

To: North Carolina Turnpike Authority      From: Fleur Hartmann, PE  
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File:      Date: December 18, 2025

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**Reference:** Carolina Bays Parkway Extension, Level 1 Transactions and Revenue Study

## 1.0 PROJECT DESCRIPTION

The objective of this study was to provide the North Carolina Turnpike Authority (NCTA) with sketch-level (Level 1) <sup>1</sup> transactions and revenue (T&R) estimates for an extension of the Carolina Bays Parkway from Horry County, South Carolina into Brunswick County, North Carolina. The portion of the extension in North Carolina would be tolled. Two corridor alignments, Alternative 4 and 4A, were evaluated as shown in **Figure 1**.

The two alignments of the Carolina Bays Parkway Extension (CBPE) evaluated were:

- Alternative 4: Extends northeast from the existing Carolina Bays Parkway in South Carolina to an interchange with Ash Little River Road, north of Hickman Road in Brunswick County, North Carolina, before veering further northeast and then southeast and ending at an interchange with US 17 and NC 904. This right-of-way serves as an alternate route to Hickman Road and US 17 between the state line and NC 904. This alternative also provides additional interchanges with Little River Road in South Carolina and Pea Landing Road in North Carolina. The full length of the CBPE-Alternative 4 in North Carolina is about 12.5 miles and includes three toll segments.
- Alternative 4A: Follows the same alignment as Alternative 4 from the state line to Pea Landing Road and then meets NC 904 with an interchange north of US 17. The extension then continues eastward to the interchange of US 17 and NC 130 (Whiteville Road). The full length of the CBPE-Alternative 4A in North Carolina is 17.5 miles and includes four toll segments.

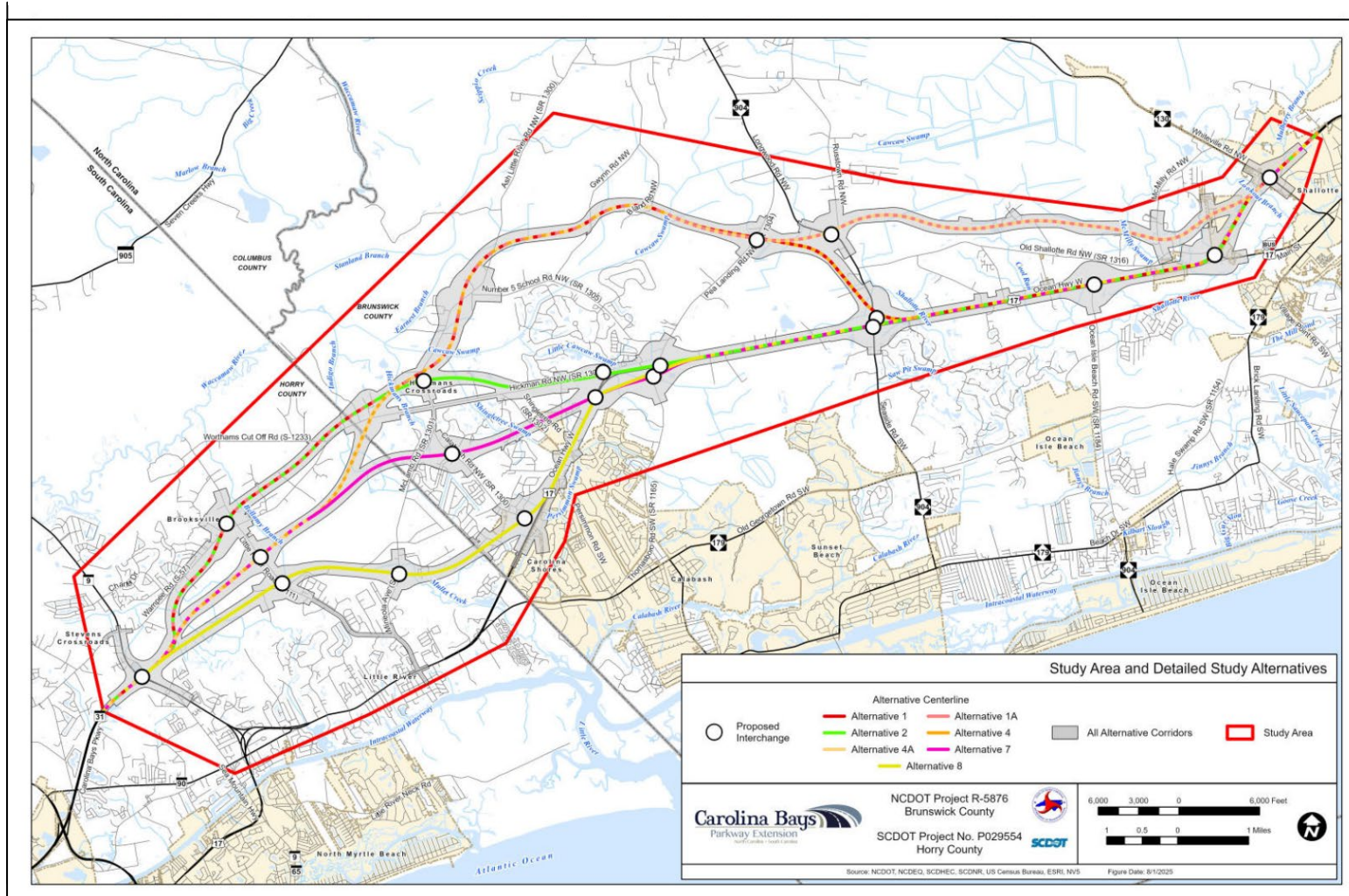
Each alignment would be opened in phases. Phase 1 is the same for both alternatives and includes the Carolina Bays Parkway extension to the most western North Carolina interchange at Ash Little River Road and expected to open in 2035. Phase 2 for both alternatives is the Full Build of the project, extending east of Ash Little River Road to the project's eastern terminus (US 17/NC 904 for Alternative 4 and US 17/NC 130 for Alternative 4A) and expected to open in 2040. The Carolina Bays extension in North Carolina is proposed to be tolled. For Alternative 4, transactions and revenue estimates were provided for two scenarios – with and without Phase 2 opening.

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<sup>1</sup> A sketch-level (of Level 1) study is a high-level feasibility assessment designed to evaluate the potential for traffic attraction to a proposed toll project. This type of study relies on existing traffic information available in a project study area and existing tools to evaluate it. The intent of a sketch level study is to provide a general indication of the revenue potential of a proposed project. The benefit of this study is a relatively quick evaluation of a project with a high-level traffic and revenue forecast. The analysis is based on a set of project assumptions; should the assumptions change; the traffic and revenue estimates may differ substantially from those presented herein.

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Figure 1: Project Location Map**



Source: NCDOT. Alternatives 4 and 4A were studied as part of this traffic and revenue study.  
Design with community in mind

**Reference:** Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

## 1.1 PROJECT METHODOLOGY

The traffic and revenue estimates for this study used existing traffic counts from SCDOT's and NCDOT's traffic count databases (including those directly on the existing Carolina Bays Parkway in SC), speed information from Google API, and origin-destination data from StreetLight Data. Stantec obtained the most recent version (September 2023) of the Grand Strand Area Transportation Study (GSATS) model from the GSATS Metropolitan Planning Organization (MPO). These models are used by the MPO to evaluate potential highway improvement projects to be included in the Grand Strand Area Transportation Study 2045 Metropolitan Transportation Plan (MTP). The data from these sources were used to understand the traffic conditions in the study area and to build a spreadsheet model to estimate tolled traffic and revenue for each alternative.

## 2.0 EXISTING TRAVEL CHARACTERISTIC DATA

### 2.1 TRAFFIC VOLUMES

Traffic volume information from July 2024 to June 2025 was collected at a continuous count location in South Carolina on existing Carolina Bays Parkway and another location on US 17 in North Carolina. In addition, recent (primarily 2023-2025) spot counts from the NCDOT traffic database were collected.

