Regional Transit Framework Plan

STOPS Ridership Modeling Results

Prepared for the Berkeley-Charleston-Dorchester Council of Governments

FINAL | September 20, 2018

Regional Transit Framework Plan

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Introduction

This technical memorandum discusses the ridership forecasts for the Berkeley Charleston Dorchester Council of Governments (BCDCOG) Regional Transit Framework Plan (RTFP) in the tri-county region. Ridership was estimated using an existing and calibrated Simplified Trips-On-Project Software (STOPS) model that was developed for the *i-26ALT* study. The following sections will provide a brief overview of STOPS, model updates, the scenarios, and ridership results.

STOPS Overview

The ridership forecast for the RTFP was estimated using a travel modeling software called STOPS (Simplified Trips-on-Project Software). The STOPS model is a stand-alone ridership forecasting software package developed by the Federal Transit Administration (FTA). The software applies a set of travel models to predict detailed travel patterns on fixed guideway systems. STOPS was specifically developed to support New Starts and Small Starts projects.

STOPS utilizes a modified four-step (trip generation, trip distribution, mode choice and trip assignment) model structure to quantify total transit ridership by trip type, mode of access and auto ownership. It also computes the change in automobile vehicle miles travelled (VMT) that is attributable to the proposed transit project. The component sub-models in STOPS have been calibrated with local adjustments and compared to rider-survey datasets from locations within six metropolitan areas (with a total of 10 lines), and validated against stop-specific counts of trips in nine other metropolitan areas (with a total of 14 lines), resulting in 24 total fixed-guideway systems.

As stated previously, the *i-26ALT* STOPS model was used for estimating ridership for the RTFP high capacity transit (HCT) corridors. The *i-26ALT* STOPS model was developed in STOPS version 1.51. A newer version was available from the FTA, therefore, the *i-26ALT* STOPS model was updated to STOPS version 2.01 dated February 15, 2017.

Model Update to version 2.01

During the conversion from STOPS Version 1.52 to 2.01, the only change that occurred is that the population and employment was adjusted based on updated socioeconomic data from BCDCOG. **Table 1** shows the population by year and by county and **Table 2** shows the employment by year and by county.

Table 1: BCDCOG Population by County

County	Year 2014	Year 2015	Year 2030	Year 2040
Berkeley	166,757	167,509	266,661	359,311
Charleston	351,518	363,313	418,712	473,933
Dorchester	129,289	127,320	174,085	201,589
Colleton	0	575	618	634
Total	**647,564**	**658,717**	**860,076**	**1,035,467**

Table 2: BCDCOG Employment by County

County	Year 2014	Year 2015	Year 2030	Year 2040
Berkeley	64,137	71,650	96,514	125,335
Charleston	224,394	241,538	280,643	316,130
Dorchester	32,091	35,387	42,249	49,033
Colleton	496	496	496	496
Total	**321,118**	**349,071**	**419,902**	**490,994**

STOPS Service Scenarios

There are three service scenarios required by STOPS: Existing, *No Build*, and Build. This section explains each of the scenarios and assumptions used for estimating ridership.

Existing Scenario

The existing transit scenario is a critical element of the ridership estimation process because it builds the foundation for all future model runs. This study uses an existing STOPS application that was previous developed for the *i-26ALT* study; therefore, the transit system (October 2014), district definition, and station boardings used for calibration were unchanged.

No Build Scenario

The *No Build* scenario is the same as the Alternative B1 recommended Build Scenario from the *i-26ALT* study. The transit system used is from October 2014, and includes changes to select local, express, and DASH routes. The following routes were modified for the *No Build* scenario:

- Route 12 – Dorchester Road
- Route 13 – Remount Road
- Route 20 – King Street/Citadel
- Route 30 – Savannah Highway
- Route 31 – Folly Road
- Route 102 – North Neck
- Route 211 – Meeting/King-DASH
- Route 213 – Lockwood/Calhoun
- Route 301 – St. Andrews
- Route XP1 – James Island-North Charleston

The following routes were removed for the *No Build* scenario:

- Route 105 – NASH
- Route 201 – North Beltline

In addition to the modifications of existing routes, one new route was added. The Alternative B1 BRT Route (US78/US52/Meeting St BRT), includes 18 stations with 5 of those stations providing parking access. Average end to end travel is approximately 60 minutes with 10-minute peak and 20-minute off-peak headways. **Figure 1** shows the alignments of Alternative 1B BRT (black line). **Table 3** shows the station to station travel times, and **Table 4** shows the headways by time period for the Alternative B1 BRT alignment.

