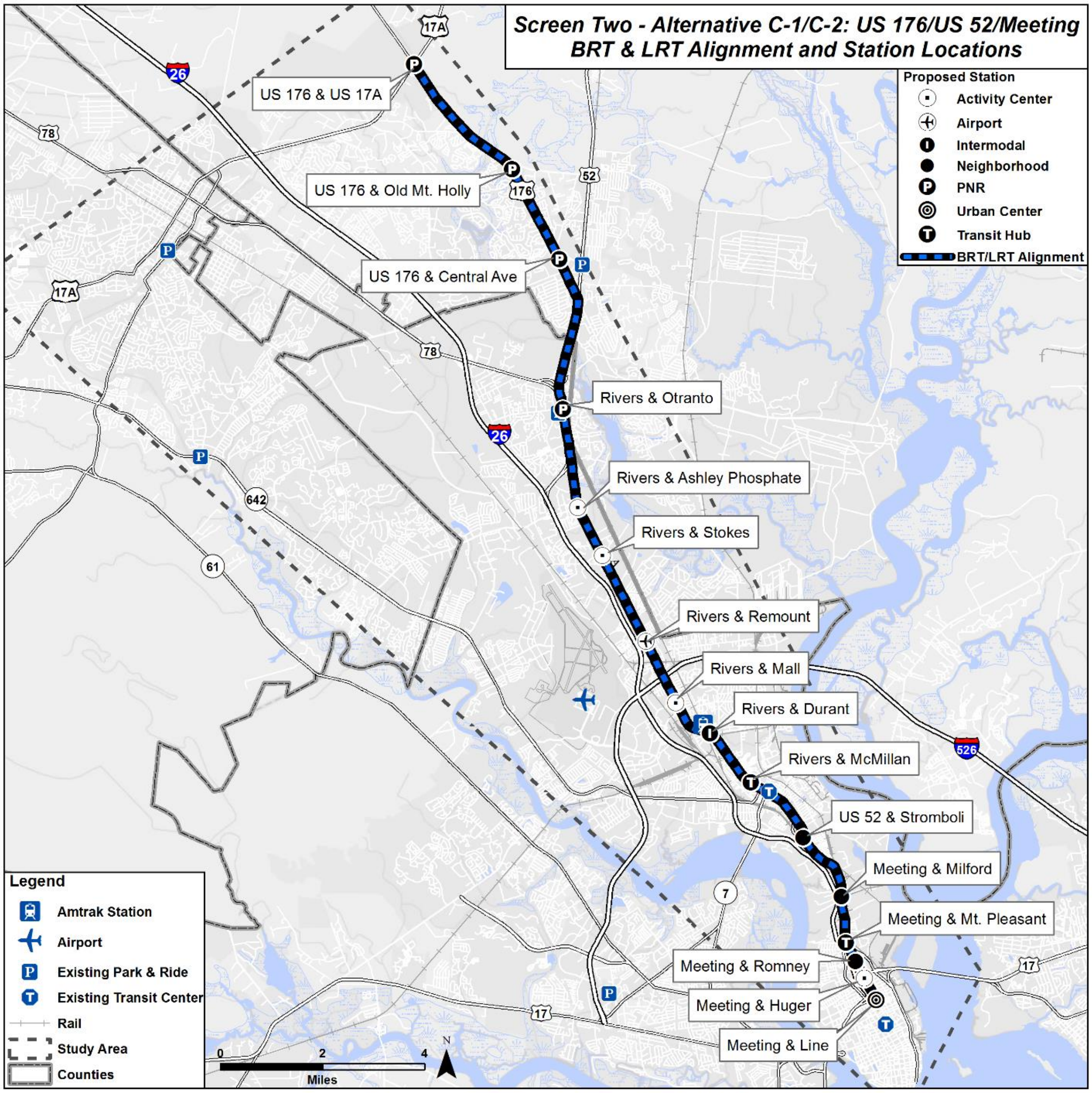

Screen Two - Alternative B-3/B-4: US 78/US 52/East Bay
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
Main & Richardson
5th & Berlin G. Myers
US 78 & Royle
US 78 & College Park
Trident Health/CSU
Rivers & Otranto
Rivers & Ashley Phosphate
Rivers & Stokes
Rivers & Remount
Rivers & Mall
Rivers & Durant
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
East Bay & Romney
East Bay & Huger
East Bay & Columbus
East Bay & Calhoun
26
17A
78
176
52
642
61
7
17
526
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
0
2
4
Miles
N

Figure A - 3


Screen Two - Alternative C-1/C-2: US 176/US 52/Meeting
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
US 176 & US 17A
US 176 & Old Mt. Holly
US 176 & Central Ave
Rivers & Otranto
Rivers & Ashley Phosphate
Rivers & Stokes
Rivers & Remount
Rivers & Mall
Rivers & Durant
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
Meeting & Romney
Meeting & Huger
Meeting & Line
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
0
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Miles
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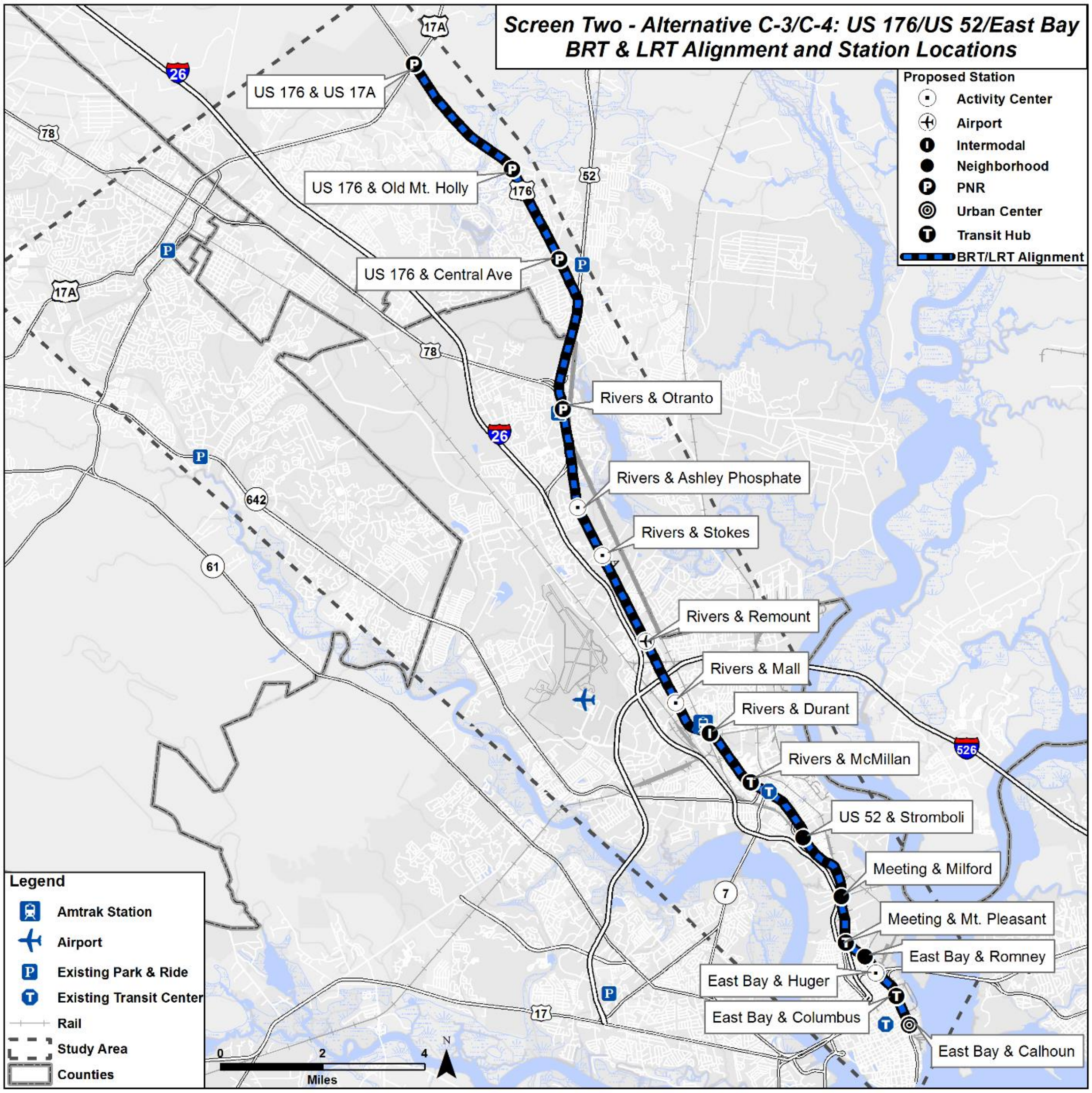
Figure A - 4


Screen Two - Alternative C-3/C-4: US 176/US 52/East Bay
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
US 176 & US 17A
US 176 & Old Mt. Holly
US 176 & Central Ave
Rivers & Otranto
Rivers & Ashley Phosphate
Rivers & Stokes
Rivers & Remount
Rivers & Mall
Rivers & Durant
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
East Bay & Romney
East Bay & Huger
East Bay & Columbus
East Bay & Calhoun
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
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Miles
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Figure A - 5

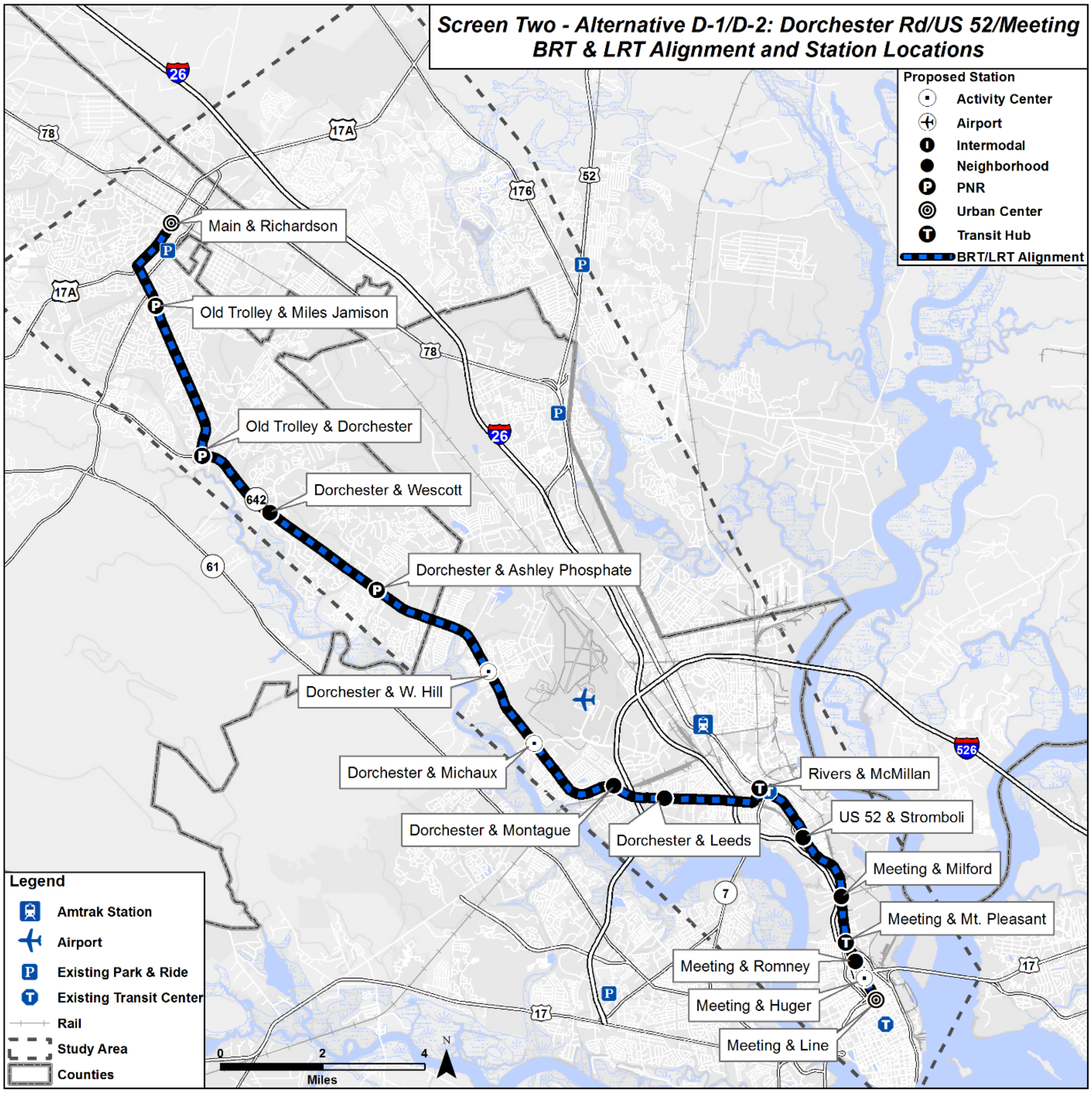
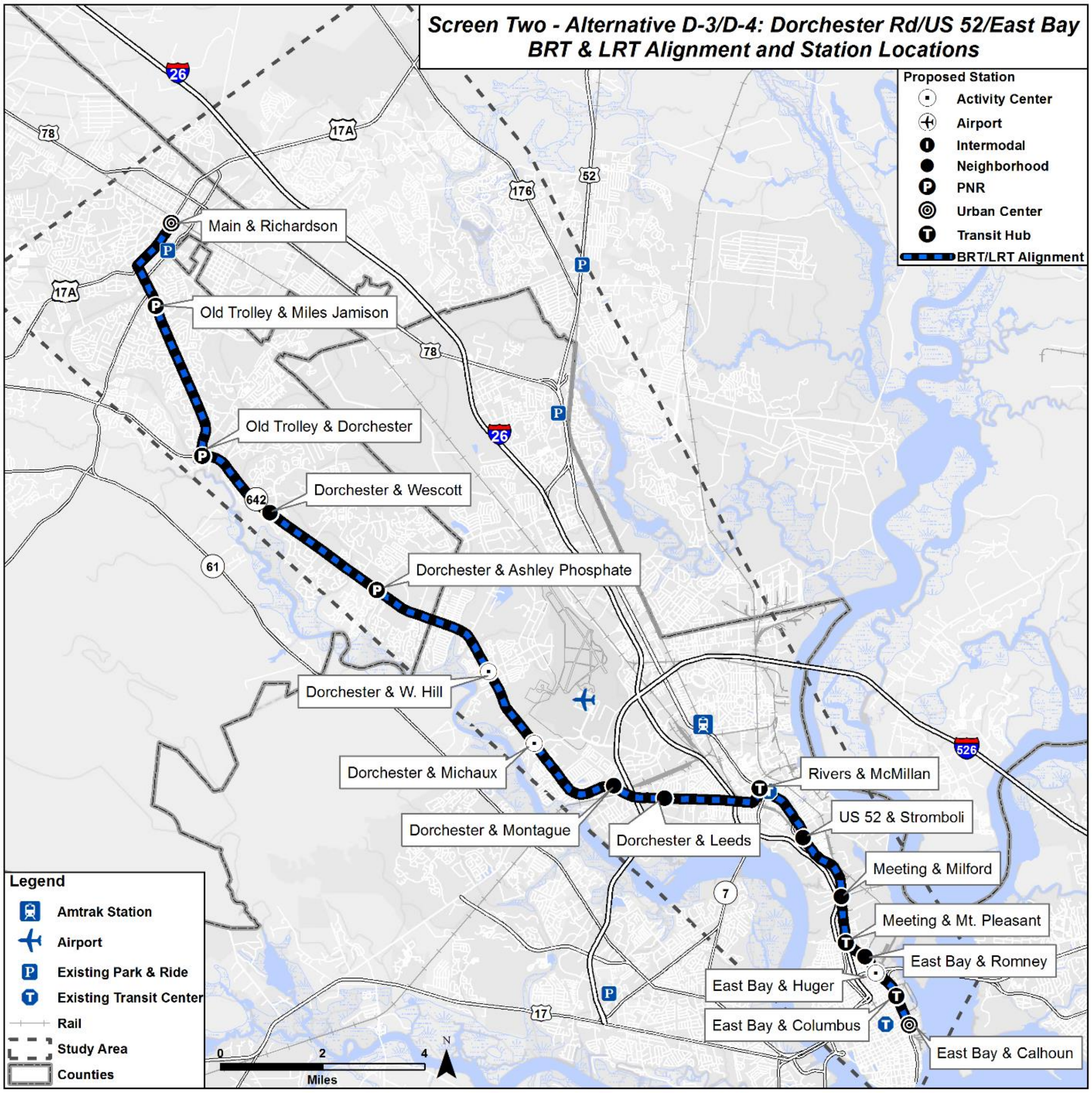

Screen Two - Alternative D-1/D-2: Dorchester Rd/US 52/Meeting
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
Main & Richardson
Old Trolley & Miles Jamison
Old Trolley & Dorchester
Dorchester & Wescott
Dorchester & Ashley Phosphate
Dorchester & W. Hill
Dorchester & Michaux
Dorchester & Montague
Dorchester & Leeds
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
Meeting & Romney
Meeting & Huger
Meeting & Line
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
Miles

Figure A - 6


Screen Two - Alternative D-3/D-4: Dorchester Rd/US 52/East Bay
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
Main & Richardson
Old Trolley & Miles Jamison
Old Trolley & Dorchester
Dorchester & Wescott
Dorchester & Ashley Phosphate
Dorchester & W. Hill
Dorchester & Michaux
Dorchester & Montague
Dorchester & Leeds
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
East Bay & Romney
East Bay & Huger
East Bay & Columbus
East Bay & Calhoun
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
0
2
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Miles
N

Appendix 5-B: Alternatives Operating Statistics

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BRT and LRT Alternatives Operating Statistics

BRT Alternatives

Alternative	AM/PM Peak							Weekday Base							Weekday Early/Late							Weekday Summary						
	Peak Frequency	Peak Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Frequency	Total Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Frequency	Total Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	**Peak Vehicles**	Base Vehicles	Total Trips	One-way Miles	One Way Dist/Time Min.	Total Revenue Hours	Total Revenue Miles
B-1 US 78/US 52/Meeting BRT	10	72	118.38	11.62	130.00	8.9%	13.00	20	54	118.38	1.62	120.00	1.3%	6.00	30	24	118.38	1.62	120.00	1.3%	4.00	**13.00**	6.00	150	23.32	59.19	156.00	3,497.25
B-3 US 78/US 52/East Bay BRT	10	72	126.58	13.42	140.00	9.6%	14.00	20	54	126.58	13.42	140.00	9.6%	7.00	30	24	126.58	23.42	150.00	15.6%	5.00	**14.00**	7.00	150	24.19	63.29	177.00	3,627.75
C-1 US 176/US 52/Meeting BRT	10	72	103.67	6.33	110.00	5.8%	11.00	20	54	103.67	16.33	120.00	13.6%	6.00	30	24	103.67	16.33	120.00	13.6%	4.00	**11.00**	6.00	150	21.63	51.83	144.00	3,244.50
C-3 US 176/US 52/East Bay BRT	10	72	111.98	8.02	120.00	6.7%	12.00	20	54	111.98	8.02	120.00	6.7%	6.00	30	24	111.98	8.02	120.00	6.7%	4.00	**12.00**	6.00	150	22.50	55.99	150.00	3,375.00
D-1 Dorchester Rd/US 52/Meeting BRT	10	72	130.07	9.93	140.00	7.1%	14.00	20	54	130.07	9.93	140.00	7.1%	7.00	30	24	130.07	19.93	150.00	13.3%	5.00	**14.00**	7.00	150	25.54	65.03	177.00	3,831.00
D-3 Dorchester Rd/US 52/East Bay BRT	10	72	138.93	11.07	150.00	7.4%	15.00	20	54	138.93	1.07	140.00	0.8%	7.00	30	24	138.93	11.07	150.00	7.4%	5.00	**15.00**	7.00	150	26.41	69.47	183.00	3,961.50

Alternative	AM/PM Peak							Saturday Base							Saturday Early Late							Saturday Summary						
	Peak Frequency	Peak Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Frequency	Total Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Frequency	Total trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Peak Vehicles	Base Vehicles	Total Trips	One-way Miles	One Way Dist/Time Min.	Total Revenue Hours	Total Revenue Miles
B-1 US 78/US 52/Meeting BRT								20	90	118.38	1.62	120.00	1.3%	6.00	30	16	118.38	31.62	150.00	21.1%	5.00	n/a	6.00	106	23.32	59.19	110.00	2,471.39
B-3 US 78/US 52/East Bay BRT								20	90	126.58	13.42	140.00	9.6%	7.00	30	16	126.58	23.42	150.00	15.6%	5.00	n/a	7.00	106	24.19	63.29	125.00	2,563.61
C-1 US 176/US 52/Meeting BRT								20	90	103.67	16.33	120.00	13.6%	6.00	30	16	103.67	16.33	120.00	13.6%	4.00	n/a	6.00	106	21.63	51.83	106.00	2,292.78
C-3 US 176/US 52/East Bay BRT								20	90	111.98	8.02	120.00	6.7%	6.00	30	16	111.98	8.02	120.00	6.7%	4.00	n/a	6.00	106	22.50	55.99	106.00	2,385.00
D-1 Dorchester Rd/US 52/Meeting BRT								20	90	130.07	9.93	140.00	7.1%	7.00	30	16	130.07	19.93	150.00	13.3%	5.00	n/a	7.00	106	25.54	65.03	125.00	2,707.24
D-3 Dorchester Rd/US 52/East Bay BRT								20	90	138.93	1.07	140.00	0.8%	7.00	30	16	138.93	11.07	150.00	7.4%	5.00	n/a	7.00	106	26.41	69.47	125.00	2,799.46

Alternative	AM/PM Peak							Sunday Base							Saturday Early Late							Sunday Summary						
	Peak Frequency	Peak Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Peak frequency	Total Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Frequency	Total trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Peak Vehicles	Base Vehicles	Total Trips	One-way Miles	One Way Dist/Time Min.	Total Revenue Hours	Total Revenue Miles
B-1 US 78/US 52/Meeting BRT								30	64	118.38	1.62	120.00	1.3%	4.00								n/a	4.00	64	23.32	59.19	64.00	1,492.16
B-3 US 78/US 52/East Bay BRT								30	64	126.58	13.42	140.00	9.6%	4.67								n/a	4.67	64	24.19	63.29	74.67	1,547.84
C-1 US 176/US 52/Meeting BRT								30	64	103.67	16.33	120.00	13.6%	4.00								n/a	4.00	64	21.63	51.83	64.00	1,384.32
C-3 US 176/US 52/East Bay BRT								30	64	111.98	8.02	120.00	6.7%	4.00								n/a	4.00	64	22.50	55.99	64.00	1,440.00
D-1 Dorchester Rd/US 52/Meeting BRT								30	64	130.07	19.93	150.00	13.3%	5.00								n/a	5.00	64	25.54	65.03	80.00	1,634.56
D-3 Dorchester Rd/US 52/East Bay BRT								30	64	138.93	11.07	150.00	7.4%	5.00								n/a	5.00	64	26.41	69.47	80.00	1,690.24

LRT Alternatives

Alternative	Weekday AM/PM Peak							Weekday Base							Weekday Early/Late							Weekday Summary						
	Peak frequency	Peak Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Peak frequency	Total Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Peak frequency	Total Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	**Peak Vehicles**	Base Vehicles	Total Trips	One-way Miles	One Way Dist/Time Min.	Total Revenue Hours	Total Revenue Miles
B-2 US 78/US 52/Meeting LRT	10	72	113.08	6.92	120.00	5.8%	12.00	20	54	113.08	6.92	120.00	5.8%	6.00	30	24	113.08	6.92	120.00	5.8%	4.00	**12.00**	6.00	150	23.32	56.54	150.00	3,497.25
B-4 US 78/US 52/East Bay LRT	10	72	122.82	7.18	130.00	5.5%	13.00	20	54	122.82	17.18	140.00	12.3%	7.00	30	24	122.82	27.18	150.00	18.1%	5.00	**13.00**	7.00	150	24.19	61.41	171.00	3,627.75
C-2 US 176/US 52/Meeting LRT	10	72	100.38	9.62	110.00	8.7%	11.00	20	54	100.38	19.62	120.00	16.3%	6.00	30	24	100.38	19.62	120.00	16.3%	4.00	**11.00**	6.00	150	21.63	50.19	144.00	3,244.50
C-4 US 176/US 52/East Bay LRT	10	72	110.12	9.88	120.00	8.2%	12.00	20	54	110.12	9.88	120.00	8.2%	6.00	30	24	110.12	9.88	120.00	8.2%	4.00	**12.00**	6.00	150	22.50	55.06	150.00	3,375.00
D-2 Dorchester Rd/US 52/Meeting LRT	10	72	127.38	2.62	130.00	2.0%	13.00	20	54	127.38	12.62	140.00	9.0%	7.00	30	24	127.38	22.62	150.00	15.1%	5.00	**13.00**	7.00	150	25.54	63.69	171.00	3,831.00
D-4 Dorchester Rd/US 52/East Bay LRT	10	72	137.12	2.88	140.00	2.1%	14.00	20	54	137.12	2.88	140.00	2.1%	7.00	30	24	137.12	12.88	150.00	8.6%	5.00	**14.00**	7.00	150	26.41	68.56	177.00	3,961.50

Alternative								Saturday Base							Saturday Early Late							Saturday Summary						
								Peak frequency	Total Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Peak frequency	Total trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles	Peak Vehicles	Base Vehicles	Total Trips	One-way Miles	One Way Dist/Time Min.	Total Revenue Hours	Total Revenue Miles
B-2 US 78/US 52/Meeting LRT								20	90	113.08	6.92	120.00	5.8%	6.00	30	16	113.08	6.92	120.00	5.8%	4.00	n/a	6.00	106	23.32	56.54	106.00	2,471.39
B-4 US 78/US 52/East Bay LRT								20	90	122.82	17.18	140.00	12.3%	7.00	30	16	122.82	27.18	150.00	18.1%	5.00	n/a	7.00	106	24.19	61.41	125.00	2,563.61
C-2 US 176/US 52/Meeting LRT								20	90	100.38	19.62	120.00	16.3%	6.00	30	16	100.38	19.62	120.00	16.3%	4.00	n/a	6.00	106	21.63	50.19	106.00	2,292.78
C-4 US 176/US 52/East Bay LRT								20	90	110.12	9.88	120.00	8.2%	6.00	30	16	110.12	9.88	120.00	8.2%	4.00	n/a	6.00	106	22.50	55.06	106.00	2,385.00
D-2 Dorchester Rd/US 52/Meeting LRT								20	90	127.38	12.62	140.00	9.0%	7.00	30	16	127.38	22.62	150.00	15.1%	5.00	n/a	7.00	106	25.54	63.69	125.00	2,707.24
D-4 Dorchester Rd/US 52/East Bay LRT								20	90	137.12	2.88	140.00	2.1%	7.00	30	16	137.12	12.88	150.00	8.6%	5.00	n/a	7.00	106	26.41	68.56	125.00	2,799.46

Alternative								Sunday Base														Sunday Summary						
								Peak frequency	Total Trips	Travel Time (in Minutes) with Delay	Layover	Cycle Time	% Layover	Total Vehicles								Peak Vehicles	Base Vehicles	Total Trips	One-way Miles	One Way Dist/Time Min.	Total Revenue Hours	Total Revenue Miles
B-2 US 78/US 52/Meeting LRT								30	64	113.08	6.92	120.00	5.8%	4.00								n/a	4.00	64	23.32	56.54	64.00	1,492.16
B-4 US 78/US 52/East Bay LRT								30	64	122.82	27.18	150.00	18.1%	5.00								n/a	5.00	64	24.19	61.41	80.00	1,547.84
C-2 US 176/US 52/Meeting LRT								30	64	100.38	19.62	120.00	16.3%	4.00								n/a	4.00	64	21.63	50.19	64.00	1,384.32
C-4 US 176/US 52/East Bay LRT								30	64	110.12	9.88	120.00	8.2%	4.00								n/a	4.00	64	22.50	55.06	64.00	1,440.00
D-2 Dorchester Rd/US 52/Meeting LRT								30	64	127.38	22.62	150.00	15.1%	5.00								n/a	5.00	64	25.54	63.69	80.00	1,634.56
D-4 Dorchester Rd/US 52/East Bay LRT								30	64	137.12	12.88	150.00	8.6%	5.00								n/a	5.00	64	26.41	68.56	80.00	1,690.24

Appendix 5-C: Alignment Variation Exhibit

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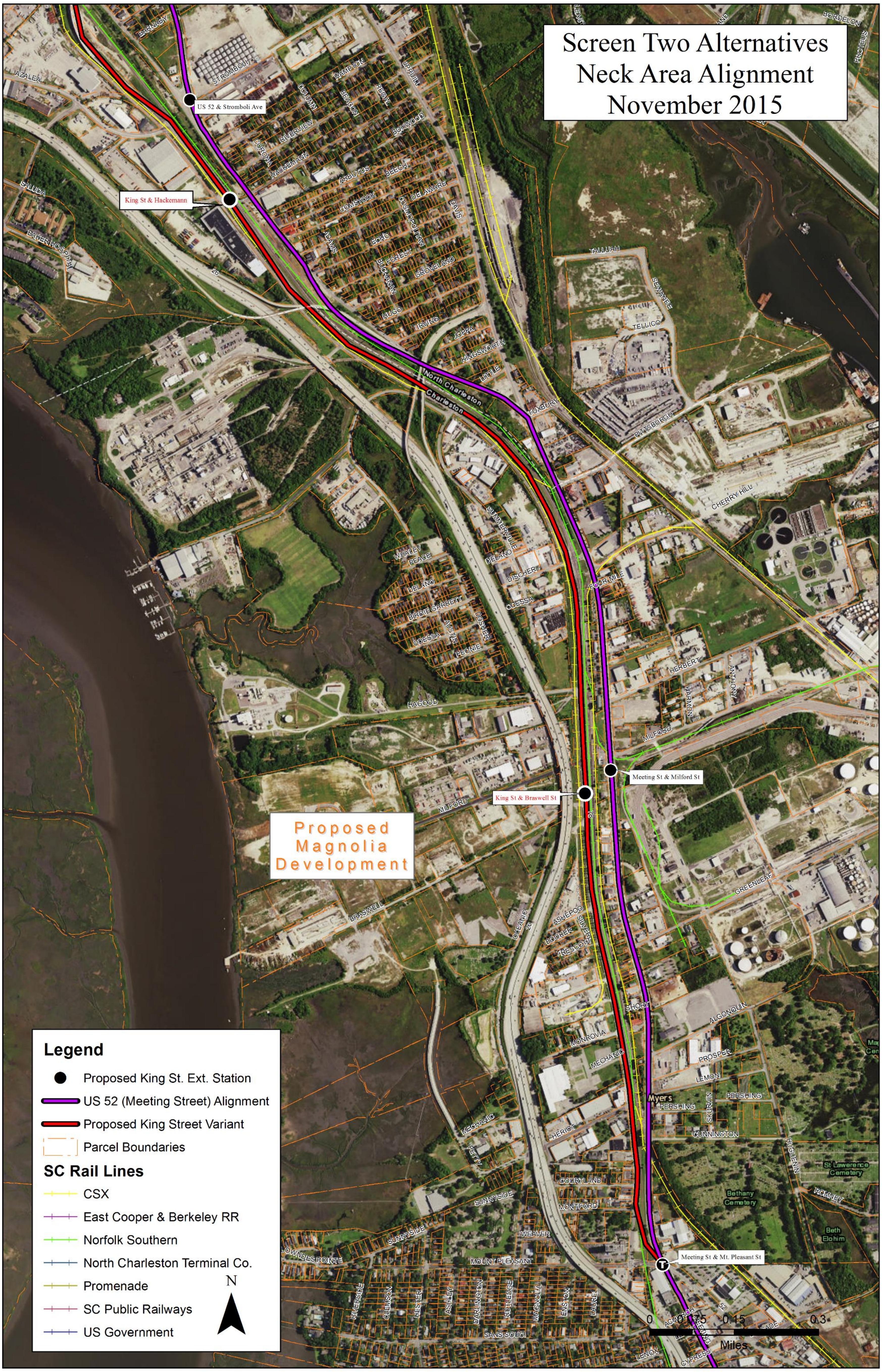
Neck Area Alignment Variant along King Street Extension



Appendix 6-A: Screen Two Build Alternatives

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Figure A - 1

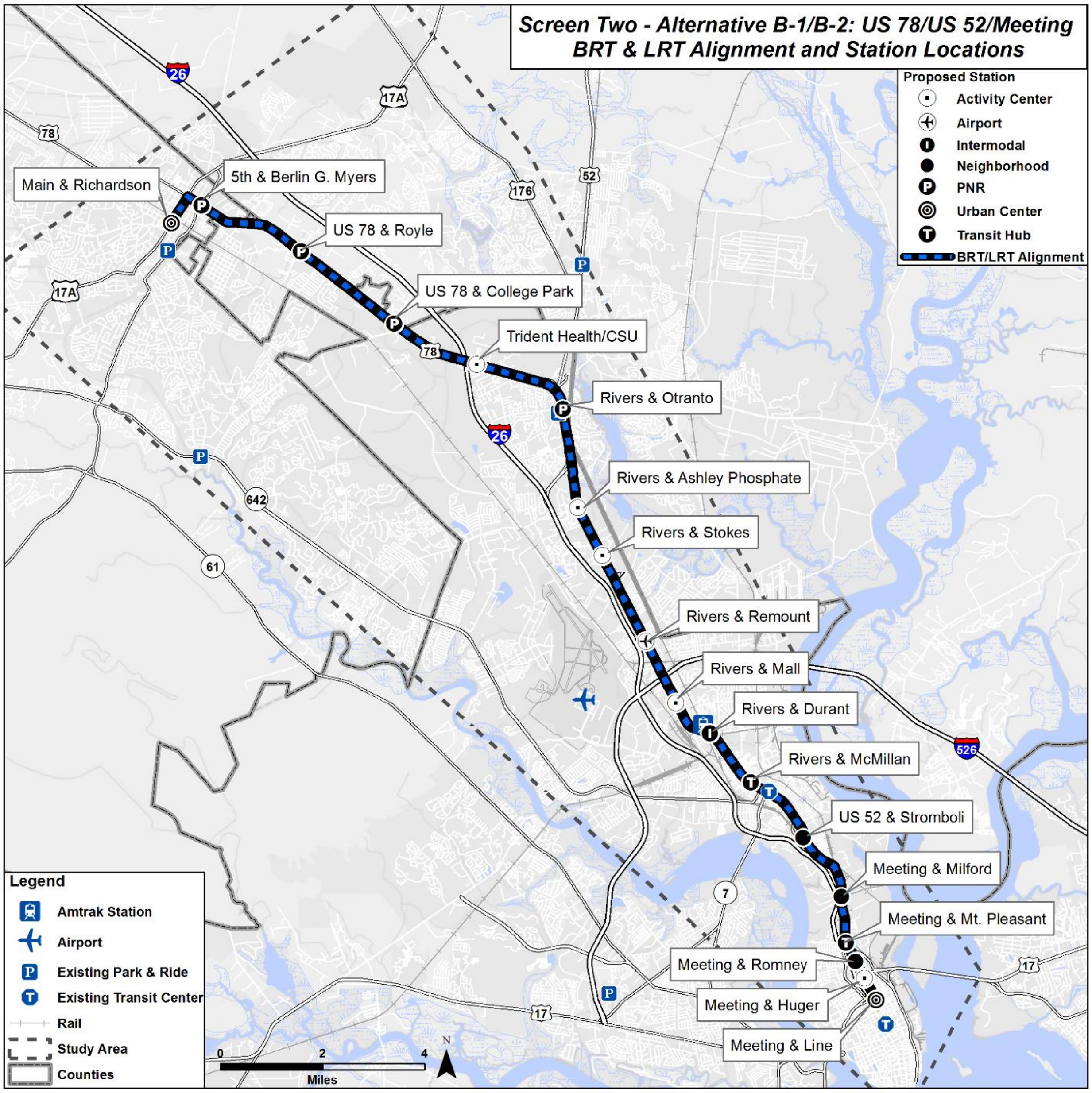

Screen Two - Alternative B-1/B-2: US 78/US 52/Meeting
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
Main & Richardson
5th & Berlin G. Myers
US 78 & Royle
US 78 & College Park
Trident Health/CSU
Rivers & Otranto
Rivers & Ashley Phosphate
Rivers & Stokes
Rivers & Remount
Rivers & Mall
Rivers & Durant
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
Meeting & Romney
Meeting & Huger
Meeting & Line
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
0
2
4
Miles
N

Figure A - 2

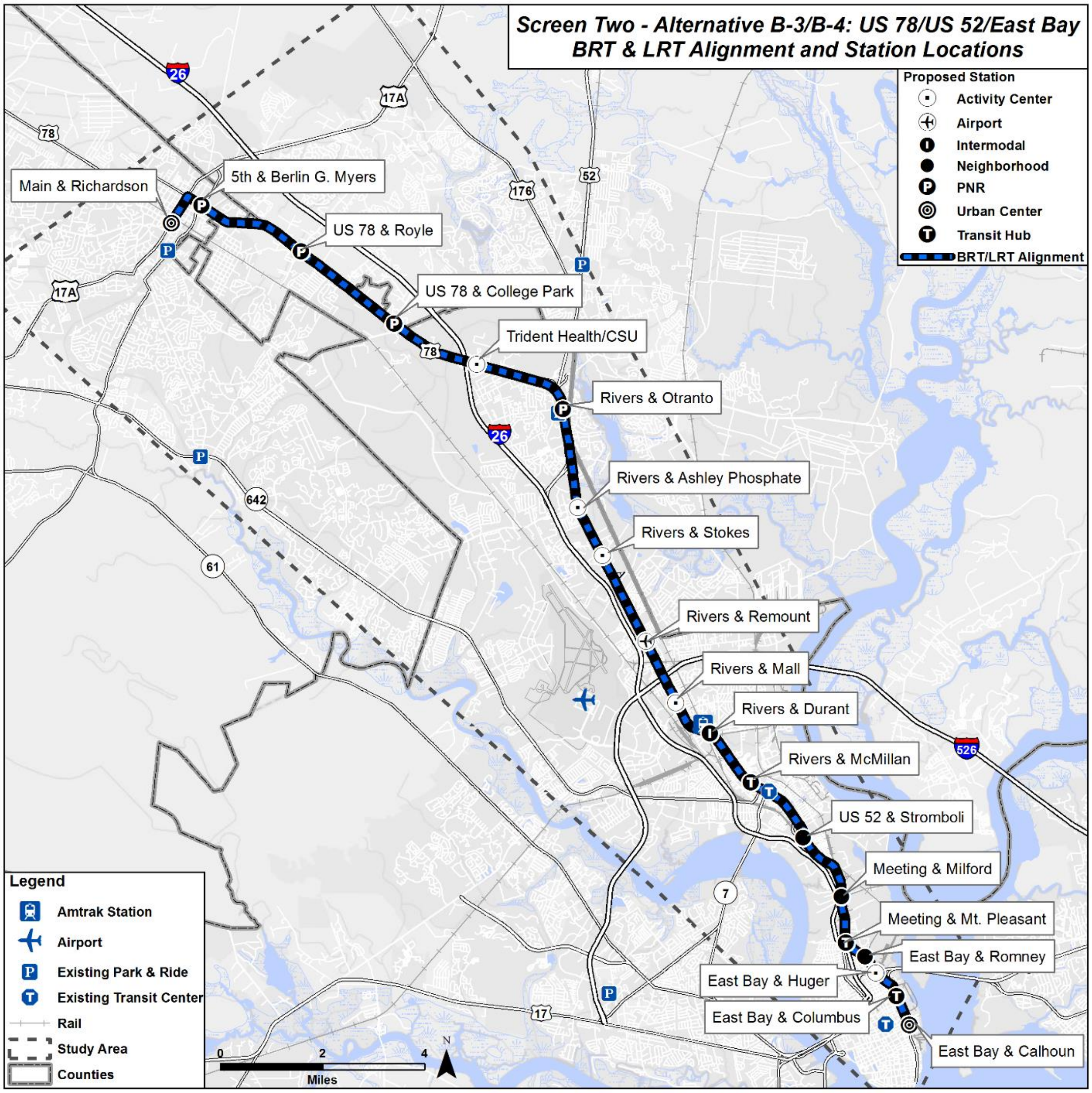

Screen Two - Alternative B-3/B-4: US 78/US 52/East Bay
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
Main & Richardson
5th & Berlin G. Myers
US 78 & Royle
US 78 & College Park
Trident Health/CSU
Rivers & Otranto
Rivers & Ashley Phosphate
Rivers & Stokes
Rivers & Remount
Rivers & Mall
Rivers & Durant
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
East Bay & Romney
East Bay & Huger
East Bay & Columbus
East Bay & Calhoun
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
0
2
4
Miles
N

Figure A - 3

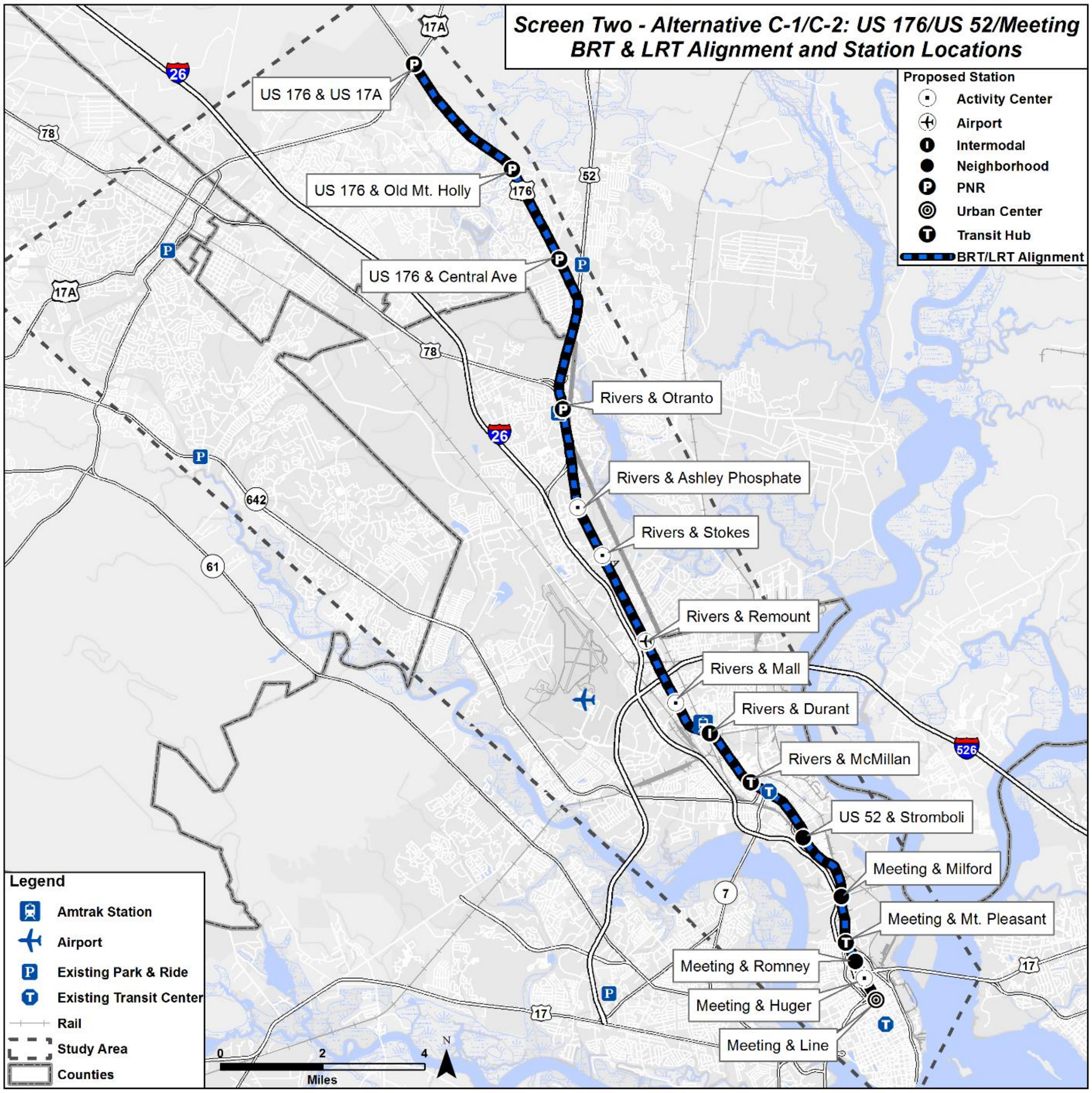

Screen Two - Alternative C-1/C-2: US 176/US 52/Meeting
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
US 176 & US 17A
US 176 & Old Mt. Holly
US 176 & Central Ave
Rivers & Otranto
Rivers & Ashley Phosphate
Rivers & Stokes
Rivers & Remount
Rivers & Mall
Rivers & Durant
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
Meeting & Romney
Meeting & Huger
Meeting & Line
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
0
2
4
Miles
N

Figure A - 4

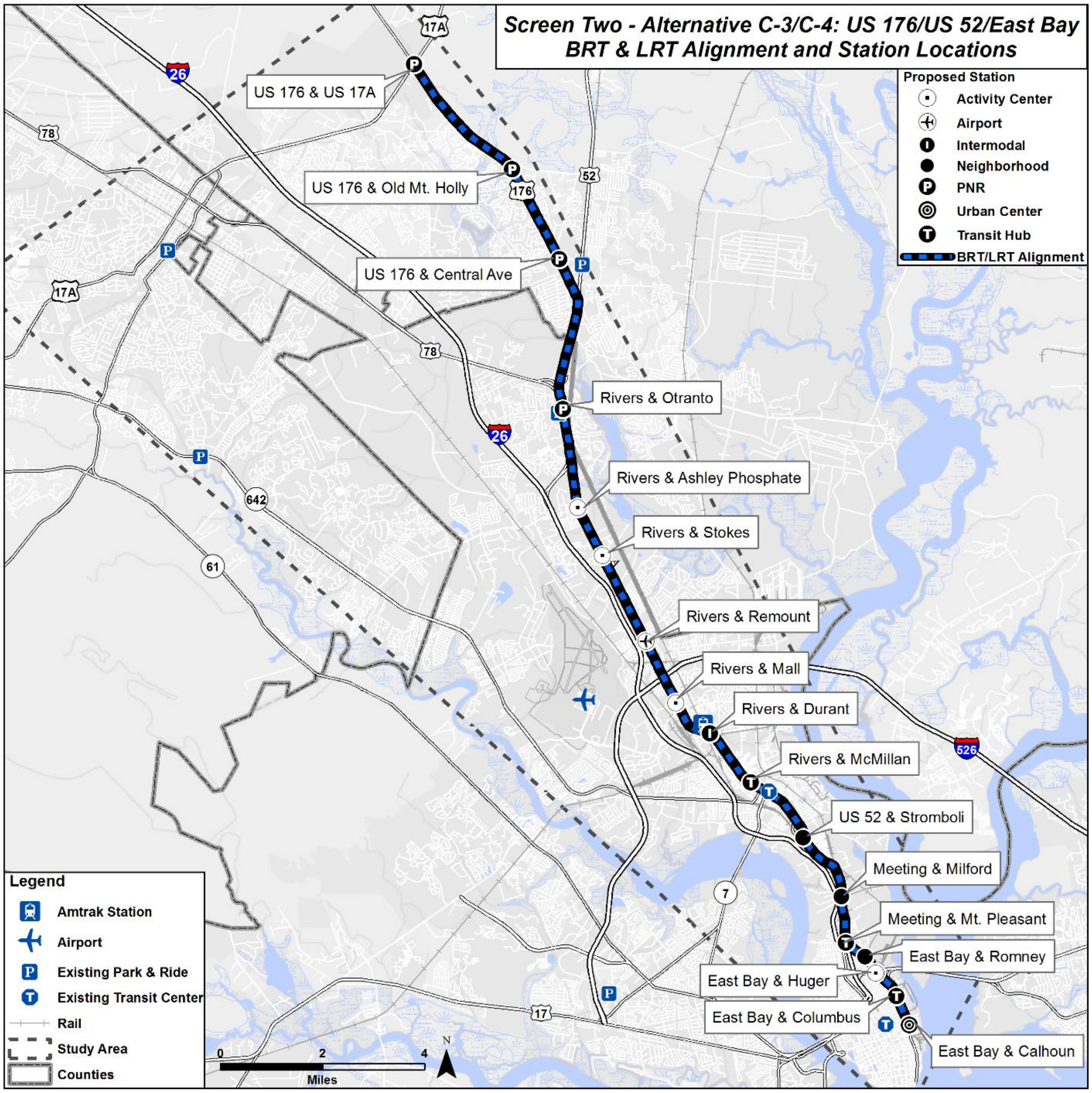

Screen Two - Alternative C-3/C-4: US 176/US 52/East Bay
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
US 176 & US 17A
US 176 & Old Mt. Holly
US 176 & Central Ave
Rivers & Otranto
Rivers & Ashley Phosphate
Rivers & Stokes
Rivers & Remount
Rivers & Mall
Rivers & Durant
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
East Bay & Romney
East Bay & Huger
East Bay & Columbus
East Bay & Calhoun
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
0
2
4
Miles
N

Figure A - 5

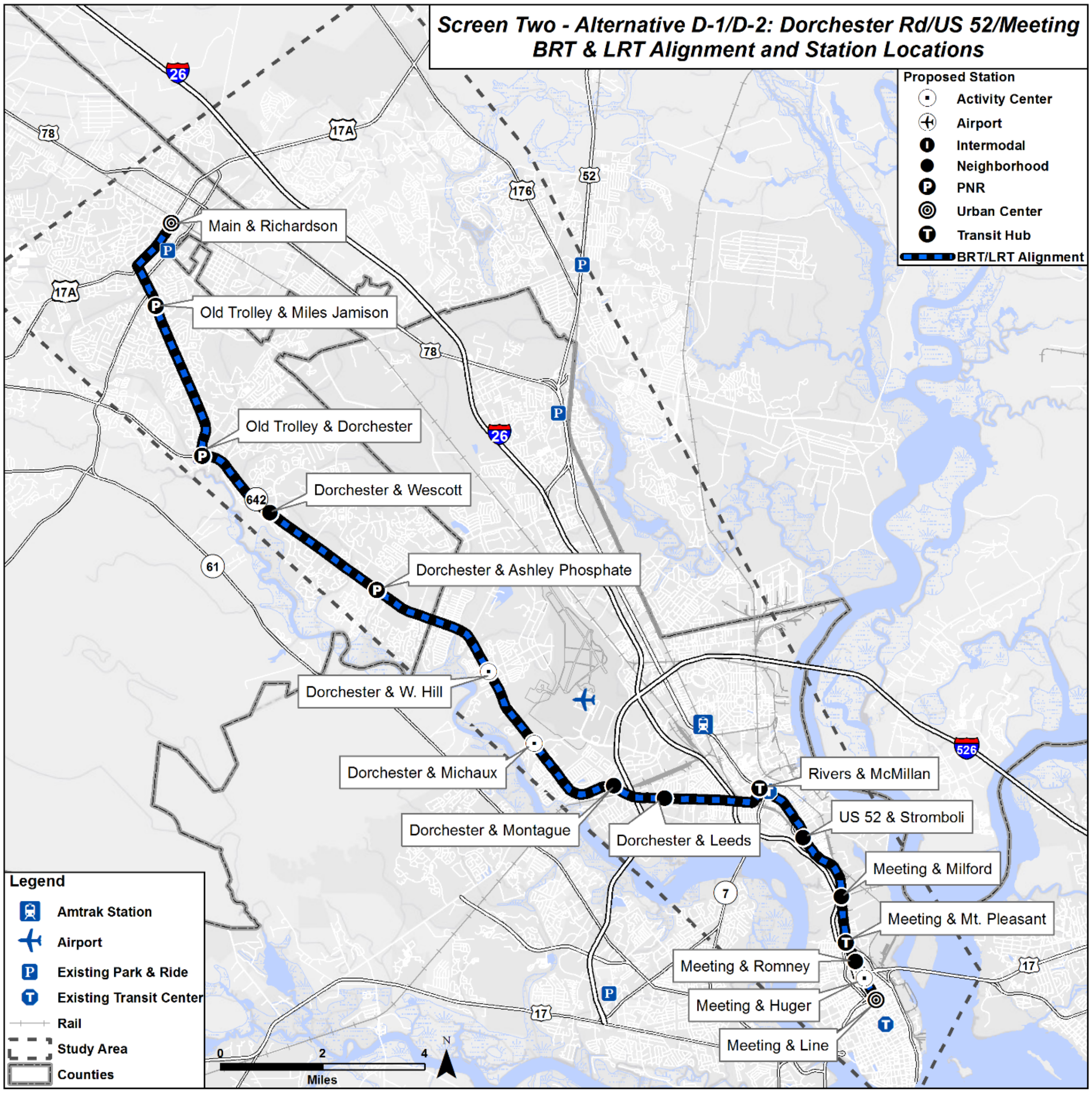
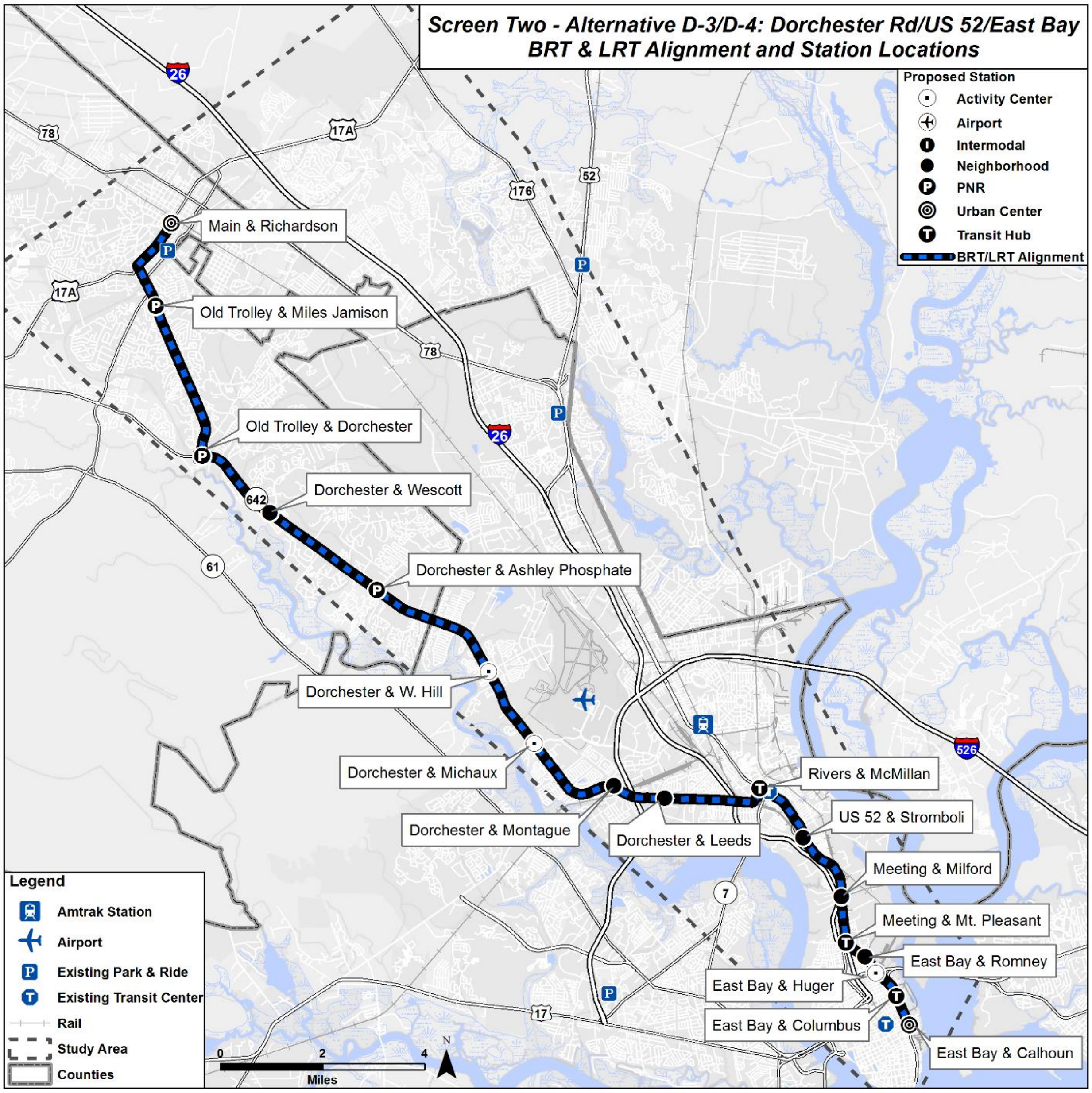

Screen Two - Alternative D-1/D-2: Dorchester Rd/US 52/Meeting
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
Main & Richardson
Old Trolley & Miles Jamison
Old Trolley & Dorchester
Dorchester & Wescott
Dorchester & Ashley Phosphate
Dorchester & W. Hill
Dorchester & Michaux
Dorchester & Montague
Dorchester & Leeds
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
Meeting & Romney
Meeting & Huger
Meeting & Line
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
0
2
4
Miles
N
26
78
17A
52
176
642
61
526
7
17

Figure A - 6


Screen Two - Alternative D-3/D-4: Dorchester Rd/US 52/East Bay
BRT & LRT Alignment and Station Locations
Proposed Station
Activity Center
Airport
Intermodal
Neighborhood
PNR
Urban Center
Transit Hub
BRT/LRT Alignment
Main & Richardson
Old Trolley & Miles Jamison
Old Trolley & Dorchester
Dorchester & Wescott
Dorchester & Ashley Phosphate
Dorchester & W. Hill
Dorchester & Michaux
Dorchester & Montague
Dorchester & Leeds
Rivers & McMillan
US 52 & Stromboli
Meeting & Milford
Meeting & Mt. Pleasant
East Bay & Romney
East Bay & Huger
East Bay & Columbus
East Bay & Calhoun
Legend
Amtrak Station
Airport
Existing Park & Ride
Existing Transit Center
Rail
Study Area
Counties
0
2
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Miles
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Appendix 6-B: Annualization Factor Tables

Draft Report – February 2016

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BRT Annualization Factors

Alternative B-1: US 78/Meeting BRT	Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS (route miles)	***23.1***	***$4,200,000***	***$97,104,000***	***$48,552,000***	***$29,131,200***	***$174,787,200***			***$7,804,235***
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	23.1	$4,200,000	$97,104,000	$48,552,000	$29,131,200	$174,787,200	30	0.0446	$7,804,235
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	***18.0***	***$750,000***	***$13,500,000***	***$6,750,000***	***$4,050,000***	***$24,300,000***			***$648,024***
20.01 Neighborhood Station	6.0	$150,000	$900,000	$450,000	$270,000	$1,620,000	70	0.0267	$43,202
20.02 Transit Node Station	6.0	$300,000	$1,800,000	$900,000	$540,000	$3,240,000	70	0.0267	$86,403
20.04 PNR Ride Station	6.0	$1,800,000	$10,800,000	$5,400,000	$3,240,000	$19,440,000	70	0.0267	$518,419
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	***16.0***	***$1,000,000***	***$16,000,000***	***$8,000,000***	***$4,800,000***	***$28,800,000***			***$509,171***
30.02 Expansion of Maintenance Facility	16.0	$1,000,000	$16,000,000	$8,000,000	$4,800,000	$28,800,000	50	0.0318	$509,171
40 SITEWORK & SPECIAL CONDITIONS	***123422.1***	***$400***	***$49,368,832***	***$24,684,416***	***$14,810,650***	***$88,863,898***			***$1,078,081***
40.01 Sitework (Linear Feet)	123422.1	$400	$49,368,832	$24,684,416	$14,810,650	$88,863,898	125	0.0218	$1,078,081
50 SYSTEMS	***98.0***	***$150,000***	***$14,700,000***	***$7,350,000***	***$4,410,000***	***$26,460,000***			***$656,354***
50.01 Traffic Signal prioritization, crossing protection, etc.	98.0	$150,000	$14,700,000	$7,350,000	$4,410,000	$26,460,000	30	0.0446	$656,354
Construction Subtotal (10 - 50)		***$6,100,400***	***$190,672,832***	***$95,336,416***	***$57,201,850***	***$343,211,098***			***$10,695,865***
60 ROW, LAND, EXISTING IMPROVEMENTS		***$3,050,200***	***$3,050,200***		***$0***	***$3,050,200***			***$66,608***
60.01 Purchase or lease of real estate	1.0	$3,050,200	$3,050,200			$3,050,200	125	0.0218	$66,608
70 VEHICLES (number)	***16.0***	***$800,000***	***$12,800,000***		***$0***	***$12,800,000***			***$1,210,363***
70.04 Bus	16.0	$800,000	$12,800,000		$0	$12,800,000	12	0.0946	$1,210,363
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)			***$95,336,416***						
80.01 Project Dev., Engineering, Project Mgmt, Construction Admin, etc.		50%	$95,336,416						
Subtotal (10 - 80)			***$301,859,448***						
90 UNALLOCATED CONTINGENCY			***$57,201,850***						
Subtotal (10 - 90)			***$359,061,298***	***$95,336,416***	***$57,201,850***	***$359,061,298***			***$11,972,836***

Alternative B-3: US 78/East Bay BRT	Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS (route miles)	***24.3***	***$4,200,000***	***$102,060,000***	***$51,030,000***	***$30,618,000***	***$183,708,000***			***$8,202,548***
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	24.3	$4,200,000	$102,060,000	$51,030,000	$30,618,000	$183,708,000	30	0.0446	$8,202,548
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	***19.0***	***$647,368***	***$12,300,000***	***$6,150,000***	***$3,690,000***	***$22,140,000***			***$590,422***
20.01 Neighborhood Station	6.0	$150,000	$900,000	$450,000	$270,000	$1,620,000	70	0.0267	$43,202
20.02 Transit Node Station	8.0	$300,000	$2,400,000	$1,200,000	$720,000	$4,320,000	70	0.0267	$115,204
20.04 PNR Ride Station	5.0	$1,800,000	$9,000,000	$4,500,000	$2,700,000	$16,200,000	70	0.0267	$432,016
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	***17.0***	***$1,000,000***	***$17,000,000***	***$8,500,000***	***$5,100,000***	***$30,600,000***			***$540,995***
30.02 Expansion of Maintenance Facility	17.0	$1,000,000	$17,000,000	$8,500,000	$5,100,000	$30,600,000	50	0.0318	$540,995
40 SITEWORK & SPECIAL CONDITIONS	***129677.8***	***$400***	***$51,871,112***	***$25,935,556***	***$15,561,334***	***$93,368,002***			***$1,132,724***
40.01 Sitework (Linear Feet)	129677.8	$400	$51,871,112	$25,935,556	$15,561,334	$93,368,002	125	0.0218	$1,132,724
50 SYSTEMS	***100.0***	***$150,000***	***$15,000,000***	***$7,500,000***	***$4,500,000***	***$27,000,000***			***$669,749***
50.01 Traffic Signal prioritization, crossing protection, etc.	100.0	$150,000	$15,000,000	$7,500,000	$4,500,000	$27,000,000	30	0.0446	$669,749
Construction Subtotal (10 - 50)		***$5,997,768***	***$198,231,112***	***$99,115,556***	***$59,469,334***	***$356,816,002***			***$11,136,437***
60 ROW, LAND, EXISTING IMPROVEMENTS		***$2,998,884***	***$2,998,884***		***$0***	***$2,998,884***			***$65,487***
60.01 Purchase or lease of real estate	1.0	$2,998,884	$2,998,884			$2,998,884	125	0.0218	$65,487
70 VEHICLES (number)	***17.0***	***$800,000***	***$13,600,000***		***$0***	***$13,600,000***			***$1,286,011***
70.04 Bus	17.0	$800,000	$13,600,000			$13,600,000	12	0.0946	$1,286,011
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)			***$99,115,556***						
80.01 Project Dev., Engineering, Project Mgmt, Construction Admin, etc.			$99,115,556						
Subtotal (10 - 80)			***$313,945,552***						
90 UNALLOCATED CONTINGENCY			***$59,469,334***						
Subtotal (10 - 90)			***$373,414,886***	***$99,115,556***	***$59,469,334***	***$373,414,886***			***$12,487,935***

Alternative C-1: US 176/Meeting BRT	Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS (route miles)	***22.1***	***$4,200,000***	***$92,652,000***	***$46,326,000***	***$27,795,600***	***$166,773,600***			***$7,446,428***
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	22.1	$4,200,000	$92,652,000	$46,326,000	$27,795,600	$166,773,600	30	0.0446	$7,446,428
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	***16.0***	***$806,250***	***$12,900,000***	***$6,450,000***	***$3,870,000***	***$23,220,000***			***$619,223***
20.01 Neighborhood Station	6.0	$150,000	$900,000	$450,000	$270,000	$1,620,000	70	0.0267	$43,202
20.02 Transit Node Station	4.0	$300,000	$1,200,000	$600,000	$360,000	$2,160,000	70	0.0267	$57,602
20.04 PNR Ride Station	6.0	$1,800,000	$10,800,000	$5,400,000	$3,240,000	$19,440,000	70	0.0267	$518,419
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	***14.0***	***$1,000,000***	***$14,000,000***	***$7,000,000***	***$4,200,000***	***$25,200,000***			***$445,525***
30.02 Expansion of Maintenance Facility	14.0	$1,000,000	$14,000,000	$7,000,000	$4,200,000	$25,200,000	50	0.0318	$445,525
40 SITEWORK & SPECIAL CONDITIONS	***116418.7***	***$400***	***$46,567,496***	***$23,283,748***	***$13,970,249***	***$83,821,493***			***$1,016,908***
40.01 Sitework (Linear Feet)	116418.7	$400	$46,567,496	$23,283,748	$13,970,249	$83,821,493	125	0.0218	$1,016,908
50 SYSTEMS	***83.0***	***$150,000***	***$12,450,000***	***$6,225,000***	***$3,735,000***	***$22,410,000***			***$555,892***
50.01 Traffic Signal prioritization, crossing protection, etc.	83.0	$150,000	$12,450,000	$6,225,000	$3,735,000	$22,410,000	30	0.0446	$555,892
Construction Subtotal (10 - 50)		***$6,156,650***	***$178,569,496***	***$89,284,748***	***$53,570,849***	***$321,425,093***			***$10,083,975***
60 ROW, LAND, EXISTING IMPROVEMENTS		***$3,078,325***	***$3,078,325***		***$0***	***$3,078,325***			***$67,222***
60.01 Purchase or lease of real estate	1.0	$3,078,325	$3,078,325			$3,078,325	125	0.0218	$67,222
70 VEHICLES (number)	***14.0***	***$800,000***	***$11,200,000***		***$0***	***$11,200,000***			***$1,059,067***
70.04 Bus	14.0	$800,000	$11,200,000			$11,200,000	12	0.0946	$1,059,067
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)			***$89,284,748***						
80.01 Project Dev., Engineering, Project Mgmt, Construction Admin, etc.			$89,284,748						
Subtotal (10 - 80)			***$282,132,569***						
90 UNALLOCATED CONTINGENCY			***$53,570,849***						
Subtotal (10 - 90)			***$335,703,418***	***$89,284,748***	***$53,570,849***	***$335,703,418***			***$11,210,265***

Alternative C-3: US 176/East Bay BRT	Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS (route miles)	***23.2***	***$4,200,000***	***$97,608,000***	***$48,804,000***	***$29,282,400***	***$175,694,400***			***$7,844,741***
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	23.2	$4,200,000	$97,608,000	$48,804,000	$29,282,400	$175,694,400	30	0.0446	$7,844,741
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	***17.0***	***$688,235***	***$11,700,000***	***$5,850,000***	***$3,510,000***	***$21,060,000***			***$561,621***
20.01 Neighborhood Station	6.0	$150,000	$900,000	$450,000	$270,000	$1,620,000	70	0.0267	$43,202
20.02 Transit Node Station	6.0	$300,000	$1,800,000	$900,000	$540,000	$3,240,000	70	0.0267	$86,403
20.04 PNR Ride Station	5.0	$1,800,000	$9,000,000	$4,500,000	$2,700,000	$16,200,000	70	0.0267	$432,016
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	***15.0***	***$1,000,000***	***$15,000,000***	***$7,500,000***	***$4,500,000***	***$27,000,000***			***$477,348***
30.02 Expansion of Maintenance Facility	15.0	$1,000,000	$15,000,000	$7,500,000	$4,500,000	$27,000,000	50	0.0318	$477,348
40 SITEWORK & SPECIAL CONDITIONS	***122674.4***	***$400***	***$49,069,772***	***$24,534,886***	***$14,720,932***	***$88,325,590***			***$1,071,551***
40.01 Sitework (Linear Feet)	122674.4	$400	$49,069,772	$24,534,886	$14,720,932	$88,325,590	125	0.0218	$1,071,551
50 SYSTEMS	***86.0***	***$150,000***	***$12,900,000***	***$6,450,000***	***$3,870,000***	***$23,220,000***			***$575,984***
50.01 Traffic Signal prioritization, crossing protection, etc.	86.0	$150,000	$12,900,000	$6,450,000	$3,870,000	$23,220,000	30	0.0446	$575,984
Construction Subtotal (10 - 50)		***$6,038,635***	***$186,277,772***	***$93,138,886***	***$55,883,332***	***$335,299,990***			***$10,531,245***
60 ROW, LAND, EXISTING IMPROVEMENTS		***$3,019,318***	***$3,019,318***		***$0***	***$3,019,318***			***$65,934***
60.01 Purchase or lease of real estate	1.0	$3,019,318	$3,019,318			$3,019,318	125	0.0218	$65,934
70 VEHICLES (number)	***15.0***	***$800,000***	***$12,000,000***		***$0***	***$12,000,000***			***$1,134,715***
70.04 Bus	15.0	$800,000	$12,000,000			$12,000,000	12	0.0946	$1,134,715
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)			***$93,138,886***						
80.01 Project Dev., Engineering, Project Mgmt, Construction Admin, etc.			$93,138,886						
Subtotal (10 - 80)			***$294,435,976***						
90 UNALLOCATED CONTINGENCY			***$55,883,332***						
Subtotal (10 - 90)			***$350,319,307***	***$93,138,886***	***$55,883,332***	***$350,319,307***			***$11,731,894***

Alternative D-1: Dorchester/Meeting BRT	Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS (route miles)	***24.6***	***$4,200,000***	***$103,362,000***	***$51,681,000***	***$31,008,600***	***$186,051,600***			***$8,307,189***
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	24.6	$4,200,000	$103,362,000	$51,681,000	$31,008,600	$186,051,600	30	0.0446	$8,307,189
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	***16.0***	***$590,625***	***$9,450,000***	***$4,725,000***	***$2,835,000***	***$17,010,000***			***$453,617***
20.01 Neighborhood Station	9.0	$150,000	$1,350,000	$675,000	$405,000	$2,430,000	70	0.0267	$64,802
20.02 Transit Node Station	3.0	$300,000	$900,000	$450,000	$270,000	$1,620,000	70	0.0267	$43,202
20.04 PNR Ride Station	4.0	$1,800,000	$7,200,000	$3,600,000	$2,160,000	$12,960,000	70	0.0267	$345,613
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	***17.0***	***$1,000,000***	***$17,000,000***	***$8,500,000***	***$5,100,000***	***$30,600,000***			***$540,995***
30.02 Expansion of Maintenance Facility	17.0	$1,000,000	$17,000,000	$8,500,000	$5,100,000	$30,600,000	50	0.0318	$540,995
40 SITEWORK & SPECIAL CONDITIONS	***129923.8***	***$400***	***$51,969,512***	***$25,984,756***	***$15,590,854***	***$93,545,122***			***$1,134,873***
40.01 Sitework (Linear Feet)	129923.8	$400	$51,969,512	$25,984,756	$15,590,854	$93,545,122	125	0.0218	$1,134,873
50 SYSTEMS	***125.0***	***$150,000***	***$18,750,000***	***$9,375,000***	***$5,625,000***	***$33,750,000***			***$837,186***
50.01 Traffic Signal prioritization, crossing protection, etc.	125.0	$150,000	$18,750,000	$9,375,000	$5,625,000	$33,750,000	30	0.0446	$837,186
Construction Subtotal (10 - 50)		***$5,941,025***	***$200,531,512***	***$100,265,756***	***$60,159,454***	***$360,956,722***			***$11,273,860***
60 ROW, LAND, EXISTING IMPROVEMENTS		***$2,970,513***	***$2,970,513***		***$0***	***$2,970,513***			***$64,868***
60.01 Purchase or lease of real estate	1.0	$2,970,513	$2,970,513			$2,970,513	125	0.0218	$64,868
70 VEHICLES (number)	***17.0***	***$800,000***	***$13,600,000***		***$0***	***$13,600,000***			***$1,286,011***
70.04 Bus	17.0	$800,000	$13,600,000			$13,600,000	12	0.0946	$1,286,011
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)			***$100,265,756***						
80.01 Project Dev., Engineering, Project Mgmt, Construction Admin, etc.			$100,265,756						
Subtotal (10 - 80)			***$317,367,781***						
90 UNALLOCATED CONTINGENCY			***$60,159,454***						
Subtotal (10 - 90)			***$377,527,234***	***$100,265,756***	***$60,159,454***	***$377,527,234***			***$12,624,738***

Alternative D-3: Dorchester/East Bay BRT		Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS (route miles)		***25.8***	***$4,200,000***	***$108,318,000***	***$54,159,000***	***$32,495,400***	***$194,972,400***			***$8,705,503***
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	25.8	$4,200,000	$108,318,000	$54,159,000	$32,495,400	$194,972,400	30	0.0446	$8,705,503
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)		***17.0***	***$485,294***	***$8,250,000***	***$4,125,000***	***$2,475,000***	***$14,850,000***			***$396,015***
20.01	Neighborhood Station	9.0	$150,000	$1,350,000	$675,000	$405,000	$2,430,000	70	0.0267	$64,802
20.02	Transit Node Station	5.0	$300,000	$1,500,000	$750,000	$450,000	$2,700,000	70	0.0267	$72,003
20.04	PNR Ride Station	3.0	$1,800,000	$5,400,000	$2,700,000	$1,620,000	$9,720,000	70	0.0267	$259,210
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		***18.0***	***$1,000,000***	***$18,000,000***	***$9,000,000***	***$5,400,000***	***$32,400,000***			***$572,818***
30.02	Expansion of Maintenance Facility	18.0	$1,000,000	$18,000,000	$9,000,000	$5,400,000	$32,400,000	50	0.0318	$572,818
40 SITEWORK & SPECIAL CONDITIONS		***136179.5***	***$400***	***$54,471,792***	***$27,235,896***	***$16,341,538***	***$98,049,226***			***$1,189,516***
40.01	Sitework (Linear Feet)	136179.5	$400	$54,471,792	$27,235,896	$16,341,538	$98,049,226	125	0.0218	$1,189,516
50 SYSTEMS		***128.0***	***$150,000***	***$19,200,000***	***$9,600,000***	***$5,760,000***	***$34,560,000***			***$857,279***
50.01	Traffic Signal prioritization, crossing protection, etc.	128.0	$150,000	$19,200,000	$9,600,000	$5,760,000	$34,560,000	30	0.0446	$857,279
Construction Subtotal (10 - 50)			***$5,835,694***	***$208,239,792***	***$104,119,896***	***$62,471,938***	***$374,831,626***			***$11,721,130***
60 ROW, LAND, EXISTING IMPROVEMENTS			***$2,917,847***	***$2,917,847***		***$0***	***$2,917,847***			***$63,718***
60.01	Purchase or lease of real estate	1.0	$2,917,847	$2,917,847			$2,917,847	125	0.0218	$63,718
70 VEHICLES (number)		***18.0***	***$800,000***	***$14,400,000***		***$0***	***$14,400,000***			***$1,361,658***
70.04	Bus	18.0	$800,000	$14,400,000			$14,400,000	12	0.0946	$1,361,658
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)				***$104,119,896***						
80.01	Project Dev., Engineering, Project Mgmt, Construction Admin, etc.			$104,119,896						
Subtotal (10 - 80)				***$329,677,535***						
90 UNALLOCATED CONTINGENCY				***$62,471,938***						
Subtotal (10 - 90)				***$392,149,473***	***$104,119,896***	***$62,471,938***	***$392,149,473***			***$13,146,506***

LRT Annualization Factors

Alternative B-2: US 78/Meeting LRT		Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS		***93493.5***	***$8,246***	***$770,954,242***	***$385,477,121***	***$231,286,272***	***$1,387,717,635***			***$62,334,423***
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	93493.5	$4,500	$420,720,750	$210,360,375	$126,216,225	$757,297,350	30	0.0446	$33,813,268
10.03	Guideway: At-grade in mixed traffic	13433.6	$2,700	$36,270,585	$18,135,293	$10,881,176	$65,287,053	20	0.0612	$3,995,568
10.04	Guideway: Aerial structure	16342.7	$9,500	$155,255,650	$77,627,825	$46,576,695	$279,460,170	80	0.0252	$7,042,396
10.11	Track: Embedded	244165.0	$650	$158,707,257	$79,353,628	$47,612,177	$285,673,062	20	0.0612	$17,483,191
20 STATIONS, STOPS, TERMINALS, INTERMODAL		***18.0***	***$4,000,000***	***$72,000,000***	***$36,000,000***	***$21,600,000***	***$129,600,000***			***$3,456,127***
20.01	At-grade station stop, shelter, mall terminal, platform	18.0	$4,000,000	$72,000,000	$36,000,000	$21,600,000	$129,600,000	70	0.0267	$3,456,127
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		***15.0***	***$2,200,000***	***$33,000,000***	***$16,500,000***	***$9,900,000***	***$59,400,000***			***$1,050,166***
30.03	Heavy Maintenance Facility & Storage Yard	15.0	$2,200,000	$33,000,000	$16,500,000	$9,900,000	$59,400,000	50	0.0318	$1,050,166
40 SITEWORK & SPECIAL CONDITIONS		***123269.8***	***$420***	***$51,773,295***	***$25,886,648***	***$15,531,989***	***$93,191,931***			***$1,130,588***
40.01	Sitework	123269.8	$420	$51,773,295	$25,886,648	$15,531,989	$93,191,931	125	0.0218	$1,130,588
50 SYSTEMS		***244165.0***	***$750***	***$183,123,758***	***$91,561,879***	***$54,937,127***	***$329,622,764***			***$8,176,462***
50.01	Train control & signals, traction power, communications, etc.	244165.0	$750	$183,123,758	$91,561,879	$54,937,127	$329,622,764	30	0.0446	$8,176,462
Construction Subtotal (10 - 50)			***$6,209,416***	***$1,110,851,294***	***$555,425,647***	***$333,255,388***	***$1,999,532,329***			***$76,147,766***
60 ROW, LAND, EXISTING IMPROVEMENTS			***$3,104,708***	***$3,104,708***		***$0***	***$3,104,708***			***$67,798***
60.01	Purchase or lease of real estate, relocations	1.0	$3,104,708	$3,104,708			$3,104,708	125	0.0218	$67,798
70 VEHICLES (number)		***15.0***	***$5,000,000***	***$75,000,000***		***$0***	***$75,000,000***			***$7,091,970***
70.01	Light Rail	15.0	$5,000,000	$75,000,000		$0	$75,000,000	12	0.0946	$7,091,970
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)				***$555,425,647***						
80.01	Project Dev., Engineering, Project Mgmt, Construction Admin, etc.			$555,425,647						
Subtotal (10 - 80)				***$1,744,381,649***						
90 UNALLOCATED CONTINGENCY				***$333,255,388***						
Subtotal (10 - 90)				***$2,077,637,037***	***$555,425,647***	***$333,255,388***	***$2,077,637,037***			***$83,307,534***

Alternative B-4: US 78/East Bay LRT		Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS		***101253.5***	***$7,979***	***$807,889,956***	***$403,944,978***	***$242,366,987***	***$1,454,201,921***			***$65,362,990***
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	101253.5	$4,500	$455,640,750	$227,820,375	$136,692,225	$820,153,350	30	0.0446	$36,619,783
10.03	Guideway: At-grade in mixed traffic	11929.3	$2,700	$32,208,975	$16,104,488	$9,662,693	$57,976,155	20	0.0612	$3,548,141
10.04	Guideway: Aerial structure	16342.7	$9,500	$155,255,650	$77,627,825	$46,576,695	$279,460,170	80	0.0252	$7,042,396
10.11	Track: Embedded	253514.7	$650	$164,784,581	$82,392,291	$49,435,374	$296,612,246	20	0.0612	$18,152,669
20 STATIONS, STOPS, TERMINALS, INTERMODAL		***19.0***	***$4,000,000***	***$76,000,000***	***$38,000,000***	***$22,800,000***	***$136,800,000***			***$3,648,134***
20.01	At-grade station stop, shelter, mall terminal, platform	19.0	$4,000,000	$76,000,000	$38,000,000	$22,800,000	$136,800,000	70	0.0267	$3,648,134
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		***16.0***	***$2,200,000***	***$35,200,000***	***$17,600,000***	***$10,560,000***	***$63,360,000***			***$1,120,177***
30.03	Heavy Maintenance Facility & Storage Yard	16.0	$2,200,000	$35,200,000	$17,600,000	$10,560,000	$63,360,000	50	0.0318	$1,120,177
40 SITEWORK & SPECIAL CONDITIONS		***129507.6***	***$420***	***$54,393,179***	***$27,196,590***	***$16,317,954***	***$97,907,723***			***$1,187,800***
40.01	Sitework	129507.6	$420	$54,393,179	$27,196,590	$16,317,954	$97,907,723	125	0.0218	$1,187,800
50 SYSTEMS		***253514.7***	***$750***	***$190,136,055***	***$95,068,028***	***$57,040,817***	***$342,244,899***			***$8,489,560***
50.01	Train control & signals, traction power, communications, etc.	253514.7	$750	$190,136,055	$95,068,028	$57,040,817	$342,244,899	30	0.0446	$8,489,560
Construction Subtotal (10 - 50)			***$6,209,149***	***$1,163,619,190***	***$581,809,595***	***$349,085,757***	***$2,094,514,543***			***$79,808,661***
60 ROW, LAND, EXISTING IMPROVEMENTS			***$3,104,574***	***$3,104,574***		***$0***	***$3,104,574***			***$67,795***
60.01	Purchase or lease of real estate, relocations	1.0	$3,104,574	$3,104,574			$3,104,574	125	0.0218	$67,795
70 VEHICLES (number)		***16.0***	***$5,000,000***	***$80,000,000***		***$0***	***$80,000,000***			***$7,564,768***
70.01	Light Rail	16.0	$5,000,000	$80,000,000		$0	$80,000,000	12	0.0946	$7,564,768
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)				***$581,809,595***						
80.01	Project Dev., Engineering, Project Mgmt, Construction Admin, etc.			$581,809,595						
Subtotal (10 - 80)				***$1,828,533,360***						
90 UNALLOCATED CONTINGENCY				***$349,085,757***						
Subtotal (10 - 90)				***$2,177,619,117***	***$581,809,595***	***$349,085,757***	***$2,177,619,117***			***$87,441,224***

Alternative C-2: US 176/Meeting LRT		Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS		***93214.7***	***$7,957***	***$741,745,309***	***$370,872,655***	***$222,523,593***	***$1,335,141,556***			***$59,154,142***
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	93214.7	$4,500	$419,466,150	$209,733,075	$125,839,845	$755,039,070	30	0.0446	$33,712,436
10.03	Guideway: At-grade in mixed traffic	6691.0	$2,700	$18,065,700	$9,032,850	$5,419,710	$32,518,260	20	0.0612	$1,990,118
10.04	Guideway: Aerial structure	16342.7	$9,500	$155,255,650	$77,627,825	$46,576,695	$279,460,170	80	0.0252	$7,042,396
10.11	Track: Embedded	229165.9	$650	$148,957,809	$74,478,905	$44,687,343	$268,124,056	20	0.0612	$16,409,192
20 STATIONS, STOPS, TERMINALS, INTERMODAL		***16.0***	***$4,000,000***	***$64,000,000***	***$32,000,000***	***$19,200,000***	***$115,200,000***			***$3,072,113***
20.01	At-grade station stop, shelter, mall terminal, platform	16.0	$4,000,000	$64,000,000	$32,000,000	$19,200,000	$115,200,000	70	0.0267	$3,072,113
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		***14.0***	***$2,200,000***	***$30,800,000***	***$15,400,000***	***$9,240,000***	***$55,440,000***			***$980,155***
30.03	Heavy Maintenance Facility & Storage Yard	14.0	$2,200,000	$30,800,000	$15,400,000	$9,240,000	$55,440,000	50	0.0318	$980,155
40 SITEWORK & SPECIAL CONDITIONS		***116248.5***	***$420***	***$48,824,378***	***$24,412,189***	***$14,647,314***	***$87,883,881***			***$1,066,192***
40.01	Sitework	116248.5	$420	$48,824,378	$24,412,189	$14,647,314	$87,883,881	125	0.0218	$1,066,192
50 SYSTEMS		***229165.9***	***$750***	***$171,874,395***	***$85,937,198***	***$51,562,319***	***$309,373,911***			***$7,674,178***
50.01	Train control & signals, traction power, communications, etc.	229165.9	$750	$171,874,395	$85,937,198	$51,562,319	$309,373,911	30	0.0446	$7,674,178
Construction Subtotal (10 - 50)			***$6,209,127***	***$1,057,244,082***	***$528,622,041***	***$317,173,225***	***$1,903,039,348***			***$71,946,780***
60 ROW, LAND, EXISTING IMPROVEMENTS			***$3,104,564***	***$3,104,564***		***$0***	***$3,104,564***			***$67,795***
60.01	Purchase or lease of real estate, relocations	1.0	$3,104,564	$3,104,564			$3,104,564	125	0.0218	$67,795
70 VEHICLES (number)		***14.0***	***$5,000,000***	***$70,000,000***		***$0***	***$70,000,000***			***$6,619,172***
70.01	Light Rail	14.0	$5,000,000	$70,000,000		$0	$70,000,000	12	0.0946	$6,619,172
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)				***$528,622,041***						
80.01	Project Dev., Engineering, Project Mgmt, Construction Admin, etc.			$528,622,041						
Subtotal (10 - 80)				***$1,658,970,687***						
90 UNALLOCATED CONTINGENCY				***$317,173,225***						
Subtotal (10 - 90)				***$1,976,143,912***	***$528,622,041***	***$317,173,225***	***$1,976,143,912***			***$78,633,747***

Alternative C-4: US 176/East Bay LRT		Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS		***100974.7***	***$7,712***	***$778,681,104***	***$389,340,552***	***$233,604,331***	***$1,401,625,986***			***$62,182,717***
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)	100974.7	$4,500	$454,386,150	$227,193,075	$136,315,845	$817,895,070	30	0.0446	$36,518,951
10.03	Guideway: At-grade in mixed traffic	5186.7	$2,700	$14,004,144	$7,002,072	$4,201,243	$25,207,459	20	0.0612	$1,542,697
10.04	Guideway: Aerial structure	16342.7	$9,500	$155,255,650	$77,627,825	$46,576,695	$279,460,170	80	0.0252	$7,042,396
10.11	Track: Embedded	238515.6	$650	$155,035,160	$77,517,580	$46,510,548	$279,063,287	20	0.0612	$17,078,673
20 STATIONS, STOPS, TERMINALS, INTERMODAL		***17.0***	***$4,000,000***	***$68,000,000***	***$34,000,000***	***$20,400,000***	***$122,400,000***			***$3,264,120***
20.01	At-grade station stop, shelter, mall terminal, platform	17.0	$4,000,000	$68,000,000	$34,000,000	$20,400,000	$122,400,000	70	0.0267	$3,264,120
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS		***15.0***	***$2,200,000***	***$33,000,000***	***$16,500,000***	***$9,900,000***	***$59,400,000***			***$1,050,166***
30.03	Heavy Maintenance Facility & Storage Yard	15.0	$2,200,000	$33,000,000	$16,500,000	$9,900,000	$59,400,000	50	0.0318	$1,050,166
40 SITEWORK & SPECIAL CONDITIONS		***122504.2***	***$420***	***$51,451,772***	***$25,725,886***	***$15,435,532***	***$92,613,190***			***$1,123,567***
40.01	Sitework	122504.2	$420	$51,451,772	$25,725,886	$15,435,532	$92,613,190	125	0.0218	$1,123,567
50 SYSTEMS		***238515.6***	***$750***	***$178,886,723***	***$89,443,361***	***$53,666,017***	***$321,996,101***			***$7,987,278***
50.01	Train control & signals, traction power, communications, etc.	238515.6	$750	$178,886,723	$89,443,361	$53,666,017	$321,996,101	30	0.0446	$7,987,278
Construction Subtotal (10 - 50)			***$6,208,882***	***$1,110,019,598***	***$555,009,799***	***$333,005,880***	***$1,998,035,277***			***$75,607,849***
60 ROW, LAND, EXISTING IMPROVEMENTS			***$3,104,441***	***$3,104,441***		***$0***	***$3,104,441***			***$67,793***
60.01	Purchase or lease of real estate, relocations	1.0	$3,104,441	$3,104,441			$3,104,441	125	0.0218	$67,793
70 VEHICLES (number)		***15.0***	***$5,000,000***	***$75,000,000***		***$0***	***$75,000,000***			***$7,091,970***
70.01	Light Rail	15.0	$5,000,000	$75,000,000		$0	$75,000,000	12	0.0946	$7,091,970
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)				***$555,009,799***						
80.01	Project Dev., Engineering, Project Mgmt, Construction Admin, etc.			$555,009,799						
Subtotal (10 - 80)				***$1,743,133,838***						
90 UNALLOCATED CONTINGENCY				***$333,005,880***						
Subtotal (10 - 90)				***$2,076,139,718***	***$555,009,799***	***$333,005,880***	***$2,076,139,718***			***$82,767,611***

Alternative D-2: Dorchester/Meeting LRT	Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS	***97076.1***	***$8,276***	***$803,397,019***	***$401,698,509***	***$241,019,106***	***$1,446,114,633***			***$65,428,049***
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	97076.1	$4,500	$436,842,540	$218,421,270	$131,052,762	$786,316,572	30	0.0446	$35,108,974
10.03 Guideway: At-grade in mixed traffic	16334.7	$2,700	$44,103,690	$22,051,845	$13,231,107	$79,386,642	20	0.0612	$4,858,462
10.04 Guideway: Aerial structure	16342.7	$9,500	$155,255,650	$77,627,825	$46,576,695	$279,460,170	80	0.0252	$7,042,396
10.11 Track: Embedded	257223.3	$650	$167,195,139	$83,597,569	$50,158,542	$300,951,249	20	0.0612	$18,418,216
20 STATIONS, STOPS, TERMINALS, INTERMODAL	***16.0***	***$4,000,000***	***$64,000,000***	***$32,000,000***	***$19,200,000***	***$115,200,000***			***$3,072,113***
20.01 At-grade station stop, shelter, mall terminal, platform	16.0	$4,000,000	$64,000,000	$32,000,000	$19,200,000	$115,200,000	70	0.0267	$3,072,113
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	***16.0***	***$2,200,000***	***$35,200,000***	***$17,600,000***	***$10,560,000***	***$63,360,000***			***$1,120,177***
30.03 Heavy Maintenance Facility & Storage Yard	16.0	$2,200,000	$35,200,000	$17,600,000	$10,560,000	$63,360,000	50	0.0318	$1,120,177
40 SITEWORK & SPECIAL CONDITIONS	***129753.6***	***$420***	***$54,496,499***	***$27,248,250***	***$16,348,950***	***$98,093,699***			***$1,190,056***
40.01 Sitework	129753.6	$420	$54,496,499	$27,248,250	$16,348,950	$98,093,699	125	0.0218	$1,190,056
50 SYSTEMS	***257223.3***	***$750***	***$192,917,468***	***$96,458,734***	***$57,875,240***	***$347,251,442***			***$8,613,750***
50.01 Train control & signals, traction power, communications, etc.	257223.3	$750	$192,917,468	$96,458,734	$57,875,240	$347,251,442	30	0.0446	$8,613,750
Construction Subtotal (10 - 50)		***$6,209,446***	***$1,150,010,985***	***$575,005,493***	***$345,003,296***	***$2,070,019,774***			***$79,424,145***
60 ROW, LAND, EXISTING IMPROVEMENTS		***$3,104,723***	***$3,104,723***		***$0***	***$3,104,723***			***$67,799***
60.01 Purchase or lease of real estate, relocations	1.0	$3,104,723	$3,104,723			$3,104,723	125	0.0218	$67,799
70 VEHICLES (number)	***16.0***	***$5,000,000***	***$80,000,000***		***$0***	***$80,000,000***			***$7,564,768***
70.01 Light Rail	16.0	$5,000,000	$80,000,000		$0	$80,000,000	12	0.0946	$7,564,768
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)			***$575,005,493***						
80.01 Project Dev., Engineering, Project Mgmt, Construction Admin, etc.			$575,005,493						
Subtotal (10 - 80)			***$1,808,121,201***						
90 UNALLOCATED CONTINGENCY			***$345,003,296***						
Subtotal (10 - 90)			***$2,153,124,497***	***$575,005,493***	***$345,003,296***	***$2,153,124,497***			***$87,056,711***

Alternative D-4: Dorchester/Eastbay LRT	Quantity	Cost per QTY	Total Base Year Dollars	Professional Service Spread	Unallocated Contingency	Revised Total Base Year Dollars	Years of Useful Life	Annualization Factor (2%)	Annualized Cost
10 GUIDEWAY & TRACK ELEMENTS	***104836.1***	***$8,016***	***$840,332,813***	***$420,166,407***	***$252,099,844***	***$1,512,599,063***			***$68,456,625***
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	104836.1	$4,500	$471,762,540	$235,881,270	$141,528,762	$849,172,572	30	0.0446	$37,915,489
10.03 Guideway: At-grade in mixed traffic	14830.4	$2,700	$40,042,134	$20,021,067	$12,012,640	$72,075,841	20	0.0612	$4,411,041
10.04 Guideway: Aerial structure	16342.7	$9,500	$155,255,650	$77,627,825	$46,576,695	$279,460,170	80	0.0252	$7,042,396
10.11 Track: Embedded	266573.1	$650	$173,272,489	$86,636,245	$51,981,747	$311,890,480	20	0.0612	$19,087,697
20 STATIONS, STOPS, TERMINALS, INTERMODAL	***17.0***	***$4,000,000***	***$68,000,000***	***$34,000,000***	***$20,400,000***	***$122,400,000***			***$3,264,120***
20.01 At-grade station stop, shelter, mall terminal, platform	17.0	$4,000,000	$68,000,000	$34,000,000	$20,400,000	$122,400,000	70	0.0267	$3,264,120
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	***17.0***	***$2,200,000***	***$37,400,000***	***$18,700,000***	***$11,220,000***	***$67,320,000***			***$1,190,188***
30.03 Heavy Maintenance Facility & Storage Yard	17.0	$2,200,000	$37,400,000	$18,700,000	$11,220,000	$67,320,000	50	0.0318	$1,190,188
40 SITEWORK & SPECIAL CONDITIONS	***136009.3***	***$420***	***$57,123,893***	***$28,561,947***	***$17,137,168***	***$102,823,008***			***$1,247,431***
40.01 Sitework	136009.3	$420	$57,123,893	$28,561,947	$17,137,168	$102,823,008	125	0.0218	$1,247,431
50 SYSTEMS	***266573.1***	***$750***	***$199,929,795***	***$99,964,898***	***$59,978,939***	***$359,873,631***			***$8,926,850***
50.01 Train control & signals, traction power, communications, etc.	266573.1	$750	$199,929,795	$99,964,898	$59,978,939	$359,873,631	30	0.0446	$8,926,850
Construction Subtotal (10 - 50)		***$6,209,186***	***$1,202,786,501***	***$601,393,251***	***$360,835,950***	***$2,165,015,703***			***$83,085,213***
60 ROW, LAND, EXISTING IMPROVEMENTS		***$3,104,593***	***$3,104,593***		***$0***	***$3,104,593***			***$67,796***
60.01 Purchase or lease of real estate, relocations	1.0	$3,104,593	$3,104,593			$3,104,593	125	0.0218	$67,796
70 VEHICLES (number)	***17.0***	***$5,000,000***	***$85,000,000***		***$0***	***$85,000,000***			***$8,037,566***
70.01 Light Rail	17.0	$5,000,000	$85,000,000		$0	$85,000,000	12	0.0946	$8,037,566
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)			***$601,393,251***						
80.01 Project Dev., Engineering, Project Mgmt, Construction Admin, etc.			$601,393,251						
Subtotal (10 - 80)			***$1,892,284,345***						
90 UNALLOCATED CONTINGENCY			***$360,835,950***						
Subtotal (10 - 90)			***$2,253,120,295***	***$601,393,251***	***$360,835,950***	***$2,253,120,295***			***$91,190,575***

Appendix 6-C: Travel Demand Forecasting Report

Draft Report – February 2016

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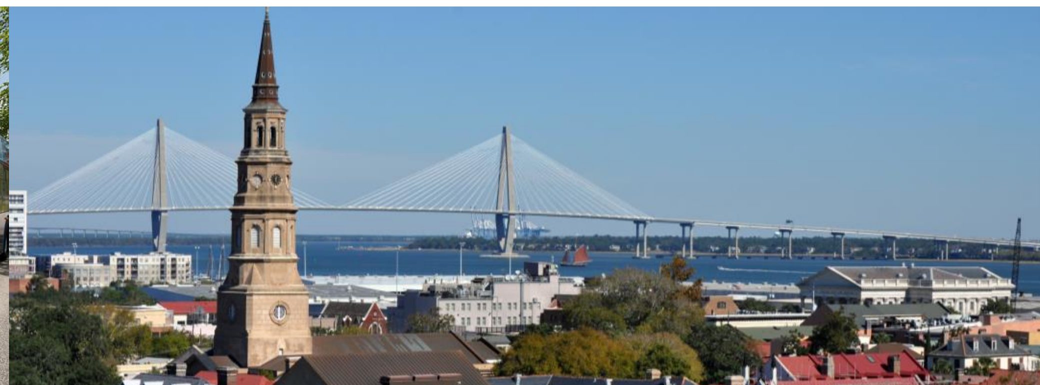
RIDERSHIP METHODOLOGY AND RESULTS REPORT

I-26 ALTERNATIVES ANALYSIS

12.14.2015



PREPARED FOR:
BERKELEY-CHARLESTON-DORCHESTER COUNCIL OF GOVERNMENTS

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1.0 INTRODUCTION

The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) initiated the I-26 Regional Fixed Guideway Transit Alternatives Analysis (i-26ALT) to improve transit options for residents and businesses along the I-26 corridor. The purpose of this analysis is to improve transit service and enhance regional mobility along the I-26 corridor connecting Summerville, North Charleston, and Charleston in South Carolina.