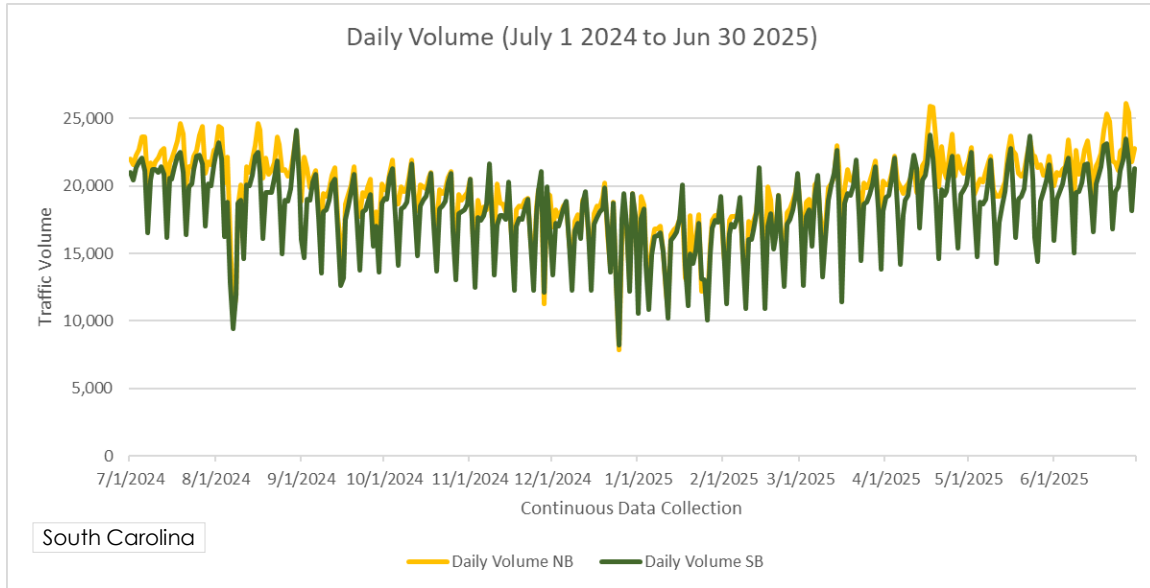
#### Continuous Traffic Count Locations

For this study, Stantec analyzed a full year of data from SCDOT's continuous count location 0120, existing Carolina Bays Parkway between SC 9 (Highway 9) and SC 31 (Robert Edge Parkway). The average daily volume for this location for the full year of data was 37,689, while the highest daily volume, recorded in April 2025, was 49,617. The volumes in both the directions were generally comparable. Stantec also analyzed a full year of data from NCDOT's continuous count location 0100000428, which is located on US 17 south of Carolina Farms Boulevard. The average daily volume for this location from the full year of data is 17,066 and the highest daily volume was 22,560 that was recorded in July 2024. The daily volume for both continuous count locations is shown in **Figure 2** and **Figure 3** below.

Stantec used the US 17 location in North Carolina to develop the factors to adjust daily volumes in the North Carolina study area. Data was analyzed for four day-types: Monday to Thursday, Friday, Saturday, and Sunday. The Friday hourly volume distribution for both directions is different from the rest of the weekdays, especially in the afternoon hours, potentially due to recreational trips heading to the beach at the start of the weekend. As such, weekdays were defined as Monday through Thursday, and weekends were defined as Friday to Sunday.

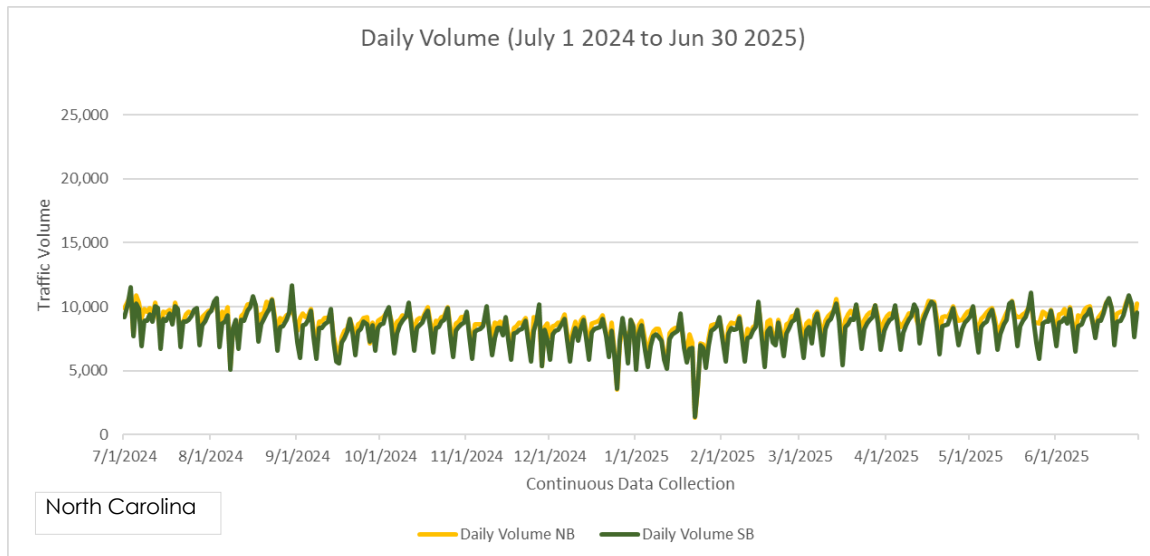
Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Figure 3: Daily Volume by Direction at SC Continuous Count Location, July 2024 – June 2025**



Source: Count data collected from State Department of Transportation traffic count databases.

**Figure 2: Daily Volume by Direction at NC Continuous Count Location, July 2024 – June 2025**



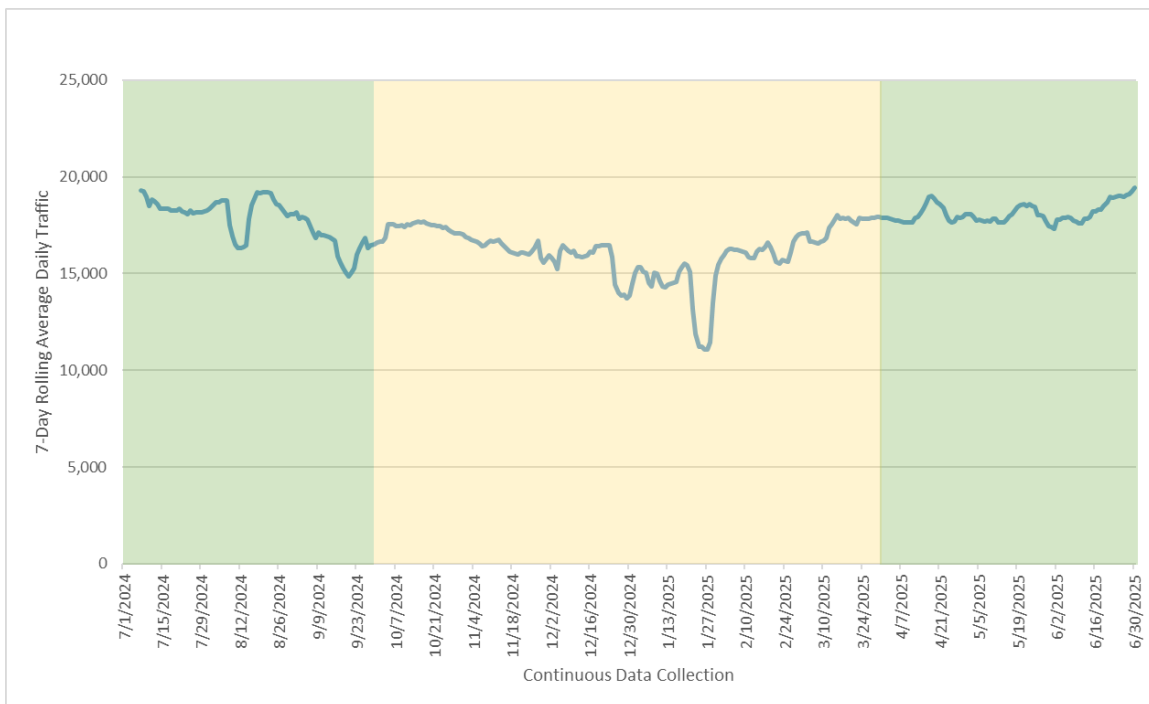
Source: Count data collected from State Department of Transportation traffic count databases.