Figure 1: BRT Alternatives

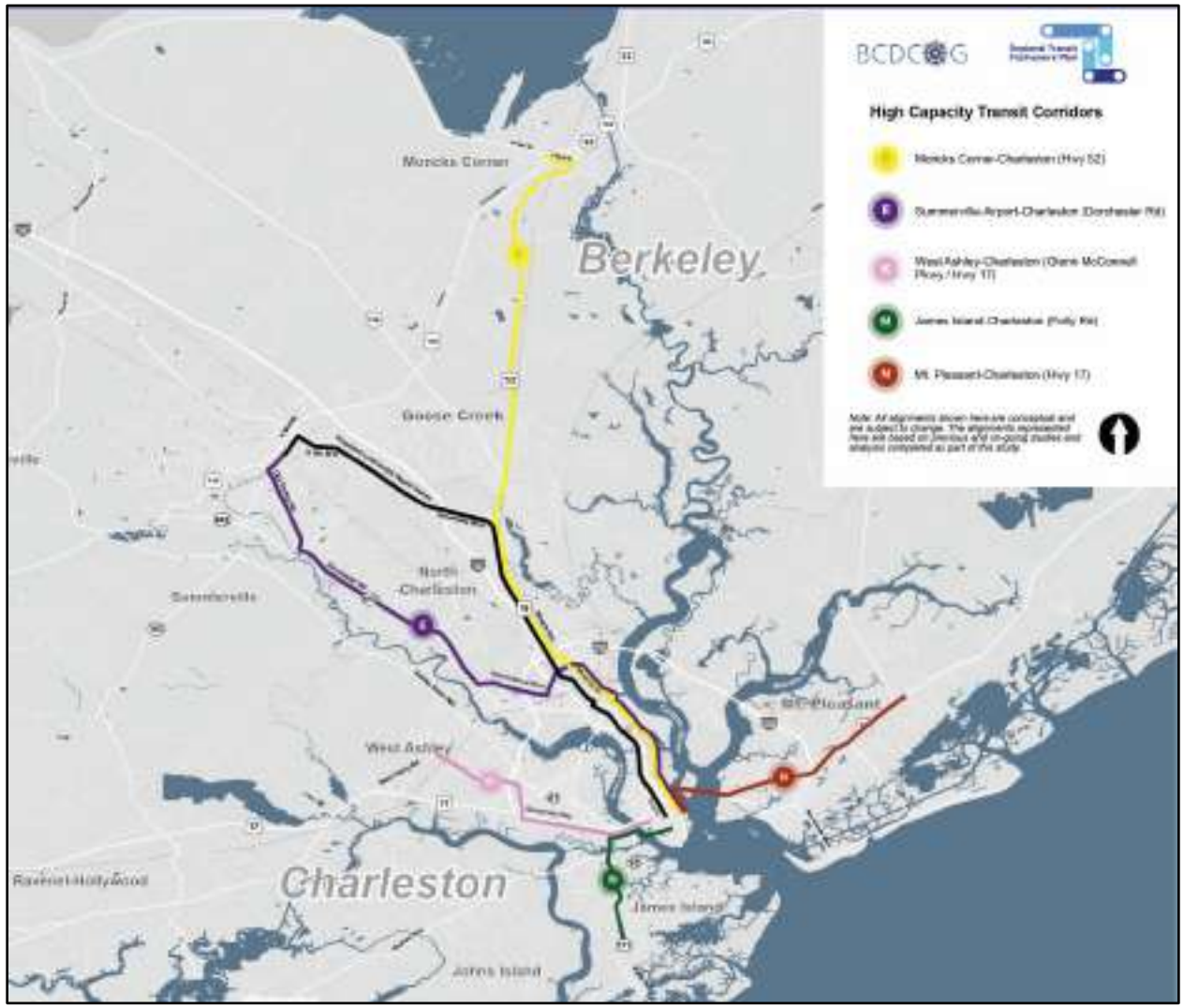

Table 3: *i-26ALT* Alternative B1 BRT Travel Times

	Southbound Travel Time		
	From	To	Travel Time (min)
Alternative B1 BRT Alignment	Main St/Richardson St	E 5N St/Berlin G Myers Pkwy	0:06:15
	E 5N St/Berlin G Myers Pkwy	US 78/Royle Rd	0:04:25
	US 78/Royle Rd	US 78/College Park Rd	0:04:47
	US 78/College Park Rd	US 78/I-26	0:03:38
	US 78/I-26	Rivers Ave/Otranto Blvd	0:04:37
	Rivers Ave/Otranto Blvd	Rivers Ave/Ashley Phosphate Rd	0:04:05
	Rivers Ave/Ashley Phosphate Rd	Rivers Ave/Stokes Ave	0:02:50
	Rivers Ave/Stokes Ave	Rivers Ave/Remount Rd	0:04:00
	Rivers Ave/Remount Rd	Rivers Ave/Mall Dr	0:03:14
	Rivers Ave/Mall Dr	Rivers Ave/Durant Ave	0:02:44
	Rivers Ave/Durant Ave	Rivers Ave/McMillan Ave	0:03:09
	Rivers Ave/McMillan Ave	US 52/Stromboli Ave	0:03:31
	US 52/Stromboli Ave	Meeting St/Milford St	0:03:37
	Meeting St/Milford St	Meeting St/Mt. Pleasant St	0:02:46
	Meeting St/Mt. Pleasant St	Meeting St/Romney St	0:02:05
	Meeting St/Romney St	Meeting St/Huger St	0:02:00
	Meeting St/Huger St	Meeting St/Line St	0:02:15
	Total Travel Time (min)		**0:59:58**

	Northbound Travel Time		
	From	To	Travel Time (min)
Alternative B1 BRT Alignment	Meeting St/Line St	Meeting St/Huger St	0:02:15
	Meeting St/Huger St	Meeting St/Romney St	0:02:00
	Meeting St/Romney St	Meeting St/Mt. Pleasant St	0:02:05
	Meeting St/Mt. Pleasant St	Meeting St/Milford St	0:02:46
	Meeting St/Milford St	US 52/Stromboli Ave	0:03:37
	US 52/Stromboli Ave	Rivers Ave/McMillan Ave	0:03:31
	Rivers Ave/McMillan Ave	Rivers Ave/Durant Ave	0:03:09
	Rivers Ave/Durant Ave	Rivers Ave/Mall Dr	0:02:44
	Rivers Ave/Mall Dr	Rivers Ave/Remount Rd	0:03:14
	Rivers Ave/Remount Rd	Rivers Ave/Stokes Ave	0:04:00
	Rivers Ave/Stokes Ave	Rivers Ave/Ashley Phosphate Rd	0:02:50
	Rivers Ave/Ashley Phosphate Rd	Rivers Ave/Otranto Blvd	0:04:05
	Rivers Ave/Otranto Blvd	US 78/I-26	0:04:46
	US 78/I-26	US 78/College Park Rd	0:03:38
	US 78/College Park Rd	US 78/Royle Rd	0:04:47
	US 78/Royle Rd	E 5N St/Berlin G Myers Pkwy	0:04:25
	E 5N St/Berlin G Myers Pkwy	Main St/Richardson St	0:04:30
	Total Travel Time (min)		**0:58:22**

Table 4: *i-26ALT* Alternative B1 BRT Frequency by Time Period

Time Period	Start	End	Headway (min)
Early AM	4:00 AM	6:00 AM	30
AM Peak	6:00 AM	9:00 AM	10
Midday	9:00 AM	4:00 PM	20
PM Peak	4:00 PM	7:00 PM	10
Evening	7:00 PM	9:00 PM	20
Night	9:00 PM	1:00 AM	30

Build Scenario

The Build scenarios includes the same transit system as the *No Build* scenario, as well as five RTFP corridors. Ridership was estimated for five RTFP corridors using one of two transit modes: BRT and BRT Lite. BRT assumes an exclusive guideway, whereas BRT Lite would operate in mixed traffic. Three of the corridors would have portions of exclusive guideway, and therefore be classified as BRT, while two corridors would operate exclusively in mixed traffic, therefore, being identified as BRT Lite.

Station to station travel times were calculated using an average speed by mode. BRT travel times were calculated using an average speed of 25 MPH and BRT Lite travel times were calculated using an average speed of 17 MPH.

Transit projects that run on exclusive guide-ways have the potential to attract more ridership because they provide more reliable service. The STOPS is designed to capture this attribute. The model uses a factor called the "Visibility Factor" to inform its component models about the extent of fixed guide-way features of the alignment. The use of the visibility factor is only applied when a "route_type" of the transit mode equals zero. For the BCDCOG study, all BRT projects were coded as Route Type 0 and a default visibility factor of 0.1 was applied, per STOPS Version 2.01 User Guide (January 4, 2017). Since the BRT Lite service operates in mixed traffic, its Route Type was set to "3" and no visibility factor was applied.

The five RTFP corridors are as follows:

- **Corridor C:** A 24-station BRT Lite corridor operating between Moncks Corner and downtown Charleston via US Highway 52 providing service to Goose Creek and Moncks Corner. Total travel time along the corridor is nearly 1 hour and 40 minutes. **Figure 1** identifies the alignment and **Table 5** shows the station to station travel times.
- **Corridor E:** A 27-station BRT corridor operating between Summerville and downtown Charleston via Dorchester Road providing service to North Charleston. Total travel time along the corridor is approximately 1 hour. **Figure 1** identifies the alignment and **Table 6** shows the station to station travel times.
- **Corridor K:** A 12-station BRT corridor operating between West Ashley and downtown Charleston via Glenn McConnell Pkwy/Hwy 17 providing

service to West Ashley. Total travel time along the corridor is 25 minutes. **Figure 1** identifies the alignment and **Table 7** shows the station to station travel times.

- **Corridor M:** A 10-station BRT Lite corridor operating between James Island and downtown Charleston via Folly Road providing service to James Island. Total travel time along the corridor is approximately 30 minutes. **Figure 1** identifies the alignment and **Table 8** shows the station to station travel times.
- **Corridor N:** A 12-station BRT corridor operating between Mt. Pleasant and downtown Charleston via US Highway 17 providing service to Mt. Pleasant. Total travel time along the corridor is nearly 33 minutes. **Figure 1** identifies the alignment and **Table 9** shows the station to station travel times.