As part of this project, a two-stage screening process was used to identify potential transit alternatives and then select thirteen alternatives for more detailed analysis. Part of the evaluation process includes an assessment of the ridership potential for each of the surviving transit alternatives. This report describes the forecasting methodology and resulting ridership forecasts for each Stage 2 screen alternative.

2.0 OVERVIEW OF APPROACH

Ridership forecasts for the I-26 Regional Fixed Guideway Transit Alternatives Analysis were prepared using Version 1.51[1] of FTA's Simplified Trips-On-Project Software (STOPS). This tool estimates transit project ridership using a streamlined set of procedures that combine data on trip-making from the Census Transportation Planning Package and transit surveys with demand models that represent demographic growth and changes in mode share. Key elements of STOPS include:

1- Estimates of total origin-to-destination travel that are derived from Census Journey-to-Work data

2- Representations of transit levels-of-service that are derived directly from published timetable information

3- Self-calibration to match current ridership count data for individual geographic subareas within the region

For the I-26 Alternatives Analysis, STOPS was calibrated to match 2014 conditions and applied to forecast transit ridership for each alternative for two horizon years--2015 and 2035. Key input information for the I-26 implementation of STOPS includes:

- BCDCOG model forecasts of population and employment by Traffic Analysis Zone (TAZ) for 2010 and 2035 (and interpolated to 2014 and 2015).
- Year 2000 work trip-making by all persons using all modes of transportation obtained from the Year 2000 Census Transportation Planning Package (CTPP) Journey-to-Work (JTW) flows.
- Highway travel times and costs obtained from the BCDCOG regional forecasting model for 2010 and 2035.
- Transit schedule data provided by the Charleston Area Regional Transportation Authority (CARTA) in General Transit Feed Specification (GTFS) format.
- Year 2000 transit mode shares from the Census Journey-to-Work.
- Transit boardings by station, stop, and route for the Charleston area developed from a 2014 survey of ridership.

STOPS uses this information to:

1- Estimate the calibration year, opening year, and horizon year all-mode person travel by factoring the 2000 CTPP using zone-level estimates of population and employment.

[1] Released July 2015

2- Estimate zone-to-zone travel times by reading each transit schedule and finding the best origin-to-destination path for each of the following conditions:

    a. Access mode: walk access, kiss-ride access, and park-ride access

    b. Path type: fixed guideway (e.g., Light Rail Transit [LRT] or Bus Rapid Transit [BRT]) only, bus-only, and fixed guideway and bus together on the same trip

    c. Time of day: AM peak and midday

    d. Scenario: calibration year, no-build, and build (Alternatives B-1 to D-4)

    e. Year: 2014, 2015, and 2035

3- Estimate Year 2014 mode shares and transit ridership by station and route and then adjust the model parameters to match both CTPP mode shares and current year counts.

4- Estimate scenario ridership for 2015 and 2035 using the model calibrated in the previous steps and transit travel times for each scenario and each year.

The next section describes how the model was implemented for Charleston, South Carolina. Section 4 presents STOPS calibration results for the Year 2014 and compares these results to observed values to confirm the performance of the model. I-26 transit alternatives are described in Section 5. Section 6 presents estimated ridership and other key statistics for each alternative in 2015 and 2035.

The report also contains two appendices. Appendix I (Section 7) presents a brief description of the STOPS model. Appendix II (Section 8) presents additional information on each alternative including a map and detailed ridership results including linked transit trips by purpose, mode-of-access, and auto ownership; linked project trips by purpose, mode-of-access, and auto ownership; and station boardings by mode of access.

3.0 STOPS IMPLEMENTATION FOR THE CHARLESTON AREA

This section describes the key assumptions that were used to configure STOPS to forecast ridership for the I-26 corridor. These assumptions represent the conditions expected in the corridor independent of whether or not the project is constructed. Alternative-specific assumptions (i.e., different service assumptions associated with each alternative) are described Section 5, Definition of Alternatives.

3.1 | GEOGRAPHIC SCOPE OF ANALYSIS

STOPS uses the census geography coded in the 2000 CTPP for most processing. The geographic scope of the analysis includes all of Charleston County and the southern parts of Berkeley and Dorchester Counties that are included in the BCDCOG travel demand forecasting model. This area system includes nearly all transit trips made in the greater Charleston, SC area.

STOPS uses aggregations of census geography (known as "districts") for calibration and reporting. Figure 1 presents the districts defined in STOPS for the entire region and Figure 2 shows a detailed view of the district definition in the I-26 corridor. These district definitions are similar to the districts defined in the BCDCOG model.

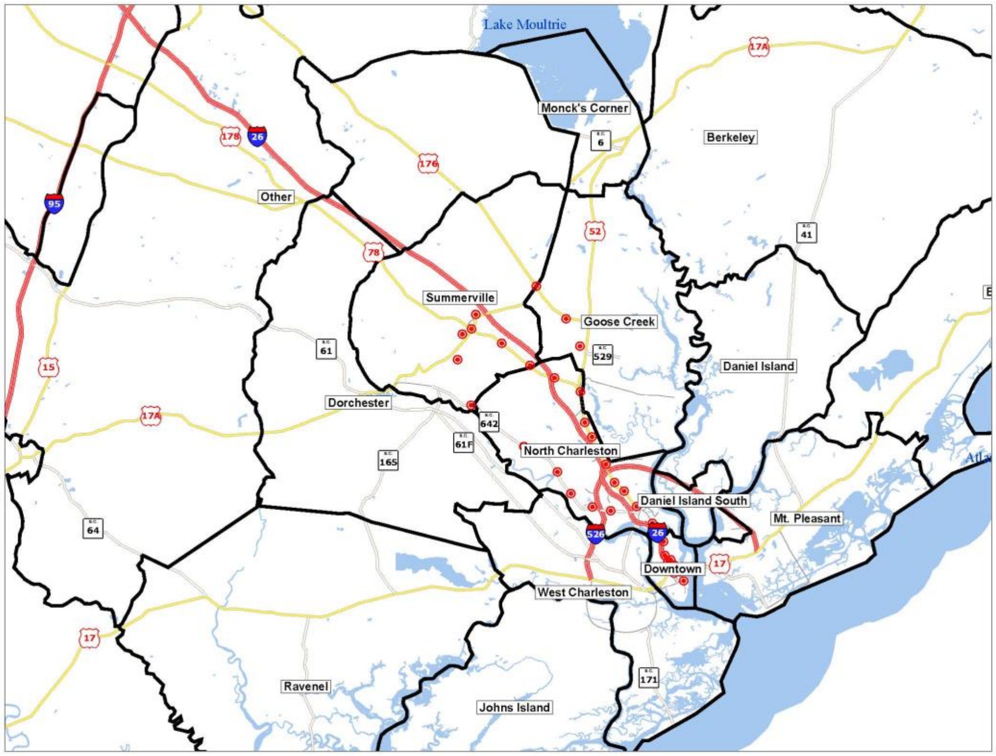

FIGURE 1 STOPS DISTRICT DEFINITION AND PROJECT STATIONS - CHARLESTON REGION

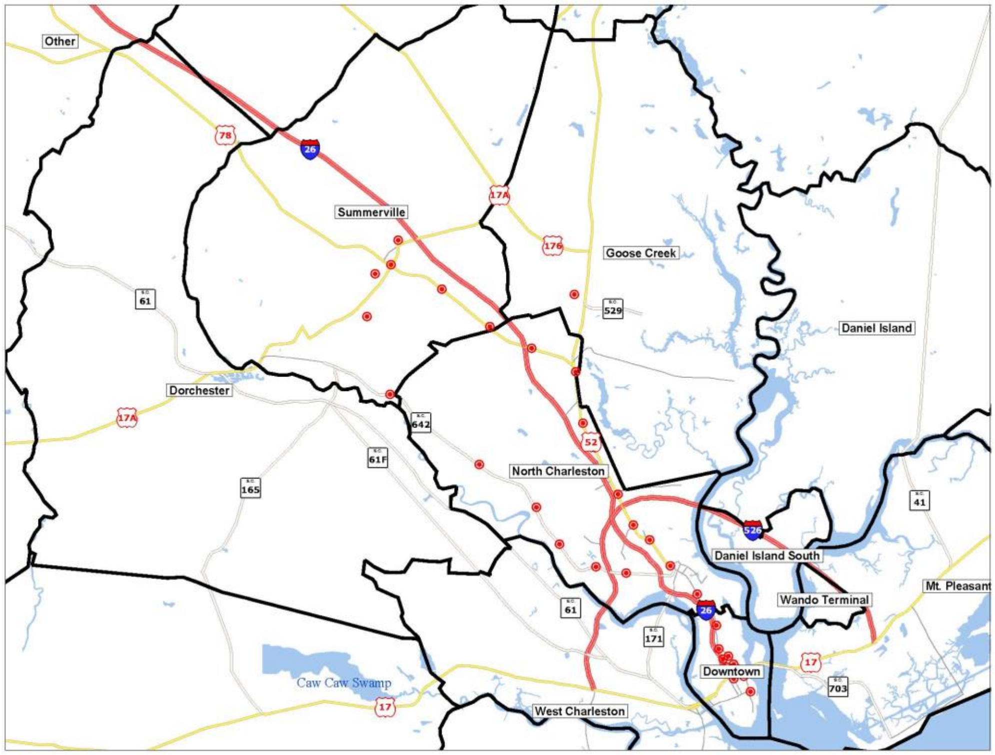

FIGURE 2 STOPS DISTRICT DEFINITION AND PROJECT STATIONS - I-26 CORRIDOR

3.2 | POPULATION AND EMPLOYMENT ASSUMPTIONS

Estimates of population and employment for the modeling region were obtained from BCDCOG for 2010 and 2035 for each TAZ in the modeling area. These projections were interpolated to estimate 2014 and 2015 population and employment for the calibration and current years. Table 1 summarizes the population and Table 2 shows employment forecasts by district in the modeling area for 2010, 2014, 2015 and 2035.

TABLE 1 YEAR 2010, 2014, 2015, AND 2035 POPULATION BY DISTRICT

District	2010	2014	2015	Growth vs. 2014	2035	Growth vs. 2014
Downtown	29,276	29,973	30,152	0.6%	33,670	12.3%
North Charleston	114,219	120,138	121,615	1.2%	151,236	25.9%
Mount Pleasant	69,992	71,101	71,384	0.4%	76,949	8.2%
West Charleston	104,503	106,705	107,262	0.5%	118,288	10.9%
Summerville	117,748	124,340	125,993	1.3%	158,976	27.9%
Goose Creek	80,869	82,874	83,369	0.6%	93,375	12.7%
John's Island	18,752	19,467	19,644	0.9%	23,218	19.3%
Ravenel	14,735	15,454	15,633	1.2%	19,233	24.5%
Monck's Corner	14,468	14,795	14,877	0.6%	16,513	11.6%
Daniel Island	6,694	6,945	7,009	0.9%	8,274	19.1%
Dorchester	10,148	13,604	14,467	6.3%	31,748	133.4%
Berkeley	14,077	14,555	14,676	0.8%	17,066	17.3%
Eastern Charleston	3,513	4,012	4,139	3.2%	6,634	65.4%
Daniel Island South	6,129	6,243	6,271	0.4%	6,839	9.5%
Wando	2,418	2,430	2,432	0.1%	2,490	2.5%
Other	1,997	2,021	2,026	0.2%	2,146	6.2%
Total	***609,547***	***634,664***	***640,957***	***1.0***%	***766,664***	***20.8***%

TABLE 2 YEAR 2010, 2014, 2015, AND 2035 CTPP-BASED EMPLOYMENT BY DISTRICT

District	2010	2014	2015	2015 Growth to 2014	2035	2035 Growth to 2014
Downtown	49,284	50,315	50,575	0.5%	55,746	10.8%
North Charleston	85,181	89,227	90,227	1.1%	110,461	23.8%
Mount Pleasant	28,584	29,366	29,567	0.7%	33,495	14.1%
West Charleston	42,082	42,864	43,062	0.5%	46,971	9.6%
Summerville	31,054	33,248	33,806	1.7%	44,790	34.7%
Goose Creek	32,966	33,494	33,625	0.4%	36,268	8.3%
John's Island	4,271	4,614	4,700	1.9%	6,412	39.0%
Ravenel	3,486	4,488	4,739	5.6%	9,748	117.2%
Monck's Corner	8,767	8,970	9,020	0.6%	10,027	11.8%
Daniel Island	5,084	5,329	5,392	1.2%	6,615	24.1%
Dorchester	2,189	3,286	3,561	8.4%	9,057	175.6%
Berkeley	1,567	2,149	2,293	6.7%	5,195	141.7%
Eastern Charleston	623	684	700	2.3%	1,003	46.6%
Daniel Island South	4,334	4,377	4,388	0.3%	4,603	5.2%
Wando	1,959	2,063	2,088	1.2%	2,605	27.3%
Other	922	1,009	1,031	2.2%	1,472	45.9%
Total	***302,361***	***315,490***	***318,781***	***1.0***%	***384,477***	***21.9***%

As these tables show, population and employment in the Charleston area are expected to grow by 21 and 22 percent, respectively between 2014 and 2035. Of particular relevance to the I-26 project, the population of the North Charleston district is expected to grow from 120,138 in 2014 to 151,236 in 2035, a 26 percent increase. Employment in North Charleston is forecasted to increase from 89,227 in 2014 to 110,461 in 2010, an increase of 24 percent. Summerville is another important part of the I-26 corridor and population and employment are expected to grow by 28 and 35 percent, respectively, between 2014 and 2035. Likewise, Goose Creek population and employment are expected to grow by 13 and 8 percent between 2014 and 2035.

Downtown Charleston is particularly important for this transit study due to its central location in the region and its role as a key transit origin and destination. Population and employment in downtown Charleston are projected to increase by 12 and 11 percent, respectively, between 2014 and 2035.

Figures 3 and 4 show the geographic distribution of population and employment, respectively, in the I-26 corridor and surrounding areas in 2035. While the corridor includes areas with relatively high densities of population or employment, other parts of the corridor have much lower densities particularly near the northern part of the US 176 alignment in Goose Creek and along parts of US 78 and Dorchester Road in North Charleston. In all three cases, population and employment are present on only one side of the alignments which will reduce, somewhat, the potential demand for the alternatives serving these areas.

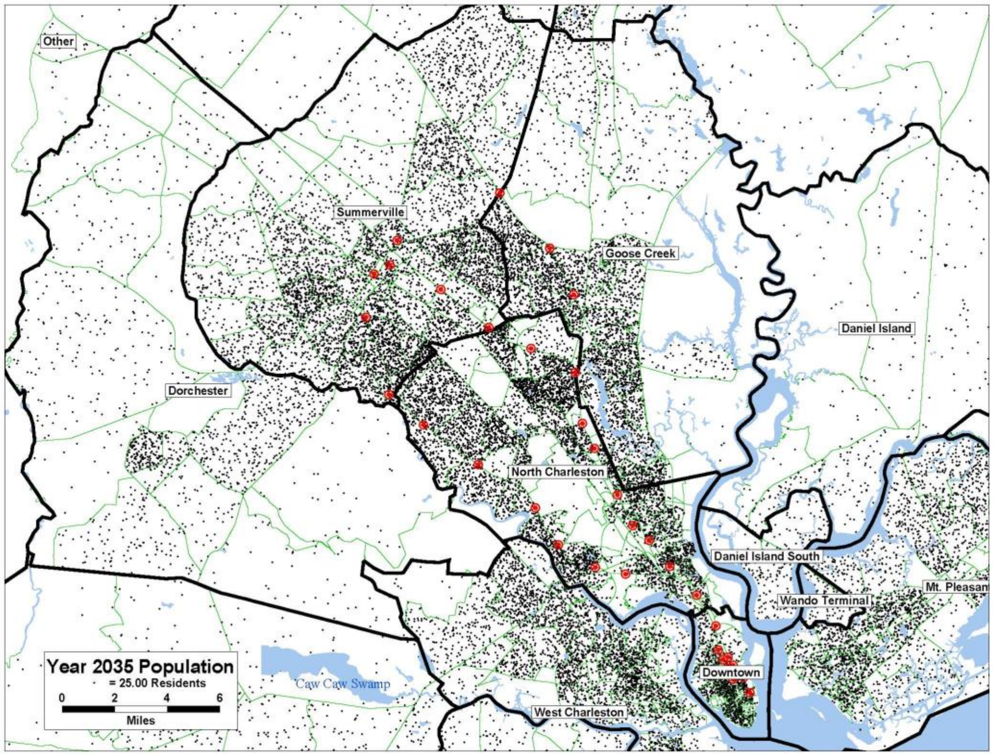

FIGURE 3 GEOGRAPHIC DISTRIBUTION OF 2035 POPULATION

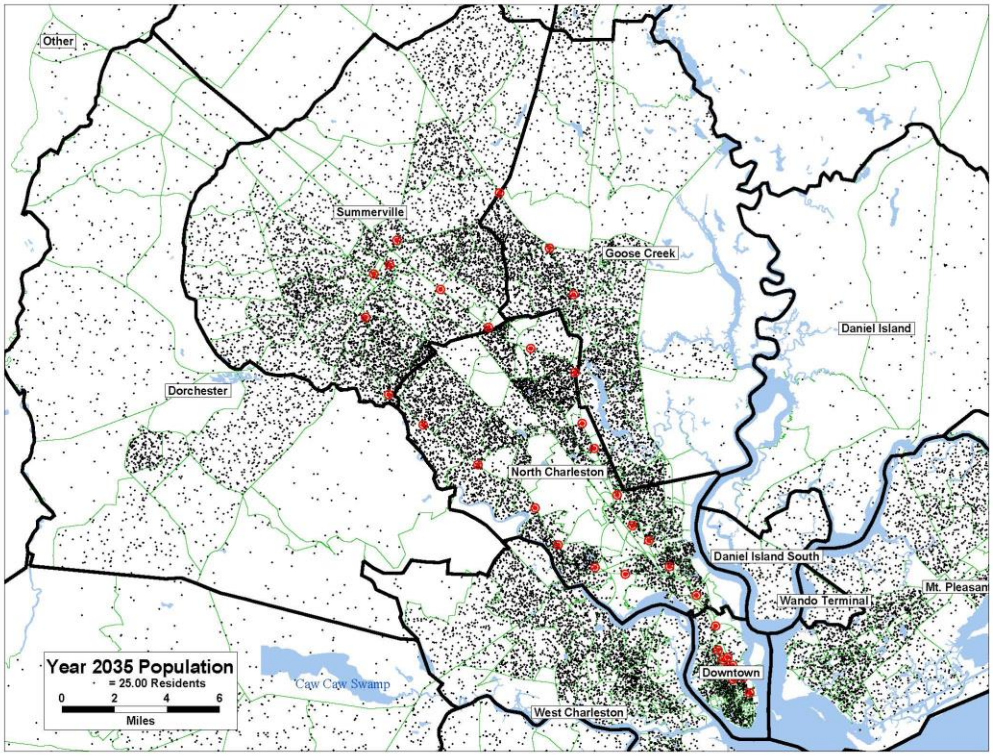

FIGURE 4 GEOGRAPHIC DISTRIBUTION OF 2035 EMPLOYMENT

3.3 | HIGHWAY OPERATING SPEED ASSUMPTIONS

TAZ-to-TAZ estimates of travel time and distance were obtained from the BCDCOG model for 2010 and 2035 and were used to show how traffic congestion is expected to change from the present to future years. The STOPS implementation for Charleston uses 2010 distances and travel times to represent the 2014 calibration year and 2015 forecast year. Year 2035 BCDCOG model estimates were used to represent highway conditions in the 2035 horizon year. Tables 3 and 4 summarize district-to-district travel times for 2010 and 2035, respectively.

TABLE 3 2010 DISTRICT-TO-DISTRICT AVERAGE AM PEAK AUTO TRAVEL TIMES (MINUTES)

Districts	Downtown	North Charleston	Mt. Pleasant	West Charleston	Summer-ville	Goose Creek	Dorchester
Downtown	7.8	19.9	17.0	15.1	38.1	26.4	48.8
N. Charleston	26.2	13.4	32.9	24.9	22.2	19.9	31.3
Mt. Pleasant	23.7	30.1	11.6	31.1	45.6	36.9	66.8
W. Charleston	20.5	25.8	30.9	12.7	40.3	34.9	34.8
Summerville	48.8	31.9	53.1	44.1	12.8	27.4	21.5
Goose Creek	38.7	23.0	40.5	36.5	22.3	12.9	36.8
Dorchester	56.9	46.1	71.3	49.1	25.7	46.5	14.3

TABLE 4 2035 DISTRICT-TO-DISTRICT AVERAGE AM PEAK AUTO TRAVEL TIMES (MINUTES)

Districts	Downtown	North Charleston	Mt. Pleasant	West Charleston	Summer-ville	Goose Creek	Dorchester
Downtown	7.9	20.8	17.0	15.8	40.6	27.0	51.4
N. Charleston	28.0	14.3	34.9	26.7	23.3	20.7	32.4
Mt. Pleasant	24.5	31.7	11.5	32.6	48.2	38.3	71.3
W. Charleston	21.9	27.5	32.2	13.2	42.0	36.5	38.1
Summerville	52.4	33.9	56.3	47.0	13.6	29.4	22.5
Goose Creek	41.9	25.4	43.7	39.9	25.0	13.8	39.9
Dorchester	62.6	48.9	76.5	54.8	26.7	49.1	15.3

As these tables show, projected highway travel times are expected to grow by a modest amount between 2010 and 2035. As an example, a trip from North Charleston to Downtown is expected to require 26 minutes in 2010 and 28 minutes in 2035, an increase of 7 percent. Some longer trips will incur higher travel time increases. For instance, a trip from Dorchester to Downtown is expected to take 57 minutes in 2010 and 63 minutes in 2035, an increase of 10 percent.

3.4 | 2014 TRANSIT SERVICE IN CHARLESTON

Most transit services in the Charleston metropolitan area are operated by the Charleston Area Regional Transportation Authority (CARTA). Weekday ridership on CARTA averaged 16,102 in 2013[2]. Connecting rural transit services between Charleston, Dorchester, and Berkeley Counties are operated by Tri-County Link. This service carried approximately 100,000 annual trips in 2013-2014[3], which is equivalent to approximately 350 riders per day. Since Tri-County Link does not have schedule data available in General Transit Feed Specification (GTFS) format and since daily ridership is relatively small compared to CARTA, these routes were not included in the forecasting analysis described in this report.

[2] National Transit Database

[3] CDM Smith for BCDCOG, *Final Report, Tri-County Routes.* October 17, 2014, P 17.

The forecasting model used for the I-26 Alternatives Analysis includes all fixed-route services operated or planned to be operated by CARTA in 2014 (the calibration year), 2015 (the current year) and 2035, the 20-year horizon. CARTA schedules for 2014 and 2015 were obtained in GTFS format. The 2015 GTFS files served as the basis for the 2035 service alternatives.

The GTFS files include all bus stop locations, bus trips, and bus scheduled stop times for the CARTA system. Additional information on existing Park-and-Ride locations were manually coded based on parking information available on CARTA's public website.

Table 5 presents general information for 2014 bus routes in the Charleston area.

TABLE 5 WEEKDAY OPERATING INFORMATION FOR BUS ROUTES IN THE REGION IN 2014

Route Number	Short Name	Approx. Headway (min)	
		Peak	Off-Peak
1	North Charleston/James Island Express	30	-
2	West Ashley/Mt. Pleasant Express	30	-
3	Dorchester Road/Summerville Exp.	30	-
4	NASH Airport	60	60
10	Rivers Ave	20	20
11	Airport	40	40
12	Upper Dorchester	45	45
13	Remount Road	60	60
20	King Street	30	30
21	Rutledge/Grove	60	60
30	Savannah Highway	45	45
31	Folly Road	90	90
32	Northbridge	60	60
40	Mount Pleasant	40	40
41	Coleman Boulevard	70	70
102	North Neck	60	60
103	Leeds Avenue	60	60
104	Montague Avenue	60	60
105	NASH	-	15/30
201	North Beltline	60	60
203	Medical Shuttle	7	-
210	Aquarium (DASH)	10	6/24
211	Meeting/King (DASH)	22	15
213	Lockwood/Calhoun (DASH)	40	-
301	St. Andrews	50	50

Year 2015 service is similar to the service operated in 2014 with the most notable exception being that routes 105 and 201 did not operate in 2015.

3.5 | TRANSIT CALIBRATION DATA

STOPS uses transit count data to refine its estimates of current-year transit ridership and then uses this understanding of existing conditions to estimate ridership for each future scenario.

Count data are based on information collected for the 2014 transit on-board survey and were aggregated into a series of stop "groups" to provide information suitable for model calibration. In keeping with current FTA recommendations, stop groups are defined using the same geographic boundaries as the districts described earlier. Figure 5 shows the station groups defined for the region and Table 6 summarizes the 2014 weekday transit boardings by stop group used to control the calibration. Table 7 provides another summary of ridership, by route level, to serve as a second check on ridership estimates. Stop- and route-level ridership estimates sum to approximately the same number but are slightly different due to different sources for the original data.

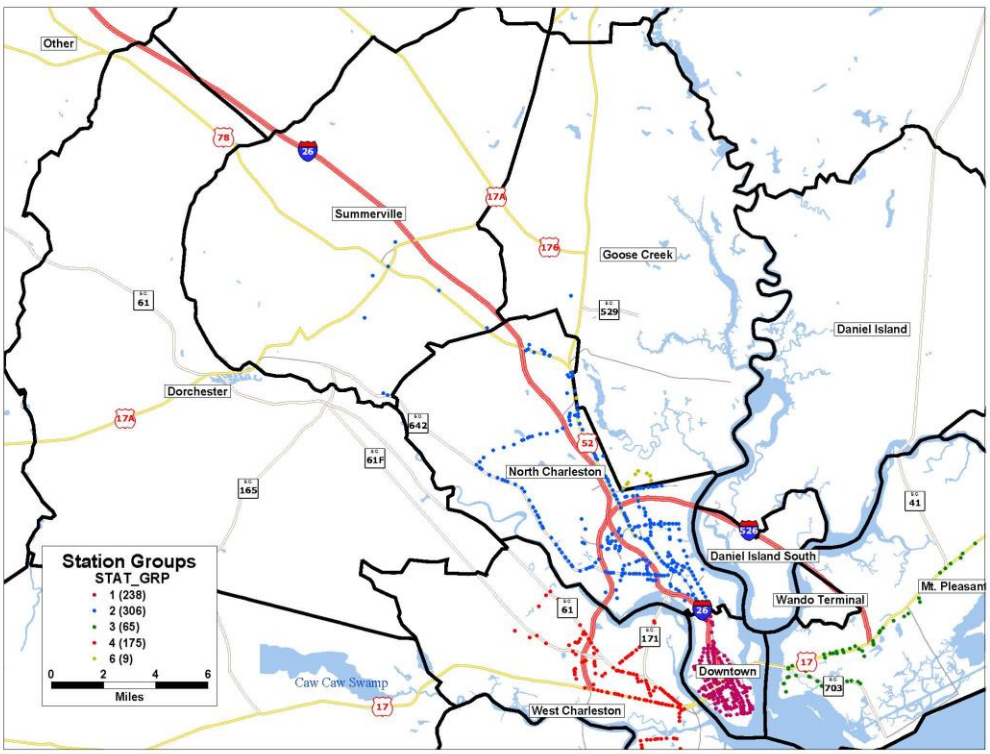

FIGURE 5 STOPS STATION GROUP DEFINITIONS

TABLE 6 OBSERVED 2014 WEEKDAY STOP GROUP BOARDINGS (UNLINKED TRIPS)

Station Group	Daily Boardings
1-Downtown	8,645
2-N. Charleston	6,117
3-Mt. Pleasant	748
4-W. Charleston	1,342
5-Goose Creek	41
Total	***16,893***

TABLE 7 OBSERVED CARTA 2014 WEEKDAY RIDERSHIP BY ROUTE (UNLINKED TRIPS)

Route	Est. Ridership (Survey)
1 James Island-North Charleston Express	788
2 Mt. Pleasant - West Ashley Express	584
3 Dorchester Road Express	249
4 NASH Express	106
10 Rivers Avenue	3,713
11 Dorchester/Airport	1,436
12 Upper Dorchester AFB	1,142
13 Remount Road	302
20 King Street/Citadel	588
21 Rutledge Grove	82
30 Savannah Highway	522
31 Folly Road	238
32 North Bridge	599
40 Mt. Pleasant	649
41 Coleman Boulevard	84
102 North Neck	205
103 Leeds Avenue	192
104 Montague Avenue	294
105 North Area Shuttle NASH	39
201 North Beltline	86
203 Medical University Shuttle	560
210 Aquarium/ CofC DASH	1,212
211 Meeting/King DASH	1,840
213 Lockwood/Calhoun DASH	541
301 St. Andrews	580
Total	***16,632***

Table 8 presents key characteristics of linked transit trips obtained from the 2014 transit origin-destination survey. Table 9 shows linked transit trip productions and attractions by district in 2014. As expected, the linked trips reported in these tables are less than the unlinked trips reported in Tables 6 and 7. The difference between these two measures is the number of transfers. Linked trips represent travel from origin to destination trip regardless of the number of transfers required to make the trip. By contrast, unlinked trips represent the number of times that all travelers board a bus—both the first time each passenger boards a bus and all transfers are included in the number of unlinked trips.

TABLE 8 SURVEYED 2014 WEEKDAY LINKED TRANSIT TRIP CHARACTERISTICS

Category	Sub Category	Survey
Trip Purpose	Home-Based Work	42%
	Home-Based Other	44%
	Non-Home based	13%
Access Mode	Walk	88%
	Kiss and Ride	4%
	Park and Ride	8%
Auto Ownership	0 Car	75%
	1+ Car	25%

TABLE 9 SURVEYED 2014 WEEKDAY LINKED TRANSIT TRIP PRODUCTIONS AND ATTRACTIONS BY DISTRICT

District	Productions	Attractions
Downtown	5,159	8,725
North Charleston	5,207	4,128
West Charleston	1,784	790
Mt Pleasant	679	733
Goose Creek	753	60
Summerville	551	21
Ravenel	67	0
Johns Island	78	0
Eastern Charleston	21	27
Berkeley	24	0
Daniel Island South	31	0
Dorchester	40	0
Other	0	0
Total	***14,394***	***14,394***

4.0 STOPS RESULTS FOR THE CALIBRATION YEAR

This section describes STOPS estimates of travel demand for the calibration year (2014) and establishes its grasp of transit trip-making in the Charleston area in general and the I-26 corridor, in particular.

4.1 | CHARACTERISTICS OF LINKED TRANSIT TRIPS

Table 10 presents a comparison of the distribution of linked transit trips by purpose, access mode, and auto ownership from the survey and the calibrated model for 2014. As this table shows, STOPS does a good job matching the transit trip characteristics obtained from the 2014 origin-destination survey. The most significant difference is that the model predicts slightly fewer transit riders from 0-car households than the survey and slightly more trips for car-owning households. This difference is not sufficiently large to warrant adjustment.

TABLE 10 COMPARISON OF SURVEYED AND MODELED 2014 WEEKDAY TRANSIT TRIP CHARACTERISTICS

Category	Sub Category	Survey	Estimated by Model
Trip Purpose	Home-Based Work	42%	43%
	Home-Based Other	44%	43%
	Non-Home based	13%	14%
Access Mode	Walk	88%	88%
	Kiss and Ride	4%	6%
	Park and Ride	8%	6%
Auto Ownership	0 Car	75%	64%
	1+ Car	25%	36%

4.2 | TRANSFER RATE

The transfer rate is measured as the ratio of unlinked transit trips to linked transit trips. This statistic is an important measure for model validation since it establishes the fact that the model appropriately represents the attractiveness of multi-leg transit trips as compared to direct trips. The surveyed 2014 transit rate in 2014 was 1.16 and STOPS estimated this value to be 1.19 – a very close match.

4.3 | TRANSIT TRIP PRODUCTION AND ATTRACTION LOCATIONS

Tables 11 and 12 present transit trip productions and attractions by district in the survey and model, respectively. STOPS estimates of region-wide and I-26 corridor (Downtown, North Charleston, Goose Creek, and Summerville districts) productions and attractions are sufficiently close to survey results so that it is not necessary to enable the STOPS production-end calibration method. This gives STOPS greater flexibility to allow growth in transit travel from newly developed areas.

TABLE 11 COMPARISON OF SURVEYED AND MODELED 2014 WEEKDAY TRANSIT LINKED TRIP PRODUCTIONS BY DISTRICT

District	Survey	Model
Downtown	5,159	6,331
North Charleston	5,207	5,086
West Charleston	1,784	1,681
Mt Pleasant	679	669
Goose Creek	753	483
Summerville	551	143
Ravenel	67	0
Johns Island	78	28
Eastern Charleston	21	0
Berkeley	24	0
Daniel Island South	31	2
Dorchester	40	4
Other	0	8
Total	***14,394***	***14,436***

TABLE 12 COMPARISON OF SURVEYED AND MODELED 2014 WEEKDAY TRANSIT LINKED TRIP ATTRACTIONS BY DISTRICT

District	Survey	Model
Downtown	8,725	8,083
North Charleston	4,128	4,258
West Charleston	790	957
Mt Pleasant	733	818
Goose Creek	60	242
Summerville	21	78
Ravenel	0	0
Johns Island	0	0
Eastern Charleston	27	0
Berkeley	0	0
Daniel Island South	0	0
Dorchester	0	0
Other	0	0

4.4 | ROUTE LEVEL RIDERSHIP

Table 13 presents observed bus route ridership from the 2014 survey and compares it to STOPS estimates of ridership. Estimates of overall ridership from STOPS match survey results very closely. STOPS also generates an appropriate estimate of ridership for routes operating in the corridor. Key routes in the corridor include:

- Express Routes (Routes 1, 3, 4): 1,143 survey vs. 953 STOPS

- Local Route (10, 11, 12, 13, 102, 103) 6,990 survey vs. 7,724 STOPS
- Total Corridor: 8,133 survey vs. 8,677 STOPS

As these results indicate, STOPS generates an accurate estimate of overall corridor ridership with a good distribution between express and local trips.

TABLE 13 COMPARISON OF SURVEYED AND MODELED WEEKDAY ROUTE-LEVEL RIDERSHIP

Route	Est. Ridership (Survey)	Est. Ridership (Model)
1 James Island-North Charleston Express	788	510
2 Mt. Pleasant - West Ashley Express	584	571
3 Dorchester Road Express	249	373
4 NASH Express	106	70
10 Rivers Avenue	3,713	4,719
11 Dorchester/Airport	1,436	1,075
12 Upper Dorchester AFB	1,142	819
13 Remount Road	302	534
20 King Street/Citadel	588	1,080
21 Rutledge Grove	82	457
30 Savannah Highway	522	1,471
31 Folly Road	238	296
32 North Bridge	599	471
40 Mt. Pleasant	649	1,077
41 Coleman Boulevard	84	445
102 North Neck	205	406
103 Leeds Avenue	192	171
104 Montague Avenue	294	362
105 North Area Shuttle NASH	39	111
201 North Beltline	86	281
203 Medical University Shuttle	560	38
210 Aquarium/ CofC DASH	1,212	360
211 Meeting/King DASH	1,840	355
213 Lockwood/Calhoun DASH	541	132
301 St. Andrews	580	977
Total	***16,632***	***17,160***

4.5 | REPRESENTATION OF GROWTH IN OVERALL TRAVEL DEMAND

The final test confirms that STOPS estimates of growth in trip-making conforms to the growth rates implied by projected increases in population and employment. The comparison of trip growth, population growth, and employment growth are presented in Table 14 (home-based work trips) and Table 15 (non-work trips). As these tables show, the projected growth in home-based work trip productions and attractions from 2014 to 2035 are very close to population and employment growth levels in each district. Other purposes are also similar to the underlying population and employment forecasts but differ to a greater degree due to the fact that these trip purposes are less connected to employment forecasts.

TABLE 14 HOME-BASED WORK DISTRICT-LEVEL ALL-MODE TRIP PRODUCTION AND ATTRACTION GROWTH FROM 2014 TO 2035

District	HBW Productions				HBW Attractions			
	2014	2035	Model grwth	Popu. grwth	2014	2035	Model grwth	Empl. grwth
Downtown	18,748	21,053	12%	12%	72,912	80,776	11%	11%
North Charleston	63,549	80,564	27%	26%	106,074	130,882	23%	24%
Mt Pleasant	43,649	48,353	11%	8%	32,855	37,237	13%	14%
West Charleston	72,830	82,213	13%	11%	50,822	55,340	9%	10%
Summerville	62,388	81,833	31%	28%	34,893	46,834	34%	35%
Goose Creek	50,424	58,290	16%	13%	22,740	25,324	11%	8%
Johns Island	9,618	11,772	22%	19%	9,519	13,053	37%	39%
Ravenel	8,107	10,402	28%	24%	3,584	8,218	129%	117%
Monck's Corner	6,546	7,545	15%	12%	10,694	11,710	10%	12%
Daniel Island	2,210	2,724	23%	19%	2,355	2,904	23%	24%
Dorchester	5,326	12,833	141%	133%	3,465	9,517	175%	176%
Berkeley	7,190	8,798	22%	17%	3,992	8,311	108%	142%
Eastern Charleston	2,691	4,566	70%	65%	1,005	1,464	46%	47%
Daniel Island	772	863	12%	10%	545	573	5%	5%
Wando	1,275	1,334	5%	2%	2,561	3,235	26%	26%
Other	5,121	5,667	11%	6%	2,429	3,432	41%	46%
Region	360,443	438,811	22%	21%	360,443	438,811	22%	22%

Note: All-Mode trip productions and attractions in this table refers to STOPS transit candidate person trips and may not equal BCDCOG estimates of total person trips

TABLE 15 NON-WORK DISTRICT-LEVEL ALL-MODE TRIP PRODUCTION AND ATTRACTION GROWTH FROM 2014 TO 2035

	Non-Work Productions				Non-Work Attractions			
District	2014	2035	Model grwth	Popu. grwth	2014	2035	Model grwth	Empl. grwth
Downtown	179,516	196,341	9%	12%	333,628	361,266	8%	11%
North Charleston	344,111	427,919	24%	26%	444,889	552,725	24%	24%
Mt Pleasant	165,069	181,365	10%	8%	125,975	139,726	11%	14%
West Charleston	307,226	336,203	9%	11%	211,820	228,917	8%	10%
Summerville	184,766	250,985	36%	28%	140,319	189,237	35%	35%
Goose Creek	158,271	180,277	14%	13%	84,170	93,578	11%	8%
Johns Island	36,857	48,275	31%	19%	33,426	46,502	39%	39%
Ravenel	15,247	26,268	72%	24%	9,565	23,335	144%	117%
Monck's Corner	18,217	19,914	9%	12%	29,448	32,669	11%	12%
Daniel Island	6,517	7,987	23%	19%	6,846	8,295	21%	24%
Dorchester	13,456	38,826	189%	133%	11,737	35,418	202%	176%
Berkeley	11,588	15,339	32%	17%	7,949	16,832	112%	142%
Eastern Charleston	3,458	5,848	69%	65%	2,296	3,424	49%	47%
Daniel Island	2,074	2,246	8%	10%	1,976	2,047	4%	5%
Wando	4,114	4,287	4%	2%	8,651	10,241	18%	26%
Other	8,220	10,056	22%	6%	6,011	7,924	32%	46%
Region	1,458,708	1,752,134	20%	21%	1,458,708	1,752,134	20%	22%

Note: All-Mode trip productions and attractions in this table refers to STOPS transit candidate person trips and may not equal BCDCOG estimates of total person trips

4.6 | CALIBRATION SUMMARY

The preceding results show that STOPS does a good job of matching survey results and is appropriate for estimating ridership for each I-26 alternative. STOPS responds to input assumptions of population and employment growth with appropriate levels of growth in overall travel.

5.0 DEFINITION OF ALTERNATIVES

This section briefly describes the 13 transit alternatives that comprise Screen 2 of the I-26 Fixed Guideway Alternatives Analysis that are the subject of this report.

5.1 | ALTERNATIVE SPECIFICATIONS

The first alternative is the No-Build alternative which includes existing (2015) CARTA bus services together with a new commuter bus route operating on I-26 in a mixed traffic. Each of the build alternatives begins with the 2015 CARTA schedule, adds the fixed guideway transit improvements specified for the alternative and makes related bus service changes. None of the build alternatives include the I-26 express bus. Each alternative is defined as follows:

1- Alternative A: No-Build I-26 Commuter Bus
  - The existing transit services as operated in 2015
  - Addition of a commuter bus route that would operate on I-26 in existing traffic, using a standard commuter coach bus.

2- Alternative B-1: BRT line along US 78/US 52/Meeting Street
3- Alternative B-2: LRT line along US 78/US 52/Meeting Street
4- Alternative B-3: BRT line along US 78/US 52/East Bay Street
5- Alternative B-4: LRT line along US 78/US 52/East Bay Street
6- Alternative C-1: BRT line along US 176/US 52/Meeting Street
7- Alternative C-2: LRT line along US 176/US 52/Meeting Street
8- Alternative C-3: BRT line along US 176/US 52/East Bay Street
9- Alternative C-4: LRT line along US 176/US 52/East Bay Street
10- Alternative D-1: BRT line along Dorchester Rd/US 52/Meeting Street
11- Alternative D-2: LRT line along Dorchester Rd/US 52/Meeting Street
12- Alternative D-3: BRT line along Dorchester Rd/US 52/East Bay Street
13- Alternative D-4: LRT line along Dorchester Rd/US 52/East Bay Street

Together, these alternatives comprise six corridors and two technologies—Light Rail Transit (LRT) and Bus Rapid Transit (BRT). LRT and BRT alternatives for each corridor share the same alignment and station locations. Service frequencies are the same for both BRT and LRT modes on each corridor; however, speeds vary by mode. Table 16 presents major characteristics for each of the build alternatives. Comprehensive operating information for each alternative can be found in *Alternatives Report: Fixed Guideway Operating Plans*[4]. Appendix II to this report presents an alignment and station location map for each alternative.

[4] Davis and Floyd for BCDCOG, Draft published September 2015 with updated travel times published in October 2015

TABLE 16 SUMMARY OF OPERATING CHARACTERISTICS BY ALTERNATIVE

Alternative	Mode	Origin	Destination	Number of Stations	Peak headway (min)	Mid-Day Headway (min)	Runtime Southbound	Runtime Northbound
B-1	BRT	Main St. & Richardson St. (Summerville)	Meeting St. & Line St. (Charleston)	18	10	20	1:00:29	57:54
B-2	LRT	Main St. & Richardson St. (Summerville)	Meeting St. & Line St. (Charleston)	18	10	20	57:39	54:57
B-3	BRT	Main St. & Richardson St. (Summerville)	East Bay St. & Calhoun St. (Charleston)	19	10	20	1:05:33	1:01:02
B-4	LRT	Main St. & Richardson St. (Summerville)	East Bay St. & Calhoun St. (Charleston)	19	10	20	1:01:12	58:02
C-1	BRT	US 176 & US 17A (Summerville)	Meeting St. & Line St. (Charleston)	16	10	20	51:36	52:04
C-2	LRT	US 176 & US 17A (Summerville)	Meeting St. & Line St. (Charleston)	16	10	20	48:53	49:25
C-3	BRT	US 176 & US 17A (Summerville)	East Bay St. & Calhoun St. (Charleston)	17	10	20	56:40	55:19
C-4	LRT	US 176 & US 17A (Summerville)	East Bay St. & Calhoun St. (Charleston)	17	10	20	54:22	52:57
D-1	BRT	Main St. & Richardson St. (Summerville)	Meeting St. & Line St. (Charleston)	16	10	20	1:05:12	1:04:52
D-2	LRT	Main St. & Richardson St. (Summerville)	Meeting St. & Line St. (Charleston)	16	10	20	58:33	57:52
D-3	BRT	Main St. & Richardson St. (Summerville)	East Bay St. & Calhoun St. (Charleston)	17	10	20	1:10:16	1:08:40
D-4	LRT	Main St. & Richardson St. (Summerville)	East Bay St. & Calhoun St. (Charleston)	17	10	20	1:07:56	1:05:35

Alternatives were coded in STOPS by preparing GTFS files that describe the proposed services. These files define mode type, working calendar, headways, station locations, station type (PNR, KNR), and arrival and departure times at each station. As described in the Alternatives Definition report, the 2015 CARTA transit network system was slightly modified for each alternative so that local bus routes will properly connect to the new transit lines and the duplicative services are removed.

5.2 | FIXED GUIDEWAY VISIBILITY FACTOR DEFINITION

STOPS subdivides transit services into two main categories—bus and fixed guideway. STOPS includes special treatment for full fixed guideway systems such as rail transit operating in its own right-of-way to represent the preferences[5] that travelers may have for these systems over local buses. STOPS also allows the user to specify the degree to which these preferences apply to fixed guideway services operating in mixed rights-of-way. This special "visibility factor" is applied to routes coded with a route_type of 0.

To determine the proper treatment of the I-26 LRT and BRT alternatives, Davis & Floyd provided the following information regarding the right-of-way status for each alternative:

LRT Alternatives

- Alternative B-2: US 78/US 52/Meeting
  - Main & Richardson to US 78 & 165 (Berlin G Myers) – 100% Mixed Traffic
  - US 78 & 165 to US 52 (Meeting) & Mount Pleasant – Fully Fixed Guideway
  - Mt. Pleasant to Line Street: 100% Mixed Traffic
- Alternative B-4: US 78/US 52/East Bay
  - Main & Richardson to US 78 & 165 (Berlin G Myers) – 100% Mixed Traffic
  - US 78 & 165 to US 52 (Meeting) & Mount Pleasant – Fully Fixed Guideway
  - Mt. Pleasant to East Bay – 75% Mixed Traffic
- Alternative C-2: US 176/US 52/Meeting
  - Fully Fixed Guideway from US 17A/US 76 to Mount Pleasant
  - 100% Mixed traffic from Mount Pleasant to Line Street
- Alternative C-4: US 176/US 52/East Bay
  - Fully Fixed Guideway from US 17A/US 76 to Mount Pleasant
  - 75% Mixed traffic from Mt. Pleasant to East Bay
- Alternative D-2: Dorchester Rd/US 52/Meeting
  - DT Summerville to Main & Old Trolley – 100% Mixed Traffic
  - Old Trolley Road to Dorchester Road – 50% Mixed Traffic
  - Dorchester Road from Old Trolley To W. Montague – Fully Fixed Guideway

[5] Above and beyond the effect of faster running times and more frequent service on ridership.

    - Dorchester Road from W. Montague to Rivers Avenue – 60% Mixed Traffic
    - Rivers Avenue (US 52) to Mt. Pleasant: Fully Fixed
    - Mt Pleasant to Line Street: 100% Mixed Traffic
- Alternative D-4: Dorchester Rd /US 52/East Bay
    - DT Summerville to Main & Old Trolley – 100% Mixed Traffic
    - Old Trolley Road to Dorchester Road – 50% Mixed Traffic
    - Dorchester Road from Old Trolley To W. Montague – Fully Fixed Guideway
    - Dorchester Road from W. Montague to Rivers Avenue – 60% Mixed Traffic
    - Rivers Avenue (US 52) to Mt. Pleasant: Fully Fixed
    - Mt. Pleasant to East Bay: 75% Mixed Traffic

BRT Alternatives

- Alternative B-1: US 78/US 52/Meeting
    - Summerville to US 78 - Mixed Traffic, Signal Preemption
    - US 78 Main to Trident Health – Bus Only Side Lanes, Signal Preemption
    - Trident Health/I-26 to Ashley Phosphate – Bus only Side Lanes, Signal Preemption
    - Ashley Phosphate to Remount – Bus Only , Fixed Center Median Lanes
    - Remount to Stromboli - Bus Only, Side Lanes, Signal Preemption
    - Remount to Mt. Pleasant – Bus Only Guideway
    - Mt. Pleasant to Line – Mixed Traffic
    - Line to DT Pts – Mixed Traffic with Peak hour bus only lanes
- Alternative B-3: US 78/US 52/East Bay
    - Summerville to US 78 - Mixed Traffic, Signal Preemption
    - US 78 Main to Trident Health – Bus Only Side Lanes, Signal Preemption
    - Trident Health/I-26 to Ashley Phosphate – Bus only Side Lanes, Signal Preemption
    - Ashley Phosphate to Remount – Bus Only , Fixed Center Median Lanes
    - Remount to Stromboli - Bus Only, Side Lanes, Signal Preemption
    - Remount to Mt. Pleasant – Bus Only Guideway
    - Mt Pleasant to East Bay – Mixed Traffic, Peak Hour bus only lanes
- Alternative C-1: US 176/US 52/Meeting
    - US 176 to US 52 – Bus Only, Side Lanes, Signal Preemption
    - US 52 to Otranto – Bus Only Side Lanes, Signal Preemption
    - Remount to Stromboli - Bus Only, Side Lanes, Signal Preemption
    - Remount to Mt. Pleasant – Bus Only Guideway
    - Mt. Pleasant to Line – Mixed Traffic
    - Line to DT Pts – Mixed Traffic with Peak hour bus only lanes
- Alternative C-3: US 176/US 52/East Bay

- US 176 to US 52 – Bus Only, Side Lanes, Signal Preemption
- US 52 to Otranto – Bus Only Side Lanes, Signal Preemption
- Remount to Stromboli - Bus Only, Side Lanes, Signal Preemption
- Remount to Mt. Pleasant – Bus Only Guideway
- Mt Pleasant to East Bay – Mixed Traffic, Peak Hour bus only lanes

- Alternative D-1: Dorchester Rd/US 52/Meeting
    - Summerville to Old Trolley – Mixed Traffic
    - Old Trolley to Dorchester – Bus Only Side Lanes, Signal Preemption
    - Dorchester – Old Trolley to Montague – Bus Only, Fixed Center Median Lanes
    - Dorchester – Montague to Rivers Avenue – Bus Only Side Lanes, 60% Mixed Traffic
    - Remount to Stromboli - Bus Only, Side Lanes, Signal Preemption
    - Remount to Mt. Pleasant – Bus Only Guideway
    - Mt. Pleasant to Line – Mixed Traffic
    - Line to DT Pts – Mixed Traffic with Peak hour bus only lanes
- Alternative D-3: Dorchester Rd/US 52/East Bay
    - Summerville to Old Trolley – Mixed Traffic
    - Old Trolley to Dorchester – Bus Only Side Lanes, Signal Preemption
    - Dorchester – Old Trolley to Montague – Bus Only, Fixed Center Median Lanes
    - Dorchester – Montague to Rivers Avenue – Bus Only Side Lanes, 60% Mixed Traffic
    - Remount to Stromboli - Bus Only, Side Lanes, Signal Preemption
    - Remount to Mt. Pleasant – Bus Only Guideway
    - Mt Pleasant to East Bay – Mixed Traffic, Peak Hour bus only lanes

Given the mix of dedicated and shared rights-of-way for all alternatives, route_type=0 was used for both LRT and BRT options. The visibility factor was set to 0.75 for LRT alternatives to represent the fact that the operating characteristics of the proposed LRT options are midway between streetcar and full LRT. Accordingly, the visibility factor is set to 0.75, which is midway between FTA's recommendation for streetcar (0.5) and its recommendation for LRT (1.0).

The BRT options have more exclusive right-of-way than many "BRT-lite" systems with a recommended visibility factor of 0.1. To reflect this fact, the factor was set to 0.25 for all BRT options in the I-26 corridor.

6.0 RIDERSHIP FORECASTS FOR EACH ALTERNATIVE

This section presents ridership forecasting results for each alternative for the 2015 and 2035 forecast years. Four key types of information are provided: mobility benefits, linked transit trips, boardings, and other measures. These terms are defined as follows:

- Mobility benefits. These benefits describe the travel time and frequency improvements generated by each option compared to existing conditions. Although these are inputs to STOPS (defined in the Alternative Definition Report), these benefits are a tangible indication of the value added by the project and help to explain the ridership impacts predicted by STOPS.
- Linked transit trips. Linked transit trips represent the number of transit trips that are made from an origin (e.g., home) to a destination (e.g., work). As an example, a commuter who rode transit both ways (to and from work) would be counted as two linked transit trips no matter how many transfers were required to complete the journey.
- Boardings. Boardings represent the number of times travelers board a transit vehicle. This statistic is also called unlinked trips. Since unlinked trips represent the total number of boardings, a trip that includes one transfer would be counted as two boardings or two unlinked trips; one for the first vehicle that was boarded and another for the transfer.
- Other measures. The last statistic describes mobility benefits of each alternative that are not directly related to transit ridership. For this project, the impacts of each alternative on reducing automobile person miles of travel and vehicle miles of travel are reported.

6.1 | ASSESSMENT OF MOBILITY BENEFITS

Tables 17 and 18 present an overview of the mobility benefits provided by the BRT and LRT alternatives, respectively. As these charts show, the BRT and LRT alternatives are expected to generate significant (and similar) levels of mobility benefit in the form of both substantial reductions in travel time and increases in frequency as compared to existing services.

Currently, transit trips from the outer segments of the corridor (Otranto or Ashley Phosphate) to downtown require over an hour to make this trip on the local bus (Routes 10 or 12, depending on location). With the BRT or LRT alternatives, this time will drop to 34 to 45 minutes, a savings of between 20 and 30 minutes depending on the alternative and the location of the trip.

Frequencies also improve significantly. Currently, Route 10 operates on 20 minute headways and Route 12 operates on 45 minute headways. The proposed BRT or LRT routes are expected to operate on 10 minute headways, which is two or more times as much service as is offered by local Routes 10 and 12 today.

It should be noted that other local and express bus routes serve portions of the I-26 corridor so some locations may see existing travel times or combined frequencies better than those offered by Routes 10 or 12, alone.

TABLE 17 MOBILITY BENEFITS OF BRT ALTERNATIVES

Origin-Destination	Statistic	Existing Local (Rts 10 and 12)	Alt B-1	Alt B-3	Alt C-1	Alt C-3	Alt D-1	Alt D-3
From Rivers Ave. & Otranto Blvd to Line St. or Columbus St.	Travel Time	1:10:41	0:36:16	0:36:40	0:36:16	0:36:40	-	-
	Headway (min)	20	10	10	10	10	-	-
	Transfer Needed?	No	No	No	No	No	-	-
	Number of Intermediate Stations	48	11	11	11	11	-	-
From Dorchester Rd & Ashley Phosphate Rd to Line St. or Columbus St.	Travel Time	1:07:10	-	-	-	-	0:45:04	0:45:28
	Headway (min)	45	-	-	-	-	10	10
	Transfer Needed?	Yes	-	-	-	-	No	No
	Number of Intermediate Stations	53	-	-	-	-	10	10
From Rivers Ave. & McMillan Ave. to Line St. or Columbus St.	Travel Time	0:24:41	0:16:14	0:16:38	0:16:14	0:16:38	0:15:57	0:16:21
	Headway (min)	20	10	10	10	10	10	10
	Transfer Needed?	No	No	No	No	No	No	No
	Number of Intermediate Stations	16	5	5	5	5	5	5

Note: Other local bus routes operate in this corridor and combined frequencies for some origin-to-destination trips are better than the value reported here for just Routes 10 and 12.

TABLE 18 MOBILITY BENEFITS OF LRT ALTERNATIVES

Origin-Destination	Statistic	Existing Local (Rts 10 and 12)	Alt B-1	Alt B-3	Alt C-1	Alt C-3	Alt D-1	Alt D-3
From Rivers Ave. & Otranto Blvd to Line St. or Columbus St.	Travel Time	1:10:41	0:34:23	0:34:47	0:34:23	0:34:47	-	-
	Headway (min)	20	10	10	10	10	-	-
	Transfer Needed?	No	No	No	No	No	-	-
	Number of Intermediate Stations	48	11	11	11	11	-	-
From Dorchester Rd & Ashley Phosphate Rd to Line St. or Columbus St.	Travel Time	1:07:10	-	-	-	-	0:43:35	0:43:59
	Headway (min)	45	-	-	-	-	10	10
	Transfer Needed?	Yes	-	-	-	-	No	No
	Number of Intermediate Stations	53	-	-	-	-	10	10
From Rivers Ave. & McMillan Ave. to Line St. or Columbus St.	Travel Time	0:24:41	0:15:25	0:15:49	0:15:25	0:15:49	0:15:09	0:15:33
	Headway	20	10	10	10	10	10	10
	Transfer Needed?	No	No	No	No	No	No	No
	Number of Intermediate Stations	16	5	5	5	5	5	5

Note: Other local bus routes operate in this corridor and combined frequencies for some origin-to-destination trips are better than the value reported here for just Routes 10 and 12.

6.2 | 2015 RESULTS

The section presents ridership results for each alternative for current-year conditions. Results are organized into 3 subsections: linked transit trips, boardings, and other results.

2015 LINKED TRIPS

Table 19 presents the number of weekday linked transit trips in the Year 2015 for the no-build and each BRT alternative. Table 20 presents the same information for each LRT alternative. Incremental linked transit trips[6] for each build alternative as compared to the no-build alternative are presented in Tables 21 and 22. Together, these tables show how the proposed projects will serve to increase overall transit ridership in the Charleston area.

These tables show that the B and D alternatives (US 78 and Dorchester Road alignments, respectively) attract similar levels of new ridership to the CARTA system with small differences between the Meeting Street and East Bay Street options in Downtown Charleston. One reason for this small difference is that existing bus services will need to be rerouted to connect to either downtown option but the impact on travel times is likely to be higher for the East Bay Street option since most routes are already operating on Meeting Street. The larger deviation adds a little extra travel time to travelers from Mt. Pleasant or West Ashley to the City Hall area of downtown Charleston. The extra time for these travelers moderates the benefits offered to travelers from North Charleston, suppressing (slightly) the overall number of linked transit trips.

The Meeting Street alignment attracts slightly higher levels of ridership because Meeting Street is more convenient to other CARTA services, which facilitates transfers to reach key activity centers in downtown Charleston and elsewhere in the region.

For the B and D alignments, BRT attracts 3,600 to 3,800 new weekday linked transit trips to the CARTA system while LRT attracts 5,800 to 6,300 new weekday linked transit trips. A small part of the higher ridership on the LRT options is a result of slightly faster running times for these alternatives as compared to the BRT options. The more important difference between the BRT and LRT options is the Fixed Guideway Visibility Factor which is set higher for LRT than for BRT. As discussed above, both options were set midway between FTA recommendations for each mode operating in mixed traffic versus operating in an exclusive right-of-way.

The C alternatives (US 176 alignment) attract considerably fewer linked transit trips – 1,700 to 1,800 BRT new trips and 3,300 to 3,400 new LRT trips. This is likely a result of the fact that the US 176 alignment extends CARTA's service area by approximately 8 miles into areas that will be partly undeveloped in 2035. Since one side of the northern part of the extension is undeveloped, ridership growth on this line is limited.

[6] Incremental linked transit trips are often called "New Transit Riders"

The other options extend local service[7] by 9 to 11 miles in areas that are more consistently developed on both sides of the alignments. These alternatives end in Summerville, an area with more urban development patterns than other parts of the corridor and therefore has a higher potential to attract transit trips.

Tables 23 and 24 present an assessment of linked project trips. This statistic is a key component of FTA's current mobility and cost effectiveness evaluation measures. Like the linked transit trip statistic, project ridership is lowest for the C Alternatives along US 176 and higher for the B and D Alternatives. For this statistic, however, ridership is higher for the B Alternatives on US 78 than for the D alternatives on Dorchester Road. This is a result of the fact that this alignment serves both the strongest existing market (US 78 / Rivers Avenue) and the strongest new market (Summerville).

Project ridership is slightly higher for East Bay Street options as compared to Meeting Street largely because East Bay Street brings travelers slightly closer to the core areas in downtown Charleston.

[7] The Dorchester Road corridor also has express bus service as far as Trolley Road but this service is oriented towards downtown and only operates during the peak periods

TABLE 19 LINKED WEEKDAY TRANSIT TRIPS BY BRT ALTERNATIVE IN 2015

Trip Purpose	Auto Ownership	No Build	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
Home-Based Work	0 Car	3,568	3,822	3,813	3,847	3,827	3,695	3,678
	1 Car	1,691	2,350	2,329	1,978	1,961	2,223	2,214
	2+ Car	939	1,938	1,937	1,261	1,256	1,940	1,942
	Subtotal	***6,197***	***8,110***	***8,079***	***7,086***	***7,044***	***7,859***	***7,834***
Home-Based Other	0 Car	4,248	4,508	4,457	4,505	4,478	4,398	4,403
	1 Car	1,082	1,472	1,446	1,251	1,230	1,502	1,481
	2+ Car	833	1,670	1,664	1,125	1,122	1,951	1,968
	Subtotal	***6,163***	***7,651***	***7,567***	***6,881***	***6,830***	***7,852***	***7,853***
Non-Home Based	0 Car	1,345	1,423	1,408	1,421	1,413	1,391	1,392
	1 Car	377	483	470	426	416	500	490
	2+ Car	334	523	522	403	402	609	610
	Subtotal	***2,056***	***2,429***	***2,400***	***2,250***	***2,230***	***2,500***	***2,492***
Total	0 Car	9,161	9,752	9,678	9,774	9,718	9,484	9,473
	1 Car	3,149	4,306	4,245	3,655	3,607	4,225	4,186
	2+ Car	2,107	4,132	4,123	2,789	2,779	4,501	4,520
	Subtotal	***14,417***	***18,189***	***18,046***	***16,218***	***16,104***	***18,210***	***18,179***

TABLE 20 LINKED WEEKDAY TRANSIT TRIPS BY LRT ALTERNATIVE IN 2015

Trip Purpose	Auto Ownership	No Build	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
Home-Based Work	0 Car	3,568	4,024	4,011	4,014	4,019	3,830	3,822
	1 Car	1,691	2,824	2,803	2,329	2,311	2,546	2,529
	2+ Car	939	2,498	2,477	1,551	1,538	2,372	2,368
	Subtotal	***6,197***	***9,347***	***9,291***	***7,894***	***7,868***	***8,749***	***8,719***
Home-Based Other	0 Car	4,248	4,689	4,669	4,664	4,667	4,554	4,555
	1 Car	1,082	1,768	1,737	1,450	1,429	1,755	1,721
	2+ Car	833	2,183	2,138	1,365	1,361	2,477	2,454
	Subtotal	***6,163***	***8,640***	***8,545***	***7,478***	***7,457***	***8,786***	***8,730***
Non-Home Based	0 Car	1,345	1,478	1,472	1,469	1,470	1,439	1,438
	1 Car	377	574	564	491	483	583	571
	2+ Car	334	671	663	481	482	779	765
	Subtotal	***2,056***	***2,722***	***2,699***	***2,441***	***2,435***	***2,801***	***2,775***
Total	0 Car	9,161	10,191	10,153	10,147	10,156	9,823	9,815
	1 Car	3,149	5,166	5,104	4,269	4,224	4,885	4,822
	2+ Car	2,107	5,352	5,279	3,396	3,380	5,628	5,587
	Subtotal	***14,417***	***20,710***	***20,535***	***17,813***	***17,760***	***20,336***	***20,224***

TABLE 21 INCREMENTAL (VS. NO-BUILD) WEEKDAY LINKED TRANSIT TRIPS BY BRT ALTERNATIVE IN 2015

Trip Purpose	Auto Ownership	No Build	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
Home-Based Work	0 Car	0	254	245	279	259	127	110
	1 Car	0	659	638	287	270	532	523
	2+ Car	0	999	998	322	317	1,001	1,003
	Subtotal	***0***	***1,913***	***1,882***	***889***	***847***	***1,662***	***1,637***
Home-Based Other	0 Car	0	260	209	257	230	150	155
	1 Car	0	390	364	169	148	420	399
	2+ Car	0	837	831	292	289	1,118	1,135
	Subtotal	***0***	***1,488***	***1,404***	***718***	***667***	***1,689***	***1,690***
Non-Home Based	0 Car	0	78	63	76	68	46	47
	1 Car	0	106	93	49	39	123	113
	2+ Car	0	189	188	69	68	275	276
	Subtotal	***0***	***373***	***344***	***194***	***174***	***444***	***436***
Total	0 Car	0	591	517	613	557	323	312
	1 Car	0	1,157	1,096	506	458	1,076	1,037
	2+ Car	0	2,025	2,016	682	672	2,394	2,413
	Subtotal	***0***	***3,772***	***3,629***	***1,801***	***1,687***	***3,793***	***3,762***

TABLE 22 INCREMENTAL (VS. NO-BUILD) WEEKDAY LINKED TRANSIT TRIPS BY LRT ALTERNATIVE IN 2015

Trip Purpose	Auto Ownership	No Build	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
Home-Based Work	0 Car	0	456	443	446	451	262	254
	1 Car	0	1,133	1,112	638	620	855	838
	2+ Car	0	1,559	1,538	612	599	1,433	1,429
	Subtotal	***0***	***3,150***	***3,094***	***1,697***	***1,671***	***2,552***	***2,522***
Home-Based Other	0 Car	0	441	421	416	419	306	307
	1 Car	0	686	655	368	347	673	639
	2+ Car	0	1,350	1,305	532	528	1,644	1,621
	Subtotal	***0***	***2,477***	***2,382***	***1,315***	***1,294***	***2,623***	***2,567***
Non-Home Based	0 Car	0	133	127	124	125	94	93
	1 Car	0	197	187	114	106	206	194
	2+ Car	0	337	329	147	148	445	431
	Subtotal	***0***	***666***	***643***	***385***	***379***	***745***	***719***
Total	0 Car	0	1,030	992	986	995	662	654
	1 Car	0	2,017	1,955	1,120	1,075	1,736	1,673
	2+ Car	0	3,245	3,172	1,289	1,273	3,521	3,480
	Subtotal	***0***	***6,293***	***6,118***	***3,396***	***3,343***	***5,919***	***5,807***

TABLE 23 WEEKDAY LINKED PROJECT TRIPS BY BRT ALTERNATIVE IN 2015

Trip Purpose	Auto Ownership	No Build	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
Home-Based Work	0 Car	0	1,034	1,133	1,088	1,154	619	755
	1 Car	0	1,156	1,158	777	776	882	896
	2+ Car	0	1,311	1,315	619	616	1,217	1,216
	Subtotal	***0***	***3,502***	***3,605***	***2,484***	***2,546***	***2,718***	***2,867***
Home-Based Other	0 Car	0	994	1,042	875	994	513	688
	1 Car	0	620	597	389	382	567	557
	2+ Car	0	1,012	1,006	463	464	1,210	1,221
	Subtotal	***0***	***2,626***	***2,645***	***1,728***	***1,839***	***2,290***	***2,467***
Non-Home Based	0 Car	0	305	322	268	306	160	216
	1 Car	0	184	176	124	122	177	174
	2+ Car	0	258	257	136	136	320	319
	Subtotal	***0***	***747***	***754***	***529***	***565***	***657***	***709***
Total	0 Car	0	2,333	2,497	2,231	2,454	1,292	1,659
	1 Car	0	1,960	1,930	1,291	1,280	1,627	1,627
	2+ Car	0	2,581	2,578	1,219	1,216	2,747	2,757
	Subtotal	***0***	***6,874***	***7,005***	***4,740***	***4,950***	***5,665***	***6,043***

TABLE 24 WEEKDAY LINKED PROJECT TRIPS BY LRT ALTERNATIVE IN 2015

Trip Purpose	Auto Ownership	No Build	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
Home-Based Work	0 Car	0	1,200	1,276	1,171	1,268	763	840
	1 Car	0	1,618	1,617	1,104	1,109	1,215	1,211
	2+ Car	0	1,859	1,841	891	884	1,652	1,642
	Subtotal	***0***	***4,677***	***4,735***	***3,166***	***3,261***	***3,630***	***3,693***
Home-Based Other	0 Car	0	1,114	1,239	1,000	1,159	799	876
	1 Car	0	910	891	578	576	827	804
	2+ Car	0	1,522	1,477	693	693	1,739	1,711
	Subtotal	***0***	***3,547***	***3,606***	***2,271***	***2,427***	***3,365***	***3,391***
Non-Home Based	0 Car	0	342	382	306	356	248	273
	1 Car	0	272	272	186	189	263	258
	2+ Car	0	406	400	211	216	490	479
	Subtotal	***0***	***1,020***	***1,054***	***703***	***761***	***1,001***	***1,010***
Total	0 Car	0	2,657	2,897	2,477	2,783	1,811	1,989
	1 Car	0	2,800	2,780	1,867	1,874	2,305	2,273
	2+ Car	0	3,787	3,718	1,795	1,793	3,881	3,832
	Subtotal	***0***	***9,244***	***9,395***	***6,139***	***6,449***	***7,996***	***8,094***

2015 BOARDINGS

Tables 25 and 26 present a comparison of weekday boardings by route in 2015 for BRT and LRT alternatives. Tables 27 and 28 present a comparison of 2015 weekday boardings by fixed guideway station for BRT and LRT, respectively. These tables show many of the same patterns seen in the linked project trip results presented above. For instance, the highest total ridership occurs for the B alternatives (US 78); closely followed by the D alternatives (Dorchester Road). The C alternatives (US 176) have the lowest levels of overall ridership.

The route level ridership report shows expected route-level diversions associated with each alternative. For instance the B and C Alternatives (US 78 and US 176, respectively) divert approximately 1,700 daily riders from Route 10, while the D alternatives (Dorchester Road) divert only 400-600 riders. Likewise, the D alternatives show the highest levels of diversions from Route 12.

Station boardings (in Table 26) sum to the same numbers as the linked trips on project reported earlier. This indicates that the current service plan is designed so that there is no need to transfer among fixed guideway routes. Additional information on station mode-of-access is presented in Appendix II (Section 8).

TABLE 25 WEEKDAY ROUTE BOARDINGS BY BRT ALTERNATIVE IN 2015

Route	No Build	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
1 James Island-North Charleston Express	518	347	237	342	229	651	507
2 Mt. Pleasant - West Ashley Express	587	614	635	607	551	617	562
3 Dorchester Road Express	419	339	338	347	344	-	-
4 NASH Express	69	51	54	51	53	53	53
10 Rivers Avenue	4,761	2,903	3,105	2,931	3,152	4,134	4,300
11 Dorchester/Airport	1,073	947	913	931	907	903	903
12 Upper Dorchester AFB	826	1,072	1,069	1,030	1,037	830	834
13 Remount Road	540	654	651	626	646	595	583
20 King Street/Citadel	1,175	1,495	1,119	1,501	1,140	1,403	1,178
21 Rutledge Grove	436	375	491	382	523	390	511
30 Savannah Highway	1,492	1,963	1,226	1,840	1,237	1,788	1,202
31 Folly Road	298	345	357	344	368	348	366
32 North Bridge	472	546	568	537	543	534	538
40 Mt. Pleasant	1,080	1,036	1,093	1,139	1,241	1,089	1,046
41 Coleman Boulevard	447	463	301	490	323	481	316
102 North Neck	408	410	228	482	222	548	289
103 Leeds Avenue	172	173	168	168	176	165	174
104 Montague Avenue	387	459	476	460	456	410	407
105 North Area Shuttle NASH	-	-	-	-	-	-	-
201 North Beltline	-	-	-	-	-	-	-
203 Medical University Shuttle	39	38	38	38	38	38	38
210 Aquarium/ CofC DASH	361	356	370	357	399	360	365
211 Meeting/King DASH	367	354	426	359	426	355	432
213 Lockwood/Calhoun DASH	152	69	157	68	157	66	164
301 St. Andrews	986	854	1,040	826	988	804	1,005
I-26 Commuter Bus	152	-	-	-	-	-	-
Fixed Guideway Route	-	6,874	7,005	4,740	4,950	5,665	6,043
Total	17,217	22,738	22,064	20,598	20,106	22,224	21,817

TABLE 26 WEEKDAY ROUTE BOARDINGS BY LRT ALTERNATIVE IN 2015

Route	No Build	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
1 James Island-North Charleston Express	518	421	356	341	242	628	499
2 Mt. Pleasant - West Ashley Express	587	713	658	619	674	606	572
3 Dorchester Road Express	419	356	355	362	358	-	-
4 NASH Express	69	51	57	51	55	53	53
10 Rivers Avenue	4,761	3,143	3,394	3,315	3,482	4,162	4,379
11 Dorchester/Airport	1,073	974	906	975	942	948	961
12 Upper Dorchester AFB	826	1,170	1,162	1,079	1,075	956	928
13 Remount Road	540	723	736	682	711	638	622
20 King Street/Citadel	1,175	1,487	1,142	1,543	1,186	1,625	1,183
21 Rutledge Grove	436	367	471	378	525	381	510
30 Savannah Highway	1,492	1,911	1,238	1,854	1,246	1,819	1,227
31 Folly Road	298	369	380	357	374	360	390
32 North Bridge	472	621	650	582	597	556	572
40 Mt. Pleasant	1,080	1,203	1,109	1,205	1,210	1,114	1,122
41 Coleman Boulevard	447	529	373	467	342	449	339
102 North Neck	408	508	260	501	291	413	302
103 Leeds Avenue	172	170	185	169	183	182	202
104 Montague Avenue	387	464	481	479	488	418	411
105 North Area Shuttle NASH	-	-	-	-	-	-	-
201 North Beltline	-	-	-	-	-	-	-
203 Medical University Shuttle	39	38	38	38	38	38	38
210 Aquarium/ CofC DASH	361	356	387	357	389	350	393
211 Meeting/King DASH	367	355	423	362	427	362	428
213 Lockwood/Calhoun DASH	152	67	157	67	157	66	167
301 St. Andrews	986	873	1,055	859	1,015	852	1,045
I-26 Commuter Bus	152	-	-	-	-	-	-
Fixed Guideway Route	-	9,244	9,395	6,139	6,449	7,996	8,094
Total	17,217	26,113	25,367	22,784	22,458	24,972	24,438

TABLE 27 WEEKDAY STATION BOARDINGS BY BRT ALTERNATIVE IN 2015

Station	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
Main St - Richardson Ave	551	552	-	-	1,026	1,031
E 5th St N - Berlin Pkwy	806	809	-	-	-	-
US78 - Royle Rd	426	424	-	-	-	-
US87 - College Park Rd	370	367	-	-	-	-
US78 - I 26	156	159	-	-	-	-
Rivers Ave - Ontario Blvd	556	549	490	483	-	-
Rivers Ave - Ashley Phosphate Rd	257	258	249	251	-	-
Rivers Ave - Stokes Ave	193	180	192	179	-	-
Rivers Ave - Remount Rd	521	529	465	466	-	-
Rivers Ave - Mall Dr	392	360	428	412	-	-
Rivers Ave - Durant Ave	241	230	219	213	-	-
Rivers Ave - McMillan Ave	630	606	545	508	560	548
US52 - Stromboli Ave	176	192	181	180	144	135
Meeting St - Milford St	122	122	127	113	96	87
Meeting St - Mt Pleasant St	231	317	198	321	186	297
Meeting St - Romney St	99	-	91	-	72	-
Meeting St - Huger St	191	-	155	-	153	-
Meeting St - Line St	957	-	886	-	560	-
East Bay St - Romney St	-	149	-	160	-	137
East Bay St - Huger St	-	219	-	275	-	179
East Bay St - Columbus St	-	378	-	311	-	234
East Bay St - Calhoun St	-	604	-	561	-	526
US176 - US17A	-	-	70	67	-	-
US176 - Old Mountain Holly Rd	-	-	198	199	-	-
US176 - Central Ave	-	-	246	250	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	962	969
Old Trolley Rd - Dorchester Rd	-	-	-	-	763	762
Dorchester Rd - Wescott Blvd	-	-	-	-	182	184
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	426	417
Dorchester Rd - W. Hill Blvd	-	-	-	-	33	33
Dorchester Rd - Michaux Pkwy	-	-	-	-	92	105
Dorchester Rd - W. Montague Ave	-	-	-	-	244	228
Dorchester Rd - Leeds Ave	-	-	-	-	165	172
Total	6,874	7,005	4,740	4,950	5,665	6,043

TABLE 28 WEEKDAY STATION BOARDINGS BY LRT ALTERNATIVE IN 2015

Station	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
Main St - Richardson Ave	766	760	-	-	1,370	1,355
E 5th St N - Berlin Pkwy	1,126	1,118	-	-	-	-
US78 - Royle Rd	609	596	-	-	-	-
US87 - College Park Rd	506	493	-	-	-	-
US78 - I 26	219	221	-	-	-	-
Rivers Ave - Ontario Blvd	756	741	636	637	-	-
Rivers Ave - Ashley Phosphate Rd	343	338	328	319	-	-
Rivers Ave - Stokes Ave	247	228	241	223	-	-
Rivers Ave - Remount Rd	634	658	548	576	-	-
Rivers Ave - Mall Dr	468	445	524	524	-	-
Rivers Ave - Durant Ave	312	322	284	298	-	-
Rivers Ave - McMillan Ave	837	834	690	681	737	726
US52 - Stromboli Ave	295	291	256	268	231	216
Meeting St - Milford St	169	149	158	139	134	115
Meeting St - Mt Pleasant St	231	375	262	411	271	373
Meeting St - Romney St	183	-	141	-	151	-
Meeting St - Huger St	230	-	260	-	215	-
Meeting St - Line St	1,313	-	1,083	-	968	-
East Bay St - Romney St	-	185	-	156	-	159
East Bay St - Huger St	-	293	-	303	-	267
East Bay St - Columbus St	-	530	-	456	-	317
East Bay St - Calhoun St	-	818	-	737	-	726
US176 - US17A	-	-	94	92	-	-
US176 - Old Mountain Holly Rd	-	-	291	291	-	-
US176 - Central Ave	-	-	343	340	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	1,303	1,296
Old Trolley Rd - Dorchester Rd	-	-	-	-	1,030	1,011
Dorchester Rd - Wescott Blvd	-	-	-	-	240	243
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	600	554
Dorchester Rd - W. Hill Blvd	-	-	-	-	48	49
Dorchester Rd - Michaux Pkwy	-	-	-	-	116	131
Dorchester Rd - W. Montague Ave	-	-	-	-	314	302
Dorchester Rd - Leeds Ave	-	-	-	-	268	255
Total	9,244	9,395	6,139	6,449	7,996	8,094

2015 OTHER IMPACTS

Tables 29 and 30 present a comparison of the effects that BRT and LRT alternatives have on automobile travel in the region. The different transit alternatives are expected to divert between 12,000 and 40,000 vehicle miles of travel away from highway system on an average weekday. The differences among alternatives are similar to the results presented for linked transit trips.