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

For each day type, the average daily volumes from different months were used to determine the seasonality. Based on the analysis of total daily volumes at this location, Stantec identified two seasons for analysis: Peak, and Off-Peak, as shown in **Figure 4**. As shown in **Table 1**, the seasons definitions are:

- Peak season: April through September
- Off-Peak season: October through March

**Figure 4: 7-Day Rolling Average Daily Total Traffic at NC Count Location 0100000428, July 2024 - June 2025**



Note: Count location 0100000428 is located on US 17 south of Carolina Farms Boulevard. The green color in the chart represents the peak season and the yellow color represents the off-peak season.

**Table 1: 2024 – 2025 Average Daily Volume by Season, Day Type and Direction for US 17, NC**

Day Type	Peak Season (April through September)			Off-Peak Season (October through March)		
	NB	SB	Total	NB	SB	Total
Mon-Thu	9,364	8,868	18,232	8,592	8,140	16,732
Fri-Sun	9,096	8,597	17,693	8,155	7,616	15,771
Daily	9,248	8,750	17,827	8,403	7,915	16,011

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

### Spot Traffic Counts

Using NCDOT's traffic count database, the latest available spot count data along the competing roadways to the potential CBPE in Brunswick County, North Carolina area were collected. Using the available spot count locations, Stantec defined screenlines across the CBPE and parallel roadways to estimate the origins of traffic that might divert to the CBPE. The spot locations and the screenlines are shown in **Figure 5**.

The spot count data were factored to represent the 2025 peak season (April through September) using data from NCDOT's continuous count location along US 17. The screenline location count data along with 2025 seasonally adjusted volumes are included in **Table 2**. As shown, the two roads from which traffic is most likely to divert to the CBPE, Hickman Road and US 17, represent about 45 to 52 percent of each screenline.

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Figure 5: Study Area Actual Traffic Count Screenlines**



Note: The letters next to each screenline location can be cross-referenced in **Table 2**.

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Table 2: Adjusted 2025 Peak Season Screenline Traffic Volumes at Spot Count Locations**

ID	Roadway	Location (Two-way)	Date	Daily Count Data	2025 Peak Season Adjusted Daily Count Volumes	
					Volume	% of Screenline
<b>Screenline 1</b>						
A	Swamp Fox Hwy E	WEST OF Ramsey Ford Rd	7/7/2025	2,565	2,565	5%
B	7 Creeks Hwy	WEST OF NC 904	6/16/2025	2,318	2,318	4%
C	SR 1303 (Hickman Rd NW)	WEST OF SR 1300 (Ash-Little River Rd NW)	5/15/2023	11,271	11,842	21%
D	McLamb Rd NW	Calabash Rd NW	5/15/2023	2,358	2,477	4%
E	US 17	WEST OF US 17 (Ocean Hwy W)	5/19/2025	17,289	17,289	31%
F	NC 179	EAST OF SR 1168 (Country Club Dr)	3/25/2024	17,504	19,489	35%
<b>Total</b>				<b>53,994</b>	<b>55,979</b>	<b>100%</b>
<b>Screenline 2</b>						
G	US 904	WEST OF ASH LITTLE RIVER	3/24/2025	2,792	3,109	6%
H	Ash Little River Rd NW	WEST OF NC 904	3/25/2024	925	1,055	2%
I	Etheridge Rd NW	EAST OF Ash Little River Rd	3/24/2025	589	655	1%
J	Pea Landing Rd NW	WEST OF NC 904	3/24/2025	2,088	2,324	4%
K	US 17	WEST OF NC 904 Seaside Rd SW (378)	10/10/2023	24,356	28,492	51%
L	NC 179	WEST OF NC 904 (Seaside Rd SW)	5/16/2023	11,586	12,173	22%
M	NC 179 BUS	NORTH OF SR 1172 (Sunset Blvd S)	5/16/2023	7,967	8,370	15%
<b>Total</b>				<b>50,302</b>	<b>56,177</b>	<b>100%</b>
<b>Screenline 3</b>						
N	Ash Little River Rd NW	WEST OF Whiteville Rd NW	3/25/2024	1,105	1,261	2%
O	Longwood Rd NW	WEST OF Whiteville Rd NW	3/25/2024	3,679	4,199	7%
P	Old Shallotte Rd NW	EAST OF Longwood Rd NW	4/9/2025	3,943	3,943	6%
Q	US 17	WEST OF SR 1319 Union School Rd NW	5/19/2025	27,805	27,805	45%
R	Old Georgetown Rd SW	SR 1163 (Old Georgetown Rd SW) EAST OF NC 179	3/26/2024	10,471	11,950	19%
S	NC 179 BUS	EAST OF SR 1232 Waterway Dr SW	10/3/2023	10,898	12,748	21%
<b>Total</b>				<b>58,834</b>	<b>61,906</b>	<b>100%</b>
<b>Screenline 4</b>						
T	Old King Rd NW	EAST OF Whiteville Rd NW	3/25/2024	684	780	1%
U	US 17	NORTH OF NC 130	4/9/2025	34,451	34,451	49%
V	Bridgers Rd	EAST OF Whiteville Rd NW	3/27/2007	6,357	11,039	16%
W	US 17 BUS	EAST OF Whiteville Rd NW	4/9/2025	24,697	24,697	35%
<b>Total</b>				<b>66,189</b>	<b>70,967</b>	<b>100%</b>

Note: The letters next to each screenline location can be cross-referenced in **Figure 5**.  
The sum of components may not add to total due to rounding.

## 2.2 ORIGIN/DESTINATION PATTERNS

Origin/destination (O/D) information was analyzed to determine the travel characteristics of corridor traffic and note whether they are long-distance (or through) trips. The raw data originated from StreetLight Data, a big data company that uses various data sources to provide travel movement records. The StreetLight platform processes over 40 billion location records each month across the geography it covers to develop a series of travel metrics. The location records are derived from connected vehicle data.

**Figure 6** shows a map of O/D zones (represented as circles and segments) analyzed along the different corridors in the Brunswick County area.

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Figure 6: Origin/Destination Zones and Segments Analyzed in Brunswick County, NC, Area**



Source: Snapshot from StreetLight Data Platform

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

In the eastbound direction, trips from US 17 at the South Carolina state border to east of NC 904 along US 17 were considered long distance trips. About 63 percent of the eastbound trips were long-distance trips traveling east of NC 904 and 53 percent traveling further to west of NC 130. In the westbound direction, the trips from west of NC 130 along US 17 or Ocean Highway Shallotte to US 17 at the South Carolina border were considered long distance trips. About 30 percent of the westbound trips were long distance trips. The O/D analysis also shows that about 40 percent of the trips in either direction is destined to the area between NC 904 and the state line. The O/D percentages are shown in **Table 3**.