In addition to the RTFP corridors, the Alternative B1 BRT was extended south along Meeting Street and west along Calhoun Street to Courtenay Street. This extension adds three more stations to this corridor with a total travel time of approximately one hour. **Table 10** shows the station to station travel times.

Table 11 identifies the service span and frequency that applies to all five RTFP corridors and Alternative B1 BRT that were used in the STOPS model.

It should be noted that Corridor C and LCRT will merge in the vicinity of University Boulevard and run along Highway 78 and further south, Corridor E will merge with both LCRT and C around International Boulevard. As a result, the combined effective headway on the BRT service would be about 3.5 minutes in the common segment of the alignment. In reality, providing such a high level of service will have operational challenges. Therefore, it is likely the service frequency will need to adjusted in the future.

Table 5: Corridor C BRT Travel Times

	Southbound Travel Time		
	From	To	Travel Time (min)
Corridor C - BRT Lite	US Hwy Bypass 52 & US Hwy 52	US Hwy Bypass 52 & Santee Cooper	0:02:33
	US Hwy Bypass 52 & Santee Cooper	US Hwy 52 & Old Hwy 52	0:04:42
	US Hwy 52 & Old Hwy 52	US Hwy 52 & Mountain Pine Rd	0:07:53
	US Hwy 52 & Mountain Pine Rd	US Hwy 52 & Gaillard Rd	0:05:05
	US Hwy 52 & Gaillard Rd	US Hwy 52 & Cypress Gardens Rd	0:13:35
	US Hwy 52 & Cypress Gardens Rd	US Hwy 52 & Goose Crk Municipal	0:15:43
	US Hwy 52 & Goose Crk Municipal	US Hwy 52 & Brandywine Blvd	0:05:54
	US Hwy 52 & Brandywine Blvd	Rivers Ave & Otranto Blvd	0:09:39
	Rivers Ave & Otranto Blvd	Rivers Ave & Ashley Phosphate Rd	0:04:43
	Rivers Ave & Ashley Phosphate Rd	Rivers Ave & Stokes Ave	0:02:32
	Rivers Ave & Stokes Ave	Rivers & Remount Rd	0:04:32
	Rivers & Remount Rd	Rivers & Mall Dr	0:03:13
	Rivers & Mall Dr	Rivers & Durant Ave	0:02:17
	Rivers & Durant Ave	Rivers & McMillan Ave	0:03:02
	Rivers & McMillan Ave	US Hwy 52 & Stromboli Ave	0:04:12
	US Hwy 52 & Stromboli Ave	Meeting St & Milford St	0:03:15
	Meeting St & Milford St	Meeting St & Mt. Pleasant St	0:02:00
	Meeting St & Mt. Pleasant St	Meeting St & Romney St	0:00:59
	Meeting St & Romney St	Meeting St & Huger St	0:00:53
	Meeting St & Huger St	Meeting St & Line St	0:01:10
	Meeting St & Line St	Meeting St & Visitors Center	0:01:13
	Meeting St & Visitors Center	Calhoun St & St Philip St	0:01:06
	Calhoun St & St Philip St	Calhoun St & Courtenay St	0:01:50
	Total Travel Time (min)		**1:42:01**

	Northbound Travel Time		
	From	To	Travel Time (min)
Corridor C - BRT Lite	Calhoun St & Courtenay St	Calhoun St & St Philip St	0:01:50
	Calhoun St & St Philip St	Meeting St & Visitors Center	0:01:06
	Meeting St & Visitors Center	Meeting St & Line St	0:01:13
	Meeting St & Line St	Meeting St & Huger St	0:01:10
	Meeting St & Huger St	Meeting St & Romney St	0:00:53
	Meeting St & Romney St	Meeting St & Mt. Pleasant St	0:00:59
	Meeting St & Mt. Pleasant St	Meeting St & Milford St	0:02:00
	Meeting St & Milford St	US Hwy 52 & Stromboli Ave	0:03:15
	US Hwy 52 & Stromboli Ave	Rivers & McMillan Ave	0:04:12
	Rivers & McMillan Ave	Rivers & Durant Ave	0:03:02
	Rivers & Durant Ave	Rivers & Mall Dr	0:02:17
	Rivers & Mall Dr	Rivers & Remount Rd	0:03:13
	Rivers & Remount Rd	Rivers Ave & Stokes Ave	0:04:32
	Rivers Ave & Stokes Ave	Rivers Ave & Ashley Phosphate Rd	0:02:32
	Rivers Ave & Ashley Phosphate Rd	Rivers Ave & Otranto Blvd	0:04:43
	Rivers Ave & Otranto Blvd	US Hwy 52 & Brandywine Blvd	0:09:39
	US Hwy 52 & Brandywine Blvd	US Hwy 52 & Goose Crk Municipal	0:05:54
	US Hwy 52 & Goose Crk Municipal	US Hwy 52 & Cypress Gardens Rd	0:15:43
	US Hwy 52 & Cypress Gardens Rd	US Hwy 52 & Gaillard Rd	0:13:35
	US Hwy 52 & Gaillard Rd	US Hwy 52 & Mountain Pine Rd	0:05:05
	US Hwy 52 & Mountain Pine Rd	US Hwy 52 & Old Hwy 52	0:07:53
	US Hwy 52 & Old Hwy 52	US Hwy Bypass 52 & Santee Cooper	0:04:42
	US Hwy Bypass 52 & Santee Cooper	US Hwy Bypass 52 & US Hwy 52	0:02:33
	Total Travel Time (min)		**1:42:01**

Table 6: Corridor E BRT Travel Times

	Southbound Travel Time		
	From	To	Travel Time (min)
Corridor E - BRT	Main St & Richardson Ave	Old Trolley Rd & State Hwy 165	0:03:53
	Old Trolley Rd & State Hwy 165	Old Trolley Rd & Crestview Dr	0:02:57
	Old Trolley Rd & Crestview Dr	Old Trolley Rd & Midland Pkwy	0:03:15
	Old Trolley Rd & Midland Pkwy	Old Trolley Rd & Dorchester Rd	0:01:55
	Old Trolley Rd & Dorchester Rd	Dorchester Rd & Parlor Dr	0:01:38
	Dorchester Rd & Parlor Dr	Dorchester Rd & Foxcroft Ln	0:02:54
	Dorchester Rd & Foxcroft Ln	Dorchester Rd & Trump St	0:02:24
	Dorchester Rd & Trump St	Dorchester Rd & Asjley Phosphate Rd	0:03:48
	Dorchester Rd & Asjley Phosphate Rd	Dorchester Rd & Foxwood Dr	0:03:29
	Dorchester Rd & Foxwood Dr	Dorchester Rd & W Hill Blvd	0:03:19
	Dorchester Rd & W Hill Blvd	Dorchester Rd & Michaux Pkwy	0:03:59
	Dorchester Rd & Michaux Pkwy	Michaux Pkwy & International Blvd	0:02:17
	Michaux Pkwy & International Blvd	International Blvd & Centre Pointe	0:02:39
	International Blvd & Centre Pointe	International Blvd & W Montague Ave	0:01:08
	International Blvd & W Montague Ave	E Montague Ave & Mall Dr	0:01:27
	E Montague Ave & Mall Dr	Rivers & Durant Ave	0:02:50
	Rivers & Durant Ave	Rivers & McMillan Ave	0:03:02
	Rivers & McMillan Ave	US Hwy 52 & Stromboli Ave	0:04:12
	US Hwy 52 & Stromboli Ave	Meeting St & Milford St	0:03:15
	Meeting St & Milford St	Meeting St & Mt. Pleasant St	0:02:00
	Meeting St & Mt. Pleasant St	Meeting St & Romney St	0:00:59
	Meeting St & Romney St	Meeting St & Huger St	0:00:53
	Meeting St & Huger St	Meeting St & Line St	0:01:10
	Meeting St & Line St	Meeting St & Visitors Center	0:01:13
	Meeting St & Visitors Center	Calhoun St & St Philip St	0:01:06
	Calhoun St & St Philip St	Calhoun St & Courtenay St	0:01:50
	Total Travel Time (min)		**1:03:32**