TABLE 29 WEEKDAY IMPACTS ON AUTOMOBILE TRAVEL (VS. NO-BUILD) BY BRT ALTERNATIVE IN 2015

Measure	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
Incremental Person Miles of Travel (vs. No-Build)	-26,064	-25,222	-13,952	-13,236	-21,427	-21,006
Incremental Vehicle Miles of Travel (vs. No-Build)	-23,695	-22,929	-12,684	-12,033	-19,479	-19,096

TABLE 30 WEEKDAY IMPACTS ON AUTOMOBILE TRAVEL (VS. NO-BUILD) BY LRT ALTERNATIVE IN 2015

Measure	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
IncrementalPerson Miles of Travel (vs. No-Build)	-44,493	-42,617	-26,164	-25,279	-35,106	-33,868
Incremental Vehicle Miles of Travel (vs. No-Build)	-40,448	-38,743	-23,785	-22,981	-31,915	-30,789

6.3 | 2035 RESULTS

The section presents ridership results for each alternative for conditions 20 years into the future. Results are organized into 3 subsections: linked transit trips, boardings, and other results.

2035 LINKED TRIPS

Table 31 presents the number of weekday linked transit trips in the Year 2035 for the no-build and each BRT alternative. Table 32 presents the same information for each LRT alternative. Incremental linked transit trips[8] for each build alternative as compared to the no-build alternative are presented in Tables 33 and 34. Together, these tables show how the proposed projects will serve to increase overall transit ridership in the Charleston area 20 years into the future.

In parallel with the 2015 results, these tables show that the B and D alternatives (US 78 and Dorchester Road alignments, respectively) attract similar levels of new ridership to the CARTA system with very little difference between the Meeting Street and East Bay Street options in Downtown Charleston. For these alignments, BRT attracts 4,000 to 4,200 new weekday linked transit trips to the CARTA system while LRT attracts 6,400 to 6,900 new weekday linked transit trips. These numbers are approximately 11 percent higher than the equivalent results from 2015. This growth between 2015 and 2035 is similar to the growth in Downtown Charleston employment; the attraction location of the majority of CARTA's choice-rider transit trips.

As in 2015, the C alternatives (US 176 alignment) attract considerably fewer linked transit trips – 2,000 to 2,100 BRT new trips and 3,800-3,900 new LRT trips. The reasons for the lower number of new linked trips is the same as was reported for the 2015 results—the nature of development in this corridor as compared to development in the B and D corridors.

Tables 23 and 24 present an assessment of linked project trips for 2035 and is similar to 2015 results but 10 to 13 percent higher depending on the specific location of the alignment and whether it is a BRT or LRT.

[8] Incremental linked transit trips are often called "New Transit Riders"

TABLE 31 LINKED WEEKDAY TRANSIT TRIPS BY BRT ALTERNATIVE IN 2035

Trip Purpose	Auto Ownership	No Build	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
Home-Based Work	0 Car	4,021	4,308	4,306	4,334	4,316	4,178	4,159
	1 Car	1,834	2,581	2,558	2,188	2,169	2,411	2,403
	2+ Car	1029	2,117	2,113	1,425	1,417	2,138	2,139
	Subtotal	***6,884***	***9,006***	***8,976***	***7,947***	***7,902***	***8,727***	***8,700***
Home-Based Other	0 Car	4,774	5,078	5,011	5,081	5,035	4,972	4,964
	1 Car	1,160	1,594	1,565	1,357	1,336	1,622	1,601
	2+ Car	887	1,781	1,774	1,224	1,220	2,111	2,129
	Subtotal	***6,822***	***8,453***	***8,350***	***7,662***	***7,592***	***8,705***	***8,694***
Non-Home Based	0 Car	1,472	1,562	1,542	1,561	1,547	1,532	1,529
	1 Car	406	528	513	464	454	540	530
	2+ Car	355	563	562	438	436	661	660
	Subtotal	***2,233***	***2,653***	***2,618***	***2,463***	***2,436***	***2,733***	***2,720***
Total	0 Car	10,267	10,948	10,859	10,975	10,898	10,682	10,652
	1 Car	3,400	4,703	4,636	4,010	3,959	4,574	4,534
	2+ Car	2,271	4,461	4,449	3,087	3,073	4,909	4,929
	Subtotal	***15,938***	***20,112***	***19,944***	***18,072***	***17,930***	***20,165***	***20,115***

TABLE 32 LINKED WEEKDAY TRANSIT TRIPS BY LRT ALTERNATIVE IN 2035

Trip Purpose	Auto Ownership	No Build	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
Home-Based Work	0 Car	4,021	4,536	4,518	4,524	4,526	4,333	4,320
	1 Car	1,834	3,100	3,079	2,580	2,562	2,776	2,755
	2+ Car	1029	2,733	2,701	1,761	1,739	2,625	2,615
	Subtotal	***6,884***	***10,369***	***10,298***	***8,866***	***8,827***	***9,733***	***9,691***
Home-Based Other	0 Car	4,774	5,287	5,239	5,260	5,240	5,148	5,128
	1 Car	1,160	1,916	1,884	1,575	1,555	1,902	1,865
	2+ Car	887	2,326	2,278	1,490	1,482	2,680	2,658
	Subtotal	***6,822***	***9,529***	***9,401***	***8,325***	***8,277***	***9,731***	***9,652***
Non-Home Based	0 Car	1,472	1,623	1,609	1,613	1,607	1,584	1,577
	1 Car	406	629	618	537	529	634	620
	2+ Car	355	727	716	527	526	847	831
	Subtotal	***2,233***	***2,979***	***2,943***	***2,677***	***2,661***	***3,065***	***3,028***
Total	0 Car	10,267	11,446	11,366	11,398	11,373	11,065	11,025
	1 Car	3,400	5,645	5,581	4,692	4,646	5,312	5,240
	2+ Car	2,271	5,786	5,695	3,778	3,747	6,152	6,105
	Subtotal	***15,938***	***22,878***	***22,643***	***19,867***	***19,766***	***22,529***	***22,370***

TABLE 33 INCREMENTAL (VS. NO-BUILD) WEEKDAY LINKED TRANSIT TRIPS BY BRT ALTERNATIVE IN 2035

Trip Purpose	Auto Ownership	No Build	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
Home-Based Work	0 Car	0	287	285	313	295	157	138
	1 Car	0	747	724	354	335	577	569
	2+ Car	0	1,088	1,084	396	388	1,109	1,110
	Subtotal	***0***	***2,122***	***2,092***	***1,063***	***1,018***	***1,843***	***1,816***
Home-Based Other	0 Car	0	304	237	307	261	198	190
	1 Car	0	434	405	197	176	462	441
	2+ Car	0	894	887	337	333	1,224	1,242
	Subtotal	***0***	***1,631***	***1,528***	***840***	***770***	***1,883***	***1,872***
Non-Home Based	0 Car	0	90	70	89	75	60	57
	1 Car	0	122	107	58	48	134	124
	2+ Car	0	208	207	83	81	306	305
	Subtotal	***0***	***420***	***385***	***230***	***203***	***500***	***487***
Total	0 Car	0	681	592	708	631	415	385
	1 Car	0	1,303	1,236	610	559	1,174	1,134
	2+ Car	0	2,190	2,178	816	802	2,638	2,658
	Subtotal	***0***	***4,174***	***4,006***	***2,134***	***1,992***	***4,227***	***4,177***

TABLE 34 INCREMENTAL (VS. NO-BUILD) WEEKDAY LINKED TRANSIT TRIPS BY LRT ALTERNATIVE IN 2035

Trip Purpose	Auto Ownership	No Build	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
Home-Based Work	0 Car	0	515	497	503	505	312	299
	1 Car	0	1,266	1,245	746	728	942	921
	2+ Car	0	1,704	1,672	732	710	1,596	1,586
	Subtotal	***0***	***3,485***	***3,414***	***1,982***	***1,943***	***2,849***	***2,807***
Home-Based Other	0 Car	0	513	465	486	466	374	354
	1 Car	0	756	724	415	395	742	705
	2+ Car	0	1,439	1,391	603	595	1,793	1,771
	Subtotal	***0***	***2,707***	***2,579***	***1,503***	***1,455***	***2,909***	***2,830***
Non-Home Based	0 Car	0	151	137	141	135	112	105
	1 Car	0	223	212	131	123	228	214
	2+ Car	0	372	361	172	171	492	476
	Subtotal	***0***	***746***	***710***	***444***	***428***	***832***	***795***
Total	0 Car	0	1,179	1,099	1,131	1,106	798	758
	1 Car	0	2,245	2,181	1,292	1,246	1,912	1,840
	2+ Car	0	3,515	3,424	1,507	1,476	3,881	3,834
	Subtotal	***0***	***6,940***	***6,705***	***3,929***	***3,828***	***6,591***	***6,432***

TABLE 35 WEEKDAY LINKED PROJECT TRIPS BY BRT ALTERNATIVE IN 2035

Trip Purpose	Auto Ownership	No Build	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
Home-Based Work	0 Car	0	1,197	1,274	1,259	1,284	786	872
	1 Car	0	1,292	1,294	895	891	992	1,013
	2+ Car	0	1,439	1,438	731	723	1,361	1,357
	Subtotal	***0***	***3,928***	***4,006***	***2,885***	***2,899***	***3,140***	***3,242***
Home-Based Other	0 Car	0	1,149	1,183	1,037	1,124	638	812
	1 Car	0	692	663	445	437	631	621
	2+ Car	0	1,087	1,081	529	527	1,332	1,340
	Subtotal	***0***	***2,928***	***2,926***	***2,011***	***2,087***	***2,601***	***2,774***
Non-Home Based	0 Car	0	343	356	308	336	194	248
	1 Car	0	211	200	144	143	197	194
	2+ Car	0	286	285	162	160	359	355
	Subtotal	***0***	***840***	***841***	***614***	***639***	***750***	***796***
Total	0 Car	0	2,688	2,812	2,604	2,744	1,618	1,931
	1 Car	0	2,196	2,157	1,484	1,471	1,820	1,828
	2+ Car	0	2,812	2,803	1,421	1,410	3,052	3,052
	Subtotal	***0***	***7,696***	***7,773***	***5,510***	***5,625***	***6,490***	***6,812***

TABLE 36 WEEKDAY LINKED PROJECT TRIPS BY LRT ALTERNATIVE IN 2035

Trip Purpose	Auto Ownership	No Build	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
Home-Based Work	0 Car	0	1,377	1,407	1,341	1,402	916	954
	1 Car	0	1,796	1,797	1,256	1,263	1,362	1,357
	2+ Car	0	2,043	2,012	1,047	1,028	1,853	1,833
	Subtotal	***0***	***5,216***	***5,217***	***3,644***	***3,693***	***4,132***	***4,144***
Home-Based Other	0 Car	0	1,289	1,358	1,162	1,278	938	989
	1 Car	0	1,003	983	647	645	916	888
	2+ Car	0	1,629	1,578	780	775	1,901	1,871
	Subtotal	***0***	***3,921***	***3,919***	***2,589***	***2,699***	***3,755***	***3,748***
Non-Home Based	0 Car	0	385	407	346	381	283	300
	1 Car	0	308	307	211	214	292	285
	2+ Car	0	450	440	245	248	544	528
	Subtotal	***0***	***1,143***	***1,153***	***802***	***844***	***1,119***	***1,112***
Total	0 Car	0	3,051	3,172	2,850	3,061	2,137	2,242
	1 Car	0	3,107	3,087	2,114	2,123	2,570	2,530
	2+ Car	0	4,122	4,030	2,071	2,052	4,298	4,232
	Subtotal	***0***	***10,281***	***10,289***	***7,035***	***7,235***	***9,005***	***9,004***

2035 BOARDINGS

Tables 37 and 38 present a comparison of weekday boardings by route in 2035 for BRT and LRT alternatives. Tables 39 and 40 present a comparison of 2035 weekday boardings by fixed guideway station for BRT and LRT, respectively. These tables show many of the same patterns seen in the linked project trip results presented above and also reported in the results for 2015.

TABLE 37 WEEKDAY ROUTE BOARDINGS BY BRT ALTERNATIVE IN 2035

Route	No Build	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
1 James Island-North Charleston Express	554	385	254	378	248	709	540
2 Mt. Pleasant - West Ashley Express	611	645	672	638	578	644	586
3 Dorchester Road Express	491	403	402	412	408	-	-
4 NASH Express	81	63	64	63	64	62	61
10 Rivers Avenue	5,194	3,112	3,327	3,111	3,354	4,443	4,615
11 Dorchester/Airport	1,230	1,104	1,069	1,096	1,069	1,073	1,074
12 Upper Dorchester AFB	893	1,188	1,190	1,139	1,147	907	913
13 Remount Road	549	664	662	640	661	614	600
20 King Street/Citadel	1,307	1,614	1,241	1,628	1,285	1,525	1,316
21 Rutledge Grove	618	440	662	445	724	467	710
30 Savannah Highway	1,722	2,331	1,407	2,190	1,411	2,150	1,388
31 Folly Road	332	422	437	421	448	426	449
32 North Bridge	488	570	597	561	569	563	570
40 Mt. Pleasant	1,183	1,136	1,207	1,258	1,395	1,194	1,151
41 Coleman Boulevard	487	508	344	538	368	529	365
102 North Neck	451	512	248	592	253	674	318
103 Leeds Avenue	176	179	174	177	190	168	182
104 Montague Avenue	423	501	519	503	498	441	437
105 North Area Shuttle NASH	-	-	-	-	-	-	-
201 North Beltline	-	-	-	-	-	-	-
203 Medical University Shuttle	51	50	50	50	50	50	50
210 Aquarium/ CofC DASH	359	355	371	356	401	360	366
211 Meeting/King DASH	368	350	427	354	427	348	433
213 Lockwood/Calhoun DASH	184	82	188	81	188	76	193
301 St. Andrews	1,119	943	1,219	904	1,135	868	1,144
I-26 Commuter Bus	177	-	-	-	-	-	-
Fixed Guideway Route	-	7,696	7,773	5,510	5,625	6,490	6,812
Total	19,048	25,255	24,504	23,045	22,496	24,783	24,274

TABLE 38 WEEKDAY ROUTE BOARDINGS BY LRT ALTERNATIVE IN 2035

Route	No Build	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
1 James Island-North Charleston Express	554	467	398	377	262	681	532
2 Mt. Pleasant - West Ashley Express	611	755	694	652	713	632	598
3 Dorchester Road Express	491	424	423	432	426	-	-
4 NASH Express	81	64	68	63	66	64	62
10 Rivers Avenue	5,194	3,393	3,671	3,576	3,748	4,514	4,733
11 Dorchester/Airport	1,230	1,144	1,068	1,152	1,114	1,146	1,163
12 Upper Dorchester AFB	893	1,300	1,293	1,202	1,195	1,056	1,024
13 Remount Road	549	733	749	693	725	664	645
20 King Street/Citadel	1,307	1,605	1,279	1,671	1,343	1,758	1,330
21 Rutledge Grove	618	420	648	440	727	458	709
30 Savannah Highway	1,722	2,261	1,426	2,203	1,423	2,175	1,419
31 Folly Road	332	449	462	436	456	440	475
32 North Bridge	488	649	683	608	626	583	602
40 Mt. Pleasant	1,183	1,323	1,224	1,336	1,349	1,223	1,246
41 Coleman Boulevard	487	581	427	515	388	498	391
102 North Neck	451	601	293	610	333	534	338
103 Leeds Avenue	176	175	192	174	191	188	213
104 Montague Avenue	423	506	524	524	533	452	443
105 North Area Shuttle NASH	-	-	-	-	-	-	-
201 North Beltline	-	-	-	-	-	-	-
203 Medical University Shuttle	51	50	50	50	50	50	50
210 Aquarium/ CofC DASH	359	356	389	357	390	350	396
211 Meeting/King DASH	368	351	425	356	428	359	429
213 Lockwood/Calhoun DASH	184	80	187	80	189	76	197
301 St. Andrews	1,119	957	1,212	937	1,160	928	1,187
I-26 Commuter Bus	177	-	-	-	-	-	-
Fixed Guideway Route	-	10,281	10,289	7,035	7,235	9,005	9,004
Total	19,048	28,926	28,074	25,479	25,069	27,833	27,186

TABLE 39 WEEKDAY STATION BOARDINGS BY BRT ALTERNATIVE IN 2035

Station	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
Main St - Richardson Ave	550	550	-	-	1,112	1,116
E 5th St N - Berlin Pkwy	869	871	-	-	-	-
US78 - Royle Rd	437	436	-	-	-	-
US87 - College Park Rd	409	405	-	-	-	-
US78 - I 26	187	189	-	-	-	-
Rivers Ave - Ontario Blvd	640	633	558	548	-	-
Rivers Ave - Ashley Phosphate Rd	283	287	277	279	-	-
Rivers Ave - Stokes Ave	196	179	199	183	-	-
Rivers Ave - Remount Rd	574	578	515	511	-	-
Rivers Ave - Mall Dr	441	404	481	460	-	-
Rivers Ave - Durant Ave	277	264	259	248	-	-
Rivers Ave - McMillan Ave	740	704	647	600	676	656
US52 - Stromboli Ave	193	208	196	193	159	148
Meeting St - Milford St	192	181	215	172	155	126
Meeting St - Mt Pleasant St	258	362	226	368	239	350
Meeting St - Romney St	109	-	103	-	80	-
Meeting St - Huger St	214	-	172	-	169	-
Meeting St - Line St	1,126	-	1,070	-	686	-
East Bay St - Romney St	-	155	-	166	-	142
East Bay St - Huger St	-	246	-	317	-	200
East Bay St - Columbus St	-	460	-	375	-	275
East Bay St - Calhoun St	-	660	-	610	-	585
US176 - US17A	-	-	113	110	-	-
US176 - Old Mountain Holly Rd	-	-	220	221	-	-
US176 - Central Ave	-	-	261	265	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	1,003	1,011
Old Trolley Rd - Dorchester Rd	-	-	-	-	866	864
Dorchester Rd - Wescott Blvd	-	-	-	-	203	206
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	485	472
Dorchester Rd - W. Hill Blvd	-	-	-	-	38	39
Dorchester Rd - Michaux Pkwy	-	-	-	-	118	139
Dorchester Rd - W. Montague Ave	-	-	-	-	317	291
Dorchester Rd - Leeds Ave	-	-	-	-	183	192
Total	7,696	7,773	5,510	5,625	6,490	6,812

TABLE 40 WEEKDAY STATION BOARDINGS BY LRT ALTERNATIVE IN 2035

Station	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
Main St - Richardson Ave	765	759	-	-	1,485	1,467
E 5th St N - Berlin Pkwy	1,206	1,199	-	-	-	-
US78 - Royle Rd	626	615	-	-	-	-
US87 - College Park Rd	556	542	-	-	-	-
US78 - I 26	260	261	-	-	-	-
Rivers Ave - Ontario Blvd	879	859	730	728	-	-
Rivers Ave - Ashley Phosphate Rd	375	366	366	351	-	-
Rivers Ave - Stokes Ave	253	231	250	229	-	-
Rivers Ave - Remount Rd	694	718	600	627	-	-
Rivers Ave - Mall Dr	517	490	578	578	-	-
Rivers Ave - Durant Ave	356	365	328	341	-	-
Rivers Ave - McMillan Ave	948	940	792	776	852	833
US52 - Stromboli Ave	317	313	274	286	248	231
Meeting St - Milford St	282	215	264	210	217	166
Meeting St - Mt Pleasant St	259	409	293	463	312	418
Meeting St - Romney St	193	-	154	-	163	-
Meeting St - Huger St	254	-	292	-	235	-
Meeting St - Line St	1,540	-	1,277	-	1,130	-
East Bay St - Romney St	-	190	-	163	-	166
East Bay St - Huger St	-	326	-	337	-	296
East Bay St - Columbus St	-	607	-	522	-	361
East Bay St - Calhoun St	-	882	-	795	-	790
US176 - US17A	-	-	153	150	-	-
US176 - Old Mountain Holly Rd	-	-	319	319	-	-
US176 - Central Ave	-	-	364	360	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	1,357	1,351
Old Trolley Rd - Dorchester Rd	-	-	-	-	1,166	1,148
Dorchester Rd - Wescott Blvd	-	-	-	-	271	275
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	677	621
Dorchester Rd - W. Hill Blvd	-	-	-	-	56	57
Dorchester Rd - Michaux Pkwy	-	-	-	-	145	167
Dorchester Rd - W. Montague Ave	-	-	-	-	396	376
Dorchester Rd - Leeds Ave	-	-	-	-	295	282
Total	10,281	10,289	7,035	7,235	9,005	9,004

2035 OTHER IMPACTS

Tables 41 and 42 present a comparison of the effects that BRT and LRT alternatives have on automobile travel in the region in 2035. The different transit alternatives are expected to divert between 15,000 and 45,000 vehicle miles of travel away from highway system on an average weekday. The differences among alternatives are similar to the results presented for linked transit trips.

TABLE 41 WEEKDAY IMPACTS ON AUTOMOBILE TRAVEL (VS. NO-BUILD) BY BRT ALTERNATIVE IN 2035

Measure	Alt. B1	Alt. B3	Alt. C1	Alt. C3	Alt. D1	Alt. D3
IncrementalPerson Miles of Travel (vs. No-Build)	-29,356	-28,329	-17,111	-16,136	-24,072	-23,493
Incremental Vehicle Miles of Travel (vs. No-Build)	-26,687	-25,754	-15,555	-14,669	-21,884	-21,357

TABLE 42 WEEKDAY IMPACTS ON AUTOMOBILE TRAVEL (VS. NO-BUILD) BY LRT ALTERNATIVE IN 2035

Measure	Alt. B2	Alt. B4	Alt. C2	Alt. C4	Alt. D2	Alt. D4
IncrementalPerson Miles of Travel (vs. No-Build)	-49,674	-47,222	-31,038	-29,658	-39,445	-37,839
Incremental Vehicle Miles of Travel (vs. No-Build)	-45,158	-42,929	-28,216	-26,962	-35,859	-34,399

6.4 | FORECAST UNCERTAINTIES

The forecasts presented in this report are the results of each alternative service plan being coded in GTFS format and analyzed with FTA's Simplified Trips-on-Project Software (STOPS). As part of its original development, STOPS was calibrated to match the actual ridership response associated with past BRT, LRT, and other fixed guideway transit projects constructed throughout the United States over the past 10 to 15 years.

As part of the I-26 project, STOPS also read Year 2014 bus stop boarding count data to help it properly represent current transit demand patterns in Charleston, SC. This calibration strategy means that STOPS has a good understanding of both the local transit system and the likely responses to changes in transit service resulting from new fixed guideway transit options. The goal for the forecasts presented in this report is to be a *plausible* set of predictions of how transit ridership in Charleston would respond to new transit investments.

Even though these forecasts may be plausible, that does not eliminate the uncertainty of the forecasts. Four main factors affect the likelihood of CARTA attracting the levels of ridership predicted by STOPS:

- ***Uncertainty of population and employment forecasts.*** STOPS forecasts of future year ridership are based on BCDCOG estimates of population and employment in the Charleston area. The ridership forecasts in this report are generally proportional to forecasts of future employment in downtown Charleston. If employment in downtown Charleston does not achieve the 11 percent growth predicted by BCDCOG for 2035, then ridership is likely to be proportionately less than the results presented in this report. Forecasts also depend on population and employment in outer parts of the region achieving the forecasted levels of development.
- ***Uncertainty of service plan.*** The alternative definitions described in this report present the expected transit level-of-service for each alternative. As projects move through the development process from plans to design to implementation, events can occur which may cause significant changes to the project definition. In some cases, the project that is actually built offers considerably different levels-of-service than that envisioned earlier in the planning phase. If the planned levels-of-service (e.g., running times, service frequency, and station locations) are changed, then the ridership estimates should be revised accordingly.
- ***Uncertainty of visibility factor.*** The visibility factor represents the expected customer response to the project beyond the changes expected from improvements to time and cost. This factor is set half-way between FTA recommendations for fixed guideway services with no exclusive right-of-way (i.e., BRT-light or streetcar) and that for systems that operate on in an exclusive right-of-way (e.g., high-end BRT or full LRT). Experience with actual projects across the United States suggests

that even when considering the right-of-way characteristics, the visibility factor is still the source of considerable uncertainties—some projects experience an increase in ridership associated with increased visibility while others do not. Tables 43 and 44 present the impact of reducing the visibility factor to the minimum typical values for BRT and LRT options, respectively. Table 45 presents LRT ridership assuming an extreme value of the visibility factor consistent with the project being perceived by customers like another bus rather than like a rail line. Results for Alternatives B-1 and B-2 are presented in these tables but other alternatives will generate similar results.

These tables show that if the BRT system is viewed as being similar to existing bus services (visibility factor equal to 0.0), then ridership could be 15 to 16 percent lower than reported elsewhere in this report. If LRT ridership is estimated with the visibility factor set to its lowest typical value for rail (0.5, corresponds to streetcar), then ridership could be 12 to 13 percent less than forecasted in this report. As an extreme test, if the LRT system is viewed as being similar to existing buses, then ridership could be 33 to 34 percent lower than reported in this report.

TABLE 43 IMPACT OF VISIBILITY FACTOR ON BRT RIDERSHIP (DAILY PROJECT LINKED TRIPS FOR ALTERNATIVE B-1)

Year	VF=0.25	VF=0.0	Percent Difference
2015	6,874	5,761	-16%
2035	7,696	6,507	-15%

TABLE 44 IMPACT OF VISIBILITY FACTOR ON LRT RIDERSHIP (DAILY PROJECT LINKED TRIPS FOR ALTERNATIVE B-2)

Year	VF=.75	VF=0.5	Percent Difference
2015	9,244	8,080	-13%
2035	10,281	9,023	-12%

TABLE 45 IMPACT OF VISIBILITY FACTOR ON LRT RIDERSHIP IF LRT IS VIEWED AS BUS (DAILY PROJECT LINKED TRIPS FOR ALTERNATIVE B-2)

Year	VF=.75	VF=0.0	Percent Difference
2015	9,244	6,091	-34%
2035	10,281	6,890	-33%

- ***Other Sources of Uncertainty.*** The forecasts presented in this report were prepared following FTA requirements that transportation policies are consistent among alternatives. This means that key assumptions such as land uses, fare policies, and costs for competing modes be consistent for all scenarios to allow for a meaningful comparison of transit alternatives. FTA also requires project sponsors to use forecasting methods that have been validated to match existing transit market characteristics. Key parameters such as trip rates, auto operating costs, and mode-specific parameters must be the same for model calibration and analysis of each alternative. Experience has shown that adherence to these requirements results in a fair analysis of alternatives and a good chance that the forecasted results will be achieved when projects are implemented.

  Nevertheless, it is possible that changes in the nature of commuting (e.g., tele-working), costs of transit or competing modes, nature of land development, or overall levels of transit service can occur over time. These changes can affect the magnitude of the projected demand for transit which are not reflected in the results presented in this report.

7.0 APPENDIX I: OVERVIEW OF STOPS

STOPS is designed to estimate fixed guideway transit trips on a project using readily available data and procedures that are calibrated to match both local and national experience related to rail and BRT ridership. STOPS is similar, in concept, to traditional trip-based four-step travel forecasting models. This structure is more complex than a simple direct-generation model so that STOPS can discern project ridership in a wide range of situations including:

- A fixed guideway starter line
- An extension to an existing fixed guideway line
- A new line added to an existing fixed guideway system
- A gap-filler project in which a new segment connects two previously separated fixed guideway systems

To be able to measure project ridership in all of these situations, STOPS includes the capability to represent the transit system and the project definition so that trips can be identified that benefit from the investment in new fixed guideway services.

In STOPS, person trip tables (i.e., the results of Steps 1 and 2 of traditional four-step models) are developed from Year 2000 Census Transportation Planning Package (CTPP) Journey-to-Work (JTW) flows that are updated to account for current and future year demographic growth. Transit timetable data from local General Transit Feed Specification (GTFS) files are used to develop zone-to-zone transit, access, and waiting times. A traditional nested logit mode choice model computes the transit shares stratified by access mode (walk, kiss-and-ride, and park-and-ride) and sub-mode (fixed guideway-only, fixed guideway and bus, and bus-only). An overview of STOPS is presented in Figure 6.

Similar to nearly all multi-modal travel forecasting models, STOPS has three parallel tracks:

- ***Highway supply.*** The left column in the flow chart represents information about the highway system in the region. STOPS does not directly process information on highway attributes and instead relies on estimates of zone-to-zone highway travel times and distances obtained from regional travel forecasting model sets maintained by Metropolitan Planning Organizations (MPOs). Since MPO models might not still use the same geographic (zone) system used in the CTPP, STOPS includes a procedure to convert MPO geography to CTPP geography.

- ***Transit supply.*** The right column represents information about the transit system. Like traditional models, transit network characteristics are used to build zone-to-zone level of service (skim) matrices and load transit trips to determine ridership by route and station. Unlike traditional forecasting models, STOPS does not use elaborate hand-coded networks. Instead, STOPS takes advantage of a recent advance in on-line schedule data—the General Transit Feed Specification (GTFS). This data format is a commonly-used format for organizing transit data so that on-line mapping programs can help customers find the optimal paths (times, routes, and stop locations) for their trips. STOPS includes a program known as GTFPath that generates the shortest path between every combination of regional origin and destination. This path is used for estimating travel times (as an input to mode choice) and for assigning transit trips (an output of mode choice) to routes and stations.

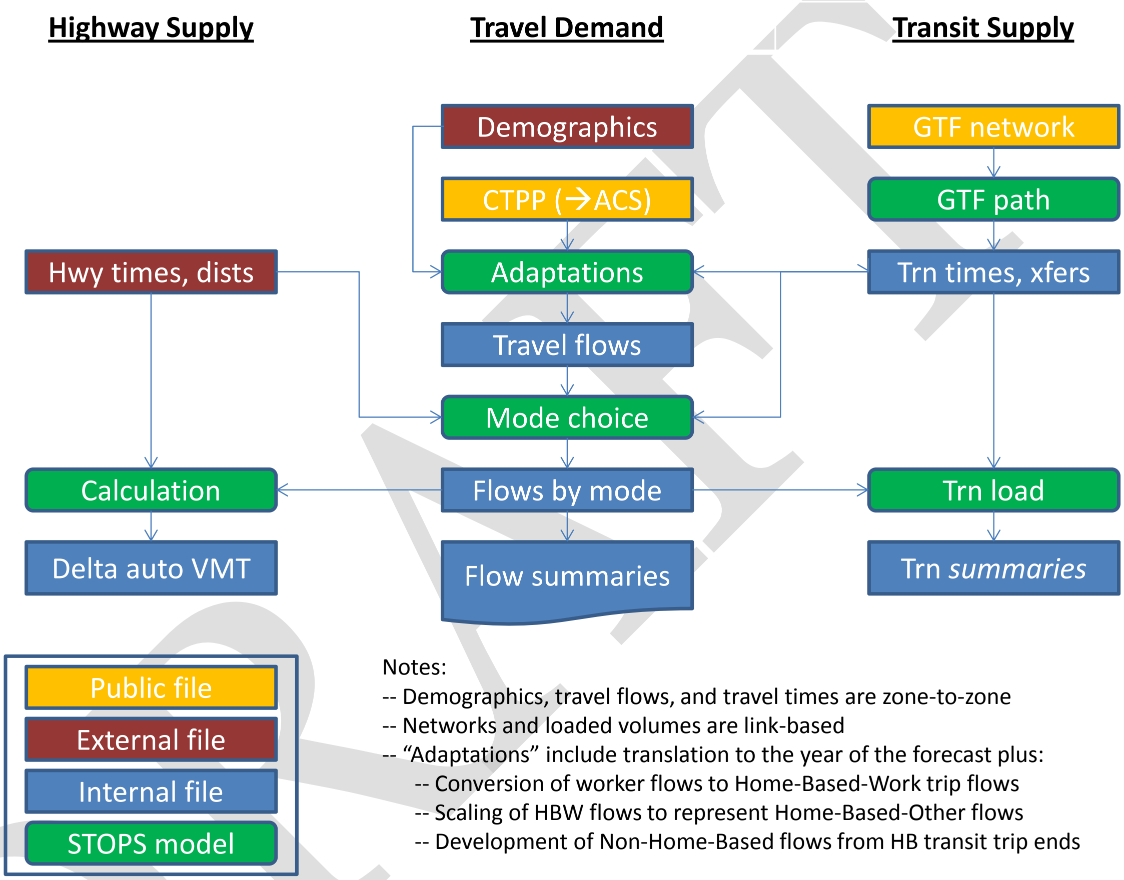

FIGURE 6 STOPS APPLICATION FLOW CHART

- ***Travel Demand.*** The central column represents the demand side of STOPS. STOPS uses Year 2000 CTPP JTW data to estimate zone-to-zone demand for travel (i.e., travel flows) as an input to the models that determine the mode of travel. This data is adapted to represent current and future years by using MPO demographic forecasts to account for zone-specific growth in population and employment. A traditional nested logit mode choice model is used to determine the proportion of trips utilizing transit stratified by access mode and transit sub-mode. Results of mode choice are summarized in a series of district-to-district flow tables.

STOPS is designed to make use of pre-existing data sources on transportation supply and demand for nearly all aspects of the ridership forecasting process. The only information that must be created specifically for a STOPS application are transit timetables (in GTFS format) representing the no-build and build scenarios.

GTFS consists of a series of files that, together, represent the stops, routes, and scheduled operation of a transit system. In some areas, all transit services are provided by a single operator and in such cases a single set of GTFS files represent all or nearly all fixed route services in a region. In other areas, multiple operators provide service and GTFS files may be available separately for each operator or may be combined into a single master GTFS dataset. STOPS only uses a sub-set of the GTFS file structure and processes GTFS data using a program called *GTFPath*. This program reads GTFS data and a set of zone centroids and creates a matrix of zone-to-zone transit times that is similar in concept to transit skim files generated by conventional travel forecasting models.

8.0 APPENDIX II: I-26 TRANSIT ALTERNATIVE ALIGNMENT AND DETAILED FORECAST RESULTS

8.1 | ALTERNATIVE B-1 AND B-2 – US 78/US 52/MEETING

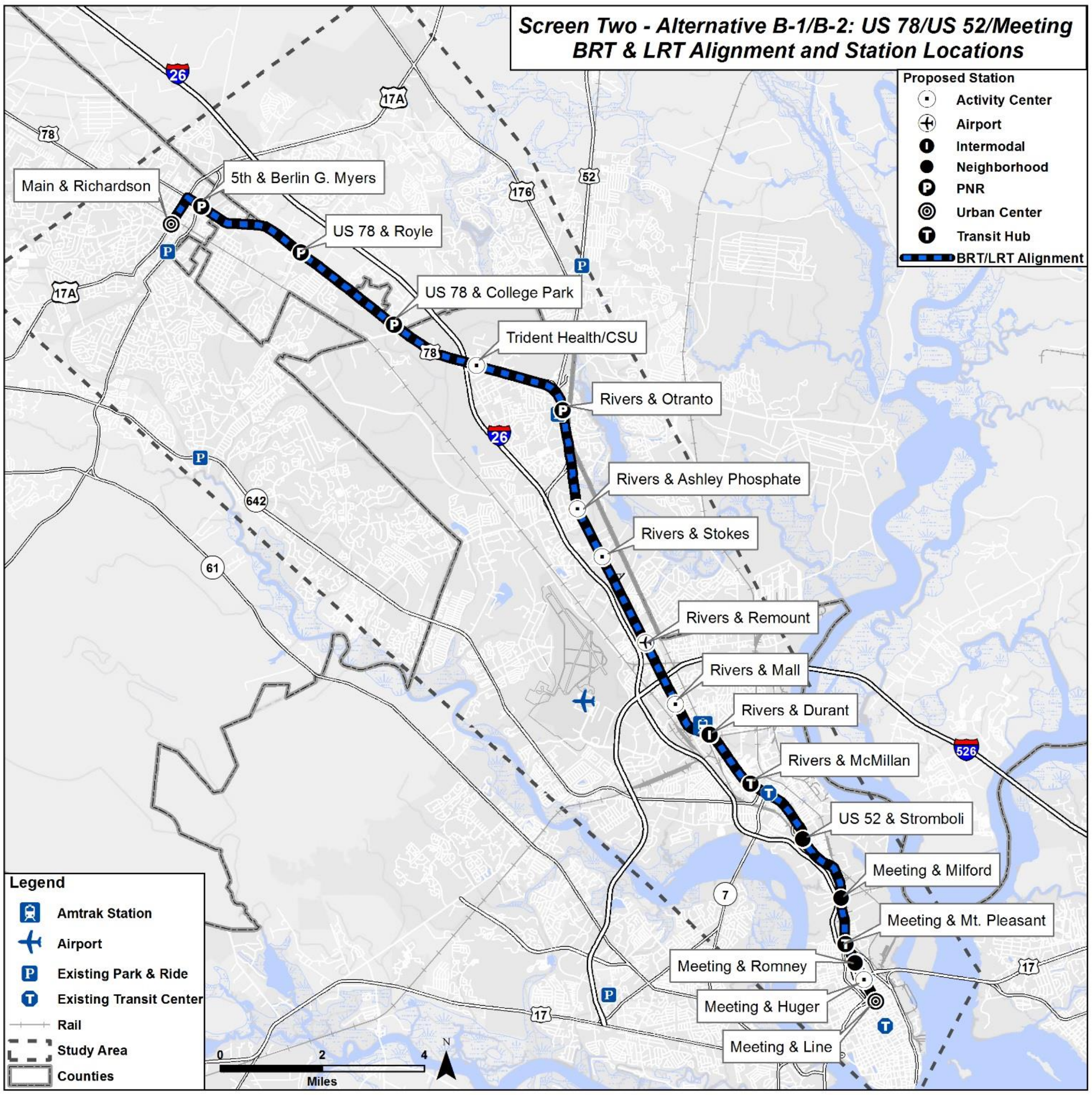

FIGURE 7 ALTERNATIVE B-1/B-2 ALIGNMENT AND STATION LOCATIONS

TABLE 46 ALTERNATIVE B-1 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative B1 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,682	120	20	3,822
	1 Car	1,364	320	666	2,350
	2+ Car	704	234	1,001	1,938
	Subtotal	***5,750***	***674***	***1,687***	***8,110***
Home-Based Other	0 Car	4,367	131	11	4,508
	1 Car	1,146	170	156	1,472
	2+ Car	974	247	448	1,670
	Subtotal	***6,487***	***548***	***615***	***7,651***
Non-Home Based	0 Car	1,343	75	5	1,423
	1 Car	385	61	38	483
	2+ Car	384	55	84	523
	Subtotal	***2,112***	***191***	***127***	***2,429***
Total	0 Car	9,392	325	35	9,752
	1 Car	2,895	551	860	4,306
	2+ Car	2,062	537	1,533	4,132
	Subtotal	***14,348***	***1,413***	***2,428***	***18,189***

TABLE 47 ALTERNATIVE B-1 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for
Alternative B1 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	971	54	10	1,034
	1 Car	537	193	427	1,156
	2+ Car	346	172	792	1,311
	Subtotal	***1,854***	***419***	***1,228***	***3,502***
Home-Based Other	0 Car	944	45	5	994
	1 Car	407	100	113	620
	2+ Car	436	188	387	1,012
	Subtotal	***1,786***	***334***	***505***	***2,626***
Non-Home Based	0 Car	282	21	2	305
	1 Car	125	33	27	184
	2+ Car	147	39	72	258
	Subtotal	***553***	***93***	***100***	***747***
Total	0 Car	2,196	121	16	2,333
	1 Car	1,068	325	566	1,960
	2+ Car	929	400	1,252	2,581
	Subtotal	***4,194***	***846***	***1,834***	***6,874***

TABLE 48 ALTERNATIVE B-1 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative B1 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	461	29	61	-	551
E 5th St N - Berlin Pkwy	539	55	213	-	806
US78 - Royle Rd	155	59	213	-	426
US87 - College Park Rd	167	49	154	-	370
US78 - I 26	132	15	-	9	156
Rivers Ave - Ontario Blvd	152	91	247	66	556
Rivers Ave - Ashley Phosphate Rd	139	21	-	97	257
Rivers Ave - Stokes Ave	156	3	-	34	193
Rivers Ave - Remount Rd	371	14	-	136	521
Rivers Ave - Mall Dr	325	9	-	58	392
Rivers Ave - Durant Ave	218	5	-	17	241
Rivers Ave - McMillan Ave	367	13	-	251	630
US52 - Stromboli Ave	163	3	-	10	176
Meeting St - Milford St	120	2	-	-	122
Meeting St - Mt Pleasant St	179	3	-	49	231
Meeting St - Romney St	95	4	-	-	99
Meeting St - Huger St	161	3	-	27	191
Meeting St - Line St	475	16	-	466	957
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	4,375	394	888	1,220	6,875

TABLE 49 ALTERNATIVE B-1 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for Alternative B1 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	4,144	141	23	4,308
	1 Car	1,471	367	742	2,581
	2+ Car	745	263	1,110	2,117
	Subtotal	***6,360***	***771***	***1,875***	***9,006***
Home-Based Other	0 Car	4,914	151	13	5,078
	1 Car	1,224	194	176	1,594
	2+ Car	1,017	274	489	1,781
	Subtotal	***7,156***	***620***	***678***	***8,453***
Non-Home Based	0 Car	1,472	84	6	1,562
	1 Car	414	70	45	528
	2+ Car	406	63	94	563
	Subtotal	***2,292***	***216***	***144***	***2,653***
Total	0 Car	10,530	376	42	10,948
	1 Car	3,109	631	963	4,703
	2+ Car	2,168	600	1,693	4,461
	Subtotal	***15,808***	***1,607***	***2,697***	***20,112***

TABLE 50 ALTERNATIVE B-1 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for
Alternative B1 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,121	63	12	1,197
	1 Car	593	218	482	1,292
	2+ Car	371	192	876	1,439
	Subtotal	***2,085***	***473***	***1,370***	***3,928***
Home-Based Other	0 Car	1,090	53	6	1,149
	1 Car	451	113	128	692
	2+ Car	460	206	421	1,087
	Subtotal	***2,001***	***372***	***555***	***2,928***
Non-Home Based	0 Car	317	24	2	343
	1 Car	142	38	32	211
	2+ Car	162	44	80	286
	Subtotal	***620***	***106***	***114***	***840***
Total	0 Car	2,528	140	21	2,688
	1 Car	1,185	369	642	2,196
	2+ Car	993	442	1,377	2,812
	Subtotal	***4,706***	***951***	***2,039***	***7,696***

TABLE 51 ALTERNATIVE B-1 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative B1 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	455	31	64	-	550
E 5th St N - Berlin Pkwy	592	56	221	-	869
US78 - Royle Rd	159	60	219	-	437
US87 - College Park Rd	179	54	176	-	409
US78 - I 26	159	16	-	12	187
Rivers Ave - Ontario Blvd	144	112	306	78	640
Rivers Ave - Ashley Phosphate Rd	147	26	-	111	283
Rivers Ave - Stokes Ave	152	4	-	40	196
Rivers Ave - Remount Rd	423	16	-	135	574
Rivers Ave - Mall Dr	366	10	-	65	441
Rivers Ave - Durant Ave	252	6	-	19	277
Rivers Ave - McMillan Ave	433	15	-	293	740
US52 - Stromboli Ave	177	3	-	13	193
Meeting St - Milford St	189	3	-	-	192
Meeting St - Mt Pleasant St	189	4	-	65	258
Meeting St - Romney St	105	4	-	-	109
Meeting St - Huger St	180	3	-	30	214
Meeting St - Line St	565	18	-	544	1,126
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	4,866	441	986	1,405	7,695

TABLE 52 ALTERNATIVE B-2 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative B2 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,874	128	22	4,024
	1 Car	1,618	373	833	2,824
	2+ Car	877	304	1,317	2,498
	Subtotal	***6,369***	***805***	***2,173***	***9,347***
Home-Based Other	0 Car	4,541	136	12	4,689
	1 Car	1,359	199	211	1,768
	2+ Car	1,239	318	626	2,183
	Subtotal	***7,138***	***654***	***848***	***8,640***
Non-Home Based	0 Car	1,395	78	5	1,478
	1 Car	453	71	50	574
	2+ Car	482	72	117	671
	Subtotal	***2,330***	***220***	***172***	***2,722***
Total	0 Car	9,810	342	39	10,191
	1 Car	3,429	643	1,094	5,166
	2+ Car	2,598	694	2,060	5,352
	Subtotal	***15,837***	***1,680***	***3,193***	***20,710***

TABLE 53 ALTERNATIVE B-2 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for
Alternative B2 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,128	60	12	1,200
	1 Car	783	243	592	1,618
	2+ Car	515	242	1,102	1.859
	Subtotal	***2,427***	***545***	***1,705***	***4,677***
Home-Based Other	0 Car	1,059	50	6	1,114
	1 Car	613	128	168	910
	2+ Car	701	259	563	1.522
	Subtotal	***2,373***	***437***	***737***	***3,547***
Non-Home Based	0 Car	316	24	2	342
	1 Car	191	42	39	272
	2+ Car	246	56	105	406
	Subtotal	***753***	***121***	***146***	***1,020***
Total	0 Car	2,503	134	20	2,657
	1 Car	1,587	413	799	2,800
	2+ Car	1,462	556	1,770	3,787
	Subtotal	***5,552***	***1,103***	***2,589***	***9,244***

TABLE 54 ALTERNATIVE B-2 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative B2 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	650	37	80	-	766
E 5th St N - Berlin Pkwy	742	73	311	-	1,126
US78 - Royle Rd	233	76	300	-	609
US87 - College Park Rd	229	62	215	-	506
US78 - I 26	186	18	-	15	219
Rivers Ave - Ontario Blvd	197	113	353	93	756
Rivers Ave - Ashley Phosphate Rd	200	28	-	115	343
Rivers Ave - Stokes Ave	192	5	-	50	247
Rivers Ave - Remount Rd	453	19	-	162	634
Rivers Ave - Mall Dr	407	12	-	48	468
Rivers Ave - Durant Ave	273	7	-	33	312
Rivers Ave - McMillan Ave	504	15	-	318	837
US52 - Stromboli Ave	269	5	-	21	295
Meeting St - Milford St	167	2	-	1	169
Meeting St - Mt Pleasant St	176	4	-	51	231
Meeting St - Romney St	178	5	-	-	183
Meeting St - Huger St	171	3	-	56	230
Meeting St - Line St	703	21	-	590	1,313
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	5,930	505	1,259	1,553	9,244

TABLE 55 ALTERNATIVE B-2 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for Alternative B2 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	4,360	150	26	4,536
	1 Car	1,745	426	929	3,100
	2+ Car	928	343	1,462	2,733
	Subtotal	***7,033***	***919***	***2,417***	***10,369***
Home-Based Other	0 Car	5,114	159	14	5,287
	1 Car	1,454	227	236	1,916
	2+ Car	1,292	354	681	2,326
	Subtotal	***7,860***	***739***	***931***	***9,529***
Non-Home Based	0 Car	1,530	87	6	1,623
	1 Car	490	81	59	629
	2+ Car	514	82	131	727
	Subtotal	***2,533***	***250***	***196***	***2,979***
Total	0 Car	11,004	396	47	11,446
	1 Car	3,688	734	1,223	5,645
	2+ Car	2,735	778	2,274	5,786
	Subtotal	***17,426***	***1,908***	***3,543***	***22,878***

TABLE 56 ALTERNATIVE B-2 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for
Alternative B2 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,293	70	14	1,377
	1 Car	855	274	667	1,796
	2+ Car	548	271	1,224	2,043
	Subtotal	***2,696***	***616***	***1,904***	***5,216***
Home-Based Other	0 Car	1,223	58	8	1,289
	1 Car	668	145	190	1,003
	2+ Car	733	285	611	1,629
	Subtotal	***2,625***	***488***	***808***	***3,921***
Non-Home Based	0 Car	355	27	3	385
	1 Car	213	48	46	308
	2+ Car	271	63	117	450
	Subtotal	***839***	***138***	***166***	***1,143***
Total	0 Car	2,871	156	24	3,051
	1 Car	1,737	467	903	3,107
	2+ Car	1,552	619	1,951	4,122
	Subtotal	***6,160***	***1,242***	***2,879***	***10,281***

TABLE 57 ALTERNATIVE B-2 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative B2 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	642	39	84	-	765
E 5th St N - Berlin Pkwy	811	75	320	-	1,206
US78 - Royle Rd	239	79	309	-	626
US87 - College Park Rd	240	71	245	-	556
US78 - I 26	221	20	-	19	260
Rivers Ave - Ontario Blvd	190	141	440	107	879
Rivers Ave - Ashley Phosphate Rd	211	34	-	130	375
Rivers Ave - Stokes Ave	190	6	-	58	253
Rivers Ave - Remount Rd	509	21	-	164	694
Rivers Ave - Mall Dr	450	14	-	53	517
Rivers Ave - Durant Ave	313	7	-	35	356
Rivers Ave - McMillan Ave	569	17	-	361	948
US52 - Stromboli Ave	288	5	-	23	317
Meeting St - Milford St	279	3	-	1	282
Meeting St - Mt Pleasant St	192	4	-	63	259
Meeting St - Romney St	188	5	-	-	193
Meeting St - Huger St	191	4	-	60	254
Meeting St - Line St	841	22	-	677	1,540
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	6,564	567	1,398	1,751	10,280

8.2 | ALTERNATIVE B-3 AND B-4 – US 78/US 52/EAST BAY

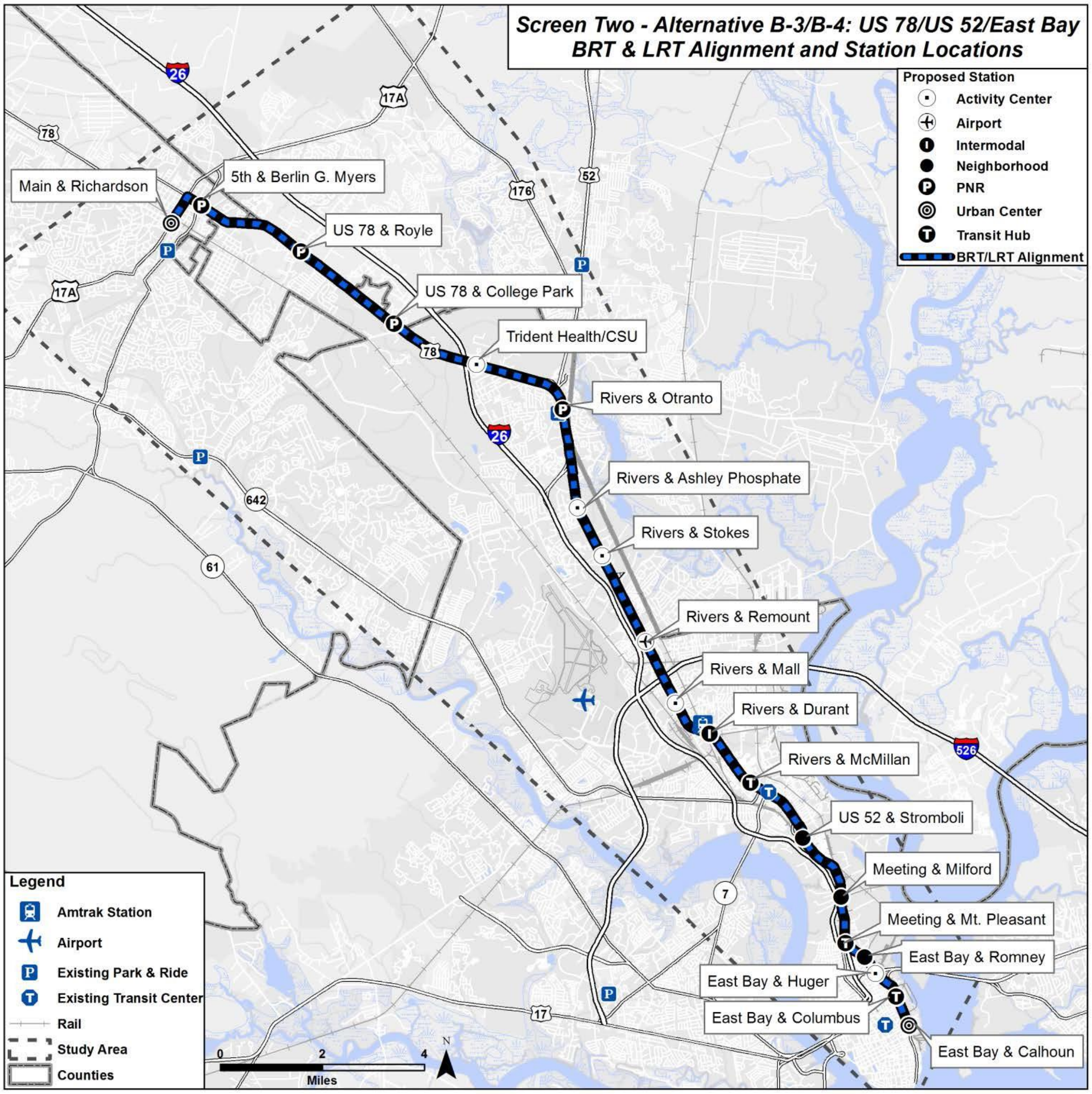

FIGURE 8 ALTERNATIVE B-3/B-4 ALIGNMENT AND STATION LOCATIONS

TABLE 58 ALTERNATIVE B-3 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative B3 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,671	123	20	3,813
	1 Car	1,359	318	652	2,329
	2+ Car	709	233	994	1,937
	Subtotal	***5,740***	***673***	***1,666***	***8,079***
Home-Based Other	0 Car	4,313	134	10	4,457
	1 Car	1,121	168	158	1,446
	2+ Car	971	248	445	1,664
	Subtotal	***6,404***	***549***	***613***	***7,567***
Non-Home Based	0 Car	1,326	77	5	1,408
	1 Car	372	60	38	470
	2+ Car	383	56	84	522
	Subtotal	***2,082***	***192***	***126***	***2,400***
Total	0 Car	9,310	333	35	9,678
	1 Car	2,852	546	847	4,245
	2+ Car	2,063	536	1,523	4,123
	Subtotal	***14,226***	***1,415***	***2,405***	***18,046***

TABLE 59 ALTERNATIVE B-3 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for
Alternative B3 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,068	57	9	1,133
	1 Car	549	190	418	1,158
	2+ Car	352	173	790	1,315
	Subtotal	***1,969***	***420***	***1,217***	***3,605***
Home-Based Other	0 Car	987	50	5	1,042
	1 Car	385	97	115	597
	2+ Car	433	188	386	1,006
	Subtotal	***1,805***	***334***	***506***	***2,645***
Non-Home Based	0 Car	296	24	2	322
	1 Car	118	31	27	176
	2+ Car	145	39	72	257
	Subtotal	***559***	***94***	***100***	***754***
Total	0 Car	2,351	130	16	2,497
	1 Car	1,052	318	560	1,930
	2+ Car	930	400	1,247	2,578
	Subtotal	***4,333***	***849***	***1,823***	***7,005***

TABLE 60 ALTERNATIVE B-3 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative B3 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	463	29	60	-	552
E 5th St N - Berlin Pkwy	543	55	211	-	809
US78 - Royle Rd	153	57	213	-	424
US87 - College Park Rd	165	49	153	-	367
US78 - I 26	136	15	-	8	159
Rivers Ave - Ontario Blvd	154	89	241	65	549
Rivers Ave - Ashley Phosphate Rd	138	20	-	101	258
Rivers Ave - Stokes Ave	156	3	-	20	180
Rivers Ave - Remount Rd	361	14	-	154	529
Rivers Ave - Mall Dr	293	7	-	61	360
Rivers Ave - Durant Ave	204	5	-	21	230
Rivers Ave - McMillan Ave	337	12	-	256	606
US52 - Stromboli Ave	162	4	-	26	192
Meeting St - Milford St	118	3	-	1	122
Meeting St - Mt Pleasant St	231	11	-	75	317
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	146	1	-	2	149
East Bay St - Huger St	178	8	-	33	219
East Bay St - Columbus St	153	5	-	220	378
East Bay St - Calhoun St	572	6	-	26	604
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	4,663	393	878	1,069	7,004

TABLE 61 ALTERNATIVE B-3 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for
Alternative B3 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	4,139	144	23	4,306
	1 Car	1,465	365	728	2,558
	2+ Car	751	262	1,100	2,113
	Subtotal	***6,355***	***770***	***1,851***	***8,976***
Home-Based Other	0 Car	4,845	154	13	5,011
	1 Car	1,196	192	176	1,565
	2+ Car	1,015	275	484	1,774
	Subtotal	***7,057***	***621***	***672***	***8,350***
Non-Home Based	0 Car	1,451	86	6	1,542
	1 Car	400	69	44	513
	2+ Car	406	63	94	562
	Subtotal	***2,257***	***218***	***143***	***2,618***
Total	0 Car	10,435	383	41	10,859
	1 Car	3,062	626	948	4,636
	2+ Car	2,172	600	1,677	4,449
	Subtotal	***15,669***	***1,609***	***2,666***	***19,944***

TABLE 62 ALTERNATIVE B-3 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for
Alternative B3 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,197	66	11	1,274
	1 Car	605	216	473	1,294
	2+ Car	376	192	870	1,438
	Subtotal	***2,178***	***474***	***1,354***	***4,006***
Home-Based Other	0 Car	1,119	57	6	1,183
	1 Car	424	109	129	663
	2+ Car	458	206	417	1,081
	Subtotal	***2,002***	***372***	***552***	***2,926***
Non-Home Based	0 Car	327	27	2	356
	1 Car	133	36	31	200
	2+ Car	161	44	80	285
	Subtotal	***620***	***107***	***114***	***841***
Total	0 Car	2,643	149	20	2,812
	1 Car	1,162	361	634	2,157
	2+ Car	995	442	1,367	2,803
	Subtotal	***4,800***	***952***	***2,020***	***7,773***

TABLE 63 ALTERNATIVE B-3 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative B3 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	456	31	62	-	550
E 5th St N - Berlin Pkwy	597	56	219	-	871
US78 - Royle Rd	158	59	220	-	436
US87 - College Park Rd	175	55	175	-	405
US78 - I 26	164	16	-	9	189
Rivers Ave - Ontario Blvd	147	110	297	79	633
Rivers Ave - Ashley Phosphate Rd	144	25	-	118	287
Rivers Ave - Stokes Ave	153	4	-	23	179
Rivers Ave - Remount Rd	407	15	-	156	578
Rivers Ave - Mall Dr	329	8	-	67	404
Rivers Ave - Durant Ave	234	6	-	24	264
Rivers Ave - McMillan Ave	395	14	-	295	704
US52 - Stromboli Ave	174	4	-	30	208
Meeting St - Milford St	177	4	-	1	181
Meeting St - Mt Pleasant St	250	11	-	101	362
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	151	1	-	2	155
East Bay St - Huger St	200	10	-	36	246
East Bay St - Columbus St	174	5	-	281	460
East Bay St - Calhoun St	623	7	-	30	660
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	5,108	441	973	1,252	7,772

TABLE 64 ALTERNATIVE B-4 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative B4 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,861	129	21	4,011
	1 Car	1,614	372	816	2,803
	2+ Car	874	301	1,302	2,477
	Subtotal	***6,348***	***803***	***2,140***	***9,291***
Home-Based Other	0 Car	4,521	138	11	4,669
	1 Car	1,332	197	208	1,737
	2+ Car	1,209	316	612	2,138
	Subtotal	***7,062***	***651***	***832***	***8,545***
Non-Home Based	0 Car	1,388	79	5	1,472
	1 Car	444	70	50	564
	2+ Car	477	72	115	663
	Subtotal	***2,309***	***220***	***170***	***2,699***
Total	0 Car	9,769	345	38	10,153
	1 Car	3,390	640	1,074	5,104
	2+ Car	2,560	689	2,030	5,279
	Subtotal	***15,719***	***1,674***	***3,142***	***20,535***

TABLE 65 ALTERNATIVE B-4 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for Alternative B4 For Year 2015					
Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,205	61	11	1,276
	1 Car	796	242	579	1,617
	2+ Car	512	239	1,090	1,841
	Subtotal	***2,514***	***542***	***1,679***	***4,735***
Home-Based Other	0 Car	1,181	52	6	1,239
	1 Car	600	125	165	891
	2+ Car	670	256	551	1,477
	Subtotal	***2,451***	***434***	***722***	***3,606***
Non-Home Based	0 Car	354	26	2	382
	1 Car	192	41	39	272
	2+ Car	242	55	103	400
	Subtotal	***788***	***122***	***144***	***1,054***
Total	0 Car	2,740	139	18	2,897
	1 Car	1,588	409	783	2,780
	2+ Car	1,424	550	1,744	3,718
	Subtotal	***5,752***	***1,098***	***2,545***	***9,395***

TABLE 66 ALTERNATIVE B-4 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative B4 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	641	37	83	-	760
E 5th St N - Berlin Pkwy	737	73	308	-	1,118
US78 - Royle Rd	229	75	292	-	596
US87 - College Park Rd	219	61	213	-	493
US78 - I 26	188	18	-	14	221
Rivers Ave - Ontario Blvd	199	111	338	93	741
Rivers Ave - Ashley Phosphate Rd	195	27	-	116	338
Rivers Ave - Stokes Ave	193	5	-	31	228
Rivers Ave - Remount Rd	448	19	-	191	658
Rivers Ave - Mall Dr	385	10	-	50	445
Rivers Ave - Durant Ave	275	7	-	39	322
Rivers Ave - McMillan Ave	475	16	-	344	834
US52 - Stromboli Ave	251	6	-	34	291
Meeting St - Milford St	140	3	-	6	149
Meeting St - Mt Pleasant St	304	11	-	60	375
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	180	1	-	3	185
East Bay St - Huger St	225	10	-	59	293
East Bay St - Columbus St	225	7	-	298	530
East Bay St - Calhoun St	768	8	-	41	818
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	6,277	505	1,234	1,379	9,395

TABLE 67 ALTERNATIVE B-4 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for Alternative B4 For Year 2035					
Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	4,342	151	25	4,518
	1 Car	1,742	425	911	3,079
	2+ Car	925	339	1,437	2,701
	Subtotal	***7,009***	***915***	***2,374***	***10,298***
Home-Based Other	0 Car	5,067	159	14	5,239
	1 Car	1,426	225	233	1,884
	2+ Car	1,262	351	665	2,278
	Subtotal	***7,754***	***735***	***912***	***9,401***
Non-Home Based	0 Car	1,515	88	6	1,609
	1 Car	479	81	58	618
	2+ Car	506	81	129	716
	Subtotal	***2,500***	***250***	***193***	***2,943***
Total	0 Car	10,923	397	45	11,366
	1 Car	3,647	731	1,203	5,581
	2+ Car	2,693	771	2,231	5,695
	Subtotal	***17,264***	***1,899***	***3,480***	***22,643***

TABLE 68 ALTERNATIVE B-4 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for
Alternative B4 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,324	70	13	1,407
	1 Car	870	273	654	1,797
	2+ Car	545	267	1,200	2,012
	Subtotal	***2,739***	***610***	***1,867***	***5,217***
Home-Based Other	0 Car	1,290	60	7	1,358
	1 Car	655	141	187	983
	2+ Car	701	281	596	1,578
	Subtotal	***2,646***	***483***	***790***	***3,919***
Non-Home Based	0 Car	376	29	2	407
	1 Car	213	47	46	307
	2+ Car	263	62	115	440
	Subtotal	***852***	***138***	***163***	***1,153***
Total	0 Car	2,990	159	23	3,172
	1 Car	1,739	462	886	3,087
	2+ Car	1,508	611	1,912	4,030
	Subtotal	***6,237***	***1,232***	***2,821***	***10,289***

TABLE 69 ALTERNATIVE B-4 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative B4 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	632	39	87	-	759
E 5th St N - Berlin Pkwy	806	75	318	-	1,199
US78 - Royle Rd	236	77	302	-	615
US87 - College Park Rd	231	69	242	-	542
US78 - I 26	224	19	-	18	261
Rivers Ave - Ontario Blvd	192	140	419	109	859
Rivers Ave - Ashley Phosphate Rd	204	33	-	130	366
Rivers Ave - Stokes Ave	191	5	-	35	231
Rivers Ave - Remount Rd	501	21	-	197	718
Rivers Ave - Mall Dr	423	12	-	54	490
Rivers Ave - Durant Ave	314	8	-	44	365
Rivers Ave - McMillan Ave	535	18	-	387	940
US52 - Stromboli Ave	268	6	-	40	313
Meeting St - Milford St	205	4	-	7	215
Meeting St - Mt Pleasant St	324	12	-	74	409
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	185	1	-	4	190
East Bay St - Huger St	249	11	-	66	326
East Bay St - Columbus St	248	7	-	353	607
East Bay St - Calhoun St	826	9	-	46	882
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	6,794	566	1,368	1,564	10,287

8.3 | ALTERNATIVE C-1 AND C-2 – US 176/US 52/MEETING

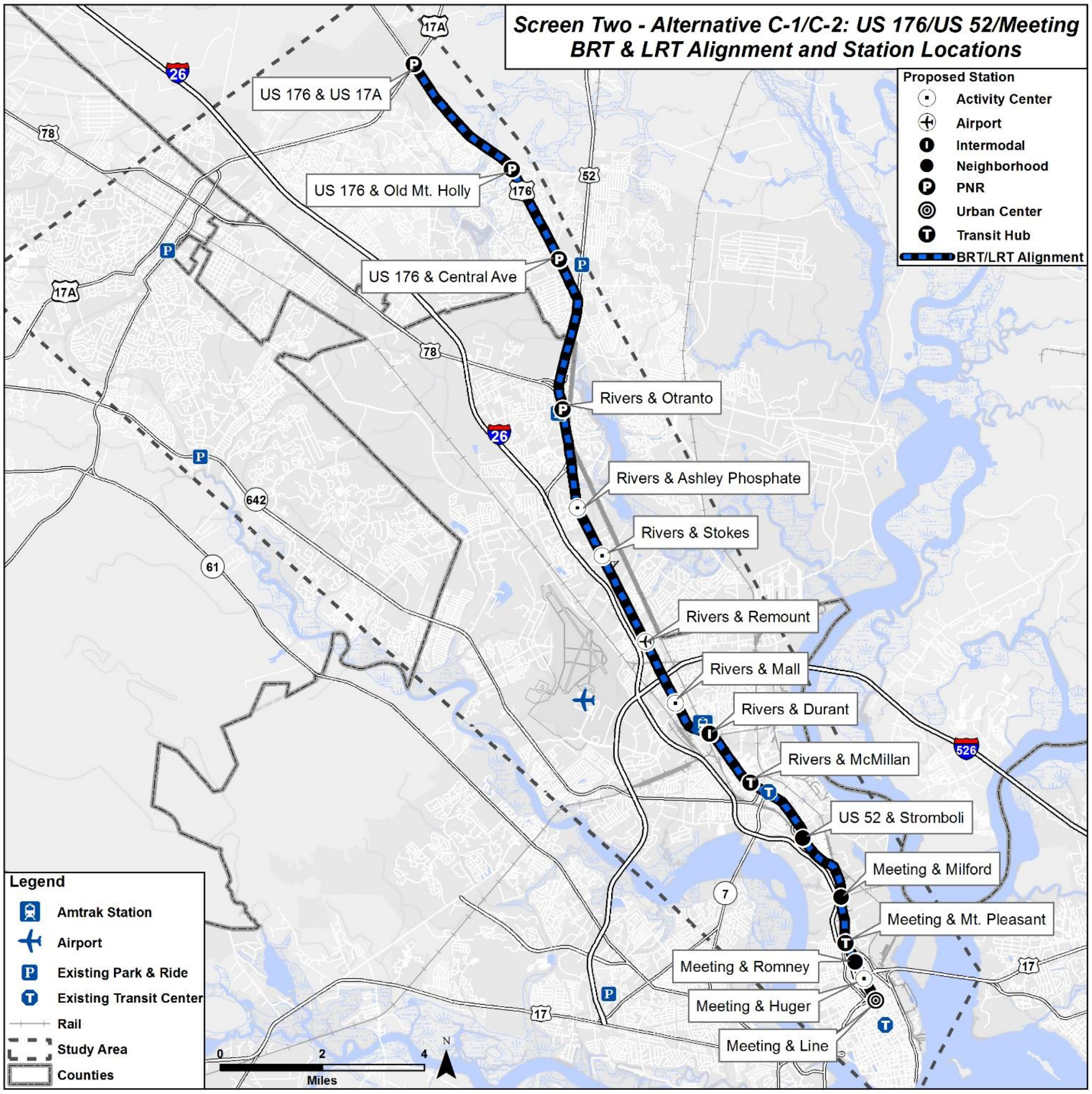

FIGURE 9 ALTERNATIVE C-1/C-2 ALIGNMENT AND STATION LOCATIONS

TABLE 70 ALTERNATIVE C-1 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative C1 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,708	120	19	3,847
	1 Car	1,275	253	449	1,978
	2+ Car	578	148	535	1,261
	Subtotal	***5,562***	***521***	***1,003***	***7,086***
Home-Based Other	0 Car	4,365	130	10	4,505
	1 Car	1,053	120	79	1,251
	2+ Car	813	134	177	1,125
	Subtotal	***6,231***	***384***	***266***	***6,881***
Non-Home Based	0 Car	1,342	74	5	1,421
	1 Car	360	46	20	426
	2+ Car	335	33	35	403
	Subtotal	***2,038***	***154***	***59***	***2,250***
Total	0 Car	9,415	324	35	9,774
	1 Car	2,689	419	548	3,655
	2+ Car	1,727	315	747	2,789
	Subtotal	***13,830***	***1,058***	***1,329***	***16,218***

TABLE 71 ALTERNATIVE C-1 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for
Alternative C1 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,027	52	9	1,088
	1 Car	449	124	204	777
	2+ Car	217	85	317	619
	Subtotal	***1,693***	***261***	***530***	***2,484***
Home-Based Other	0 Car	826	45	5	875
	1 Car	304	50	35	389
	2+ Car	271	76	116	463
	Subtotal	***1,400***	***171***	***156***	***1,728***
Non-Home Based	0 Car	246	21	2	268
	1 Car	98	18	9	124
	2+ Car	97	17	23	136
	Subtotal	***440***	***55***	***33***	***529***
Total	0 Car	2,099	118	15	2,231
	1 Car	850	192	248	1,291
	2+ Car	585	178	456	1,219
	Subtotal	***3,534***	***488***	***719***	***4,740***

TABLE 72 ALTERNATIVE C-1 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative C1 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	-	-	-	-	-
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	151	74	212	53	490
Rivers Ave - Ashley Phosphate Rd	124	17	-	108	249
Rivers Ave - Stokes Ave	144	3	-	44	192
Rivers Ave - Remount Rd	333	10	-	123	465
Rivers Ave - Mall Dr	357	9	-	62	428
Rivers Ave - Durant Ave	200	4	-	16	219
Rivers Ave - McMillan Ave	310	8	-	227	545
US52 - Stromboli Ave	175	3	-	3	181
Meeting St - Milford St	124	1	-	1	127
Meeting St - Mt Pleasant St	164	3	-	31	198
Meeting St - Romney St	88	3	-	-	91
Meeting St - Huger St	123	3	-	29	155
Meeting St - Line St	441	13	-	431	886
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	31	38	-	70
US176 - Old Mountain Holly Rd	146	12	40	-	198
US176 - Central Ave	176	24	46	-	246
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	3,056	218	336	1,128	4,740

TABLE 73 ALTERNATIVE C-1 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for Alternative C1 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	4,170	141	23	4,334
	1 Car	1,378	298	513	2,188
	2+ Car	613	175	636	1,425
	Subtotal	***6,161***	***614***	***1,172***	***7,947***
Home-Based Other	0 Car	4,915	153	13	5,081
	1 Car	1,127	140	90	1,357
	2+ Car	855	158	211	1,224
	Subtotal	***6,898***	***450***	***314***	***7,662***
Non-Home Based	0 Car	1,471	84	6	1,561
	1 Car	387	54	23	464
	2+ Car	355	39	43	438
	Subtotal	***2,214***	***177***	***72***	***2,463***
Total	0 Car	10,557	377	41	10,975
	1 Car	2,892	492	626	4,010
	2+ Car	1,824	372	891	3,087
	Subtotal	***15,273***	***1,241***	***1,558***	***18,072***

TABLE 74 ALTERNATIVE C-1 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for
Alternative C1 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,187	61	11	1,259
	1 Car	500	147	248	895
	2+ Car	235	103	393	731
	Subtotal	***1,922***	***311***	***652***	***2,885***
Home-Based Other	0 Car	977	54	6	1,037
	1 Car	342	60	43	445
	2+ Car	296	91	142	529
	Subtotal	***1,615***	***205***	***191***	***2,011***
Non-Home Based	0 Car	282	24	2	308
	1 Car	112	22	11	144
	2+ Car	113	20	29	162
	Subtotal	***507***	***66***	***41***	***614***
Total	0 Car	2,446	139	19	2,604
	1 Car	954	229	302	1,484
	2+ Car	643	214	564	1,421
	Subtotal	***4,043***	***582***	***884***	***5,510***

TABLE 75 ALTERNATIVE C-1 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative C1 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	-	-	-	-	-
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	144	91	257	66	558
Rivers Ave - Ashley Phosphate Rd	132	21	-	123	277
Rivers Ave - Stokes Ave	142	3	-	54	199
Rivers Ave - Remount Rd	380	11	-	124	515
Rivers Ave - Mall Dr	400	11	-	70	481
Rivers Ave - Durant Ave	238	4	-	17	259
Rivers Ave - McMillan Ave	368	10	-	269	647
US52 - Stromboli Ave	189	3	-	4	196
Meeting St - Milford St	211	2	-	1	215
Meeting St - Mt Pleasant St	173	4	-	49	226
Meeting St - Romney St	100	3	-	-	103
Meeting St - Huger St	136	3	-	33	172
Meeting St - Line St	551	15	-	504	1,070
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	45	68	-	113
US176 - Old Mountain Holly Rd	167	12	41	-	220
US176 - Central Ave	188	25	48	-	261
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	3,519	263	414	1,314	5,512

TABLE 76 ALTERNATIVE C-2 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative C2 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,868	125	21	4,014
	1 Car	1,498	294	537	2,329
	2+ Car	700	186	665	1,551
	Subtotal	***6,066***	***605***	***1,223***	***7,894***
Home-Based Other	0 Car	4,518	134	12	4,664
	1 Car	1,220	134	96	1,450
	2+ Car	974	163	228	1,365
	Subtotal	***6,711***	***431***	***335***	***7,478***
Non-Home Based	0 Car	1,387	77	5	1,469
	1 Car	416	52	24	491
	2+ Car	397	40	44	481
	Subtotal	***2,200***	***168***	***73***	***2,441***
Total	0 Car	9,773	336	38	10,147
	1 Car	3,133	479	657	4,269
	2+ Car	2,070	389	937	3,396
	Subtotal	***14,976***	***1,204***	***1,632***	***17,813***

TABLE 77 ALTERNATIVE C-2 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for
Alternative C2 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,105	56	10	1,171
	1 Car	656	160	287	1,104
	2+ Car	332	120	438	891
	Subtotal	***2,094***	***336***	***736***	***3,166***
Home-Based Other	0 Car	949	46	6	1,000
	1 Car	462	63	53	578
	2+ Car	425	103	164	693
	Subtotal	***1,836***	***211***	***223***	***2,271***
Non-Home Based	0 Car	282	22	2	306
	1 Car	150	22	13	186
	2+ Car	156	23	32	211
	Subtotal	***589***	***67***	***46***	***703***
Total	0 Car	2,336	123	18	2,477
	1 Car	1,269	245	353	1,867
	2+ Car	914	247	634	1,795
	Subtotal	***4,519***	***615***	***1,005***	***6,139***

TABLE 78 ALTERNATIVE C-2 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative C2 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	-	-	-	-	-
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	193	86	291	67	636
Rivers Ave - Ashley Phosphate Rd	183	21	-	125	328
Rivers Ave - Stokes Ave	182	4	-	55	241
Rivers Ave - Remount Rd	402	13	-	133	548
Rivers Ave - Mall Dr	439	13	-	72	524
Rivers Ave - Durant Ave	248	5	-	31	284
Rivers Ave - McMillan Ave	424	9	-	257	690
US52 - Stromboli Ave	247	5	-	4	256
Meeting St - Milford St	153	2	-	3	158
Meeting St - Mt Pleasant St	182	4	-	76	262
Meeting St - Romney St	137	4	-	-	141
Meeting St - Huger St	165	3	-	92	260
Meeting St - Line St	658	17	-	409	1,083
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	40	54	-	94
US176 - Old Mountain Holly Rd	201	19	70	-	291
US176 - Central Ave	252	31	60	-	343
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	4,066	276	475	1,324	6,139

TABLE 79 ALTERNATIVE C-2 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for Alternative C2 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	4,353	147	25	4,524
	1 Car	1,618	345	617	2,580
	2+ Car	743	220	797	1,761
	Subtotal	***6,714***	***712***	***1,439***	***8,866***
Home-Based Other	0 Car	5,088	157	14	5,260
	1 Car	1,308	156	110	1,575
	2+ Car	1,024	192	273	1,490
	Subtotal	***7,421***	***506***	***398***	***8,325***
Non-Home Based	0 Car	1,521	86	6	1,613
	1 Car	448	60	29	537
	2+ Car	424	47	55	527
	Subtotal	***2,393***	***193***	***90***	***2,677***
Total	0 Car	10,962	390	46	11,398
	1 Car	3,374	562	756	4,692
	2+ Car	2,192	460	1,126	3,778
	Subtotal	***16,528***	***1,411***	***1,928***	***19,867***

TABLE 80 ALTERNATIVE C-2 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for
Alternative C2 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,264	65	13	1,341
	1 Car	720	189	347	1,256
	2+ Car	357	145	545	1,047
	Subtotal	***2,341***	***399***	***904***	***3,644***
Home-Based Other	0 Car	1,100	55	7	1,162
	1 Car	509	74	64	647
	2+ Car	455	123	201	780
	Subtotal	***2,065***	***252***	***273***	***2,589***
Non-Home Based	0 Car	318	25	2	346
	1 Car	168	27	16	211
	2+ Car	176	28	41	245
	Subtotal	***663***	***80***	***59***	***802***
Total	0 Car	2,682	145	23	2,850
	1 Car	1,397	290	426	2,114
	2+ Car	989	296	786	2,071
	Subtotal	***5,068***	***731***	***1,235***	***7,035***

TABLE 81 ALTERNATIVE C-2 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative C2 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	-	-	-	-	-
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	186	108	356	79	730
Rivers Ave - Ashley Phosphate Rd	195	25	-	146	366
Rivers Ave - Stokes Ave	181	4	-	66	250
Rivers Ave - Remount Rd	453	14	-	133	600
Rivers Ave - Mall Dr	484	15	-	79	578
Rivers Ave - Durant Ave	289	6	-	33	328
Rivers Ave - McMillan Ave	483	11	-	298	792
US52 - Stromboli Ave	264	5	-	5	274
Meeting St - Milford St	258	2	-	4	264
Meeting St - Mt Pleasant St	192	4	-	97	293
Meeting St - Romney St	150	4	-	-	154
Meeting St - Huger St	182	4	-	107	292
Meeting St - Line St	791	18	-	468	1,277
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	58	95	-	153
US176 - Old Mountain Holly Rd	228	19	72	-	319
US176 - Central Ave	268	32	63	-	364
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	4,604	329	586	1,515	7,034

8.4 | ALTERNATIVE C-3 AND C-4 – US 176/US 52/EAST BAY

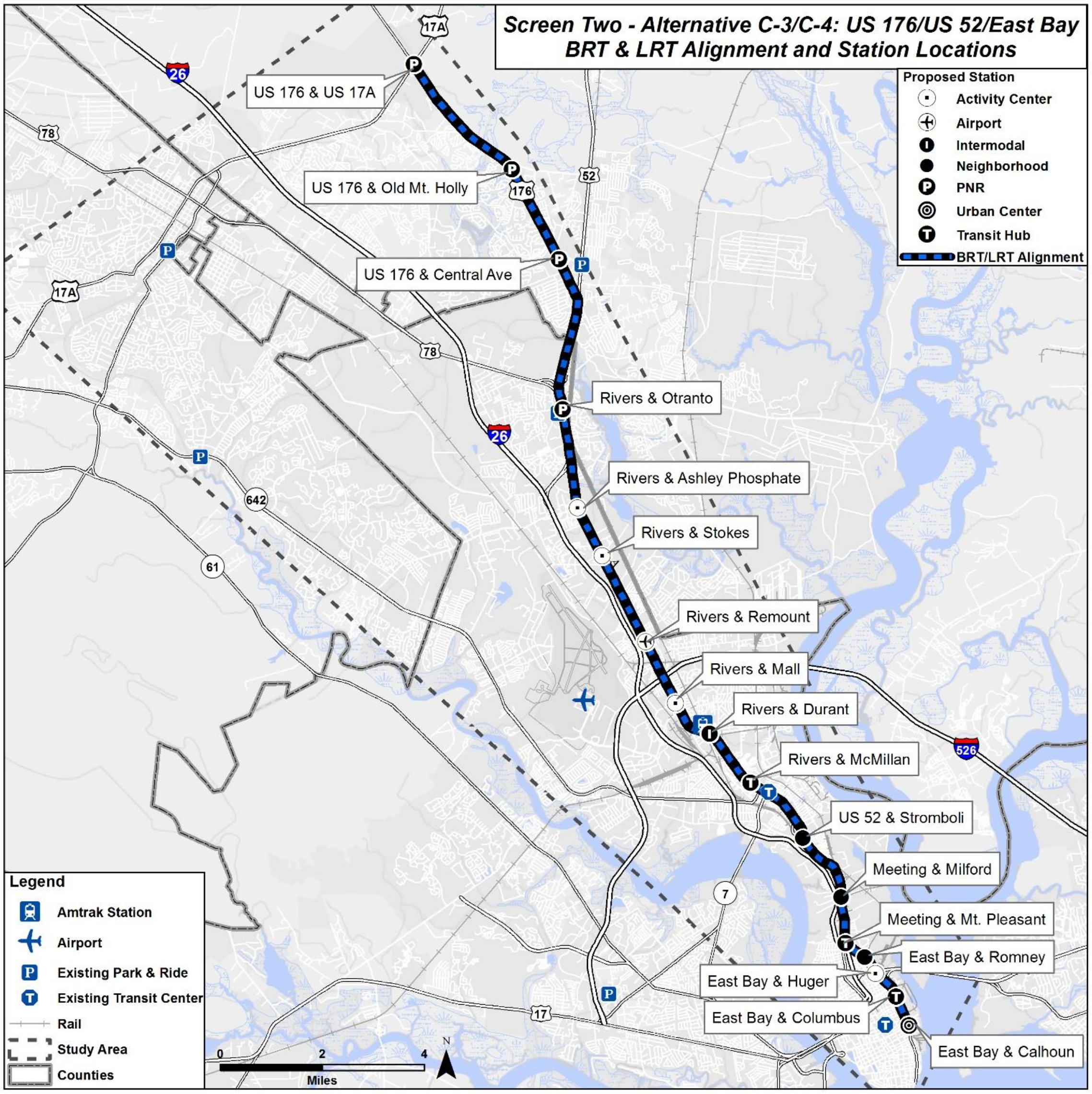

FIGURE 10 ALTERNATIVE C-3/C-4 ALIGNMENT AND STATION LOCATIONS

TABLE 82 ALTERNATIVE C-3 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative C3 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,685	123	19	3,827
	1 Car	1,268	252	440	1,961
	2+ Car	579	148	528	1,256
	Subtotal	***5,532***	***524***	***988***	***7,044***
Home-Based Other	0 Car	4,333	134	11	4,478
	1 Car	1,034	120	77	1,230
	2+ Car	814	134	174	1,122
	Subtotal	***6,181***	***388***	***261***	***6,830***
Non-Home Based	0 Car	1,332	77	5	1,413
	1 Car	350	46	19	416
	2+ Car	334	33	34	402
	Subtotal	***2,016***	***156***	***58***	***2,230***
Total	0 Car	9,350	333	35	9,718
	1 Car	2,652	419	537	3,607
	2+ Car	1,727	316	736	2,779
	Subtotal	***13,729***	***1,068***	***1,307***	***16,104***

TABLE 83 ALTERNATIVE C-3 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for
Alternative C3 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,091	55	8	1,154
	1 Car	455	122	199	776
	2+ Car	217	85	314	616
	Subtotal	***1,762***	***262***	***521***	***2,546***
Home-Based Other	0 Car	939	50	5	994
	1 Car	297	50	34	382
	2+ Car	274	76	114	464
	Subtotal	***1,510***	***176***	***153***	***1,839***
Non-Home Based	0 Car	281	24	2	306
	1 Car	96	18	8	122
	2+ Car	97	17	22	136
	Subtotal	***475***	***59***	***32***	***565***
Total	0 Car	2,311	128	15	2,454
	1 Car	848	190	241	1,280
	2+ Car	588	178	450	1,216
	Subtotal	***3,747***	***497***	***706***	***4,950***

TABLE 84 ALTERNATIVE C-3 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative C3 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	-	-	-	-	-
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	154	72	205	51	483
Rivers Ave - Ashley Phosphate Rd	122	17	-	113	251
Rivers Ave - Stokes Ave	144	3	-	32	179
Rivers Ave - Remount Rd	317	10	-	139	466
Rivers Ave - Mall Dr	341	8	-	63	412
Rivers Ave - Durant Ave	181	4	-	28	213
Rivers Ave - McMillan Ave	278	8	-	223	508
US52 - Stromboli Ave	171	4	-	5	180
Meeting St - Milford St	109	3	-	1	113
Meeting St - Mt Pleasant St	232	10	-	80	321
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	157	1	-	2	160
East Bay St - Huger St	166	8	-	101	275
East Bay St - Columbus St	161	4	-	146	311
East Bay St - Calhoun St	525	5	-	31	561
US176 - US17A	-	31	36	-	67
US176 - Old Mountain Holly Rd	147	12	40	-	199
US176 - Central Ave	179	24	46	-	250
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	3,384	224	327	1,015	4,949

TABLE 85 ALTERNATIVE C-3 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for Alternative C3 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	4,148	145	23	4,316
	1 Car	1,369	297	503	2,169
	2+ Car	614	175	627	1,417
	Subtotal	***6,131***	***617***	***1,154***	***7,902***
Home-Based Other	0 Car	4,867	156	13	5,035
	1 Car	1,107	141	88	1,336
	2+ Car	855	158	207	1,220
	Subtotal	***6,829***	***455***	***308***	***7,592***
Non-Home Based	0 Car	1,456	86	6	1,547
	1 Car	376	54	23	454
	2+ Car	354	39	42	436
	Subtotal	***2,186***	***179***	***71***	***2,436***
Total	0 Car	10,470	386	42	10,898
	1 Car	2,853	493	614	3,959
	2+ Car	1,823	373	876	3,073
	Subtotal	***15,147***	***1,251***	***1,532***	***17,930***