**Table 3: Origin/Destination Patterns in Brunswick County, NC**

Origin/Destination	Direction	US 17 - SC border	Hickman Road - State border	Ocean Highway - east of NC 904	Ocean Highway - Shallotte (west of NC 130)
Hickman Road - State border	EB/NB	-	100%	63%	53%
US 17 - NC border	EB/NB	100%	-	53%	43%
Ocean Highway - Shallotte (west of NC 130)	WB/SB	<5%	28%	69%	100%

## 2.3 TRAVEL SPEEDS

Speed data were collected using Google API between July 18 and July 25, 2025, from 6 AM to 10 PM. Stantec uses an in-house tool to collect travel time, distance and speed for specific routes automatically and periodically using Google API. The data are then analyzed by time of day and direction for the different corridors in the study area.

US 17 between NC 904 and Ocean Isle Beach Road (SR 1184), a 3.15-mile stretch, is generally a divided roadway with two lanes in each direction with a posted speed limit of 55 mph. There are median openings at some minor roadway intersections, as well as a few signalized intersections with crossing streets. There are some driveways giving direct access to residences along the road as well as some commercial development. Based on the data collected, the hourly speeds in the eastbound direction on US 17 were not less than 50 mph. In the westbound direction, some hourly speeds were slightly less, at 48 mph in four different hours. Generally, the speeds in this stretch of US 17 are close to the speed limit of 55 mph. **Table 4** shows the hourly speeds for the days that data were collected. The shades of red in the **Table 4** represent speeds at or lower than the posted speed limit of 55 mph and shades of green show the speeds higher than the posted speed limit.

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**
**Table 4: US 17 Speeds between NC 904 and Ocean Isle Beach Road, July 2025**

Date	Day	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM
Eastbound																	
7/18/2025	Fri	59	57	55	55	50	53	54	53	52	54	55	55	56	58	57	57
7/19/2025	Sat	59	58	57	56	55	55	54	55	53	55	55	56	57	59	58	57
7/20/2025	Sun	59	59	59	58	56	56	55	56	57	56	57	58	58	59	58	57
7/22/2025	Tue	56	56	54	54	54	54	53	55	53	53	54	54	55	57	58	57
7/23/2025	Wed	57	56	54	54	54	54	54	53	54	53	53	55	57	57	58	57
7/24/2025	Thu	59	57	53	53	54	53	54	53	55	54	54	54	57	57	57	54
Westbound																	
7/18/2025	Fri	59	56	53	54	52	52	50	51	50	52	49	52	54	57	57	54
7/19/2025	Sat	58	57	56	55	53	51	50	51	53	49	52	53	56	58	57	56
7/20/2025	Sun	59	59	59	57	56	53	52	54	55	54	54	56	58	58	58	57
7/22/2025	Tue	56	56	52	55	54	54	53	51	52	52	50	52	56	58	58	56
7/23/2025	Wed	57	56	53	54	51	53	52	52	51	52	52	53	57	57	56	55
7/24/2025	Thu	58	56	54	52	48	53	52	52	52	49	51	51	58	57	56	54

Source: Based on Google API data collected

US 17, the 6.1-mile segment from Calabash Road (located just east of the State line) to NC 904, is a divided two-lane roadway in each direction with a posted speed limit of 55 mph. There are some driveways giving direct access to residences along the road as well as some commercial development. **Table 5** shows the hourly speeds on for the days that data were collected. The slower speeds within this corridor correspond to locations with driveways. The average hourly speeds in this section are lower than the posted speed limit of 55 mph. The shades of red in the **Table 5** represent speeds at or lower than the posted speed limit of 55 mph and shades of green show the speeds higher than the posted speed limit.

**Table 5: US 17 Speeds between Calabash to NC 904, July 2025**

Date	Day	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM
Eastbound																	
7/18/2025	Fri	55	54	51	51	49	50	48	49	50	50	49	51	53	54	54	53
7/19/2025	Sat	57	55	53	52	50	50	50	52	51	51	52	52	54	55	54	54
7/20/2025	Sun	57	56	55	53	52	52	51	51	53	52	53	54	53	54	55	55
7/22/2025	Tue	55	51	50	50	51	50	50	50	49	48	48	50	53	54	54	53
7/23/2025	Wed	55	52	50	50	50	50	49	50	49	50	50	50	52	55	54	53
7/24/2025	Thu	55	52	49	50	49	50	49	49	50	50	50	51	54	54	52	51
Westbound																	
7/18/2025	Fri	57	55	53	51	50	50	49	50	49	50	50	51	53	55	55	53
7/19/2025	Sat	58	57	55	54	51	51	51	51	50	51	51	52	53	54	55	54
7/20/2025	Sun	58	57	56	55	53	53	51	52	53	52	53	53	54	55	55	55
7/22/2025	Tue	55	55	52	51	50	51	51	51	51	48	49	52	54	55	55	54
7/23/2025	Wed	56	55	53	52	50	51	50	51	52	51	51	51	54	55	55	54
7/24/2025	Thu	56	55	53	52	50	50	50	50	50	50	50	51	53	54	52	53

Source: Based on Google API data collected

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

Hickman Road, a 5.9-mile segment between the NC State line and US 17, is generally a single lane in each direction with two-way turn-lane in some sections, and with a posted speed limit of 45 mph and mostly residential development in the immediate vicinity of the road. **Table 6** shows the hourly speeds for the days that data were collected. The average hourly speeds on Hickman Road are slower than that on US 17, but the average speeds were close to the posted speed limit except for one hour when the average speed was 36 mph. The shades of red in **Table 6** represent speeds at or lower than the posted speed limit of 45 mph and shades of green show the speeds higher than the posted speed limit.

**Table 6: Hickman Road between NC State Line and Rt 17, July 2025**

Date	Day	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM
Eastbound																	
7/18/2025	Fri	51	47	45	42	45	45	45	45	45	44	45	46	47	48	48	47
7/19/2025	Sat	51	49	48	47	46	46	45	46	45	47	46	48	47	48	48	47
7/20/2025	Sun	51	52	50	47	46	46	44	44	47	47	47	48	47	50	49	48
7/22/2025	Tue	49	46	45	45	46	43	45	46	45	40	41	44	47	48	49	47
7/23/2025	Wed	49	47	45	45	45	43	45	45	45	45	46	47	48	49	48	47
7/24/2025	Thu	49	47	45	45	45	43	44	45	45	45	45	47	47	48	42	46
Westbound																	
7/18/2025	Fri	51	51	48	47	45	46	45	43	44	45	36	45	48	49	48	48
7/19/2025	Sat	52	51	50	48	46	46	46	46	45	47	47	47	48	50	50	49
7/20/2025	Sun	54	53	51	50	48	48	47	47	48	48	49	49	50	50	50	49
7/22/2025	Tue	50	49	48	47	46	46	46	47	46	40	40	46	47	50	50	49
7/23/2025	Wed	51	50	48	47	46	46	46	46	47	45	46	46	48	49	48	48
7/24/2025	Thu	51	50	48	47	47	46	46	46	45	45	46	47	47	48	42	47

Source: Based on Google API data collected

Generally, the hourly speed data collected along Hickman Road and US 17 do not show significant congestion, although it should be noted these are average hourly speeds over one week and that some localized congestion may occur.

## 2.4 TRUCK SHARES

It is assumed that the CPBE would have a similar mix of traffic by vehicle classification as the existing Carolina Bays Parkway. As such, the classified vehicle data for the existing Carolina Bays Parkway were summarized from SCDOT's continuous count location Station ID 0120 from June 2024 to July 2025. **Table 7** shows the truck percentage used for the analysis. Classes 3 through 6 were considered medium trucks and classes 7 through 13 were considered heavy trucks.