	Northbound Travel Time		
	From	To	Travel Time (min)
Corridor E - BRT	Calhoun St & Courtenay St	Calhoun St & St Philip St	0:01:50
	Calhoun St & St Philip St	Meeting St & Visitors Center	0:01:06
	Meeting St & Visitors Center	Meeting St & Line St	0:01:13
	Meeting St & Line St	Meeting St & Huger St	0:01:10
	Meeting St & Huger St	Meeting St & Romney St	0:00:53
	Meeting St & Romney St	Meeting St & Mt. Pleasant St	0:00:59
	Meeting St & Mt. Pleasant St	Meeting St & Milford St	0:02:00
	Meeting St & Milford St	US Hwy 52 & Stromboli Ave	0:03:15
	US Hwy 52 & Stromboli Ave	Rivers & McMillan Ave	0:04:12
	Rivers & McMillan Ave	Rivers & Durant Ave	0:03:02
	Rivers & Durant Ave	E Montague Ave & Mall Dr	0:02:50
	E Montague Ave & Mall Dr	International Blvd & W Montague Ave	0:01:27
	International Blvd & W Montague Ave	International Blvd & Centre Pointe	0:01:08
	International Blvd & Centre Pointe	Michaux Pkwy & International Blvd	0:02:39
	Michaux Pkwy & International Blvd	Dorchester Rd & Michaux Pkwy	0:02:17
	Dorchester Rd & Michaux Pkwy	Dorchester Rd & W Hill Blvd	0:03:59
	Dorchester Rd & W Hill Blvd	Dorchester Rd & Foxwood Dr	0:03:19
	Dorchester Rd & Foxwood Dr	Dorchester Rd & Asjley Phosphate Rd	0:03:29
	Dorchester Rd & Asjley Phosphate Rd	Dorchester Rd & Trump St	0:03:48
	Dorchester Rd & Trump St	Dorchester Rd & Foxcroft Ln	0:02:24
	Dorchester Rd & Foxcroft Ln	Dorchester Rd & Parlor Dr	0:02:54
	Dorchester Rd & Parlor Dr	Old Trolley Rd & Dorchester Rd	0:01:38
	Old Trolley Rd & Dorchester Rd	Old Trolley Rd & Midland Pkwy	0:01:55
	Old Trolley Rd & Midland Pkwy	Old Trolley Rd & Crestview Dr	0:03:15
	Old Trolley Rd & Crestview Dr	Old Trolley Rd & State Hwy 165	0:02:57
	Old Trolley Rd & State Hwy 165	Main St & Richardson Ave	0:03:53
	Total Travel Time (min)		**1:03:32**

Table 7: Corridor K BRT Travel Times

	Eastbound Travel Time		
	From	To	Travel Time (min)
Corridor K - BRT	Glenn McConnell Pkwy & Bees Ferry	Glenn McConnell Pkwy & Mary Ader	0:02:10
	Glenn McConnell Pkwy & Mary Ader	Glenn McConnell Pkwy & Magwood Dr	0:03:48
	Glenn McConnell Pkwy & Magwood Dr	Orleans Rd & Citadel Mall	0:03:31
	Orleans Rd & Citadel Mall	US Hwy 17 & Orleans Rd	0:01:35
	US Hwy 17 & Orleans Rd	US Hwy 17 & Pryor Ct	0:02:36
	US Hwy 17 & Pryor Ct	US Hwy 17 & Maple St	0:03:22
	US Hwy 17 & Maple St	US Hwy 17 & Wesley Dr	0:01:44
	US Hwy 17 & Wesley Dr	State Hwy 61 & Ashley Point Dr	0:01:52
	State Hwy 61 & Ashley Point Dr	Calhoun St & Courtenay St	0:02:24
	Calhoun St & Courtenay St	Calhoun St & St Philip St	0:01:50
	Calhoun St & St Philip St	Meeting St & Visitors Center	0:01:06
	Total Travel Time (min)		**0:25:58**

	Westbound Travel Time		
	From	To	Travel Time (min)
Corridor K - BRT	Meeting St & Visitors Center	Calhoun St & St Philip St	0:01:06
	Calhoun St & St Philip St	Calhoun St & Courtenay St	0:01:50
	Calhoun St & Courtenay St	State Hwy 61 & Ashley Point Dr	0:02:24
	State Hwy 61 & Ashley Point Dr	US Hwy 17 & Wesley Dr	0:01:52
	US Hwy 17 & Wesley Dr	US Hwy 17 & Maple St	0:01:44
	US Hwy 17 & Maple St	US Hwy 17 & Pryor Ct	0:03:22
	US Hwy 17 & Pryor Ct	US Hwy 17 & Orleans Rd	0:02:36
	US Hwy 17 & Orleans Rd	Orleans Rd & Citadel Mall	0:01:35
	Orleans Rd & Citadel Mall	Glenn McConnell Pkwy & Magwood Dr	0:03:31
	Glenn McConnell Pkwy & Magwood Dr	Glenn McConnell Pkwy & Mary Ader	0:03:48
	Glenn McConnell Pkwy & Mary Ader	Glenn McConnell Pkwy & Bees Ferry	0:02:10
	Total Travel Time (min)		**0:25:58**

Table 8: Corridor M BRT Travel Times

	Northbound Travel Time		
	From	To	Travel Time (min)
Corridor M - BRT Lite	Folly Rd & S Grimball Rd	Folly Rd & George L Griffith Blvd	0:05:12
	Folly Rd & George L Griffith Blvd	Folly Rd & Camp Rd	0:02:59
	Folly Rd & Camp Rd	Folly Rd & Central Park Rd	0:04:19
	Folly Rd & Central Park Rd	Maybank Hwy & Old Folly Rd	0:03:04
	Maybank Hwy & Old Folly Rd	US Hwy 17 & Wesley Dr	0:04:18
	US Hwy 17 & Wesley Dr	State Hwy 61 & Ashley Point Dr	0:02:44
	State Hwy 61 & Ashley Point Dr	Calhoun St & Courtenay St	0:03:32
	Calhoun St & Courtenay St	Calhoun St & St Philip St	0:02:42
	Calhoun St & St Philip St	Meeting St & Visitors Center	0:01:36
	Total Travel Time (min)		**0:30:26**