TABLE 86 ALTERNATIVE C-3 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for
Alternative C3 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,210	64	11	1,284
	1 Car	505	145	241	891
	2+ Car	234	103	387	723
	Subtotal	***1,949***	***312***	***638***	***2,899***
Home-Based Other	0 Car	1,059	59	6	1,124
	1 Car	335	60	42	437
	2+ Car	297	91	139	527
	Subtotal	***1,691***	***210***	***186***	***2,087***
Non-Home Based	0 Car	307	27	2	336
	1 Car	110	22	10	143
	2+ Car	112	20	28	160
	Subtotal	***529***	***69***	***40***	***639***
Total	0 Car	2,576	150	19	2,744
	1 Car	951	226	293	1,471
	2+ Car	642	214	553	1,410
	Subtotal	***4,169***	***590***	***865***	***5,625***

TABLE 87 ALTERNATIVE C-3 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative C3 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	-	-	-	-	-
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	147	89	249	62	548
Rivers Ave - Ashley Phosphate Rd	129	21	-	129	279
Rivers Ave - Stokes Ave	142	3	-	38	183
Rivers Ave - Remount Rd	358	11	-	142	511
Rivers Ave - Mall Dr	380	10	-	70	460
Rivers Ave - Durant Ave	212	5	-	31	248
Rivers Ave - McMillan Ave	329	9	-	262	600
US52 - Stromboli Ave	182	5	-	6	193
Meeting St - Milford St	167	4	-	1	172
Meeting St - Mt Pleasant St	247	10	-	111	368
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	162	1	-	2	166
East Bay St - Huger St	184	9	-	124	317
East Bay St - Columbus St	188	4	-	182	375
East Bay St - Calhoun St	570	5	-	34	610
US176 - US17A	-	44	66	-	110
US176 - Old Mountain Holly Rd	167	12	42	-	221
US176 - Central Ave	192	25	48	-	265
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	3,756	267	405	1,194	5,626

TABLE 88 ALTERNATIVE C-4 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative C4 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,870	128	21	4,019
	1 Car	1,501	293	518	2,311
	2+ Car	700	187	651	1,538
	Subtotal	***6,071***	***608***	***1,189***	***7,868***
Home-Based Other	0 Car	4,519	137	12	4,667
	1 Car	1,204	133	92	1,429
	2+ Car	973	164	223	1,361
	Subtotal	***6,696***	***434***	***327***	***7,457***
Non-Home Based	0 Car	1,386	79	5	1,470
	1 Car	408	52	23	483
	2+ Car	398	40	44	482
	Subtotal	***2,192***	***170***	***72***	***2,435***
Total	0 Car	9,774	344	38	10,156
	1 Car	3,113	478	633	4,224
	2+ Car	2,072	391	918	3,380
	Subtotal	***14,959***	***1,212***	***1,588***	***17,760***

TABLE 89 ALTERNATIVE C-4 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for
Alternative C4 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,201	57	10	1,268
	1 Car	680	159	270	1,109
	2+ Car	335	122	427	884
	Subtotal	***2,216***	***338***	***707***	***3,261***
Home-Based Other	0 Car	1,102	51	6	1,159
	1 Car	465	62	49	576
	2+ Car	428	104	161	693
	Subtotal	***1,995***	***217***	***216***	***2,427***
Non-Home Based	0 Car	329	25	2	356
	1 Car	154	22	12	189
	2+ Car	162	24	31	216
	Subtotal	***645***	***71***	***45***	***761***
Total	0 Car	2,632	134	17	2,783
	1 Car	1,299	243	331	1,874
	2+ Car	925	249	619	1,793
	Subtotal	***4,856***	***626***	***967***	***6,449***

TABLE 90 ALTERNATIVE C-4 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative C4 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	-	-	-	-	-
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	195	85	275	82	637
Rivers Ave - Ashley Phosphate Rd	176	20	-	123	319
Rivers Ave - Stokes Ave	183	4	-	36	223
Rivers Ave - Remount Rd	399	13	-	164	576
Rivers Ave - Mall Dr	436	12	-	76	524
Rivers Ave - Durant Ave	252	6	-	40	298
Rivers Ave - McMillan Ave	407	10	-	265	681
US52 - Stromboli Ave	244	6	-	18	268
Meeting St - Milford St	132	3	-	4	139
Meeting St - Mt Pleasant St	283	10	-	117	411
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	152	1	-	3	156
East Bay St - Huger St	215	9	-	78	303
East Bay St - Columbus St	229	5	-	221	456
East Bay St - Calhoun St	699	7	-	31	737
US176 - US17A	-	39	52	-	92
US176 - Old Mountain Holly Rd	203	20	69	-	291
US176 - Central Ave	251	31	58	-	340
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	4,456	281	454	1,258	6,451

TABLE 91 ALTERNATIVE C-4 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for Alternative C4 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	4,350	150	25	4,526
	1 Car	1,623	344	595	2,562
	2+ Car	743	221	776	1,739
	Subtotal	***6,716***	***715***	***1,396***	***8,827***
Home-Based Other	0 Car	5,067	160	14	5,240
	1 Car	1,292	157	107	1,555
	2+ Car	1,023	193	266	1,482
	Subtotal	***7,381***	***509***	***387***	***8,277***
Non-Home Based	0 Car	1,513	88	6	1,607
	1 Car	441	60	28	529
	2+ Car	425	47	54	526
	Subtotal	***2,378***	***196***	***87***	***2,661***
Total	0 Car	10,929	398	46	11,373
	1 Car	3,355	561	730	4,646
	2+ Car	2,191	461	1,095	3,747
	Subtotal	***16,475***	***1,420***	***1,870***	***19,766***

TABLE 92 ALTERNATIVE C-4 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for Alternative C4 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	1,322	67	12	1,402
	1 Car	747	188	328	1,263
	2+ Car	358	146	524	1,028
	Subtotal	***2,427***	***401***	***865***	***3,693***
Home-Based Other	0 Car	1,210	60	7	1,278
	1 Car	512	73	60	645
	2+ Car	458	123	195	775
	Subtotal	***2,180***	***257***	***262***	***2,699***
Non-Home Based	0 Car	351	28	2	381
	1 Car	172	27	15	214
	2+ Car	181	28	39	248
	Subtotal	***704***	***83***	***56***	***844***
Total	0 Car	2,883	156	22	3,061
	1 Car	1,432	288	403	2,123
	2+ Car	996	297	758	2,052
	Subtotal	***5,311***	***741***	***1,183***	***7,235***

TABLE 93 ALTERNATIVE C-4 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative C4 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	-	-	-	-	-
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	189	106	335	99	728
Rivers Ave - Ashley Phosphate Rd	188	25	-	139	351
Rivers Ave - Stokes Ave	182	4	-	43	229
Rivers Ave - Remount Rd	447	14	-	166	627
Rivers Ave - Mall Dr	480	14	-	83	578
Rivers Ave - Durant Ave	290	7	-	44	341
Rivers Ave - McMillan Ave	462	12	-	302	776
US52 - Stromboli Ave	260	7	-	19	286
Meeting St - Milford St	202	4	-	5	210
Meeting St - Mt Pleasant St	300	10	-	153	463
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	158	1	-	3	163
East Bay St - Huger St	235	11	-	91	337
East Bay St - Columbus St	261	6	-	256	522
East Bay St - Calhoun St	755	7	-	33	795
US176 - US17A	-	57	93	-	150
US176 - Old Mountain Holly Rd	229	19	71	-	319
US176 - Central Ave	267	32	61	-	360
Old Trolley Rd - Miles Jamison Rd	-	-	-	-	-
Old Trolley Rd - Dorchester Rd	-	-	-	-	-
Dorchester Rd - Wescott Blvd	-	-	-	-	-
Dorchester Rd - Ashley Phosphate Rd	-	-	-	-	-
Dorchester Rd - W. Hill Blvd	-	-	-	-	-
Dorchester Rd - Michaux Pkwy	-	-	-	-	-
Dorchester Rd - W. Montague Ave	-	-	-	-	-
Dorchester Rd - Leeds Ave	-	-	-	-	-
Total	4,905	336	560	1,436	7,235

8.5 | ALTERNATIVE D-1 AND D-2 – DORCHESTER ROAD/US 52/MEETING

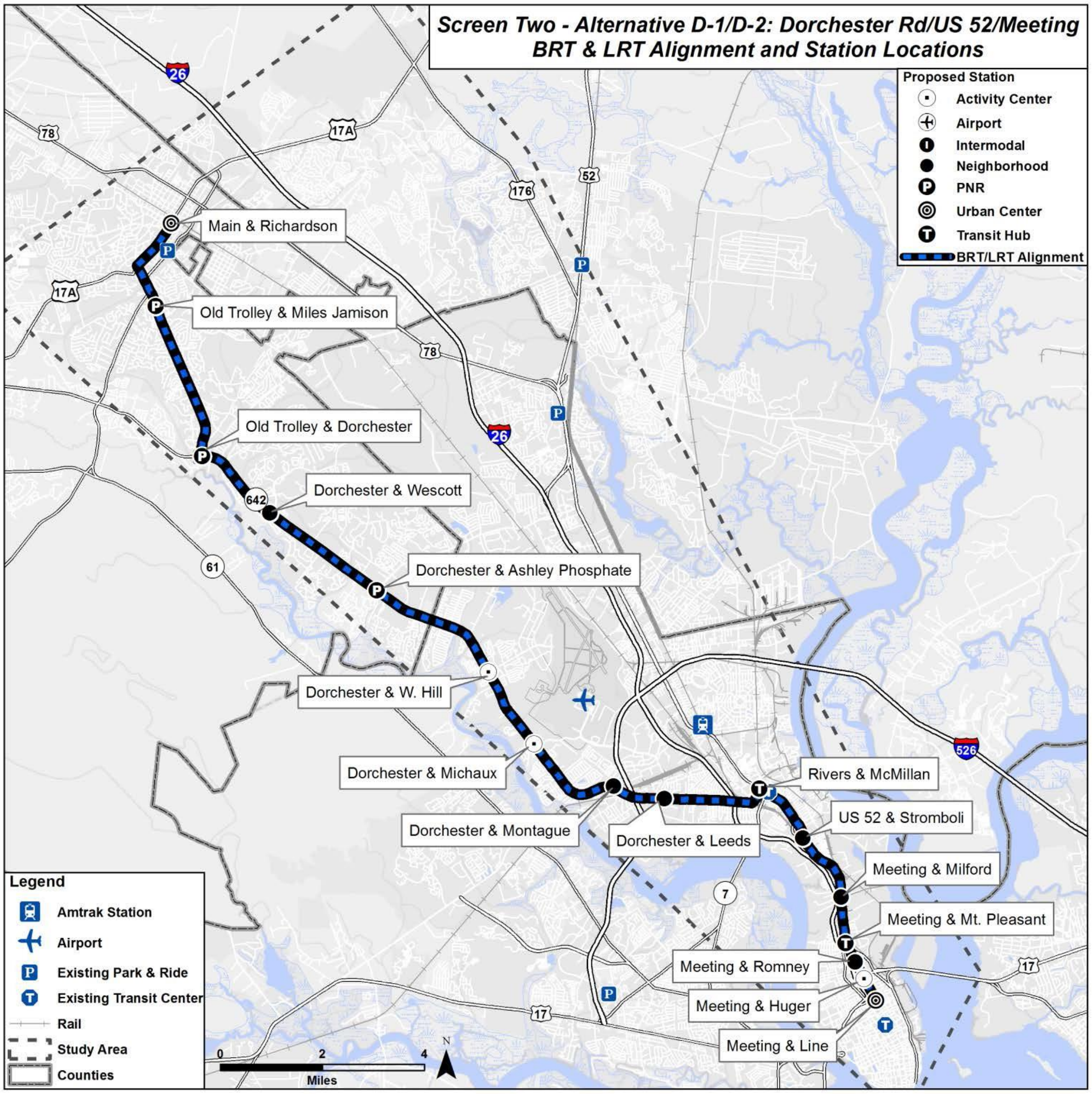

FIGURE 11 ALTERNATIVE D-1/D-2 ALIGNMENT AND STATION LOCATIONS

TABLE 94 ALTERNATIVE D-1 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative D1 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,561	114	20	3,695
	1 Car	1,262	305	656	2,223
	2+ Car	730	217	994	1,940
	Subtotal	***5,553***	***636***	***1,670***	***7,859***
Home-Based Other	0 Car	4,261	128	10	4,398
	1 Car	1,134	192	176	1,502
	2+ Car	1,209	264	477	1,951
	Subtotal	***6,604***	***584***	***663***	***7,852***
Non-Home Based	0 Car	1,312	75	5	1,391
	1 Car	379	73	47	500
	2+ Car	446	67	97	609
	Subtotal	***2,137***	***215***	***148***	***2,500***
Total	0 Car	9,133	317	34	9,484
	1 Car	2,776	570	879	4,225
	2+ Car	2,385	548	1,568	4,501
	Subtotal	***14,294***	***1,435***	***2,481***	***18,210***

TABLE 95 ALTERNATIVE D-1 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for
Alternative D1 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	567	44	7	619
	1 Car	381	166	335	882
	2+ Car	370	150	696	1,217
	Subtotal	***1,318***	***361***	***1,038***	***2,718***
Home-Based Other	0 Car	474	36	3	513
	1 Car	326	117	124	567
	2+ Car	623	196	391	1,210
	Subtotal	***1,423***	***349***	***518***	***2,290***
Non-Home Based	0 Car	141	18	1	160
	1 Car	100	44	33	177
	2+ Car	190	49	80	320
	Subtotal	***430***	***112***	***115***	***657***
Total	0 Car	1,182	99	12	1,292
	1 Car	806	328	492	1,627
	2+ Car	1,183	396	1,168	2,747
	Subtotal	***3,171***	***823***	***1,671***	***5,665***

TABLE 96 ALTERNATIVE D-1 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative D1 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	948	25	53	-	1,026
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	-	-	-	-	-
Rivers Ave - Ashley Phosphate Rd	-	-	-	-	-
Rivers Ave - Stokes Ave	-	-	-	-	-
Rivers Ave - Remount Rd	-	-	-	-	-
Rivers Ave - Mall Dr	-	-	-	-	-
Rivers Ave - Durant Ave	-	-	-	-	-
Rivers Ave - McMillan Ave	291	19	-	251	560
US52 - Stromboli Ave	140	3	-	1	144
Meeting St - Milford St	95	1	-	-	96
Meeting St - Mt Pleasant St	96	2	-	88	186
Meeting St - Romney St	69	2	-	-	72
Meeting St - Huger St	131	3	-	19	153
Meeting St - Line St	282	11	-	267	560
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	437	91	435	-	962
Old Trolley Rd - Dorchester Rd	478	59	226	-	763
Dorchester Rd - Wescott Blvd	95	87	-	-	182
Dorchester Rd - Ashley Phosphate Rd	198	52	96	80	426
Dorchester Rd - W. Hill Blvd	23	7	-	3	33
Dorchester Rd - Michaux Pkwy	74	7	-	11	92
Dorchester Rd - W. Montague Ave	174	10	-	59	244
Dorchester Rd - Leeds Ave	89	9	-	67	165
Total	3,620	388	810	846	5,664

TABLE 97 ALTERNATIVE D-1 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for Alternative D1 For Year 2035					
Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	4,020	134	24	4,178
	1 Car	1,360	344	707	2,411
	2+ Car	777	247	1,114	2,138
	Subtotal	***6,157***	***725***	***1,845***	***8,727***
Home-Based Other	0 Car	4,811	150	12	4,972
	1 Car	1,219	214	189	1,622
	2+ Car	1,283	299	529	2,111
	Subtotal	***7,313***	***663***	***729***	***8,705***
Non-Home Based	0 Car	1,442	85	6	1,532
	1 Car	408	82	51	540
	2+ Car	476	75	109	661
	Subtotal	***2,325***	***242***	***166***	***2,733***
Total	0 Car	10,272	369	41	10,682
	1 Car	2,987	640	947	4,574
	2+ Car	2,536	621	1,752	4,909
	Subtotal	***15,795***	***1,630***	***2,740***	***20,165***

TABLE 98 ALTERNATIVE D-1 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for
Alternative D1 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	724	54	8	786
	1 Car	436	188	368	992
	2+ Car	405	173	783	1,361
	Subtotal	***1,565***	***414***	***1,160***	***3,140***
Home-Based Other	0 Car	589	45	4	638
	1 Car	370	128	132	631
	2+ Car	678	221	433	1,332
	Subtotal	***1,638***	***394***	***569***	***2,601***
Non-Home Based	0 Car	170	23	1	194
	1 Car	113	48	36	197
	2+ Car	213	55	90	359
	Subtotal	***496***	***126***	***127***	***750***
Total	0 Car	1,483	121	14	1,618
	1 Car	920	364	537	1,820
	2+ Car	1,297	449	1,307	3,052
	Subtotal	***3,699***	***934***	***1,857***	***6,490***

TABLE 99 ALTERNATIVE D-1 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative D1 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	1,004	34	74	-	1,112
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	-	-	-	-	-
Rivers Ave - Ashley Phosphate Rd	-	-	-	-	-
Rivers Ave - Stokes Ave	-	-	-	-	-
Rivers Ave - Remount Rd	-	-	-	-	-
Rivers Ave - Mall Dr	-	-	-	-	-
Rivers Ave - Durant Ave	-	-	-	-	-
Rivers Ave - McMillan Ave	356	23	-	297	676
US52 - Stromboli Ave	156	3	-	1	159
Meeting St - Milford St	154	1	-	-	155
Meeting St - Mt Pleasant St	107	2	-	130	239
Meeting St - Romney St	77	2	-	1	80
Meeting St - Huger St	142	3	-	23	169
Meeting St - Line St	356	13	-	318	686
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	478	90	434	-	1,003
Old Trolley Rd - Dorchester Rd	523	72	271	-	866
Dorchester Rd - Wescott Blvd	114	89	-	-	203
Dorchester Rd - Ashley Phosphate Rd	202	69	119	95	485
Dorchester Rd - W. Hill Blvd	27	7	-	4	38
Dorchester Rd - Michaux Pkwy	97	9	-	13	118
Dorchester Rd - W. Montague Ave	220	12	-	86	317
Dorchester Rd - Leeds Ave	95	9	-	79	183
Total	4,108	438	898	1,047	6,489

TABLE 100 ALTERNATIVE D-2 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative D2 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,690	119	21	3,830
	1 Car	1,437	340	769	2,546
	2+ Car	882	264	1,227	2,372
	Subtotal	***6,009***	***722***	***2,017***	***8,749***
Home-Based Other	0 Car	4,411	134	10	4,554
	1 Car	1,311	214	231	1,755
	2+ Car	1,537	319	621	2,477
	Subtotal	***7,259***	***666***	***862***	***8,786***
Non-Home Based	0 Car	1,356	78	5	1,439
	1 Car	439	82	62	583
	2+ Car	565	83	131	779
	Subtotal	***2,360***	***243***	***198***	***2,801***
Total	0 Car	9,457	330	36	9,823
	1 Car	3,187	636	1,062	4,885
	2+ Car	2,983	666	1,979	5,628
	Subtotal	***15,627***	***1,631***	***3,077***	***20,336***

TABLE 101 ALTERNATIVE D-2 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for
Alternative D2 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	709	46	8	763
	1 Car	557	201	458	1,215
	2+ Car	520	197	934	1,652
	Subtotal	***1,786***	***444***	***1,401***	***3,630***
Home-Based Other	0 Car	755	41	4	799
	1 Car	510	139	179	827
	2+ Car	954	250	535	1,739
	Subtotal	***2,218***	***430***	***718***	***3,365***
Non-Home Based	0 Car	226	21	1	248
	1 Car	161	53	49	263
	2+ Car	310	65	115	490
	Subtotal	***697***	***139***	***165***	***1,001***
Total	0 Car	1,689	108	14	1,811
	1 Car	1,228	392	685	2,305
	2+ Car	1,784	512	1,584	3,881
	Subtotal	***4,701***	***1,012***	***2,283***	***7,996***

TABLE 102 ALTERNATIVE D-2 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative D2 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	1,262	31	77	-	1,370
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	-	-	-	-	-
Rivers Ave - Ashley Phosphate Rd	-	-	-	-	-
Rivers Ave - Stokes Ave	-	-	-	-	-
Rivers Ave - Remount Rd	-	-	-	-	-
Rivers Ave - Mall Dr	-	-	-	-	-
Rivers Ave - Durant Ave	-	-	-	-	-
Rivers Ave - McMillan Ave	402	22	-	314	737
US52 - Stromboli Ave	226	3	-	1	231
Meeting St - Milford St	132	1	-	1	134
Meeting St - Mt Pleasant St	196	3	-	72	271
Meeting St - Romney St	147	3	-	1	151
Meeting St - Huger St	177	4	-	33	215
Meeting St - Line St	515	15	-	439	968
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	624	108	572	-	1,303
Old Trolley Rd - Dorchester Rd	649	65	316	-	1,030
Dorchester Rd - Wescott Blvd	134	106	-	-	240
Dorchester Rd - Ashley Phosphate Rd	286	62	145	107	600
Dorchester Rd - W. Hill Blvd	31	9	-	8	48
Dorchester Rd - Michaux Pkwy	92	11	-	13	116
Dorchester Rd - W. Montague Ave	225	15	-	74	314
Dorchester Rd - Leeds Ave	150	14	-	104	268
Total	5,248	472	1,110	1,167	7,996

TABLE 103 ALTERNATIVE D-2 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for Alternative D2 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	4,169	139	25	4,333
	1 Car	1,558	384	833	2,776
	2+ Car	942	300	1,383	2,625
	Subtotal	***6,669***	***823***	***2,241***	***9,733***
Home-Based Other	0 Car	4,980	156	13	5,148
	1 Car	1,418	238	246	1,902
	2+ Car	1,631	359	691	2,680
	Subtotal	***8,029***	***752***	***950***	***9,731***
Non-Home Based	0 Car	1,491	88	6	1,584
	1 Car	475	92	67	634
	2+ Car	606	93	148	847
	Subtotal	***2,571***	***272***	***221***	***3,065***
Total	0 Car	10,639	382	44	11,065
	1 Car	3,451	714	1,146	5,312
	2+ Car	3,179	751	2,222	6,152
	Subtotal	***17,269***	***1,848***	***3,412***	***22,529***

TABLE 104 ALTERNATIVE D-2 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for
Alternative D2 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	852	55	10	916
	1 Car	631	227	505	1,362
	2+ Car	567	225	1,062	1,853
	Subtotal	***2,049***	***506***	***1,577***	***4,132***
Home-Based Other	0 Car	883	49	5	938
	1 Car	575	151	190	916
	2+ Car	1,025	280	596	1,901
	Subtotal	***2,484***	***480***	***791***	***3,755***
Non-Home Based	0 Car	256	25	2	283
	1 Car	182	58	52	292
	2+ Car	343	72	129	544
	Subtotal	***782***	***155***	***183***	***1,119***
Total	0 Car	1,991	129	17	2,137
	1 Car	1,388	435	747	2,570
	2+ Car	1,935	577	1,786	4,298
	Subtotal	***5,315***	***1,141***	***2,550***	***9,005***

TABLE 105 ALTERNATIVE D-2 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative D2 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	1,334	43	108	-	1,485
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	-	-	-	-	-
Rivers Ave - Ashley Phosphate Rd	-	-	-	-	-
Rivers Ave - Stokes Ave	-	-	-	-	-
Rivers Ave - Remount Rd	-	-	-	-	-
Rivers Ave - Mall Dr	-	-	-	-	-
Rivers Ave - Durant Ave	-	-	-	-	-
Rivers Ave - McMillan Ave	468	26	-	358	852
US52 - Stromboli Ave	243	3	-	2	248
Meeting St - Milford St	214	1	-	1	217
Meeting St - Mt Pleasant St	204	3	-	104	312
Meeting St - Romney St	158	4	-	1	163
Meeting St - Huger St	194	4	-	37	235
Meeting St - Line St	617	17	-	496	1,130
East Bay St - Romney St	-	-	-	-	-
East Bay St - Huger St	-	-	-	-	-
East Bay St - Columbus St	-	-	-	-	-
East Bay St - Calhoun St	-	-	-	-	-
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	678	107	572	-	1,357
Old Trolley Rd - Dorchester Rd	709	79	379	-	1,166
Dorchester Rd - Wescott Blvd	160	111	-	-	271
Dorchester Rd - Ashley Phosphate Rd	293	79	180	125	677
Dorchester Rd - W. Hill Blvd	36	9	-	10	56
Dorchester Rd - Michaux Pkwy	116	13	-	15	145
Dorchester Rd - W. Montague Ave	275	17	-	104	396
Dorchester Rd - Leeds Ave	159	14	-	122	295
Total	5,858	530	1,239	1,375	9,005

8.6 | ALTERNATIVE D-3 AND D-4 – DORCHESTER ROAD/US 52/EAST BAY

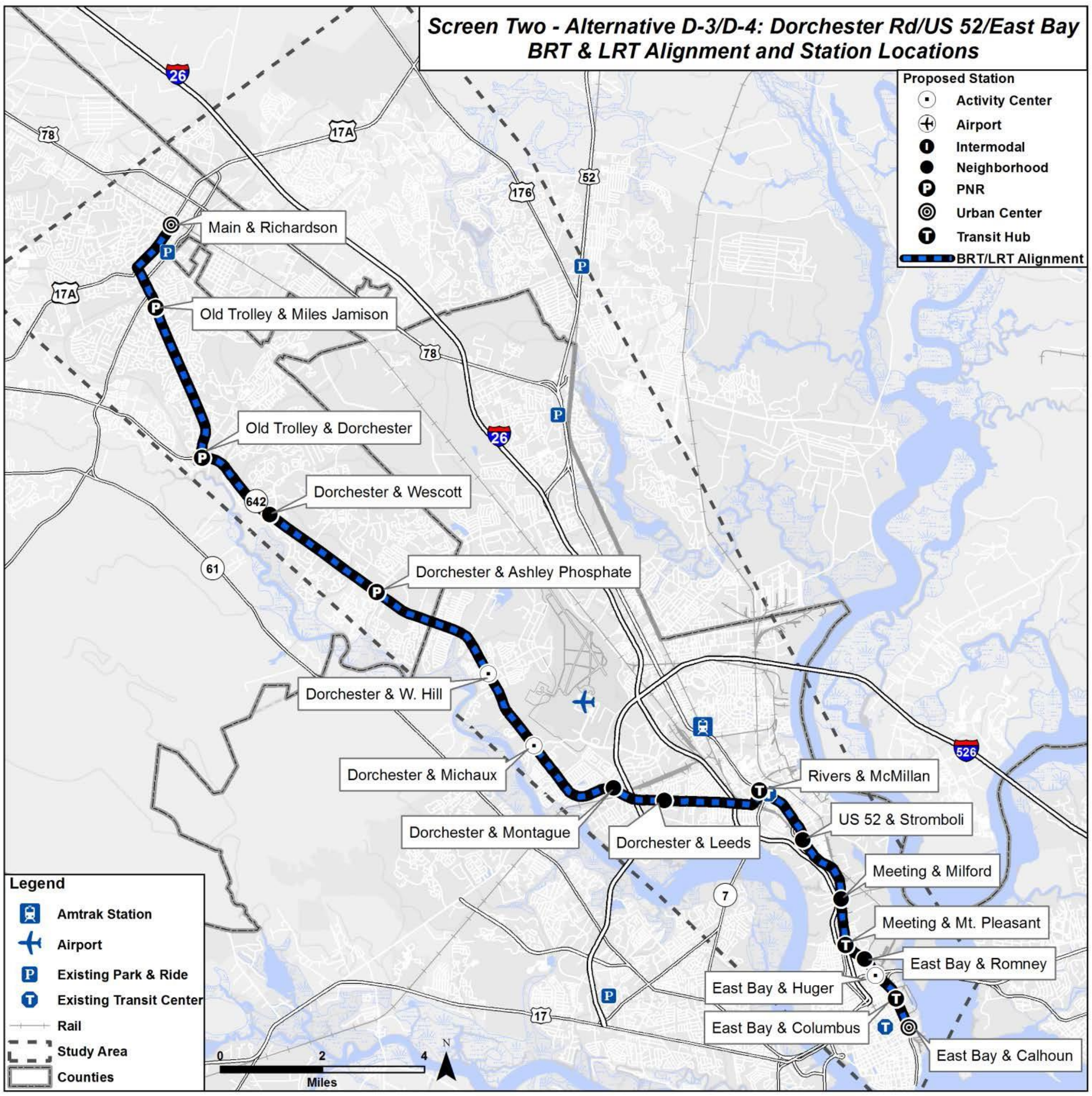

FIGURE 12 ALTERNATIVE D-3/D-4 ALIGNMENT AND STATION LOCATIONS

TABLE 106 ALTERNATIVE D-3 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative D3 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,541	116	20	3,678
	1 Car	1,257	305	652	2,214
	2+ Car	734	217	991	1,942
	Subtotal	***5,532***	***639***	***1,663***	***7,834***
Home-Based Other	0 Car	4,261	132	10	4,403
	1 Car	1,120	189	173	1,481
	2+ Car	1,220	265	483	1,968
	Subtotal	***6,601***	***586***	***666***	***7,853***
Non-Home Based	0 Car	1,311	77	4	1,392
	1 Car	372	72	46	490
	2+ Car	446	66	98	610
	Subtotal	***2,129***	***215***	***148***	***2,492***
Total	0 Car	9,113	326	34	9,473
	1 Car	2,749	566	871	4,186
	2+ Car	2,400	548	1,572	4,520
	Subtotal	***14,262***	***1,440***	***2,477***	***18,179***

TABLE 107 ALTERNATIVE D-3 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for Alternative D3 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	701	46	7	755
	1 Car	395	168	333	896
	2+ Car	373	150	693	1,216
	Subtotal	***1,470***	***364***	***1,034***	***2,867***
Home-Based Other	0 Car	644	41	3	688
	1 Car	323	113	121	557
	2+ Car	631	194	396	1,221
	Subtotal	***1,599***	***348***	***521***	***2,467***
Non-Home Based	0 Car	193	22	1	216
	1 Car	99	42	32	174
	2+ Car	191	48	81	319
	Subtotal	***483***	***112***	***114***	***709***
Total	0 Car	1,538	109	11	1,659
	1 Car	818	322	487	1,627
	2+ Car	1,195	391	1,170	2,757
	Subtotal	***3,552***	***823***	***1,668***	***6,043***

TABLE 108 ALTERNATIVE D-3 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative D3 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	952	25	54	-	1,031
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	-	-	-	-	-
Rivers Ave - Ashley Phosphate Rd	-	-	-	-	-
Rivers Ave - Stokes Ave	-	-	-	-	-
Rivers Ave - Remount Rd	-	-	-	-	-
Rivers Ave - Mall Dr	-	-	-	-	-
Rivers Ave - Durant Ave	-	-	-	-	-
Rivers Ave - McMillan Ave	269	17	-	262	548
US52 - Stromboli Ave	124	3	-	8	135
Meeting St - Milford St	84	3	-	-	87
Meeting St - Mt Pleasant St	181	8	-	107	297
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	125	1	-	11	137
East Bay St - Huger St	154	7	-	19	179
East Bay St - Columbus St	99	2	-	132	234
East Bay St - Calhoun St	502	6	-	18	526
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	440	91	438	-	969
Old Trolley Rd - Dorchester Rd	480	59	222	-	762
Dorchester Rd - Wescott Blvd	101	83	-	-	184
Dorchester Rd - Ashley Phosphate Rd	200	51	95	71	417
Dorchester Rd - W. Hill Blvd	22	6	-	5	33
Dorchester Rd - Michaux Pkwy	81	7	-	16	105
Dorchester Rd - W. Montague Ave	156	10	-	61	228
Dorchester Rd - Leeds Ave	92	10	-	69	172
Total	4,062	389	809	779	6,044

TABLE 109 ALTERNATIVE D-3 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for Alternative D3 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,998	137	24	4,159
	1 Car	1,356	344	703	2,403
	2+ Car	782	247	1,110	2,139
	Subtotal	***6,136***	***727***	***1,838***	***8,700***
Home-Based Other	0 Car	4,798	154	12	4,964
	1 Car	1,204	211	186	1,601
	2+ Car	1,292	300	537	2,129
	Subtotal	***7,294***	***665***	***735***	***8,694***
Non-Home Based	0 Car	1,436	87	5	1,529
	1 Car	400	80	50	530
	2+ Car	475	75	110	660
	Subtotal	***2,312***	***243***	***165***	***2,720***
Total	0 Car	10,232	378	41	10,652
	1 Car	2,960	635	939	4,534
	2+ Car	2,549	622	1,758	4,929
	Subtotal	***15,742***	***1,635***	***2,738***	***20,115***

TABLE 110 ALTERNATIVE D-3 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for
Alternative D3 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	810	54	8	872
	1 Car	456	190	367	1,013
	2+ Car	408	171	779	1,357
	Subtotal	***1,674***	***414***	***1,154***	***3,242***
Home-Based Other	0 Car	757	50	4	812
	1 Car	370	122	129	621
	2+ Car	683	218	439	1,340
	Subtotal	***1,810***	***391***	***573***	***2,774***
Non-Home Based	0 Car	220	26	2	248
	1 Car	113	46	34	194
	2+ Car	210	54	90	355
	Subtotal	***544***	***126***	***126***	***796***
Total	0 Car	1,787	130	14	1,931
	1 Car	939	358	531	1,828
	2+ Car	1,301	443	1,308	3,052
	Subtotal	***4,028***	***931***	***1,853***	***6,812***

TABLE 111 ALTERNATIVE D-3 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative D3 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	1,008	34	75	-	1,116
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	-	-	-	-	-
Rivers Ave - Ashley Phosphate Rd	-	-	-	-	-
Rivers Ave - Stokes Ave	-	-	-	-	-
Rivers Ave - Remount Rd	-	-	-	-	-
Rivers Ave - Mall Dr	-	-	-	-	-
Rivers Ave - Durant Ave	-	-	-	-	-
Rivers Ave - McMillan Ave	328	21	-	307	656
US52 - Stromboli Ave	135	4	-	10	148
Meeting St - Milford St	123	3	-	-	126
Meeting St - Mt Pleasant St	194	8	-	147	350
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	128	1	-	12	142
East Bay St - Huger St	171	8	-	22	200
East Bay St - Columbus St	114	3	-	159	275
East Bay St - Calhoun St	549	7	-	28	585
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	482	91	438	-	1,011
Old Trolley Rd - Dorchester Rd	525	72	267	-	864
Dorchester Rd - Wescott Blvd	121	85	-	-	206
Dorchester Rd - Ashley Phosphate Rd	204	67	117	83	472
Dorchester Rd - W. Hill Blvd	27	6	-	6	39
Dorchester Rd - Michaux Pkwy	111	9	-	20	139
Dorchester Rd - W. Montague Ave	191	12	-	88	291
Dorchester Rd - Leeds Ave	98	10	-	84	192
Total	4,509	441	897	966	6,812

TABLE 112 ALTERNATIVE D-4 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2015

Linked Transit Trips for Alternative D4 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	3,679	122	21	3,822
	1 Car	1,424	341	765	2,529
	2+ Car	887	263	1,217	2,368
	Subtotal	***5,990***	***726***	***2,003***	***8,719***
Home-Based Other	0 Car	4,408	137	10	4,555
	1 Car	1,281	213	227	1,721
	2+ Car	1,509	320	626	2,454
	Subtotal	***7,198***	***669***	***863***	***8,730***
Non-Home Based	0 Car	1,354	79	5	1,438
	1 Car	428	82	61	571
	2+ Car	553	82	130	765
	Subtotal	***2,335***	***244***	***196***	***2,775***
Total	0 Car	9,441	338	36	9,815
	1 Car	3,133	636	1,053	4,822
	2+ Car	2,950	665	1,973	5,587
	Subtotal	***15,523***	***1,638***	***3,062***	***20,224***

TABLE 113 ALTERNATIVE D-4 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2015

Linked Project Trips for
Alternative D4 For Year 2015

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	783	50	8	840
	1 Car	560	201	450	1,211
	2+ Car	525	195	921	1,642
	Subtotal	***1,868***	***445***	***1,379***	***3,693***
Home-Based Other	0 Car	828	44	4	876
	1 Car	493	136	175	804
	2+ Car	925	248	539	1,711
	Subtotal	***2,246***	***428***	***717***	***3,391***
Non-Home Based	0 Car	248	23	1	273
	1 Car	158	52	48	258
	2+ Car	303	64	113	479
	Subtotal	***709***	***139***	***162***	***1,010***
Total	0 Car	1,859	117	13	1,989
	1 Car	1,212	389	672	2,273
	2+ Car	1,753	506	1,573	3,832
	Subtotal	***4,824***	***1,013***	***2,258***	***8,094***

TABLE 114 ALTERNATIVE D-4 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2015

Station Boardings for Alternative D4 For Year 2015

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	1,251	30	74	-	1,355
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	-	-	-	-	-
Rivers Ave - Ashley Phosphate Rd	-	-	-	-	-
Rivers Ave - Stokes Ave	-	-	-	-	-
Rivers Ave - Remount Rd	-	-	-	-	-
Rivers Ave - Mall Dr	-	-	-	-	-
Rivers Ave - Durant Ave	-	-	-	-	-
Rivers Ave - McMillan Ave	378	21	-	326	726
US52 - Stromboli Ave	203	4	-	8	216
Meeting St - Milford St	112	2	-	1	115
Meeting St - Mt Pleasant St	259	8	-	105	373
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	146	1	-	12	159
East Bay St - Huger St	211	8	-	47	267
East Bay St - Columbus St	154	3	-	160	317
East Bay St - Calhoun St	680	9	-	38	726
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	612	110	574	-	1,296
Old Trolley Rd - Dorchester Rd	629	66	316	-	1,011
Dorchester Rd - Wescott Blvd	139	104	-	-	243
Dorchester Rd - Ashley Phosphate Rd	270	60	137	86	554
Dorchester Rd - W. Hill Blvd	32	8	-	9	49
Dorchester Rd - Michaux Pkwy	98	11	-	22	131
Dorchester Rd - W. Montague Ave	210	14	-	77	302
Dorchester Rd - Leeds Ave	148	15	-	93	255
Total	5,532	474	1,101	984	8,095

TABLE 115 ALTERNATIVE D-4 WEEKDAY LINKED TRANSIT TRIPS BY ACCESS MODE IN 2035

Linked Transit Trips for Alternative D4 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	4,152	143	25	4,320
	1 Car	1,544	384	827	2,755
	2+ Car	948	299	1,369	2,615
	Subtotal	***6,643***	***826***	***2,221***	***9,691***
Home-Based Other	0 Car	4,957	159	13	5,128
	1 Car	1,385	237	243	1,865
	2+ Car	1,601	360	697	2,658
	Subtotal	***7,943***	***756***	***952***	***9,652***
Non-Home Based	0 Car	1,482	90	6	1,577
	1 Car	462	92	66	620
	2+ Car	592	92	146	831
	Subtotal	***2,536***	***273***	***218***	***3,028***
Total	0 Car	10,590	391	44	11,025
	1 Car	3,391	713	1,136	5,240
	2+ Car	3,141	751	2,212	6,105
	Subtotal	***17,123***	***1,856***	***3,392***	***22,370***

TABLE 116 ALTERNATIVE D-4 WEEKDAY PROJECT TRIPS BY ACCESS MODE IN 2035

Linked Project Trips for
Alternative D4 For Year 2035

Trip Purpose	Auto Ownership	Walk Access	KNR Access	PNR Access	Total
Home-Based Work	0 Car	886	58	10	954
	1 Car	636	227	495	1,357
	2+ Car	572	222	1,039	1,833
	Subtotal	***2,094***	***506***	***1,543***	***4,144***
Home-Based Other	0 Car	931	53	5	989
	1 Car	555	148	185	888
	2+ Car	994	278	599	1,871
	Subtotal	***2,481***	***478***	***789***	***3,748***
Non-Home Based	0 Car	271	27	2	300
	1 Car	177	57	51	285
	2+ Car	331	71	126	528
	Subtotal	***779***	***154***	***179***	***1,112***
Total	0 Car	2,088	137	16	2,242
	1 Car	1,368	432	731	2,530
	2+ Car	1,897	570	1,764	4,232
	Subtotal	***5,354***	***1,139***	***2,511***	***9,004***

TABLE 117 ALTERNATIVE D-4 WEEKDAY STATION BOARDINGS BY ACCESS MODE IN 2035

Station Boardings for Alternative D4 For Year 2035

Station	Walk	KNR	PNR	Transfer	Total
Main St - Richardson Ave	1,324	41	103	-	1,467
E 5th St N - Berlin Pkwy	-	-	-	-	-
US78 - Royle Rd	-	-	-	-	-
US87 - College Park Rd	-	-	-	-	-
US78 - I 26	-	-	-	-	-
Rivers Ave - Ontario Blvd	-	-	-	-	-
Rivers Ave - Ashley Phosphate Rd	-	-	-	-	-
Rivers Ave - Stokes Ave	-	-	-	-	-
Rivers Ave - Remount Rd	-	-	-	-	-
Rivers Ave - Mall Dr	-	-	-	-	-
Rivers Ave - Durant Ave	-	-	-	-	-
Rivers Ave - McMillan Ave	436	25	-	372	833
US52 - Stromboli Ave	216	5	-	10	231
Meeting St - Milford St	162	2	-	1	166
Meeting St - Mt Pleasant St	272	9	-	137	418
Meeting St - Romney St	-	-	-	-	-
Meeting St - Huger St	-	-	-	-	-
Meeting St - Line St	-	-	-	-	-
East Bay St - Romney St	150	1	-	15	166
East Bay St - Huger St	231	9	-	57	296
East Bay St - Columbus St	171	4	-	186	361
East Bay St - Calhoun St	732	10	-	49	790
US176 - US17A	-	-	-	-	-
US176 - Old Mountain Holly Rd	-	-	-	-	-
US176 - Central Ave	-	-	-	-	-
Old Trolley Rd - Miles Jamison Rd	667	109	575	-	1,351
Old Trolley Rd - Dorchester Rd	688	80	379	-	1,148
Dorchester Rd - Wescott Blvd	166	109	-	-	275
Dorchester Rd - Ashley Phosphate Rd	276	77	167	101	621
Dorchester Rd - W. Hill Blvd	37	8	-	11	57
Dorchester Rd - Michaux Pkwy	129	13	-	26	167
Dorchester Rd - W. Montague Ave	251	17	-	108	376
Dorchester Rd - Leeds Ave	156	15	-	110	282
Total	6,064	534	1,224	1,183	9,005

Appendix 6-D: Air Quality Evaluation

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Air Quality Carbon Monoxide (CY)		Alt B-1: US 78/Mtg BRT			Alt B-3: US 78/EB BRT			Alt C-1: US 176/Mtg BRT			Alt C-3: US 176/EB BRT			Alt D-1: Dorch/Mtg BRT			Alt D-3: Dorch/EB BRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT)	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.01677	6847855	114838.5284	$9,187.08	6,626,481	111126.0864	$8,890.09	3,665,676	61473.38652	$4,917.87	3,477,537	58318.29549	$4,665.46	5,629,431	94405.55787	$7,552.44	5,518,744	92549.33688	$7,403.95
Diesel Bus	0.00583	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.00583	-1096830.86	-6394.523914	($511.56)	-1,137,759	-6633.135786	($530.65)	-1,017,562	-5932.384828	($474.59)	-1,058,490	-6170.9967	($493.68)	-1,201,504	-7004.766921	($560.38)	-1,242,432	-7243.378793	($579.47)
CNG Bus	0.03962	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.00645	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.00706	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.01051	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Diesel Locomotive or DMU)	0.01680	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.01680	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.01281	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**5751024.14**	**108444.0044**	**$8,675.52**	**5488721.86**	**104492.9506**	**$8,359.44**	**2,648,114**	**55541.00169**	**$4,443.28**	**2,419,047**	**52147.29879**	**$4,171.78**	**4,427,927**	**87400.79095**	**$6,992.06**	**4,276,312**	**85305.95809**	**$6,824.48**

Air Quality Carbon Monoxide (CY)		Alt B-2: US 78/Mtg LRT			Alt B-4: US 78/EB LRT			Alt C-2: US 176/Mtg LRT			Alt C-4: US 176/EB LRT			Alt D-2: Dorch/Mtg LRT			Alt D-4: Dorch/EB LRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT)	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.01677	11,689,472	196032.4454	$15,682.60	11,196,727	187769.1118	$15,021.53	6,873,865	115274.7161	$9,221.98	6,641,509	111378.1059	$8,910.25	9,223,435	154677.005	$12,374.16	8,898,021	149219.8122	$11,937.58
Diesel Bus	0.00583	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.00583	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
CNG Bus	0.03962	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.00645	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.00706	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.01051	-2,193,662	-23055.38468	($1,844.43)	-2,275,518	-23915.69712	($1,913.26)	-2,035,123	-21389.14735	($1,711.13)	-2,116,980	-22249.4598	($1,779.96)	-2,403,006	-25255.59306	($2,020.45)	-2,485,008	-26117.42904	($2,089.39)
Commuter Rail (Diesel Locomotive or DMU)	0.01680	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.01680	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.01281	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**9495810.28**	**172977.0608**	**$13,838.16**	**8,921,209**	**163853.4147**	**$13,108.27**	**4,838,742**	**93885.5687**	**$7,510.85**	**4,524,529**	**89128.64613**	**$7,130.29**	**6,820,429**	**129421.4119**	**$10,353.71**	**6,413,013**	**123102.3831**	**$9,848.19**

Air Quality: Mono-Nitrogen Oxides (NOx)		Alt B-1: US 78/Mtg BRT			Alt B-3: US 78/EB BRT			Alt C-1: US 176/Mtg BRT			Alt C-3: US 176/EB BRT			Alt D-1: Dorch/Mtg BRT			Alt D-3: Dorch/EB BRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.00091	6847855	6231.54805	$80,760.86	6,626,481	6030.09771	$78,150.07	3,665,676	3335.76516	$43,231.52	3,477,537	3164.55867	$41,012.68	5,629,431	5122.78221	$66,391.26	5,518,744	5022.05704	$65,085.86
Diesel Bus	0.00867	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.00867	-1096830.86	-9509.523556	($123,243.43)	-1,137,759	-9864.371744	($127,842.26)	-1,017,562	-8822.260112	($114,336.49)	-1,058,490	-9177.1083	($118,935.32)	-1,201,504	-10417.0376	($135,004.81)	-1,242,432	-10771.88579	($139,603.64)
CNG Bus	0.00384	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.00583	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.00638	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.00950	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Diesel Locomotive or DMU)	0.01320	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.09300	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.01157	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**5751024.14**	**-3277.975506**	**($42,482.56)**	**5488721.86**	**-3834.274034**	**($49,692.19)**	**2,648,114**	**-5486.494952**	**($71,104.97)**	**2,419,047**	**-6012.54963**	**($77,922.64)**	**4,427,927**	**-5294.255389**	**($68,613.55)**	**4,276,312**	**-5749.828747**	**($74,517.78)**

Air Quality: Mono-Nitrogen Oxides (NOx)		Alt B-2: US 78/Mtg LRT			Alt B-4: US 78/EB LRT			Alt C-2: US 176/Mtg LRT			Alt C-4: US 176/EB LRT			Alt D-2: Dorch/Mtg LRT			Alt D-4: Dorch/EB LRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.00091	11,689,472	10637.41952	$137,860.96	11,196,727	10189.02157	$132,049.72	6,873,865	6255.21715	$81,067.61	6,641,509	6043.77319	$78,327.30	9,223,435	8393.32585	$108,777.50	8,898,021	8097.19911	$104,939.70
Diesel Bus	0.00867	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.00867	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
CNG Bus	0.00384	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.00583	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.00638	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.00950	-2,193,662	-20839.78634	($382,618.48)	-2,275,518	-21617.42366	($396,895.90)	-2,035,123	-19333.67268	($354,966.23)	-2,116,980	-20111.31	($369,243.65)	-2,403,006	-22828.557	($419,132.31)	-2,485,008	-23607.57144	($433,435.01)
Commuter Rail (Diesel Locomotive or DMU)	0.01320	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.09300	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.01157	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**9495810.28**	**-10202.36682**	**($244,757.52)**	**8,921,209**	**-11428.40209**	**($264,846.18)**	**4,838,742**	**-13078.45553**	**($273,898.62)**	**4,524,529**	**-14067.53681**	**($290,916.35)**	**6,820,429**	**-14435.23115**	**($310,354.80)**	**6,413,013**	**-15510.37233**	**($328,495.31)**

Air Quality: Particulate Matter ($PM_{2.5}$)		Alt B-1: US 78/Mtg BRT			Alt B-3: US 78/EB BRT			Alt C-1: US 176/Mtg BRT			Alt C-3: US 176/EB BRT			Alt D-1: Dorch/Mtg BRT			Alt D-3: Dorch/EB BRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.000010	6847855	68.47855	$46,592.81	6,626,481	66.26481	$45,086.58	3,665,676	36.65676	$24,941.26	3,477,537	34.77537	$23,661.16	5,629,431	56.29431	$38,302.65	5,518,744	55.18744	$37,549.53
Diesel Bus	0.000480	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.000480	-1096830.86	-526.4788128	($358,216.18)	-1,137,759	-546.1243872	($371,583.03)	-1,017,562	-488.4296256	($332,327.52)	-1,058,490	-508.0752	($345,694.37)	-1,201,504	-576.7218048	($392,401.52)	-1,242,432	-596.3673792	($405,768.36)
CNG Bus	0.000010	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.000378	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.000413	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.000615	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Diesel Locomotive or DMU)	0.000190	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.004600	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.000750	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**5751024.14**	**-458.0002628**	**($311,623.38)**	**5488721.86**	**-479.8595772**	**($326,496.46)**	**2,648,114**	**-451.7728656**	**($307,386.26)**	**2,419,047**	**-473.29983**	**($322,033.20)**	**4,427,927**	**-520.4274948**	**($354,098.87)**	**4,276,312**	**-541.1799392**	**($368,218.83)**

Air Quality: Particulate Matter ($PM_{2.5}$)		Alt B-2: US 78/Mtg LRT			Alt B-4: US 78/EB LRT			Alt C-2: US 176/Mtg LRT			Alt C-4: US 176/EB LRT			Alt D-2: Dorch/Mtg LRT			Alt D-4: Dorch/EB LRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.000010	11,689,472	116.89472	$79,535.17	11,196,727	111.96727	$76,182.53	6,873,865	68.73865	$46,769.78	6,641,509	66.41509	$45,188.83	9,223,435	92.23435	$62,756.25	8,898,021	88.98021	$60,542.13
Diesel Bus	0.000480	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.000480	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
CNG Bus	0.000010	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.000378	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.000413	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.000615	-2,193,662	-1349.101958	($757,655.66)	-2,275,518	-1399.443742	($785,927.61)	-2,035,123	-1251.600916	($702,899.07)	-2,116,980	-1301.9427	($731,171.02)	-2,403,006	-1477.84869	($829,959.82)	-2,485,008	-1528.279625	($858,281.84)
Commuter Rail (Diesel Locomotive or DMU)	0.000190	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.004600	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.000750	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**9495810.28**	**-1232.207238**	**($678,120.49)**	**8,921,209**	**-1287.476472**	**($709,745.08)**	**4,838,742**	**-1182.862266**	**($656,129.30)**	**4,524,529**	**-1235.52761**	**($685,982.19)**	**6,820,429**	**-1385.61434**	**($767,203.57)**	**6,413,013**	**-1439.299415**	**($797,739.70)**

Air Quality: Volatile Organic Compounds (VOCs)		Alt B-1: US 78/Mtg BRT			Alt B-3: US 78/EB BRT			Alt C-1: US 176/Mtg BRT			Alt C-3: US 176/EB BRT			Alt D-1: Dorch/Mtg BRT			Alt D-3: Dorch/EB BRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT)	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.000600	6847855	4108.713	$12,408.31	6,626,481	3975.8886	$12,007.18	3,665,676	2199.4056	$6,642.20	3,477,537	2086.5222	$6,301.30	5,629,431	3377.6586	$10,200.53	5,518,744	3311.2464	$9,999.96
Diesel Bus	0.000730	**0**	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.000730	-1096830.86	-800.6865278	($2,418.07)	-1,137,759	-830.5641722	($2,508.30)	-1,017,562	-742.8200556	($2,243.32)	-1,058,490	-772.6977	($2,333.55)	-1,201,504	-877.0977448	($2,648.84)	-1,242,432	-906.9753892	($2,739.07)
CNG Bus	0.000146	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.000120	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.000130	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.000190	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Diesel Locomotive or DMU)	0.000550	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.004360	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.000240	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**5751024.14**	**3308.026472**	**$9,990.24**	**5488721.86**	**3145.324428**	**$9,498.88**	**2,648,114**	**1456.585544**	**$4,398.89**	**2,419,047**	**1313.8245**	**$3,967.75**	**4,427,927**	**2500.560855**	**$7,551.69**	**4,276,312**	**2404.271011**	**$7,260.90**

Air Quality: Volatile Organic Compounds (VOCs)		Alt B-2: US 78/Mtg LRT			Alt B-4: US 78/EB LRT			Alt C-2: US 176/Mtg LRT			Alt C-4: US 176/EB LRT			Alt D-2: Dorch/Mtg LRT			Alt D-4: Dorch/EB LRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT)	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.000600	11,689,472	7013.6832	$21,181.32	11,196,727	6718.0362	$20,288.47	6,873,865	4124.319	$12,455.44	6,641,509	3984.9054	$12,034.41	9,223,435	5534.061	$16,712.86	8,898,021	5338.8126	$16,123.21
Diesel Bus	0.000730	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.000730	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
CNG Bus	0.000146	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.000120	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.000130	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.000190	-2,193,662	-416.7957268	($1,258.72)	-2,275,518	-432.3484732	($1,305.69)	-2,035,123	-386.6734536	($1,167.75)	-2,116,980	-402.2262	($1,214.72)	-2,403,006	-456.57114	($1,378.84)	-2,485,008	-472.1514288	($1,425.90)
Commuter Rail (Diesel Locomotive or DMU)	0.000550	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.004360	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.000240	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**9495810.28**	**6596.887473**	**$19,922.60**	**8,921,209**	**6285.687727**	**$18,982.78**	**4,838,742**	**3737.645546**	**$11,287.69**	**4,524,529**	**3582.6792**	**$10,819.69**	**6,820,429**	**5077.48986**	**$15,334.02**	**6,413,013**	**4866.661171**	**$14,697.32**

Appendix 6-E: Greenhouse Gases Evaluation

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Greenhouse Gases - Carbon Dioxide Equivalent (CO_2e)		Alt B-1: US 78/Mtg BRT			Alt B-3: US 78/EB BRT			Alt C-1: US 176/Mtg BRT			Alt C-3: US 176/EB BRT			Alt D-1: Dorch/Mtg BRT			Alt D-3: Dorch/EB BRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT)	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.000532	6847855	3643.05886	$138,436.24	6,626,481	3525.287892	$133,960.94	3,665,676	1950.139632	$74,105.31	3,477,537	1850.049684	$70,301.89	5,629,431	2994.857292	$113,804.58	5,518,744	2935.971808	$111,566.93
Diesel Bus	0.003319	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.002655	-1096830.86	-2912.085933	($110,659.27)	-1,137,759	-3020.750517	($114,788.52)	-1,017,562	-2701.626367	($102,661.80)	-1,058,490	-2810.29095	($106,791.06)	-1,201,504	-3189.992483	($121,219.71)	-1,242,432	-3298.657066	($125,348.97)
CNG Bus	0.002935	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.002934	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.003211	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.004779	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Diesel Locomotive or DMU)	0.007970	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.007970	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.005821	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**5751024.14**	**730.9729267**	**$27,776.97**	**5488721.86**	**504.5373753**	**$19,172.42**	**2,648,114**	**-751.4867346**	**($28,556.50)**	**2,419,047**	**-960.241266**	**($36,489.17)**	**4,427,927**	**-195.1351908**	**($7,415.14)**	**4,276,312**	**-362.6852582**	**($13,782.04)**

Greenhouse Gases - Carbon Dioxide Equivalent (CO_2e)		Alt B-2: US 78/Mtg LRT			Alt B-4: US 78/EB LRT			Alt C-2: US 176/Mtg LRT			Alt C-4: US 176/EB LRT			Alt D-2: Dorch/Mtg LRT			Alt D-4: Dorch/EB LRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT)	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.000532	11,689,472	6218.799104	$236,314.37	11,196,727	5956.658764	$226,353.03	6,873,865	3656.89618	$138,962.05	6,641,509	3533.282788	$134,264.75	9,223,435	4906.86742	$186,460.96	8,898,021	4733.747172	$179,882.39
Diesel Bus	0.003319	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.002655	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
CNG Bus	0.002935	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.002934	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.003211	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.004779	-2,193,662	-10483.50936	($398,373.36)	-2,275,518	-10874.70186	($413,238.67)	-2,035,123	-9725.85492	($369,582.49)	-2,116,980	-10117.04742	($384,447.80)	-2,403,006	-11483.96567	($436,390.70)	-2,485,008	-11875.85094	($451,282.34)
Commuter Rail (Diesel Locomotive or DMU)	0.007970	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.007970	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.005821	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**9495810.28**	**-4264.710256**	**($162,058.99)**	**8,921,209**	**-4918.043096**	**($186,885.64)**	**4,838,742**	**-6068.95874**	**($230,620.43)**	**4,524,529**	**-6583.764632**	**($250,183.06)**	**6,820,429**	**-6577.098254**	**($249,929.73)**	**6,413,013**	**-7142.103766**	**($271,399.94)**

Appendix 6-F: Energy Use Evaluation

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Energy Use - British Thermal Units (BTU)		Alt B-1: US 78/Mtg BRT			Alt B-3: US 78/EB BRT			Alt C-1: US 176/Mtg BRT			Alt C-3: US 176/EB BRT			Alt D-1: Dorch/Mtg BRT			Alt D-3: Dorch/EB BRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT)	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.007559	6847855	51762.93595	$89,032.25	6,626,481	50089.56988	$86,154.06	3,665,676	27708.84488	$47,659.21	3,477,537	26286.70218	$45,213.13	5,629,431	42552.86893	$73,190.93	5,518,744	41716.1859	$71,751.84
Diesel Bus	0.041436	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.033149	-1096830.86	-36358.84618	($56,719.80)	-1,137,759	-37715.57773	($58,836.30)	-1,017,562	-33731.15346	($52,620.60)	-1,058,490	-35087.88501	($54,737.10)	-1,201,504	-39828.64814	($62,132.69)	-1,242,432	-41185.37969	($64,249.19)
CNG Bus																			
Electric Bus																			
Heavy Rail																			
Light Rail/Street Car (CART Miles)																			
Commuter Rail (Diesel Locomotive or DMU)	0.096138	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.096138	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)																			
Total Change	---	**5751024.14**	**15404.08977**	**$32,312.45**	**5488721.86**	**12373.99215**	**$27,317.76**	**2,648,114**	**-6022.308572**	**($4,961.39)**	**2,419,047**	**-8801.182827**	**($9,523.97)**	**4,427,927**	**2724.220789**	**$11,058.24**	**4,276,312**	**530.806202**	**$7,502.65**

Energy Use - British Thermal Units (BTU)		Alt B-2: US 78/Mtg LRT			Alt B-4: US 78/EB LRT			Alt C-2: US 176/Mtg LRT			Alt C-4: US 176/EB LRT			Alt D-2: Dorch/Mtg LRT			Alt D-4: Dorch/EB LRT		
Mode/Technology	Conversion Factor: Emissions (kg)/VMT)	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement	VMT Decrease (Increase)	Emissions Decrease (Increase) (kg)	Value of Improvement
Automobile	0.007559	11,689,472	88360.71885	$151,980.44	11,196,727	84636.05939	$145,574.02	6,873,865	51959.54554	$89,370.42	6,641,509	50203.16653	$86,349.45	9,223,435	69719.94517	$119,918.31	8,898,021	67260.14074	$115,687.44
Diesel Bus	0.041436	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.033149	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
CNG Bus																			
Electric Bus																			
Heavy Rail																			
Light Rail/Street Car (CART Miles)																			
Commuter Rail (Diesel Locomotive or DMU)	0.096138	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.096138	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)																			
Total Change	---	**11689472**	**88360.71885**	**$151,980.44**	**11,196,727**	**84636.05939**	**$145,574.02**	**6,873,865**	**51959.54554**	**$89,370.42**	**6,641,509**	**50203.16653**	**$86,349.45**	**9,223,435**	**69719.94517**	**$119,918.31**	**8,898,021**	**67260.14074**	**$115,687.44**

Appendix 6-G: Safety Evaluation

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Safety: Injuries		Alt B-1: US 78/Mtg BRT			Alt B-3: US 78/EB BRT			Alt C-1: US 176/Mtg BRT			Alt C-3: US 176/EB BRT			Alt D-1: Dorch/Mtg BRT			Alt D-3: Dorch/EB BRT		
Mode/Technology	**Conversion Factor: Emissions (kg)/VMT**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**
Automobile	0.000000195	6847855	1.335331725	$654,312.55	6,626,481	1.292163795	$633,160.26	3,665,676	0.71480682	$350,255.34	3,477,537	0.678119715	$332,278.66	5,629,431	1.097739045	$537,892.13	5,518,744	1.07615508	$527,315.99
Diesel Bus	0.000001824	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.000001824	-1096830.86	-2.000619489	($980,303.55)	-1,137,759	-2.075272671	($1,016,883.61)	-1,017,562	-1.856032577	($909,455.96)	-1,058,490	-1.93068576	($946,036.02)	-1,201,504	-2.191542858	($1,073,856.00)	-1,242,432	-2.266196041	($1,110,436.06)
CNG Bus	0.000001824	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.000001458	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.000000155	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.000001696	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Diesel Locomotive or DMU)	0.000001746	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.000001746	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.000001746	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**5751024.14**	**-0.665287764**	**($325,991.00)**	**5488721.86**	**-0.783108876**	**($383,723.35)**	**2,648,114**	**-1.141225757**	**($559,200.62)**	**2,419,047**	**-1.252566045**	**($613,757.36)**	**4,427,927**	**-1.093803813**	**($535,963.87)**	**4,276,312**	**-1.190040961**	**($583,120.07)**

Safety: Injuries		Alt B-2: US 78/Mtg LRT			Alt B-4: US 78/EB LRT			Alt C-2: US 176/Mtg LRT			Alt C-4: US 176/EB LRT			Alt D-2: Dorch/Mtg LRT			Alt D-4: Dorch/EB LRT		
Mode/Technology	**Conversion Factor: Emissions (kg)/VMT**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**
Automobile	0.000000195	11,689,472	2.27944704	$1,116,929.05	11,196,727	2.183361765	$1,069,847.26	6,873,865	1.340403675	$656,797.80	6,641,509	1.295094255	$634,596.18	9,223,435	1.798569825	$881,299.21	8,898,021	1.735114095	$850,205.91
Diesel Bus	0.000001824	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.000001824	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
CNG Bus	0.000001824	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.000001458	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.000000155	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.000001696	-2,193,662	-3.720450277	($1,823,020.64)	-2,275,518	-3.859279003	($1,891,046.71)	-2,035,123	-3.451569354	($1,691,268.98)	-2,116,980	-3.59039808	($1,759,295.06)	-2,403,006	-4.075498176	($1,996,994.11)	-2,485,008	-4.214572754	($2,065,140.65)
Commuter Rail (Diesel Locomotive or DMU)	0.000001746	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.000001746	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.000001746	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**9495810.28**	**-1.441003237**	**($706,091.59)**	**8,921,209**	**-1.675917238**	**($821,199.45)**	**4,838,742**	**-2.111165679**	**($1,034,471.18)**	**4,524,529**	**-2.295303825**	**($1,124,698.87)**	**6,820,429**	**-2.276928351**	**($1,115,694.89)**	**6,413,013**	**-2.479458659**	**($1,214,934.74)**

Safety: Fatalities		Alt B-1: US 78/Mtg BRT			Alt B-3: US 78/EB BRT			Alt C-1: US 176/Mtg BRT			Alt C-3: US 176/EB BRT			Alt D-1: Dorch/Mtg BRT			Alt D-3: Dorch/EB BRT		
Mode/Technology	**Conversion Factor: Emissions (kg)/VMT**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**
Automobile	0.000000013	6,847,855	0.089022115	$810,101.25	6,626,481	0.086144253	$783,912.70	3,665,676	0.047653788	$433,649.47	3,477,537	0.045207981	$411,392.63	5,629,431	0.073182603	$665,961.69	5,518,744	0.071743672	$652,867.42
Diesel Bus	0.000000004	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.000000004	-1096830.86	-0.004387323	($39,924.64)	-1,137,759	-0.004551037	($41,414.43)	-1,017,562	-0.004070247	($37,039.25)	-1,058,490	-0.00423396	($38,529.04)	-1,201,504	-0.004806015	($43,734.74)	-1,242,432	-0.004969728	($45,224.53)
CNG Bus	0.000000004	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.000000004	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.000000007	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.000000009	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Diesel Locomotive or DMU)	0.000000012	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.000000012	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.000000001	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**5751024.14**	**0.084634792**	**$770,176.60**	**5488721.86**	**0.081593216**	**$742,498.27**	**2,648,114**	**0.043583541**	**$396,610.22**	**2,419,047**	**0.040974021**	**$372,863.59**	**4,427,927**	**0.068376588**	**$622,226.95**	**4,276,312**	**0.066773944**	**$607,642.89**

Safety: Fatalities		Alt B-2: US 78/Mtg LRT			Alt B-4: US 78/EB LRT			Alt C-2: US 176/Mtg LRT			Alt C-4: US 176/EB LRT			Alt D-2: Dorch/Mtg LRT			Alt D-4: Dorch/EB LRT		
Mode/Technology	**Conversion Factor: Emissions (kg)/VMT**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**	**VMT Decrease (Increase)**	**Emissions Decrease (Increase) (kg)**	**Value of Improvement**
Automobile	0.000000013	11,689,472	0.151963136	$1,382,864.54	11,196,727	0.145557451	$1,324,572.80	6,873,865	0.089360245	$813,178.23	6,641,509	0.086339617	$785,690.51	9,223,435	0.119904655	$1,091,132.36	8,898,021	0.115674273	$1,052,635.88
Diesel Bus	0.000000004	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Hybrid Bus	0.000000004	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
CNG Bus	0.000000004	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Electric Bus	0.000000004	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Heavy Rail	0.000000007	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Light Rail/Street Car (CART Miles)	0.000000009	-2,193,662	-0.019742955	($179,660.89)	-2,275,518	-0.020479665	($186,364.95)	-2,035,123	-0.018316111	($166,676.61)	-2,116,980	-0.01905282	($173,380.66)	-2,403,006	-0.021627054	($196,806.19)	-2,485,008	-0.022365068	($203,522.12)
Commuter Rail (Diesel Locomotive or DMU)	0.000000012	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Used Diesel Locomotive)	0.000000012	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Commuter Rail (Electric or EMU)	0.000000001	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00	0	0	$0.00
Total Change	---	**9495810.28**	**0.132220181**	**$1,203,203.64**	**8,921,209**	**0.125077786**	**$1,138,207.86**	**4,838,742**	**0.071044134**	**$646,501.62**	**4,524,529**	**0.067286797**	**$612,309.85**	**6,820,429**	**0.098277601**	**$894,326.17**	**6,413,013**	**0.093309205**	**$849,113.77**

Appendix 6-H: Land Use & Economic Development Analysis

Draft Report – February 2016

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Table of Contents

1 Introduction

Under the Federal Transit Administration's (FTA) Capital Investment Grant Program, project sponsors are required to submit to FTA documentation regarding existing land use and economic development effects for evaluation and rating of the project. The land use measure includes an examination of existing corridor and station area development; existing corridor and station are development character; existing station area pedestrian facilities; parking supply; and proportion of legally binding affordability restricted housing. The economic development measure is the extent to which a proposed project is likely to induce additional, transit-supportive development in the future based on a qualitative examination of the existing local plans and policies to support economic development proximate to the project. This Screen Two Land Use and Economic Development Analysis describes the methodology used to rate each Screen Two Alternative. Each alternative transit corridor alignment is analyzed according to specific qualitative and quantitative characteristics, and the FTA provided breakpoints are applied to rate the alignments from low to high.

2 Proposed Alignments

Results of the Screen One Analysis, input from the I-26 Alternatives Analysis Steering and Technical Advisory Committees, and community feedback identified the following alternatives to move forward into the Screen Two Analysis:

* Screen Two - Alternative A: No Build I-26 Commuter Bus
* Screen Two - Alternative B-1: US 78/US 52/Meeting– BRT
* Screen Two - Alternative B-2: US 78/US 52/Meeting – LRT
* Screen Two - Alternative B-3: US 78/US 52/East Bay – BRT
* Screen Two - Alternative B-4: US 78/US 52/East Bay – LRT
* Screen Two - Alternative C-1: US 176/US 52/Meeting – BRT
* Screen Two - Alternative C-2: US 176/US 52/Meeting – LRT
* Screen Two - Alternative C-3: US 176/US 52/East Bay – BRT
* Screen Two - Alternative C-4: US 176/US 52/East Bay – LRT
* Screen Two - Alternative D-1: Dorchester Rd/US 52/Meeting – BRT
* Screen Two - Alternative D-2: Dorchester Rd/US 52/Meeting – LRT
* Screen Two - Alternative D-3: Dorchester Rd/US 52/East Bay – BRT
* Screen Two - Alternative D-4: Dorchester Rd /US 52/East Bay – LRT

2.1 Proposed Station Typology

In the Screen One Land Use Analysis, station locations were identified and assigned distinct station typologies with general characteristics based partially on FTA guidelines and partially on comparable transit studies. Proposed typology designations and target employment and population densities establish the general development dynamics that would support the identified fixed guideway facility.

Station Designation	Station Characteristics	
Urban Core *(Core-Urban Center)*	Primary and/or significant center of economic and cultural activities, regional-scaled destination. **Housing Mix:** High-rise and mid-rise apartments and condos. **Retail Character:** Regional-serving destination retail, need for local-serving retail.	*Mode Supported:* All *Peak Transit Frequency:* < 5 minutes *Station Area Total Units Target*: 8,000 -30,000 *Station Area Unit Target Density (du/acre):* 16 - 60 *Station Area Total Jobs Target:* 40,000 – 150,000
Major Activity Center *(Center-Regional employment or destination draw)*	Significant center of economic and cultural activities, regional-scaled destination. **Housing Mix:** Mid-rise, low-rise, some high-rise and townhomes. **Retail Character:** Regional-serving destination retail, need for local-serving and community-serving retail.	*Mode Supported:* Commuter rail, local/regional bus hub, and LRT *Peak Transit Frequency:* 5 - 30 minutes *Station Area Total Units Target*: 1,500 -7,500 *Station Area Unit Target Density (du/acre):* 3 -20 *Station Area Total Jobs Target:* 7,500 – 50,000
Transit Node *(Village-Small center within the urban area)*	Local center of economic and community activity. **Housing Mix:** Mid-rise, low-rise, townhomes, and small-lot single family. **Retail Character:** Community-serving and destination retail opportunity; need for local-serving retail.	*Mode Supported:* Commuter rail, local/regional bus hub, and LRT *Peak Transit Frequency:* 5 - 30 minutes *Station Area Total Units Target*: 1,500 -7,500 *Station Area Unit Target Density (du/acre):* 3 -20 *Station Area Total Jobs Target:* 0 – 7,500
Special Use District *(Destination-Significant attraction with a large, singular base i.e. Airport, Coliseum, etc.)*	Local focus of economic and community activity without distinct center. **Housing Mix**: Limited residential potential, mid-rise and high-rise appropriate. **Retail Character:** Potential for community-serving and regional-serving retail but need to balance demands for access.	*Mode Supported:* LRT/street car, BRT, potential heavy rail *Peak Transit Frequency:* 15 - 30 minutes *Station Area Total Units Target*: 2,000 -5,000 *Station Area Unit Target Density (du/acre):* 4 -10 *Station Area Total Jobs Target:* 7,500 – 50,000

**Note – Station Area is defined as the area within ½-mile walk radius of station location.*

2.2 Land Use Measure

2.2.1 Population and Employment

Using TAZ data from the Charleston Area Transportation Study (CHATS) Regional Transportation Model, corridor level population, population densities, households, and total employment were estimated for a half-mile radius around proposed stations based on FTA applied methodology to obtain current year (2010) and future year (2040) demographic data.

FTA breakpoints for station area population densities, total employment served and Central Business District (CBD) parking supply are as follows:

Table 3 - 1: FTA Station Area Development Breakpoints

	Station Area Development		Parking Supply	
Rating	**Employment served by system**[1]	**Avg. Population density (persons/square mile)**[2]	**CBD typical cost per day**[3]	**CBD spaces per employee**[4]
High	> 220,000	> 15,000	> $16	< 0.2
Medium-High	140,000-219,999	9,600 - 15,000	$12 - $16	0.2 – 0.3
Medium	70,000-139,999	5,760 – 9,599	$8 - $12	0.3 – 0.4
Medium-Low	40,000-69,999	2,561 – 5,759	$4 - $8	0.4 – 0.5
Low	<40,000	< 2,560	< $4	> 0.5

Source: Final Interim Policy Guidance FTA Capital Investment Grant Program (2015)

2.2.2 "Legally Binding Affordability Restricted" Housing

FTA policy guidance defines a legally binding affordability restriction as "… a lien, deed of trust or other legal instrument attached to a property and/or housing structure that restricts the cost of housing units to be affordable to households at specified income levels for a defined period of time and requires that households at these income levels occupy these units".

This definition, includes, but is not limited to, state or federally supported public housing, and housing owned by organizations dedicated to providing affordable housing. For the land use measure looking at existing affordable housing, FTA is seeking legally binding affordability restricted units to renters with incomes below 60 percent of the area median income and/or owners with incomes below the area median that are within ½ mile of station areas and in the counties through which the project travels.

The FTA assigns a value to this measure by comparing (a) the percent of total units in the transit corridor (defined as 1/2 mile around each proposed station) that are legally binding affordability restricted housing to (b) the percent of total units in the counties in which the stations are located that are legally binding affordability restricted housing.

[1] The employment breakpoints are based on the Institute for Transportation Engineer's document entitled "A Toolbox for Alleviating Traffic Congestion," which suggests minimum non-residential development concentrations of 20 million square feet for frequent local bus service and 35 million square feet for light rail service. At 500 square feet per employee, these figures are equivalent to 40,000 and 70,000 employees, respectively. The total employment served includes employment along the entire line on which a no-transfer ride from the proposed project's stations can be reached.

[2] The average population density breakpoints are based on the Institute for Transportation Engineer's document entitled "A Toolbox for Alleviating Traffic Congestion," which suggests light rail and frequent bus service requires a minimum of 9 to 15 dwelling units per acre. This data has been used to inform the medium breakpoint shown.

[3] CBD core (not fringe parking)

[4] Average across CBD

Table 3 - 2: FTA Affordable Housing Breakpoints

Rating	Proportion of legally binding affordability restricted housing in the project corridor compared to the proportion in the counties through which the project travels
High	$\geq$ 2.50
Medium-High	2.25 – 2.49
Medium	1.50 - 2.24
Medium-Low	1.10 - 1.49
Low	< 1.10

Source: Final Interim Policy Guidance FTA Capital Investment Grant Program (2015)

Data obtained from the National Housing Preservation Database (NHPD) as well as public housing inventory for the City of Charleston served as the prime sources for this analysis. Analysis was done for all affordable housing options available to moderate and low income individuals within the region and project corridor, as well as a more conservative measure for options that are available to individuals making at most 60 percent of the average median income (AMI) as identified by the NHPD program description.

2.2.3 Park-and-Ride Demand

Park-and-ride facilities provide an opportunity for travelers to transfer between private automobiles and transit or between the single occupant vehicle (SOV) and other higher occupancy vehicle (HOV) modes such as carpool and vanpool. However, the facility can also support intermodal transfers between less typical modes including pedestrian, bicycle, paratransit, intercity bus transit, airport service, and other modes, depending on the facility's location, and system needs and opportunities available.[5]

The current CARTA system serves six park-and-ride facilities (Table 3-3). Two of these facilities, Super K-Mart (North Charleston) and the Dorchester Village Shopping Center park-and-ride (Summerville) are located within the I-26 Study Area. In general, these lots are formal joint-use facilities used to accommodate commuter vehicles during the day. The system's park-and-ride lots are privately owned; however, there is an agreement between the owner of the lot and the transit agency for commuter parking use. While the joint-use lot model can be quickly implemented at minimal cost, the lot's sponsor (transit agency) has limited control of the lot. If conflict arises between the parking demand of transit users and that of customers and employees of the primary use, lot owners may choose to reduce the spaces available to commuters or prohibit commuter use of the lot entirely. Similarly, in the event that the demand for commuter parking is greater than the spaces available or in instances where demand for commuter parking might increase more than anticipated, it might be difficult for the transit agency to secure additional parking spaces. Another practical problem that joint-use parking lot operations may face is that of integrating transit vehicle access and circulation patterns into lot layout and design.

Table 3 - 3: CARTA Park-and-Ride Facilities

Park-and-Ride	Location	Facility Type
Super K-Mart	North Charleston	Joint Use Facility
Dorchester Village Shopping Center	Summerville	Joint Use Facility
Citadel Mall	West Ashley	Joint Use Facility
Wal-Mart (Folly Road)	James Island	Joint Use Facility
Wal-Mart (Wando Crossing)	Mount Pleasant	Joint Use Facility
Wal-Mart (Oakland Plantation)	Mount Pleasant	Joint Use Facility

[5] Spillar, Robert J. (1997). Park-and-Ride Planning and Design Guidelines.

In an effort to estimate the demand that might be generated for a new park-and-ride facility, baseline demand estimates were established for the two existing park-and-ride facilities located in the I-26 Study Area. The baseline demand established for the North Charleston park-and-ride is applied to the park-and-ride stations located along the US 78/52 and US 176/52 alternative alignments as well as the No Build alternative. The demand established for the Dorchester Village Shopping Center park-and-ride is applied to the park-and-ride facilities located along the proposed Dorchester Road alignment.

Baseline demand factors were calculated using the modal split procedure which determines the market area population working in a defined activity center served by the park-and-ride[6]. The general methodology utilized to obtain park-and-ride estimates is as follows:

1. Establish market population coverage area for existing park-and-ride facilities. The North Charleston Super K-Mart park-and-ride coverage area utilized a 5-mile buffer around the facility based on the average distance travelled by existing users obtained from collected origin-and-destination survey data and general observations of land use and roadway access to the facility. The Dorchester Village Shopping Center facility coverage area utilized a 2.5-mile buffer based on the average distance travelled by existing users obtained from collected origin-and-destination survey data and general observations of land use and roadway access to the facility.
2. Determine CBD workers originating from established coverage area using Longitudinal Employer-Household Dynamics (LEHD) analysis.
3. Obtain market area population using existing park-and-ride facilities (estimated from ridership data obtained from boarding and alighting count collection done for existing CARTA express bus service from each park-and-ride facility).

The baseline estimates calculated for the North Charleston and Dorchester Road park-and-ride facilities are as follows:

Existing PNR	CBD Workers	Ridership	Demand Factor
Super K-Mart PNR	3934	360	0.092
Dorchester Village PNR	2360	96	0.041

Applying the calculated demand factors to the working population accessing the CBD originating from within the market/coverage areas of each alignment's proposed park-and-ride facilities, the following estimated park-and-ride demand was generated*:

Alignment	CBD Workers	Factor	Demand Estimate
No-Build I-26 Commuter Bus	5090	0.092	466
US 78/52	10678	0.092	977
US 176/52	8064	0.092	738
Dorchester Road/US 52	4825	0.041	196

**Note – Demand estimates are calculated for the composite market area for all park-and-ride facilities identified in each alignment (aggregate demand) to avoid double counting. Estimated park-and-ride demand is distributed to individual station locations based on land use, roadway access to facility, station type, and general observation.*

[6] Nungesser, Lisa G. and Ledbetter, Nancy P. (1987). Procedures for Estimating Park-and-Ride Demand in Large Texas Cities.

3 Screen Two Land Use Summary

3.1 Population, Housing, and Employment

		2010 (TAZ)						2040 (TAZ)					
Alternative	Land Area (sq. miles)	Households	Population	Population Density (persons/sq. mile)	Rating	Employment	Rating	Households	Population	Population Density (persons/sq. mile)	Rating	Employment	Rating
A: No Build I-26 Commuter Bus	3.84	7,317	15,357	3,999	*Medium-Low*	35,729	*Low*	8,635	17,374	4,524	*Medium-Low*	46,504	*Medium-Low*
B-1/B-2: US 78/US 52/Meeting– BRT/LRT	12.79	12,126	28,861	2,257	*Low*	28,058	*Low*	16,995	37,511	2,933	*Medium-Low*	36,017	*Low*
B-3/B-4: US 78/US 52/East Bay – BRT/LRT	13.52	11,317	26,857	1,986	*Low*	33,336	*Low*	16,365	36,019	2,664	*Medium-Low*	42,018	*Medium-Low*
C-1/C-2: US 176/US 52/Meeting– BRT/LRT	11.37	11,652	27,989	2,462	*Low*	23,521	*Low*	15,786	35,046	3,082	*Medium-Low*	29,368	*Low*
C-3/C-4: US 176/US 52/East Bay – BRT/LRT	12.11	10,843	25,985	2,146	*Low*	28,799	*Low*	15,156	33,554	2,771	*Medium-Low*	35,369	*Low*
D-1/D-2: Dorchester Rd/US 52/Meeting– BRT/LRT	11.41	11,933	28,697	2,515	*Low*	18,730	*Low*	16,048	36,108	3,165	*Medium-Low*	23,189	*Low*
D-3/D-4: Dorchester Rd/US 52/East Bay– BRT/LRT	12.14	11,124	26,693	2,199	*Low*	24,008	*Low*	15,418	34,616	2,851	*Medium-Low*	29,190	*Low*

		2013 (Census)		
Alternative	Land Area (sq. miles)	Population	Population Density (persons/sq. mile)	Rating
A: No Build I-26 Commuter Bus	3.84	16,452	4,284	*Medium-Low*
B-1/B-2: US 78/US 52/Meeting– BRT/LRT	12.79	32,216	2,519	*Low*
B-3/B-4: US 78/US 52/East Bay – BRT/LRT	13.52	31,205	2,308	*Low*
C-1/C-2: US 176/US 52/Meeting– BRT/LRT	11.37	29,824	2,623	*Medium-Low*
C-3/C-4: US 176/US 52/East Bay – BRT/LRT	12.11	30,835	2,546	*Low*
D-1/D-2: Dorchester Rd/US 52/Meeting– BRT/LRT	11.41	30,283	2,654	*Medium-Low*
D-3/D-4: Dorchester Rd/US 52/East Bay– BRT/LRT	12.14	29,272	2,411	*Low*

FTA Station Area Breakpoints

Station Area Development		
Rating	**Employment served by system**[1]	**Avg. Population density (persons/square mile)**[1]
High	> 220,000	> 15,000
Medium-High	140,000-219,999	9,600 - 15,000
Medium	70,000-139,999	5,760 – 9,599
Medium-Low	40,000-69,999	2,561 – 5,759
Low	<40,000	< 2,560

3.2 Affordable Housing

Alternative	Transit Corridor Housing Units	Transit Corridor LBAH*	Transit Corridor Percent [A]	County Total Housing Units	County Total LBAH*	County Total Percent [B]	Ratio [A]/[B]	Rating
A: No Build I-26 Commuter Bus	7,696	425	5.52%	245,906	4,316	1.76%	3.15	High
B-1/B-2: US 78/US 52/Meeting– BRT/LRT	14,534	1225	8.43%	301,477	5,516	1.83%	4.61	High
B-3/B-4: US 78/US 52/East Bay – BRT/LRT	13,932	1126	8.08%	301,477	5,516	1.83%	4.42	High
C-1/C-2: US 176/US 52/Meeting– BRT/LRT	13,964	1382	9.90%	245,906	4,316	1.76%	5.64	High
C-3/C-4: US 176/US 52/East Bay – BRT/LRT	13,362	1279	9.57%	245,906	4,316	1.76%	5.45	High
D-1/D-2: Dorchester Rd/US 52/Meeting– BRT/LRT	13,107	932	7.11%	227,196	4,492	1.98%	3.60	High
D-3/D-4: Dorchester Rd/US 52/East Bay– BRT/LRT	12,505	829	6.63%	227,196	4,492	1.98%	3.35	High

**Note - LBAH (Legally Binding Affordable Housing) includes afforable housing units generated from National Housing Preservation Database available to individuals making at or below 60% AMI.*

FTA Affordable Housing Breakpoints

Rating	Proportion of legally binding affordability restricted housing in the project corridor compared to the proportion in the counties through which the project travels
High	≥ 2.50
Medium-High	2.25 – 2.49
Medium	1.50 - 2.24
Medium-Low	1.10 - 1.49
Low	< 1.10

3.3 Park-and-Ride Demand Estimates

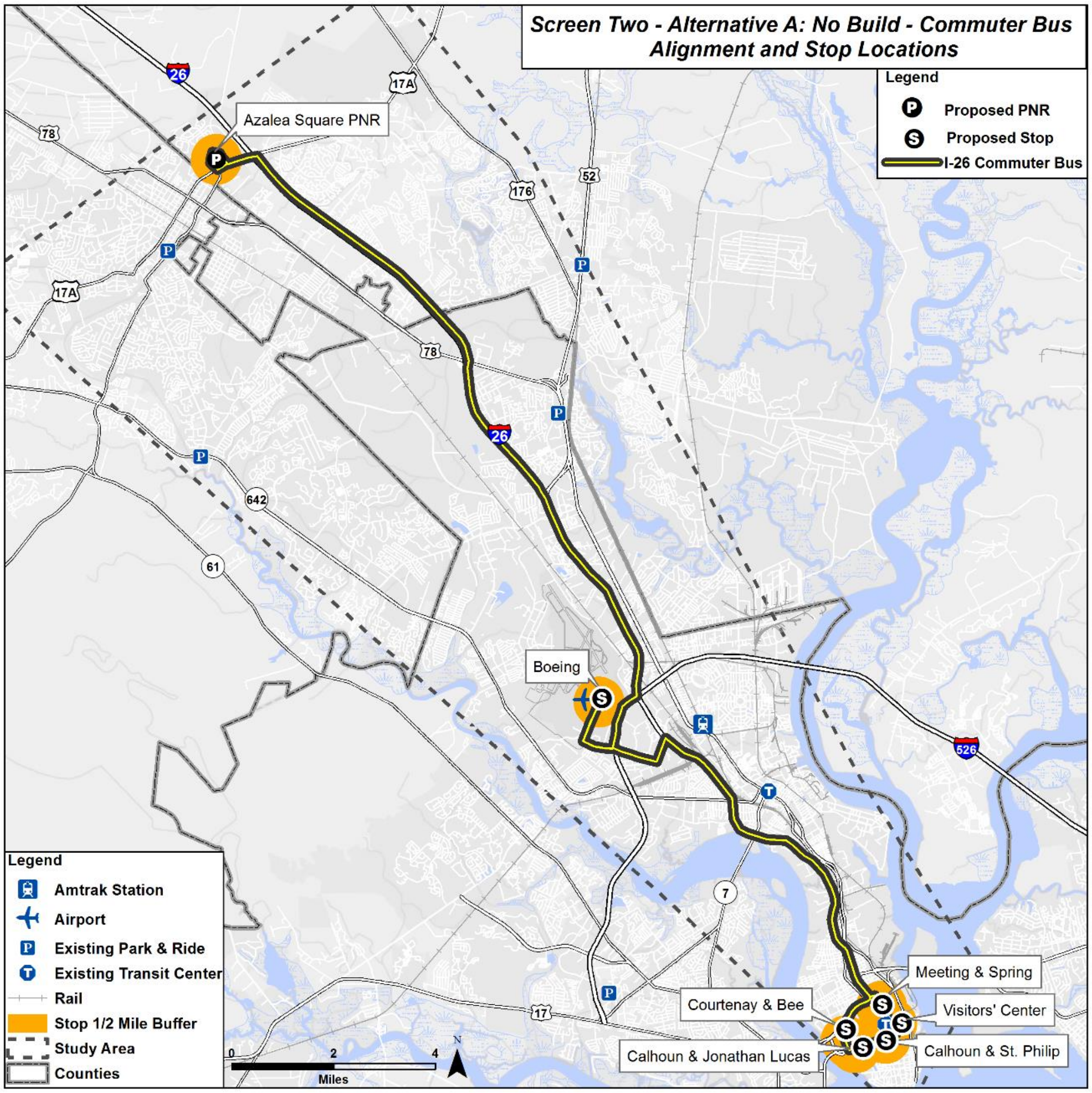
US 78/52	PNR Demand Estimate
5th & Berlin G. Myers	342
US 78 & Royle	147
US 78 & College Park	147
Rivers & Otranto	342
Total Estimated Demand	**977**

US 176/52	PNR Demand Estimate
5th & Berlin G. Myers	258
US 78 & Royle	111
US 78 & College Park	111
Rivers & Otranto	258
Total Estimated Demand	**738**

Dorchester Rd/US 52	PNR Demand Estimate
Old Trolley & Miles Jamison	65
Old Trolley & Dorchester	65
Dorchester & Ash. Phosphate	65
Total Estimated Demand	**196**

** Park-and-ride demand estimates were distributed between station locations based on land use, roadway access, proposed station types, and general observation.*

3.4 Alternative A: No-Build I-26 Commuter Bus



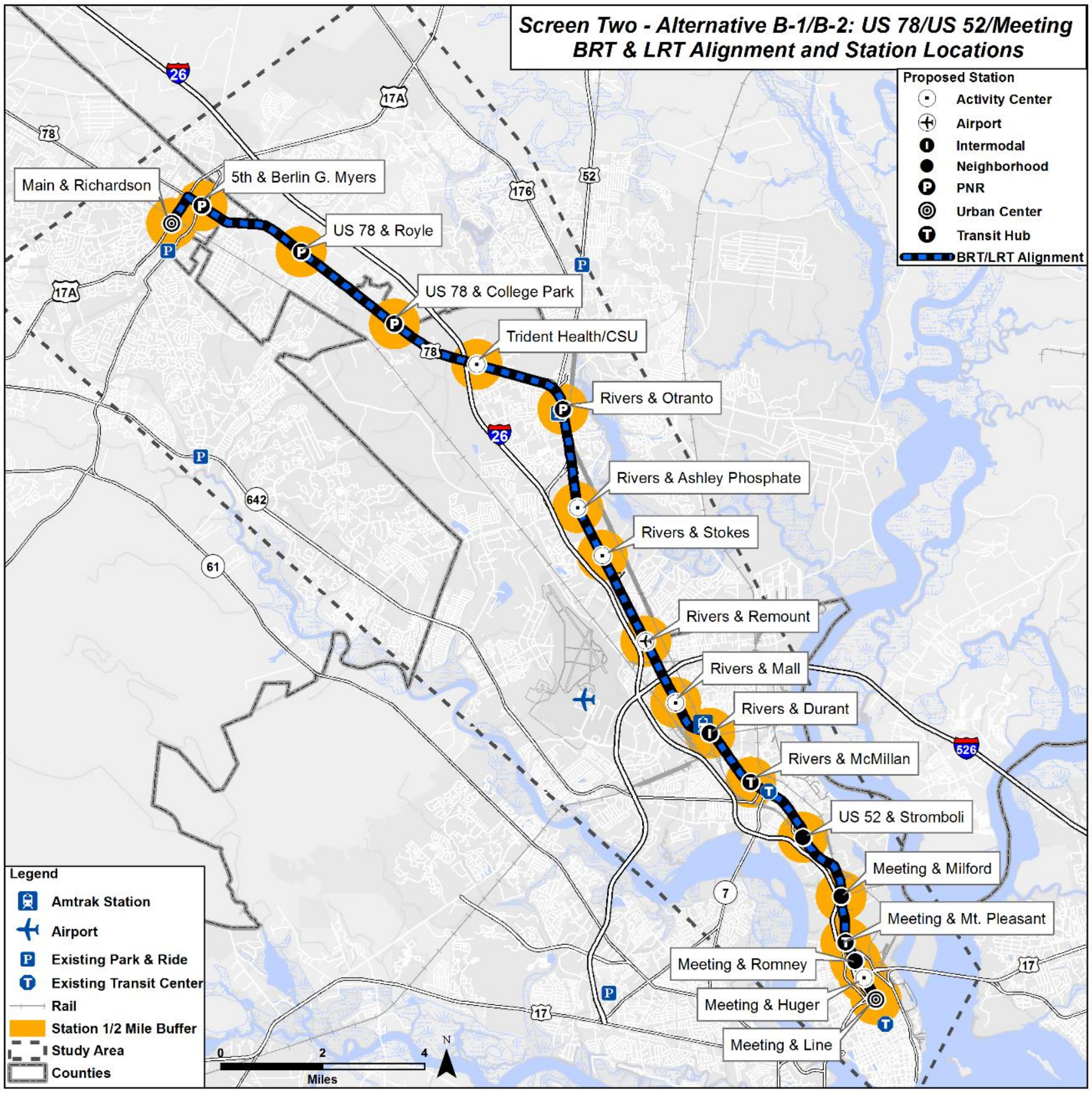
Land Use: Station Area Development

A: No Build I-26 Commuter Bus		Land Area (sq. miles)	2010 Households	2010 Population	2010 Population Density (persons/sq. mile)	2010 Employment	2040 Households	2040 Population	2040 Population Density (persons/sq. mile)	2040 Employment
Stop A	Azalea Square P&R	0.79	582	1,474	1,878	1,594	711	1,730	2,204	2,307
Stop B	Boeing	0.79	4	14	18	1,688	4	13	17	2,528
Stop C - G	Meeting & Spring Meeting & John Calhoun & St. Philip Calhoun & Jonathan Lucas Courtenay & Bee	2.27	6,731	13,869	6,110	32,447	7,920	15,631	6,886	41,669
Total Station Area		3.84	7,317	15,357	3,999 *Medium-Low*	35,729 *Low*	8,635	17,374	4,524 *Medium-Low*	46,504 *Medium-Low*

Development Potential

A: No Build I-26 Commuter Bus		% Pop. Change (2010-2040)	% Emp. Change (2010-2040)	Planning studies or developments that may impact station location
Stop A	*Azalea Square P&R*	17.37%	44.73%	Summerville Vision Plan: Identified as Reinvest & Infill District. Increased access from proposed Bear Island Road extension. Adjacent to Nexton development: 4,500 acres; 13,000 housing units; 6 million sq. ft. commercial use.
Stop B	*Boeing*	-7.14%	49.76%	Boeing campus expansion.
Stop C - G	*Meeting & Spring* *Meeting & John* *Calhoun & St. Philip* *Calhoun & Jonathan Lucas* *Courtenay & Bee*	12.70%	28.42%	Courier Square Mixed-Use development: ~12 acres; Phase 1 (Meeting St. & Columbus St.). Horizon District Redevelopment Master Plan: 22 acre development.