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Table 7: Existing Carolina Bays Parkway (SC) Truck Shares, July 2024 – June 2025**

Truck Type	Truck Percentage
Total Trucks	4.6%
Medium Trucks	2.7%
Heavy Trucks	1.9%

Source: SCDOT Station ID 0120, June 2024-July 2025

### 3.0 POPULATION DATA

#### 3.1 HISTORICAL POPULATION AND GROWTH

**Table 8** shows the historical population in the study area between the years 2000 and 2024 from four available sources: the US Census, Woods & Poole, South Carolina Revenue and Fiscal Affairs Office, and the North Carolina State Data Center. Growth in the area has historically been between 2.8 - 3.3 percent in 2000-2022 and increased slightly to 2.7 – 5 percent, particularly after the COVID pandemic.

**Table 8: Historical Population and Annual Growth, 2000 - 2024**

Source	Population							Growth (CAGR)		
	2000	2010	2020	2021	2022	2023	2024	2000-2020	2020-2024	2022-2024
<b>Horry County, South Carolina</b>										
Census	196,629	270,274	353,779	366,164	383,372	398,374	413,391	3.0%	4.0%	3.8%
W&P	198,019	270,046	353,765	366,093	383,147	397,478	403,783	2.9%	3.4%	2.7%
South Carolina Revenue and Fiscal Affairs Office	196,629	269,291	353,765	366,093	383,147	397,478	405,078	3.0%	3.4%	2.8%
<b>Brunswick County, North Carolina</b>										
Census	73,143	108,069	138,167	144,869	152,836	159,855	167,112	3.2%	4.9%	4.6%
W&P	73,717	107,881	138,168	144,843	152,908	159,964	162,763	3.2%	4.2%	3.2%
North Carolina State Data Center	73,141	107,431	138,756	144,938	152,549	160,440	168,153	3.3%	4.9%	5.0%

#### 3.2 FORECASTED FUTURE POPULATION GROWTH

**Table 9** shows the forecasted population in the study area between the years 2025 and 2040. Note that the Census does not provide future population forecasts. In many cases, annual growth in the study area is expected to slow over the next 15 years to less than half the annual growth of the last two years. This data was compared with the household data from the most recent version (September 2023) of the Grand Strand Area Transportation Study (GSATS) model from the GSATS Metropolitan Planning Organization (MPO). The GSATS model uses households instead of population as their model input to develop trip generation. The forecasted household growth from the GSATS model is similar to the forecasted population growth from Woods & Poole.

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

**Table 9: Forecasted Future Population Growth**

Source	Year					Growth (CAGR)	
	2025	2030	2035	2040	2045	2025-2040	2025-2045
<b>Population Forecast, Horry County, South Carolina</b>							
W&P	410,160	442,758	476,362	510,593	-	1.5%	-
South Carolina Revenue and Fiscal Affairs Office	416,066	473,345	533,818	596,398	-	2.4%	-
<b>Household Forecast, Horry County, South Carolina</b>							
GSATS Model	234,102	-	-	-	330,538	-	1.7%
<b>Population Forecast Brunswick County, North Carolina</b>							
W&P	165,607	180,369	195,988	212,343	-	1.7%	-
North Carolina State Data Center	175,047	201,455	221,669	239,871	-	2.1%	-
<b>Household Forecast, Brunswick County, North Carolina</b>							
GSATS Model	53,023	-	-	-	72,821	-	1.6%

## 4.0 FUTURE YEAR TOLL-FREE TRAVEL DEMAND MODELING

Stantec obtained the most recent version (September 2023) of the Grand Strand Area Transportation Study (GSATS) model from the GSATS Metropolitan Planning Organization (MPO). These models are used by the MPO to evaluate potential highway improvement projects to be included in the Grand Strand Area Transportation Study 2045 Metropolitan Transportation Plan (MTP). It has a calibration year of 2019 and is a peak season (June-August) daily traffic count model. Stantec benchmarked the models to ensure that when we ran the models, our results matched the MPO results. No additional calibration was completed as part of this study.

Stantec used the 2025 and future 2045 models for this study. A No Build scenario (without the project) was run to understand traffic patterns for 2025 and future 2045 models. For a Phase 1 Build scenario, the Phase 1 project was coded into the 2025 Existing Plus Committed (E&C) model network and into the 2045 Fiscally Constrained Metropolitan Transportation Plan (FCMTP). The rest of the model networks were unchanged except for the addition of the Carolina Bays Parkway (CBPE). The same process was completed for Phase 2 of each of the alignments studied for the project. All the model runs assumed no tolls on the CBPE.

The following sections discuss the results of the model.

### 4.1 2025 NO BUILD COMPARISON TO ACTUAL COUNTS

As described in section 2.1 and shown in **Figure 5**, four screenlines were developed that comprised of 2025 actual traffic counts and other recent actual counts (primarily 2023-2025) that were factored to the 2025 daily peak season based on the permanent count location data. For this analysis, we used the GSATS definition of peak season being June-August (for the toll and revenue forecast development, peak season was defined as April – September). As shown in **Table 10**, the 2025 No-

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

Build Model volume overestimates the actual total 2025 screenline volumes by about 24 to 43 percent. One traffic volume is overestimated by over 600 percent. The two locations that are not overestimated by the model, NC 179 – east of SR 1168 (Country Club Drive) and Old Georgetown Road – east of NC 179, are located at the southern end of each screenline far from where the proposed location of the CBPE. Hickman Road and US 17, the CBPE's most likely competitors, are overestimated by between 5 and 31 percent. Due to the daily volume differences between the 2025 model volumes and the 2025 peak season adjusted daily count volumes (over 3,000 vehicles on average, or 23 percent), Stantec used the 2025 peak season adjusted daily count volumes instead of the travel demand model as the base from which to divert traffic to the CBPE.

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Table 10: Comparison of 2025 Model Volumes and 2025 Peak Season Adjusted Daily Traffic Count Volumes**

ID	Roadway	Location (Two-way)	2025 Model Volumes	2025 Peak Season Adjusted Daily Count Volumes	Difference	Percent Difference
<b>Screenline 1</b>						
A	Swamp Fox Hwy E	WEST OF Ramsey Ford Rd	9,122	2,565	6,557	255.64%
B	7 Creeks Hwy	WEST OF NC 904	8,886	2,318	6,568	283.34%
C	SR 1303 (Hickman Rd NW)	WEST OF SR 1300 (Ash-Little River Rd NW)	12,491	13,185	-694	-5.26%
D	McLamb Rd NW	Calabash Rd NW	7,501	2,758	4,743	171.98%
E	US 17	WEST OF US 17 (Ocean Hwy W)	22,698	19,250	3,448	17.91%
F	NC 179	EAST OF SR 1168 (Country Club Dr)	19,389	19,489	-100	-0.51%
<b>Total</b>			<b>80,087</b>	<b>59,565</b>	<b>20,522</b>	<b>34.45%</b>
<b>Screenline 2</b>						
G	US 904	WEST OF ASH LITTLE RIVER	15,848	3,109	12,739	409.79%
H	Ash Little River Rd NW	WEST OF NC 904	1,354	1,055	299	28.36%
I	Etheridge Rd NW	EAST OF Ash Little River Rd	1,997	655	1,342	204.78%
J	Pea Landing Rd NW	WEST OF NC 904	5,142	2,324	2,818	121.23%
K	US 17	WEST OF NC 904 Seaside Rd SW (378)	37,107	28,492	8,615	30.24%
L	NC 179	WEST OF NC 904 (Seaside Rd SW)	14,517	13,553	964	7.11%
M	NC 179 BUS	NORTH OF SR 1172 (Sunset Blvd S)	7,634	9,319	-1,685	-18.08%
<b>Total</b>			<b>83,599</b>	<b>58,507</b>	<b>25,092</b>	<b>42.89%</b>
<b>Screenline 3</b>						
N	Ash Little River Rd NW	WEST OF Whiteville Rd NW	7,407	1,261	6,146	487.59%
O	Longwood Rd NW	WEST OF Whiteville Rd NW	10,927	4,199	6,728	160.25%
P	Old Shallotte Rd NW	EAST OF Longwood Rd NW	10,143	4,390	5,753	131.03%
Q	US 17	WEST OF SR 1319 Union School Rd NW	33,273	30,959	2,314	7.48%
R	Old Georgetown Rd SW	SR 1163 (Old Georgetown Rd SW) EAST OF NC 179	12,042	11,950	92	0.77%
S	NC 179 BUS	EAST OF SR 1232 Waterway Dr SW	14,813	12,748	2,064	16.19%
<b>Total</b>			<b>88,605</b>	<b>61,906</b>	<b>26,699</b>	<b>43.13%</b>
<b>Screenline 4</b>						
T	Old King Rd NW	EAST OF Whiteville Rd NW	5,600	780	4,820	617.85%
U	US 17	NORTH OF NC 130	43,574	38,359	5,215	13.60%
V	Bridgers Rd	EAST OF Whiteville Rd NW	13,486	11,039	2,447	22.16%
W	US 17 BUS	EAST OF Whiteville Rd NW	25,835	27,498	-1,663	-6.05%
<b>Total</b>			<b>88,495</b>	<b>70,967</b>	<b>17,527</b>	<b>24.70%</b>