	Southbound Travel Time		
	From	To	Travel Time (min)
Corridor M - BRT Lite	Meeting St & Visitors Center	Calhoun St & St Philip St	0:01:36
	Calhoun St & St Philip St	Calhoun St & Courtenay St	0:02:42
	Calhoun St & Courtenay St	State Hwy 61 & Ashley Point Dr	0:03:32
	State Hwy 61 & Ashley Point Dr	US Hwy 17 & Wesley Dr	0:02:44
	US Hwy 17 & Wesley Dr	Maybank Hwy & Old Folly Rd	0:04:18
	Maybank Hwy & Old Folly Rd	Folly Rd & Central Park Rd	0:03:04
	Folly Rd & Central Park Rd	Folly Rd & Camp Rd	0:04:19
	Folly Rd & Camp Rd	Folly Rd & George L Griffith Blvd	0:02:59
	Folly Rd & George L Griffith Blvd	Folly Rd & S Grimball Rd	0:05:12
	Total Travel Time (min)		**0:30:26**

Table 9: Corridor N BRT Travel Times

	Westbound Travel Time		
	From	To	Travel Time (min)
Corridor N - BRT	US Hwy 17 & Porchers Bluff Rd	US Hwy 17 & Six Mile Rd	0:05:19
	US Hwy 17 & Six Mile Rd	US Hwy 17 & Market Centre Blvd	0:03:12
	US Hwy 17 & Market Centre Blvd	US Hwy 17 & Stuart Engals Blvd	0:02:41
	US Hwy 17 & Stuart Engals Blvd	US Hwy 17 & Anna Knapp Blvd	0:02:43
	US Hwy 17 & Anna Knapp Blvd	US Hwy 17 & S Shelmore St	0:02:04
	US Hwy 17 & S Shelmore St	Houston Northcutt Blvd & Harbor	0:02:31
	Houston Northcutt Blvd & Harbor	Meeting St & Huger St	0:08:56
	Meeting St & Huger St	Meeting St & Line St	0:01:10
	Meeting St & Line St	Meeting St & Visitors Center	0:01:13
	Meeting St & Visitors Center	Calhoun St & St Philip St	0:01:06
	Calhoun St & St Philip St	Calhoun St & Courtenay St	0:01:50
	Total Travel Time (min)		**0:32:45**

	Eastbound Travel Time		
	From	To	Travel Time (min)
Corridor N - BRT	Calhoun St & Courtenay St	Calhoun St & St Philip St	0:01:50
	Calhoun St & St Philip St	Meeting St & Visitors Center	0:01:06
	Meeting St & Visitors Center	Meeting St & Line St	0:01:13
	Meeting St & Line St	Meeting St & Huger St	0:01:10
	Meeting St & Huger St	Houston Northcutt Blvd & Harbor	0:08:56
	Houston Northcutt Blvd & Harbor	US Hwy 17 & S Shelmore St	0:02:31
	US Hwy 17 & S Shelmore St	US Hwy 17 & Anna Knapp Blvd	0:02:04
	US Hwy 17 & Anna Knapp Blvd	US Hwy 17 & Stuart Engals Blvd	0:02:43
	US Hwy 17 & Stuart Engals Blvd	US Hwy 17 & Market Centre Blvd	0:02:41
	US Hwy 17 & Market Centre Blvd	US Hwy 17 & Six Mile Rd	0:03:12
	US Hwy 17 & Six Mile Rd	US Hwy 17 & Porchers Bluff Rd	0:05:19
	Total Travel Time (min)		**0:32:45**

Table 10: *i-26ALT* Alternative B1 BRT Travel Times (for the Build Scenario)

	Southbound Travel Time		
	From	To	Travel Time (min)
Alternative B1 BRT Alignment	Main St/Richardson St	E 5N St/Berlin G Myers Pkwy	0:06:15
	E 5N St/Berlin G Myers Pkwy	US 78/Royle Rd	0:04:25
	US 78/Royle Rd	US 78/College Park Rd	0:04:47
	US 78/College Park Rd	US 78/I-26	0:03:38
	US 78/I-26	Rivers Ave & Otranto Blvd	0:04:37
	Rivers Ave & Otranto Blvd	Rivers Ave & Ashley Phosphate Rd	0:04:43
	Rivers Ave & Ashley Phosphate Rd	Rivers Ave & Stokes Ave	0:02:32
	Rivers Ave & Stokes Ave	Rivers & Remount Rd	0:04:32
	Rivers & Remount Rd	Rivers & Mall Dr	0:03:13
	Rivers & Mall Dr	Rivers & Durant Ave	0:02:17
	Rivers & Durant Ave	Rivers & McMillan Ave	0:03:02
	Rivers & McMillan Ave	US Hwy 52 & Stromboli Ave	0:04:12
	US Hwy 52 & Stromboli Ave	Meeting St & Milford St	0:03:15
	Meeting St & Milford St	Meeting St & Mt. Pleasant St	0:02:00
	Meeting St & Mt. Pleasant St	Meeting St & Romney St	0:00:59
	Meeting St & Romney St	Meeting St & Huger St	0:00:53
	Meeting St & Huger St	Meeting St & Line St	0:01:10
	Meeting St & Line St	Meeting St & Visitors Center	0:01:13
	Meeting St & Visitors Center	Calhoun St & St Philip St	0:01:06
	Calhoun St & St Philip St	Calhoun St & Courtenay St	0:01:50
	Total Travel Time (min)		**1:00:39**

	Northbound Travel Time		
	From	To	Travel Time (min)
Alternative B1 BRT Alignment	Calhoun St & Courtenay St	Calhoun St & St Philip St	0:01:50
	Calhoun St & St Philip St	Meeting St & Visitors Center	0:01:06
	Meeting St & Visitors Center	Meeting St & Line St	0:01:13
	Meeting St & Line St	Meeting St & Huger St	0:01:10
	Meeting St & Huger St	Meeting St & Romney St	0:00:53
	Meeting St & Romney St	Meeting St & Mt. Pleasant St	0:00:59
	Meeting St & Mt. Pleasant St	Meeting St & Milford St	0:02:00
	Meeting St & Milford St	US Hwy 52 & Stromboli Ave	0:03:15
	US Hwy 52 & Stromboli Ave	Rivers & McMillan Ave	0:04:12
	Rivers & McMillan Ave	Rivers & Durant Ave	0:03:02
	Rivers & Durant Ave	Rivers & Mall Dr	0:02:17
	Rivers & Mall Dr	Rivers & Remount Rd	0:03:13
	Rivers & Remount Rd	Rivers Ave & Stokes Ave	0:04:32
	Rivers Ave & Stokes Ave	Rivers Ave & Ashley Phosphate Rd	0:02:32
	Rivers Ave & Ashley Phosphate Rd	Rivers Ave & Otranto Blvd	0:04:43
	Rivers Ave & Otranto Blvd	US 78/I-26	0:04:46
	US 78/I-26	US 78/College Park Rd	0:03:38
	US 78/College Park Rd	US 78/Royle Rd	0:04:47
	US 78/Royle Rd	E 5N St/Berlin G Myers Pkwy	0:04:25
	E 5N St/Berlin G Myers Pkwy	Main St/Richardson St	0:04:30
	Total Travel Time (min)		**0:59:03**

Table 11: BRT/BRT Lite Frequency by Time Period

Time Period	Start	End	Headway (min)
Early AM	4:00 AM	5:59 AM	30
AM Peak	6:00 AM	8:59 AM	10
Midday	9:00 AM	3:59 PM	20
PM Peak	4:00 PM	6:59 PM	10
Evening	7:00 PM	8:59 PM	20
Night	9:00 PM	12:59 AM	30

Results

The STOPS model outputs a variety of results, including a summary of linked/unlinked trips, the change in person miles traveled (PMT), system-wide ridership, trips on project by trip purpose, and daily boardings by route. The model was submitted for 2015, 2030 and 2040. The forecast results discussed in this memorandum are for year 2015 (identified as Opening Year in STOPS) and long term year 2040.