3.5 Alternative B-1/B-2: US 78/ US 52/Meeting – BRT/LRT



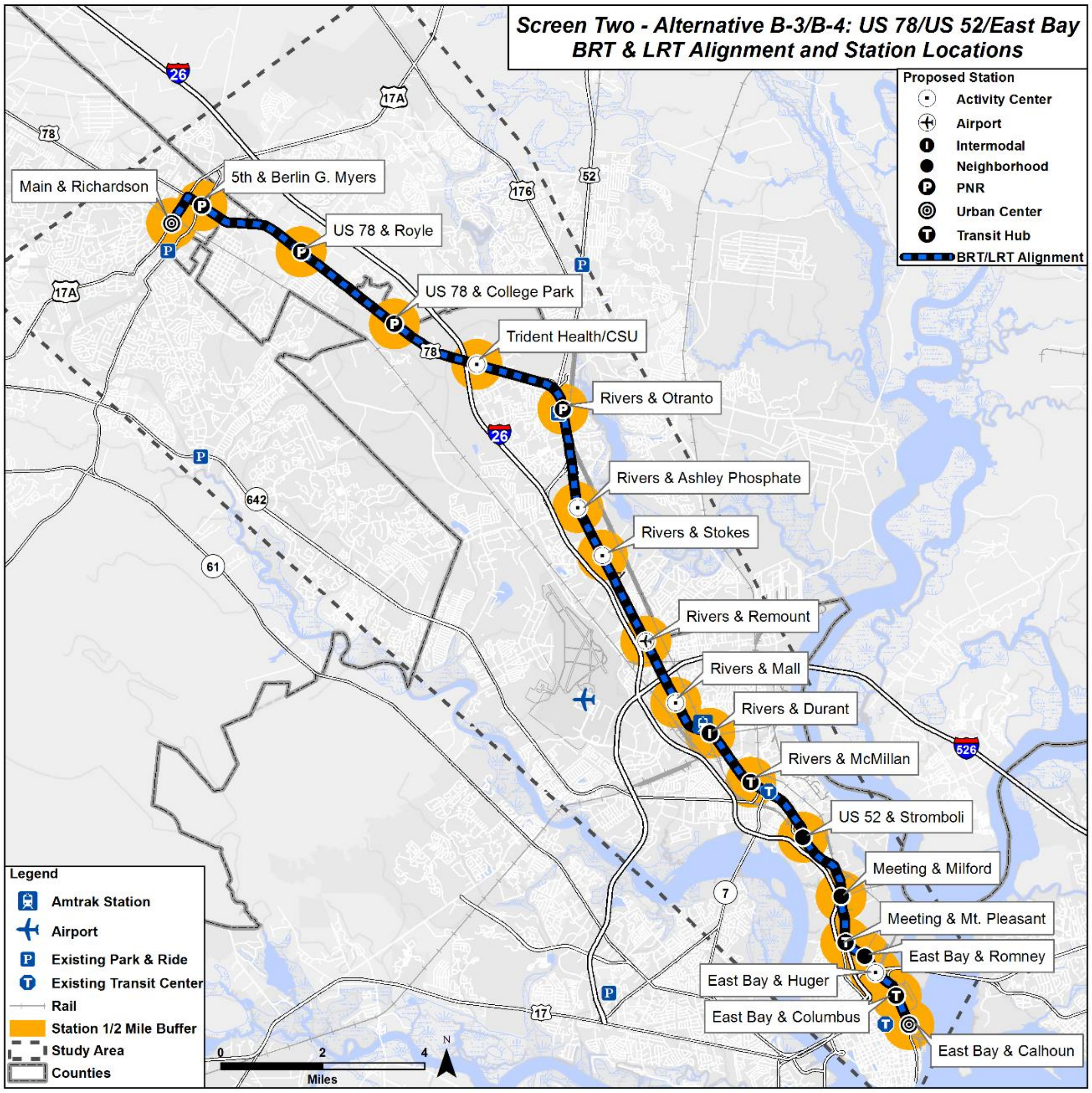
Land Use: Station Area Development

B-1/B-2: US 78/US 52/Meeting - BRT/LRT		Land Area (sq. miles)	2010 Households	2010 Population	2010 Population Density (persons/sq. mile)	2010 Employment	2040 Households	2040 Population	2040 Population Density (persons/sq. mile)	2040 Employment
Station A - B	Main & Richardson 5th & Berlin G. Myers	1.41	1,001	2,448	1,733	3,601	1,489	3,444	2,437	4,706
Station C	US 78 & Royle	0.79	342	928	1,182	403	394	1,000	1,274	559
Station D	US 78 & College Park	0.79	280	763	972	419	489	1,249	1,591	685
Station E	Trident Health/CSU	0.79	362	783	997	1,380	612	1,389	1,769	2,557
Station F	Rivers & Otranto	0.79	981	2,278	2,902	1,001	1,147	2,629	3,349	1,367
Station G	Rivers & Ashley Phosphate	0.79	275	711	906	3,115	337	792	1,009	4,133
Station H	Rivers & Stokes	0.79	569	1,511	1,925	1,880	669	1,603	2,042	2,385
Station I	Rivers & Remount	0.79	531	1,393	1,775	2,403	662	1,572	2,003	3,097
Station J - K	Rivers & Mall Rivers & Durant	1.54	1,208	3,002	1,952	4,389	1,937	4,356	2,832	4,907
Station L	Rivers & McMillan	0.79	1,115	2,820	3,592	1,857	1,675	3,783	4,819	2,097
Station M	US 52 & Stromboli	0.79	579	1,455	1,854	978	961	2,109	2,687	1,123
Station N	Meeting & Milford	0.79	159	308	392	970	683	1,483	1,889	1,579
Station O - R	Meeting & Mt. Pleasant Meeting & Romney Meeting & Huger Meeting & Line	1.99	4,724	10,461	5,257	5,662	5,940	12,103	6,082	6,823
Total Station Area		**12.79**	**12,126**	**28,861**	**2,257** ***Low***	**28,058** ***Low***	**16,995**	**37,511**	**2,933** ***Medium-Low***	**36,017** ***Low***

Development Potential

B-1/B-2: US 78/US 52/Meeting - BRT/LRT		% Pop. Change (2010-2040)	% Emp. Change (2010-2040)	Planning studies or developments that may impact station location
Station A - B	*Main & Richardson* *5th & Berlin G. Myers*	40.66%	30.66%	Summerville Vision Plan: Downtown District Plan including The Dorchester Mixed-Use Project and Hutchinson Square Revitalization Project. Adjacent to Nexton development: 4,500 acres; 13,000 housing units; 6 million sq. ft. commercial use.
Station C	*US 78 & Royle*	7.76%	38.71%	Summerville Vision Plan: Included in parks and trails network - US 78 upgrade.
Station D	*US 78 & College Park*	63.70%	63.48%	Ingleside Mixed-Use development.
Station E	*Trident Health/CSU*	77.39%	85.29%	Ingleside Mixed-Use development.
Station F	*Rivers & Otranto*	15.41%	36.56%	
Station G	*Rivers & Ashley Phosphate*	11.39%	32.68%	
Station H	*Rivers & Stokes*	6.09%	26.86%	
Station I	*Rivers & Remount*	12.85%	28.88%	
Station J - K	*Rivers & Mall* *Rivers & Durant*	45.12%	11.80%	Adjacent to Mixson Mixed-Use development: 43 acres; 650 dwelling units. North Charleston Regional Intermodal Facility. Neck Area Plan: Redevelopment area; increased access and transit node development.
Station L	*Rivers & McMillan*	34.15%	12.92%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station M	*US 52 & Stromboli*	44.95%	14.83%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station N	*Meeting & Milford*	381.49%	62.78%	Magnolia development: 182 acres; 3,500 housing units; 1.3 million sq. ft. commercial.
Station O - R	*Meeting & Mt. Pleasant* *Meeting & Romney* *Meeting & Huger* *Meeting & Line*	15.70%	20.51%	Upper Peninsula Initiative: Mixed-use development, increased pedestrian access and connectivity. Upper Peninsula Zoning District: increased densities, mixed-use development. Peninsula Mobility Report: parking consolidation, pedestrian access and connectivity. Courier Square Mixed-Use development: ~12 acres; Phase 1 (Meeting St. & Columbus St.). Horizon District Redevelopment Master Plan: 22 acre development.

3.6 Alternative B-3/B-4: US 78/US 52/ East Bay – BRT/LRT



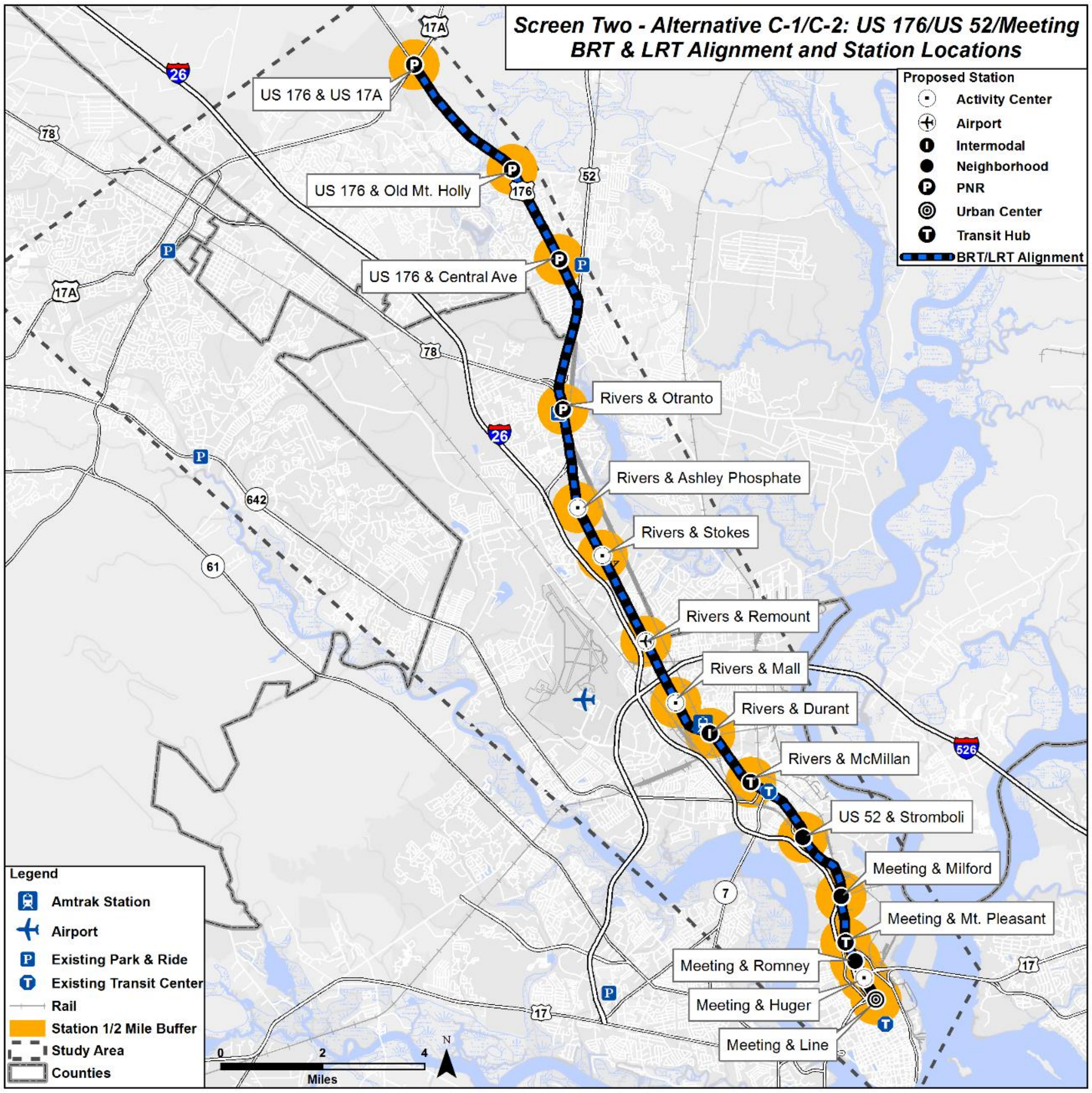
Station Area Development Statistics

B-3/B-4: US 78/US 52/East Bay - BRT/LRT		Land Area (sq. miles)	2010 Households	2010 Population	2010 Population Density (persons/sq. mile)	2010 Employment	2040 Households	2040 Population	2040 Population Density (persons/sq. mile)	2040 Employment
Station A - B	Main & Richardson 5th & Berlin G. Myers	1.41	1,001	2,448	1,733	3,601	1,489	3,444	2,437	4,706
Station C	US 78 & Royle	0.79	342	928	1,182	403	394	1,000	1,274	559
Station D	US 78 & College Park	0.79	280	763	972	419	489	1,249	1,591	685
Station E	Trident Health/CSU	0.79	362	783	997	1,380	612	1,389	1,769	2,557
Station F	Rivers & Otranto	0.79	981	2,278	2,902	1,001	1,147	2,629	3,349	1,367
Station G	Rivers & Ashley Phosphate	0.79	275	711	906	3,115	337	792	1,009	4,133
Station H	Rivers & Stokes	0.79	569	1,511	1,925	1,880	669	1,603	2,042	2,385
Station I	Rivers & Remount	0.79	531	1,393	1,775	2,403	662	1,572	2,003	3,097
Station J - K	Rivers & Mall Rivers & Durant	1.54	1,208	3,002	1,952	4,389	1,937	4,356	2,832	4,907
Station L	Rivers & McMillan	0.79	1,115	2,820	3,592	1,857	1,675	3,783	4,819	2,097
Station M	US 52 & Stromboli	0.79	579	1,455	1,854	978	961	2,109	2,687	1,123
Station N	Meeting & Milford	0.79	159	308	392	970	683	1,483	1,889	1,579
Station O - R	Meeting & Mt. Pleasant East Bay & Romney East Bay & Huger East Bay & Columbus East Bay & Calhoun	2.72	3,915	8,457	3,109	10,940	5,310	10,611	3,901	12,824
Total Station Area		13.52	11,317	26,857	1,986 *Low*	33,336 *Low*	16,365	36,019	2,664 *Medium-Low*	42,018 *Medium-Low*

Development Potential

B-3/B-4: US 78/US 52/East Bay - BRT/LRT		% Pop. Change (2010-2040)	% Emp. Change (2010-2040)	Planning studies or developments that may impact station location
Station A - B	*Main & Richardson* *5th & Berlin G. Myers*	40.66%	30.66%	Summerville Vision Plan: Downtown District Plan including The Dorchester Mixed-Use Project and Hutchinson Square Revitalization Project. Adjacent to Nexton development: 4,500 acres; 13,000 housing units; 6 million sq. ft. commercial use.
Station C	*US 78 & Royle*	7.76%	38.71%	Summerville Vision Plan: Included in parks and trails network - US 78 upgrade.
Station D	*US 78 & College Park*	63.70%	63.48%	Ingleside Mixed-Use development.
Station E	*Trident Health/CSU*	77.39%	85.29%	Ingleside Mixed-Use development.
Station F	*Rivers & Otranto*	15.41%	36.56%	
Station G	*Rivers & Ashley Ph.*	11.39%	32.68%	
Station H	*Rivers & Stokes*	6.09%	26.86%	
Station I	*Rivers & Remount*	12.85%	28.88%	
Station J - K	*Rivers & Mall* *Rivers & Durant*	45.12%	11.80%	Adjacent to Mixson Mixed-Use development: 43 acres; 650 dwelling units. North Charleston Regional Intermodal Facility. Neck Area Plan: Redevelopment area; increased access and transit node development.
Station L	*Rivers & McMillan*	34.15%	12.92%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station M	*US 52 & Stromboli*	44.95%	14.83%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station N	*Meeting & Milford*	381.49%	62.78%	Magnolia development: 182 acres; 3,500 housing units; 1.3 million sq. ft. commercial.
Station O - R	*Meeting & Mt. Pleasant* *East Bay & Romney* *East Bay & Huger* *East Bay & Columbus* *East Bay & Calhoun*	25.46%	17.22%	Upper Peninsula Initiative: Mixed-use development, increased pedestrian access and connectivity. Upper Peninsula Zoning District: increased densities, mixed-use development. Peninsula Mobility Report: parking consolidation, pedestrian access and connectivity. Courier Square Mixed-Use development: ~12 acres; Phase 1 (Meeting St. & Columbus St.). Horizon District Redevelopment Master Plan: 22 acre development.

3.7 Alternative C-1/C-2: US 176/US 52/ Meeting – BRT/LRT



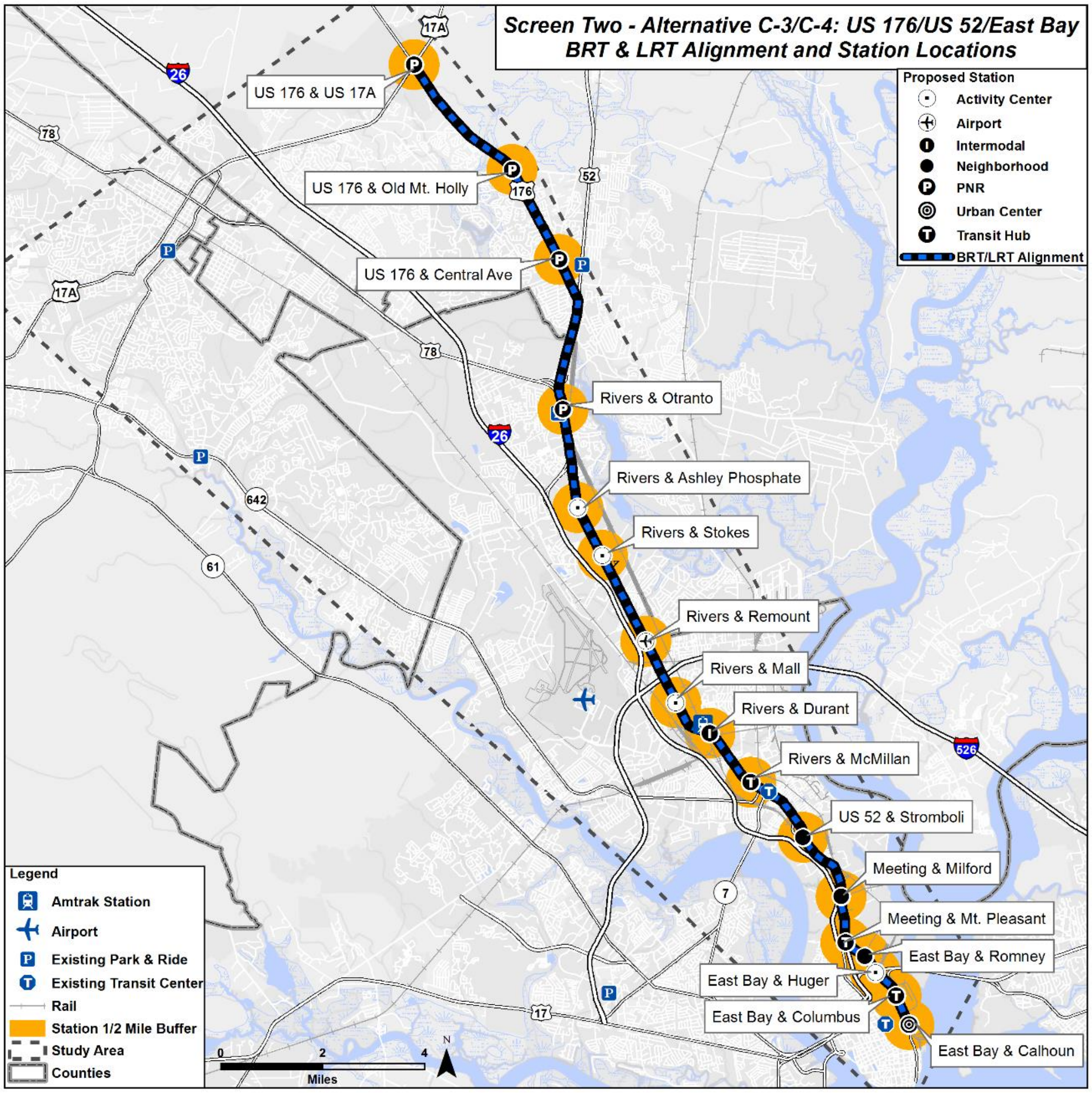
Station Area Development Statistics

C-1/C-2: US 176/US 52/Meeting - BRT/LRT		Land Area (sq. miles)	2010				2040			
			Households	Population	Population Density (persons/sq. mile)	Employment	Households	Population	Population Density (persons/sq. mile)	Employment
Station A	US 176 & US 17A	0.79	200	548	698	85	323	842	1,073	272
Station B	US 176 & Old Mt. Holly Rd.	0.79	559	1,516	1,931	483	609	1,604	2,043	768
Station C	US 176 & Central Ave.	0.79	752	1,986	2,530	698	843	2,170	2,764	817
Station D	Rivers & Otranto	0.79	981	2,278	2,902	1,001	1,147	2,629	3,349	1,367
Station E	Rivers & Ashley Phosphate	0.79	275	711	906	3,115	337	792	1,009	4,133
Station F	Rivers & Stokes	0.79	569	1,511	1,925	1,880	669	1,603	2,042	2,385
Station G	Rivers & Remount	0.79	531	1,393	1,775	2,403	662	1,572	2,003	3,097
Station H - I	Rivers & Mall Rivers & Durant	1.54	1,208	3,002	1,949	4,389	1,937	4,356	2,828	4,907
Station J	Rivers & McMillan	0.79	1,115	2,820	3,592	1,857	1,675	3,783	4,819	2,097
Station K	US 52 & Stromboli	0.79	579	1,455	1,854	978	961	2,109	2,687	1,123
Station L	Meeting & Milford	0.79	159	308	392	970	683	1,483	1,889	1,579
Station M - P	Meeting & Mt. Pleasant Meeting & Romney Meeting & Huger Meeting & Line	1.99	4,724	10,461	5,257	5,662	5,940	12,103	6,082	6,823
Total Station Area		**11.37**	**11,652**	**27,989**	**2,462** *Low*	**23,521** *Low*	**15,786**	**35,046**	**3,082** *Medium-Low*	**29,368** *Low*

Development Potential

C-1/C-2: US 176/US 52/Meeting - BRT/LRT		% Pop. Change (2010-2040)	% Emp. Change (2010-2040)	Planning studies or developments that may impact station location
Station A	*US 176 & US 17A*	53.65%	220.00%	Cane Bay development: 4,500 acres; 10,000 housing units.
Station B	*US 176 & Old Mt. Holly Rd.*	5.80%	59.01%	Carnes Crossroads development: 2,300 acres; 4,300 – 5,300 housing units.
Station C	*US 176 & Central Ave.*	9.26%	17.05%	Carnes Crossroads development: 2,300 acres; 4,300 – 5,300 housing units.
Station D	*Rivers & Otranto*	15.41%	36.56%	
Station E	*Rivers & Ashley Phosphate*	11.39%	32.68%	
Station F	*Rivers & Stokes*	6.09%	26.86%	
Station G	*Rivers & Remount*	12.85%	28.88%	
Station H - I	*Rivers & Mall* *Rivers & Durant*	45.12%	11.80%	Adjacent to Mixson Mixed-Use development: 43 acres; 650 dwelling units. North Charleston Regional Intermodal Facility. Neck Area Plan: Redevelopment area; increased access and transit node development.
Station J	*Rivers & McMillan*	34.15%	12.92%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station K	*US 52 & Stromboli*	44.95%	14.83%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station L	*Meeting & Milford*	381.49%	62.78%	Magnolia development: 182 acres; 3,500 housing units; 1.3 million sq. ft. commercial.
Station M - P	*Meeting & Mt. Pleasant* *Meeting & Romney* *Meeting & Huger* *Meeting & Line*	15.70%	20.51%	Upper Peninsula Initiative: Mixed-use development, increased pedestrian access and connectivity. Upper Peninsula Zoning District: increased densities, mixed-use development. Peninsula Mobility Report: parking consolidation, pedestrian access and connectivity. Courier Square Mixed-Use development: ~12 acres; Phase 1 (Meeting St. & Columbus St.). Horizon District Redevelopment Master Plan: 22 acre development.

3.8 Alternative C-3/C-4: US 176/US 52/ East Bay – BRT/LRT



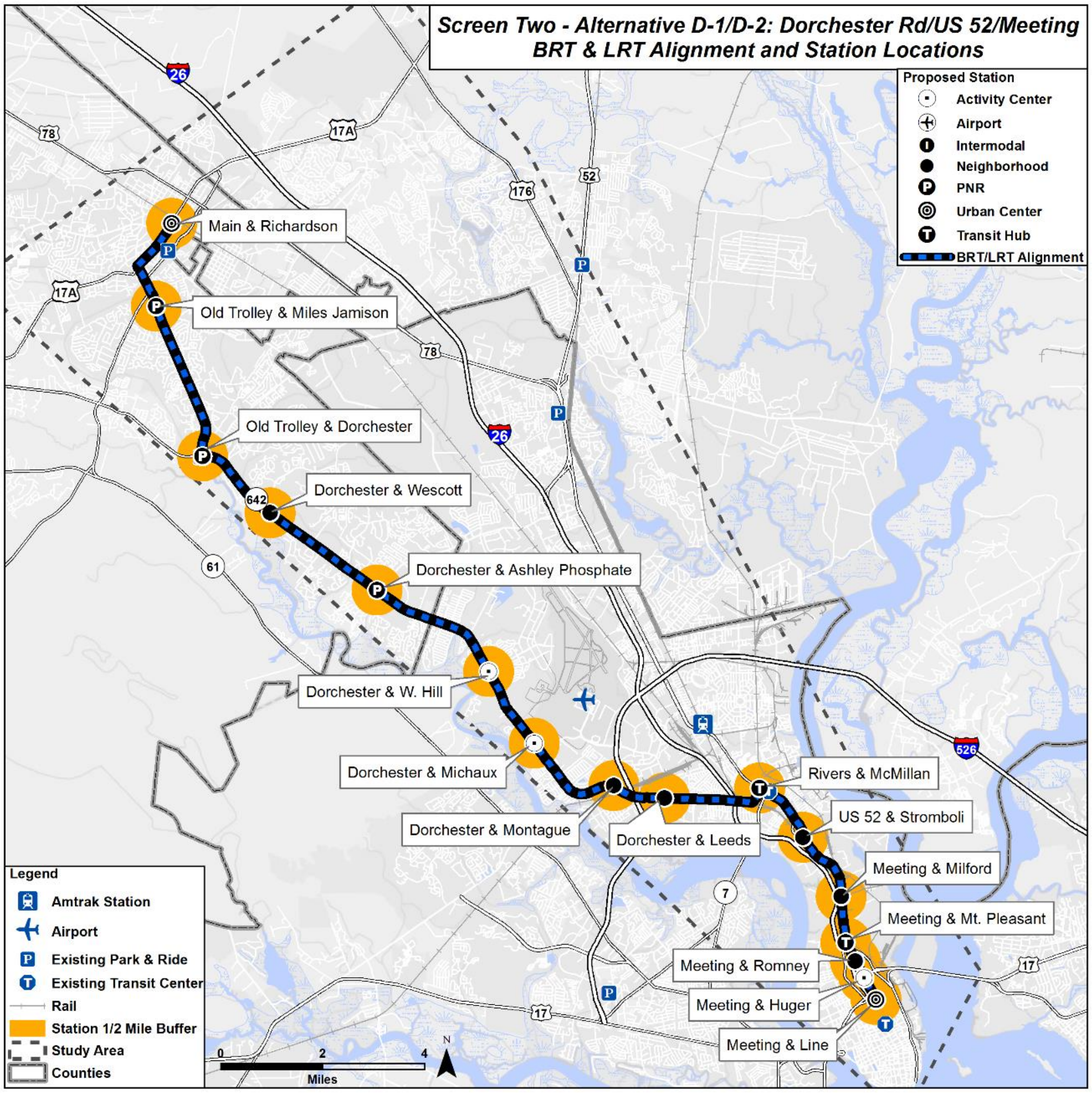
Station Area Development Statistics

C-3/C-4: US 176/US 52/East Bay - BRT/LRT		Land Area (sq. miles)	2010 Households	2010 Population	2010 Population Density (persons/sq. mile)	2010 Employment	2040 Households	2040 Population	2040 Population Density (persons/sq. mile)	2040 Employment
Station A	US 176 & US 17A	0.79	200	548	698	85	323	842	1,073	272
Station B	US 176 & Old Mt. Holly Rd.	0.79	559	1,516	1,931	483	609	1,604	2,043	768
Station C	US 176 & Central Ave.	0.79	752	1,986	2,530	698	843	2,170	2,765	817
Station D	Rivers & Otranto	0.79	981	2,278	2,902	1,001	1,147	2,629	3,349	1,367
Station E	Rivers & Ashley Phosphate	0.79	275	711	906	3,115	337	792	1,009	4,133
Station F	Rivers & Stokes	0.79	569	1,511	1,925	1,880	669	1,603	2,042	2,385
Station G	Rivers & Remount	0.79	531	1,393	1,775	2,403	662	1,572	2,003	3,097
Station H - I	Rivers & Mall Rivers & Durant	1.54	1,208	3,002	1,952	4,389	1,937	4,356	2,832	4,907
Station J	Rivers & McMillan	0.79	1,115	2,820	3,592	1,857	1,675	3,783	4,819	2,097
Station K	US 52 & Stromboli	0.79	579	1,455	1,854	978	961	2,109	2,687	1,123
Station L	Meeting & Milford	0.79	159	308	392	970	683	1,483	1,889	1,579
Station M - Q	Meeting & Mt. Pleasant East Bay & Romney East Bay & Huger East Bay & Columbus East Bay & Calhoun	2.72	3,915	8,457	3,109	10,940	5,310	10,611	3,901	12,824
Total Station Area		**12.11**	**10,843**	**25,985**	**2,146** *Low*	**28,799** *Low*	**15,156**	**33,554**	**2,771** *Medium-Low*	**35,369** *Low*

Development Potential

C-3/C-4: US 176/US 52/East Bay - BRT/LRT		% Pop. Change (2010-2040)	% Emp. Change (2010-2040)	Planning studies or developments that may impact station location
Station A	*US 176 & US 17A*	53.65%	220.00%	Cane Bay development: 4,500 acres; 10,000 housing units.
Station B	*US 176 & Old Mt. Holly Rd.*	5.80%	59.01%	Carnes Crossroads development: 2,300 acres; 4,300 – 5,300 housing units.
Station C	*US 176 & Central Ave.*	9.26%	17.05%	Carnes Crossroads development: 2,300 acres; 4,300 – 5,300 housing units.
Station D	*Rivers & Otranto*	15.41%	36.56%	
Station E	*Rivers & Ashley Phosphate*	11.39%	32.68%	
Station F	*Rivers & Stokes*	6.09%	26.86%	
Station G	*Rivers & Remount*	12.85%	28.88%	
Station H - I	*Rivers & Mall* *Rivers & Durant*	45.12%	11.80%	Adjacent to Mixson Mixed-Use development: 43 acres; 650 dwelling units. North Charleston Regional Intermodal Facility. Neck Area Plan: Redevelopment area; increased access and transit node development.
Station J	*Rivers & McMillan*	34.15%	12.92%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station K	*US 52 & Stromboli*	44.95%	14.83%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station L	*Meeting & Milford*	381.49%	62.78%	Magnolia development: 182 acres; 3,500 housing units; 1.3 million sq. ft. commercial.
Station M - Q	*Meeting & Mt. Pleasant* *East Bay & Romney* *East Bay & Huger* *East Bay & Columbus* *East Bay & Calhoun*	25.46%	17.22%	Upper Peninsula Initiative: Mixed-use development, increased pedestrian access and connectivity. Upper Peninsula Zoning District: increased densities, mixed-use development. Peninsula Mobility Report: parking consolidation, pedestrian access and connectivity. Courier Square Mixed-Use development: ~12 acres; Phase 1 (Meeting St. & Columbus St.). Horizon District Redevelopment Master Plan: 22 acre development.

3.9 Alternative D-1/D-2: Dorchester Rd/US 52/ Meeting – BRT/LRT



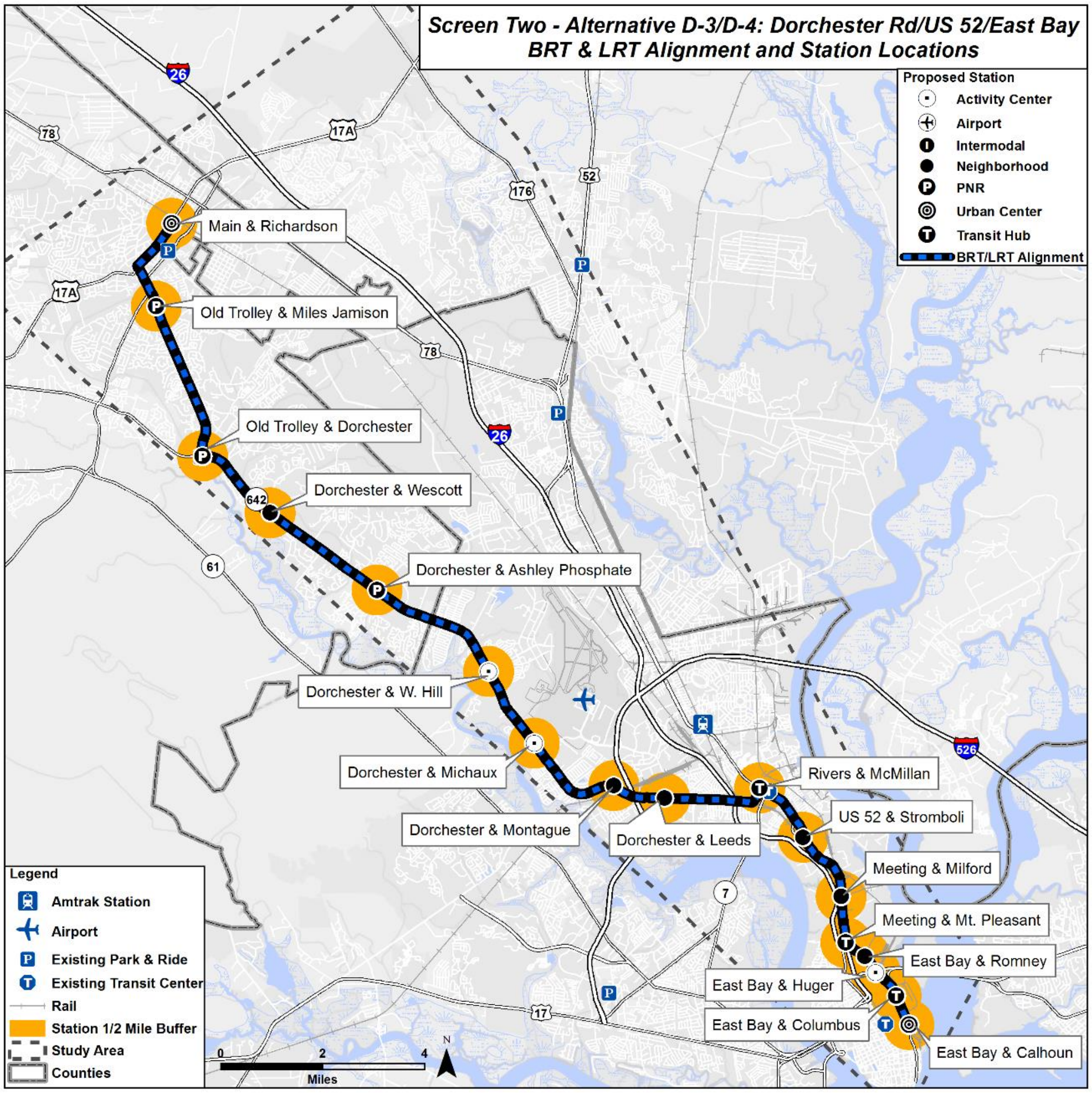
Station Area Development Statistics

D-1/D-2: Dorchester/US 52/Meeting - BRT/LRT		Land Area (sq. miles)	2010 Households	2010 Population	2010 Population Density (persons/sq. mile)	2010 Employment	2040 Households	2040 Population	2040 Population Density (persons/sq. mile)	2040 Employment
Station A	Main & Richardson	0.79	519	1,369	1,744	2,643	707	1,714	2,183	3,259
Station B	Old Trolley & Miles Jamison	0.79	845	2,183	2,781	449	991	2,496	3,180	675
Station C	Old Trolley & Dorchester	0.79	815	1,894	2,413	1,042	993	2,320	2,955	1,388
Station D	Dorchester & Wescott	0.79	539	1,526	1,944	112	812	2,191	2,791	195
Station E	Dorchester & Ash Phosphate	0.79	572	1,478	1,883	755	740	1,872	2,385	920
Station F	Dorchester & W. Hill	0.79	286	781	995	748	337	881	1,122	849
Station G	Dorchester & Michaux	0.79	837	2,100	2,675	318	925	2,170	2,764	409
Station H	Dorchester & Montague	0.79	712	1,798	2,290	807	887	2,129	2,712	906
Station I	Dorchester & Leeds	0.79	271	687	875	2,295	298	707	901	2,854
Station J	Dorchester & Rivers	0.79	1,075	2,657	3,385	1,951	1,774	3,933	5,010	2,209
Station K	US 52 & Stromboli	0.79	579	1,455	1,854	978	961	2,109	2,687	1,123
Station L	Meeting & Milford	0.79	159	308	392	970	683	1,483	1,889	1,579
Station M - P	Meeting & Mt. Pleasant Meeting & Romney Meeting & Huger Meeting & Line	1.99	4,724	10,461	5,257	5,662	5,940	12,103	6,082	6,823
Total Station Area		11.41	11,933	28,697	2,515 *Low*	18,730 *Low*	16,048	36,108	3,165 *Medium-Low*	23,189 *Low*

Development Potential

D-1/D-2: Dorchester/US 52/Meeting - BRT/LRT		% Pop. Change (2010-2040)	% Emp. Change (2010-2040)	Planning studies or developments that may impact station location
Station A	*Main & Richardson*	25.20%	23.31%	Summerville Vision Plan: Hutchinson Square.
Station B	*Old Trolley & Miles Jamison*	14.34%	50.33%	
Station C	*Old Trolley & Dorchester*	22.49%	33.21%	Summerville Vision Plan: Oakbrook Mixed Use Development.
Station D	*Dorchester & Wescott*	43.58%	74.11%	
Station E	*Dorchester & Ash Phosphate*	26.66%	21.85%	
Station F	*Dorchester & W. Hill*	12.80%	13.50%	
Station G	*Dorchester & Michaux*	3.33%	28.62%	
Station H	*Dorchester & Montague*	18.41%	12.27%	
Station I	*Dorchester & Leeds*	2.91%	24.36%	
Station J	*Dorchester & Rivers*	48.02%	13.22%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station K	*US 52 & Stromboli*	44.95%	14.83%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station L	*Meeting & Milford*	381.49%	62.78%	Magnolia development: 182 acres; 3,500 housing units; 1.3 million sq. ft. commercial.
Station M - P	*Meeting & Mt. Pleasant* *Meeting & Romney* *Meeting & Huger* *Meeting & Line*	15.70%	20.51%	Upper Peninsula Initiative: Mixed-use development, increased pedestrian access and connectivity. Upper Peninsula Zoning District: increased densities, mixed-use development. Peninsula Mobility Report: parking consolidation, pedestrian access and connectivity. Courier Square Mixed-Use development: ~12 acres; Phase 1 (Meeting St. & Columbus St.). Horizon District Redevelopment Master Plan: 22 acre development.

3.10 Alternative D-3/D-4: Dorchester/US 52/ East Bay – BRT/LRT



Station Area Development Statistics

D-3/D-4: Dorchester/US 52/East Bay - BRT/LRT		Land Area (sq. miles)	2010 Households	2010 Population	2010 Population Density (persons/sq. mile)	2010 Employment	2040 Households	2040 Population	2040 Population Density (persons/sq. mile)	2040 Employment
Station A	Main & Richardson	0.79	519	1,369	1,744	2,643	707	1,714	2,183	3,259
Station B	Old Trolley & Miles Jamison	0.79	845	2,183	2,781	449	991	2,496	3,180	675
Station C	Old Trolley & Dorchester	0.79	815	1,894	2,413	1,042	993	2,320	2,955	1,388
Station D	Dorchester & Wescott	0.79	539	1,526	1,944	112	812	2,191	2,791	195
Station E	Dorchester & Ash Phosphate	0.79	572	1,478	1,883	755	740	1,872	2,385	920
Station F	Dorchester & W. Hill	0.79	286	781	995	748	337	881	1,122	849
Station G	Dorchester & Michaux	0.79	837	2,100	2,675	318	925	2,170	2,764	409
Station H	Dorchester & Montague	0.79	712	1,798	2,290	807	887	2,129	2,712	906
Station I	Dorchester & Leeds	0.79	271	687	875	2,295	298	707	901	2,854
Station J	Dorchester & Rivers	0.79	1,075	2,657	3,385	1,951	1,774	3,933	5,010	2,209
Station K	US 52 & Stromboli	0.79	579	1,455	1,854	978	961	2,109	2,687	1,123
Station L	Meeting & Milford	0.79	159	308	392	970	683	1,483	1,889	1,579
Station M - Q	Meeting & Mt. Pleasant East Bay & Romney East Bay & Huger East Bay & Columbus East Bay & Calhoun	2.72	3,915	8,457	3,109	10,940	5,310	10,611	3,901	12,824
Total Station Area		12.14	11,124	26,693	2,199 Low	24,008 Low	15,418	34,616	2,851 Medium-Low	29,190 Low

Development Potential

D-3/D-4: Dorchester/US 52/East Bay - BRT/LRT		% Pop. Change (2010-2040)	% Emp. Change (2010-2040)	Planning studies or developments that may impact station location
Station A	*Main & Richardson*	25.20%	23.31%	Summerville Vision Plan: Hutchinson Square.
Station B	*Old Trolley & Miles Jamison*	14.34%	50.33%	
Station C	*Old Trolley & Dorchester*	22.49%	33.21%	Summerville Vision Plan: Oakbrook Mixed Use Development.
Station D	*Dorchester & Wescott*	43.58%	74.11%	
Station E	*Dorchester & Ash Phosphate*	26.66%	21.85%	
Station F	*Dorchester & W. Hill*	12.80%	13.50%	
Station G	*Dorchester & Michaux*	3.33%	28.62%	
Station H	*Dorchester & Montague*	18.41%	12.27%	
Station I	*Dorchester & Leeds*	2.91%	24.36%	
Station J	*Dorchester & Rivers*	48.02%	13.22%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station K	*US 52 & Stromboli*	44.95%	14.83%	Neck Area Plan & Lowcountry Alliance for Model Communities Revitalization Plan: Redevelopment area; increased access and transit node development.
Station L	*Meeting & Milford*	381.49%	62.78%	Magnolia development: 182 acres; 3,500 housing units; 1.3 million sq. ft. commercial.
Station M - Q	*Meeting & Mt. Pleasant* *East Bay & Romney* *East Bay & Huger* *East Bay & Columbus* *East Bay & Calhoun*	25.46%	17.22%	Upper Peninsula Initiative: Mixed-use development, increased pedestrian access and connectivity. Upper Peninsula Zoning District: increased densities, mixed-use development. Peninsula Mobility Report: parking consolidation, pedestrian access and connectivity. Courier Square Mixed-Use development: ~12 acres; Phase 1 (Meeting St. & Columbus St.). Horizon District Redevelopment Master Plan: 22 acre development.

4 Economic Development Potential Summary

Transit Supportive Plans and Policies	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
Growth Management:						
Concentration of development around established activity centers and regional transit	High	High	Medium-High	Medium-High	Medium-High	Medium-High
Land conservation and management	Medium	Medium	Medium-Low	Medium-Low	High	High
Transit Supportive Corridor Policies						
Plans and policies to increase corridor and station area development	Yes	Yes	Yes	Yes	Yes	Yes
Plans and policies to enhance transit-friendly character of corridor and station area development	Nexton/Ingleside/Mixson/Magnolia/Courier Square ; City of Charleston Peninsula Mobility Report; Neck Area Plan	Nexton/Ingleside/Mixson/ Magnolia/Courier Square; City of Charleston Peninsula Mobility Report; Neck Area Plan	Cane Bay/Carnes Crossing/Mixson/Magnolia/Courier Square; City of Charleston Peninsula Mobility Report; Neck Area Plan	Cane Bay/Carnes Crossing/Mixson/Magnolia/ Courier Square; City of Charleston Peninsula Mobility Report; Neck Area Plan	Oakbrook/Courier Square/Wescott/Magnolia; City of Charleston Peninsula Mobility Report; Neck Area Plan	Oakbrook/Courier Square/Wescott/Magnolia; City of Charleston Peninsula Mobility Report; Neck Area Plan
Plans to improve pedestrian facilities including facilities for persons with disabilities	Yes	Yes	Yes	Yes	Yes	Yes
Parking policies	City of Charleston Peninsula Mobility Report	City of Charleston Peninsula Mobility Report	City of Charleston Peninsula Mobility Report	City of Charleston Peninsula Mobility Report	City of Charleston Peninsula Mobility Report	City of Charleston Peninsula Mobility Report
Supportive Zoning Regulations Near Transit Station						
Zoning ordinances that support increased development density in transit station areas	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District
Zoning ordinances that enhance transit-oriented character of station area development and pedestrian access	Yes - PDD zoning (Mixson/Horizon Village/Ingleside)	Yes - PDD zoning (Mixson/Horizon Village/Ingleside)	Yes - PDD zoning (Mixson/Horizon Village)	Yes - PDD zoning (Mixson/Horizon Village)	No - Dorchester Rd. Overlay District (restrictive)	No - Dorchester Rd. Overlay District (restrictive)
Zoning allowances for reduced parking and traffic mitigation	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District
Tools to Implement Land Use Policies						
Outreach to government agencies and the community in support of transit supportive planning	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)
Regulatory and financial incentives to promote transit-supportive development	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District	Yes - Proposed Upper Peninsula Zoning District
Efforts to engage the development community in station area planning and transit-supportive development	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)	Upper Peninsula Initiative (http://charlestonup.com/)

Performance and Impacts of Land Use Policies	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
Performance of Land Use Policies						
Demonstrated cases of developments affected by transit-supportive policies	Yes - Mixson	Yes - Mixson	Yes - Mixson	Yes - Mixson		
Station area development proposals and status						
Potential impact of Transit Project on Regional Land Use						
Adaptability of station area land for development	Medium-High	Medium-High	High	High	Low	Low
Corridor economic environment	High	High	Medium-High	Medium-High	Low	Low

Tools to Maintain or increase the Share of Affordable Housing	Alt B-1: US 78/Mtg BRT Alt B-2: US 78/Mtg LRT	Alt B-3: US 78/EB BRT Alt B-4: US 78/EB LRT	Alt C-1: US 176/Mtg BRT Alt C-2: US 176/Mtg LRT	Alt C-3: US 176/EB BRT Alt C-4: US 176/EB LRT	Alt D-1: Dorch/Mtg BRT Alt D-2: Dorch/Mtg LRT	Alt D-3: Dorch/EB BRT Alt D-4: Dorch/EB LRT
Evaluation of corridor-specific affordable housing needs and supply						
Plans and polices to preserve and increase affordable housing in the region and/or corridor	Medium-Low	Medium-Low	Medium-Low	Medium-Low	Medium-Low	Medium-Low
Adopted financing tools and strategies targeted to preserving and increasing affordable housing in the region and/or corridor	Low	Low	Low	Low	Low	Low
Evidence of public sector and developer activity to preserve and increase affordable housing in the corridor						
Extent to which plans and policies account for long-term affordability and needs of the very-and extremely-low income households in the corridor	Low	Low	Low	Low	Low	Low

5 Station Statistics: Household, Population and Employment (2010 & 2040 TAZ)

Station Location	Alternative Served	Households (2010)	Population (2010)	Employment (2010)	Households (2040)	Population (2040)	Employment (2040)
Azalea Square	A	582	1,474	1,594	711	1,730	2,307
Boeing & Aviation Ave	A	4	14	1,688	4	13	2,528
Spring St & Meeting St	A	2,768	6,065	4,531	3,362	6,841	5,187
John & Meeting St	A	2,638	5,369	2,443	3,135	6,103	11,346
St Phillip & Calhoun	A	3,242	6,406	13,002	3,406	6,526	13,658
Johnathan Lucas St & Calhoun	A	2,054	4,106	17,726	2,182	4,346	25,559
Courtenay & Bee	A	1,538	3,218	16,747	1,798	3,685	24,766
E. 5th N. St & Berlin G Myers	B1-B4	604	1,405	1,684	945	2,134	2,477
US 78 & Royle Rd	B1-B4	342	928	403	394	1,000	559
US 78 & College Park Rd	B1-B4	280	763	419	489	1,249	685
Trident Health & CSU	B1-B4	362	783	1,380	612	1,389	2,557
US 176 & 17A	C1-C4	200	548	85	323	842	272
US 176 & Old Mt Holly Rd	C1-C4	559	1,516	483	609	1,604	768
US 176 & Central Ave	C1-C4	752	1,986	698	843	2,170	817
Main St & Richardson Ave	B1-B4, D1-D4	519	1,369	2,643	707	1,714	3,259
Old Trolley Rd & Miles Jamison Rd	D1-D4	846	2,184	449	991	2,496	675
Old Trolley Rd & Dorchester Rd	D1-D4	815	1,895	1,042	993	2,320	1,388
Dorchester Rd & Wescott Blvd	D1-D4	539	1,526	113	812	2,191	195
Dorchester Rd & Ashley Phosphate	D1-D4	572	1,479	755	740	1,872	920
Dorchester Rd & West Hill Blvd	D1-D4	286	782	748	337	881	849
Dorchester Rd & Michaux Parkway	D1-D4	837	2,101	318	925	2,170	409
Dorchester Rd & W. Montague Ave	D1-D4	712	1,798	808	887	2,129	906
Dorchester Rd & Leeds Ave	D1-D4	272	687	2,295	298	707	2,854
Dorchester Rd & Rivers Ave	D1-D4	1,075	2,657	1,951	1,774	3,933	2,209
Rivers Ave & Otranto Blvd	B1-B4, C1-C4	981	2,278	1,001	1,147	2,629	1,367
Rivers Ave & Ashley Phosphate Rd	B1-B4, C1-C4	275	711	3,115	337	792	4,133
Rivers Ave & Stokes Ave	B1-B4, C1-C4	569	1,511	1,880	669	1,603	2,385
Rivers Ave & Remount Rd	B1-B4, C1-C4	531	1,393	2,403	662	1,572	3,097
Rivers Ave & Mall Dr	B1-B4, C1-C4	683	1,795	2,959	788	1,798	3,287
Rivers Ave & Durant Ave	B1-B4, C1-C4	547	1,260	1,521	1,175	2,614	1,722
Rivers Ave & McMillian Ave	B1-B4, C1-C4	1,115	2,820	1,857	1,675	3,783	2,097
US 52 & Stromboli Ave	B1-B4, C1-C4, D1-D4	579	1,455	978	961	2,109	1,123
Meeting St & Milford St	B1-B4, C1-C4, D1-D4	159	308	970	683	1,483	1,579
Meeting St & Mt Pleasant St	B1-B4, C1-C4, D1-D4	1,078	2,411	1,550	1,324	2,744	2,068
Meeting St & Romney St	B1-B2, C1-C2, D1-D2	1,411	3,200	2,047	1,937	4,029	2,533
Meeting St & Huger St	B1-B2, C1-C2, D1-D2	1,834	4,153	1,727	2,652	5,395	2,160
Meeting St & Line St	B1-B2, C1-C2, D1-D2	2,786	6,164	3,307	3,492	7,089	3,782
East Bay & Romney St	B3-B4, C3-C4, D3-D4	856	2,063	1,658	1,298	2,781	2,134
East Bay & Huger St	B3-B4, C3-C4, D3-D4	1,054	2,496	1,239	1,709	3,555	1,621
East Bay & Columbus	B3-B4, C3-C4, D3-D4	1,373	3,160	2,229	1,773	3,617	2,634
East Bay & Calhoun	B3-B4, C3-C4, D3-D4	1,270	2,394	6,938	1,645	3,056	7,771
Nexton+		424	1,167	574	532	1,405	837
Azalea & King St+		521	1,317	283	946	2,099	1,135
Braswell & US 78+		195	369	903	804	1,736	1,505
Meeting & Brigade+		1,248	2,837	1,831	1,581	3,296	2,369

Source: CHATS Regional Transportation Model (2015)

+ Additional station locations identified for consideration (generated from stakeholder meetings).

Public Involvement Plan

Prepared by: Davis & Floyd
September 2014

Updated

i-26ALT

BCDCOG

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Public Involvement Plan

Contents

1.0 Project Overview

The Alternatives Analysis (AA) is a process for analyzing and comparing all reasonable transportation alternatives along a corridor to address defined mobility problems and achieve specific goals. The AA transportation planning process informs the public and local decision makers with an assessment of a wide range of public transportation or multimodal alternatives to address transportation problems within a corridor; provides information for project justification and local financial commitment; supports the selection of a locally preferred alternative; and enables regional leaders to adopt the locally preferred alternative as part of the Long-Range Transportation Plan. The Alternatives Analysis is part of the FTA's Section 5309 Fixed Guideway Capital Investment Grants (New Starts) process that project sponsors must undergo to be eligible for capital funding to build new and expanded rail, bus rapid transit, and ferry systems.

Initiated by the Regional Metropolitan Planning Organization (MPO) called the Charleston Area Transportation Study (CHATS), the I-26 Alternatives Analysis will identify and evaluate transit solutions for the I-26 Corridor. The purpose of the I-26 Alternatives Analysis is to improve transit service and enhance regional mobility along the I-26 Corridor between Summerville and Charleston to manage existing and future transportation demand, support the regional economy, and create livable communities. This Public Involvement Plan defines strategies for communicating with agencies, stakeholders, and the public about the I-26 Regional Fixed Guideway Transit Alternatives Analysis (i-26*ALT*) project. The outreach conducted will focus on engaged participation by a variety of stakeholders and the public with the goal of selecting a Locally Preferred Alternative (LPA) for transit improvements along the study corridor. It also supports the ongoing advocacy and outreach activities set forth by CHATS and the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) to promote coordinated regional transportation planning.

The i-26*ALT* Public Involvement Plan (PIP) aims to ***identify*** the various audiences vested and affected; ***educate*** them on the purpose and need for the project through public meetings, online marketing, print media, etc.; and ***engage*** them in the decision-making process.

2.0 Goals & Objectives

The following goals and objectives provide guidelines for the implementation of the I-26 Alternatives Analysis PIP. The process is designed to provide opportunities for interested parties to receive information, discuss issues, and partake in the decision-making process during the study, particularly at its key milestones. The following goals and objectives are consistent with the existing policies the CHATS Public Involvement Plan and with strategies recommended by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA).

GOAL 1: <u>Create opportunities for early and continuing community and agency buy-in and participation in the decision-making process.</u>

Objectives:

1. Develop and implement a formal process for enabling the public and agencies to actively participate in the decision-making process, including the development of alternatives, identification of evaluation criteria, and selection of feasible transit alternatives for the I-26 study corridor.

   - Create a project Steering Committee consisting of representatives from local, county, state, and federal governmental agencies, area transit providers, as well as area chambers of commerce to ensure that all communities within the study area are able to actively participate in all aspects of the study process.

   - Create a Technical Advisory Committee consisting of staff from each of the affected agencies (Steering Committee agencies).

   - Identify and contact Key Stakeholders via a face-to-face meeting or written email/letter to obtain input on local issues and concerns regarding transportation problems and potential improvement strategies along the study corridor.

   - Hold all public meetings at various locations within the corridor study area at key project milestones in order to share analysis and receive comments. Distribute, collect and transcribe comment cards during all meetings, for inclusion in reports to the region’s decision-makers.

GOAL 2: Inform, educate, and engage the public and regional agencies throughout the project.

Objectives:

1. Provide open access to information on the objectives of the I-26 Alternatives Analysis process and explain the public's role in defining transit improvement alternatives along the study corridor and in assisting in the selection of the most feasible LPA.

   - Communicate with the public and agencies via a wide range of outreach tools tailored to diverse target audiences (steering and technical advisory committee meetings, project website, project newsletter, public notices, flyers/posters, all varieties of media, etc.)

   - Assure inclusion of traditionally under-represented groups in the planning process.

     a. Seek out the participation of low-income, minority, youth, and elderly populations, as well as persons with disabilities. Monitor participation of these groups and adjust involvement methods as necessary to ensure their representation and participation.

     b. Present information in a manner that overcomes potential language, economic, or cultural barriers, and is meaningful to different cultural groups (Spanish language translations, etc.).

GOAL 3: Maintain accountability, credibility, and responsibility of the i-26ALT Steering and Technical Advisory Committee and sponsoring agencies throughout the study.

Objectives:

1. Clearly communicate the roles of the Steering and Technical Advisory Committees in recommending the final study conclusions for the I-26 Alternatives Analysis to the MPO (CHATS) and the BCDCOG based on the results of the planning process.

2. Maintain accurate documentation and attendance records of all project meetings so that interested parties can be informed of discussions, results and decisions (shared on project website), and so that the responsibilities can be assigned to key project participants (accountability).

3. Identify potential conflicts of interest or other related issues among the active study participants.

4. Cooperate with local and regional transportation agencies conducting concurrent or adopted transportation/transit studies in order to avoid public confusion and the duplication of effort between related projects in the study area.
   - Our Region, Our Plan
   - Charleston Partnership for Prosperity Neck Area Master Plan
   - I-526 Mark Clark Extension Study
   - CARTA: East Cooper & Charleston Peninsula Route Studies
   - Sheep Island Road Interchange
   - Port Access Road
   - SCDOT Statewide Multimodal Transportation Plan
   - TriCounty Link Route Assessment

GOAL 4: Achieve regional consensus among competing public interests.

Objectives:

1. Present study findings in a comprehensive, objective, and reader-friendly manner, focusing on how the results of the I-26 Alternatives Analysis will meet the transit alternative needs in the study area.
2. Facilitate a formalized process to include public and agency feedback into the technical analyses performed during the study and be able to demonstrate to the public that their issues and concerns have been reasonably considered, even if not adopted.

3.0 Public Involvement Action Items

The following outlines the action items for the Public Involvement Plan: Identify & Organize, Educate, and Engage.

3.1 Identify & Organize

Identified stakeholders include interested citizens, organizations, elected officials, employers and property owners within the study area. The project team will maintain a contact list database which includes the names and email addresses of all project stakeholders and interested public citizens. The project team will solicit the names and contact information of interested parties via the project website, sign-up sheets at public meetings, and referrals from existing agency contacts. This database will be used throughout the study for mailings, invitations, and public notices.

The following lists of regional leaders were invited to serve on one of two critical project committees: Steering and Technical Advisory.

Project Steering Committee

The individuals listed below represent the interests of the publics they serve within the i-26ALT study corridor. The project team will report to the Steering Committee at key project milestones and as needed.

The i-26ALT Steering Committee (SC) is responsible for:

- Providing direction and guidance throughout the study process;
- Resolving obstacles and barriers that may arise during the study process;
- Acting as project champions and advocates to constituents;
- Sharing feedback; and
- Developing policy and recommendations for the Locally Preferred Alternative.

Table 1: i-26ALT Steering Committee

Agency	Representative
Charleston Area Transportation Study (CHATS)	Mr. Elliott Summey, Chairman
Federal Transit Administration (FTA)	Ms. Yolanda Morris
Federal Highway Administration (FHWA)	Ms. Jessica Heckter
South Carolina Department of Transportation (SCDOT)	Mr. Doug Frate, Director of Intermodal Planning
Charleston Area Regional Transportation Authority (CARTA)	Mr. Jeff Burns, Interim Executive Director
Tri-County Link	Mr. Eric Shuler, Operations Manager
Berkeley County	Mr. Dan Davis, County Supervisor
Charleston County	Mr. Teddie E. Pryor, Sr., Chairman of the Board Mr. Jim Armstrong, Chairman of the Transportation Committee
Dorchester County	Mr. Larry Hargett, Councilman Mr. Jason Ward, County Administrator
City of Charleston	Mr. Hernan E. Pena, Jr., Traffic & Transportation Director
City of North Charleston	Mr. Raymond H. Anderson, Jr., Assistant to the Mayor
Town of Summerville	Mayor William C. Collins
City of Hanahan	Mr. John P. Cribb, City Administrator
Town of Lincolnville	Mayor Charles Duberry
City of Goose Creek	Mayor Michael J. Heitzler
Charleston Metro Chamber	Ms. Mary Graham, Senior Vice President
Tri-County Regional Chamber (TCRCC)	Ms. Teresa M. Hatchell, Executive Director
Greater Summerville/Dorchester Chamber	Ms. Rita Berry, President/CEO
Berkeley Chamber	Ms. Elaine Morgan, CEO
South Carolina Legislative Delegation	Representative William Crosby
Joint Base Charleston	Mr. William Werrell, Community Planner

Technical Advisory Committee

The i-26ALT Technical Advisory Committee (TAC) is responsible for providing:

- Technical guidance;
- Review and comments on evaluation criteria, conceptual alternatives, and screening processes;
- Project updates to their respective organizations;
- Assistance in creating the stakeholder database; and
- Feedback to the consultant team on the accuracy and clarity of public presentations and informational marketing materials.

Table 2: i-26ALT Technical Advisory Committee

Agency	Representative
City of Charleston	Mr. Tim Keane
City of Goose Creek	Mr. Dennis C. Harmon
Federal Highway Administration (FHWA)	Ms. Jessica Heckter
Federal Transit Administration (FTA)	Ms. Holly Peterson
South Carolina Department of Transportation (SCDOT)	Ms. Diane Lackey
South Carolina State Ports Authority (SCSPA)	Mr. Patrick Moore
Dorchester County	Mr. Alec Brebner
Town of Mt. Pleasant	Mr. Brad Morrison
Charleston County	Mr. Dan Pennick
Town of Summerville	Ms. Madelyn Robinson
Coastal Conservation League	Myles Maland
Charleston Area Regional Transportation Authority (CARTA)	Ms. Ginger Stevens
Joint Base Charleston	Mr. Al Urrutia
City of North Charleston	Ms. Eyda Arroyave
CSX	Mr. Christopher Philips
City of Hanahan	Mr. Johnny Cribb
Charleston County Aviation Authority (CCAA)	Mr. Al Britnell
Tri-County Link	Mr. Eric Shuler
Berkeley County	Mr. Eric Greenway
Norfolk Southern	

Key Stakeholders (Private & Public)

The following industries and agencies will be kept current with the progress and findings of the i-26ALT study by directing them to the project website where documents and contact information may be accessed. Face-to-face meetings will be conducted as deemed necessary by the project team.

Private:
Boeing
Bosch
MeadWestvaco
Cummings
Verizon
Force Protection
Tanger Outlets
Palmetto Commerce Park
Charleston Southern University
The Art Institute of Charleston
Virginia College
Roper St. Francis Healthcare
Ralph H. Johnson VA Medical Center
Trident Health System

Public:
U.S. Army Corps of Engineers, Charleston District
U.S. Environmental Protection Agency, Region 4
US Department of Navy
South Carolina State Historic Preservation Office
South Carolina Department of Natural Resources
South Carolina Department of Commerce
South Carolina Department of Social Services
South Carolina Department of Parks, Recreation, and Tourism
South Carolina Trucking Association
South Carolina State Ports Authority
South Carolina Department of Disabilities and Special Needs
South Carolina Department of Health and Environmental Control

South Carolina Emergency Management Division
South Carolina Department of Public Safety
Federal Law Enforcement Training Center (FLETC)
BCD Rural Transportation Management Association (Tri-County Link)
Charleston County Human Service Commission
Charleston County Aviation Authority
Coastal Conservation League
Charleston Moves
Charleston Area Convention & Visitors Bureau
Berkeley County Economic Development
Charleston County Economic Development
Dorchester County Department of Economic Development
Charleston Regional Development Alliance
Historic Charleston Foundation
Preservation Society Trident Area Council on Aging
SC Community Loan Fund
Donnelly Foundation
College of Charleston
Trident Technical College
Medical University of South Carolina

3.2 Educate

Public and private agency involvement is critical during project milestones. The following methods will be used to educate and obtain input from a variety of citizens, organizations, and agencies. Minutes and/or presentation materials for all meetings will be captured and made available to the public.

1. **Stakeholder Outreach Meetings –** Throughout the study process, targeted meetings with identified key stakeholders will be conducted in an effort to garner a balanced view of opinions, interests, and concerns regarding the study area. Discussions will be documented in meeting minutes and incorporated into the technical analysis for consideration.

2. **Project Steering Committee Meetings** – The project team will provide periodic project updates. One workshop may be held to provide an in-depth explanation of the plan's technical process and recommendations.

3. **Technical Advisory Committee Meetings –** The project team will meet with the TAC as necessary throughout the study process.

4. **Public Involvement Meetings** – Public meetings will be held at various locations within the corridor study area. These meetings will take place at key project milestones to share analysis and receive comments. All meetings will have Spanish-speaking team members available as well as presentation materials translated in Spanish. Comment cards will be distributed during all meetings, collected, and transcribed for inclusion in decision-making.

3.3 Engage

The following marketing tactics will be used to involve the public in the i-26ALT study process.

1. **Public Notices** – The public will be notified of project workshops at least 15 days prior to the event. The project team will send notices to the major regional newspapers and popular minority radio stations (media contact list is available upon request).

2. **Newsletters** – The project team will prepare and publish a project newsletter quarterly which will be posted on the project website.

3. **Media Relations –** The project team will issue media releases to local newspapers and television and radio stations throughout the process. The Project Kick-off Public Meeting will serve as a press conference to build awareness for the study and promote the project website.

4. **Flyers/Posters** – The project team will distribute, as deemed appropriate to increase participation and expand reach, flyers/posters to public libraries, senior living centers, community centers, religious institutions, and other popular meeting locations within the study area.

5. **Website & Social Media** – The project team will establish and maintain a project website to include:

    - Brief description of the i-26ALT project with maps, photos, and renderings
    - Meeting Calendar – including agendas and minutes
    - Project newsletters
    - Project surveys
    - Social Media – Facebook and LinkedIn

6. **Cross-promotions –** The project team will work with allied organizations to promote the project website and public meetings via their websites, e-newsletters, etc.

7. **Comment Cards** – The project team will distribute and collect comment cards during all public workshops and transcribe the feedback for inclusion in decision-making.

8. **Speakers Bureau –** The project team will present information regarding the i-26ALT study as requested by regional organizations.

9. **Focus Groups** – The project team will conduct focus groups as deemed necessary throughout the study process. Potential focus groups could include industry sectors (i.e. hospitality and tourism); demographic groups (i.e. senior populations); neighborhood improvement groups, or special interest groups.

10. **Email Blasts –** The project team will send emails to the project's mailing list comprising of Steering Committee members, Technical Advisory Committee members, subscribers to the project website, and other contacts derived from mailing lists and other relevant sources announcing public meetings and findings as they come to the forefront.

Appendix I shows the project team's phased approach to achieving the public education and engagement goals identified in the Public Involvement Plan.

Appendix I: Phased Approach to Public Involvement

The public outreach process will be employed throughout the study process using a variety of techniques and approaches to reach a broad range of stakeholders. Three phases of outreach are proposed to achieve the goals and objectives identified in the Public Involvement Plan. The phases include:

1) Establishing a vision for transit in 2035 along the I-26 Corridor: What does urban transit in the region look like today and what could it look like in 2035?
2) Turning the vision into a plan for transit along the I-26 Corridor: How should transit travel along the corridor (modes) and where should it stop (nodes)?
3) Steps toward implementing transit along the I-26 Corridor

<u>Phase 1: Establishing a Vision for Transit along the I-26 Corridor</u>

The first phase of the public outreach process is intended to provide information about the study to the public, as well as to give the public the opportunity to provide input toward a macro-level, system-wide vision which looks at "big picture" items such as the current transit system and corridors served; gaps that need to be filled; future conditions that might need to be addressed; and what general modes stakeholders see existing and interacting along the I-26 Corridor by 2035.

1) Stakeholder Lists: The project team will utilize existing stakeholder lists to reach out to community leaders and groups to inform them of the study and upcoming opportunities for input. The project newsletter will include public involvement dates. Meetings and interviews will be scheduled as appropriate to supplement the interviews that were held in February/March 2013. Additionally, the project team will make itself available for presentations to local organizations as requested.
2) Transit Rider Outreach: The project team will conduct a series of street sessions at major CARTA transfer locations, express bus stops, or other public locations where transit riders congregate. Sessions will include a regional map with existing transit routes and survey forms to provide the opportunity for the public to provide input to team members or via comment card. Location, dates and times of sessions will be announced in advance. Proposed locations include:
    a. Mary Street Garage Transfer Location
    b. John Street Transfer Location
    c. Spring Street (BI-LO DT Charleston) Transfer Location

d. North Charleston SuperStop
e. North Charleston K-Mart Park and Ride
f. Dorchester Rd. Park and Ride

3) Public Meetings: Three public meetings will be held, one each in Summerville, North Charleston, and Charleston. The two-hour meeting format will be set up as follows:
   - :00-:15 Open House
   - :15-:30 Presentation
   - :30-:00 Vision Session Rules/Break-Out
   - :00-:30 Visioning Session
   - :30-:00 Visioning Results

   The purpose of these meetings will be to help establish a systemwide vision for transit along the I-26 Corridor. The room will be set up with tables of 8-10 people. Each table will have a designated facilitator and scribe represented by a member of the project team and a regional map. Each table will be asked to mark up suggested modifications to the existing transit network as well as to provide input toward a macro-level vision and goals of what the urban transit network should look like by 2035. The focus of these meetings will be on the urban transit network's service area and high capacity, fixed guideway alignments along the I-26 Corridor. The project team members will facilitate the process, and at the end of the session, each table will present its vision to the entire group.

The result of the first phase of outreach will be to establish the community priorities and vision for transit along the I-26 Corridor to guide the next phase, which will further refine this vision to identify potential station areas and transit modes serving these areas.

Phase 2: Turning the Vision into a Plan for Transit

The second phase of public outreach will involve micro-level visioning along the I-26 Corridor alignments to develop a plan for potential transit station locations (nodes) based on the fixed guideway alignments and potential transit modes (Commuter Rail, Light Rail, Bus Rapid Transit, etc.) that can serve the alignment. This phase will look at how the "lay-of-the-land" might be influenced. It would take a closer look at where stations might be located, and what land use might look like along corridors or around station locations.

A series of surveys and public meetings will help to develop the transit plan.

1) Transit Rider Outreach: An onboard survey of riders on CARTA routes that collects origin and destination, as well as demographic information, will provide another opportunity for transit riders to provide input, and the project team to understand how existing transit riders are currently using the system.
2) Stakeholder Outreach
    a. Employee Survey: A web-based employee survey will be sent to major employers throughout the region to support outreach to the commuter market that is not currently using or being served by transit. The project team will coordinate with local agencies (i.e. SC Works) and local Chambers of Commerce to identify these employers.
    b. Focused Outreach: Local colleges and universities make up a significant population of the current transit ridership as well as workforce along the I-26 Corridor; thus, a targeted outreach campaign on the campuses will be focused on this unique market to include:
        i. College of Charleston
        ii. Trident Technical College
        iii. Medical University of South Carolina
        iv. Charleston Southern University
3) Public Meetings
    a. High Capacity Transit/Station Area Planning Land Use Workshops: As described in the revised scope of work, a series of workshops will be held in spring 2015 that will focus on fixed guideway transit modes (i.e. commuter rail, LRT, BRT) and the opportunities for transit stations and/or transit oriented development (TOD) based on:
        i. Existing/Future Activity Centers
        ii. Opportunities for Infill Development
        iii. Affordable Housing
        iv. Major Residential and Employment areas
        v. Existing/Future Park & Rides and/or Transit Stations

        These sessions are intended to understand the land uses along the fixed guideway alignments identified in the visioning sessions within the corridor to further refine where stations and TOD could be located. These sessions could include a presentation, preference surveys, and/or interactive planning sessions to identify TOD/station areas. It is proposed that up to five sessions as needed will be held with a focus on the following subareas:

i. Summerville/Lincolnville – West of I-26
ii. Summerville/Goose Creek – East of I-26
iii. North Charleston/Hanahan
iv. Northern Peninsula/Neck Area
v. Downtown Charleston

b. Public Input Meeting: Three public meetings will be held in summer 2015 as the screening process progresses. These sessions will provide the public an opportunity to review the results of the analysis and the alternatives that have come to the forefront in the process, as well as to comment on the recommended short, mid, and long range urban transit network. The goal of these sessions will be to gain public input and buy-in for a Locally Preferred Alternative. Three meetings will be held, one each in the cities of Summerville, North Charleston, and Charleston.

Phase 3: Moving Forward with Transit along the I-26 Corridor

The final outreach effort will be to present the Locally Preferred Alternative as selected and refined following the summer meetings, as well as to present the short, mid, and long range transit plans. This meeting will share costs as well as next steps to move forward in the process. These meetings will also provide the opportunity for public input toward funding and other policies necessary to implement the plan.

JOINT MEETING
ALTERNATIVE ANALYSIS TECHNICAL COMMITTEE
&
ALTERNATIVE ANALYSIS STEERING COMMITTEE
MEETING SUMMARY
OCTOBER 3, 2014

I. Welcome and Introductions

The Berkeley Charleston Dorchester Council of Governments (BCDCOG) Planning Director, Kathryn Basha extended comments welcoming everyone in attendance giving the opportunity to all attendees to make brief introductions.

II. Project Overview & Update

A recap of past activity was given in order to bring the committees up to speed noting work on this project was halted because of the Federal Transit Administration's new legislation, Map 21. A Commuter Rail feasibility study Phase II conducted in 2011 recommended the Alternative Analysis report, a FTA Guided process. Awarded in 2012, the alternative analysis study was initiated just as Map 21 was signed into law a few months later, causing the project to pause in order for staff to gain a thorough understanding of the new legislation and its impact on FTA's New Starts - capital investment program requirements. After many conversations between the BCDCOG and FTA, staff now has direction necessary in order to proceed with the study. The criteria rating was dramatically change because of the new legislation which increases the competitiveness of applications seeking project funding.

Davis & Floyd was contracted to conduct the Alternative Analysis (AA) research so that the best transit alternative can be determined to improve transit services along the I26 corridor from Summerville to Charleston. Sharon Hollis with Davis & Floyd is leading this initiative and spoke on work completed, why the study is being done and what to expect over the next 15 months, placing emphasis on the project goals. Six goals identified for the study included (1) a transit alternative that would improve mobility & accessibility for the transit system, (2) a cost effective and financially feasible system that could be implemented within the community, (3) an alternative that supports local land use as well as projected growth, (4) respond to community needs, (5) have community support and (6) a plan that will support a diverse regional economy. Ultimately, the intent is to create a project that qualifies for federal funding of a capital investment in a fixed guideway system.

The BCDCOG, CARTA and TriCounty Link, the two transit providers servicing this corridor from Summerville to downtown Charleston, are the three major partners involved in this initiative along with SC Department of Transportation and the FTA. Moving forward, members of the committee were advised of their involvement as well as what will be expected of them during this process. A comparison of the old and new AA processes was presented.

Ms. Hollis continued sharing information on new criteria used to score projects that will need to be met in order to receive a medium ranking or higher to qualify for FTA funding. Criterion includes mobility improvements, environmental, congestion reduction, cost effectiveness, economic development and land use. The second component that will be evaluated by the alternative analysis initiative to demonstrate readiness to receive FTA funding is the local financial commitment. The financial condition will include an assessment of the current financial conditions of the area's transit system to demonstrate successfully management of the existing system, which includes an overview of the current system. Secondly, commitment of funds is expected at a certain level for each phase typically falling around 80% of the capital cost, but at least 60% in order to remain competitive.

Therefore, other local funding sources must be identified and available for the region to remain competitive with the other projects. Lastly, the reliability and the capacity to operate a sustainable system is the third component considered when looking at the local financial commitment.

Now in the pre-project development phase, a comprehensive operational analysis is necessary for both transit systems within the tri-county, similar to what TriCounty Link recently completed. In tandem will be the alternative analysis that will take into account key factors such as environmental and mobility benefits.

The FTA Travel Demand model will be used during this process as well as surveying of passengers, employers and employees in order to estimate potential ridership. Public involvement will increase to assist with refining the study. RSG services were retained to handle the travel demand forecasting since their firm developed the travel demand model used by FTA and their involvement will be advantageous the region because they have a very strong understanding of what is required.

In preparation for the project development phase, a comprehensive operational analysis consisting of data collection will be done first, to include public input to assess the type of system that would be needed in order to be successful. An additional emphasis will be placed on land use. A funding recommendation memorandum will be drafted giving options of funding sources available to the region to help offset the required match. In addition, preliminary screening criteria will be conducted to assist with determining whether the region is competitive.

As part of the PowerPoint presentation distributed at the meeting, a project timeline was addressed noting public meetings - October/November 2014, CARTA passenger Outreach – October/November 2014, FTA Coordination - CARTA ridership counts October/November 2014, COA/AA Alternative Development – Fall 2014/Winter 2015, and the Next Steering Committee/TAC Meeting – January 2015. Kick off meetings are being scheduled for Summerville, North Charleston and Charleston to acquire comments on the existing transit service in November.

The Planning Director elaborated on why the existing system is looked at in such detail explaining FTA requires examining the existing system to demonstrate that everything possible has been identified towards improving the system prior to requesting dollars to design something different. This will be accomplished through the operational analysis. It will give the region an opportunity to achieve short-term resolution of transit service issues, as well as identify the required match funding that will be brought to the table.

The committee wanted to know what local options are available/envisioned in order to satisfy the match requirement. Currently, existing options are extremely limited consisting of Charleston County's local option sales tax and small state contribution and federal contribution. The study will include the process of determining funding options, which will have to be a very large capital and operational investment requiring new multi-jurisdictional funding source.

Members of the Committee had strong opinions about introducing new legislation that would fund this project. It was pointed out Berkeley County would have difficulty contributing funds towards this project since their local sales tax program is definitive in the projects it can support.

The topic of commuter rail and previous studies was discussed, with one committee member noting the federal process was not followed in 2008 when the study was completed in addition to the fact that findings revealed the capital investment could not be supported. It was also pointed out if the state fuel tax is not increased, efforts to implement a new and successfully transportation system would be defeated. A consensus among residents was thought to be the key toward achieving this initiative.

III. Other Items/Discussion

None.

IV. Adjourn

MINUTES
I-26 Fixed Guideway Alternatives Analysis
Joint Steering & Technical Advisory Committees Meeting

DATE: 3/16/2015

TIME: 2:00 PM

LOCATION: BCDCOG (Berkeley-Charleston-Dorchester Council of Governments)

ATTENDANCE: See attached Sign-In sheet

Agenda:

I. Welcome and Introductions
II. Project Updates
  a. Public Meetings (November 2014)
  b. Comprehensive Operational Analysis Update
III. Alternatives Analysis Discussion
  a. Existing Conditions
  b. Alternatives Screening
  c. Land Use Analysis
IV. Next Steps/Upcoming Meetings

Discussion Comments:

1. The project should include "safety" in the defined goals.

   Goal #1: "Improve Mobility, ***Safety***, Accessibility and Connectivity of the Transit System and Region".

2. Suggestion made to also revise Goal #1 to include language that the project seeks to improve the mobility and connectivity within the corridor, to more explicitly address congestion by improving/developing an efficient and competitive transit system.

3. Question was posed to Norfolk Southern (NS) about the current capacity on the NS rail line from Summerville to Charleston and if that capacity might allow for commuter rail along the corridor.

   NS could not explicitly answer the level of rail activity or the capacity on the Summerville line, but suggested that if the NS rail alignment was selected as the preferred alignment a more detailed study would have to be done to clearly determine how the future rail needs for passenger and freight could be accommodated along the corridor. NS pointed out that it would have to study and take into account the impact of or schedule of higher use/

frequency of lines through the Summerville area that might result from the projected increase in port activity.

One known is that currently the NS line out of Summerville is an un-signalized main track. For passenger service to run on any NS line, tracks will have to be signalized to accommodate passenger operations.

Again NS stated that projections would have to be completed to determine future levels of service and track needs. A more formal study would have to be undertaken to determine this and would depend on the information needs/requests of the I-26ALT study team.

4. NS was asked what the average timeframe to conduct and complete a study that would answer these questions (current and future rail capacity on line and if excess capacity will allow commuter rail option; as well as the cost to signalize the track along the corridor to allow passenger operations).

   NS recently completed a similar study in Raleigh, NC which took a little over a year. If the community had the money to undertake a rail study, the process could take anywhere from 12-18 months which accounts for getting the agreement in place, conducting market and future operations forecasting, and includes determining the signalization needs along the corridor. The cost to signalize the line could run somewhere around a couple $100 million (average cost/signal mile).

5. Norfolk Southern was asked if there are inactive lines or if NS right-of-way has allowance for an alternative mode like Bus Rapid Transit (BRT) to operate.

   NS could not answer the question without the proper research, but suggested that the next step in the process should be a written request from the Study Team that outlines the information needed from Norfolk Southern (signal pricing, right-of-way, track usage, cost of reactivating tracks for use, etc.)