Note: The letters next to each screenline location can be cross-referenced in **Figure 5**. GSATS defines peak season as being June-August. Stantec used the GSATS definition for the peak season to develop 2025 Peak Season Adjusted Daily Count Volumes for this table. In all other instances of this memo, a peak season definition of April-September is used.

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

## 4.2 MODELED GROWTH

The predicted traffic growth, from the Grand Strand Area Transportation Study (GSATS) model, between 2025 and 2045 at each of the screenlines was evaluated for the No-Build condition. As shown in **Table 11**, the growth between 2025 and 2045 varied by location and in some locations showed negative growth over the 20-year period. Total growth at the screenlines was more consistent, between 0.57 and 1.03 percent. When compared to the forecasted 1.7 to 2.1 percent population growth in Brunswick County between 2025 and 2045, the screenline growth was considered reasonable. The overall growth was ultimately used for the forecast.

**Table 11: Comparison of Modeled 2025 and 2045 Traffic Volumes**

ID	Roadway	Location (Two-way)	2025 No Build Model Volumes	2045 No Build Model Volumes	CAGR
<b>Screenline 1</b>					
A	Swamp Fox Hwy E	WEST OF Ramsey Ford Rd	9,122	11,788	1.29%
B	7 Creeks Hwy	WEST OF NC904	8,886	11,975	1.50%
C	SR 1303 (Hickman Rd NW)	WEST OF SR 1300 (Ash-Little River Rd NW)	12,491	15,231	1.00%
D	McLamb Rd NW	Calabash Rd NW	7,501	8,053	0.36%
E	US 17	WEST OF US 17 (Ocean Hwy W)	22,698	27,223	0.91%
F	NC 179	EAST OF SR 1168 (Country Club Dr)	19,389	20,271	0.22%
<b>Total</b>			<b>80,087</b>	<b>94,542</b>	<b>0.83%</b>
<b>Screenline 2</b>					
G	US 904	WEST OF ASH LITTLE RIVER	15,848	21,386	1.51%
H	Ash Little River Rd NW	WEST OF NC904	1,354	4,541	6.24%
I	Etheridge Rd NW	EAST OF Ash Little River Rd	1,997	4,680	4.35%
J	Pea Landing Rd NW	WEST OF NC904	5,142	6,614	1.27%
K	US 17	WEST OF NC904 Seaside Rd SW (378)	37,107	39,744	0.34%
L	NC 179	WEST OF NC904 (Seaside Rd SW)	14,517	16,170	0.54%
M	NC 179 BUS	NORTH OF SR 1172 (Sunset Blvd S)	7,634	9,464	1.08%
<b>Total</b>			<b>83,599</b>	<b>102,600</b>	<b>1.03%</b>
<b>Screenline 3</b>					
N	Ash Little River Rd NW	WEST OF Whiteville Rd NW	7,407	10,804	1.91%
O	Longwood Rd NW	WEST OF Whiteville Rd NW	10,927	14,144	1.30%
P	Old Shallotte Rd NW	EAST OF Longwood Rd NW	10,143	12,498	1.05%
Q	US 17	WEST OF SR 1319 Union School Rd NW	33,273	35,875	0.38%
R	Old Georgetown Rd SW	SR 1163 (Old Georgetown Rd SW) EAST OF NC 179	12,042	14,390	0.89%
S	NC 179 BUS	EAST OF SR 1232 Waterway Dr SW	14,813	18,197	1.03%
<b>Total</b>			<b>88,605</b>	<b>105,908</b>	<b>0.90%</b>
<b>Screenline 4</b>					
T	Old King Rd NW	EAST OF Whiteville Rd NW	5,600	7,982	1.79%
U	US 17	NORTH OF NC130	43,574	42,177	-0.16%
V	Bridgers Rd	EAST OF Whiteville Rd NW	13,486	23,781	2.88%
W	US 17 BUS	EAST OF Whiteville Rd NW	25,835	25,208	-0.12%
<b>Total</b>			<b>88,495</b>	<b>99,147</b>	<b>0.57%</b>

Note: The letters next to each screenline location can be cross-referenced in **Figure 5**.

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

## 5.0 Daily Toll Transactions and Gross Toll Revenues

### 5.1 Toll Policy And Payment Assumptions

Toll policy assumptions provide a framework for available payment options and pricing strategies for a toll facility. Stantec used the same tolling policy currently being used on the Monroe Expressway, another toll road operated by NCTA. The toll policy assumptions are as follows:

1. Tolls will be collected via electronic toll collection (ETC) or Bill by Mail (BBM).
2. The ETC toll rate is discounted by 50 percent from the BBM rate.
3. The ETC car toll is \$0.15 per mile.
4. Truck tolls will be set as multiples of the car toll. Medium trucks will pay two times the passenger car rate and heavy trucks will pay four times the passenger car rate.
5. ETC penetration rates are estimated based on invoicing and collections data received from the NCTA's Monroe Expressway. Approximately 56 percent of customers pay by ETC and 44 percent pay by BBM. These rates are assumed to remain constant throughout the forecast period.
6. The toll rates will be increased at the rate of anticipated inflation. As such, all tolls and revenues shown in this document, unless otherwise stated, are in 2025 dollars.
7. Phase 1 is expected to open in 2035.
8. For estimates where Phase 2 is assumed, it is expected to open in 2040.

### 5.2 2025 Peak Season Toll Transactions and Gross Toll Revenue

Stantec developed a spreadsheet model to estimate the tolled traffic volumes on the CBPE in each phase and each alternative. The percentage of traffic from each competing route that was diverted to the toll-free CPBE (the No-Build) was informed by comparing the screenline volumes between the 2025 No-Build and toll-free Build scenarios in the GSATS model results. These percentages were applied to the adjusted 2025 screenline volumes to update the No Build volumes to the existing condition. The volumes were split into trips that would end between the State line and NC 904 and those that extended further to the east and to the west. This split was based on the results of the O/D analysis. Finally, the toll-free volumes were reduced to account for diversions due to tolls. These diversions were developed based on Stantec's experience on other projects and considered the following:

- The distance the original route is from the proposed CBPE. More distant facilities would see less of a change in route or diversion to the proposed CPBE.