Table 12 presents a summary of the year 2015 ridership statistics. At the systems level, the Build scenario is projected to produce an additional 12,100 daily unlinked trips (transit boardings) when compared to the No-Build scenario. In terms of linked trips, this scenario would generate 10,600 more transit trips than the No-Build scenario. These additional trips are new transit trips that would be diverted from the automobile mode. As a result, there would be a reduction in person miles of travel (PMT). The estimated PMT reduction is 76,000 person miles a day.

Table 12 shows total trips-on-project for the RTFP corridors. In year 2015, the number of project trips area nearly 18,200, with 22.4 percent of those trips from zero car households.

Table 12: Year 2015 Results by Mode and Alternative

RTFP Model		Year 2015
Linked/Unlinked Trips		
No Build	Linked	18,741
	Unlinked	23,068
Build	Linked	29,337
	Unlinked	35,183
Change	Linked	**10,596**
	Unlinked	**12,115**
Person Miles Travel		
Change	PMT	**-75,971**
Trips on Project		
All Trips	Home Based Work	7,727
	Home Based Other	8,289
	Non Home Based	2,182
	Total	**18,198**
Zero Car Trips	Home Based Work	2,337
	Home Based Other	1,583
	Non Home Based	165
	Total	**4,085**
	Percent Total of Zero car trips	**22.4%**

Figure 2 shows the ridership for each RTFP corridor by mode of access for year 2015. **Table 13** shows the station boardings by corridor and mode of access. **Table 14** shows the system ridership for year 2015.

Figure 2: Year 2015 Ridership by RTFP Corridor and Access Mode

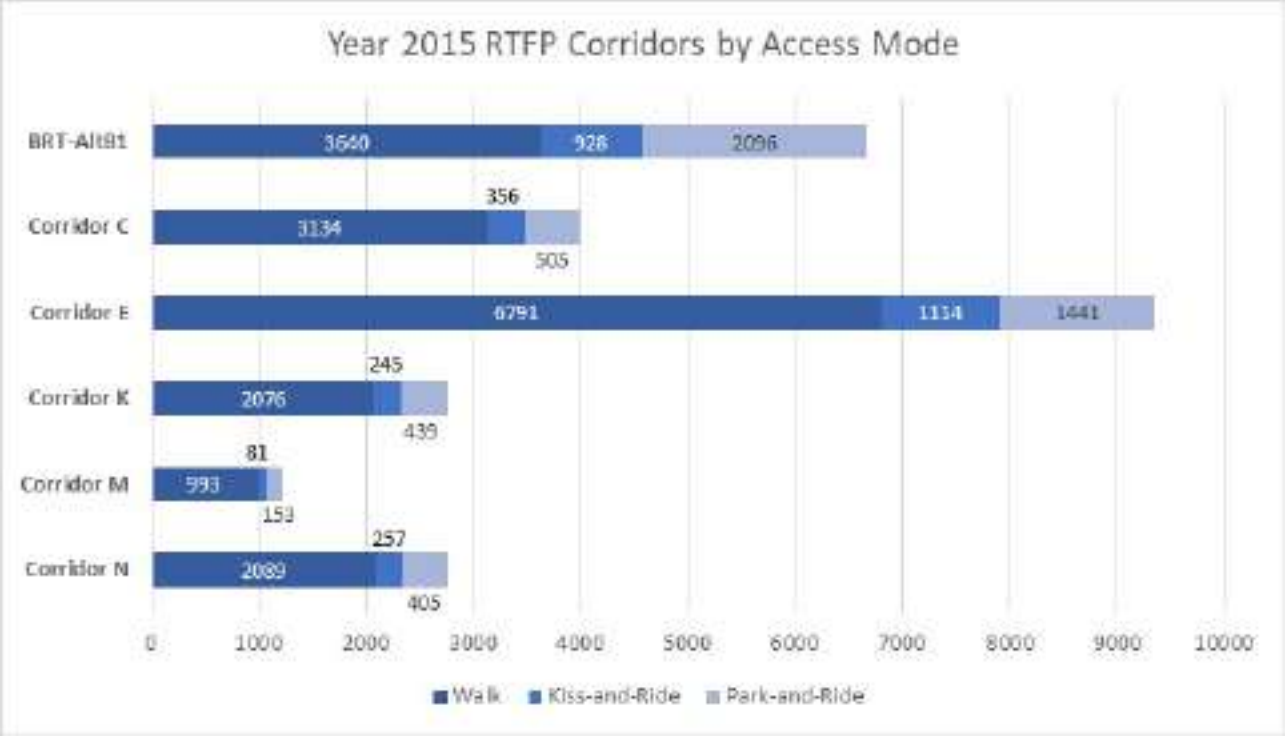

Table 13: Station Boardings by Corridor and Mode of Access for Year 2015

Corridor	Station Name	Walk	Kiss-and-Ride	Park-and-Ride	Transfer	ALL
K, M	US Hwy 17 & Wesley Dr	70	2	0	17	89
K, M	State Hwy 61 & Ashley Point Dr	74	2	0	46	122
C, E, K, L, M, N	Calhoun St & Courtenay St	1,638	30	0	537	2,205
C, E, K, L, M, N	Calhoun St & St Philip St	1,904	12	0	574	2,490
C, E, K, L, M, N	Meeting St & Visitors Center	588	14	0	949	1,551
C, E, L, N	Meeting St & Line St	587	8	0	69	664
C, E, L, N	Meeting St & Huger St	496	9	0	20	525

Corridor	Station Name	Walk	Kiss-and-Ride	Park-and-Ride	Transfer	ALL
C, E, L	Meeting St & Romney St	277	2	0	3	282
C, E, L	Meeting St & Mt. Pleasant St	535	7	0	4	546
C, E, L	Meeting St & Milford St	288	4	0	2	294
C, E, L	US Hwy 52 & Stromboli Ave	286	9	0	84	379
C, E, L	Rivers & McMillan Ave	640	25	0	317	982
C, E, L	Rivers & Durant Ave	406	28	0	129	563
M	Maybank Hwy & Old Folly Rd	68	1	0	2	71
M	Folly Rd & Central Park Rd	175	3	0	4	182
M	Folly Rd & Camp Rd	66	5	0	1	72
M	Folly Rd & George L Griffith Blvd	104	15	70	0	189
M	Folly Rd & S Grimball Rd	0	4	0	0	4
K	US Hwy 17 & Maple St	135	1	0	1	137
K	US Hwy 17 & Pryor Ct	283	5	0	0	288
K	US Hwy 17 & Orleans Rd	88	7	0	1	96
K	Orleans Rd & Citadel Mall	242	41	193	42	518
K	Glenn McConnell Pkwy & Magwood Dr	222	12	0	3	237
K	Glenn McConnell Pkwy & Mary Ader A*	45	11	0	10	66
K	Glenn McConnell Pkwy & Bees Ferry *	0	10	0	0	10
E	E Montague Ave & Mall Dr	140	11	0	0	151
E	International Blvd & W Montague Ave	176	3	0	4	183
E	International Blvd & Centre Pointe*	127	2	0	8	137
E	Michaux Pkwy & International Blvd	322	5	0	6	333
E	Dorchester Rd & Michaux Pkwy	98	16	0	18	132
E	Dorchester Rd & W Hill Blvd	42	1	0	62	105
E	Dorchester Rd & Foxwood Dr	257	21	0	6	284
E	Dorchester Rd & Asjley Phosphate Rd	323	28	0	38	389
E	Dorchester Rd & Trump St	433	20	0	0	453
E	Dorchester Rd & Foxcroft Ln	0	1	0	0	1
E	Dorchester Rd & Parlor Dr	0	138	0	0	138
E	Old Trolley Rd & Dorchester Rd	563	37	326	0	926
E	Old Trolley Rd & Midland Pkwy	280	27	0	0	307
E	Old Trolley Rd & Crestview Dr	1,061	7	0	0	1,068
E	Old Trolley Rd & State Hwy 165	298	23	0	0	321
E	Main St & Richardson Ave	797	60	265	401	1,523
C, L	Rivers & Mall Dr	315	11	0	35	361
C, L	Rivers & Remount Rd	473	33	208	80	794
C, L	Rivers Ave & Stokes Ave	178	5	0	2	185