6. The Study Team asked whether Highway 61 had been identified as a possible alignment for fixed guideway. There is a power easement which parallels the road facility that might facilitate BRT service. Suggested that the study group look at this possibility.

7. The next phase of the study is to narrow down the preferred alignments and modes and to evaluate existing land uses in areas where transit stations might be located. The Study Team was asked if there were members of the Committees who are interested in serving on a Land Use Sub-committee of the TAC. Meeting attendees that volunteered include:

   a. William Peagler, Berkeley County
   b. Christopher Morgan, City of Charleston
   c. Andrea Harris-Long, Charleston County
   d. William Werrell, Joint Base Charleston
   e. Wannetta Mallette, City of North Charleston

8. Study Team also requested if any members would be able to help engage Boeing and Joint Base Charleston to participate in the employer survey.

9. Committee members were asked to provide comments or questions on the draft technical documents in review (Existing Conditions Technical Memorandum, Alternatives Screening Criteria Methodology, Potential Alternative Alignments Map, Existing Zoning, Land Development & Planning Studies Map, and High Capacity Transit Land Use Analysis Methodology). These documents are posted on the BCDCOG website.

10. Committee members were informed that a set of Transit Talks are being set up to facilitate dialogues among three types of community groups: development, environmental, and business communities. The next series of public meetings are being planned for April 20, 21, and 22. A MindMixer forum for the project should also be coming online in the next few weeks.

A copy of the presentation used to facilitate the above discussions is attached to these minutes.

Next Meeting

June 2015 - TBD

MINUTES
I-26 Fixed Guideway Alternatives Analysis
Joint Steering & Technical Advisory Committees Meeting

DATE: 7/28/2015

TIME: 10:00 AM

LOCATION: BCDCOG (Berkeley-Charleston-Dorchester Council of Governments)

ATTENDANCE: Available Upon Request

Agenda:

I. Welcome and Introductions
II. Project Update
   a. Public Meetings (April 2015)
   b. Comprehensive Operational Analysis
   c. Peer City Review
   d. Initial Screening
III. Screen One Alternatives Analysis
   a. Transit Technology Overview
   b. Corridor Alignments & Considerations
   c. Screening Criteria
IV. Discussion: Alternatives to move forward into Screen Two – Detailed Screening
V. Next Steps and Schedule

Discussion Comments:

1. Prior conversation was held with Norfolk Southern (NS) Railway about introducing commuter rail in the region. Conversations revealed the very high insurance cost that is associated with providing passenger rail service. A major point of contention during discussions at that time was the allocation of passenger rail liability responsibilities (insurance costs).

2. Comment was made on the ranking of the Dorchester Road alternative. Committee members suggested that the Dorchester Road alternative, which ranked #10 out of 20 in the Screen One Analysis, should be revisited. Major factors identified and presented for consideration that might impact the Dorchester Road ranking include:

   a. Traffic volumes have increased over time along the corridor.

b. Residential growth is expected along the Dorchester corridor (partially due to the Wescott and Oakbrook developments located at the northern end of Dorchester Road)

c. Dorchester Road has right-of-way available in the large grassed median which runs from Parlor Drive to Cross County Road.

d. Dorchester and Charleston counties have entertained the idea of introducing commuter traffic lanes on the Dorchester Road corridor.

3. Committee members elected not to move the utility corridor alternatives (Santee Cooper and SCE&G) forward into Screen Two. Given the screening criteria used to assess alternative alignment suitability, the utility corridors under consideration did not score high in achieving the screen one goals. These goals included:

   a. Improve mobility, accessibility, safety and connectivity of the transit system and region
   b. Promote a cost effective and financially feasible transit alternative
   c. Support local land use objectives
   d. Plan for projected growth in an environmentally sustainable manner
   e. Respond to community needs and support
   f. Support a diverse regional economy

   The utility corridors did not serve areas with high employment densities in comparison to other alignments. It was also noted that there will be associated costs with property acquisition since the alignment will impact some private residential properties, as well as with utility infrastructure relocation (poles and lines). Finally, ease and speed of implementation is a high priority for the steering committee, and the utility coordination adds a time and unknown cost element that is greater than the other alternatives.

4. Committee members elected not to move the CSX and Norfolk Southern rail line options forward into Screen Two. From the project staff's experience and peer system review, it was noted that many rail related projects that operate on rail right-of-way typically made use of abandoned or relatively inactive/underutilized rail lines. Both the CSX and Norfolk Southern rail lines in the Charleston area are active lines and lines of interest to the operators because of the planned Port of Charleston expansion. Due to these facts, negotiation of rail right-of-way or the possibility of shared rail lines are limited. Conversations with the rail operators also indicated that a rail related capacity analysis, led by the rail operators and funded by the region, will have to be conducted to determine the future capacity needs of the rail operators along the corridor, the potential operation needs of the proposed fixed guideway and the infrastructure needed to implement passenger service (safety features/signals/crossings, etc.). It was also noted that the CSX rail alignment would have to utilize some roadway facilities to link the Summerville, North Charleston, and Charleston corridor; and the Norfolk Southern rail alignment paralleled much of the US 78/US 52 alternative alignment. When comparison was made been the two similar alignments and the relative costs and level of uncertainty associated with the

two options the committees opted to not move forward with consideration of the rail right-of-way alignments.

5. Given the major project goals identified, committee members were supportive of the US 52/78 and US 52/176 alignment options. These alignments best serve the Summerville-North Charleston-Charleston corridor, operate along the existing high transit corridor (Rivers Avenue), and provide Transit Oriented Development (TOD) opportunities needed to support a high capacity transit option.
6. Comment made that the mode considered should be guided by the overall cost to implement, the implementation timeframe and the likelihood of the project securing federal support/funding.
7. General consensus identified that in the short-term, Bus Rapid Transit (BRT) technology is the most logical of the technologies presented since it can be implemented at the lowest cost per mile, and it has a relatively short implementation time.
8. Although members suggested that BRT technology could be realistically implemented in the short/mid-range timeframe, the Committee suggested moving a Light Rail Transit (LRT) option into a long-range or future project phase.
9. Committee members were supportive of developing a phased project implementation approach. Through this approach, the identified fixed guideway implementation schedule should propose a major segment or foundation segment that should be implemented first, and subsequent segments and phases should also be identified for later implementation.
10. Even though this process should ultimately pick the Locally Preferred Alternative for implementing a fixed guideway option in the Charleston region, members suggested that consideration should be given to other alternatives that could benefit from high capacity transit and how these corridors could be integrated into the greater I-26 transit corridor system. Consideration should also be given to how other routes could benefit from some of the technologies explored during the process such as signal priority technology along select routes.
11. At the end of the Joint Steering and Technical Advisory Committee meeting, the following alternatives were suggested to move forward into the Screen Two Analysis:
    a. US52/78: BRT
    b. US52/78: LRT
    c. US 52/176: BRT
    d. US 52/176: LRT
    e. Dorchester Road: BRT
    f. Dorchester Road: LRT

A copy of the presentation used to facilitate the above discussions is attached to these minutes.

Next Meeting

October/November 2015 - TBD

MINUTES
I-26 Fixed Guideway Alternatives Analysis
Joint Steering & Technical Advisory Committees Meeting

DATE: 01/15/2016

TIME: 10:00 AM

LOCATION: BCDCOG (Berkeley-Charleston-Dorchester Council of Governments)

ATTENDANCE: Available Upon Request

Agenda:

I. Welcome and Introductions
II. Project Update
III. Screen Two Alternatives Analysis
IV. Financial Analysis
V. Project Justification Screening
   a. Travel Demand Forecast
   b. Cost effectiveness
   c. Mobility and congestion relief
   d. Environmental
   e. Land Use and Economic Development analysis
VI. Conclusion/Next Steps
VII. Adjourn

Discussion Comments:

1. The Steering and Technical Advisory Committees were presented with the Screen Two Analysis results and the alternative that overall rated highest in the evaluation: Alternative B-1: US 78/US 52/Meeting BRT.
2. Comment was made on more fully addressing the development potential of both light rail and bus rapid transit systems. Research has shown that the return on investment/development potential is greater for light rail investments. These differences need to be noted in the land use and economic development analysis of alternatives.
3. If a BRT alternative moves forward into implementation, steps need to be taken to limit "BRT creep" – or the loss of a high level BRT plan. A high level BRT plan encompasses specific elements such as use of dedicated bus lanes, enhanced BRT stations, off-board ticketing, bus signal priority, etc. "BRT creep" usually occur as a result of the ease at which BRT can be stripped down in an effort to cut cost. If care is not taken in the

implementation of service the BRT system could easily become an enhanced bus service instead of a premium BRT transit option as originally envisioned.

4. The City of Charleston expressed interest in when in the process will more detailed planning of the system occur (station level planning/more detailed alignment and circulation options) and to what degree would variances in the general alignment be examined?

   As the process moves into Project Development, the alignment would be further refined or examined to address items such as system circulation in downtown Summerville, the engineering needs to effectively get buses through the Neck Area (address the high rail conflict in this area), the traffic impact of introducing bus only lanes, or variances in the alignment in the downtown area, etc..

   The City of Charleston expressed support of recommending BRT as the preferred alternative for the I-26 Alternatives Analysis Study given the relative cost-benefit of implementing a comparable LRT system. However, it was noted that planning for a BRT system should account for future conversion of the system to LRT. Thus planning for BRT should ensure that right-of-way is preserved and alignment elevations and turn radii are able to accommodate possible light rail in the future.

5. Norfolk Southern (NS) commented that the Neck Area alignment variance on King Street was not desirable because of the limited right-of-way available. NS was more supportive of the US 52 (Meeting Street) alignment under consideration.

6. The City of Goose Creek commented that the "Our Region Our Plan" identified the US 17A/US 176 intersection as a high growth area in the future. Concern was expressed that the northern alignment of the fixed guideway system did not include this area.

   It was explained that the US 17A/US 176 area and the corridor along US 176 did have the potential to support a fixed guideway in the future. The higher rating of the US 78 corridor from Summerville to North Charleston resulted from the development that currently exists along that corridor. The study team also explained that in the development of the system, recommendations would be provided on the expansion of the system to include these "spur" corridors such as US 176. Recommendations would include, for example, provision of enhanced bus service along these "spur" corridors that feed into the BRT system. These corridors could be upgraded to BRT corridors in the future as demand warrants and as funds allow.

7. The joint committee expressed support of Alternative B-1: US 78/ US 52/ Meeting BRT as the recommended locally preferred alternative to move forward from the I-26 Alternative Analysis.

A copy of the presentation used to facilitate the above discussions is attached to these minutes.

Next Step:

Presentation of recommended local preferred alternative (LPA) to the public at Public Meetings (January 25th, 26th and 28th).

Memo

To: Jessica Gillis, BCDCOG

From: Davis & Floyd

Date: **2/28/2013**

Re: **DRAFT -** Round 1 Stakeholder Interview Comments

Job No: 31497.00

STAKEHOLDER MEETINGS – ROUND 1

Stakeholder meetings held during the month of January 2013 were focused on jurisdictions inside the I-26 Corridor study area. Stakeholder meetings were requested with planning and engineering staff for Berkeley, Charleston and Dorchester Counties, and the Cities of Charleston, Goose Creek, Hanahan, Lincolnville, North Charleston and Summerville. The following interviews were held:

Municipality	Date	Attendees
Berkeley County	January 17, 2013	Frank Carson Eric Greenway Dan Davis
Charleston County	January 23, 2013	Dan Pennick Planning Staff
Dorchester County	January 24, 2013	Alec Brebner
City of Charleston	January 30, 2013	Christopher Morgan
City of Goose Creek	January 15, 2013	Jeff Molinari Sarah Hanson
City of North Charleston	January 15, 2013	Ray Anderson Gwen Moultrie Eileen Duffy James Hutto Wanetta Mallette
City of Summerville	January 10, 2013	Madelyn Robinson
City of Hanahan	March 13, 2013	John Cribb Michael Sally

A meeting with the City of Lincolnville was requested but not successfully coordinated. The following summarizes the comments made during the interviews with the municipalities located inside the I-26 corridor.

TRANSIT

Discussions on existing transit were primarily focused on Express Service and Tri-County Link Service. Express routes in the corridor are perceived as doing well, specifically service from the Oakbrook area to Downtown Charleston. Express park and ride service from Summerville is identified as an opportunity to build the market for a fixed guideway service. The North Charleston free circulator, when implemented, will provide circulation for employment areas, hotels, the convention center, and retail. Overall, the level of transit service operated in the Tri-County Link service area is perceived as adequate. Tri-County Link services from St. George and between Summerville to Moncks Corner are also perceived to be successful. Tri-County Link service to Santee Cooper indicates there is a market for choice riders. Transit is underutilized in Goose Creek, with little service available. Most stakeholders identified a need to coordinate transit services between Tri-County Link, CARTA, and any additional systems in the future.

When asked about potential new local transit service, the following suggestions were identified:

- St. George/Tri-County Link feeder route serving a fixed guideway;
- Opportunity to link Hwy. 17A and I-26;
- Orangeburg Road in Dorchester County in the future;
- Local transit service is a higher priority for Dorchester County than a fixed guideway, specifically coordinating Tri-County Link and CARTA;
- Volunteer transit has growth opportunity;
- Transit should include everyone i.e. elderly, blind, etc.;
- Employment areas from Summerville to Santee Cooper via bus;
- Park and rides with commuter/limited stop bus service;
- North Charleston circulator bus system serving Tangier Outlets, Northwoods Mall, and riverfront that feeds into fixed route service;
- Route between North Charleston Visitors' Center and Downtown Visitors' Center, and North Charleston hotel shuttle connector service;
- Not enough airport traffic to support a route to the airport, maybe in the future;
- Service to Maritime Center downtown from North Charleston with a park and ride in North Charleston for cruise ship traffic;
- North Charleston to Town Center/Mount Pleasant;
- Connectivity with Tri-County Link;
- Augment school service; i.e. Magnet Schools as partners; and
- Existing bus service to St. George combined with more opportunity to serve the Town of Summerville.

FOR TRANSIT TO BE SUCCESSFUL

Jurisdictions were asked what it would take for transit to be successful in their community. The following comments were made:

- Flexible;
- Increased frequency to make transit a good alternative;
- Attract choice riders;
- Pedestrian friendly;
- For BRT to be successful, need to convince public that it is not a bus;
- Target employees/employers;

- Requires a society/culture change;
- Education for public on how to ride transit and its advantages;
- Walkability;
- Complete streets;
- Quality of life benefits;
- Transit Oriented Development and land use: Density needs a "better word";
- Convenient and attractive;
- Improve bus image, branding;
- Accessible, quick, comfortable and easy to use;
- Reliability, gets you to where you are going;
- Centrally located;
- Convenient and frequent;
- Two Visions: 1) Normal Timeframe with slow change and 2) outside source that triggers change; i.e. energy crisis;
- Infrastructure, i.e. shelters and pedestrian amenities;
- Education, look at the school system model, convert transit dependent students to transit riding adults;
- Phone Apps and bus arrival/schedules with real time information;
- Dependable; and
- Free Park and Rides.

Land Use/Economic Development

Jurisdictions were asked about current and future economic conditions, land use and development trends, and travel patterns in their communities. The following summarizes responses based on density/travel patterns, major developments, and policies that are in place or should be in place to promote transit and a fixed guideway alternative.

Density/Travel Patterns

Dorchester County: Densification in Dorchester is not widely accepted. Trolley Road has the most density in Dorchester County. Approximately two thirds of the population travels to North Charleston or Downtown Charleston for employment. Future trends may change with some job growth in the county. Oakbrook redevelopment could create an urban core with a link along Trolley Road. Currently, residents expect a 45-minute commute, but could opt to drive to a transit station rather than sit in traffic.

Charleston County: Charleston County is currently in the process of completing a five-year review of the 2008 Comprehensive Plan which will include a dramatic change to the previous plan. The plan will focus on reinforcing the urban growth boundary and will include transit. Employment growth is projected for Ingleside Plantation and Palmetto Commerce Parkway, with an opportunity to connect to airport and Ashley Phosphate Road. Emphasis is on jobs, redevelopment along Rivers Avenue to Palmetto Commerce Parkway, and Aviation Road to the Airport.

Berkeley County: Employment growth is projected at I-26/Hwy. 176 from Drop-off Drive to Jedburg Road, to include industrial development with new Interchange and job growth from Google industrial site. Development off of Hwy. 176, i.e. Nexton, Cane Bay, etc., will likely continue over the next 10-20 years. Residential areas on Hwy. 52/Old 52 include Cypress Garden Road and Spring Grove neighborhoods. A vacant nursery site has opportunity for office/mixed use. Local employment includes Santee Cooper, Alcoa and Google. Residents work locally with some commuters out of the county. Morning peak travel is southbound and evening peak travel is northbound.

Goose Creek has residential development (i.e. Carnes Crossroads). Nexton development is mixed use with goal to reverse job balance, could create reverse flow. Sheep Island area density may be greater than the CHATS model (17A/Exit 199) with current plans for 350-360 unit apartments.

Goose Creek: Concentrated growth on Hwy. 176 to 17A (Roper Hospital, Carnes Crossroad, Ryland Mixed Use Development). Goose Creek City Hall has plans that include adjacent developments, bike paths, and residential. Carnes Crossroads could be like Town Center in Mt. Pleasant. Hwy. 176/17A Alcoa property could impact growth to Carnes Crossroads. Downtown Master Plan for a central area of commerce includes streetscape to enhance corridors and overlay zoning, along Central, Brandywine, and Thomason Streets. Most residents travel toward Charleston (some to Summerville) during the peak travel times. Goose Creek is an auto thoroughfare; most people leave the community to do shopping. Shopping is oriented more toward Azalea Square in Summerville. Residents consider traffic when choosing where to live.

North Charleston: Economic trends include Palmetto Commerce Parkway (Weber Road); the south end, and airport area. Dorchester Road has mixed land use, i.e. suburban, call centers, and Bosch. Opportunities for growth also exist with Navy Base and Ingleside development. Redevelopment opportunity exists along Rivers Avenue, which is currently underdeveloped. Transfer of Development Rights has not been utilized. There is a need to focus density to stop the spread of development. Hwy. 52/78 north towards the airport and Ingleside is growth area. Neck Area Master Plan includes transit. Dorchester Road to Azalea Drive is alternate commuter route. Travelers also use North Rhett Avenue; Remount Road, Aviation Road and Leeds Avenue; travel from West Ashley to the Weapons Station; Mount Pleasant to North Charleston; and downtown to Bosch and Boeing.

Summerville: Sixty percent of the workforce in Summerville commutes to other areas. The goal is to increase employment. Opportunities include Nexton Development; Hillwood Development (Industrial development); and Midland Parkway – a medical area that should continue to grow. Oakbrook is a redevelopment area, and there are several donut holes throughout the city that could be redeveloped. Density increases are planned from Main Street to the railroad over a nine-block radius from Gum Street to Hickory Road with more mixed uses.

City of Charleston: Densities are being put in place to develop into light rail one day. City wants to develop the Low Line as a Bike/Ped park under the bridge at Line Street. Laurel Island is an industrial development site adjacent to the State Port Authority. MUSC is major job center.

City of Hanahan: The city has approximately 18,000 people and at full build out will have 22,000 to 23,000 people. The community is primarily residential, and traffic is not a negative issue since the city is centralized to most areas. The community has some industry, but most work in other areas.

Regionally Significant Developments

Several developments identified by stakeholders as having regional significance and potential opportunity for the I-26 corridor are listed below. Where available, the website and a description of the development are also provided.

Carnes Crossroads: www.carnescharleston.com

Carnes Crossroads is a 4,300 acre mixed-use development with an expected 15,000 people living in the community. Plans include residential units, retailers, restaurants, offices, and a hospital owned by Roper St. Francis Healthcare. Commercial space will include a 48,756 square foot Harris Teeter grocery store, a 60,0000 retail center called the Market at Carnes Crossroads, and 25,000 square feet of office space.

Cane Bay Plantation: www.cane-bay.com

Cane Bay Plantation will include 4,500 acres of mixed use residential, commercial and office, with 2,000 acres under development on Hwy. 176 and Hwy. 17A, six miles from I-26 with new interchange at marker 197 to serve the development.

East Edisto: www.eastedisto.com

East Edisto is a 72,000-acre area of MeadWestvaco property near Summerville outside of the study area. The master plan retains East Edisto's rural environment, while providing opportunities for people to live, work and play with the initial phase likely to take place over the next 15-20 years, and will include the creation of Summers Corner and the first two villages, Pine Hill and Ashley Ridge near Summerville, the corner of Good Hope and Greenwood along Hyde Park Road in Charleston County, and the Parkers Ferry Nature Center. Although outside of the study area, this development will likely have a regional impact.

Ingleside Plantation

Ingleside Plantation is a 1,600 acre site located in North Charleston. The first phase, located along U.S. 78, would be on 156 acres of land and will have retail stores, office space, residential apartments, and hotels. The second phase of the plan includes a town center, pedestrian walking trails, and a luxury hotel. The final phase of the project is anticipated to include a transit-type development near the existing rail line

Nexton: www.nextonsc.com

Nexton includes 4,500 acres at the intersection of I-26 and Hwy. 17A, near Summerville, that will be an urban live-work-play environment with an emphasis on the high tech industry.

Policies

Many of the stakeholders identified polices that were either in place or should be in place to promote a transit alternative or alleviate transportation issues in the region. The following summarizes those comments.

- Need to coordinate with current plans (i.e. Neck Area Master Plan);
- Provide incentives for trucking industry to limit movement during peak travel times;
- Transportation should be a local decision, i.e. local option gas tax;
- Implement nodes that are self sufficient with mix of uses;
- Plan for mobility – workers do not want to be stuck in one place;
- Regulations/form-based zoning;
- Transit oriented development;
- Focus density to stop spread of development;
- Parking policy should be aligned with transit;
- Provide incentives for developers (i.e. density bonus) and incentives for employers to create transit;
- Berkeley County has impact fees but no development agreements; although, economy may be a factor in impact fees;
- Sales tax and impact fees to fund a system;
- Difficult to raise taxes; gas tax is stagnant;
- People are freight; create an operating agreement with railroad; and
- Encourage employment to the northern areas to reduce congestion and long commutes.

Transportation/Infrastructure

When asked about transportation challenges, infrastructure needs, and roadway congestion; interviewees identified the following:

- Right of way limitations are present in the City of Charleston.
- I-26 cannot be widened and choke points exist at Ashley Phosphate Road and Aviation Drive.
- There is a need to change commuting patterns; exit lanes contribute to congestion.
- MeadWestvaco land development potential
- Roads are high speed, not pedestrian friendly for transit.
- Berlin Meyer Parkway expansion will help with traffic congestion
- Congestion exist in the Oakbrook area and Hwy. 17A at I-26;
- Surface street improvements are needed to create accessible roads that everyone can use;
- Most of the traffic occurs north of I-526.
- Dorchester Road, I-26 and US 52 make a funnel, North Rhett is the other side of the funnel not identified in the study area, with most of the traffic being work traffic and is congested to Red Bank Road.
- Congested Roadways were identified as follows:
    - Dorchester (a majority of the stakeholders identified this road as being the most congested)
    - I-26
    - US 78
    - Hwy. 17A Between Summerville and Moncks Corner
    - Hwy. 52 Rivers Avenue to Goose Creek (Hwy. 52 & Hwy. 176 are not bad from Moncks Corner to Goose Creek)
    - Ladson Road to Summerville has a bottleneck
    - Rivers Avenue
    - West Montague Avenue
    - Ashley Phosphate Road
    - North Rhett Avenue
    - Remount Road

Alternatives

Jurisdictions were provided a description of the modes and conceptual alignments that will be considered as part of the analysis. Comments on the alternatives are summarized as follows:

Mode

- **Bus**: Respondents identified this mode to operate on diamond Lanes/HOV Lanes using higher occupancy vehicles or bus rapid transit. Bus should be a limited stop service. It was noted that HOV was studied but not constructed; a true HOV program with express bus service would help. Buses on I-26 would create the opportunity to improve I-26 with lane enhancements. Commuter bus could be successful from Goose Creek if the price of gas was higher.
- **Bus Rapid Transit**: Articulated Bus is not practical in Downtown Charleston. Dorchester Road could accommodate BRT in a fixed guideway from Oakbrook area south, and in mixed traffic north of Oakbrook. BRT could operate from a park and ride at 17A (Rose Drive behind Hess Station) with commuter service. BRT is a great alternative that can operate in mixed traffic until density supports fixed guideway. BRT should incorporate bike lanes. Residential areas in Berkeley County over next 5-8 years could support BRT. Perception of bus would need to be changed. BRT is appealing because it is flexible.

- **Commuter Rail**: Transit would need to be high speed to key employment areas in order to compete. Could be developed in small towns along the rail with parking in the towns. Perceived as the simplest solution since the rail line is already there.
- **Light Rail**: Many were not convinced LRT would be the right fit. Density does not exist to support LRT. With fewer stops, commuter rail could transition to LRT as density increases.
- **Waterborne:** A Water Taxi Dock is proposed for Waterfront Park. Daniel Island has potential, along with Ripley Light Marina, and a link to the West Ashley Greenway. It would not be convenient to take waterborne from Daniel Island to MUSC. Waterborne can serve tourism and employment areas. Waterborne was not considered feasible for Dorchester County, Berkeley County or Summerville.
- **Other:** Other modes identified included zip car/car share program using electric vehicles, and employee vanpools.

ALIGNMENTS

- **Rail Corridor:** Commuter rail and light rail would need to end at Line Street. Rail along the corridor between Summerville to DT is a priority for Dorchester County (but Local Transit is higher). Summerville prefers a commuter rail alternative; which could be simplest alternative. Rail right-of-way has a lot of capacity. An alignment could follow Rivers Avenue to the rail corridor into DT Charleston.
- **I-26:** Stakeholders suggested multiple alignments should converge onto I-26. I-26 alternatives could include BRT/bus from Summerville to MUSC and HOV lanes with Express Bus or BRT. This alignment is perceived to make sense, be the most visible, and central to everything. Stakeholders suggested a redo of I-26 and using right of way acquisition as a baseline. A 5th lane was suggested in areas where there are only four lanes under bridges. Richmond to DC HOV lanes is an example of how HOV lanes can work.
- **52/78 Corridor:** Transit alignment should be on I-26, Hwy. 52, or US 78 (close to Corridor). Rivers Avenue is perceived as a transit corridor.
- **Dorchester Road:** Dorchester Road could support local transit. Hwy. 78 and Dorchester Road have a median, which could allow enough capacity for a fixed guideway.
- **Utility Corridor**: Most stakeholders were intrigued with the utility corridor, as it could be fast with fewer stops. It also converges into I-26 from both Summerville and Moncks Corner (i.e. utility corridor from Moncks Corner to I-26, continue down I-26). This would be a path of least resistance, and could use electrical power access for a LRT. Potential to combine corridor through Bureau of Land Management. From an economic development perspective, it was not desirable as it does not hit the densest areas of development.
- **Other:** One suggestion included utilizing a Port Access Road to Peninsula for an express service.

STOPS

Potential stop locations identified throughout the interview process included:

- Line Street
- Downtown Charleston
- Boeing
- Charleston International Airport
- Goose Creek
- Downtown Charleston (LRT stops): Line, Huger, Mt Pleasant, Magnolia
- Commuter Rail Stops: Air Force/Boeing & Peninsula Charleston
- Park and Rides at 17A

- Northwoods Mall
- Ingleside Plantation
- Nexton
- Downtown Summerville
- Oakbrook
- Remount Road
- CSX Line (behind Hanahan City Hall)

Outside Corridor

Stakeholders also mentioned areas outside of the corridor in need of an alternative; particularly I-26 to I-526 to serve Citadel Mall/St. Francis. Savannah Highway would need an alternative that can operate in mixed traffic. It was suggested to identify an alternative that can be implemented along other corridors as complementary service.

Daniel Island to Peninsula Charleston was also discussed, particularly in terms of waterborne transit as the most direct route.

Additionally, the employment area on Remount Road just outside of the study boundary was identified as a major trip generator (SPAWAR, Stanley, Port, Paper Mill, and base). Although they are outside of the study area boundary the trips generated by the locations impact the corridor and will be included in the analysis.

Opportunities

Many stakeholders identified other communities as examples, including:

- Baltimore
- Fort Lauderdale
- San Antonio
- Nashville
- Minneapolis
- Charlotte
- Las Vegas
- Washington DC

It was noted that the project will need the support of the business community, and to find a champion in the business community, i.e. reach out to the Business Alliance – CRDA; identify the leaders that are not politically connected, government, or educational entities; and find organizations that have influence with outside force. Find a pilot/prototype project that can be replicated, and create a Public Private Partnership. Nexton Development has to rebuild Park & Ride at 17A and could be potential partner. It was also noted that alternatives need central nodes with easy connections to where you need to go, i.e. hop on the train at the airport and go downtown).

To consider it a Success

When asked what they would like to see at the end of the study to consider the I-26 Alternatives Analysis a success, stakeholders responded as follows:

- Identify a plausible step forward toward funding and implementation;
- Objective, reasonable recommendations based on real data that concentrates on where the need exists;

- Does it get the attention of decision makers?
- Can we get past the paralysis, fund the system, and generate economic development by realigning transit?
- Sustainable, fully funded system with no additional tax burden;
- A plan that includes BRT, Transit Oriented Development, develops infill areas, reduces commuter traffic, converts those on the fence, is dependable and flexible and disincentives driving and parking.
- A study that is implementable and promotes job development;
- A true, viable, and focused alternative with a commitment from leaders, follows through, and includes a Plan B.
- When all is said and done, “how will it benefit me?”

Between January and March 2013, Round 1 and Round 2 stakeholder interviews were conducted which included a total of 21 personal interviews out of 25 requested interviews. The following summarizes the stakeholder interviews conducted in February and March during Round 2 with major employers and organizations inside the study area.

College of Charleston

Stephen C. Osborne – Executive Vice President for Business Affairs/Chief Financial Officer
Brian McGee – Chief of Staff and Senior Policy Advisor

The College of Charleston has 10,000 undergraduates and 1,700 graduates. The College has a campus in North Charleston on International Drive with approximately 750 students. The college does expect the North Charleston campus to grow in the future, and it could triple in size. The College also has a Marine Lab on James Island, athletic facilities on Mount Pleasant, and Dixie Plantation on Hwy. 176. There is some movement between North Charleston and the Peninsula Charleston campuses; however, more of the North Charleston students will stay at north campus in the future.

The College currently has 2,150 faculty/staff. Employee residences are widely dispersed among Goose Creek, Summerville, West Ashley, and Mount Pleasant, with some living on the Peninsula. Future employees will likely live north toward Summerville and Goose Creek for affordable housing. Transportation is a downside, and rapid transit would be welcome. The college has heard reports of the Express bus with CARTA from Summerville to Downtown overcrowding. Ridership on the West Ashley to Mount Pleasant express routes has also had a steady increase in use. Many of the faculty and staff stopped using the express buses because they are perceived as having standing room only.

Parking is challenging for the downtown campus, and CARTA bus lines help ease the burden. Employees will ride transit; however, gas prices and cost to drive versus ride are factors. The college currently subsidizes transit passes for students and employees with free transit passes. CARTA bills the college for routes used. The College charges for parking--$400 per year for surface parking and $600 to $700 for garage parking. The college takes the cost out of yearly payroll. The school owns two parking garages, and employees can use city garages for $5.00/day as an incentive to use transit with a daily option to drive. The College does not charge a transportation fee. Some parking has been lost due to new construction. Additionally, there are no more parking decks south of Cannon.

Commuting occurs primarily during peak hours. Most classes are held between 8 a.m. and 5 p.m. Currently, there are 3,400 beds on campus, with 2/3 of the students living on the peninsula. No freshmen can park on campus; however, private lots and city decks are available to them. A small fleet or zip car system is being considered, and the perception is that not many students or faculty are using the trolley for trips other than access to the parking garage at the aquarium. If transit were better publicized and more convenient, it may be better utilized.

Students and faculty generally have a positive view of transit; however, they want the service to be more convenient and consistent. Employees will take DASH to the Aquarium parking deck, which is $200 to park, so there is an incentive. The lot has 750 spaces with 625 currently being used. Mount Pleasant congestion will likely worsen long term with infill development and due to the city ranking as the 5th largest growing city. Folly Road can be congested. James Island has the most convenient travel time to the college (Mount Pleasant is 2nd most convenient), and I-26 has the worst travel time from Summerville. Faculty members are attracted to Summerville because of the home prices and school system. Goose Creek is also a problem area for traffic. St. Phillip and Coming Streets are being converted to two-way streets, which raises concerns over traffic and pedestrians on campus. These roads are being converted to add to capacity, and have been one-way since 1959.

A ferry service that is reasonably priced for athletic events such as baseball and soccer could be a benefit for parking. The College expressed that commuter rail with limited stops would be better than bus for direct, fast service, and that riders would likely transfer to local bus service for the final leg of the trip, if it was convenient. Transit alternatives need to be convenient with a low cost in order to move commuters to transit over driving and parking. Alternative should be a mode that is comfortable, dependable, well timed, with trips during the middle of day to accommodate part-time and midday workers. People will be willing to pay more.

In order to consider the project a success the college would like to see a plan for developing a more convenient transit system.

MeadWestvaco

John Grab, Vice President, Real Estate Development
Norman Brody, Director, Commercial Development
Robert Robins, Attorney at Law
Brent Gibadlo, Director of Real Estate Development – Special Projects

The Nexton Development will attract jobs. The project includes an anticipated 10,000 residential units with all phases, and six million SF of commercial space. Nexton will be a job center with industrial and office jobs. Access will be increased with the new Sheep Island Interchange. The town center will be located between the two interchanges on I-26. The 1st phase is 150 acres, with 320 apartments and a four-story office building. Parking in Phase 1 is 6 spaces/1,000 SF of commercial space. In upcoming year, new development will include a school and 750 residential units. Phase 1 will have 2,000 apartments when complete. Development will grow organically with lower density closer to HWY 176. The parkway will be complete by 2015 with the city center being built two years after to create more of a destination.

Transit access is a question they receive from prospective tenants of the office space, especially from medical professions. Traffic studies are updated, today the travel pattern is a reverse commute to get to Nexton, but it may not be in the future. 35,000 housing units will be located in the area 10-15 years from now, with 90,000 people. 30,000 ADTS are anticipated in the future. MWV also described the Miramar FL Parking/Transit Hub project as an example of a public private partnership with transit oriented development. Nexton has considered the need for an internal community shuttle in future phases and understands the need for a right of way for dedicated lane to be considered in the early phases. Bike and pedestrian access is also a priority.

Joint Base Charleston

Glenn Easterby – Deputy base Civil Engineer, 628th Civil Engineer Squadron
Todd Martin – Chief, Project Management Element – 628th CES/CEPM

Limited growth is anticipated at airbase, as it is space constrained for the airfield. Economic trends currently indicate no growth. There are 1,300 civilians and 2,500 military with 22,000-25,000 trips (back & forth). This total does not include the weapons base and SPAWAR with anywhere from 3,000 to 15,000, respectively. Currently, there are 345 housing units on the Airbase. The existing 200 housing units on Dorchester Road will go away in the next year or so. The Airbase has two gates: 60% of the trips use the front gate (Dorchester Road) and 40% use the back gate (Rivers Gate). These commuters likely travel I-26 to South Aviation. Commercial vehicles must use the back gate (Rivers). The Weapons Station is currently running a temporary shuttle due to displaced parking. Currently, one school bus goes through the gate, but it required coordination with security to search mixed passengers.

MNPTC (Nuclear School) could have a student demand for transit on weekends; however, the school is a good distance from I-26. The school has two phases with a large dropout rate. The Base is trying to be pedestrian friendly. Commuter Service would need to get people from Point A to Point B. Airbase traffic would need to be a lot worse. The commute from Summerville via Dorchester Rd. may have the biggest need. People use their own vehicle as the base is eliminating department owned vehicles. The expense to set up transit on base would be difficult to convince others that it makes sense.

People want instant gratification, so frequency is important, especially for Military where schedule and time is important. A light rail stop for transient population could work, but would require a connection at the gate and would need to be frequent for commuters to use it. Additionally, security for transit would be a challenge, and the liability may cause reluctance: would transit operate on base or off base, would they get off and get on a shuttle? Most people are area specific, and most are just not willing to walk. The Airfield also limits the location of some facilities.

Currently, there is not a predicted increase in the population on base, and there is extra capacity for parking. NAF and contractor employees may ride transit. There is no off base parking. Peak commute hours are 6:45 a.m. – 8:00 a.m. and 3:30 p.m. to 5:00 p.m.; however, travel time on other bases vary (i.e. Weapons Station is 6:00 a.m. – 6:45 p.m.); Remount Road-SPAWAR – ranges more as they stagger shifts.

The utility easement alignment has some hurdles. Encroachment and impacts to runway will need to be addressed. Airfield restrictions such as height and accident potential zone (APZ1) will need to be addressed. Any alignment that cuts through the base will be a challenge, as the base is trying to build the perimeter to be more secure. Palmetto Parkway was a challenge. Anything elevated would be an issue. Also, need to consider what the passenger can see when they travel along the alignment. Security would be a concern. The utility easement alignment passes near Senior Leadership Housing and a youth center. Bus modes would meet the standards; however, stand offs would be higher for trains. The base would need positive control that the perimeter could not be breached, and transit solutions would need to be grade separated over base roads. It is possible, but would be difficult. It would require some meeting s to discuss how it could work.

Commuter Rail – NS line is at back gate, which would be a benefit to base if shuttles were provided. There is a lateral clearance on the base side (where commuter rail would be) of 1,000 ft. Dorchester road is most congested. US 52 jams up, but not as bad. Dorchester Road is priority, Dorchester Road will get worse, other missions will come to the base, and there is a need. Rail would be good and would serve back gate, most of those using that gate are going to Mt. Pleasant currently.

Changes are planned for Hunley Park. Palmetto School (Charter School) is moving to Hunley Park with 500 students in 2014. The housing is going to be privatized, and current housing on Dorchester Road will be leased. Several groups have expressed interest in the space. The center part of Hunley Park will stay as is, but the southern part (behind the elementary school) is an area of interest. This part is currently proposed to be broken up, with expressed interest for 50 acres. Only the Palmetto Academy Charter School is definite.

To consider the project a success the project needs a solution that relieves congestion while meeting the mission and security of Joint Base, meets those design challenges and limitations, and alleviates congestion on Dorchester Road.

Boeing

Rickey (Rick) Muttart, Director, Site Services

Boeing's product has a long lifecycle and plants are developed with long rang plans in mind. Boeing is active with transit in other areas of the country – i.e. providing transit passes, or other incentive to take transit. Some plants will allow transit vehicles through the gate, but it depends on how far the walk would be. To enter the gate, transit vehicles are typically a dedicated bus to Boeing. Commuter lanes would be used when driving just gets too difficult. A Commuter train would be more appealing, especially if it is wired with amenities. Boeing actively encourages transit, as there is a need to balance the needs of parking and space, especially when there is a shift change. California requires transit programs, and it is legislated based on size of employment. Boeing has organized commuting programs that set up kiosks and commuting fairs at other plants that bring in all of the modes.

Commuters are using Dorchester/Ashley Phosphate, as a feeder from Summerville to I-526. Others are commuting from Hanahan or Summerville. Demographic and household locations of workers have not changed. Housing will continue to be to the north, and suppliers will go where the land is available, which is likely to occur to the north. Rapid transit must weigh the cost versus what you get. A hub and spoke system with conventional transit modes is desirable where capacity is limited. Alternative should consider what amenities the outlying areas will offer, and where will people be going in the future. Transit to the airport should be reliable and repeatable. Transit should work with operating times to deal with parking, start/stop times, and congestion during shift changes. Transit needs to be reliable. Transit to Boeing would require the guard to enter the bus if it is open door, or it would need to park outside. The driver would also need credentials to drive on base.

Many are not aware of the existing CARTA route to Boeing, and it is not evident that anyone uses the service. Transit would need to accommodate unplanned events with taxi voucher program. Dorchester Road and I-26 are congested. The alternatives need to be realistic about expectations. Alternatives should consider vans/small buses and where major stops will be in the future. Transit needs to be flexible.

To consider the project a success, the study should create awareness, education, and understanding among politicians and the masses on what future will look like, why it is important, and understanding of the cost benefit. The alternative should look at long term needs and see the path through implementing it.

Education is important; transit is competing with other dollars. Demonstrate how transit will lead to other benefits, i.e. economic development. The alternative should be the whole package: car charging stations, offer other modes, comprehensive and integrated, and include distribution of rural communities. Consider trip purposes: i.e. expendable income and where those trips may go: sporting events, family entertainment; look at colleges with remote campuses; and small towns that have what people need. Alternative should consider the CDRA's master plan.

Trident Health

Deb Campeau, Assistant Vice President, Business Development
Vickie Cumming, Vice President, Human Resources

Trident Health has 1,500 employees at main campus, not including volunteers, 500 employees in Summerville, and 50 employees in Mocks Corner. Probably a few hundred more employees surround main campus, including HealthSouth with 150 employees, nursing homes, doctors, etc. The location in Moncks Corner will add 50 beds, and Summerville location will have 30 more beds and a staff expansion. Trident Health also has a free standing ER near Tanger Outlets. The main hospital has plans to increase staff and beds in the future as well.

Currently, few employees ride transit. The hospital does not provide transit passes for employees. Shift times are 7AM to 7PM and 7PM to 7AM. Some staff work traditional 8AM to 5PM shift as well. Employees work all hours/all days, with some reduction on the weekends (app. 350 to 450).

A transit alternative would need to operate on the weekend; however, even service on weekdays would help as long as it was consistent. The hospital provides free parking for employees and free valet parking for patients. More employees live to the north in Summerville and Goose Creek, and a table with actual numbers was provided. Employees likely travel via US 78 and Lincolnville, Dorchester to Ladson, US 52 and 17A. Few travel on I-26. Some employees travel from North Charleston, but not a lot from Mount Pleasant. Employees from North Charleston do not take the current CARTA route that is provided. Transit service needs to be convenient and dependable, and cannot be late. A station in the area would be well received. Students at CSU across the street do not have a car, so there is opportunity in the area. The area would be an employment hub.

Dorchester Road is the most congested. US78 to Summerville is congested in the morning, and US 52 is backed up. Ladson at US 78 turn is also congested. US78 from Rivers on the flyover is backed up, and episodic traffic occurs north to Goose Creek and north to Summerville. Palmetto Commerce Parkway could alleviate some congestion if it cut across and had an exit to 78. Travelers could take Dorchester Road to Patriots to Trident Health, and it would create another opening to Oakbrook.

The Express Bus to Kmart is well received, though it does not serve the hospital well. Express bus is needed to move more people faster with routes from Moncks Corner, Goose Creek and Summerville to Hospital via park and rides. A light rail can stop regularly, but an express bus would be more direct. The

CARTA Express goes to KMART so not convenient for employees, and Route 10 to hospital would be used by patients but not employees. Transit has not been promoted to employees. The hospital does not have a carpool program in place, and will be looking at parking capacity which is currently constrained. The hospital would be interested in the option of providing transit passes for employees, especially if there was an easy fare card they could sell or give to employees that could be swiped on the bus.

Alternative needs to consider the paratransit population and accessibility, as well as passenger amenities such as bike racks, etc. so multiple modes can be used. Alternative needs to be beneficial, and worth making the connection. Service should be direct and provide travel time saving. Riders need an incentive, as time is valuable. Two routes are needed: one from Summerville and one from Goose Creek. Currently, Oakbrook does not have a good linkage, but there is a master plan for Oakbrook redevelopment. If a bus operated faster in a median, there is a perception that would occur as others are sitting in traffic seeing the bus or train go faster than they are. Alternative would need to have wifi to allow work and other things to do during the ride. Alternative would be beneficial for non-regular travel downtown as well to avoid parking hassles.

To consider the study a success, would like to see the arteries that bring employees to the hospital working better, i.e. Dorchester Road and Oakbrook.

Force Protection

Tommy Pruitt, Communications and Marketing

Force Protection manufactures armored vehicles. Currently they have 550 employees. The 1st shift is the largest shift from 6:00 a.m. to 2:30 p.m. Some work is done around the clock. Most employees drive, no carpooling is apparent. Currently no transit routes serve the facility. Employees have not expressed a demand for transit, and the plant currently has adequate parking. Most employees live within a five-mile radius; some may travel from Daniel Island/West Ashley. Most employees stay on facility during lunch with food truck. Congestion occurs on US 78 and US 52, coming in from Summerville/Goose Creek in the morning, arteries can back up. Visitor parking can be a problem. Currently, there is some movement of people between the airport and the facility, which can have congestion. Some suppliers travel from Ladson to SPAWAR area

Light rail seems to be the best way to move people. Transit stop locations would matter. Dorchester County, development in Summerville, and residential areas in Westcott are all growing. Summerville to North Charleston could be potential between Summerville and North Charleston with stops at Park Circle, Northwood's Mall, and Naval Weapons Station. The Nuclear Training School has potential. Alternative is an opportunity to be strategic. The area will continue to grow; thus, an alternative is needed. Creating alternatives would be biggest priority in order to save money, and use car less. Alternative needs to be affordable and get riders where they need to go at convenient times. Alternative would likely need to stop at Boeing.

The challenge will be moving across different political boundaries and jurisdictions, establishing who pays for it, and how much it will cost. Will require more collaboration, how it will work, and discussion of the issue. Answer questions on where does the alignment go, does it use existing right-of-way, does it serve residential and areas that are heavily traveled. Would like to see where people want to go and what people are thinking about in terms of transit; not just a political view. Alternative study should answer the questions: What does the community want and is it affordable?

Town Square in Summerville to Charleston for commuters and on weekends and evening for events would be best usage. I.e. traveling downtown for dinner, riders would circulate on trolley or bus from a train. This is also an opportunity for service to the Summerville festival, which brings congestion when 250,000 people attend the event. Would like to see a benchmark of what other similar sized cities are doing, lessons learned and best practices, to learn from their mistakes.

Medical University of South Carolina

John Runyon, Director of Business Services

CARTA currently circulates the MUSC campus, with parking located in various areas: near Joe Riley Stadium, lease 800 spaces from city, the campus owns 175 spaces, and utilizes various other garages. Currently, MUSC has 3,500 people for 1,000 spaces. With various schedules, they are able to accommodate the need. The circulator bus connects remote parking to the university, with peak travel times occurring from 7AM to 9AM with 1,400 people arriving and 2:30PM until 7:30PM. The university has zip code information by employee that they can provide.

MUSC operates nine buses, and augments the service with CARTA buses via the Medical 203, which is a public route on top of MUSC route. During seasonal demand, MUSC can react quickly to changes by using the CARTA routes and preserve the nine MUSC buses. CARTA service is purchased by the hour. Any MUSC employee can ride any CARTA route 7 days a week, and MUSC is charged by headcount. For CARTA express routes, MUSC receives a discount on retail, and is charge by headcount of MUSC riders by trip. The university pays the full amount, as it became too complicated to pay half and have the employee pay the other half.

Approximately, 600 people per day are riding the CARTA Express routes--the equivalent of a 450 car garage. Transit is 100% funded by MUSC; pretax parking is paid for by employees. Transit ridership is variable. As fuel price goes up, ridership goes up. The 600 riders are the core riders that stick with it. Dorchester Road route to Summerville (RT 3) is well received, but may have taken from TriCounty Link/North Charleston Express Route. Boeing stop on Route 3 makes no sense; Dorchester to Michaux, bus cannot go straight, it turns around at airport cell phone lot and is time consuming. West Ashley route to Ravenel/Hollywood stops at Citadel – should keep coming downtown. Complaints are that routes are not meeting schedules. Very few complaints come in from northern Express routes. Estimated 20,000 transit riders (can provide actual number) - 1,000 trips on express/day, 25,000/month. Peak travel times are 6:30 a.m. to 8:30 p.m., and 2:30 p.m. to 7:00 p.m., but not at midday. Minimal usage of existing transit, trolley is used to access parking, but not for local trips.

MUSC has 12,000 employees, medical staff and students; the total does not include volunteers. MUSC is two corporate entities, a university with six colleges and research, also five hospitals. MUSC also has clinics around the area, but they are not nodes of large employment. Downtown has 9,000 parking spaces, 7,000 for employees/student, 2,000 patients, 2.5 million patient visits per year. The entire parking system is at capacity and MUSC has a long term parking plan. Horizon project will take existing parking away and rebuild it as garages, retail, etc. Currently 1.5 is the space assignment, 460 people with no parking. 3,500 people will need parking, MUSC leases 798 spaces for $320,000, breakeven is cost, and could be $2.5 million. MUSC has a formal carpool program; some people are registered but it is lightly used. MUSC also provides a Share a Space program that is lightly used.

Current growth is stable, but 10-12 years out Horizon Plan growth estimates 1,000 to 1,500 more people. ART Hospital phase 1 will be followed by CMH hospital (will change to Art) and Wellness Center (will change to ART) with three new bed towers and no real parking available. Almost all surface parking. Calhoun /Lockwood garage is owned by MUSC with 200 spaces at $300 per space plus cost for insurance and operating a year. City rates are $140 / month, which is a good return from small amount of money.

The area has a culture of congested roadways. I-26 has opened up. Summerville office is 40 minutes. Back up at I26 and Ashley phosphate. Afternoon from 4:15 – 4:45 pm is a good commute, after 5:00 p.m. it adds 15 to 20 minutes. Upper Dorchester is bad. North of US 17-A and US 176 will have new communities, with Boeing employees. Ashley phosphate to Bacons Bridge is congested. US 17-A in either direction is congested with local trips to Knightsville. Old Orangeburg Rd. could have potential for transit. No nexus for local service. Scattered development served by transit will be a challenge. Hwy. 52 to Goose Creek is congested. Alternate to congestion is to travel via North Rhett to avoid 52. Hwy. 52 to Trident to St. James to Red Bank is slammed all day with traffic, but there is reasonable flow on north Rhett.

People want direct door to door service, which requires a transit stop "up front" that connects to the train with frequent service. Example: Peachtree Center station on MARTA line in ATLANTA – station is where you work. I-26 would be the alignment with the least number of stops. Do not require changing bus from North Charleston. Alternative should circulate around the university. If alternative has fewer stops, and travel time saving, and the bus/technology/amenities would not impact speed from point A to point B, transit mode is not as important.

An Alternative on I-26 is the #1 priority, second is US 52, and third is Dorchester. Commuter Bus, Light Rail, or BRT would all be appreciated. No toll roads currently on the roadways, should consider as a fee for service. Alternative will require a culture shifts. Parking capacity plays a roll. Transit is the biggest need. All roads are parallel. Shift requires a change in culture; need convince people to take transit.

To consider it a success MUSC would like to see an implementation plan, (studies are a dime a dozen), that is integrated, follow through needs to complete all of the steps in the implementation plan to be successful. MUSC can provide zip code reports to validate commuter location. Leadership is needed to change culture. Currently there are no incentives or tax imposed on parking versus transit, dis-incentivize parking to make it unattractive, and incentivize transit. MUSC would like to be included on the dates for advisory committee meetings.

Trident Technical College

Bob Walker, Vice President, Continuing Education & Economic Development

This year is the 50th anniversary of school with enrollment of 17,000 students, which has grown in past five years. The main campus is on Rivers Avenue. Three other campuses: Moncks Corner (17A) with 1,000 students; Downtown Palmer Campus with 2,000 students; and Mount Pleasant (Johnny Dodd's) with 400 students). Additional sites with non degree programs in St. George, on Trolley Road, St. Paul's Parish.

The majority of the students drive to campus. The TTC Green Committee completed a study of faculty and staff/students two years ago that collected zip code and travel patterns to estimate their carbon foot print. TTC green committee study goal was to maximize use of green transit. Parking issues on the main campus have leased a car lot for overflow parking at times. Campus looks for parking where they can expand it. Palmer Campus had parking problems three years ago, the campus has the fewest spots, (parking for 2,000) and they limited offerings because of parking. The Palmer Campus also has more bus/bike users than others. CARTA Route 10 stops used to be across road, CARTA rerouted onto the campus. Bus passes are sold for $42 for any bus any time. Student services sell the passes in the book store, school does not subsidize. It would be cost prohibitive for the school to take on an Express route.

Many of the students live in Summerville, and do not pay for parking. The school is a 2-year technical college, students take the 1st two years for an associate in science to then move to large university. The school has 150 programs of study for career training, and a variety of direct career training programs. Continuing education is 10% of revenue. College also provides short term training for business and industry, and runs a kid's college in the summer with 1,300 students.

There is some movement of students between the campuses: Mount Pleasant & Palmer, Palmer & Rivers, and little between Berkley and Rivers. The 1st year of classes is typically at one location. Some teachers split campuses but it is by day of the week. Peak class times are from 9:00 am until lunch and 3:00 p.m. into the evening. Mornings at the beginning of the semester are chaotic. Rivers Campus has functions at college center where they rent it out. Parking for that area is designated for 200- 300 people. Classes end as late as 9:30 p.m. to 10:00 p.m., and CARTA started a later run. The route has two interior bus stops on campus for a small circulation.

Students have expressed some desire for transit. A 3-4 hour transit trip from Mount Pleasant is not convenient. School had a rideshare program that fizzled out. Some faculty/staff carpool. Transit needs time savings and convenience. Routes are on website, but there is not a huge push for transit, some but very little information is provide. Peak travel days are Monday – Thursday; Fridays are lighter, and there is some Saturday activity. Students would be receptive to an alternative and would likely be willing to ride. Transit would require a culture change, and will gradually gain momentum, but it needs to be convenient.

I-26 is the most congested to the main campus. US 52 is congested to Moncks Corner. Henry Brown Blvd. into Remount Rd. is congested. Dorchester Road at Ashley Phosphate is congested. Commuters find the best route for them. Transit Alternative is needed, but needs to address what to do with riders once they get off, i.e. a circulator system. Stops should be at locations that cross I-26, i.e.: Hwy. 78, Ashley Phosphate, Montague, Dorchester, College Park, Neck Area. Park & Ride locations should be safe (near shopping and places for errands) and convenience. This could make carpooling more attractive than it was. I-26 is central to everything, providing crisscross feeder service would also make sense, with a series of service on Rivers and Dorchester, but will need to address walkablilty. Alternative could branch out from I-26 to get on Rivers and Dorchester Road south. Alternative needs to include amenities, shelters, and sidewalks.

Alternative should consider incorporating bikes, bring bike along and go, which would be a plus for distances of ½ mile to 1 mile. Transit would appeal to the younger generation. A faster bus lane (BRT) would make the most sense, would be cost efficient, and flexible. Second would be light rail. Alternative needs to be convenience and affordable. Convenience is the biggest challenge because the region is so spread out. If the cost of gas is $200/month, and a transit pass is $100, allow riders to do other things.

To consider it a success, the study should address how much will it cost, provide a timeline for implementation, a phased approach; details on how users can ride; and passenger cost. TTC Green Committee did a survey of faculty and students that pulled data on where they live and work, with a detailed analysis. The TTC Green committee can provide support the survey effort.

SC Ports Authority

Barbara Melvin, Senior Vice President, External Affairs

The Port is a major economic engine that facilitates commerce and is growing. Specific statistics are available online. Growth is anticipated to reach 2008 market and above. A new facility will open in 2018, at the Navy Base Terminal. Traffic counts for that facility are in the EIS. Dual Rail served at navy facility will likely not affect this study. By September 1, the inland port in Greer will open and traffic will utilize I-26, initial traffic estimates are 40,000 trips/year, with 100,000 trips/year later on.

Gate hours are 7:00 a.m. – 6:00 p.m. It is cost prohibitive for trucks to sit in traffic and the Port is attempting to mitigate this. Trucks travel the reverse times than commuter travel. Truck will avoid rush hour, and travel from 9:00 a.m. to 3 p.m. Some sit at Exit 203 to wait for traffic to end. Rapid Rail Program is a multi terminal initiative where the Port has taken over the rail coordination from dock to rail. Will not see any more trucks deadheading, the "match back" is currently subsidized and has been successful.

The port has an estimated 500 employees that are Port Authority employees. Many live in Mount Pleasant. If a ship is in, there could be an additional 100 people per facility. The Cruise Ship terminal has approximately 400 cars traveling in/out. There are 70 cruises per year, and parking capacity is good. Cruisers park in warehouses. Cruise industry is a drive market; the site has 12 bus parking spaces, and approximately 2,000 people drive or come in by taxi. Approximately 1/3 of cruisers are from SC, the southeastern states make up the rest.

Transit is not often requested, and the Port is not aware of any carpooling, and do not anticipate future issues due to parking. The operation is 24-7, but not the gate, there is some overnight impact but negligible. The gate is Monday through Friday, but can be open on Saturday and Sunday. Available warehouse/distribution space will fill up as port grows, Alternative should look at where the warehouse and available land is located as that will impact the corridors. Jedburg Interchange (Hodge tract) will have some of this. If space is in the Port line of access, it will be impacted.

If it is economically feasible, an alternative would help to mitigate traffic. Alternative would need to be convenient and affordable, and ensure it does not interrupt the flow. People move to where they are willing to commute. Alternative needs to be economically feasible. There are limitations from being constrained by peninsula. Inland port will have one- train a day, with additional length. We cannot pave our way out of congestion.

Need to consider the cost to build. North Charleston overpass were discussed to mitigate trains blocking roadways, have also discussed one lane in median for emergency vehicles. A study will be conducted as a result of the MOU, and should coordinate with any alternative that may use the same alignment. The study will likely be a one year study.

The number 1 priority is good interstate access, followed by good rail access and good harbor access. Roadway is priority (Wando is largest facility and has no rail access). The biggest challenge will be convincing people to give up their cars. Transit will require a culture shift - expectation that not everyone can drive. Alternative needs to be convenient and include an overall shift in strategy. Everyone needs to participate in a comprehensive strategy – changes in hours of operations, etc. People will change, but it will take time. Alternative will need to appeal to broader view.

To consider it a success: study needs to challenge to everyone and include something that affects everyone, with a strategy to implement, help to solve the problem, and looks at travel time hours for all industry.

BOSCH

Thomas Schanz, Manager, Deployment of Business Excellence

Bosch is in the manufacturing industry and has been here since 1974. The area is attractive due to its sea, air, and land access. Distribution point from harbor, growth in automotive in Mexico makes the area attractive. Plant is open 24 hours/day; 7 days a week; most employees work 5- day work weeks, some on weekend. There are various shifts, with products being picked up by truck. Plant does not have any external warehouses. There is another facility on Appian Way that is a separate unit. The plant has 1,390 on site employees all shifts. The 1^{st} shift is the largest employment, and 2^{nd} and 3^{rd} shifts are all operational. Arrivals are staggered between 6:00 a.m. or 7:00 a.m. Exempt employees have flex hours with 6:30 a.m. – 8 a.m. arrivals (during the peak travel time).

The Plant has ample parking on site with room to grow, and has potential extra parking available in the future. There is currently some coordination required at shift change but few complaints. Parking is free for employees. There are some CARTA express riders that park at Bosch, and they are working with CARTA to be a good neighbor and coordinate as needed. Most employees drive. BOSCH discussed with CARTA Express from Summerville to Bosch with no stops. The feedback from employees was interest, but it was not used, likely due to flexibility, timing, and need to drive to PNR. The cost versus time benefit was not there.

To be successful, transit would need more stops, more frequent service, within a five minute walk, (people will want to not drive at all). Some carpooling occurs at BOSCH, but it is not organized. Growth is anticipated to be stable over the next few years. Shift changes have a 10 minute overlay, and BOSCH can provide shift times and zip codes. There may be some interest in transit, but it would need to be direct, cost effective ($3.00 for 2-way trip currently is costly) and provide service to a greater distance. Bosch decided not to subsidize transit for employees.

Dorchester Road is congested during the peak travel times/directions. Traffic is normally OK (slow) but during incidents it becomes a standstill. A transit corridor is needed to remove cars from the roadway and free up congestion, but it needs to be convenient. Dorchester Road could have light rail independent from road traffic, and a commuter bus or rail down I-26 to pull cars from Dorchester that are going to drive on I-26 at one point or the other. As a plant, the priority would be to offer a system that is financially feasible for riders and flexibility. The biggest challenge will be funding. Alternative needs to look at the long term sustainability. Tweaks to the roadways, etc. solve the short term need, but the long term solution would be a commuter rail or light rail system. BRT would be accepted if the stops, routes, and service were frequent and convenient. The spread out nature of our communities will be a challenge, people don't want to drive then park then get on transit. People are willing to walk 5-minutes to transit, and the interest is there.

To consider it a success, the study should provide a comprehensive mass transit along the main arteries with an alternative to single occupancy vehicles on the roadway to serve commuters. Bosch would like to be involved and copied on events to inform employees.

Lowcountry Housing Trust

Michelle Mapp, Executive Director
Debby Waid, Program Director
Patrick King, Assistant Director

Lowcountry Housing Trust is a nonprofit Community Development Certified Financial Institution. The Trust is a bank that provides funding to developers for affordable housing, healthy food resources, community facilities and community business. Organization made its first loan in 2005. Started in City of Charleston and expanded to the Tri-County region and is looking to expand into Beaufort, Georgetown and Horry County.

The organization's role includes education, advocacy and finance. Education includes the need for affordable housing; they provide the gap in financing. Education about transportation, housing plus transportation costs is 50-60 percent of income. Advocacy includes state level in search of capital money and locally in terms of planning and zoning for affordable housing. Finance includes loans for affordable housing, technical assistance, tax credit, and Habitat developments, etc. LHT works with all entities, private and public. Financing started with housing, but discovered the communities had no other facilities, no economic development, so loan program was expanded to those areas.

The Trust has a staff of 10 people (6 fulltime, 2 part-time, and 2 contract) and they hold education events throughout the region. Provide GAP financing with a $500,000 maximum loan (i.e. Seven Farms Community project). The Trust provides funding from one home to multifamily. Affordable house is considered 12% of the area average. Currently conducting a housing needs assessment and a Housing Summit is planned for May 17. In 2007, College of Charleston conducted an affordable housing study for the entire tri-county region. Gaps exist. There is a gap between the Jobs/Housing balance i.e. hospital workers can't live near the hospital. Mount Pleasant has a gap in affordable housing/jobs, Kiawah is bussing in people because there is no affordable housing. The urban core has a shortage of affordable housing. Boeing employees do not have an opportunity to live close by, and homes that are built are selling fast. Ashley phosphate is the most congested, as well as Dorchester Road and Rivers Avenue.

Need for a transit option does exist. Issues to address include where other stops could be (i.e. 3,000 people at base area, but no convenient transit stop. Transit service to Wal-mart on River's Avenue and Tanger is useful. Issues for commuters include lack of convenient and assessable transit. No good transportation options with frequent stops on fixed route. Challenges also include how to accommodate people who attend frequent meetings. Transit could work for nurses or stationary people. There is a service gap between Tri-county Link and CARTA, no direct bus service between Summerville and Charleston. Cainhoy also has a gap. Study should address how it will benefit travelers on I-526. Tourists come to Charleston and use the trolley, but how do they get to airport other than renting cars?

Density is needed to support transit. Alternative needs to address ridership and cost effectiveness, how to balance the two. People don't like change, and the perception is that density brings more cars. People need to see successful projects in place, some local examples could be the Meeting Street project and Concord Street; however, both require parking underneath. The west and east side of the peninsula has market rate housing. Planning meetings have a NIMBY-ism attitude toward affordable housing. Affordable housing needs density to be financially feasible. Peninsula opposition toward affordable housing is oriented toward college students. Magnolia development could be an opportunity to create a student housing/college station type environment with a transportation corridor to college. Senior housing is also an issue, all are on waiting list. Horizon Village has a concentration of senior housing.

North Charleston has need for sub standard rentals to be replaced with high quality multifamily, and to develop older neighborhoods. Rental housing at one point made up 70% of the housing stock in North Charleston. This is related to home ownership and difficulties being improved. The city has down zoned density to help relieve this, and the housing bubble has helped as well. APZ zones also create a challenge, how much can you infill with the new runway, and where does it go?

Light Rail is appealing to have a rail line for those who live in Summerville. Should also have alternative that serves the local market i.e. Boeing, Noisette, Port. Also need feeders off of the alignment and need to resolve issues for pedestrians and bicycles across all boundaries of government – DOT, DOE, etc. Transit can create Live/Work communities, support affordable housing, be used as an economic development tool, and a tax and job driver. Identify the tax and job impact it can bring. Alternative needs to address the whole community and the whole package of options. Charlotte addresses transportation and housing in funding for projects with a 15 million bond for transit, where more money is spent on the local bus rather than the premium transit. Realize that housing and transportation is 50 percent of your livelihood, most "drive till you qualify". Infill is more desirable, advocate to create density bonuses, rather than green space. Ridership capacity is not even with need.

Other markets that are successful include Europe and NYC, where transit is market driven. Parking and density make it work. You have to drive to get where you need to go, coordinate with your schedule, and buses get stuck in traffic. Transit needs to be on time, convenient, frequent, and reliable. Bike share program and zip car could help with the last leg, but what is the cost per trip. Travel time is growing. Alternative needs to be multimodal (i.e. Rivers Avenue has bike route, Mt Pleasant has bike connection.) Other connections are lacking.

To consider it a success, alternative needs to be something that the community embraces, a move forward, something the public wants to use, user friendly, able to address all trips and linkages, and flexible to allow unexpected trips.

Additional comments included an example of a need, a low income worker works in Charleston, lives in North Charleston, but only space for daycare is in West Ashley, and must travel all over the region inefficiently by bus to make these trips. When educating the public on transit, study needs to show the development around transit and what it looks like. The study team should also talk to the LAMC organization (communities in the Neck area - Bill Stanfield).

Charleston Regional Development Alliance

David T. Ginn, President & CEO

Discussion about I-26 Alternative Analysis identified the need to align planning and infrastructure. Align all of the pieces – infrastructure and transportation, Donnelly Foundation is looking at these issues and should be informed about the study. Our natural environment is an asset, and we need to conserve it. A Recent Chamber study identifies 20 infrastructure projects, and study team should look to see how that translates to this study. There is significant growth coming, i.e. Nexton development, and need to address future needs. Oklahoma City is a model for funding mechanisms.

Charleston Southern University

John Strubel, Director of Integrated Marketing

CSU enrollment is approximately 3,300 students, and will grow 2-3% per year to reach 4,000 by 2020. Two thirds of the students are commuters, 1,200 live on campus. The Wingate hotel is also on campus and is owned by CSU which bring traffic (appx. 90 rooms). 10 year strategic plan is underway which will double the nursing building (three times the enrollment this year); athletic center (with 2 additional phases by 2020, a 4,500 seat center for events with draft plans with parking; Christian leadership Building (satellite and video conference and lecture center opening in May 2013); and plans for additional parking. Parking is close to being maxed out and CSU would need to add more parking with growth in students or student housing. Students pay for parking.

There is minimal transit usage. CSU had a commuter page that offered discounts, and the bookstore sold discount cards to encourage transit. (Note: Team stopped by bookstore and asked if they sold transit passes. They do not, but it is something they plan to look into in the summer since there is service on the campus, and a few students have asked in the past).

More students travel from Dorchester and Berkeley Counties. Students travel from Summerville, Goose Creek, North Charleston, and Hanahan (not likely from downtown Charleston). Approximately 65-75% of the students are from the tri-county area and 80% in state. The location of apartments nearby is convenient for students and they are not moving far away; thus, they may or may not want transit. Congestion occurs on Rivers Avenue and US 78; US 78 to and From Berlin G Meyers to 1st school entrance from Summerville; and Ladson and Jameson, which is the most congested route. I-26 is OK, but US 17-A to Summerville is congested. The school has approximately 152 faculty and 300-350 staff. Employees do not pay for parking

Transit is needed based on volume of traffic; the area has become more congested as more business arrives. Alternative would need to be unique, light rail would be distinctive, and would be harder to sell the BRT as something other than CARTA. Need to ensure the affordability stays intact, and provide discounts for users. US 78/52 (Rivers) alignment makes sense, as well as the Norfolk Southern Rail Line. Alternative should provide commuters from Summerville to CSU service.

Classes start at 8:00 a.m. with congestion at campus heaviest from 7:30 am to 8:00 am, and at 5 p.m. exits are congested with traffic leaving the campus. Athletic season brings some draw on weekends, evenings, i.e. football, basketball and baseball, and this will continue to increase as new facilities come online. CSU does not have any satellite campuses, and none are currently planned for the future. Students would be the best to speak to on transit usage, and student forum would be a good venue to get input. The average student age is 32 to 33 years old, and they are working adult students. The night campus is smaller, with the last class ending at 9:00 p.m.

To consider the study a success: it should provide a direct route for the majority of off campus commuters to the campus, offer options, and incentive to buy annual pass for students.

I-26 Fixed Guideway Alternatives Analysis
Collected Public Comments

	A	B	C	D
1	**Date**	**Source**	**Path**	**Comment**
2	11/17/2014	Meeting #1	Comment Card	Best option we have in long run- need park & ride, bus lanes, HOV, timed on ramps.
3	11/17/2014	Meeting #1	Comment Card	1. I work on leeds ave. and have been there for 1 year. I just found out a bus system runs to there. Advertise existing bus system to get the public to acknowledge its existence, maybe it will gain popularity then acceptance. 2. I have lived in James Island, Downtown, and Mount Pleasant, and I continue to sit still at green lights & see awkward traffic for no reason. Study traffic patterns and recalibrate street lights for smooth flow. 3. Whe did my Geico insurance agent laugh at me over the phone when I questioned why my rates substantially increased on my flawless driving record for my car and motorcycle moving to SC? I think we need to accept the fact that SC has citizens with poor driving habits. Re-evaluate and enforce drivers education across the demographic. 4. I heard a crazy statistic on how motorcycles help offset traffic? Not sure this has ever been done, but maybe offer incentives for on-road, insured, 250cc+ motorcycles. NOT INSURANCELESS DUI SCOOTERS! ** These options utilize existing systems but will require some tear-up, motivation and a dash of good luck.
4	11/17/2014	Meeting #1	Comment Card	Build more of everything! Buses need to be more convenient. They need to run more often.
5	11/17/2014	Meeting #1	Comment Card	Ride under the bridges instead! Explore public- private partnership that would enable ferry service- James Island, Mt. Pleasant, Peninsula Charleston. The public would help finance the necessary infrastructure to enable ferries to dock/undock; And with public's access to the docking areas (foot paths, bike paths, roadway drop offs); many of these may already exist if agreements can be arranged with private owners willing to share its facilities! The waterway corridors already exist and perhaps private investment for ferries and their operation/maintenance could be incentivizes to make it all work!
6	11/17/2014	Meeting #1	Comment Card	1. No more lane additions on I-26 or 526! 2. Carpool! Turn "fast lane" into HOV lane during peak commute hours. Also include park & ride areas. 3. Dedicated bus/rail lines. Show people there is a better alternative. 4. Develop impact fees! Make all new homes (especially in suburban subdivisions) pay for regional improvements. 5. Fix I-26/I-526 Interchanges.
7	11/17/2014	Meeting #1	Comment Card	For funding if SC passed a "Misclassification of workers" bill we would have more tax dollars for projects like this.
8	11/17/2014	Meeting #1	Comment Card	Mass transit has been pushed to the bottom of the list for far too long. We cannot wait for commuters to decide to give up their cars. Mass transit must be a priority and we must fast track funding and construction. Light rail would be the most effective but also take the longest to implement. Perhaps rapid bus while a rail system is being constructed. Short term, covered bus stops with seating would greatly increase ridership which would pump up the numbers to make federal funding more favorable. Glad this is getting the attention it needs but another feasibility study that goes nowhere is frustrating and non-productive.
9	11/18/2014	Meeting #1	Comment Card	Please consider loop routes for "in town" Summerville/Oak Brook Connector
10	11/18/2014	Meeting #1	Comment Card	Lend dignitiy to those using public transit- assure covered/protected wait stations
11	11/18/2014	Meeting #1	Comment Card	Wi-Fi is a MUST!
12	11/18/2014	Meeting #1	Comment Card	Would like to see rail from Summerville, downtown to Charleston City
13	11/18/2014	Meeting #1	Comment Card	I would like to see light transit. I would love to be able to travel to Charleston or the airport via train. Unless the bus stops in front of my house, I am not going to take the bus. If I have to get in my car to go to the bus, I would rather just travel the whole way in my car. We lived near DC and loved taking the train to various parts of the city.
14	11/18/2014	Meeting #1	Comment Card	Having lived in the Washington DC area and used the metro, we are in full support of a light or commuter rail solution to the Summerville/Charleston transit issues
15	11/18/2014	Meeting #1	Comment Card	Quick route from Summerville to MUSC. Takes an hour now via express. Not acceptable commute 5 days a week via express bus. Would rather not ride, but I am in a cast and can't drive. Injured in a bus accident...we need seatbelts! **No problems with bus until 5 weeks ago. Stopped feeling safe.
16	11/18/2014	Meeting #1	Comment Card	I'm all for mass transit. Let's pay for it with private funds not taxes or fees. We pay more than enough taxes & fees.
17	11/18/2014	Meeting #1	Comment Card	I have lived in areas that now have lite rail systems. I have used a monorail system also. I have also used buses- never again if possible. Having worked with railroads, I can not see commuter trains on our 2 existing railroads having priority over revenue freight. I can not see us having space for dedicated roadway such as Atlanta.
18	11/18/2014	Meeting #1	Comment Card	Possibility of widening Rt. 78 to 4 lanes from Summerville? Commuter rail or Amtrak into Charleston? Both possibilities would help. More speeding and less driving tickets could prevent accidents, and traffic jams resulting from accidents.
19	11/18/2014	Meeting #1	Comment Card	We must understand our relationship to the automobile. How many people will use whatever alternative we choose? I prefer the commuter rail or bus that acts like a commuter rail. I go from Summerville to downtown Chalreston 3-4 days a week.
20	11/18/2014	Meeting #1	Comment Card	Are grants from foreign countries and/or private organizations? (NGOS)

I-26 Fixed Guideway Alternatives Analysis
Collected Public Comments

	A	B	C	D
21	11/18/2014	Meeting #1	Comment Card	Most people have reduced the # of trips due to gas cost. They have a planned route for errands. Tracking this on the bus would be impossible. This would be best for job destinations (to and from)
22	11/18/2014	Meeting #1	Comment Card	We can provide zip sort of our employee base to identify commuter potential (Trident Hospital/CSU)
23	11/19/2014	Meeting #1	Comment Card	Whatever we do: 1. keep it sustainable. 2. Don't ruin walkability & bicycling routes 3. Don't split up neighborhoods with highways.
24	11/19/2014	Meeting #1	Comment Card	I have a good plan for ferry service if anyone is interested in looking more deeply at utilizing our already available resources.
25	4/20/2015	Meeting #2	Comment Card	We need TWICE as many buses running twice as often 24/7
26	4/20/2015	Meeting #2	Comment Card	Improve start time and consider express bus for early morning. Improve bus to airport or discontinue.
27	4/20/2015	Meeting #2	Comment Card	Please don't build I-526 - waste of resources
28	4/20/2015	Meeting #2	Comment Card	Please, please give us transportation that is accessible, fast, and affordable
29	4/20/2015	Meeting #2	Comment Card	Reach others more effectively. Maybe have meetings on the buses transit sites, eg. Superstop, N. Charleston
30	4/20/2015	Meeting #2	Comment Card	Don't spend anymore money on I-526. Use it on alternative transportation solutions.
31	4/20/2015	Meeting #2	Comment Card	Is there a study of what people are able to pay or will pay for any transit from Summerville to Charleston? And, will most systems require many auto parking lots along the way? Good job so far!
32	4/20/2015	Meeting #2	Comment Card	I believe BRT is the most viable and cost effective system for the region .
33	4/20/2015	Meeting #2	Comment Card	Provide rail transit to airport
34	4/20/2015	Meeting #2	Comment Card	The counties need to restrict/comtrol/plan the long term expansion. Fill-in what is there.
35	4/20/2015	Meeting #2	Comment Card	More transportation without gentrification.
36	4/20/2015	Meeting #2	Comment Card	More routes, light rais, trains, metros, bullet trains, skyways, monorails
37	4/20/2015	Meeting #2	Comment Card	To be an active part of meetings more advertisements need to be available. At bus stops/in various places so that people can be aware of meetings.
38	4/20/2015	Meeting #2	Comment Card	Gentrificaton: People of color are being pushed out of the city/out of downtown and into areas where transit is not easilty acessible. MORE ACCESSIBLE TRANSIT. ALL HOURS OF DAY.
39	4/20/2015	Meeting #2	Comment Card	I run hungryneck straphangers.
40	4/21/2015	Meeting #2	Comment Card	Would support rapid transit and interested to see how your study plays out for which option is the best for our region – Transit Oriented Development is important.
41	4/21/2015	Meeting #2	Comment Card	Live in Mount Pleasant, North End and commute by car to Sigma Drive in Summerville/Nexton daily. Would like to see clean, fast transit between Summerville, Downtown and Mount Pleasant.
42	4/21/2015	Meeting #2	Comment Card	Please make yourselves comfortable/aware of the current and future projects in the area. I-26 widening will accommodate dedicated bus routes in the fly-by lanes. Please be mindful of residential ability of quiet enjoyment of homes in/near the construction areas. My areas of concern: [1] noise, [2] environmental impact, [3] sinkholes, [4] reducing traffic emissions.
43	4/21/2015	Meeting #2	Comment Card	I trust you will keep our legislators in the know about your findings so they can be looking out for funding. Keep all segments of population and society in mind with decision. Have commercials about your efforts to get the word out more.
44	4/21/2015	Meeting #2	Comment Card	Not enough parking downtown. Good incentive to ride transit as long as there is good connectivity between several destinations. Would have used transit when I got my degree at College of Charleston if it had been available. I regularly ride Amtrak to Philadelphia, Washington, DC, and NY and love their Metro and light rail there.
45	4/21/2015	Meeting #2	Comment Card	Attempted the Express #3 CARTA route, but buses were routinely late picking up at 5:00 PM. A 30-45 minute delay impacts other family responsibilities.
46	4/21/2015	Meeting #2	Comment Card	Service is reasonably accessible. Used to park at Super K-Mart because it was still 7 miles from my home to the one in Summerville.
47	4/22/2015	Meeting #2	Comment Card	Would love to hear more buzz about rail options. I have ridden MARTA all my life in Atlanta until moving here. Such a good alternative in a city who is already green-minded.
48	4/22/2015	Meeting #2	Comment Card	Combination of bus-rail. Possible elevated train/magnetic system. I would like to see the matrix for how the routes were established. Possibility of comparing a point-to-point, to a circular route.
49	4/22/2015	Meeting #2	Comment Card	It is getting harder and harder to find parking downtown.
50	4/22/2015	Meeting #2	Comment Card	Please include bike facilities! Bike lanes alongside transit, bike lockers at transit stations, bike storage space on the buses/trains – more than 2 bikes per bus please.
51	4/22/2015	Meeting #2	Comment Card	I am very pleased that we have the buses to get to work and shopping because I cannot drive and that's the only way for me to get around.

I-26 Fixed Guideway Alternatives Analysis
Collected Public Comments

	A	B	C	D
52	4/22/2015	Meeting #2	Comment Card	Alternate to I-26 but also eventually US 17. More service times and upgrades to existing buses. Hopefully light rail in the near future.
53	4/22/2015	Meeting #2	Comment Card	Get traffic off the roads! Use water taxis and make Charleston area another Venice of the Lowcountry!
54	9/24/2015	Meeting #3	Comment Card	Funds should be spent on existing transit system and light rail. The existing system needs to be upgraded with more modern buses, more visible and safe stops. The current system will have to provide a way for riders to access light rail. Light rail will attract riders who would not normally ride a bus. We will have to do both in 2050.
55	9/24/2015	Meeting #3	Comment Card	Desperately need rapid transit. Nor more road widening. No more tree clearing.
56	9/24/2015	Meeting #3	Comment Card	We have got to do something in this area.
57	9/24/2015	Meeting #3	Comment Card	Besides having scores and cost numbers, it would also be useful to come up with some numbers on estimated commute times for people likely to ride the system compared to driving a car. You have to get people out of their cars – eventually I-26 will be a parking lot. Estimate times for the future: 2020, 2030, etc.
58	9/24/2015	Meeting #3	Comment Card	Driver education, traffic management (getting vehicles off the road). Things you can do now –traffic czar, education and incentivizing.
59	9/24/2015	Meeting #3	Comment Card	Need to improve existing now and work toward a BRT; SCDOT traffic Czar; Daily Radio info on congestion and alternative routes; Helpful tips on reducing accidents; Rapid removal of stalled vehicles and accidents without personal injuries; Incentivize drivers to not travel during peak hours; Possible user fees for I-26 drivers during peak hours; Create I-26 community to work together to ease traffic flow versus current "every man for himself"; More cameras and consequences for poor driving behaviors during rush hour.
60	9/28/2015	Meeting #3	Comment Card	I do not ride transit because of the bus times. I would love to ride transit if convenient.
61	9/28/2015	Meeting #3	Comment Card	The presentation was very informative. I would rather go online and read more about. I think I would like the hybrid better.
62	9/28/2015	Meeting #3	Comment Card	Excellent work and extremely comprehensive. Thanks!
63	9/28/2015	Meeting #3	Comment Card	Frustrated that the current bus system leaves before the scheduled time.
64	9/28/2015	Meeting #3	Comment Card	Need fixed guideway or BRT but also add HOV lanes on I-26 and I-526.
65	9/28/2015	Meeting #3	Comment Card	Charleston and North Charleston need smaller buses coming more often on many routes.
66	9/28/2015	Meeting #3	Comment Card	Extend CARTA service to Folly.
67	9/28/2015	Meeting #3	Comment Card	How much of current commuters are you capturing on CARTA? How many commuters have no way to take CARTA? (i.e. It doesn't go where they need to go? It does not come near their origin?) What's your goal – number or percent of commuters you hope to take off I-26 through this plan? Has there been a region wide O-D study to assess all commuters?
68	9/28/2015	Meeting #3	Comment Card	BRT seems like the only reasonable option considering immediate need and limited funds.
69	9/28/2015	Meeting #3	Comment Card	BRT as initial investment then work on a long term solution.
70	9/28/2015	Meeting #3	Comment Card	The 26-30 [age] group wants to not spend money on cars, insurance, maintenance, and parking. Strong vote for light rail. Invest in light rail that can carry more people and take more time to build. Future planning and costs pay off.
71	9/28/2015	Meeting #3	Comment Card	Uber water taxis for the multiple bridges in the Charleston area.
72	9/28/2015	Meeting #3	Comment Card	BRT is more feasible – hopefully that's the locally preferred option!
73	9/28/2015	Meeting #3	Comment Card	This [new] system seems to relieve a lot of problems with the existing system such as lack of efficiency. I also think reducing traffic congestion is important.
74	9/28/2015	Meeting #3	Comment Card	I prefer BRT.
75	9/28/2015	Meeting #3	Comment Card	Either BRT or LRT.
76	9/28/2015	Meeting #3	Comment Card	I encourage you to pick BRT.
77	9/29/2015	Meeting #3	Comment Card	I would like a new fixed guideway transit system.
78	9/29/2015	Meeting #3	Comment Card	We need this yesterday for safety and smart growth. Thank you for trying to implement this.
79	9/29/2015	Meeting #3	Comment Card	I would prefer light rail (more predictable, would encourage more permanent development near stations). However due to cost and ROW constraints, I might choose BRT as more feasible.
80	9/29/2015	Meeting #3	Comment Card	½ cent sales tax that should not be for roads. It should be to build dedicated lanes for BRT, signal priority technology. Also for bike lanes and sidewalks.
81	9/29/2015	Meeting #3	Comment Card	Rail transit.
82	9/29/2015	Meeting #3	Comment Card	In addition to a new fixed guideway system I would invest in bicycle infrastructure (protected bike lanes, painted bike boxes at intersections, etc.). I would also put money/effort toward updating zoning to establish an urban growth boundary and discourage future sprawl development.

I-26 Fixed Guideway Alternatives Analysis
Collected Public Comments

	A	B	C	D
83	9/29/2015	Meeting #3	Comment Card	Want 60% of funds to go toward monorail and 40% toward new roads, better merge lanes.
84	9/29/2015	Meeting #3	Comment Card	Please do not do anything that encourages more single-occupancy car driving (e.g. widening I-26)! Provide incentives for people to get out of their cars.
85	9/29/2015	Meeting #3	Comment Card	Incorporate bike racks and other mechanisms to make it easier for people to bike to and from transit stations.
86	9/29/2015	Meeting #3	Comment Card	The system needs to provide direct access to the airport and to Boeing. None of the options effectively do this.
87	1/25/2016	Meeting #4	Comment Card	Automated electronic payment; elevated/entry level platforms; express routes; covered modern shelters; BRT with traffic signal override; Rivers Avenue corridor.
88	1/25/2016	Meeting #4	Comment Card	I-26ALT is the best!
89	1/26/2016	Meeting #4	Comment Card	The City and CARTA should make designated bus lanes down Rivers and US 17 for example until the i-26ALT is completed to speed up the service that exists now.
90	1/26/2016	Meeting #4	Comment Card	I support the BRT option.
91	1/26/2016	Meeting #4	Comment Card	Provide added BRT loops to airport and further downtown – perhaps around past aquarium (Concord St.) to Calhoun Street then circle around MUSC complex. Give further consideration to having the terminus at E. Bay and Calhoun.
92	1/28/2016	Meeting #4	Comment Card	No matter how attractive and cost effective the bus system will be there are certain segments of the population that will never ride a bus.
93	1/28/2016	Meeting #4	Comment Card	BRT: Excessive long distance travel time; make it a plug-in hybrid; $10 is not cost competitive to cars (at least to me); many ROW issues including insufficient/unused ROW, interference with existing high traffic.
94	1/28/2016	Meeting #4	Comment Card	Thank you for the information. We need to move on mass transit ASAP.
95	11/18/2014	e-mail	BCDCOG	I was listening to the radio this morning, while sitting in traffic, and heard your interview at the public meeting last night regarding the I-26 corridor. I wanted to share a couple ideas I have seen recently that may be a good fit for the I-26 corridor in addition to the options you are considering. The following is a link to Georgia DOT's fall 2014 newslwtter: http://www.dot.ga.gov/informationcenter/pressroom/Documents/publications/MilepostFall2014.pdf. There is an article on page 4 that discusses express lanes and their use in urban areas, specifically Atlanta. The concept is that you have one lane reserved as a toll lane so that people who would like to pay to drive in less traffic can do so, at a determined cost. You could also put your express buses in this lane to move people faster using mass transit. Of course there would have to be some research to see what the cost per vehicle would need to be to prevent congestion in the express lane, but it is an option that does not require widening. The piggy backs of the larger concept of "congestion pricing" which regulates the supply and demand of roadways by charging a fee during peak usage periods. Here is a link to more info: http://en.wikipedia.org/wiki/Congestion pricing. These are just my personal comments / ideas on the problem that I thought I would share, good luck with your project and the public meetings. Thanks!
96	12/1/2014	Mail	BCDCOG	Wonderful that the COG is exploring all options before it is too late due to massive traffic increases and new houses being built for population increases. We must increase the availability of various public transit systems including light rail, commuter rail and others that ... CARTA has done a great job in expanding its service nad frequency. In addition to theses infrastructure improvements, the new appraoch should also include working with Chambers of Commerce and the largest employer (by workforce numbers) to develop staggered start and end work times to reduce the problems of traffic james/problems during traditional commute times. Note - I ride CARTA and picked this up during morning commute from Mt. Pleasant to Charleston.
97	12/7/2014	Mail	BCDCOG	I am sorry I had not written back sooner, but I had some health problems I had to take care of. I have looked over everything you sent me, but I think there is not enough people in the area for anything to work financially. Plus, I sense the federal government is technically broke and the state government cannot support maintenance of roads and bridges and the local governments I think has borrow[ed] so much money for to many other projects with TIF, local taxes. I do not [think] they can afford any more projects. Local governments cannot afford CARTA system because they always changing and dropping routes to save money.
98	1/26/2015	Website Comment	i26alt Web	I support and commend your efforts to get a fixed public transport system in from Summerville to Charleston. I live in Summerville and have long wanted an alternative to driving. I am retired so would use it for leisure purposes to reach downtown Charleston. I realize this route is your priority, and urge you also to at least keep in mind the need to extend the route to Columbia at some point, and even to Greenville/Spartanburg as well. Thank you.
99	1/27/2015	Website Comment	i26alt Web	I ride the #12 route daily to get to and from work, from my home at Wescott Plantation (Dorch.Rd) to the Old Navy Base, and am glad for it. Letting someone else handle the stress of rush-hour traffic keeps my blood pressure down, gives me welcome reading time, and saves me expenses of gas and maintenance on my vehicle. Though a light rail would be faster and probably more comfortable, it would, more importantly, relieve the congestion on Dorch. Road caused by traffic to Bosch, AFB, Boeing, and Airport as well as those seeking access to 26 via Michaux Parkway...thanks!