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

- The speeds in the study area. As shown in Section 2.3, existing speeds are generally close to the posted speed limit on the primary competing roads (Hickman Road and US 17) and on average, do not show significant congestion.
- The origins and destinations of the existing trips in the study area. Many of the trips in the study area within North Carolina are on the road that they are on for a reason. For example, the trip may be a local one to a specific business or the trip taker's home may be along the route. Longer trips are more likely to use the toll road.
- Brunswick County has many seasonal visitors. Of the 88,330 housing units in the county in 2020, 20,558 were seasonal units<sup>2</sup>. The seasonal visitors are generally concentrated along the shore communities, relatively far from where the CBPE will be located. Also, visitors do not make as many trips as a local resident as they often are not making commuting trips.
- According to the North Carolina Association of County Commissioners, Brunswick County has the highest proportion of residents aged 65 and over of all NC counties. At 33 percent, this is nearly twice that of the state (18 percent) and the nation (17.7) percent. According to the North Carolina Office of State Budget and Management projections, over 40 percent of Brunswick County's population will be 65 or older by 2045. Older drivers tend to make shorter trips and are often on fixed incomes, making them more sensitive to trip costs.
- Generally, the areas with highest household incomes in the study area are located along the shoreline. The CBPE will not be a likely route from trips in this area due to its lack of proximity to the shoreline.

Of all the traffic originating on competing facilities without the CBPE's presence, 0 to 25 percent of traffic would divert to the tolled CBPE. Hickman Road, a proximate competing route to the CBPE, would have an estimated 25 percent traffic divert to the tolled CBPE. Roadways further away would have lower traffic diversions; 7 Creeks Highway, for instance, would have less than 1 percent of traffic divert to the tolled CBPE.

For each segment in each phase, the gross toll revenue, or the toll revenue that would be collected if everyone on the toll facility pays their toll, was calculated based on the assumed toll rates, the toll segment distances, the assumed mix of vehicle class traffic, and toll payment type in each toll segment. The percentage of customers using electronic toll collection was assumed to be similar to that on the Monroe Expressway, approximately 56 percent. The Monroe Expressway is another traditional toll road that is near the border of North and South Carolina in the Charlotte area that is operated by NCTA. The mix of traffic on the proposed CPBE was assumed to be similar to that on the existing CBP.

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<sup>2</sup> Based on information found at Log Into North Carolina (LINC) data portal from NC Office of State Budget and Management (OSBM): <https://www.osbm.nc.gov/facts-figures/linc>.

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

After accounting for the diversions from other roadways, 2025 peak season pro forma daily transactions were derived for each of the segments for all the scenarios as shown in **Table 12**. The 2025 peak season daily transactions were further used to calculate the daily gross toll revenue for each of the segments.

**Table 12: 2025 Peak Season Daily Pro Forma Values**

Segment	Segment Location	2025 Peak Season Pro Forma Values	
		Daily Transactions	Daily Gross Revenue
Alternative 4 (Phase 1 Only)			
A	b/w Little River Rd & Ash Little River Rd	2,765	\$4,497
Alternative 4 (Phase 1+ Phase 2)			
A	b/w Little River Rd & Ash Little River Rd	5,042	\$8,200
B	b/w Ash Little River Rd & Pea Landing Rd NW	5,722	\$16,370
C	b/w Pea Landing Rd NW & Route 904	5,399	\$5,726
Alternative 4A (Phase 1+ Phase 2)			
A	b/w Little River Rd & Ash Little River Rd	5,014	\$8,336
B	b/w Ash Little River Rd & Pea Landing Rd NW	5,703	\$16,675
C	b/w Pea Landing Rd NW & Route 904	5,867	\$3,340
D	b/w Route 904 & Ocean Isle Beach Rd SW (on US 17, two-way link)	5,666	\$15,870

## 6.0 FUTURE ANNUAL TOLL TRANSACTIONS AND GROSS TOLL REVENUES

This section describes the process used to convert daily toll transactions and revenues forecasts to annual forecasts.

### 6.1 ANNUALIZATION

The spreadsheet model for this project estimated the toll transactions and gross toll revenue for each season and day type combination. These estimates were converted to annual totals by multiplying them by the number of days of each day type in a year, then adding the products. **Table 13** shows

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

the number of days for each day type. The additional day in a leap year would have an immaterial impact on the conclusions of this study, as it would occur during the Off-Peak season.

**Table 13: Annualization Factors for CBPE, toll Transactions and Gross Toll Revenues**

Season	Dates	Day Types	Number of days
Peak	April - September	Mon-Thu	104
		Fri-Sun	79
Off-Peak	January - March	Mon-Thu	104
	October - December	Fri-Sun	78
Total Days			365

## 6.2 RAMP-UP FACTORS

Models used for predicting traffic on new roadways assume that when future roadway projects are completed, drivers alter their trip patterns instantly and that all drivers completely understand the access features of the new facility. Experience with the traffic growth on start-up toll facilities has proven that these events occur over time. The time during which this occurs is known as the ramp-up period. On a toll road, ramp-up typically accounts for the build-up of traffic associated with travelers finding the access points to the new facility, trying it out, and understanding the time advantages and reliability associated with it. Ramp-up factors are typically applied to annual traffic forecasts for new facilities to account for this process.

**Table 14** shows the ramp-up factors used for this project that were developed based on Stantec's experience on other facilities and considerations including the volume of seasonal and local traffic and likely trip purposes. The ramp-up was applied to the first two years of the Phase 1 project and then the additional trips expected when Phase 2 opens for each alignment.

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

**Table 14: Ramp-Up Factors, by Phase**

Year	Phase 1	Full Build
2035	60%	-
2036	85%	-
2037	100%	-
2040	100%	60%
2041	100%	85%
2042	100%	100%

Note: The Full Build ramp-up is only applied to the new trips, not those trips already present as part of Phase 1.

### 6.3 TOLL REVENUE COLLECTIBILITY

Gross potential toll revenue is defined as toll revenue that would be obtained if every vehicle paid their toll. The 2025 daily peak season pro forma transactions and gross toll revenue presented in the previous section represent gross potential toll revenue and do not account for any payment leakage (the inability to collect revenue from a portion of toll customers). Revenue could be uncollectible, or leaked, due to several reasons such as the inability to identify customers through license plate images or DMV record to send them an invoice, or customers refusing to pay the invoice.

Revenue leakage was estimated based on invoicing and collections data received from the NCTA's Monroe Expressway. Like the proposed CBPE project, the Monroe Expressway permits both transponder (ETC) and Bill by Mail (BBM) payments. Since this is a Level 1 Study, there was no ETC leakage assumed. On other toll facilities in the state, the ETC leakage is less than one percent. Data from the Monroe Expressway were made available by NCTA and are summarized in **Table 15**.

**Table 15: Leakage Assumptions for Bill by Mail Customers on CBPE**

Leakage Rate	Trip Shares	Passenger Cars	Heavy Vehicles
Out-of-State	43%	34%	41%
In State	57%	14%	23%

Since collectability rates for Bill by Mail transactions vary depending on the customer's home state (North Carolina or out-of-state), in-state and out-of-state toll revenue were estimated separately.

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

Toll leakage losses are assumed to negatively impact gross toll revenue only, while transactions are assumed to be unchanged. Customers that cannot be billed or refuse to pay still use the facility, so their usage should be factored into any cost estimates.

## **6.4 ALTERNATIVE 4 (PHASE 1 ONLY) ANNUAL TOLL TRANSACTIONS AND COLLECTIBLE TOLL REVENUE ESTIMATES**

Stantec's forecasts of annual toll transactions and collectible toll revenues for Alternative 4 (Phase 1 only) assume that Phase 1 of the CBPE will be open to toll-paying traffic on January 1, 2035.

The estimated daily toll transactions and gross toll revenues were annualized, adjusted for ramp up, further adjusted for toll collectability and used to develop the year-by-year traffic and revenue streams shown in **Table 16** and **Table 17**. Growth for each phase was estimated using the 2025 and 2045 models. Growth was extrapolated after model year 2045 and gradually tapered down throughout the forecast period.

In 2035 (the first year of proposed operation, when only Phase 1 is open), Stantec estimates that the CBPE would record about 0.6 million transactions and \$0.46 million in collectible toll revenue (2025 dollars). In 2045, transactions and collectible toll revenue are estimated to increase to about 1.15 million and \$0.84 million (2025 dollars), respectively.