Corridor	Station Name	Walk	Kiss-and-Ride	Park-and-Ride	Transfer	ALL
C, L	Rivers Ave & Ashley Phosphate Rd	267	31	0	192	490
C, L	Rivers Ave & Otranto Blvd	154	121	305	152	732
C	US Hwy 52 & Brandywine Blvd	34	11	12	0	57
C	US Hwy 52 & Goose Crk Municipal & *	0	17	49	0	66
C	US Hwy 52 & Cypress Gardens Rd	0	26	0	0	26
C	US Hwy 52 & Gaillard Rd	0	0	0	0	0
C	US Hwy 52 & Mountain Pine Rd	350	3	0	0	353
C	US Hwy 52 & Old Hwy 52	321	9	32	0	362
C	US Hwy Bypass 52 & Santee Cooper	0	3	14	0	17
C	US Hwy Bypass 52 & US Hwy 52	0	0	0	0	0
N	Houston Northcutt Blvd & Harbor Po*	273	3	0	17	293
N	US Hwy 17 & S Shelmore St	177	8	0	0	185
N	US Hwy 17 & Anna Knapp Blvd	195	12	0	0	207
N	US Hwy 17 & Stuart Engals Blvd	185	20	133	0	338
N	US Hwy 17 & Market Centre Blvd	170	7	0	0	177
N	US Hwy 17 & Six Mile Rd	64	7	0	0	71
N	US Hwy 17 & Porchers Bluff Rd	0	30	41	0	71
L	MainStRichardsonAve	505	29	61	401	996
L	E5StBerlinPKWY	572	38	176	0	786
L	US78RoyleRd	196	74	218	0	488
L	US87CollegePark	236	70	156	0	462
L	US78I26	192	19	0	1	212
Total Station Boardings		**18,991**	**1,254**	**2,259**	**4,238**	**26,742**

C= Corridor C
E= Corridor E
K= Corridor K
L= Low County Rapid Transit (Alternative 1B BRT)
M=Corridor M
N=Corridor N

Table 14: Year 2015 System Ridership

	No Build	Build	Change
Local Bus	12,586	6,788	-5,798
DASH Routes	1,063	746	-317
Express Routes	1,286	319	-967
Airport Routes	983	585	-398
BRT-AltB1	7,150	6,665	-485
Corridor C	0	3,995	3,995
Corridor E	0	9,346	9,346
Corridor K	0	2,760	2,760
Corridor M	0	1,227	1,227
Corridor N	0	2,751	2,751
Total-System	**23,068**	**35,182**	**12,114**

Year 2040 Results

Ridership for the RTFP corridors was also projected for the year 2040. The 2040 transit network in the tri-county area was assumed to be the same as in the opening year 2015. **Table 15** shows the results for year 2040.

Table 15: Year 2040 Results by Mode and Alternative

RTFP Model		Year 2040
Linked/Unlinked Trips		
No Build	Linked	21,520
	Unlinked	26,407
Build	Linked	34,020
	Unlinked	40,610
Change	Linked	**12,500**
	Unlinked	**14,202**
Person Miles Travel		
Change	PMT	**-89,567**
Project Trips		
All Trips	Home Based Work	9,677
	Home Based Other	9,920
	Non Home Based	2,717
	Total	**22,314**
Zero Car Trips	Home Based Work	3,088
	Home Based Other	2,126
	Non Home Based	201
	Total	**5,415**
	Percent Total	**24.3%**

Figure 3 shows the ridership for each corridor by mode of access for year 2040. **Table 16** shows the station boardings by corridor and mode of access. **Table 17** shows the system ridership for year 2040.