I-26 Fixed Guideway Alternatives Analysis
Collected Public Comments

	A	B	C	D
100	4/16/2015	Website Comment	i26alt Web	I am very excited to hear about this effort and completely support an alternative mode of transportation on I-26!! I think it will benefit air quality, decrease car accidents, and improve overall quality of life in this area. Thank you for considering impacts to natural resources as well when you think about siting. All the best, Lauren Long.
101	4/29/2015	Website Comment	i26alt Web	To whom it may concern: As my husband's caregiver I could not attend your public hearings. However, I fully support finding a cost-effective way to improve the transportation corridor along I16 from Summerville to Charleston. If it means a dedicated bus lane, that would be better than nothing. If economically feasible, especially with Boeing's presence, it would be better to have a real high-speed transportation system. Thank you.
102	5/5/2015	Website Comment	i26alt Web	Thank you for taking the time to answer questions about the project this morning, I appreciated the additional detail. If the team is looking for any volunteers from the community to assist, please feel free to pass along my information. I am a member of the Board of Directors for my HOA and a Project Manager at Benefitfocus, a software company on Daniel Island. I'm happy to assist in any way I can.
103	5/5/2015	Website Comment	i26alt Web	I have a solution...stop growing charleston. Grow out from summerville, Hollywood, goose creek, and mount pleasant. Spread the wealth of over population around. These people allowed builders to come in and build thousands of homes on the land the size of a postage stamp. People got rich and others got screwed. Pretty funny the person wanting to talk about 126 traffic was caught in traffic...welcome to our hell.
104	9/22/2015	Website Comment	i26alt Web	1. How much with the Fed DOT contribute? 2. The Bus Rapid Transit (BRtT) seems to be cheaper, more flexible, and faster to complete. What are the disadvantages? 3. The BRT would involve building a complete new, separate road? 4. Could the BRT road be expanded to include an additional Toll road, to encourage large 18-wheelers at first, maybe expanding to others. later? An electric Toll option, just for 18 wheelers might help reduce congestion and maintenacne costs. 5. Is it cost prohibative to consider building solar capability into the road shoulders [non-traffic areas], along with storage cells to provide power for lighting, etc. 6. Is there any consideration for solar, electric buses? Or a potential Next Generation option? 7. Google and Apple are working on 'self-driving' capabilities within 4 years. Might these options be considered as opart of the plan to reduce some costs, while potentially increasing safety?
105	9/22/2015	Website Comment	i26alt Web	I think light rail is a great idea, but the problem is that the final destinations for everyone is spread out. It would be great to have term parking lot rentals at the rail drop off locations. Someone can drive to the departure station, ride the rail to their destination station and then take their car from station lot to work location. Or have buses ready to drop people at their final work destinations from the rail stations. Cheap small smart car daily rentals available at the rail stations would work as well. PS - Fix Glenn McConnell. Kill the West Ashley High School stop light. It reeks havoc on everyone coming from Bees Ferry. Make it a traffic circle!!! People are getting angry and ready to fight with each other every morning. To make decent time to work, I have to leave Village Green on 61, cut through Shadowmoss, then get on Bees Ferry, pass through the Glenn McConnell stop light, take back road into Carolina Bay, cut through Carolina Bay, turn left onto Savannah Highway, then merge onto 526 just to get to my job at 550 Long Point Road in Mount Pleasant within a decent time. Otherwise, i will have to sit at the Bees Ferry/Glenn McConnell stop light to turn left for over 40 minutes thanks to the West Ashley stop light at Mary Ader. This would not happen if we had traffic circles like Mount Pleasant.
106	9/24/2015	Website Comment	i26alt Web	I think light rail is a great idea, but the problem is that the final destinations for everyone is spread out. It would be great to have long term parking lot rentals at the rail drop off locations. Someone can drive to the departure station, ride the rail to their destination station and then take their car from station lot to drive to work location. Or have buses ready to drop off people at their final work destinations from the rail stations. Cheap small smart car daily rentals available at the rail stations would work as well. PS - Fix Glen McConnell. Kill the West Ashley High School stop light. It reeks havoc on everyone coming from Bees Ferry. Make it a traffic circle!!! People are getting angry and ready to fight with each other every morning. To make decent time to work, I have to leave Village Green on 61, cut through Shadowmoss, then get on Bees Ferry, pass through the Glenn McConnell stop light, take back road into Carolina Bay, cut through Carolina Bay, turn left onto Savannah Hwy, then merge onto 526 just to get to my job at 550 Long Point Road in Mount Pleasant within a decent time. Otherwise, I will have to sit at the Bees Ferry/Glen McConnell stop light to turn left for over 40 minutes thanks to the West Ashley High School stop light at Mary Ader. This wouldn't happen if we had traffic circles like Mount Pleasant.
107	1/20/2016	Website Comment	i26alt Web	Great. Another waste of time. Affluent people will NOT ride buses. Stop with the buses already. They may be the cheapest option, but they will certainly never be the most utilized.

MEETING SUMMARY

I-26 Fixed Guideway Alternatives Analysis

Public Meetings – November 17-19, 2014

PURPOSE: I-26 Fixed Guideway Alternatives Analysis (Public Meeting #1)

ATTENDANCE: Sign-In sheets available upon request

Presentation Outline:

I. Project Overview
II. Project Partners
III. Study Process
   a. Pre-Project Development
   b. Comprehensive Operational Analysis
   c. Fixed Guideway Alternatives Analysis of I-26 Corridor
   d. Federal Transit Administration (FTA) Coordination
   e. Public Involvement
IV. Fixed Guideway Alternatives Analysis
V. Funding a Regional System
VI. Next Steps

Meeting Summary:

The first round of I-26 Fixed Guideway Alternative Analysis public meetings was held in November, 2014 in Summerville, North Charleston and Charleston. The following presents the meeting locations and times:

1. ***Downtown Charleston*** –
   Charleston Progressive Academy
   Monday, November 17, 2014
   6:00 PM – 8:00 PM
2. ***Summerville*** –
   Rollings Middle School of the Arts
   Tuesday, November 18, 2014
   7:00 PM – 9:00 PM
3. ***North Charleston*** –
   North Charleston High School
   Wednesday, November 19, 2014
   6:00 PM – 8:00 PM

A total of 87 persons attended these meetings: Summerville (41), North Charleston (21) and Charleston (25).

The meetings' proceedings consisted of a short welcome and project overview, which covered the planning process and set the expectations of the night. Emphasis was placed on creating a public dialogue about public transit in the region and encouraged the public to voice their opinions on what they envisioned for the region today as well as 20 years in the future.

Meeting presentations in Summerville (top left), Downtown Charleston (top right), and North Charleston (bottom).

Attendees were invited to circulate the meeting room and visit the project stations, which included:

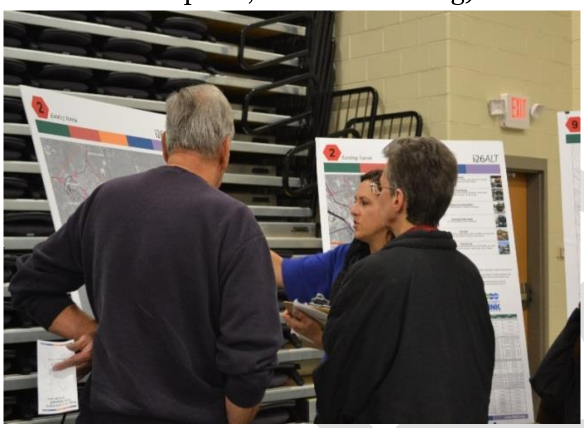
- Station 1: Study Process Overview
- Station 2: Existing Transit
- Station 3: I-26 Corridor Regional Transit Alternatives
- Station 4: Funding Alternatives
- CARTA station

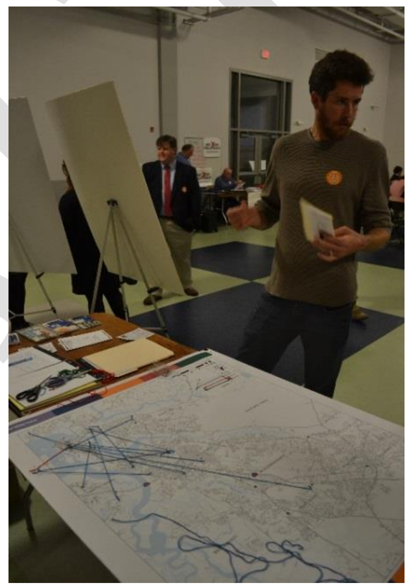
Each station had pre-defined exercises and materials to solicit input from the public and inform the process moving forward. All station boards/presentation materials are provided in the appendix.

Station 2: Existing Transit provided information about the CARTA system and TriCounty Link routes and connections on three (3) project boards. This station solicited input from attendees with respect to how they currently use transit: does transit serves their needs; if they don't use transit, what might make them use transit; what works well in the system, and what does not work well; where transit stops, transfer locations, and commuter services are needed; and any additional suggestion to improve the current system. Facilitators at this station included a mix of staff from Davis & Floyd and BCDCOG.

Station 3: I-26 Corridor Regional Transit Alternatives had five (5) project boards including an overview of the universe of transit alternatives boards, the corridor's potential alignments and an interactive "Draw Your Commute" map. This exercise sought to determine how travelers make their commute along the corridor and by what mode. Input was also solicited on what potential transit modes the corridor might sustain and along what alignments. Facilitators at this station included staff from both Davis & Floyd and BCDCOG.

Station 4: Funding Alternatives sought to gain input from participants on how a new system might be funded. A "Transit Funding" board provided information on current trends of transit funding for the region and also provided information on the various funding mechanisms that are available to such projects. An interactive exercise provided participants with $100 (project money) and asked to them to distribute it across the various funding sources (local or state fees, local or state taxes, public bonds, federal grant programs, local value capture, other financing) that they think should finance a future transit option. Participants were also encouraged to provide comment on any creative financing ideas that might be considered. Facilitators included staff from both Davis & Floyd and BCDCOG.





Station 2: Existing Transit; Station 3: Dreaw Your Commute

Feedback and Comments:

The following provides the most prominent themes and insights arising from the three public meetings.

STATION 2: Existing Transit

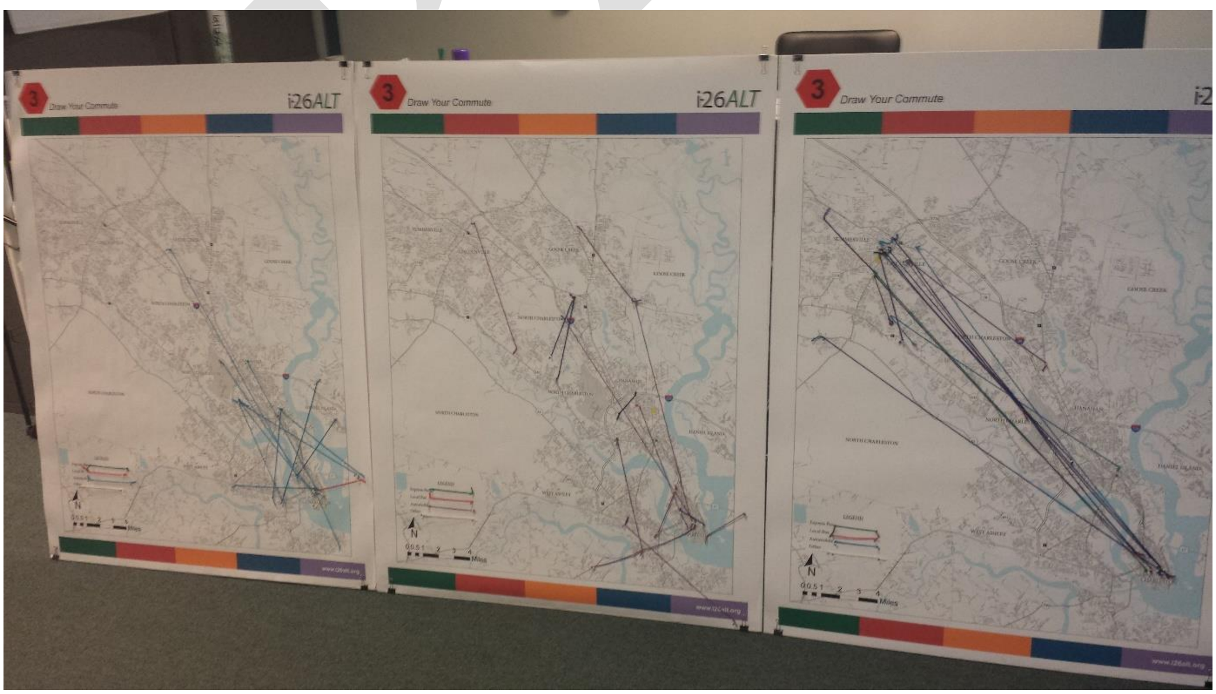
Some of the comments made by attendees about the current transit system were consistent from one location to the next. The themes that were recurrent at all locations included:

- There is a need for current services to be more frequent, on-time, and overall reliable.
- Service hours need to be extended to accommodate workers who get off work late or for late night activities.

- Many non-riders expressed that the services offered by CARTA need to be better advertised to users. By increasing public awareness of service or service visibility through better advertising, there might be a positive impact on the use of the service.
- Current service needs to be more in tune with the needs of regional workers especially shift workers who get off work after transit routes stop operating.
- Better east-west connections to new and growing employment areas (West Ashley, Mt. Pleasant, Highway 41, etc.) are needed.
- Increase worker mobility.
- Some services are good, especially the express routes, trolley services and NASH service from the airport to downtown.
- New developments should pay for improvements and infrastructure like sidewalks, etc. New developments should be planned with transit access in mind.
- There needs to be a shift in attitudes toward transit in the region. Transit and other alternative modes need to be more present in forms such as bike lanes, more complete sidewalk infrastructure, better signage, more Park & Ride facilities, or making driving in certain areas less convenient (making parking downtown less desirable).
- The current transportation system still has opportunities to improve mobility through HOV lanes, carpooling, ramp metering, or better infrastructure for non-motorized modes (sidewalks/trails), which would improve current access to transit and could encourage current use of system.

STATION 3: I-26 Corridor Regional Transit Alternatives

The major mode of transportation used by attendees was the private automobile. The major trend of Summerville commuters was movement along the corridor from Summerville to Downtown Charleston. Attendees to the North Charleston and Downtown Charleston meetings made shorter commutes as well as east-west trips across the corridor.

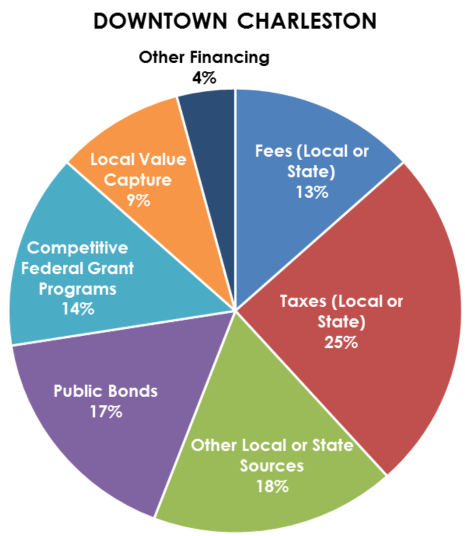


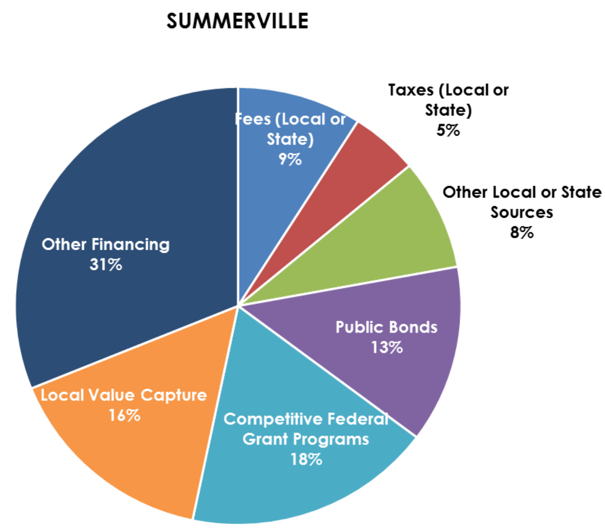
Draw your commute boards from Downtown Charleston, North Charleston and Summerville meeting locations (left to right).

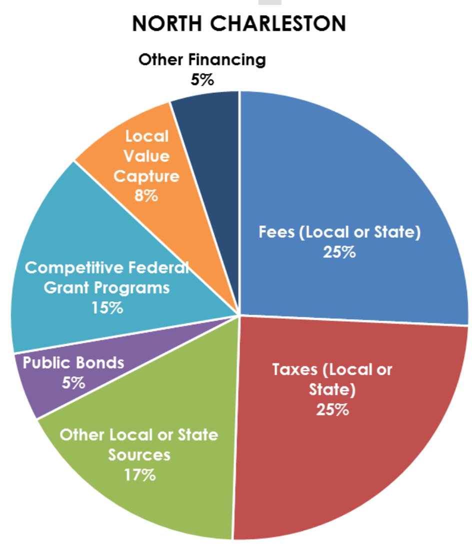
Attendees also stated that a regional transit alternative was needed to improve mobility within the region. Summerville participants were most vocal about the use of a rail alternative. Commuter bus or BRT services were identified by Summerville attendees as the least desirable alternative.

STATION 4: Funding

All sources of funding were considered at the three meeting locations. Attendees considered all suggested funding categories; no option was excluded. Funding through local and state sources (fees, taxes, and other sources) seemed to be more heavily weighted by participants at the Downtown Charleston and North Charleston locations.







Additonal comments made in regards to project funding included the use of impact fees, vehicle inspection fees, vehicle registration fees, increasing the fuel tax, using revenues from a half cent sales tax, and toll roads. Suggstions from the Summerville location included funding should come fully from private sources, while one attendee expressed that a transit alternative project should not be funded.

MEETING SUMMARY

I-26 Fixed Guideway Alternatives Analysis

Public Meetings – April 20-22, 2015

PURPOSE: I-26 Fixed Guideway Alternatives Analysis (Public Meeting #2)

ATTENDANCE: Sign-In sheets available upon request

Presentation Outline:

I. Project Overview
II. Comprehensive Operational Analysis
III. I-26 Alternatives Analysis
   a. Pre-Screening
   b. Conceptual Alignments
   c. Transit Modes
IV. Screening Priorities
V. Station Area Planning
VI. Next Steps

Meeting Summary:

The second round of I-26 Fixed Guideway Alternative Analysis public meetings was held in April, 2015 in Summerville, North Charleston and Charleston at the following meeting locations:

1. ***Downtown Charleston*** –
   Charleston Progressive Academy
   April 20, 2015
   6:00 PM – 8:00 PM
2. ***Summerville*** –
   Bethany United Methodist Church
   April 21, 2015
   7:00 PM – 9:00 PM
3. ***North Charleston*** –
   North Charleston High School
   April 22, 2015
   6:00 PM – 8:00 PM

A total of 84 persons attended these meetings: Summerville (32), North Charleston (21) and Charleston (31).

Building on input from the first round of public meetings and community outreach, these public meetings focused on existing transit, transit alternatives, environmental and community goals, land use, and funding alternatives. Emphasis was placed on creating a public dialogue about the presented topic areas and encouraged the public to voice their opinion on what they envisioned for the region today as well as 20 years in the future.

The following provides an overview of the project stations:

Downtown Charleston Public Meeting

North Charleston Public Meeting Presentation

- Station 1: Planning Process – Provided general project information and overall purpose of the project. Supporting material included a project fact sheet, project newsletter (March, 2015), informational brochure (English and Spanish versions), and general comment cards for community feedback.
- Station 2: Existing Transit – Provided an opportunity for participants to comment on the current/existing transit system. This station solicited input from participants on how they utilize the current transit system, as well as opportunities for improvement. A Comprehensive Operational Analysis Transit Questionnaire was provided to guide conversation and prompt input to questions concerning current level of service (route frequency, scheduled operating time, and weekday/weekend service); route connections (recommended route segment modifications); route efficiency (combining or splitting routes); route alignments (transit stop additions or removal); identification of route markets (extension of existing or introduction of new routes); potential transfer centers and bus stops (transfer centers and hub locations, need for shelter/bench or other amenities); and overall transit priorities (short, mid- and long term).
- Station 3: Transit Alternatives – Provided summary information on the transit modes under consideration (commuter rail, bus rapid transit (BRT), and light rail transit (LRT)), and the alignments along which each mode could potentially operate in the region. This station provided participants with the opportunity to vote for their preferred transit mode and alignment. Feedback from this exercise provided preliminary insight into which modes/alignments are most favored by the community and why.
- Station 4: Environmental and Community Goals – The community goals were presented for public comment. Supporting material included a composite map of the area's environmental and historic resources (wetlands, historic sites and districts, protected lands, etc.), and identification of transit dependent groups (minorities, disabled, zero vehicle households, elderly, youth, college aged, and Limited English Proficiency (LEP) populations).
- Station 5: Land Use – Provided a summary map of the current land use along the I-26 corridor, a synthesis map of areas identified in other planning studies (current/future) that

support high capacity transit, and a map of proposed station area typologies which identified four TOD station area types with their accompanying densities and land uses.

- Station 6: Funding Alternatives – Provided an overview of potential funding sources for fixed guideway projects. Participants were encouraged to comment on how they might fund a proposed fixed guideway system.

Each station was staffed by facilitators from the BCDCOG and/or the Davis & Floyd study team. Representatives from CARTA were also present to answer questions as needed.

Feedback and Comments:

The following provides the most prominent themes and insights arising from the three public meetings. A comprehensive list of all comments made at each meeting location can be found in the individual meeting summaries recorded.

Comments:

- Transit services need to be expanded to the Summerville, Goose Creek, and Moncks Corner areas.
- Consideration needs to be given on how the system could be extended to other corridors like Mount Pleasant, West Ashley, and James Island in the future.
- Transit service need to be more frequent and well timed to accommodate transfers.
- Charlotte's LRT system has produced great revitalization/development opportunities for the city. (This can be applied here in Charleston)
- CARTA should have a local route to Summerville.
- Need to improve pedestrian access to current routes and stop locations (facilities and infrastructure surrounding stop locations).
- The current CARTA service needs to be better advertised. The public needs to be better informed about the current bus system and how to use the system and the facilities.
- Schedules and maps need to be easier to read, and should be posted or made available at all shelters.
- The Rivers Avenue Corridor should be strongly considered because people along that corridor greatly depend on the existing bus system. It also passes through the Neck communities that have high populations without access to personal vehicles and offers many of them required access to jobs on the peninsula.
- Major roadways such as Savannah Highway, Dorchester Road, Rivers Avenue, US 17 (Mount Pleasant) should utilize signal priority to move the buses more efficiently along the roadways.
- US 52 needs express service from Goose Creek into North Charleston and Downtown Charleston.
- CARTA needs to develop more business partnerships to help fund the system.
- Partnerships with the school system need to be explored to offer service to juniors/seniors.
- Consider the use of water taxis in the region.
- Some attendees noted that rail would be a nice option, but they would support an alternative that can be implemented relatively quickly.
- More park-and-ride options should be made available to users.

- Parking in Downtown Charleston has become difficult.
- Future system should be flexible and able to adapt as needs evolve.

Transit Survey:

Participants were also provided with a transit survey to determine current transit use and attitudes toward service. The survey provided preliminary insight into public support for a fixed guideway system. Of the participants giving feedback the following results/comments were recorded:

- Most participants did not use transit because they are unaware of the service offered (schedule times, fares, where routes go, how to use, etc.), service times are not convenient, service is unreliable or not frequent enough, don't have enough late night service, buses don't offer service to employment areas, access to/from routes are limited.
- Persons would consider using transit if service was reliable (on time) and frequent, provided better night and weekend service, had accessible routes, and included service to Summerville and beach area; if buses had their own lane, service was BRT or light rail, or more direct/express service.
- Of the 32 participants providing feedback on the transit mode they would ride, 29 would use commuter rail, 26 would use bus rapid transit, 30 would use light rail transit, and 20 would utilize park-and-ride/express bus service.

Transit Alternatives Votes:

Each meeting attendee was provided with one dot to place on the boards with their preferred mode/corridor; based on the information provided at the meeting. A total of 46 votes were collected and summarized in the table below. BRT on US 78/US52 received the most votes, at 18.

Alignment	Mode	Corridor	Description	Charleston	Summerville	North Charleston	Total
Alignment 1	BRT	SCE&G-Utility Corridor	SCE&G/Azalea to 78/52		6		**6**
Alignment 2	LRT	SCE&G-Utility Corridor	SCE&G/Azalea to 78/52	1	1	1	**3**
Alignment 3	BRT	Dorchester Road	Old Trolley, Dorchester to 78/52				**0**
Alignment 4	LRT	Dorchester Road	Old Trolley, Dorchester to 78/52		1	1	**2**
Alignment 5	CR	Norfolk Southern	Norfolk Southern Rail Line from 17A to Mt Pleasant		3		**3**
Alignment 6	BRT	US 78/US52	US 78 & US52	5	5	8	**18**
Alignment 7	LRT	US 78/US52	US 78 & US52	2	3	4	**9**
Alignment 8	BRT/CMR	US78/CSX	BRT-US 78; CR - CSX		3		**3**
Alignment 9	BRT	176/Santee Cooper	176 to Santee Cooper/SCE&G				**0**
Alignment 10	LRT	176/Santee Cooper	176 to Santee Cooper/SCE&G		1	1	**2**
Alignment 11	BRT	US52	176 to US 52				**0**
Alignment 12	LRT	US 52	176 to US52				**0**
Alignment 13	BRT/CR	176/52/CSX	BRT-176/52; CR CSX				**0**
I26	BRT	I-26	I26				**0**
I26	LRT	I-26	I26				**0**
			Total	**8**	**23**	**15**	**46**

MEETING SUMMARY

I-26 Fixed Guideway Alternatives Analysis

Public Meetings – September 24, 28 & 29, 2015

PURPOSE: I-26 Fixed Guideway Alternatives Analysis (Public Meeting #3)

ATTENDANCE: Sign-In sheets available upon request

Presentation Outline:

I. Project Overview

II. Project Update
   a. CARTA Comprehensive Operational Analysis
   b. Peer City Review
   c. Pre-Screen Alignments

III. Screen One Alternatives Analysis
   a. Screen One: Analysis Criteria
   b. Screen One: Alternatives Ranking
   c. Transit Modes

IV. Screen Two Alternatives

V. Imagine an Alternative

VI. Next Steps

Meeting Summary:

The third round of I-26 Fixed Guideway Alternative Analysis public meetings was held in September, 2015 in Summerville, North Charleston and Charleston at the following meeting locations:

1. ***Summerville*** –
   Bethany United Methodist Church
   September 24, 2015
   7:00 PM – 9:00 PM
2. ***Charleston*** –
   Charleston Museum
   September 28, 2015
   6:00 PM – 8:00 PM
3. ***North Charleston*** –
   North Charleston City Hall
   September 29, 2015
   6:00 PM – 8:00 PM

A total of 79 persons attended these meetings: Summerville (25), North Charleston (21) and Charleston (33).

This round of meetings provided results from the CARTA system passenger ridecheck survey conducted during November 2014 and January/February 2015; a peer review of select BRT, LRT, Commuter Rail and Hybrid Rail transit systems from around the United States; results of the Initial Alternatives Screening: Screen One Analysis; and a summary of the BRT and LRT alternative alignments that are recommended to move forward into the more detailed Screen Two Analysis. Screen Two will estimate ridership, as well as refine the construction and annual operating costs for each alternative. The team will test each alternative against the FTA's criteria for projects in the Capital Investment Grant program to identify which alternative best competes for federal funds. The results of this screening will provide the necessary information to identify a locally preferred alternative to move forward into further refinement and project development.

Although preliminary insights were presented, participants were encouraged to provide feedback on the project materials to date. Project materials were organized by station and facilitated discussions were encouraged at each station location. The following provides an overview of the project stations:

- Stations 1 & 2: Existing Transit System and CARTA System Evaluation – Provided summary survey results obtained from the CARTA system ridecheck survey as well as results from the *CARTA Comprehensive Operational Analysis – System and Service Analysis* conducted by the project team. This station also solicited input from attendees with respect to how they currently use transit, if transit serves their purpose, if they don't use transit what might make them use transit, what works well in the system, what does not work well in the system, comments on stop and transfer locations, commuter services, and any additional suggestion to improve the current system.
- Stations 3, 4 & 5: Peer City Review, Rail Alternatives and Bus Alternatives – Informational boards providing definitions and typical characteristics of Light Rail Transit (LRT), Commuter Rail, Commuter Bus and Bus Rapid Transit (BRT) technologies. The Peer City Review provided a summary of select BRT, LRT, Commuter Rail and Hybrid Rail transit systems operating in the United States. Case studies are intended to provide background information on the planning and implementation of the systems identified. Focus was placed on illustrating the local conditions that spurred the need for the identified transit system; asset and right-of-way acquisitions required; system operations (span of service, service frequency, price of one-way trip, etc.); system stations (number and spacing, general design and amenities included, etc.); vehicles (type of vehicle, seating capacity, procurement costs, etc.); project capital costs and funding sources (federal, state, local, or other sources); current system performance (average daily/annual riders, operating cost per hour, etc.); and any project experiences that would serve to better inform the I-26 Alternatives Analysis process.

- Station 6: Pre-Screen Analysis – Reference board providing a comprehensive list of all alignments (utility, rail, roadway, and water corridors) initially identified for the I-26 Corridor from stakeholder meetings, community outreach, steering and technical committee meetings, field surveys, and planning study reviews.
- Station 7: Screen One: Initial Screening – Summary of the criteria used to rank the suitability of the identified alignments and the top ranked alternative alignment and mode combinations recommended to move forward into the Screen Two Analysis. Results from the Screen One Analysis with input from the project steering and technical advisory committees, identified two modes (BRT and LRT), and three alignments (Dorchester Road, US 78/US52, and US 176/US 52) to advance into the more detailed Screen Two Analysis.
- Station 8: Screen Two: Detailed Screening – Interactive station where participants were asked to vote for their preferred alignment (Dorchester Road, US 78/US 52 or US 176/US 52) and transit mode (BRT or LRT). Participants were also asked to vote for their preferred downtown alignment, either along Meeting Street ending at Line Street or along East Bay Street ending at Calhoun Street.
- Station 9: What does traffic congestion mean to you? – Interactive station requiring participants to appropriate "$100 dollars" toward relief from congestion. Participants could invest their money in the current transit system, build a new fixed guideway alternative (i-26*ALT*), invest in other solutions (carpooling, new roads, etc.), or they may choose to not invest any money on relieving traffic congestion.

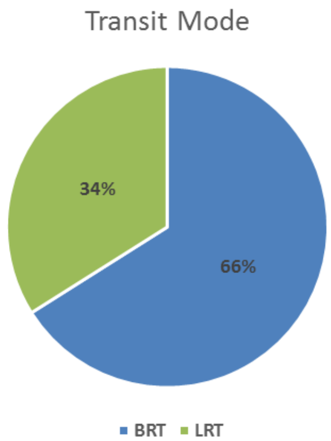
Each station was staffed by facilitators from the BCDCOG and/or the Davis & Floyd study team. CARTA staff was also present to answer questions from the public as needed. The following results/comments were noted.

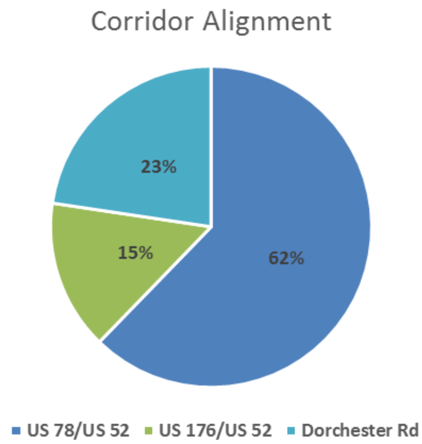
A total of 54 participants voted for their preferred Screen Two alternative at the three area meetings. The most supported alternative was the B-1: US 78/US52/Meeting BRT alternative with 23% of the votes. Overall, the most supported corridor was the US 78/US 52 corridor.

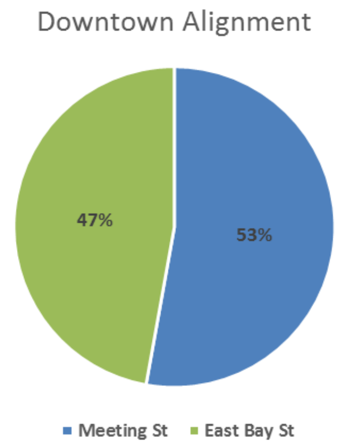
	Summerville	North Charleston	Charleston	TOTAL VOTES	%
A: No Build - Commuter Bus	0	0	1	**1**	**2%**
B-1: US 78/US 52/Meeting BRT	5.5	4	3	**12.5**	**23%**
B-2: US 78/US 52/Meeting LRT	1	2	3	**6**	**11%**
B-3: US 78/US 52/East Bay BRT	1.5	2	6	**9.5**	**18%**
B-4: US 78/US 52/East Bay LRT	1	2	2	**5**	**9%**
C-1: US 176/US 52/Meeting BRT	1	0	2	**3**	**6%**
C-2: US 176/US 52/Meeting LRT	0	0	0	**0**	**0%**
C-3: US 176/US 52/East Bay BRT	0	1	1	**2**	**4%**
C-4: US 176/US 52/East Bay LRT	2	0	1	**3**	**6%**
D-1: Dorchester Rd/US 52/Meeting BRT	2	2	0	**4**	**7%**
D-2: Dorchester Rd/US 52/Meeting LRT	1.5	1	0	**2.5**	**5%**
D-3: Dorchester Rd/US 52/East Bay BRT	2	1	1	**4**	**7%**
D-4: Dorchester Rd/US 52/East Bay LRT	1.5	0	0	**1.5**	**3%**
TOTAL	**19**	**15**	**20**	**54**	**100%**

Of the 53 participants voting for a build alternative:

- 66 % preferred BRT
- 62% preferred the US 78/US 52 corridor
- 53% preferred the Meeting Street alignment

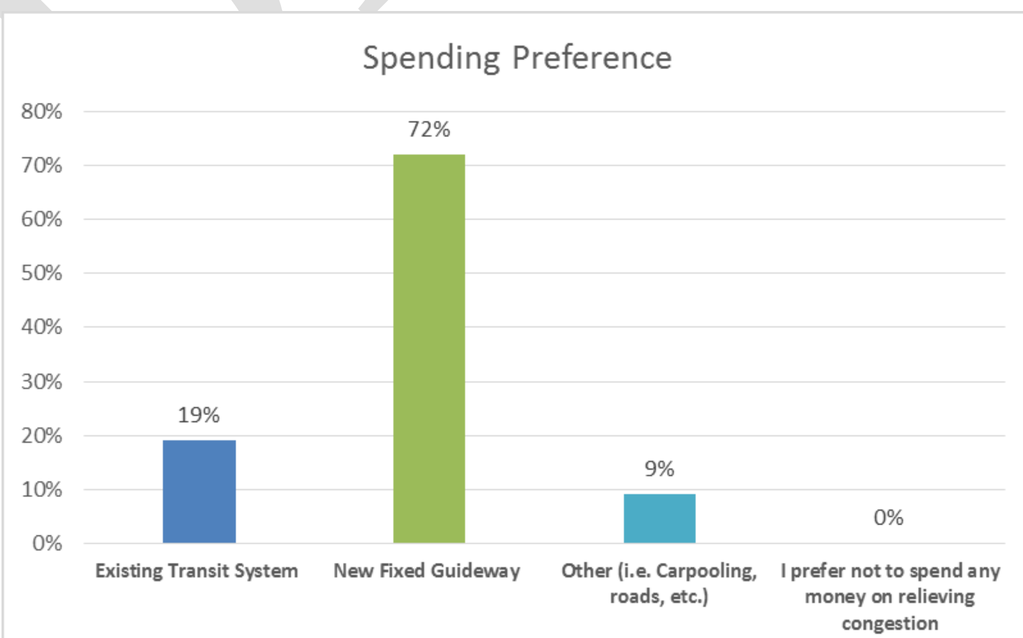






Of the three meeting locations (Summerville, North Charleston and Charleston), participants from the Summerville area meeting were most receptive to the Dorchester Road alignment (37%); whereas, five percent of Charleston meeting participants supported the Dorchester Road corridor. Both Summerville and North Charleston preferred the downtown alignment along Meeting Street, which ended at Line Street. Participants from the Charleston area favored the East Bay Street alignment to Calhoun Street.

What does traffic congestion mean to you? –
Sixty-one (61) individuals participated in the spending exercise. Participants were asked to appropriate "$100 dollars" toward relief from congestion. Individuals could invest their money in the current transit system, build a new fixed guideway alternative (i-26*ALT*), invest in other solutions (carpooling, new roads, etc.), or they may choose to not invest any money on relieving traffic congestion. The following provides how persons are willing to spend to relieve congestion in the region.



Overall, participants appropriated 72 percent of their funds toward building a new fixed guideway alternative.

Comments collected from comment cards included:

Summerville

- Funds should be spent on existing transit system and light rail. The existing system needs to be upgraded with more modern buses, more visible and safe stops. The current system will have to provide a way for riders to access light rail. Light rail will attract riders who would not normally ride a bus. We will have to do both in 2050.
- Desperately need rapid transit. Nor more road widening. No more tree clearing.
- We have got to do something in this area.
- Besides having scores and cost numbers, it would also be useful to come up with some numbers on estimated commute times for people likely to ride the system compared to driving a car. You have to get people out of their cars – eventually I-26 will be a parking lot. Estimate times for the future: 2020, 2030, etc.
- Driver education, traffic management (getting vehicles off the road). Things you can do now – traffic czar, education and incentivizing.
- Need to improve existing now and work toward a BRT.
  - SCDOT traffic Czar
  - Daily Radio info on congestion and alternative routes
  - Helpful tips on reducing accidents
  - Rapid removal of stalled vehicles and accidents without personal injuries
  - Incentivize drivers to not travel during peak hours
  - Possible user fees for I-26 drivers during peak hours
  - Create I-26 community to work together to ease traffic flow versus current "every man for himself"
  - More cameras and consequences for poor driving behaviors during rush hour

North Charleston

- I would like a new fixed guideway transit system.
- We need this yesterday for safety and smart growth. Thank you for trying to implement this.
- I would prefer light rail (more predictable, would encourage more permanent development near stations). However, due to cost and ROW constraints, I might choose BRT as more feasible.
- ½ cent sales tax that should not be for roads. It should be to build dedicated lanes for BRT, signal priority technology. Also for bike lanes and sidewalks.
- Rail transit.
- In addition to a new fixed guideway system, I would invest in bicycle infrastructure (protected bike lanes, painted bike boxes at intersections, etc.). I would also put money/effort toward updating zoning to establish an urban growth boundary and discourage future sprawl development.
- Want 60% of funds to go toward monorail and 40% toward new roads, better merge lanes.
- Please do not do anything that encourages more single-occupancy car driving (e.g. widening I-26)! Provide incentives for people to get out of their cars.

Charleston

- I do not ride transit because of the bus times. I would love to ride transit if convenient.
- The presentation was very informative. I would rather go online and read more about. I think I would like the hybrid better.
- Excellent work and extremely comprehensive. Thanks!
- Frustrated that the current bus system leaves before the scheduled time.
- Need fixed guideway or BRT but also add HOV lanes on I-26 and I-526.
- Charleston and North Charleston need smaller buses coming more often on many routes.
- Extend CARTA service to Folly.
- How much of current commuters are you capturing on CARTA? How many commuters have no way to take CARTA? (i.e. It doesn't go where they need to go? It does not come near their origin?) What's your goal – number or percent of commuters you hope to take off I-26 through this plan? Has there been a region wide O-D study to assess all commuters?
- BRT seems like the only reasonable option considering immediate need and limited funds.
- BRT as initial investment then work on a long term solution.
- The 26-30 [age] group wants to not spend money on cars, insurance, maintenance, and parking. Strong vote for light rail. Invest in light rail that can carry more people and take more time to build. Future planning and costs pay off.
- Uber water taxis for the multiple bridges in the Charleston area.
- BRT is more feasible – hopefully that's the locally preferred option!
- This [new] system seems to relieve a lot of problems with the existing system such as lack of efficiency. I also think reducing traffic congestion is important.
- I prefer BRT.
- Either BRT or LRT.
- I encourage you to pick BRT.

MEETING SUMMARY

I-26 Fixed Guideway Alternatives Analysis

Public Meetings – January 25, 26 & 28, 2016

PURPOSE: I-26 Fixed Guideway Alternatives Analysis (Public Meeting #4)

ATTENDANCE: Sign-In sheets available upon request

Presentation Outline:

- I. Project Update
- II. Comprehensive Operational Analysis
- III. Screen Two Alternatives Analysis
  - a. FTA CIG Project Justification Criteria
  - b. Project Justification Screening Results
- IV. Recommended Alternative
- V. Characteristics of Bus Rapid Transit (BRT)
- VI. Next Steps

Meeting Summary:

The fourth and final round of I-26 Fixed Guideway Alternative Analysis public meetings was held in January, 2016 in Summerville, North Charleston and Charleston at the following meeting locations:

1. ***North Charleston*** –
   North Charleston High School
   January 25, 2016
   6:00 PM – 8:00 PM
2. ***Downtown Charleston*** –
   Charleston Progressive Academy
   January 26, 2016
   6:00 PM – 8:00 PM
3. ***Summerville*** –
   Bethany United Methodist Church
   January 28, 2016
   7:00 PM – 9:00 PM

A total of 138 persons attended these meetings: Summerville (46), North Charleston (45) and Charleston (47).

In this final round of public meetings the project team focused on providing the results of the Screen Two Analysis and the recommended alternative to move forward into the FTA Capital Investment Grant Program project development process. The meeting set-up followed prior formats where project material was arranged into stations. Project staff served as facilitators at each station to engage participants one-on-one.

The following provides an overview of the project stations:

- Station 1: Study Process – Provided general project information and overall purpose of the study as well as an overview of the screening process undertaken in the Alternatives Analysis.

- Station 2: Existing Transit – Provided an opportunity for participants to comment on the current/existing transit system. Provided an overview of the Comprehensive Operation Analysis undertaken as part of the i-26*ALT* study.

- Station 3: Progression of Alternatives – Provided summary information on the three levels of screening (Pre-Screen "Fatal Flaw", Screen One and Screen Two) that were undertaken through the Alternatives Analysis process, the alternatives that were considered in each screen as well as the alternatives moved forward at each stage of analysis.

- Station 4: Screen Two Alternatives and Project Justification Criteria (Results) – Summary boards providing the results of the Screen Two Analysis for the BRT and LRT alternatives considered. The FTA project justification measures considered for each alternative included:

    1. Cost Effectiveness
    2. Mobility Improvements
    3. Congestion Relief
    4. Environmental Benefits
    5. Land Use Impacts
    6. Economic Development
    7. Overall Rating (composite rating of identified criteria)

- Station 5: Recommended Alternative – Land Use Analysis and Forecasted Ridership for the highest ranked alternative (recommended alternative). Recommended alternative presented as an aerial image of the identified alignment (US 78/52/Meeting corridor) with identified station locations, and operating plan for proposed BRT system.

- Station 6: Funding Alternatives – Provided an overview of potential funding sources for fixed guideway projects. Participants were encouraged to comment on how they might fund a proposed fixed guideway system.

Each station was staffed by facilitators from the BCDCOG and/or the Davis & Floyd study team. Representatives from CARTA were also present to answer questions as needed.

Feedback and Comments:

The following provides the comments made and insights arising from the three public meetings.

Comments:

- Given the time and effort placed in this study, the region should implement a light rail system. We should think about what the communities would use.

- I fully support the effort that is being made to provide better transit for Charleston. I think in the long run we should look to get light rail but I understand that the proposed BRT route could address our needs in the near future. This is long overdue!
- The system, either BRT or light rail, should be flexible and able to adapt to our transit needs. Our jobs and lives are not based around a fixed 9-5 model anymore. Many people work non-traditional hours or may need to travel to multiple locations within the region within a day. The system has to be able to accommodate these needs.
- The proposed 10 minute frequencies are needed. If I can get a bus every 10 minutes and can depend on that I would use it.
- The BRT needs to operate later than 1:00 AM. That is way too early for service works who might be getting off at 2-3 AM in the morning.
- The line needs to go beyond Summerville. With the employment growth occurring in Berkeley County we need service out to Ridgeville.
- The eighteen (18) proposed stations seem to be too many stops. If you factor in the time for stopping and loading passengers that would make the travel time between Summerville and Downtown too long.
- Would pedestrian and bike infrastructure factor into this project? There are areas along Rivers Avenue that are very dangerous.
- The end of line on the recommended alternative ends at Line Street however, many people want to get to MUSC or the College of Charleston for work. People do not want to go to Line Street.
- I would love to see light rail in this area. But given the time frame that the BRT line could be done I agree that something needs to get done today.
- The business community needs to help pay for this system. There should be some way to assess businesses in the corridor (size, no. of employees, etc.) and have then pay for the number of persons they bring into the corridor to work or determine the benefit a system like this would offer to them and have them contribute to build or operate the system.
- No matter how attractive and cost effective the bus system will be there are certain segments of the population that will never ride a bus.
- BRT: Excessive long distance travel time; make it a plug-in hybrid; $10 is not cost competitive to cars (at least to me); many ROW issues including insufficient/unused ROW, interference with existing high traffic.
- Thank you for the information. We need to move on mass transit ASAP.
- Provide added BRT loops to airport and further downtown – perhaps around past aquarium (Concord St.) to Calhoun Street then circle around MUSC complex. Give further consideration to having the terminus at E. Bay and Calhoun.
- I support the BRT option.
- The City and CARTA should make designated bus lanes down Rivers and US 17 for example until the i-26ALT is completed to speed up the service that exists now.
- I-26ALT is the best!
- Automated electronic payment; elevated/entry level platforms; express routes; covered modern shelters; BRT with traffic signal override; Rivers Avenue corridor.

MINUTES
I-26 Fixed Guideway Alternatives Analysis
Land Use Sub-Committee Workshop

DATE: 4/9/2015

TIME: 1:00 PM – 3:00 PM

LOCATION: BCDCOG (Berkeley-Charleston-Dorchester Council of Governments)

PURPOSE: Technical Advisory Subcommittee Land Use Workshop

ATTENDANCE: See attached Sign-In sheet

Agenda:

I. Project Overview
II. FTA Land Use and Economic Development Rating Criteria
III. Station Area Typologies
IV. Corridor Typology Selection/Potential Transit Supportive Areas
V. Project Next Steps

Discussion/Comments:

The intent of the workshop was to solicit input from local planning professionals regarding the current and future land use and zoning in the region that is supportive of transit oriented development. Consideration was given to the following during discussions:

- Transit Oriented Development and existing/future ordinances
- Affordable Housing/Inclusionary Zoning
- TOD incentives to developers
- Public perception of TOD and TOD densities
- Potential corridor alignments
- Station locations and typologies
- Station spacing and quantities
- Infrastructure needs/challenges
- Connections to secondary transit modes
- Vacant/Developable land
- Other potential opportunities and Obstacles for High Capacity Transit

The following comments were noted:

- Certain locations that have the potential to be transit stations/stops (Trident Health area, for example) do not have a developed street grid network that supports the connectivity needed to link the uses and activities surrounding a more typical, built-out transit station. There is a need to consider how an area's current roadway system will serve a station and its land use and what changes need to be made to enhance connectivity in the future.

- Comment was made about the density thresholds associated with the various typologies (core/center/village/destination) identified. The densities provided are illustrative of typical density figures provided from a more national perspective. Through the study process the study team with the input from the Technical Advisory Committee, will have to develop suggested density thresholds that are relevant to the region and local conditions.
- The City of Charleston identified that higher densities that provide support for transit are currently being focused along the King and Meeting Street corridors up to Morrison Drive. There are no specific density limits, but the 100'-120' height restrictions in certain areas generally translate to residential densities of 40-50 units/acre. The City's mixed-use areas (MU-1/MU-2) are primarily focused between Meeting and King Streets which allows for high density residential and commercial uses along these corridors. There are also areas zoned Mixed Use, Workforce Housing (MU-1/WH and MU-2/WH) which require that 15% of housing units in proposed developments are made available to individuals making 80% (rental) or 120% (owner-occupied) of the area median income or that the majority of the ground floor is dedicated to non-residential uses. Affordable housing units are protected for 10 years.
- The proposed plan and zoning designations for the Magnolia development north of Mt. Pleasant Street is supportive of TOD principles.
- The 2011 City of Charleston Comprehensive Plan identifies potential transit stops. The City is also looking at open air trolleys, which could provide a guideway on which BRT could share. The project team will look at these plans for potential stop locations/connections to future modes of transportation. There is an opportunity for BRT to
- LRT and other dedicated-guideway modes are potentially suitable north of Line Street. Transit south of Line Street will likely need to operate in mixed traffic (streetcar/bus).
- BRT could be supported in the urban core area if it allows for flexibility in the potential alignment. If BRT is implemented, the MUSC area could serve as the potential terminus / turn-around location. A BRT system could potentially travel south into the Peninsula along Meeting Street, west along Calhoun Street, north along Ashley Avenue, and then outbound along the Crosstown.
- The project team discussed the viability of operating commuter rail service on existing freight lines, and some of the operational challenges that will need to be considered.
- The City of North Charleston does not have specific zoning categories that are supportive of TOD; however, the Rivers Avenue corridor has been identified to potentially support fixed-guideway transit (BRT) along its median which extends south to Durant Street. South of Durant, the system would likely be required to operate in mixed traffic. Potential stations along this alignment include Mall Drive at Rivers Avenue, the Stromboli corridor, Shipwatch Square, and the Mixson area.
- The City of North Charleston suggested that once potential station locations are identified, they would be willing to revisit current zoning around these locations to provide support in the form of, for example, TOD overlays (Charleston County expressed support of this approach).

- Though there is currently no zoning designation to allow for mixed-use development, Shipwatch Square (currently zoned B-2) is designated for mixed use development in the Future Land Use plan (allowing of residential densities of approximately 29 units/acre).
- The current CARTA Super Stop intersection (Cosgrove@Rivers) raises concern as a future transit hub based on the proposed Intermodal Container Facility Plans. The proposed plan affects the character of the facility and its surroundings due to changes in truck routing and a potential fly-over at the subject intersection. These changes will negatively affect pedestrian use and safety and discourage the application of the TOD principles required for a high-capacity transit hub. The Shipwatch Square area offers a better option for a future station location.
- Other identified high activity nodes/potential station areas include Trident Technical College and the Northwoods Mall area which serves as a regional shopping destination.
- Redevelopment potential also exists around the current K-Mart Park-and-Ride facility as it is an existing and highly-utilized transit location that serves multiple systems (TriCounty Link and CARTA).
- The project team should evaluate the Boeing campus and Palmetto Commerce Parkway as major employment areas. The 2010 Census and TAZ density data does not reflect these major employment areas. The BCDCOG is currently working on updating the CHATS Regional Transportation Model which will account for these major activity centers. More current model data will be available once the update is complete (anticipated end of May 2015).
- Comment made that the project team should research Boeing's support of transit in Seattle and how similar partnerships could be applied to support our local transit system. Project team answered that the peer system review offers a forthcoming opportunity to evaluate partnerships in other regions.
- Comment made that the project team should be mindful of Clear Zones and Accident Potential Zones as different alignments are considered.
- The Trident Health Center provides a natural northern transit station location that could be developed into a future transit hub since it serves as a connection point between multiple transit systems (TriCounty Link and CARTA) and its location could accommodate connections to Summerville and to the Goose Creek areas.
- The subcommittee questioned if this location (Trident Health Center) should serve as the corridor's main transfer hub since it offers connection opportunities to Summerville, Goose Creek and Moncks Corner, and could also serve as a gateway to areas served by Ladson Road and Dorchester Road. Users from these areas could be pooled at this northern terminus and then transported along a common alignment through North Charleston and into the Peninsula.
- It was noted that the alignments along utility corridors may encounter large wetland impact issues.
- The alignment along Dorchester Road was identified as a less successful corridor since it bypasses many of the corridor's major activity centers and higher density areas. It was also noted that the current ridership on routes along the Dorchester corridor are not as high as along other routes. Additionally, overlays and current zoning discourage TOD principles and high-density mixed-use developments.
- US 78 should be considered as a potential connection between North Charleston and Summerville, since this alignment would also serve Lincolnville.

- The Summerville Azalea/Nexton area has the potential for a significant transit market due to the proposed Carnes Crossroads and Nexton developments. This area may support a Park and Ride facility to serve these large, yet somewhat low-density, adjacent communities.
- Henry E. Brown Jr. Boulevard should also be considered potential as a transit corridor.
- Downtown Summerville has a good street grid network, but it may not have the density necessary to support a high-capacity transit station (residential densities 4-5 units/acre).
- There are other Summerville locations that may better support the higher densities needed for transit station locations. The Berlin G. Myers corridor has higher densities, and its planned northern extension will tie into Sheep Island Road.
- Due to the low infrastructure costs and the ability to connect Goose Creek, Hanahan, Daniel Island, and North Charleston, a ferry system along the Cooper River should be considered as a viable transit option.

MINUTES
I-26 Fixed Guideway Alternatives Analysis
Land Use Sub-Committee Workshop 2

DATE: 6/24/2015

TIME: 2:00 PM – 3:30 PM

LOCATION: BCDCOG (Berkeley-Charleston-Dorchester Council of Governments)

PURPOSE: Technical Advisory Subcommittee Land Use Workshop

ATTENDANCE: See attached Sign-In sheet

Agenda:

I. Welcome and Introductions
II. Project Overview/Schedule and Public Meetings/Transit Talk Recap
III. Land Use Analysis Workshop
IV. Project Next Steps

Discussion/Comments:

The intent of the workshop was to present the methodology and findings from the Land Use Analysis and Alignment Rankings to the Land Use Subcommittee for approval and subsequent recommendation to the Steering & Technical Advisory Committee. Consideration was given to the following during discussions:

- Methodology for mapping exercise and Alignment Ranking Matrix
- Each alignment's adjacency to future and existing points of interest
- Each alignment's relationship with existing and future high density areas
- Prohibitive zoning overlays and restrictions
- Potential for Transit Oriented Design (TOD) overlay zones
- AICUZ zones and how they affect TOD
- Significant pockets of developable vacant land
- Environmentally and culturally sensitive areas
- Infrastructure needs/challenges
- Desirable alignments within the Charleston peninsula
- Known and anticipated future development areas
- Other potential opportunities and obstacles for High Capacity Transit

The following comments were noted:

- Each of the restrictive zoning overlays shown in the analysis has increased setbacks prohibitive to TOD; however, zoning can be changed to accommodate TOD.
- Dorchester County has a Transitional Overlay District which requires a 40' buffer along the primary corridor and increases to 80' at intersections. Along other rights-of-way in the district, the required buffer is 15'. Fifty foot residential buffers are also required in these areas. Care should be taken in discussions with communities in this area to distinguish between Transit Oriented Design and Transitional Overlay District, both of which are more commonly referred to by the acronym TOD.
- Buffers, such as the Dorchester County Overlay described above, do offer unique opportunities for the development of a fixed guideway transit system because they have reserved large acreages of land directly adjacent to existing rights-of-way. That said, Dorchester County does not recommend placing the proposed system along Dorchester Road as it is not a suitable alternative for high density development or high capacity transit.
- Consideration should be given to proposed development within and directly adjacent to the corridor. There are several residential, commercial, and industrial developments underway and anticipated for the future, and any transit should plan for these changing populations. Specific developments mentioned include Nexton, Carnes Crossroads, Cane Bay, Ingleside and Palmetto Commerce Parkway, the future Volvo plant, and the proposed extensions and interchanges that will connect Sheep Island Road to I-26.
- Density mapping should be updated as new data is available. The TAZ maps used in this analysis are based on 2035 projections. 2040 projections will be available soon and incorporated into the study. Adjustments will be made to the recommendations of the analysis based on any significant changes to projected population and employment densities.
- Phasing of the system may be ideal to offer service to more established areas first, and to adapt its alignment to accommodate future growth as densities and uses change.
- Once the alignments and modes are narrowed down, consideration should be given to how and where the system will operate south of the Neck within the Charleston peninsula. For BRT or LRT, the terminus will likely be Line Street. For rail, the terminus will likely be Mount Pleasant Street.
- General consensus was that the rankings accurately reflect the land use goals of the region.

MINUTES
I-26 Fixed Guideway Alternatives Analysis
Transit Talk – Environmental & Community Organizations

DATE: 4/14/2015

TIME: 8:30 PM – 10:00 PM

LOCATION: Coastal Community Foundation – Zucker Conference Room

PURPOSE: Environmental and Community Organizations Transit Talk

ATTENDANCE: See attached Sign-In sheet

Agenda:

I. Introductions
II. Project Overview
III. Alternatives Screening
IV. Environment and Mobility Discussion Items
   a. Multi-modal mobility
   b. Low Income Households
   c. Transit Dependent Populations
   d. Natural, Cultural, and Historic Resources
   e. Funding
V. Upcoming Public Meetings
VI. Project Next Steps

Discussion/Comments:

The livability transit talk was focused on bringing together a mix of environmental and community organizations throughout the study area to discuss how transit can preserve and enhance the natural and human environment along the I-26 Corridor between Summerville and Charleston. The intent of the transit talk was to inform these organizations about the study and upcoming public meetings; as well as solicit input regarding the mobility needs and concerns of these groups.

The following comments were noted:

- Transit has to become a part of a regional multi-modal system through education and outreach efforts. The public has to be educated and informed about what services the system offers and how to use/navigate the transit system.

- The current #10 Rivers Avenue route has the highest ridership of the CARTA routes. It was noted that given the already high use along this corridor (~25% ridership), it might be telling that this corridor is most suited for an alternative like BRT.
- Community safety is of major importance. Both current and future transit stops/stations have to consider safe pedestrian crossings for users at these locations.
- Summerville has a great need for transit within the local community. The current commuter service provided does not circulate around the city. Summerville residents need transit to get to medical appointments, shop, work, etc., as well as commute from Summerville to downtown Charleston.
- Comment was made about the high ridership that originates from the US 52 corridor out of Berkeley County to the K-Mart Park and Ride (Rivers Avenue). This might reflect a high demand along this US 52 corridor (Goose Creek and Moncks Corner).
- Given that the mode utilized is closely tied to the trip purpose and the distance one needs to travel, has any data been collected that will provide this information? The study has undertaken both an employer survey and origin-destination (O-D) survey that will provide this information.
- Question was posed to CARTA about the materials and system signage that are provided for non-English speaking users. CARTA provides Spanish translated system schedules to the public. On-route signage is however, primarily in English.
- "Millennials" are making the choice to use alternative modes such as transit. However, they have the flexibility to move to regions that have robust transit systems that can support their mode choice. Low-income and senior populations are usually dependent on transit services and do not have the same level of mobility as millennials. They therefore have to stay in place and make do with the current transit system. Transit should serve the needs of both of these groups.
- The land use along the corridor should look for infill opportunities to preserve currently undeveloped land and save rural areas.
- Although the current study looks at the I-26 Corridor, there has been a marked increase in use along the US 17 corridor (West Ashley/Mount Pleasant). There is a need to identify how these other corridors of high use will tie into the proposed system.
- A participant noted that this project has to show or demonstrate the viability of a new system (operational viability). If a system is proposed that is not viable and it fails, it will negatively impact the public attitude toward transit in the region.
- In determining an alternative, the community might place higher importance on a mode that is easy to implement (cost) and also has a fast implementation timeframe. Looking at these factors, BRT might be a supported mode since it seems have a relatively quick setup time (~4 years), and its startup cost is lower relative to other alternatives (commuter rail/light rail).
- A comment was noted regarding air quality; although the region is not currently a "non-attainment' area, historically, we have come close. In the future those standards may change, and our region may be faced with "non-attainment" status. Air quality should be a consideration in the study.
- The Rivers Avenue corridor might also be the best corridor to run BRT service because it has the space (median), it is already a high transit use corridor and it has the option to serve the Amtrak station, which is the future site for the Intermodal facility.

May 12, 2015

To: Kathryn Basha, AICP
Planning Director
BCDCOG

From: Sharon Hollis, AICP
Senior Transportation Planner
Davis & Floyd

RE: i-26*ALT* Transit Talk – Land Use Transit Talk
Developer Workshop, April 30, 2015, 9:00 AM – 1:00 PM
Nexsen Pruet Board Room, Charleston SC
Catalyzing the Conversation about Transit Public Forum, April 30, 2015 3:30 PM – 5:00 PM
Charleston Museum, Charleston, SC

Meeting Recap

Developer Workshop

Moderator: Marilee Utter, Urban Land Institute

Attendees:

- Heather Foley, Urban Land Institute
- Jeff Baxter, CityVolve
- Jeff Fort, Gramling Brothers
- Ryan Knapp, Middle Street Partners
- Michelle Mapp, SC Community Loan Fund
- John Truluck, Dorchester County
- Vince Graham, The I'On Group
- Stuart Coleman, CC&T Real Estate
- Mark Taylor, Stone Street Capital
- Kent Johnson, The Beach Company
- Ashley Heggie, Greystar
- Neil Robinson, Nexsen Pruet

ULI and the i-26ALT project team opened up the meeting with an overview of the day's agenda and the i-26*ALT* project. Marilee Utter began to moderate the discussion with the attendees on the best corridors for transit oriented development. She opened the discussion with her experience with TOD and the 4 things that are needed:

1) Vision (i.e. zoning)

2) Market
3) Land
4) Champion

A discussion was held about where growth will be in the future. Attendees noted that growth will occur along I-26 where land is available, primarily from outside I-526 and beyond Summerville. Attendees noted that exit 199 will likely become the center of the Lowcountry in the future, and this will create a reverse commute.

A discussion was held on the best transit alignments in the study area for transit oriented development. The Park Circle area was identified as an upcoming trendy area outside of downtown. The Upper Peninsula/NoMo area was also noted as an area with TOD development opportunity. Morrison and Rivers both have the capacity to add transit. Attendees identified two major corridors:

- Old Trolley Road to Dorchester Road to Magnolia, Peninsula, and MUSC
- US 78 to Rivers Avenue, McMillan-Shipwatch, and Morrison Drive.

Rivers Avenue was the most commonly accepted corridor among the group.

Mode was not as much of a concern as land price (affordability) and in-place zoning that allows the required density. Safety was noted as a concern for some in areas that could be redeveloped. Parking as a consideration was also discussed.

A discussion was held about density and the current "anti-growth/anti-density" sentiment in communities throughout the region. Zoning was discussed as one area where stronger local and community support is needed to support higher density development. North Charleston offers a potential opportunity for TOD zoning districts since the city has a tendency to be pro-growth.

It was noted that the transit system needs to be affordable and have the ridership to make it feasible, and attendees were interested in how to measure a successful system. Transit was not as much of a draw for developers, as was the potential streetscaping that would come with a Light Rail or Bus Rapid Transit system.

Attendees identified Rivers Avenue from Montague to Reynolds as a first phase. The group also discussed the need for a Champion for the project.

May 14, 2015

To: Kathryn Basha, AICP
Planning Director
BCDCOG

From: Sharon Hollis, AICP
Senior Transportation Planner
Davis & Floyd

RE: i-26*ALT* Transit Talk – Business Focus
Transit Makes Good Business – May 5, 2015, 7:30 AM – 9:00 AM
Montague Terrace, North Charleston, SC

Meeting Recap

Total Attendees RSVP: 81
Total attendees that signed in: 41

Moderator: Deb Campeau, AVP Business Development, Trident Health Systems

Panel Members in Attendance:

- Perrin Lawson, Deputy Director, Charleston Area Convention & Visitors Bureau: Supporting the Tourism Industry – How Transit Serves Tourism in our Region
- Mike Graney, VP Global Business Development, Charleston Regional Development Alliance: Maintaining a Competitive Edge - Transit's Role when Industries Consider our Region
- John Runyon, Director, Business Services, Medical University of South Carolina: Leveraging Employee Parking with Transit – MUSC's Partnership with CARTA
- Raymond Smith, Director of Human Resources, Santee Cooper: Building Successful Partnerships - Santee Coopers iRide Program and Partnership with TriCounty Link

Also invited to the panel, but delayed due to a traffic incident on I-26:

- Robert "Robby" Robbins, Charleston Metro Chamber of Commerce Infrastructure Taskforce Chairman: Understanding Opportunities and Challenges - Chambers' View on Transit Infrastructure Needs and Challenges

The meeting began at 8:00 a.m. Because the BCDCOG's Executive Director was delayed due to the traffic incident, Kathryn Basha, Planning Director for BCDCOG gave an introductory presentation on the i-26*ALT* project. Deb Campeau introduced the panel and opened the discussion with questions to the panel.

The panel discussion is summarized as follows:

1) Panelists were asked to give their observation of what are the region's challenges to transit?

   - Geographic: Our region has unique geographic challenges, i.e. rivers and waterways that do not lend themselves to a traditional hub & spoke system. We do not have a central city with surrounding suburbs, and as a result, growth tends to be linear.
   - Cultural: Transit is not part of our community culture. People are attached to their cars and do not have confidence in the transit system. In other cities, transit is more culturally accepted.

2) Santee Cooper provided an overview of the i-Ride program, which has successfully initiated a cultural shift by its employees from single occupancy vehicle commutes to one that includes transit.

   - Express bus service travels from urban area to rural jobs (reverse commute).
   - 700 people use the transit routes.
   - Link to Lunch route was created so employees do not need to take cars to lunch.
   - Routes are used for other trips in the community as well. For many, TriCounty Link is a *Link to Life*.

3) MUSC provided an overview on how transit service is part of their parking strategy.

   - MUSC has appx. 9,000 parking spaces; 7,000 are in parking garages.
   - MUSC has appx. 2,000,000 visitors per year and 11,000 students/workers.
   - MUSC transit system carries 1,600 persons/twice per day between campus and remote parking lots.
   - Route 213 travels from the Hagood parking lot to campus.
   - As new facilities come online, the cost to build parking structures is high; as a result, the cost benefit of subsidizing transit in lieu of parking makes sense for MUSC.
   - MUSC does not subsidize parking, but they do subsidize transit 100% through a partnership with CARTA.
   - Appx. 500 to 600 round trips a day by MUSC employees ride CARTA Express to work. Although ridership was higher when gas prices were up, ridership has remained stable despite lower gas prices.

4) A discussion was held on the transit needs for the Visitors and Convention Bureau industry.

   - CARTA's DASH is a productive service, and the new NASH service connects Tanger Outlets/Airport to DT Visitors Center.
   - Charleston's visitors' come from major metropolitan areas through expanded airline service and the drive market is still big from Charlotte, Columbia, and Georgia cities.

5) A discussion on transit's role for industry and economic development initiatives in the region was held.

- Industry wants access to market diversity and will go where real estate costs are low.
- Access to talent is number one priority. Are there workers with skills/capacity to do a job, and will the talent be attracted to this region if coming from a metropolitan area with a robust transit system?
- I-26 is a travel shed to regional talent, and industry is not mode specific on how workers get to work on time--they want the best system overall.
- Currently, manufacturing/industrial is main industry looking at the region, but 3-5 years from now, the IT clusters/creative cluster is anticipated to grow, which will bring a workforce looking for transit alternatives. The region needs to be on top of it today to be ready for that market.
- Industrial jobs will continue to grow, and the I-26 corridor it will expand, since environmental concerns limit growth in other directions.
- The corridor needs to be efficient and predictable.

6) Is industry willing to make the investment needed?
   - The region competes with other areas; anything that is a disincentive would make it harder to compete.

The panel discussion was opened to the audience, and comments/questions are summarized as follows.

1) Audience member wanted to know if the planned Amtrak Station/Intermodal Facility will tie into the system. The project team discussed how the Amtrak Station would be considered as a potential stop for the Rivers Avenue and CSX alignments.
2) Audience member asked about how the private sector could help with park & rides, which led to a discussion about real estate being at a premium and the need for partnerships.
3) A discussion was held on whether panelists used flex time, vanpool incentive program, or shared parking. For some, employers offer, but employees do not participate. Santee Cooper has a vanpool program that 400 employees use.
4) Audience member asked if there was any consideration to adding HOV lanes to I-26.
5) A discussion on the food & beverage industry was held. It was noted that employees have a problem getting downtown to jobs, and their needs should be included. Shift times do not align with transit service hours.
6) Audience member commented on the correlation between parking costs and transit usage, and how high parking costs can incentivize transit usage and potentially fund transit service.
7) An audience member asked about how connections between CARTA and TriCounty Link could be improved in the process. The recommendations from a comprehensive analysis of both systems will be incorporated as part of the overall plan.

8) Audience member mentioned how reliability of current transit service is important. People are interested in using the system, but routes do not go where they need to go or are not reliable enough to get them to work on time.

9) Audience member asked if there was any consideration for Ferry Service.

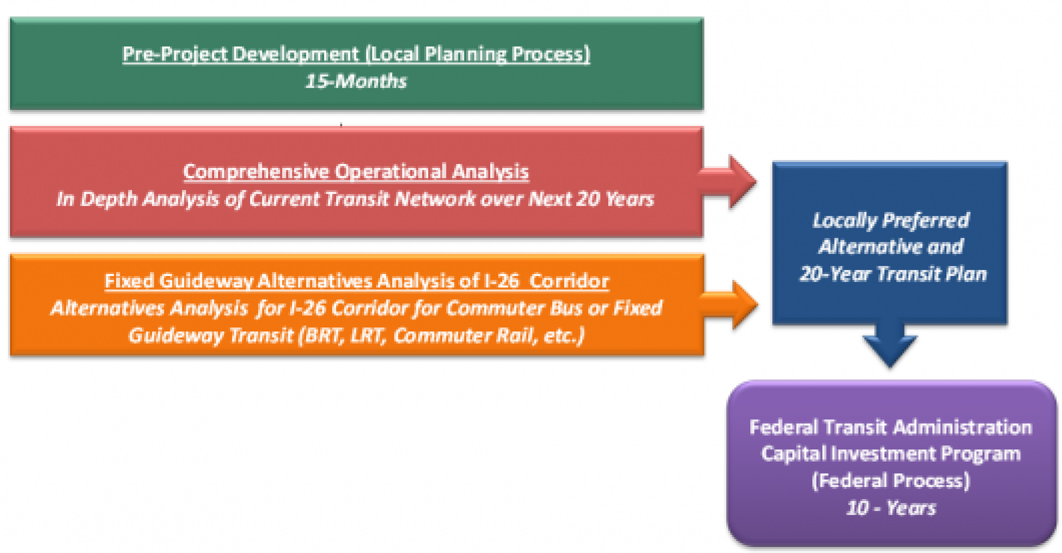
i-26ALT Update

Issue 2 | November 2014

Where Will Transit Take You Over the Next 20 Years?

The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) initiated the I-26 Regional Fixed Guideway Transit Alternatives Analysis (I-26ALT) to answer this question. I-26ALT is the next step toward identifying and establishing a long term transit solution for the Charleston region along the I-26 Corridor between Summerville and Charleston. The purpose of this 15-month study is to identify transit modes, such as bus rapid transit (BRT), light rail, or commuter rail, and alignments that will manage transportation demand, support the regional economy, and create livable communities within the study area.

Successful results from the I-26ALT project will rely heavily on public input from across the region. Combined with information from a comprehensive assessment of the existing CARTA transit system, a 20-year strategic plan to develop fixed guideway service along the I-26 corridor will be established. This plan is required by the Federal Transit Authority to be in place as a major component of any future funding requests the region submits to fund development of the fixed guideway service.



Why a Transit Alternative and Why Now?

With anticipation that the region's population will approach one million residents within the next 20 years, the I-26 corridor will experience even greater congestion than exists today. Thus we are focused not only on improving transit service for today's residents of and visitors to Charleston, but also on defining and constructing the most effective and sustainable transit system that will serve our future residents. The I-26 Regional Fixed Guideway Transit Alternatives Analysis is the next step toward identifying and establishing a long term transit solution for the Charleston region along the I-26 Corridor between Summerville and Charleston.

What Transit Alternatives Will be Considered for the I-26 Corridor?

The I-26 Corridor from Summerville to Charleston is a critical route for commuters, visitors, and industry.*I-26ALT* will take a closer look at alternatives for Commuter Rail, Light Rail and Bus Rapid Transit, and other options for transit along the 22-mile corridor. Other fixed guideway options that may be considered are express bus, personal rapid transit, ferry boats, heavy rail, monorail, and people movers.

Who Will Pay for a Regional Transit System?

I-26ALT will begin the region's dialogue on how a regional fixed guideway transit solution along the I-26 corridor can be funded. Although *this study* will follow the guidelines for the Federal Transit Administration's Capital Investment Grant Program for New Starts/Small Starts projects, there are no guarantees whether and how much federal funding can be secured. This is a very competitive federal grant program and one criterion that will be evaluated in any funding request, will include the certainty of local funding committed to leverage federal dollars that are requested. *I-26ALT* will also identify potential funding options for the constructing and operating the preferred transit alternative selected during the study.

We Need Your Input!

The public is encouraged to attend one of the project meetings on the dates listed below. At each meeting, details will be shared regarding the study's strategic process and timeline, the project study area, and the various transit options available for consideration. More importantly, the project team will be gathering the public's input on whether and how it uses transit today, and what improvements in the system would prompt residents to use transit in the future. A project website has been launched and is maintained to ensure opportunity for everyone to access information on the I-26 Alternatives Analysis as it proceeds – www.i26ALT.org

Monday, November 17, 2014- 6PM- 8PM:
Charleston Progressive Academy, 382 Meeting Street, Charleston, SC 29403

Tuesday, November 18, 2014- 7PM-9PM:
Rollings Middle School of the Arts, 815 S Main St, Summerville, SC 29483

Wednesday, November 19, 2014- 6PM-8PM:
North Charleston High School, 1087 E Montague Ave, North Charleston, SC 29405

We invite you and your friends, neighbors and co-workers to join us in deciding how transit can best serve your needs over the next 20 years!

i-26ALT

www.i26ALT.org

i26*ALT*

Project Newsletter **March 2015**

The Community Speaks

First Round of Public Meetings Held

In November, i26*ALT* held a series of public meetings in Charleston, North Charleston, and Summerville to kick off the study and gather input from the community. Copies of the presentation, handouts, and boards displayed at these meetings can be found at www.i26alt.org/resources/

During the meeting, attendees were invited to visit three interactive stations.

- **Station 1: Existing Transit** - attendees were asked how they currently use transit and if they do not, why?
- **Station 2: Regional Alternatives** - the study team shared information about the study area and discussed potential "fixed guideway" options such as commuter rail, light rail, and bus rapid transit.
- **Station 3: Draw your Commute**- attendees mapped their current commuting patterns on an interactive board and shared their opinion on the kind of transit alternative they would like to see. And finally,
- **Station 4: Funding Alternatives** - attendees were invited to share ideas on how to best spend "transit dollars" and explore funding options for the future.

Dear i26ALT Friends -

The last few months have been busy for the i26*ALT* study team.

In November we held three public meetings to hear directly from current and potential users of the region's current transit system. We also spent some time aboard CARTA conducting surveys with the riders. In *The Community Speaks* to the left and *Ridership Survey Results* on page 2,we review the methods used to gather the data and share some of the results received to-date.

The study team also began work on a Comprehensive Operational Analysis (COA) to evaluate the CARTA transit system. The goal of the COA is to identify strengths and weaknesses and provide suggestions for improved efficiency/effectiveness. Our approach and timeline for the COA can be found in *A Review of Current Operations* on page 2.

Finally, many of you have asked us to explain the term 'fixed guideway transit' as well as the differences between the alternatives that have been discussed at the public meetings. In *Transit-Speak* on page 3, we offer this explanation.

Your interest and support of the i26*ALT* study is critical. The next round of public meetings takes place in April. Dates and locations will be posted at www.i26alt.org We hope to see you at the next meeting!

i26ALT Study Team

ridership survey

RESULTS

From January 22 - February 6, the i26ALT team jumped aboard CARTA buses to conduct a ridership count and survey. Thank you to all riders who shared their time and thoughts with us!

17,000
the approximate number of passengers on a typical weekday

ROUTE 10 Rivers Avenue
the route with the highest daily ridership count

STOP

Mary Street Transfer Center & North Charleston SuperStop
the most active stops in the CARTA system, with 20% of the system-wide activity occurring at these two stops

22%
the percentage of CARTA customers that ride the free DASH trolley routes

A Review of Current Operations

Comprehensive Operational Analysis of CARTA

The i26*ALT* project includes a Comprehensive Operational Analysis (COA) of the Charleston region's transit system, CARTA. A COA is a fact finding tool used to identify existing strengths and weaknesses in the operations of a transit system. Once identified, recommendations for service improvements are presented as suggested actions items for implementation in the short-, mid-, and long-term.

The COA process includes extensive data collection, service analysis, and public outreach to answer the following questions.

- Who are CARTA's current and potential customers?
- How is the overall system performing and what areas need improvement?
- How can CARTA best serve its markets within its financial and operational capabilities?

Based on the information captured during the COA, two strategies will be developed to improve CARTA's operations. The first is a short/mid-range strategy which will develop a plan for the CARTA system over the next 10 years under its current capacity. The second is a long- range strategy to incorporate a fixed guideway alternative to the overall system.

Transit-Speak

Breaking Down the Terminology

As the project team talks to the community about which alternatives will work along the I-26 Corridor, we get questions about what the term "fixed guideway" means. Simply put, fixed guideway transit is public transportation that operates in its own designated right of way (such as a rail, roadway, or other track that cannot be easily moved).

So what is the difference is between Bus Rapid Transit, Light Rail Transit, and Commuter Rail? The project team will be hitting the road this spring to talk more about these options, but here are brief descriptions to hold you over until then.

Bus Rapid Transit
A system of rubber-tired buses that operate like a conventional rail in reserved guideways or mixed traffic. Cities with BRT: Orlando, Las Vegas, Los Angeles, Eugene (Oregon), Seattle, Cleveland

Light Rail Transit
Short passenger rail cars on fixed rails in right-of-way that is separated from other traffic or mixed with traffic, powered electrically from an overhead electric line. Cities with Light Rail Systems: Charlotte, Norfolk, Phoenix, San Diego, Portland

Commuter Rail
Urban passenger train service consisting of local, short-distance travel between a central city and adjacent suburbs using electric or diesel locomotive hauled or self-propelled railroad passenger cars. Cities with Commuter Rail: Nashville, Orlando, Washington DC, Dallas, San Diego

project
TIMELINE

Phase 1
October 2014 - February 2015
Project Kick-off
Data Collection

Phase 2
March 2015 - May 2015
Service Evaluation
Fixed Guideway Alternatives Development

Phase 3
May 2015 - August 2015
Develop Future Service Plans
Alternatives Screening

Phase 4
September 2015 - December 2015
Locally Preferred Alternative Identification
Implementation
Funding Plan

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Next on the Agenda

i26*ALT* Outreach Activities

March 14
Charleston Black Expo, North Charleston Convention Center, 10:30am – 7:00pm, BCDCOG booth

April 8
Stand Up For Transit, Charleston League of Women Voters Forum, 5:30 – 8:00pm

April 18
Earth Day Festival, North Charleston Riverfront Park, 11:00am – 4:00pm

April Events

Transit Talks - a series of discussions will be held across the region in April focusing on key project goals related to mobility, environment, business, and land use (dates to be announced)

Public Meetings: Round 2 - the next round of public meetings will be held in April (dates to be announced)

i26ALT

Project Newsletter **September 2015**

Narrowing Down the Alternatives

One Screening Left To Make Our Selection

To select a transit alternative that best suits the I-26 Corridor connecting Charleston, North Charleston, and Summerville, the I-26 Alternatives Analysis must meet the prioritized environmental, land use, economic, and community objectives developed by the region's stakeholders last fall. Additionally, the project is following Federal Transit Administration guidelines to design a project that can compete for limited federal funds.

Throughout September, we will seek input on the Screen One Analysis. The public is invited to attend one of three public meetings and/or join the conversation on our [MindMixer] website. Following these meetings, the project team will complete the Screen Two Analysis to develop a locally preferred fixed guideway alternative and 20-Year Transit Plan for the I-26 Corridor to be presented to the public at the end of the year.

Community input is vital as we near the end of the study. Save the following dates to your calendar to be sure your voice is heard.

- **Sept. 24 - Summerville**, Bethany United Methodist, 7:00 – 9:00pm
- **Sept. 28 - Charleston**, Charleston Museum Auditorium, 6:00 – 8:00pm
- **September 29 - North Charleston,** North Charleston City Hall, 6:00 – 8:00pm
- Or anytime on [MindMixer]

Dear i26ALT Friends -

The i26*ALT* study team has had a busy summer! Thanks to the overwhelming input from the public meetings, Transit Talks series, MindMixer, and community outreach events, we've developed and refined several potential fixed guideway transit alternatives for the I-26 Corridor. Since last April and May, we've met with community members at three public meetings, three transit talks, and three community outreach events. The team has also looked at different transit projects across the country, completing an analysis of fixed guideway systems in a number of Charleston's peer cities. In "What Would Our Peers Do?" on page 2, we provide a brief overview of those findings. The complete Peer Review document can be downloaded from our website [here].

The biggest task completed over the summer was the Screen One Analysis, which ranked the 20 transit alignments and mode combinations. Rankings were based on a subjective and quantitative assessment of each alternative using the project goals identified through the scoping process and public meetings last Fall. You can download a summary of the rankings [here].

As a result of the Screen One Analysis, the project's steering committee has selected two corridors, US 78/US52 and Dorchester Road, and two modes, BRT and LRT, to move forward into the more detailed Screen Two Analysis. Read "Corridors & Modes Selected for Next Step" on page 3 for an overview.

i26ALT Study Team

MINDMIXER STATS

Mindmixer has served as our digital platform for public outreach, letting all of your voices and ideas be heard. Thank you for all that have participated.

"... the population growth of people can definitely appreciate a much better and convenient system here in the Charleston area." -Marlene D.

"BRT is a much faster and cheaper path to implementation" -Tasha G.

67.8 VIEWS

10,107 VIEWS TOTAL

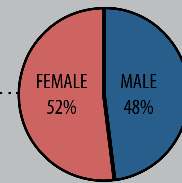
28.6 VISTORS PER DAY

42.9% PARTICIPANTS AGE 25-34 yrs

19% PARTICIPANTS AGE 45-54 yrs

14.3% PARTICIPANTS AGE 35-44 yrs

GENDER DISTRIBUTION



22.7% FROM SUMMERVILLE

Join Us on MindMixer

What Would Our Peers Do?

Lessons Learned in Peer Reviews

Healthline BRT. Cleveland, Ohio

As part of the Screen One Analysis, a peer review was conducted of cities with fixed guideway systems. The purpose of the analysis was to understand the successes and lessons learned in comparable cities that have recently implemented Bus Rapid Transit (BRT), Light Rail Transit (LRT) Commuter Rail (CR) or Hybrid Rail (HY). Although every community has a unique set of circumstances, the peer review provides some insight on the number of daily riders, construction costs, operating requirements, and other factors that may influence the success of one mode over another in the Charleston region. The following summarizes some key comparisons from the peer systems reviewed to help us consider what could work in our community.

BRT

	HealthLine (Euclid Avenue)	Metro Area Express (MAX)
Location	Cleveland, OH	Kansas City, MO
Service Area Population	1,412,140	748,415
Corridor Length (miles)	7	9
Stations	40	44
Span of Service	7 days a week	7 days a week
Weekday Span of Service	24 hours per day	4:00 AM – 1:00 AM
Weekday Service Frequency	7 minutes (peak); 10-15 minutes (off peak)	10 minutes (peak); 15-30 minutes (off peak)
Average Daily Riders	13,248 (4.8 million annually)	5,115 (1.5 million annually)
Cost per Hour	$89.65	$125.78
Cost per Passenger	$1.28	$3.51
Fleet Size	21 articulated buses	14 diesel buses
Project Capital Cost	$168.4 million ($24.05 million per mile)	$21 million ($2.3 million per mile)
Funding Source	Federal (49%), State (30%), Local/Other (21%)	Federal (80%), Local/Other (20%)

LRT

	LYNX Blue Line	The Tide
Location	Charlotte, NC	Norfolk, VA
Service Area Population	1,098,944	1,439,666
Corridor Length (miles)	9.6	7.4
Stations	15	11
Span of Service	7 days a week	7 days a week
Weekday Span of Service	5:30 AM – 1:30 AM	6:00 AM – 11:00 PM
Weekday Service Frequency	7 minutes (peak); 15-20 minutes (off peak)	10 minutes (peak); 15 minutes (off peak)
Average Daily Riders	15,546 (4.9 million annually)	5,531 (1.7 million annually)
Cost per Hour	$239.04	$412.78
Cost per Passenger	$2.66	$7.02
Fleet Size	20 articulated light rail vehicles	9 low-floor light rail vehicles
Project Capital Cost	$462 million ($48 million per mile)	$318 million ($42.9 million per mile)
Funding Source	Federal (39%), State (27%), Local/Other (34%)	Federal (52%), State (23%), Local (25%)

Commuter Rail

	New Mexico Rail Runner Express	Music City Star
Location	Albuquerque, NM	Nashville, TN
Service Area Population	929,543	1,583,115
Corridor Length (miles)	99	32
Stations	14	6
Span of Service	7 days a week	Mon - Fri
Weekday Span of Service	4:30 AM – 10:30 PM	AM and PM peak periods
Weekday Service Frequency	30-60 minutes	3 trips (AM peak); 3 trips (PM peak)
Average Daily Riders	3,681 (1.1 million annually)	997 (252,220 annually)
Cost per Hour	$751.05	$642.60
Cost per Passenger	$24.86	$16.57
Fleet Size	9 locomotives, 22 coach cars	3 locomotives, 11 coach cars
Project Capital Cost	$385 million ($3.9 million per mile)	$32 million ($1 million per mile)
Funding Source	Federal (0%), State/Local/Other (100%)	Federal (80%), State (8%), Local (12%)

Hybrid

	A-Train	Capital MetroRail Red Line
Location	Denton County, TX	Austin, TX
Service Area Population	234,552	1,046,404
Corridor Length (miles)	21	32
Stations	5	9
Span of Service	Mon - Sat	Mon - Sat
Weekday Span of Service	4:30 AM – 10:00 PM	5:00 AM and 7:30 PM (1:30 AM Friday)
Weekday Service Frequency	20 minutes (peak); 60 minutes (off peak)	30 minutes (peak); 60 minutes (off peak)
Average Daily Riders	1,883 (510,738 annually)	2,962 (834,699 annually)
Cost per Hour	$508.72	$1,186.51
Cost per Passenger	$22.16	$16.43
Fleet Size	11 diesel multiple units	6 diesel multiple units
Project Capital Cost	$312.4 million ($14.8 million per mile)	$90 million ($2.8 million per mile)
Funding Source	Federal (0%), State (80%), Local (20%)	Federal (0%), State (70%), Local (30%)

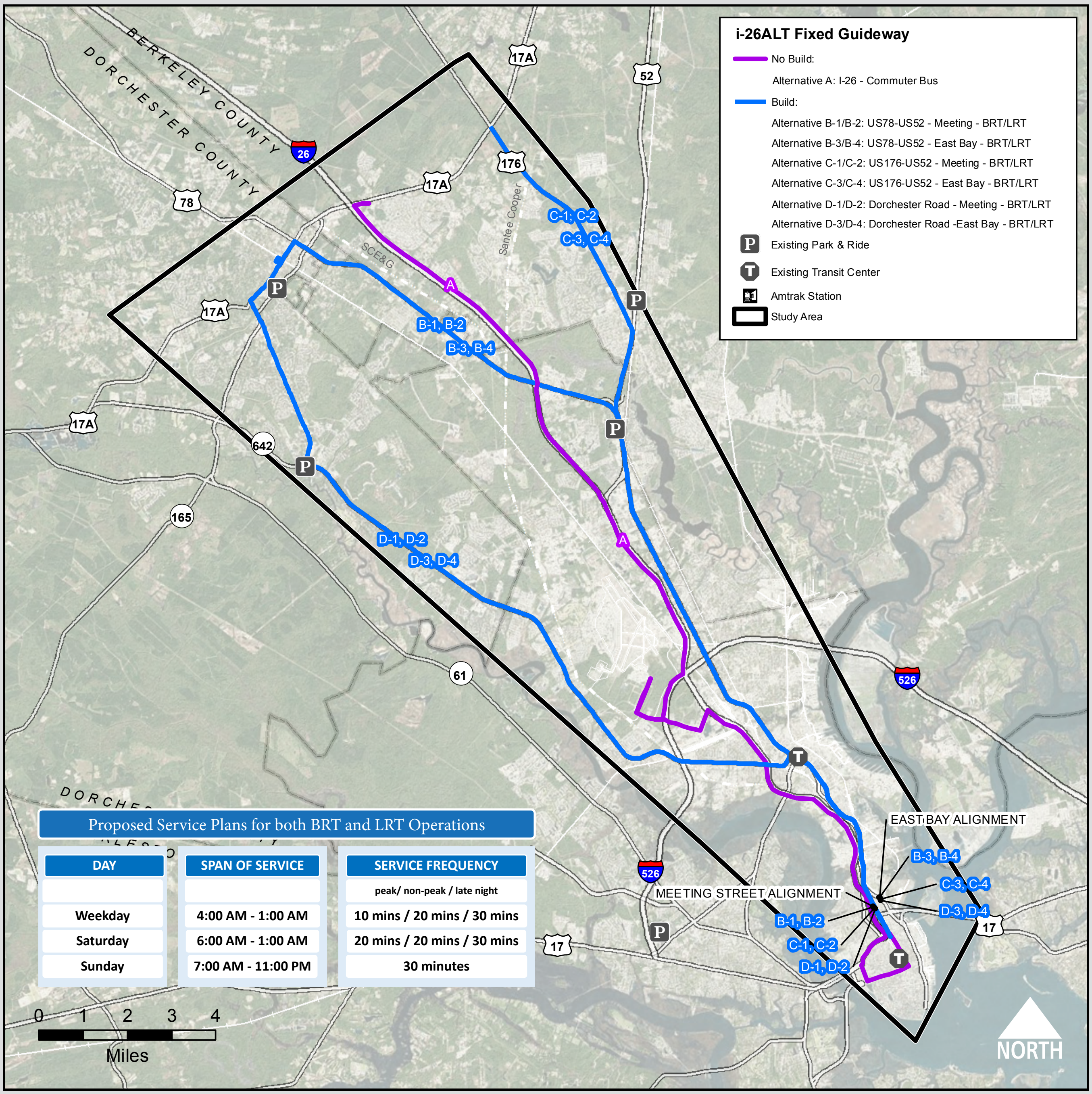
Corridors & Modes Selected for Next Step

Alternatives for Review During Screen Two Analysis

As a result of the Screen One Analysis, the project's steering committee selected two corridors, **US 78/US52** and **Dorchester Road**, and two modes, **BRT** and **LRT**, to move forward into the more detailed Screen Two Analysis.

Following the September public meetings, the project team will begin the Screen Two Analysis. Screen Two is a more detailed analysis of the six highest ranked BRT and LRT alternatives selected from the Screen One Analysis. Screen Two will estimate ridership, as well as refine the construction and annual operating costs for each alternative. We will test each alternative against the FTA's criteria for projects in the Capital Investment Grant program to identify which alternative best competes for federal funds. The following graphic shows the proposed alignments as well as the proposed schedule for the Screen Two Alternatives.

Your input on these alternatives at the meetings in September is important as we begin the Screen Two Analysis and work to identify one Locally Preferred Alternative by the end of the year.



Proposed Service Plans for both BRT and LRT Operations

DAY	SPAN OF SERVICE	SERVICE FREQUENCY
		peak/ non-peak / late night
Weekday	4:00 AM - 1:00 AM	10 mins / 20 mins / 30 mins
Saturday	6:00 AM - 1:00 AM	20 mins / 20 mins / 30 mins
Sunday	7:00 AM - 11:00 PM	30 minutes

project
TIME LINE

Phase 1
October 2014 - February 2015
Project Kick-off
Data Collection

Phase 2
March 2015 - April 2015
Service Evaluation
Fixed Guideway Alternatives Development

Phase 3
May 2015 - September 2015
Develop Service Plans
Alternatives Screening

Phase 4
October 2015 - December 2015
Locally Preferred Alternative
Implementation Plan
Funding Plan

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Next on the Agenda ...

i26*ALT* September Public Meetings

Thursday, September 24, 2015
Summerville Area Meeting
Bethany United Methodist - Fellowship Hall
118 W. 3rd Street South
Summerville, SC 29483
7:00 – 9:00pm

Monday, September 28, 2015
Charleston Area Meeting
Charleston Museum Auditorium
360 Meeting Street
Charleston, SC 29403
6:00 – 8:00pm

Tuesday, September 29, 2015
North Charleston Area Meeting
North Charleston City Hall, Council Chambers
2500 City Hall Lane
North Charleston, SC 29406
6:00 – 8:00pm

Or anytime in September on MindMixer
www.i26alt.mindmixer.com

i-26ALT

Project Newsletter **January 2016**

Assessing the Modes

The Screen Two Analysis

Last fall, stakeholders and community members developed six goals that have guided the alternatives screening process: 1) Improve mobility, accessibility, safety, and connectivity of the transit system and region; 2) Promote a cost effective and financially feasible transit alternative; 3) Support land use objectives; 4) Plan for projected growth in an environmentally sustainable manner; 5) Respond to community needs and support; and 6) Support a diverse regional economy.

With these goals in mind, the Screen Two Analysis rates two transit modes, BRT and LRT, on three major corridors, US 78/US 52 (Rivers Avenue), US 176/US 52 (Rivers Avenue) and Dorchester Road/US 52. The screening process uses the Federal Transit Administration's (FTA) criteria for projects in the Capital Investment Grant (CIG) Program to identify which alternative has the greatest potential to compete for federal funds. The Analysis also assesses the alternatives based on mobility improvements, cost effectiveness, congestion relief, environmental benefits, land use impacts and economic development potential.

During our final round of meetings, we will share details from the Screen Two Analysis as well as present the Recommended Alternative to move forward into the Project Development phase of the FTA's CIG Program. Please share your thoughts during one of the January public meetings or visit us online.

SAVE THE DATES:

- **Jan. 25th - North Charleston**, City Hall Council Chambers, 6:00pm – 8:00pm
- **Jan. 26th - Charleston**, Charleston Museum Auditorium, 6:00pm – 8:00pm
- **Jan. 28th - Summerville,** Bethany United Methodist's Fellowship Hall, 7:00pm – 9:00pm
- **Online** at www.i26alt.mindmixer.com and our project website www.I26Alt.org

Dear i26ALT Friends -

For the past 15 months, the *i-26ALT* study team has been analyzing transit alternatives to traffic along the I-26 corridor to improve mobility between Charleston, North Charleston, and Summerville. Your participation throughout the process has been invaluable, and we now have a final recommendation to share.

Since our last newsletter, we have completed the final round of screening. In "Assessing the Modes" to the left, we walk you through the Screen Two Analysis process.

The team has also taken a look at local funding alternatives used in other communities to successfully build regional transit systems. In "How Would You Fund a Regional Transit System?" on page 2, we provide a sample of some of those sources. If you are interested in viewing the complete "Screen Two Financial Analysis" document, please visit our website's Resource page.

Finally, on page 3, we reveal the Recommended Alternative to move forward to the FTA's Project Development phase.

Thank you again for taking part in the *i-26ALT* study!

i-26ALT Study Team

How Would You Fund a Regional Transit System?

Successful Funding Strategies from Peer Cities

The FTA's CIG Program can fund up to 80% of the capital costs for a project. With many regions vying for these limited funds, securing them is a very competitive process. The best way to be competitive is to have a project with a strong funding package.

i-26ALT analyzed successful transit funding strategies in other cities to help identify opportunities for funding in the Charleston region. The following is a snapshot with a few of the different funding sources in the "Screen Two Financial Analysis" which could help support the construction, operations, and maintenance of a new BRT system in the Charleston area.

Funding & Financial Analysis Snapshot

Source	Use	Considerations	Support
Federal Funding	Capital	- Projects must meet minimum performance thresholds to compete for projects. - Very competitive process.	- The New Starts program could fund up to 60% percent of construction costs; Small Starts could fund up to 80%. - BRT projects have been successful in receiving TIGER grants.
Sales Taxes	Capital and Operations	- Subject to voter approval. - Highly used by other agencies with large success. - Use of revenue determines the size and duration of tax. - Affected by economic cycles. - Revenue can be leveraged as match for other federal funds.	- The counties of interest currently levy a transportation sales tax used for roads and/or transit. - Communities have been successful with regional transit sales tax initiatives with strong multi-jurisdictional coordination and cooperation in other states.
Special Assessment Districts	Capital and Operations	- Need for increased transit oriented development around fixed-guideway stations. - Land use and zoning will have to provide for TOD development (increased densities, mixed-use, height limits, ability to waive parking requirements, etc.)	- Revenues collected can be leveraged to promote TOD development at stations and along the corridor. - Development can improve transit ridership.
Naming Rights	Operations/Maintenance	- Provides an innovative option for generating revenue and is being considered more often by systems. - Naming rights agreements usually result in a loss of revenue from more traditional advertising.	- Revenue from this source is typically used to offset the loss of revenue from more traditional advertising. - Usually used to support operating expenses. - Can help shape the branding and marketing of system.

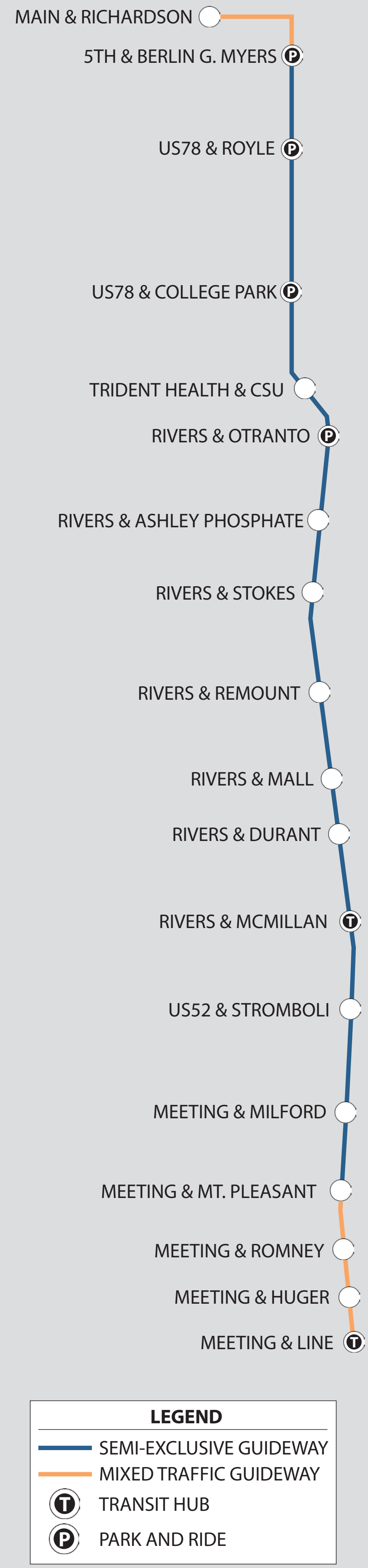
The Recommended Alternative is … Bus Rapid Transit

As a result of the Screen Two Analysis, the steering committee has identified Bus Rapid Transit along US 78 and US 52 (Rivers Avenue) connecting Summerville, North Charleston, and Charleston as the Recommended Alternative to move forward into Project Development. What do you think? Let us know at our next round of public meetings or online through Mindmixer or the project website.

Semi-Exclusive Guideway

Alternative B-1: US 78/US 52/Meeting BRT	
Route Length:	23.1 Miles
Vehicles:	Hybrid, articulated BRT bus
Bus Lanes:	Semi-exclusive - 89% Mixed-Traffic - 11%
Number of Stations:	18
Frequency:	Weekdays: 10 mins (peak); 20 mins (off-peak); 30 mins (late) Saturday: 20 mins (peak/off-peak); 30 mins (late) Sunday: 30 mins
Hours of Operation:	Weekdays: 4:00 a.m. - 1:00 a.m. Saturday: 6:00 a.m. - 1:00 a.m. Sunday: 7:00 a.m. - 11:00 p.m.
Travel Speeds:	70% increase in bus speed
Estimated Trips on Project:	6,800 daily trips/1.9 million annual trips 3,800 "new" daily trips
Estimated Cost*:	$360 Million Capital ($15.5M/mile) $5.8 Million Annual Operating Cost

**Reflects planning level cost estimates (base year 2015)*



PROJECT
TIMELINE

Phase 1
October 2014 - February 2015
Project Kick-off
Data Collection

Phase 2
March 2015 - April 2015
Service Evaluation
Pre-Screen "Fatal Flaw" Analysis

Phase 3
May 2015 - September 2015
Develop Service Plans
Screen One Analysis

Phase 4
October 2015 - December 2015
Screen Two Analysis
Select Preferred Alternative

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Next on the Agenda ...

i26*ALT* January Public Meetings

Monday, January 25, 2016
North Charleston Area Meeting
North Charleston City Hall, Council Chambers
2500 City Hall Lane
North Charleston, SC 29406
6:00pm – 8:00pm

Tuesday, January 26, 2016
Charleston Area Meeting
Charleston Museum Auditorium
360 Meeting Street
Charleston, SC 29403
6:00pm – 8:00pm

Thursday, January 28, 2016
Summerville Area Meeting
Bethany United Methodist - Fellowship Hall
118 W. 3rd Street South
Summerville, SC 29483
7:00pm – 9:00pm

Or anytime on MindMixer
www.i26alt.mindmixer.com

Topic Name: Public Transportation Improvements in your Community

Idea Title: Utilize existing railroad parallel to I-26 for commuter rail service from Ridgeville to downtown Charleston

Idea Detail: There is already railroad paralleling I-26 extending from Ridgeville to Downtown Charleston. It already passes through the following areas, which would be station sites: 1. Central Ridgeville, 2. Downtown Summerville, 3. Ladson Rd, 4. Palmetto Commerce Parkway area, 5. Ashley Phosphate Rd, 6. Aviation/Remount near CHS airport and AFB, 7. Montague Ave/Mall Dr, 8. Dorchester/Cosgrove Rd, 9. The Neck Area, and currently ends in Wagener Terrace. The service may be extended further downtown by reopening portions of unused railroad that extend alongside the elevated portion of I-26.

CARTA bus routes may be reconfigured or new routes created to include the rail stations. Free transfer may be allowed from train to bus. This would increase CARTA ridership and help bring rail commuters from a broader area. The downtown terminal could be a hub for the free CARTA trolley, allowing excursions to downtown Charleston from Summerville and North Charleston without a car.

Park and ride stations should be utilized in stations located in lower-density residential areas. Stations in higher density commercial areas could potentially include newsstands or retail/food kiosks.

A shuttle should operate between the airport and the station at Aviation/Remount. Large employers like Boeing and MUSC could consider implementing shuttles for their employees.

The rail could also serve as a hurricane evacuation route. The railroad extends to Columbia, and trains could shuttle thousands of residents inland if needed.

Idea Author: Nick S

Number of Stars 39

Number of Comments 1

Address: 221 Church St 29472, United States

Comment 1: I received an interesting article.

"U.S. Transportation Secretary Foxx Announces LadderStep Technical Assistance Program" .

http://content.govdelivery.com/accounts/USDOT/bulletins/100ace9

I would like to see our Representatives assist with getting findings for transportation projects instead of cutting it. At the end of the day, the low country is growing and the problem is not going away.

| By Michelle M

Idea Title: Light rail system

Idea Detail: Light rail system from Summerville to Charleston with multiple stops with parking. Another light rail system for downtown an upper peninsula.

Idea Author: Edward A

Number of Stars 27

Number of Comments 0

Idea Title: Regional Transportation Hubs

Idea Detail: My thoughts are to install throughout the Charleston region Multimode Transportation hubs that are capable of accommodating the different modes of public transportation and private passenger vehicles. These hubs will serve as the initial hubs for "light Rail" and Transit Buses. Also keep in mind that the use of these hubs should be designed with multi-use and expansion into the future. While studies are currently underway these hubs should be first phase of the plan in order to put into use now for reducing area congestion. During this phase we will need to also increase the number of transit buses in our region to serve these hubs. I can not get into more detail with this medium but I am willing to share more of my vision with whoever will listen.
My key ideas are to install the necessary infrastructure that will allow us to transition into a regional multi-use transportation facility (Hubs), expand the number of transit buses, and continue the current studies being conducted.

Idea Author: Blanks B

Number of Stars 25

Number of Comments 0

Address: 184 Pavilion St 29483, United States

Idea Title: Bike path under I-26

Idea Detail: Future growth in Charleston is going to hamper opportunities to expand alternate transportation. Right now the railway easement still exists parallel to I-26. This is a great opportunity to build a wide bike path and possibly a light rail that connects downtown, park circle, and north charleston. As downtown continues to gentrify and rent prices increase, many of the people who work or go to school downtown can no longer afford to live there, and soon will not be able to afford to park. We need to find ways to allow people to come down to the peninsula without bringing their cars with them.

Idea Author: Jon M

Number of Stars 12

Number of Comments 0

Address: 67 St Augustine's Ct 29403, United States

Idea Title: Demolish the Midland Park Road Bridge and build a new one

Idea Detail: This map does not work as designed, as the location I click is not the location that pops up. I am trying to point out that the Midland Park Road bridge is a choke point that causes traffic to continue to be clogged well above the 526 interchange. The Remount/Aviation ramp merges traffic at the same point that the highway loses a lane.

Idea Author: Roger C

Number of Stars 9

Number of Comments 0

Address: 2262 Townsend Rd 29406, United States

Idea Title: Summerville Hub

Idea Detail: If there is going to be a transportation hub in Summerville should it be within walking distance of the new Hotel in downtown Summerville. It would be a great selling point for the condo's that will be build by the Hotel as well as Hotel Guests can take mass transit to go to Charleston.

Idea Author: Patricia H

Number of Stars 9

Number of Comments 0

Idea Title: Add Bike Lanes to E Montague

Idea Detail: Add dedicated bike lanes to E/W Montague Ave (especially on bridges and at major intersections, such as this one).

Idea Author: David C

Number of Stars 9

Number of Comments 0

Address: I 26 29418, United States

Idea Title: Add Bike Lanes to W Montague

Idea Detail: Add dedicated bike lanes to W Montague Ave (especially on bridges and at major intersections, such as this one).

Idea Author: David C

Number of Stars 9

Number of Comments 0

Address: 3824 W Montague Ave 29418, United States

Idea Title: Sync the stop lights at this notorious triangle

Idea Detail: Install computer controlled lights that work together surrounding lights to help control the flow of this area

Idea Author: David S

Number of Stars 9

Number of Comments 0

Address: 9616 Highway 78 29456, United States

Idea Title: Eliminate the cloverleaf

Idea Detail: This interchange design is horribly outdated, probably why we see traffic and accidents at this location almost daily. Instead of building a new highway that's not needed (526), fix the one that we already have so it's not made for 1950's traffic volumes

Idea Author: Roger C

Number of Stars 8

Number of Comments 1

Address: I 526 29406, United States

Comment 1: Fly overs are the way to go. | By David S

Idea Title: Downtown Summerville commuter train station

Idea Detail: Having a commuter rail system within walking distance from the new Hotel being built in downtown Summerville will be a great economic booster in that area Hotel visitors can commute between here and Charleston, A great selling point for the condo's that are going up next to the Hotel Boutique. What about creating bike paths that lead to the station from Knightsville and Oakbrook

Idea Author: Patricia H

Number of Stars 7

Number of Comments 0

Idea Title: Add bike lane

Idea Detail: Help Boeing bike commuters, reduce congestion/parking issues.

Idea Author: Krystina J

Number of Stars 7

Number of Comments 1

Address: 5297 International Blvd 29418, United States

Comment 1: Agreed! I'm a bike commuter in North Charleston and always appreciate having more safe options for getting around by bike. It would be nice to have it situated near / parallel to transit, so that you could ride transit for longer distances and then hop on your bike to get to your final destination. Or if someone is feeling ambitious, just bike the whole way. | By David C

Idea Title: Need another Bridge across the Ashley

Idea Detail: Need another Bridge across the Ashley

Idea Author: David S

Number of Stars 6

Number of Comments 0

Address: 7490 Dorchester Rd 29418, United States

Idea Title: Finish Frontage roads

Idea Detail: Connect Gateway Drive to Excellence Way

Idea Author: David S

Number of Stars 4

Number of Comments 0

Idea Title: Accessible Route Across the Bridge

Idea Detail: I would like to see an accessible route (bike abd pedestrian) to cross the bridge to downtown and then take transit up the i26 corridor.

Idea Author: Elizabeth L

Number of Stars 4

Number of Comments 0

Address: 59 Folly Rd Blvd 29407, United States

Idea Title: Another outdated cloverleaf interchange

Idea Detail: Fix it!

Idea Author: Roger C

Number of Stars 3

Number of Comments 0

Address: I 26 29405, United States

Idea Title: Tear down the viaduct

Idea Detail: And create an urban boulevard that repairs some of the damage inflicted on these neighborhoods when a highway was built through them.

Idea Author: Roger C

Number of Stars 3

Number of Comments 0

Address: 97 Romney St 29403, United States

Idea Title: Finish Frontage Roads 2

Idea Detail: Connect Blue House Rd. to Seabrook Dr. and then Connect Ancrum Rd to that.

Idea Author: David S

Number of Stars 3

Number of Comments 0

Address: 3067 Ancrum Rd 29456, United States

Idea Title: Finish Frontage Roads 3

Idea Detail: Connect Frank Jones Rd to Judy Hill Dr. Also Bring Jockey Ct By Walmart all the way down and connect into Royle Rd. Frontage Roads will also help with evac situations for Hurricanes.

Idea Author: David S

Number of Stars 3

Number of Comments 0

Address: 1025 Jockey Ct 29483, United States

Idea Title: Review Train/Intermodal Station Project for capacity & expansion

Idea Detail: The scope of the new station needs to be reviewed for future capacity and integrated for bikes, pedestrians, cars, train, taxi access, traffic and parking. The Rivers Ave train overpass at Durant needs to be addressed as well.

Idea Author: Tasha G

Number of Stars 3

Number of Comments 0

Address: 4529 Gaynor Ave 29405, United States

Idea Title: Integrated Easy to Use Payment System

Idea Detail: With instant fillable cards available via vending machine or smart phone at the many locations and stops including the Super Stop.

Idea Author: Tasha G

Number of Stars 3

Number of Comments 0

Address: 3366 Rivers Ave 29405, United States

Idea Title: No new interchange

Idea Detail: Adding new interchanges does not solve the traffic problems we have to face every day, it just adds more cars to the equation and makes traffic even worse. This survey is a good idea but there's a pervasive culture here that shuns public transportation and seems to think adding more lanes will solve all of their problems. Good luck getting anything done, I expect the uneducated masses will strike down any good idea you guys put forward. At least there are some cities in this country that see the true value in public transit and has better ideas than building more and bigger highways.

Idea Author: Roger C

Number of Stars 2

Number of Comments 0

Address: 2999 Buckfield Dr 29406, United States

Idea Title: Underpass/overpass so neighborhood isn't cut off by rail

Idea Detail: 526 access stunted by rail line.

Idea Author: Krystina J

Number of Stars 2

Number of Comments 0

Address: 5160 N Rhett Ave 29405, United States

Idea Title: Bike/ped lane or bridge?

Idea Detail: No easy access to Daniel Island

Idea Author: Krystina J

Number of Stars 1

Number of Comments 0

Address: I 526 29405, United States

Idea Title: Add bike access route

Idea Detail: Add bike lane

Idea Author: Krystina J

Number of Stars 1

Number of Comments 0

Address: 216A 29405, United States

Idea Title: Public Bike Sharing in Downtown Charleston

Idea Detail: Downtown would have to be more accommodating to bikes, but this would greatly reduce number of cars downtown.

Idea Author: Matthew F

Number of Comments 0

Idea Title: Hwy 78 Widening

Idea Detail: Hwy 78 needs to be widened between fairgrounds and Summerville,, bad bottleneck there every day all day and worse during rush hours.

Idea Author: Carol D

Number of Comments 0

Address: 1110 Limehouse Ln 29456, United States

Idea Title: Commuter Rail

Idea Detail: The roads are all ready slammed full of cars and buses. People complain about road construction all the time what do you think they are going to say when they are tearing up the median of Dorchester, Rivers Ave or where ever they are going to put Light Rail or the Bus Rapid system. That system is only a temporary fix. What I mean by that is, it might work now but 20 years from now when Ridgeville and other small towns start growing it will be a mess they will be tearing up more road's to build the light rails or Bus Transit. The best option is Commuter Rail. This is a easy option that we could use and guess what the construction on the roads is slim to none. Also, its out of sight of the public.The Rail Traffic in the Summerville area is also very low, a train might pass through town maybe once an hour. The commuter train might start off small but once it gets started and the towns start to grow in the future all the construction that is going to have to take place is building the stations. The tracks from Summerville lead all the way to Columbia so there is plenty of room to grow and expand and on the Goose Creek side its all set up for commuter rail, the reason for that is the Amtrak runs through town everyday. So most of the construction would take place between Summerville and Charleston.

Idea Author: Garrett W

Number of Comments 0

Idea Title: Park and Ride Station for Light Rail

Idea Detail: As an alternative to driving on I26, Summerville commuters can park their cars and ride into town on a new light rail transit line which is constructed along nearby electric transmission lines right of way. This will decrease traffic on 78 which is already a bottleneck during rush hours.

Idea Author: Mary Alice W

Number of Comments 0

Address: Ingleside Blvd 29456, United States

Idea Title: underpass/overpass for connectivity

Idea Detail: rail line currently blocks road--cars/buses/bikes

Idea Author: Krystina J

Number of Comments 0

Address: 1891 E Montague Ave 29405, United States

Topic Name: Final Round of Public Meetings!

Idea Title: Light rail system from Summerville to Downtown

Idea Detail: I recently made a trip to Dallas TX and was blown away at the rail system (DART) that is integrated into the entire city. Cost me $5 to go from the airport to Downtown (25miles). The streets of downtown are amazingly light with traffic. I believe this similar system could be implemented into Charleston. If I worked and commuted downtown I would gladly pay up to $5 to take a train. Thank you for working towards preplanning on this much needed transit system.

Idea Author: Tyler C

Number of Stars 18

Number of Comments 2

Comment 1: to add on to the light rail discussion... wasn't there a monorail study several years back; what was the result of that? Seems like that would be a good system to use to conserve land and bridge over waterways/wetlands. Recently read about a monorail type system call Metrail http://www.metrail.com/ which might be something to look into. Another thing to consider is how future development will impact light rail, roads, bikeways, etc. The issues I see with public transportation around the tri-county area is that businesses, homes, and public transportation are so far apart from each other that I do not see a whole lot of people utilizing public transportation unless it is convenient to where they work, live, shop, etc. Making it convenient is going to be an essential part of the planning process. | By Gerald S

Comment 2: I was commenting that I work down charleston and would gladly use an efficent cost effective solution. I do not use the express bus becase I would have to travel 10 miles in any direction to get to an express lot. when it takes me 12 miles to get to downtown. CARTA would also add at least 1 to 1.5 hours to my day. If someone could show me a solution that would be comparable to my current commute and cost per year I would be all in. | By jeanette C

Idea Title: Bus Rapid Transit between Monks Corner and Charleston

Idea Detail: Dedicate lanes to buses, have terminals for pre-boarding check in, have parking and/or local connecting buses for commuters & tourists who live beyond walking distance of terminals (but don't require tourists to have "fast pass" cards), have amenities (WiFi, newspapers, fruit, doughnuts, coffee) available. The bus driver should have remote traffic-light control. The bus should be faster (or at least as fast) as a car on this route. There should also

be links from N.Charleston to Summerville via Dorchester Rd and via Ladson.
Beyond the metro area, primary routes should be upgraded to provide controlled-access divided-highway alternatives to I-26 to get to Columbia, Augusta, and Florence. Without them, emergency evacuation will almost certainly be snarled by even the most minor accident on I-26

Idea Author: L E M

Number of Stars 9

Number of Comments 0

Idea Title: Line Extensions & Spurs

Idea Detail: Would be very useful to present add/alternative cost for:
-extending the line from Line St to the Mary St transit center
-extending a spur to MUSC/West Edge development
-extending a spur to Boeing/Airport

Idea Author: Tasha G

Number of Stars 5

Number of Comments 1

Comment 1: what would be the overall commute times ? | By jeanette C

Idea Title: Sidings to allow Express Service

Idea Detail: If sidings could be added so that local service could pull off to allow Express Service from the northern-most stops to the southern-most stops (with 1-2 intermediate stops instead of 18), there would be more buy-in for the project and ridership adoption.

Idea Author: Tasha G

Number of Stars 5

Number of Comments 4

Comment 1: I cannot imagine a scenario where CARTA would stop the local service; and I completely agree that the proposal has far toooooo many stops. | By Charles D

Comment 2: Thanks for clarifying, Tasha - I agree with this suggestion! | By David C

Comment 3: According to the first presentation last night (repeated tonight downtown and tomorrow in S'ville), the current draft proposal is for one route of semi-local with 18 stops between S'ville and downtown that runs every 10 minutes during peak hours and every 20 minutes during non-peak. My comment here proposes *adding* an express route (not taking away the local). To do that, they would need sidings (additional parallel track) at stops to let the express bypass those stops. It's similar to how express subways run concurrently with local subway trains in NYC. You would continue to have local service for groceries, appointments etc while increasing the participation (ridership) from the northern-most stops (S'ville, Moncks Corner, etc). More ridership means more income for the system and less cars on the road. But the commute time needs to be same or less for riders to adopt. I'm suggesting that northern-most ridership would be negatively impacted by 18 stops and the resulting increased commute time.
| By Tasha G

Comment 4: How do you know this? Has anyone done a study on how most people along this route get to and from work. What about cost analysis they currently incur compared to time lost and additional cost and inconveniences of not being able to stop for groceries in route | By jeanette C

Idea Title: Funding Sources

Idea Detail: The City of North Charleston and developers in the Rivers Ave corridor stand to benefit from this route financially. The City should contribute to this route from general operating funds and should/could also establish a TIF district and/or developer impact fee to provide additional funding (especially to fund an add/alternative spur to Boeing/Airport. The corridor is also ripe for an overall overhaul of Rivers Avenue and certain areas should be examined for PUD zoning. Affordable Housing projects should be prioritized in any PUD or redevelopment efforts.

Idea Author: Tasha G

Number of Stars 5

Number of Comments 1

Comment 1: Industry and development has dumped on this area and it has not seen any improvement in these oldest communities. So no, I think we have paid our dues in property value and deserve some consideration to the amount of noise and chemical pollution we have been subjected to. | By jeanette C

Idea Title: Rapid transit

Idea Detail: Know it's more expensive, but won't even a separate bus lane still be hindered when there is an accident on the interstate? Also widening the entrance ramps and merge lanes where 526 meets 26 needs to happen asap in both directions.

Idea Author: Pam M

Number of Stars 5

Number of Comments 1

Comment 1: I think a bus with a truly separated lane (i.e., physical barrier between cars and buses, even if it's just concrete parking block like they use in Bogota: http://i26alt.mindmixer.com/ideas/215864/bogota-colombia) would keep buses moving even when there is a car crash, unless the car somehow jumped the barrier while crashing. | By David C

Idea Title: Provide integrated bike infrastructure

Idea Detail: Bikes are a great way to span the first and last mile of transit trips. Please be sure the proposed system supports bike integration with the following features:

--When the road cross section is redesigned (e.g., Rivers Ave), provide separated bike lanes alongside the bus lanes for the entire length of the corridor. Provide a physical barrier between the bikes and other traffic (curb, planters, etc.) to make the lanes safe and protected. Ideally paint the entire bike lane green, as Charlotte and other cities have done.
--Provide bike lockers and bike racks at all transit stops, especially major nodes. Provide video surveillance if possible, or at least ample lighting.
--Consider establishing a bike-share program with racks at major nodes (Downtown Summerville, Rivers & Durant, Downtown Charleston, for example) to allow visitors to bike to their final destination.
--Provide space in transit buses for people to carry their bikes with them.
--Use NACTO Transit Street Design standards.

Idea Author: David C

Number of Stars 3

Number of Comments 0

Idea Title: Utilize our waterways

Idea Detail: The low country already has the infrastructure in place for moving people from Summerville to Kiawah. Take people off the highways and put them on the water.

Idea Author: Robert B

Number of Stars 3

Number of Comments 0

Idea Title: Light Rail- no one likes riding the bus.

Idea Detail: Light rail would be ideal if your going to sell it to the public and vistors to our city. Charleston would be the first in the state to have a greener mass transit option . People for some reason feel better about saying ," I took the train in to work today." Vers I rode the bus. It's more money but better option and more people will use it. It shouldn't even be a question . We have needed this for years, it's time to think ahead vers the problem right now. Traffic is only going to get worse.

Idea Author: Matthew H

Number of Stars 3

Number of Comments 0

Idea Title: Light rail would seem to be the most efficient, & reliable

Idea Detail: Train is most efficient and most reliable mode.   Most major cities use this with much success

Idea Author: Valerie C

Number of Comments 0

Idea Title: We need rapid transit rail Charleston /airport/

Idea Detail: Please look at successful transit all over the world moving large numbers of people supported by bus system arteries. Use I26 as the main corridor between Charleston / airport / Summerville

Idea Author: Patricia D

Number of Comments 0

Topic Name: Improving Our Community's Transportation

Idea Title: The existing transit options are not adequate enough.

Idea Detail: Since moving here from New York in 1997 where exists the "best and largest" public transit system in the world, the population growth of people can definitely appreciate a much better and convenient system here in the Charleston area. I would love to be able to take a train or bus from Goose Creek where I live to downtown Charleston, Mt.Pleasant, the other neighboring cities in the Low Countryand leave my car parked at or near home within walking distance.

Idea Author: MARLENE D

Number of Stars 16

Number of Comments 1

Comment 1: Great idea to build on!! | By Elaine Yates A

Idea Title: HOV Lane

Idea Detail: There needs to be an HOV lane on 26 and 526. This would be for buses, motorcycles, and any vehicle with 2+ passengers. This would provide a faster route for the responsible commuters, and reduce traffic for the other drivers.

Idea Author: Logan M

Number of Stars 12

Number of Comments 4

Comment 1: Another Paper from a Professor at UC Berkeley..
http://www.uctc.net/access/27/Access%2027%20-%2002%20-%20What%20We've%20Learned.pdf
| By David S

Comment 2: Here is a study done on HOV lanes by the California State University...
http://robotics.eecs.berkeley.edu/~varaiya/papers_ps.dir/HOV.pdf
| By David S

Comment 3: HOV Lanes are bad for traffic and pollution. If you are going to add a lane then let

everybody use it so people get off the roads faster. If you are converting an existing lane to HOV then you add to the problem for all of the traffic that is not allowed in that lane. Any way you cut it HOV means more cars on the roads for longer periods of time there by increasing traffic and pollution. All around bad idea | By David S

Comment 4: HOV Lanes are bad for traffic and pollution. If you are going to add a lane then let everybody use it so people get off the roads faster. If you are converting an existing lane to HOV then you add to the problem for all of the traffic that is not allowed in that lane. Any way you cut it HOV means more on the roads for longer there by increasing traffic and pollution. | By David S

Idea Title: Existing transit options suck

Idea Detail: The "express" buses sit in the same traffic as everyone else. At the very LEAST, this corridor needs an HOV lane. The interchanges need to be redesigned and perhaps consolidated near the airport corridor, the c/d lanes don't work when they dump you out right at the next exit and cause everyone to have to weave and merge. There's an abandoned rail corridor under the city end of 26 and between King and Meeting as you go through the neck. There's also an absurdly wide median on much of Rivers Ave. This should be used as a busway or for some type of rail! The line is just sitting there, ugly as can be...in a city that's supposed to pride itself on historical reuse, it's the obvious place for mass transit. An HOV lane is sorely needed on the interstate, perhaps from Cosgrove Ave north (this would eliminate extra cost by building one on the elevated section) that completely bypasses the 26 interchange (see I-77 in Charlotte for motivation) and has a THREE person limit in cars

Idea Author: Roger C

Number of Stars 10

Number of Comments 0

Idea Title: A mag-lev, busses, van-pools, and bike trail

Idea Detail: Mag-Levs are energy efficient and environmentally friendly. The bus system could be made more robust with more stops through-out Summerville, Ladson, goose-creek, Hanahan, moncks corner, etc., more routes, and frequent pick-up drop off times. A bike path can be constructed to encourage a fit community. Incentives can be offered to those who leverage these alternatives. I believe there are enough commuters in the area to make these ideas successful, and the area is only growing.

Idea Author: Amy L

Number of Stars 9

Number of Comments 0

Idea Title: More park and ride locations. Bike capacity.

Idea Detail: Ortranto kmart express works well. Need more routes like that. Ball field at N. Rhett and Remount may be a good place for park and ride to downtown and mt. P. Also increasing bicycle capacity. If you wait for a bus and the rack is full you're out of luck. 4 position racks or space inside needed. Smaller shuttles for local routes. I have watched the fullsize bus go by my area around Rhett and Remount for several years with less than 3 riders. Improved timing of routes so when you have to change buses you are not waiting, makes commute time too long.

Idea Author: martin B

Number of Stars 9

Number of Comments 1

Comment 1: Otranto KMart express works well...except the fact that the bus has to sit in the same traffic as everyone else on 26, so it's not really "express" at all except for the fact that it doesn't have intermediate stops. An HOV lane or busway would be the logical way to make it truly "express" and give commuters a legitimate option besides sitting in traffic on 26. Imagine the incentive to use transit or carpool when you see other people whizzing by on the HOV lane getting from Cosgrove to Ashley Phosphate in only minutes at the height of rush hour. They are too worried about adding new interchanges for unbuilt developments and reconfiguring interchanges for the port traffic when it's all moot anyways because everyone STILL has to sit through the 26/526 debacle. This whole area needs to be redesigned along with the 526/Rivers exit | By Roger C

Idea Title: Light Rail is the Optimum

Idea Detail: Having worked in the Light Rail industry, I believe that our area would benefit from such a system. Compared to Heavy Rail, more and conveniently located stops can be provided thereby improving the level of service. Commuter buses would be handicapped by the freeway congestion that currently, and for the foreseeable future, exists. Bus service can be re-directed to feed the rail stops. Commuter parking lots can be provided at rail stops along with kiss-and-ride lanes.

Idea Author: Dennis Z

Number of Stars 8

Number of Comments 0

Idea Title: Potential North Charleston-West Ashley crossing and parkway

Idea Detail: Michaux Parkway currently terminates at the entrance to a residential neighborhood in North Charleston. There is unoccupied land along the north of this neighborhood extending from Dorchester Rd to the Ashley River. There is also unoccupied land on the opposite side of the Ashley River to the south and east of Drayton Hall Plantation extending to Highway 61.

Michaux Parkway could be realigned to intersect and extend beyond Dorchester Road, cross the Ashley River and intersect Highway 61. It would continue parallel to Bees Ferry Road, eventually intersecting the upcoming extension of Glenn McConnell Parkway from West Ashley Circle.

This would alleviate a significant amount of congestion on Glenn McConnell Parkway, Highway 61 and I-526 between North Charleston and West Ashley, thereby shortening the commutes of thousands of drivers.

Idea Author: Nick S

Number of Stars 7

Number of Comments 2

Comment 1: David C nailed it...you want to build a "new" Bees Ferry Road...in 20 years it'll be just like the "old" one and then we'll need yet another "new" one...we need to start thinking of true alternatives to even more roads, more lanes, and ultimately more SPRAWL | By Roger C

Comment 2: I see how this would benefit lots of drivers, but I fear that it would encourage more "sprawl" growth in West Ashley. It would be nice if the new bridge were accessible to transit, walkers, and bikers, but not to single occupancy vehicles. | By David C

Idea Title: Right Hand Turn Lanes, Public Transportation

Idea Detail: I think there is a serious lack of right hand turn lanes at busy intersections which causes the traffic to back up for quite a way. I also think some safe, convenient form of public transportation would be a great option. I would be willing to park my car and ride a train if it was convenient and easy to access.

Idea Author: Abby P

Number of Stars 6

Number of Comments 1

Comment 1: I think a lot more people would park their cars if we had a dependable public transportation system. A BRT system with the articulated bus. After all, the company that makes the bellows and articulation is in Mount Pleasant, SC. | By Michelle M

Idea Title: Express bus park and ride

Idea Detail: Express bus park and ride from Ball field at Remount and N. Rhett to downtown and Mt. Pleasant.
More bicycle capacity to allow people to get from home to the bus and the bus to work. I have ridden buses with rack / wheelchair space inside, We CAN do it.

Idea Author: martin B

Number of Stars 6

Number of Comments 0

Idea Title: Passenger train out of downtown Summerville.

Idea Detail: Would bring much tourism to Summerville to advertise "let us drive you to Charleston for the day." Summerville--on the "Edge of Everything!" No parking, no one way streets, no heavy traffic to find a place to stay... Summerville can especially offer new Marriott nearby and down town hotel to come & Bed & Breakfast can benefit, too ! I would never drive into Charleston again to shop if could ride from Summerville. Free trolleys once you get there to get around...

Idea Author: Elaine Yates A

Number of Stars 6

Number of Comments 0

Idea Title: Nodal Developments, zoned pricing, and park n rides

Idea Detail: Intense development in specific locations along corridors. Charge for rides based on distance between origin and destination zones. Strategically locate PnRs to get more people out of their cars. Once these things are in place the system will become more robust and can generate the needed metrics to contemplate alternative modes.

Idea Author: Charles D

Number of Stars 5

Number of Comments 0

Idea Title: improving the way we get around to work and more

Idea Detail: They should be some type of transit system going from downtown connecting at the new main n.chas station. Then from there it will split 3 ways. one going up dorchestor ending around the wescott/old trolley area. Another one going up rivers ending somewhere near goose creek. And one going up 26 ending in summertime. With main stops at places like ash phos. Also connecting to jobs like bosch, boeing, airport, and trident. These places can promote ridership to and from work. Also a better bus system to help along with this. Also downtown Charleston should have a trolley system that will help with visitors getting around town

Idea Author: clif C

Number of Stars 5

Number of Comments 0

Idea Title: A commuter train

Idea Detail: Train is in Summerville on a side track overnight. at 7:00 am it takes commuters to Boeing area and downtown Charleston. At 10 am it brings Tourists back here to Summerville to lunch and tour. Then at 3:00 it takes tourists back to Charleston and brings the commuters back here about 6:30. Costs for running a car everyday would be about $700 in gas alone for a year. If you could price this at $550 for a year pass, 6 days a week for 52 weeks people would ride. I would ride twice a month for $250 a year, just to go downtown and shop and come back. To avoid I-26 would be heaven. Parking for the commuters could be in a large lot and a shuttle could bring them to the train station in downtown Summerville. Boeing would pay for a shuttle for their group and the hospitals and businesses downtown Charleston could run a shuttle down there...or use the current shuttle system with non-stops to different locations. It makes sense and it really needs to happen SOON.

Idea Author: Deb C

Number of Stars 5

Number of Comments 0

Idea Title: I would like a train to run between the metro areas

Idea Detail: a train - like the marta train that runs between Atlanta and surrounding areas.

Idea Author: lisa P

Number of Stars 4

Number of Comments 0

Idea Title: Ferry System

Idea Detail: At the risk of being repetitive, I think we need to delve more deeply into the prospect of a regional ferry system with connection possibilities near I-526 on the Cooper, at the end of Seven Farms Dr on the Cooper, at Patriots Point - existing on CHS harbor, downtown - existing on CHS harbor, and Fort Johnson area on CHS harbor.
Investments in this type of infrastructure tend to run in the millions and tens of millions, but not in the hundreds of millions.
Aside from being a viable way to remove commuter traffic from the roads, ferries have the added benefit of attracting tourism dollars and choice riders.
I have looked into fleet investments to try to roughly calibrate travel times that would be incurred from those general locations listed above; there is a wide variety in the speeds and types of ferries that can be operated. "Fast ferries" operate around 25 to 50 knots and that seems to create viable transit times.

Idea Author: Charles D

Number of Stars 3

Number of Comments 0

Idea Title: more park and ride locations.

Idea Detail: Ball field at Remount and N. Rhett would be a good location for park and ride. Could have express buses to downtown and Mt, Pleasant.

Idea Author: martin B

Number of Stars 3

Number of Comments 0

Idea Title: Coach/pick up runs parrallel too I26 down Rivers Ave

Idea Detail: Stop points to pick up & deliver by coach to downtown Charleston near MUSC. Charge monthly fees like subways. Adequate park & stop pick places. Not everyone wants to travel Interstate or that speed! The interstate is not for all drivers!! Especially with the seniors moving to this area! Other alternate routes to downtown necessary & can travel by coach or car service. Much needed alternate Highways to downtown. Car Services to offer monthly fees, too.

Idea Author: Elaine Yates A

Number of Stars 3

Number of Comments 0

Idea Title: Commuter Rail

Idea Detail: This would be the best mode of transportation for the Summerville, North Charleston, Charleston and the Goose Creek area. The roads are all ready packed with cars, there is still a tone of rail capacity left. Summerville has very light rail traffic a train might pass threw town maybe once every hour. And the Goose creek side is all ready running Amtrak on the lines so they are already for the commuter rail. On the other hand Summerville is not so lucky there is only a freight line running threw town. If Norfolk Southern does agree to let a Commuter Rail run on there tracks I believe that they will half to double line the tracks to accommodate the traffic difference because freight does not run on a time schedule it would be hard to make a scheduled up for the commuter rail to run. With this mode of transportation in place, the area can evolve around this if this is successful the rail can be expanded to accommodate the future needs. A great example would be Sun Rail and Tri Rail in FL

Idea Author: Garrett W

Number of Stars 2

Number of Comments 0

Idea Title: How about developing a carpool lane,

Idea Detail: ParkNgo points could be established where carpools could be established as well as pickup points for express buses.

Idea Author: John G

Number of Stars 1

Number of Comments 0

Idea Title: Better downtown Charleston public transit is needed

Idea Detail: Public bike sharing like Savannah would be very beneficial to reduce the number of cars downtown. I'd like the ability to transit downtown Charleston without a car. An all day trolley pass for tourists would be beneficial.

Idea Author: Matthew F

Number of Comments 1

Comment 1: FYI - trolley is already free! So why need a pass? | By Dan Y

Idea Title: Inner-City Trolleys

Idea Detail: We have DASH Trolleys in downtown Charleston; we need additional trolley-like services to facilitate short trips in other high-population areas, such as Summerville and Mt. Pleasant.

Idea Author: Dan Y

Number of Comments 0

Idea Title: Light rail transit, see what New Mexico did

Idea Detail: During my 30 years in New Mexico the state had the same problem we have here. They went out and purchased some rail from AMTRAK and some of their own and created an

80 mile commuter rail system that carries 5,000 daily to and from Santa Fe and Albuquerque. Rail is more efficient in the fact that as the population grows there is no need to widen roads, just add more rail cars which carry more people. They did it and succeeded. Thank you for listening.

Idea Author: Clark A

Number of Comments 0

Idea Title: More destinations for express bus

Idea Detail: The airport, the Air base, Boeing, Bosch, the Medical Complex, CoC, and the Tanger Outlets all have stops on Express bus lines. Other similar destinations could be the Navy Base, the Citadel, Blackbaud, Trident, etc. These specific places could probably even form their own loop around 526, 17, and 26 with a park and ride location or 2.

Idea Author: Sean R

Number of Comments 0

Topic Name: Drawing Inspiration

Idea Title: Bogota, Colombia

Idea Detail: Bogota is much larger than Charleston (about 9 million people) but has one of the best BRT systems in the world (called Transmilenio). Key elements are walk-in, pay first, bus-level stations and separated bus lanes. It works like a subway system but with buses.

Other cities in Colombia with populations much closer to Charleston's (Cartagena, Barranquilla, Cali) have smaller versions of Transmilenio that could work here.

Idea Author: Ed B

Number of Stars 9

Number of Comments 1

Comment 1: I'm a big fan of Bogotá's system too - especially the visibility of buses running right next to cars but in separated lanes. It's good advertisement for transit when cars stuck in traffic are repeatedly passed by buses. I'd love to see bike lanes incorporated as well (Bogotá's system includes one of the most comprehensive bike lane networks in the world I believe.). | By David C

Idea Title: Savannah

Idea Detail: Wonderful bike sharing program.

Idea Author: Matthew F

Number of Stars 6

Number of Comments 2

Comment 1: Integration of modes! David's #3 above providing bike sharing at key transit stops would be great and would be made far more effective if safe bicycle travel lanes were established in areas surrounding said key transit stops | By Charles D

Comment 2: I agree that it would be great to integrate bikes into the transit plan.
1.) Provide protected bike lanes alongside all transit lanes.
2.) Provide bike racks on board the transit buses/trains.
3.) Consider providing bike share stations at key transit stops, so people can get off the

bus/train and complete their trip on a bike.
4.) Provide bike lockers (or at least covered, secure bike racks) at key transit stops so people can start/finish their trip by bike and use transit in the middle, knowing their bike is safe where they left it. Washington, DC, has done a great job of implementing this near Metro stops. | By David C

Idea Title: Aesthetics

Idea Detail: Make the system attractive to passengers, this is a BRT system that I would want to ride! Everybody needs some mother nature in their commute.

Idea Author: Nick A

Number of Stars 6

Number of Comments 2

Comment 1: No final plan is started yet, so I don't understand your comment. And I believe the people that live near these encroachments would appreciate aesthetics to be part of the final plans inspiration... | By Nick A

Comment 2: aesthetics are important but so are the values of the people that have long lived near these encrochments. They should be better informed of new projects well before any final plan is started | By jeanette C

Idea Title: Look at europe.

Idea Detail: While Europe has many differences than america they still have an existing rail that allows for commuter traffic between municipalities. That is really what the I26alt is looking at. We are looking to connect different municipalities. This is not terrible different than the rail connecting London to France with the exclusion of crossing the channel of course. But getting different governments cooperating and crossing different levels of jurisdiction should be quite similar. Also every instance that makes America unique can be found somewhere in Europe at one place or another even if there is no where with all of our circumstances.

Idea Author: Herbie R

Number of Stars 6

Number of Comments 1

Comment 1: Rail is the way to go.
| By Ron J

Idea Title: Before we consider a fixed rail system

Idea Detail: Yes, a fixed rail system like the 2.7 mile (won't even get you off the peninsula) retro street car rail as in Tampa may be glamorous but, I believe we should first develop a better bus system.

One system that I was impressed with is in Oahu. This system is used by tourists and locals alike. Much like it would be used here. You can travel quickly to Pearl Harbor , Waikiki, Hanauma Bay, Holels , The Convention center along with business and shopping areas.

People resist mass transit and carpooling because they want to be in control. To overcome this buses have to run at least every 15 minutes, 10 during peak times. They also need to be equipped with GPS and the ETA has to be posted at the stop. This keeps passengers informed and gives them a sense of control. I agree, a kiosk or prepaid card is a must to speed boarding. Also when the capacity is not required use smaller buses.

I need more than 1000 characters.

Idea Author: martin B

Number of Stars 5

Number of Comments 1

Comment 1: I agree that these would be great features to add to the buses. | By David C

Idea Title: St Louis

Idea Detail: The light rail, elevated system St. Louis has running from the airport into the downtown area provides relatively small vehicles so you don't feel like you're on a subway, which get off and stop where you want them to - inexpensively. It follows right-of-way already established by roads and railroads. One stop is Union Station (the only pic I have), now a hotel and shopping mall. Since so many people are "commuting" from the airport to the city, it's similar to our needs, with people commuting from Summerville to Charleston.

Idea Author: James P

Number of Stars 5

Number of Comments 0

Idea Title: Before we consider a fixed rail system cont.

Idea Detail: Every driver complains about traffic but, they are the traffic. This is akin to a fisherman who does not practice catch and release complaining there are no fish left in the lake. We have to change peoples attitudes and behavior. Unfortunately the only way I know to do this is to make the behavior you want to change more painful or expensive. As evidenced by the consumption data people are driving much more now than when gasoline was $4/gal. Raising the cost with a decent tax will reduce the number of cars on the road and fund alternatives.
It is true if you build it they will come. More and wider roads will definitely lead to more cars using them.

Idea Author: martin B

Number of Stars 3

Number of Comments 0

Idea Title: London

Idea Detail: In order to increase the incentive to ride on the transit, a congestion price could be added to travel on roads in certain areas at certain times of days. London does this with cameras keeping track of which license plates have passed by the cameras. This story describes a study that found that the availability of transit itself won't decrease traffic (but is worth installation for other benefits) so other ways than just availability are needed to get people to ride. http://journalistsresource.org/studies/environment/transportation/fundamental-law-road-congestion-evidence-u-s-cities

Idea Author: Sean R

Number of Stars 3

Number of Comments 1

Comment 1: Very interesting article, thanks for sharing. | By David C

Idea Title: Check out Eugene, Ore.

Idea Detail: Their BRT is great -- and growing!

Idea Author: Daniel B

Number of Stars 3

Number of Comments 1

Comment 1: Looks great - I like it! | By David C

Idea Title: Tucson

Idea Detail: Tucson has started with a 3.9 mile long streetcar system to complement its bus network. Baby steps!

Idea Author: Charles D

Number of Comments 0

Idea Title: Miami

Idea Detail: The Miami Metro Rail is awesome. Elevated and gets you pretty easily around the city and several other local attractions.

Idea Author: Jerry L

Number of Comments 0

Idea Title: Before we consider a fixed rail system one more

Idea Detail: Cities also have to improve the job/housing/quality of life balance in all areas so people are not commuting so far. Mt Pleasant for example has an abundance of food service and retail jobs but, you can't live there on those wages so you have to live in Summerville or N. Charleston and commute every day. N. Charleston has a lot of good paying jobs But, not the fluff (AKA quality of life) people desire.

Idea Author: martin B

Number of Comments 0

Idea Title: If Walt Disney were alive today, what would he build.....

Idea Detail: If Mr. Disney were alive today, how would he build a system without raising taxes and keep the fares minimal or free for citizens to use?
1) He would use a guide way mag-lev system similar to SKYTRAN.
2) Power the system with LOCAL energy via wind, solar, tidal and subdivision produced methane and hydrogen gas. De-Centralized energy production instead of SCE&G central energy that would be a single point of failure.
3) He would use existing public easement over roads, highways, railroads, and power lines so minimal further land would be required.
4) Use Kickstarter and non-profits to ensure all financial records are accountable and verifiable in real time for everyone to see.
5) Use ad revenue from wifi and sponsor ships to generate operational income.
6) Harness our local high school students to RUN the system as a part of their EDUCATION.
7) No one over 21 allowed to work or serve on board.
8) Use retired volunteer stewards to oversee operations via social media/open records

Idea Author: Philip B

Number of Comments 0

Idea Title: Atlanta.... for sure!

Idea Detail: To continue to request and enlist input from all sources. The answer is there for the seeking.

Idea Author: Elaine Yates A

Number of Comments 0

Idea Title: Atlanta, Ga. Savannah, Ga.

Idea Detail: Summerville can become a self-contained pod just like Nexton and Carnes plans to do in the future. If transportation can be readily available to these Pod areas as well will promote it well. Charge monthly like the subways in NY. if possible.

Idea Author: Elaine Yates A

Number of Comments 0

Idea Title: topic details can not be viewed

Idea Detail: I can not because I have tried to open link but it will not open so from the one picture I see I could not tell you about features, lighting parking routes location

Idea Author: jeanette C

Number of Comments 0

Idea Title: no ideas yet will read provide information and get back

Idea Detail: thank-you I can read it now

Idea Author: jeanette C

Number of Comments 0

Topic Name: Preserve and Protect

Idea Title: Limiting access to the downtown peninsula

Idea Detail: Set up tolls at the 6 entry points into the peninsular region of Charleston. Add an impact fee to vehicular registration for residents of the tri-county region so that they can "fast pass" the tolls, and make the toll fee large enough to generally discourage out of town travelers from bringing their cars onto the peninsula. Set up major transit stations just outside the toll areas with park and ride lots. Allow hotels to utilize the space as well as the regional transit provider. Bam! increased ridership for the system, refocused routing, more robust service, and a windfall of local money to build alternative modes of transportation.

Idea Author: Charles D

Number of Stars 6

Number of Comments 0

Idea Title: Focus on Reducing Carbon Footprint

Idea Detail: Invest in sustainable energy designs: solar energy, net-zero energy buildings and bus stations. We have the potential to be a national leader in sustainable public transportation.

Greenfield Massachusetts has already built the first zero net energy transit center in the U.S. Obviously a different climate has helped, but this is a very doable solution.

Idea Author: Matthew F

Number of Stars 6

Number of Comments 0

Idea Title: Require project to be Envision certified

Idea Detail: Envision is like LEED, but for infrastructure. LEED is for vertical buildings like offices, Envision is for horizontal infrastructure projects like roadways, pipelines, and transit systems.

Require the project to be designed in a way that achieves at least a Silver rating in the Envision system (ideally Platinum, although that would probably add significant cost.), and require the design firm to have staff with the ENV SP credential (Envision Sustainability

Professional) working on the planning and design. Incorporate this from the very beginning, since even the scoping of the project can be affected by sustainability considerations.

http://www.sustainableinfrastructure.org/index.cfm

Idea Author: David C

Number of Stars 3

Number of Comments 0

Idea Title: Incentives for living where you work

Idea Detail: The traffic is a mess because, simply, there are too many cars on the road. The roadways cannot possibly accommodate everyone who wishes to travel by automobile. I propose offering financial incentives for living close to your work / working close to where you live. By reducing the need to drive, you naturally reduce the number of cars on the road.

Idea Author: Enrique P

Number of Comments 0

Topic Name: Next Round of Public Meetings!

Idea Title: Rethink School Schedules

Idea Detail: I enjoyed all of the ideas about limiting congestion downtown. However, the problem is not downtown. Also, a bike lane will fix nothing. The problem is I26 between Ashley Phosphate and Ladson in the AM - and 526/I26 interchange in PM. I live in North Charleston and have ZERO PROBLEMS during the summer months - however, EXACTLY when school begins, do we see ROUTINE gridlock. Will commuter rail fix this? No. Statistically 75% of kids take a personal vehicle to school. They say NO to busing and they will say NO light rail. Light rail does not address the problem. Also, public transit doesn't work in the south due to CRIME, temperature, and urban sprawl. Anything short of building NEW ROADS and offering MORE OPTIONS, I26 will continue to just get worse by the day. Solution Summary: Build a toll road from raised gas tax, enforce the MANDATORY use of school buses, MANDATE staggered release schedules from Boeing, Bosch etc

Idea Author: Nick C

Number of Stars 3

Number of Comments 0

Topic Name (Instant Poll): Transit Oriented Development (TOD)

Idea Title: Quality public transit

Number of votes: 40

Idea Title: Pedestrian and bicycle-oriented design

Number of votes: 22

Idea Title: Vibrant public spaces

Number of votes: 15

Idea Title: Preservation of open space and natural resources

Number of votes: 13

Idea Title: Connected streets

Number of votes: 12

Idea Title: Higher densities

Number of votes: 12

Idea Title: Mix of uses including office and retail

Number of votes: 11

Idea Title: Limited surface parking and efficient parking management

Number of votes: 10

Idea Title: Infill development

Number of votes: 6

Idea Title: Mix of housing types, including multifamily

Number of votes: 5

Idea Title: Other (please explain)

Number of votes: 4

Idea Title: I do not think we should incorporate TOD along the i-26ALT corridor (please explain)

Number of votes: 3

Comments

Number of Comments 6

Comment 1: I agree with Charles D that I would like to have checked all the boxes (except the "do not incorporate TOD" box). | By David C

Comment 2: David have you ever heard any responce or up-dates on your comparision to the Bogata, Columbia system | By jeanette C

Comment 3: Light rail appears the suggestion most favorably received. Would vehicular traffic be held up when trains cross streets just as it is at present? To build over-passes would probably be cost prohibitive and unwelcome in most neighborhoods. | By Margot C

Comment 4: This is also a question I have with light rail. I thought the thought at the last meeting at city hall it was discussed that the best coridor would be down the middle of Rivers Ave. How would this affect vehicular cross traffic?, how will you get riders to this rail? Where would you park cars ? Would you plan to have small public transit buses pick-up commuters from neighborhoods? | By jeanette C

Comment 5: Public transit should go where their customers are, not vice versa.. Smaller buses that transport residents from their subdivisions' to a CARTA bus stop might encourage many to leave their vehicle at home.. | By Margot C

Comment 6: I would have liked to check all of the boxes! | By Charles D

Topic Name (Instant Poll): Air Quality and Greenhouse Gas Emissions

Idea Title: 5 - Very Important

Number of votes: 21

Idea Title: 4 - Important

Number of votes: 9

Idea Title: 2 - Not important

Number of votes: 2

Idea Title: 3 - Not sure

Number of votes: 2

Idea Title: 1 - Not important at all

Number of votes: 0

Comments

Number of Comments 0

Topic Name (Instant Poll): Regional Transportation

Idea Title: Light Rail Tranist

Number of votes: 21

Idea Title: Commuter Rail

Number of votes: 10

Idea Title: Bus Rapid Transit

Number of votes: 8

Idea Title: Commuter Bus

Number of votes: 1

Comments

Number of Comments 6

Comment 1: I think any public transit which will allow for faster commute than driving wil be best because that will offer more incentive to use that system. | By Herbie R

Comment 2: BRT most flexible alternative; can be mixed with CB and existing bus routes. Free bus service for students, as in Clemson area. Routes need to be changed to meet riders' needs - not everyone needs to get downtown Charleston. Need routes in new development areas - i.e. Cane Bay to Summerville & Goose Creek. | By Dan Y

Comment 3: BRT most flexible alternative; can be mixed with CB and existing bus routes. Free bus service for students, as in Clemson area. Routes need to be changed to meet riders' needs - not everyone needs to get downtown Charleston. Need routes in new development areas - i.e. Cane Bay to Summerville & Goose Creek. | By Dan Y

Comment 4: BRT is a much faster and cheaper path to implementation. Need to include shelters at all stops, easier payment systems, safe pedestrian and bike access, crossings and overpasses. With BRT, more routes can be implemented across the region faster. BRT can use alternate fuel sources.
| By Tasha G

Comment 5: Any mode that most motivates commuters to use public transit is an improvement. | By Enrique P

Comment 6: Emission Free!! also could add multiple stops just like BRT. BRT get its own lane so does Light Rail. Its would be awesome to see something futuristic in this historic town. In Phoenix where I lived for few years Students ride for free gives them oppturnities to live out side of expensive area. Seniors ride for discounted rate. Main connections were Hospitals, Retails, Business District, Airports, and colleges. In Charleston not only it will be benefit for those who live in surrounding towns but also tourist attraction will increase they can go out side of historic downtown with easy access. Over the years it will eventually tickets sales will increase and oppturnities to expand further out. Doing construction for light rail tracks will allow us to update any utility lines that are underground which could be updated for better and newer lines. | By Vedit P

Topic Name (Instant Poll): Local Funding Sources

Idea Title: Local taxes

Number of votes: 11

Idea Title: Government bonds

Number of votes: 6

Idea Title: Public Private Partnership

Number of votes: 6

Idea Title: Other (please explain)

Number of votes: 6

Idea Title: State taxes

Number of votes: 5

Idea Title: Special assessments (i.e. TIF District, Community Improvement District, etc.)

Number of votes: 3

Comments

Number of Comments 7

Comment 1: State Transportation Infrastructure Bank can bond out funds for projects like this -- it doesn't all have to be roads | By R T

Comment 2: All of the above. Transit should be a priority at the local, regional, and state level and we should seek investments from as many sources as possible so that no one entity bears the entire financial responsibility for the match. Local tax and government bonds (through the state infrastructure bank) are the most obvious sources of funding and are the most commonly used, but we should also explore public/private partnerships (with major industries/employers), special assessments, and state taxes (specific to transit--not merely a gas tax without prioritization of project funding because the money will be wasted on useless new road projects) as well. | By Natalie O

Comment 3: Charge tolls for entering the peninsula. Tri-County residents pay for the toll annually with vehicle property tax and receive an EZ pass. All others pay a toll to use the peninsula or they can park outside the peninsula and take transit in. | By Charles D

Comment 4: Plus local business tax and local gas tax. | By Charles D

Comment 5: check out what the state of New Mexico did and how they funded it. They bought the existing rail line and leased it back to the railroad. So the railroad pays the state! | By Clark A

Comment 6: GAS TAX. DONE!
Raises the funds, people will drive less, makes alternative transportation more attractive. | By martin B

Comment 7: Public Private Partnership (Boeing, MUSC, Volvo, CARTA, etc). SC residents are already bogged down with taxes, but see very little improvement. SC roads, bridges, infrastructure are in desperate need of improvement; overhaul in some cases. It would be poor management of funds and resources to force tax payers to contribute to public transit when only a fraction of those tax payers will actually use it. While folks sit in traffic, companies lose money. Their employees are often late to work which result in loss of productivity. Companies also lose qualified candidates because the commute is a headache. Roads really need to be the primary focus. Until that is resolved, I don't think public transit should be on the table unless public private partnerships can meet federal government funding. | By Tracy S

Topic Name (Instant Poll): Potential Fixed Guideway Alignment

Idea Title: Norfolk Southern (NS) Rail Alignment (Blue Line, Image #2)

Number of votes: 5

Idea Title: US78-US52 Roadway Alignment (Green Line, Image #7)

Number of votes: 5

Idea Title: I-26 Roadway Alignment (Light Blue Line, Image #5)

Number of votes: 3

Idea Title: Dorchester Roadway Alignment (Purple Line, Image #6)

Number of votes: 3

Idea Title: US176-US52 Roadway Alignment (Orange Line, Image #8)

Number of votes: 2

Idea Title: CSX Rail Alignment (Red Line, Image #1)

Number of votes: 1

Idea Title: SCE&G Utility Alignment (Yellow Line, Image #4)

Number of votes: 1

Idea Title: Santee Cooper Utility Alignment (Pink Line, Image #3)

Number of votes: 0

Comments

Number of Comments 0

Topic Name: Funding

Idea Title: New Fixed Guideway Transit System

Allocation 63

Number of Funds 21

Number of Comments 0

Idea Title: Other (i.e. Carpooling, new roads, etc.)

Allocation 18

Number of Funds 17

Number of Comments 2

Comment 1: Rather than building roads or transportation systems to promote or entice sprawl, we should focus getting people to live closer to employment and other places of business.
I think the best way to fix a problem is by the root cause. Sprawl and the distance between home, work etc, is the root cause of traffic. Getting this places closer together opens up the option to walk or bike also.
| By martin B

Comment 2: I would like to see a much bigger emphasis on installation of protected bike lanes along busy corridors (e.g., E & W Montague Ave, Dorchester Rd, Ashley Phosphate Rd, Rivers Ave north of the existing bike lanes). I understand from talking with the I-26ALT project engineers that a "well done" BRT system includes revamping the entire streetscape to include facilities for pedestrians, bicyclists, transit, and automobiles. In that case I wholeheartedly support a "well done" BRT system and would encourage local leaders not to settle for anything less. | By David C

Idea Title: Existing Transportation System

Allocation 17

Number of Funds 14

Number of Comments 1

Comment 1: Are you serious? | By Nick C

Idea Title: I prefer not to spend any money on relieving traffic congestion

Allocation 1

Number of Funds 1

Number of Comments 2

Comment 1: I support MartinB17's comment, although I think a robust transit system is still needed in Charleston given the sprawl that has already occurred. | By David C

Comment 2: " If you build it they will come"   I think the best way to fix a problem is by the root cause.
Rather than building roads or transportation systems to promote or entice sprawl, we should focus on getting people to live closer to employment and other places of business.
I guess we could do nothing and when it becomes too expensive or unbearable people will move or find employment closer to home. I went through this years ago and found even with a pay cut I came out way ahead.
It's all positive, big savings in transportation costs, more time to yourself, ability to walk or bike to work rather than paying that gym membership, never late for work due to traffic and less stress.
Incentives could help move this process along. Reward people who put one less car on the road by building proper pedestrian and bike ways that seamlessly connect places they need to go. | By martin B

Topic Name (Instant Poll): Primary Transportation

Idea Title: Auto

Number of votes: 0

Idea Title: Bicycle

Number of votes: 0

Idea Title: Bus

Number of votes: 0

Idea Title: Ride Share

Number of votes: 0

Idea Title: Train

Number of votes: 0

Idea Title: Walking

Number of votes: 0

Comments

Number of Comments 0

Survey: Level of Service

Question: How often do you ride Transit?

If other, please explain. : 2

Frequency depends on events happening in the various regions of Charleston.

I would use transit an days I don't want to bike to work if it was easier to get from downtown to the area around the navy base where I work. I would also use transit to get over to a school by ashley phosphate and dorchester roads I sometimes help at after work at 4 and home at 6 if the timing were to work out well for me.
If there was a route more convenient for the train station I would use it when I travel by rail. I use transit when traveling by air and the timing works out.

Daily : 0

Weekly : 0

Monthly : 0

Yearly : 1

Question: In your opinion, which routes need greater frequency?

Route #1 : 0

Route #2 : 0

Route #3 : 0

Route #4 : 1

Route #10 : 1

Route #11 : 0

Route #12 : 1

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 0

Route #31 : 2

Route #32 : 2

Route #40 : 0

Route #41 : 1

Route #102 : 0

Route #103 : 0

Route #104 : 0

Route #105 : 0

Route #201 : 0

Route #203 : 0

Route #210 : 0

Route #211 : 0

Route #213 : 0

Route #301 : 2

Question: In your opinion, which routes need less frequency?

Route #1 : 0

Route #2 : 0

Route #3 : 0

Route #4 : 0

Route #10 : 1

Route #11 : 0

Route #12 : 0

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 0

Route #31 : 1

Route #32 : 1

Route #40 : 0

Route #41 : 0

Route #102 : 0

Route #103 : 0

Route #104 : 1

Route #105 : 0

Route #201 : 1

Route #203 : 0

Route #210 : 0

Route #211 : 0

Route #213 : 0

Route #301 : 1

Question: In your opinion, which routes need to start earlier?

Route #1 : 0

Route #2 : 0

Route #3 : 0

Route #4 : 1

Route #10 : 1

Route #11 : 0

Route #12 : 1

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 0

Route #31 : 1

Route #32 : 2

Route #40 : 0

Route #41 : 0

Route #102 : 0

Route #103 : 0

Route #104 : 0

Route #105 : 0

Route #201 : 0

Route #203 : 0

Route #210 : 0

Route #211 : 0

Route #213 : 0

Route #301 : 2

Question: In your opinion, which routes need to end later?

Route #1 : 1

Route #2 : 1

Route #3 : 1

Route #4 : 0

Route #10 : 1

Route #11 : 0

Route #12 : 1

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 0

Route #31 : 2

Route #32 : 2

Route #40 : 0

Route #41 : 1

Route #102 : 0

Route #103 : 0

Route #104 : 0

Route #105 : 0

Route #201 : 0

Route #203 : 0

Route #210 : 0

Route #211 : 0

Route #213 : 0

Route #301 : 2

Question: In your opinion, which routes should operate on Saturdays?

Route #1 : 1

Route #2 : 0

Route #3 : 1

Route #4 : 1

Route #10 : 2

Route #11 : 1

Route #12 : 0

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 1

Route #31 : 1

Route #32 : 1

Route #40 : 1

Route #41 : 1

Route #102 : 0

Route #103 : 0

Route #104 : 0

Route #105 : 1

Route #201 : 0

Route #203 : 0

Route #210 : 1

Route #211 : 1

Route #213 : 1

Route #301 : 1

Question: In your opinion, which routes should operate on Sundays?

Route #1 : 1

Route #2 : 0

Route #3 : 1

Route #4 : 1

Route #10 : 2

Route #11 : 1

Route #12 : 0

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 1

Route #31 : 1

Route #32 : 1

Route #40 : 1

Route #41 : 1

Route #102 : 0

Route #103 : 0

Route #104 : 0

Route #105 : 1

Route #201 : 0

Route #203 : 0

Route #210 : 1

Route #211 : 1

Route #213 : 1

Route #301 : 1

Question: If "yes" to any of the questions above, please explain. (i.e. what frequency, how early, how late)

> **At certain times of the day, rt 4 could use more than 1 trip/hr. It could also start earlier, bc by 7 am, there are already flights.**
> **On summer weekends, routes 31 and 41 could be used to get to (or at least near to) the beach for people who are interested in avoiding traffic and parking. These specific buses might need more space for bicycles. People might also need this to be suggested to them such as with alternate names for the routes or signs. rts 1 and 3 could also help get to downtown.**
>
> **West Ashley to North Charleston is underserved for morning commute. Better WA transit will alleviate congestion.**
>
> **With regard to running late the routes chosen should operate at lease until 12:00 AM**

Comments

Number of Comments 1

Comment 1: Why does the #10 Rivers southbound bus waste time going through the Trident Tech campus on the weekends??? There is never anyone getting on or off here, it's such a waste of 10 minutes with the way the bus has to do the funky north-then-south on Rivers again after exiting. Leave this loop for the weekdays only! And even then it's probably a waste besides a few trips a day. Make them walk to the bus on Rivers just like everyone else, I'm sure everyone would like if the bus detoured off Rivers to serve each individual area but it's such a waste of time for everyone else! Northbound #10 needs to continue across Rivers at Greenridge and take Antler to KMart instead of turning back onto Rivers and having to wait for the left turn light at KMart parking lot. Perhaps it could continue on Antler to Old Univ Blvd to get to 78 instead of waiting for the light at Otranto (although the left pullout onto 78 without a light might be an issue). And why stop at the RR crossings that aren't even used?? | By Roger C

Survey: Route Alignment Alternatives

Question: Which transit alternative alignment do you prefer? *See images above

US 52/78 (Image #1) : 27

US 52/176 (Image #2) : 8

Dorchester Road (Image #3) : 8

Question: Which mode of transit would you like to see on your preferred alignment?

Light Rail : 38

Bus Rapid Transit : 5

Question: Where would you like to see stations along your preferred route alignment?

1. Frequently visited shopping plazas and 2. densely populated (relatively within a determined radius) residential areas. 3. Key historical/tourit sites & attractions, 4. the beaches

176 and 17A with plenty of parking for park and ride, stop at North woods mall, and downtown to connect to the trolley system

526&17, 526 & Dorchester Rd., Ashley Phospate Rd.

A station close to MUSC and one near Park Circle

Air base/Airport, Dorchester/Ashley Phosphate, Summerville's town center (connect Summerville, the airport, and Downtown Charleston by light light)

All along the favorable stops into Charleston through busy areas.

Amtrack
Montague

An average of every two miles along the whole route, generally, with more stop density as the route nears downtown Charleston.

Berlin G. Meyers Parkway and 78

BRT is so much cheaper you could do it on all 3 alignments for the price of one light rail line. Stops at the obvious major intersections and neighborhoods.

Cane Bay / Nexton - 75,000 new homes being built there
Northwoods Mall

Close to schools and businesses please.

Dorchester Rd & I 26

downtown

Downtown Charleston, Cosgrove Avenue, Montage Avenue, Ashley-Phosphate Avenue

Downtown Summerville and Rutledge Ave,

Downtown Summerville/Knightsville area

Empty/under developed areas that could be turned into "Park and Ride" stations.

I do not see a CHOICE for the SKYTRAN System to be implemented...?? These surveys and every meeting I go too support BIG OIL...! Do you know how many citizens actually know about SKYTRAN as a CHOICE.....that is the problem. NO ONE is aware or even EDUCATED about all the choices. Light Rail and Bus still use ground easement instead of easement ABOVE the existing roadways. Just for your awareness....how hard is it for YOU to search the Post and Courier for articles telling citizens.?

I live off Liberty Hall Rd. I would like someplace in Goose Creek that would be convenient to reach from my home

I would like to see as many as possible along the route which would allow for the most users.

intermodel n charleston and old center summerville

K-Mart, Northwoods Mall

Ladson Road

Ladson Road, near the Fairgrounds or Palmetto Commerce area; North Charleston, near Tanger Outlets; and Mount Pleasant, near Coleman/Arthur Ravenal exit.

Major Roads and Developments

Major shopping centers, community centers, government centers

Morrison/Meeting, Greenleaf/Meeting, Spruill/Meeting, Burton/Meeting, Cosgrove/Rivers, Durant/Rivers, Montague/Rivers

Near Mt Pleasant St, Cosgrove Ave, Durant Ave, Remount Rd, College Dr (Trident Tech), Ashley Phosphate Rd, and Trident Medical Center / Charleston Southern Univ. I'm not familiar with the area beyond that so I can't provide any good recommendations for stops there.

not sure

OFF TOPIC!! BTR is a cheaper option but if your making and investment look for something in long run. LR is expensive but in the long run it will be worth it. Look at the quality of the product not cost. As far as the station go on 78 where CSU and Trident Health and on Rivers ave by Northwoods Mall area, walmart target, and perhaps around Remount Rd area.

Park Circle

Park Circle, Boeing/Airport, CARTA transit center, Tanger, Downtown Lower, Downtown Upper

Ridgeville, Northwoods Mall Area

Stations near Micheax parkway, Ashley Phosphate, Trolley Rd,

Summerville, Goose Creek, Hanahan, I526/I26, Intermodel Facility (train station), Rivers Ave. (old Navy Hospital building), Windsor Place, Wagner Terrace, Arthur Ravenel Jr. Bridge

The image is too small on a tablet; therefore, I cannot see the detail needed to pinpoint where I feel stations should be located. Downtown Summerville is foremost. Wescott, Airport, Tanger, North Charleston PAC and Arena, Downtown Charleston Visitor's Center, etc. would all be good.

There are plenty of natural stops along the route such as Montague, Remount, Hanahan Road, Trident Tech, Ashley Phosphate, Northwoods Mall, etc, etc

Though I marked light rail, I really believe that the route should be heavy rail. Light rail would be beneficial from The Market to the old naval yard, airport, and park circle. Heavy rail could run along CSX lines in place. Use Sunrail as an example in Orlando.

I would love to discuss more,

Eric Pohlman, CNU-A

eapohlman@gmail.com

We ride/share and park and ride stops along 26. CARTA only has a few routes in the am and pm to MUSC. Buses are often full with people standing. People take cars in case they need to leave in the middle of the day. I live in Hanahan and would have to back-track to KMart on Rivers Avenue to get the CARTA bus. Traffic rules need to be better enforced as well. Many accidents are caused by rude, impatient drivers.

Where 52 & 78 join.

yes I think a monorail system serviced by light bus. Dorchester road and connecting to Red bank road through intermitted bus pick-ups and so forth all the way up to the Summerville area. Kind of like small U shaped routes all dumping to monorail transport stations with the monorail connecting all the way to Charleston

You would reach a broader range of areas that people could commute to then get on mass transit.

Comments

Number of Comments 1

Comment 1: I want to welcome you to come to SPAWAR Atlantic and brief the command about this informative transportation planning. Considering that your tax dollars as well as mine have been put to use to develop the SKYTRAN System out at the Ames Research Facility, do you find it interesting how it is NEVER MENTIONED ...? I realize as you sit and read this that you may be offended at my tone.........but ....you do realize how many troops have DIED for fossil oil in Iraq, and "other" locations, don't you. We at SPAWAR Atlantic aim to be informational-ly Dominant to enable our troops to be the most informed...but yet when it comes to the troops' parents and fellows citizens, they are kept in the fossil OIL dark.!!

I welcome your feedback.... Philip C. Branton 8432183243 | By Philip B

Survey: Route Alignments

Question: Are there any portions of routes that could be served by a higher frequency? (choose one route and tell us which portion needs more frequent service)

Which portions need more frequent service? : 0

Route #1 : 0

Route #2 : 0

Route #3 : 0

Route #4 : 0

Route #10 : 0

Route #11 : 0

Route #12 : 0

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 0

Route #31 : 0

Route #32 : 0

Route #40 : 0

Route #41 : 0

Route #102 : 0

Route #103 : 0

Route #104 : 0

Route #105 : 0

Route #201 : 0

Route #203 : 0

Route #210 : 0

Route #211 : 0

Route #213 : 0

Route #301 : 0

Question: Are there any routes that should be altered by adding stops? (choose up to three)

Route #1 : 0

Route #2 : 0

Route #3 : 0

Route #4 : 0

Route #10 : 0

Route #11 : 0

Route #12 : 0

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 0

Route #31 : 0

Route #32 : 0

Route #40 : 0

Route #41 : 0

Route #102 : 0

Route #103 : 0

Route #104 : 0

Route #105 : 0

Route #201 : 0

Route #203 : 0

Route #210 : 0

Route #211 : 0

Route #213 : 0

Route #301 : 0

Question: Are there any routes that should be altered by removing stops? (choose up to three)

Route #1 : 0

Route #2 : 0

Route #3 : 0

Route #4 : 0

Route #10 : 0

Route #11 : 0

Route #12 : 0

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 0

Route #31 : 0

Route #32 : 0

Route #40 : 0

Route #41 : 0

Route #102 : 0

Route #103 : 0

Route #104 : 0

Route #105 : 0

Route #201 : 0

Route #203 : 0

Route #210 : 0

Route #211 : 0

Route #213 : 0

Route #301 : 0

Comments

Number of Comments 0

Survey: Route Connections

Question: Which routes do you think should be realigned?

Route #1 : 0

Route #2 : 0

Route #3 : 0

Route #4 : 0

Route #10 : 1

Route #11 : 0

Route #12 : 0

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 0

Route #31 : 0

Route #32 : 0

Route #40 : 0

Route #41 : 0

Route #102 : 1

Route #103 : 1

Route #104 : 1

Route #105 : 0

Route #201 : 0

Route #203 : 0

Route #210 : 0

Route #211 : 0

Route #213 : 0

Route #301 : 0

Question: Are there route segments that should be part of a different route?

> **I do not use any other routes.**

> **Those 3 lines should be redesigned to be short feeders into the #10.**

Question: Are there route segments that should be removed?

> **#41 should meet the #40 at the foot of the bridge, so the #41 never leaves MtP**

> **I do think that a number of routes are just entirely too long.**

Comments

Number of Comments 0

Survey: Route Efficiency

Question: In your opinion, are there any two routes that should be combined into a single route? (choose two)

Route #1 : 0

Route #2 : 0

Route #3 : 0

Route #4 : 0

Route #10 : 0

Route #11 : 0

Route #12 : 0

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 0

Route #31 : 0

Route #32 : 0

Route #40 : 0

Route #41 : 0

Route #102 : 0

Route #103 : 0

Route #104 : 0

Route #105 : 0

Route #201 : 0

Route #203 : 0

Route #210 : 0

Route #211 : 0

Route #213 : 0

Route #301 : 0

Question: In your opinion, are there any routes that should be separated into two or more routes?

Route #1 : 0

Route #2 : 0

Route #3 : 0

Route #4 : 0

Route #10 : 0

Route #11 : 0

Route #12 : 0

Route #13 : 0

Route #20 : 0

Route #21 : 0

Route #30 : 0

Route #31 : 0

Route #32 : 0

Route #40 : 0

Route #41 : 0

Route #102 : 0

Route #103 : 0

Route #104 : 0

Route #105 : 0

Route #201 : 0

Route #203 : 0

Route #210 : 0

Route #211 : 0

Route #213 : 0

Route #301 : 0

Comments

Number of Comments 0

Survey: Route Markets

Question: Are there any areas or places where a route should be extended to serve?

Question: Are there any areas or places that need a new route?

Question: Are there any routes you think should be eliminated?

Comments

Number of Comments 0

Survey: Transfer Centers and Bus Stops

Question: Where should transfer centers & transfer hubs be located?

Away form clutter near airport or in between Tanger outlet area and exit 209 to give enough room to flow traffic through all directions or else it will be another choke point.

In areas with open land to create multiple parking opportunities. It'd be nice to have these built in areas that could be redeveloped (provided that the redevelopment opportunities are presented fairly for all citizens to take part).

Midway between Summerville and Downtown Charleston = North Charleston, both along the Rivers Ave./I-26 corridor and along Dorchester Road. Also in West Ashley and Mt. Pleasant, midway between outer limit of routes and downtown Charleston.

The transfers centers and hubs s/b located at the major intersections.

Question: Where is there a need for shelters, benches, or other amenities?

Everywhere

In my opinion no benches but if it needs to be cost efficient then yes. Shelters yes good idea get local artist involved have them create funky/historic shelters give them opportunity to be creative and it can be cool standing art/landmark.

Shelters should be provided at as many locations as possible.

There is a need for these amenities at all bus stops.

Question: Are there any stops that are no longer needed?

don't know; but don't make hasty decision on this

Dont travel on buses but where ever there is less ticket sales no need for one their. Best to do research and see wherever there is mediocre income and who depends on public transportation. Just a thought! Downtown, airport, beaches?, historic attraction, business/industrial parks, recreational is must obviously.

Not knowledgable about routes to answer confidently.

unknown

Comments

Number of Comments 0

Survey: Transit Priority

Question: What is your top priority for transit over the next five years? (short term)

Bus transit hubs where a high volumn of commuters travel to a similar place. Two suggestions: 1-Citadel Mall to MUSC and C of C and Boeing. Park and ride lot at Citadel Mall. 2- Gathering Place on James Island to the Albermarle area and then on to MUSC and College of Charleston.

Plan strategically for short-term congestion events to minimize traffic. Use electronically smart buses for special events in Charleston.

Pass the gas tax to fund transportation projects.

Commuter Rail from Summerville to Charleston

Improve reliability of existing routes; extend service to later and night and on weekends. Provide more covered bus stops.

Keeping traffic flowing along Rt 78, Rivers Ave, and I-26

More frontage, secondary, and tributary roads

My top priority for transit over the next five years is to be able to travel by bus or train from Goose Creek to anywhere I want ot go in the Lowcountry.

Question: What is you top priority for transit over the next five to ten years? (mid-term)

A commuter train in place which will allow me to CONNECT from Goose Creek to anywhere I want to go.

Create transportation infrastructure before development is completed. Rapid shuttle service on Norfolk Southern railroad line with greenways for bikes and pedestrians. Rapid service should include park and ride sites in Summerville, Goose Creek, and Moncks Corner so service workers can get to Volvo,Boeing, and downtown colleges and hospitals.

Design a fixed rail system to supplement CARTA. Find funding and build consensus for the route alignments.

Getting an alternate mode of transportation to the automobile.

Light Rail in downtown and neck area of Charleston

More sidewalks, bike lanes. Emphasis on building homes UP versus OUT. Creating more live/work/shop centers.

Question: What is your top priority for transit over the next ten to twenty years? (long term)

A complete transit hub with a rail system

A transit that will enable senior citizens to be picked up at home and transported to the transit station.

Commuter Rail Mt. Pleasant to West Ashley

Do everything in the "Accelerate Charleston" plan proposed by Ginny Deerin. The plan is available at http://ginnyformayor.com/news/KeepCHSMoving

Expanding the non-auto mode beyond the Summerville-to-peninsula corridor.

Install a robust, reliable, affordable, clean, easy transit system that allows people to live in Charleston without owning a car, and allows visitors to get from the airport to any major destination easily and quickly. See Philadelphia for a good, mature example.

Comments

Number of Comments 0