Figure 3: Year 2040 Ridership by RTFP Corridor and Access Mode

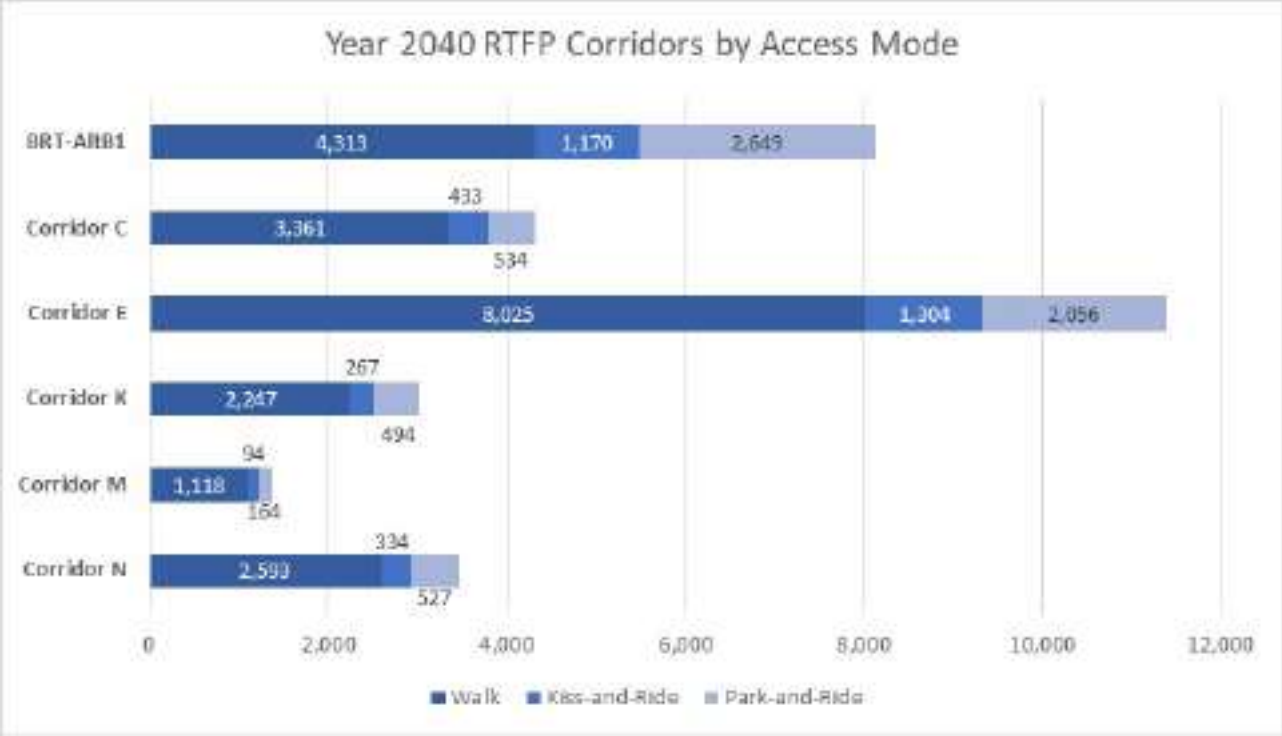

Table 16: Station Boardings by Corridor and Mode of Access for Year 2040

Corridor	Station Name	Walk	Kiss-and-Ride	Park-and-Ride	Transfer	ALL
K, M	US Hwy 17 & Wesley Dr	76	2	0	20	98
K, M	State Hwy 61 & Ashley Point Dr	83	2	0	49	134
C, E, K, L, M, N	Calhoun St & Courtenay St	2,435	35	0	665	3,135
C, E, K, L, M, N	Calhoun St & St Philip St	2,022	13	0	708	2,743
C, E, K, L, M, N	Meeting St & Visitors Center	647	19	0	1,039	1,705
C, E, L, N	Meeting St & Line St	648	9	0	70	727
C, E, L, N	Meeting St & Huger St	674	11	0	20	705

Corridor	Station Name	Walk	Kiss-and-Ride	Park-and-Ride	Transfer	ALL
C, E, L	Meeting St & Romney St	365	2	0	4	371
C, E, L	Meeting St & Mt. Pleasant St	570	8	0	4	582
C, E, L	Meeting St & Milford St	813	9	0	3	825
C, E, L	US Hwy 52 & Stromboli Ave	298	11	0	96	405
C, E, L	Rivers & McMillan Ave	724	29	0	370	1,123
C, E, L	Rivers & Durant Ave	491	31	0	147	669
M	Maybank Hwy & Old Folly Rd	75	3	0	1	79
M	Folly Rd & Central Park Rd	216	3	0	5	224
M	Folly Rd & Camp Rd	70	5	0	1	76
M	Folly Rd & George L Griffith Blvd	123	15	73	0	211
M	Folly Rd & S Grimball Rd	0	4	0	0	4
K	US Hwy 17 & Maple St	139	1	0	1	141
K	US Hwy 17 & Pryor Ct	277	4	0	0	281
K	US Hwy 17 & Orleans Rd	87	6	0	1	94
K	Orleans Rd & Citadel Mall	281	43	213	47	584
K	Glenn McConnell Pkwy & Magwood Dr	257	12	0	3	272
K	Glenn McConnell Pkwy & Mary Ader A*	51	12	0	9	72
K	Glenn McConnell Pkwy & Bees Ferry *	0	12	0	0	12
E	E Montague Ave & Mall Dr	163	11	0	0	174
E	International Blvd & W Montague Ave	176	2	0	5	183
E	International Blvd & Centre Pointe*	143	2	0	9	154
E	Michaux Pkwy & International Blvd	412	6	0	8	426
E	Dorchester Rd & Michaux Pkwy	109	16	0	23	148
E	Dorchester Rd & W Hill Blvd	52	1	0	63	116
E	Dorchester Rd & Foxwood Dr	282	20	0	6	308
E	Dorchester Rd & Asjley Phosphate Rd	337	26	0	46	409
E	Dorchester Rd & Trump St	508	24	0	0	532
E	Dorchester Rd & Foxcroft Ln	0	2	0	0	2
E	Dorchester Rd & Parlor Dr	0	141	0	0	141
E	Old Trolley Rd & Dorchester Rd	575	72	453	0	1,100
E	Old Trolley Rd & Midland Pkwy	281	27	0	0	308
E	Old Trolley Rd & Crestview Dr	1,242	8	0	0	1,250
E	Old Trolley Rd & State Hwy 165	296	21	0	0	317
E	Main St & Richardson Ave	805	100	431	449	1,785
C, L	Rivers & Mall Dr	324	12	0	37	373
C, L	Rivers & Remount Rd	556	38	249	80	923
C, L	Rivers Ave & Stokes Ave	193	6	0	2	201

Corridor	Station Name	Walk	Kiss-and-Ride	Park-and-Ride	Transfer	ALL
C, L	Rivers Ave & Ashley Phosphate Rd	284	54	0	214	552
C, L	Rivers Ave & Otranto Blvd	155	146	393	195	889
C	US Hwy 52 & Brandywine Blvd	32	10	18	0	60
C	US Hwy 52 & Goose Crk Municipal & *	0	20	57	0	77
C	US Hwy 52 & Cypress Gardens Rd	0	42	0	0	42
C	US Hwy 52 & Gaillard Rd	0	0	0	0	0
C	US Hwy 52 & Mountain Pine Rd	435	4	0	0	439
C	US Hwy 52 & Old Hwy 52	411	10	40	0	461
C	US Hwy Bypass 52 & Santee Cooper	0	3	16	0	19
C	US Hwy Bypass 52 & US Hwy 52	0	0	0	0	0
N	Houston Northcutt Blvd & Harbor Po*	397	3	0	26	426
N	US Hwy 17 & S Shelmore St	226	15	0	0	241
N	US Hwy 17 & Anna Knapp Blvd	216	14	0	0	230
N	US Hwy 17 & Stuart Engals Blvd	225	28	180	0	433
N	US Hwy 17 & Market Centre Blvd	194	8	0	0	202
N	US Hwy 17 & Six Mile Rd	75	9	0	0	84
N	US Hwy 17 & Porchers Bluff Rd	0	33	47	0	80
L	MainStRichardsonAve	482	35	62	449	1,028
L	E5StBerlinPKWY	628	49	209	0	886
L	US78RoyleRd	228	71	217	0	516
L	US87CollegePark	268	106	235	0	609
L	US78I26	261	19	0	2	282
Total Station Boardings		**22,393**	**1,515**	**2,893**	**4,877**	**31,678**

C= Corridor C
E= Corridor E
K= Corridor K
L= Low County Rapid Transit (Alternative 1B BRT)
M=Corridor M
N=Corridor N

Table 17: Year 2040 System Ridership

	No Build	Build	Change
Local Bus	14,282	7,208	-7,074
DASH Routes	1,020	702	-318
Express Routes	1,507	334	-1,173
Airport Routes	1,150	684	-466
BRT-AltB1	8,449	8,133	-316
Corridor C	0	4,328	4,328
Corridor E	0	11,385	11,385
Corridor K	0	3,008	3,008
Corridor M	0	1,375	1,375
Corridor N	0	3,454	3,454
Total-System	**26,408**	**40,611**	**14,203**

Conclusion

Transit ridership for the RTFP was estimated using FTA's ridership forecast model software known as STOPS. The model was calibrated to year 2014 observed ridership counts and was applied to estimate opening year 2015 and long term year 2040 ridership for the RTFP corridors. The model results indicate, if the BRT projects were built today, all the five corridors have the potential to carry about 20,100 trips. The corridors would generate 10,600 additional transit trips which would be diverted from the auto mode and this diversion would contribute to a PMT reduction of about 76,000 person miles a day. In the long term (2040), all the five corridors have the potential to carry about 23,600 trips. The corridors would generate 12,500 additional transit trips which would be diverted from the auto mode and this diversion would contribute to a PMT reduction of about 89,600 person miles a day.