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Table 16: Alternative 4 (Phase 1 only) Estimated Annual Transactions, by Vehicle and Toll Payment Class, 2035-2085**

FY	ETC Class 1	ETC Class 2	ETC Class 3	BBM Class 1	BBM Class 2	BBM Class 3	Total
2035	336,862	9,610	6,781	264,678	7,551	5,328	<b>630,810</b>
2036	481,469	13,735	9,692	378,297	10,792	7,615	<b>901,601</b>
2037	571,476	16,303	11,504	449,016	12,810	9,039	<b>1,070,147</b>
2038	576,562	16,448	11,606	453,013	12,924	9,119	<b>1,079,671</b>
2039	581,693	16,595	11,709	457,045	13,039	9,200	<b>1,089,280</b>
2040	586,870	16,742	11,813	461,112	13,155	9,282	<b>1,098,975</b>
2041	592,093	16,891	11,919	465,216	13,272	9,365	<b>1,108,756</b>
2042	597,363	17,042	12,025	469,357	13,390	9,448	<b>1,118,624</b>
2043	602,679	17,193	12,132	473,534	13,509	9,532	<b>1,128,579</b>
2044	608,043	17,346	12,240	477,748	13,629	9,617	<b>1,138,624</b>
2045	613,455	17,501	12,349	482,000	13,751	9,702	<b>1,148,757</b>
2046	618,915	17,656	12,459	486,290	13,873	9,789	<b>1,158,981</b>
2047	624,423	17,814	12,569	490,618	13,996	9,876	<b>1,169,296</b>
2048	629,980	17,972	12,681	494,985	14,121	9,964	<b>1,179,703</b>
2049	635,587	18,132	12,794	499,390	14,247	10,053	<b>1,190,202</b>
2050	641,244	18,293	12,908	503,834	14,373	10,142	<b>1,200,795</b>
2051	646,951	18,456	13,023	508,319	14,501	10,232	<b>1,211,482</b>
2052	652,709	18,621	13,139	512,843	14,630	10,323	<b>1,222,264</b>
2053	658,518	18,786	13,256	517,407	14,761	10,415	<b>1,233,143</b>
2054	664,379	18,953	13,374	522,012	14,892	10,508	<b>1,244,118</b>
2055	670,292	19,122	13,493	526,658	15,025	10,601	<b>1,255,190</b>
2056	676,257	19,292	13,613	531,345	15,158	10,696	<b>1,266,361</b>
2057	682,276	19,464	13,734	536,074	15,293	10,791	<b>1,277,632</b>
2058	688,348	19,637	13,856	540,845	15,429	10,887	<b>1,289,003</b>
2059	694,475	19,812	13,980	545,659	15,567	10,984	<b>1,300,475</b>
2060	700,655	19,988	14,104	550,515	15,705	11,082	<b>1,312,049</b>
2061	706,891	20,166	14,229	555,414	15,845	11,180	<b>1,323,727</b>
2062	713,183	20,346	14,356	560,358	15,986	11,280	<b>1,335,508</b>
2063	719,530	20,527	14,484	565,345	16,128	11,380	<b>1,347,394</b>
2064	725,934	20,709	14,613	570,376	16,272	11,481	<b>1,359,386</b>
2065	732,394	20,894	14,743	575,453	16,417	11,584	<b>1,371,484</b>
2066	738,913	21,080	14,874	580,574	16,563	11,687	<b>1,383,690</b>
2067	745,489	21,267	15,006	585,741	16,710	11,791	<b>1,396,005</b>
2068	752,124	21,457	15,140	590,955	16,859	11,896	<b>1,408,430</b>
2069	758,818	21,648	15,275	596,214	17,009	12,002	<b>1,420,965</b>
2070	765,571	21,840	15,411	601,520	17,160	12,108	<b>1,433,611</b>
2071	772,385	22,035	15,548	606,874	17,313	12,216	<b>1,446,370</b>
2072	779,259	22,231	15,686	612,275	17,467	12,325	<b>1,459,243</b>
2073	786,195	22,429	15,826	617,724	17,622	12,435	<b>1,472,230</b>
2074	793,192	22,628	15,967	623,222	17,779	12,545	<b>1,485,333</b>
2075	800,251	22,830	16,109	628,769	17,938	12,657	<b>1,498,553</b>
2076	807,373	23,033	16,252	634,365	18,097	12,770	<b>1,511,890</b>
2077	814,559	23,238	16,397	640,011	18,258	12,883	<b>1,525,346</b>
2078	821,809	23,445	16,543	645,707	18,421	12,998	<b>1,538,921</b>
2079	829,123	23,653	16,690	651,453	18,585	13,114	<b>1,552,618</b>
2080	836,502	23,864	16,838	657,251	18,750	13,230	<b>1,566,436</b>
2081	843,947	24,076	16,988	663,101	18,917	13,348	<b>1,580,377</b>
2082	851,458	24,290	17,140	669,003	19,085	13,467	<b>1,594,442</b>
2083	859,036	24,507	17,292	674,957	19,255	13,587	<b>1,608,633</b>
2084	866,681	24,725	17,446	680,964	19,427	13,708	<b>1,622,950</b>
2085	874,395	24,945	17,601	687,024	19,599	13,830	<b>1,637,394</b>

ETC = Electronic      Class 1= Auto      Class 3= Heavy Trucks  
BBM = Bill-By-Mail      Class 2= Medium Trucks

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Table 17 : Alternative 4 (Phase 1 only) Estimated Collectible Revenue, by Vehicle and Toll Payment Class, 2035-2085, \$2025**

FY	ETC Class 1	ETC Class 2	ETC Class 3	BBM Class 1	BBM Class 2	BBM Class 3	Total
2035	\$ 184,432	\$ 10,523	\$ 14,850	\$ 224,322	\$ 11,453	\$ 16,163	\$ 461,743
2036	\$ 263,604	\$ 15,040	\$ 21,225	\$ 320,618	\$ 16,369	\$ 23,101	\$ 659,958
2037	\$ 312,883	\$ 17,852	\$ 25,193	\$ 380,555	\$ 19,429	\$ 27,419	\$ 783,331
2038	\$ 315,668	\$ 18,011	\$ 25,417	\$ 383,942	\$ 19,602	\$ 27,663	\$ 790,303
2039	\$ 318,477	\$ 18,171	\$ 25,643	\$ 387,359	\$ 19,777	\$ 27,909	\$ 797,337
2040	\$ 321,311	\$ 18,333	\$ 25,872	\$ 390,806	\$ 19,953	\$ 28,158	\$ 804,433
2041	\$ 324,171	\$ 18,496	\$ 26,102	\$ 394,285	\$ 20,130	\$ 28,408	\$ 811,592
2042	\$ 327,056	\$ 18,661	\$ 26,334	\$ 397,794	\$ 20,310	\$ 28,661	\$ 818,816
2043	\$ 329,967	\$ 18,827	\$ 26,568	\$ 401,334	\$ 20,490	\$ 28,916	\$ 826,103
2044	\$ 332,904	\$ 18,994	\$ 26,805	\$ 404,906	\$ 20,673	\$ 29,174	\$ 833,455
2045	\$ 335,867	\$ 19,163	\$ 27,043	\$ 408,510	\$ 20,857	\$ 29,433	\$ 840,873
2046	\$ 338,856	\$ 19,334	\$ 27,284	\$ 412,145	\$ 21,042	\$ 29,695	\$ 848,357
2047	\$ 341,872	\$ 19,506	\$ 27,527	\$ 415,813	\$ 21,230	\$ 29,960	\$ 855,907
2048	\$ 344,914	\$ 19,679	\$ 27,772	\$ 419,514	\$ 21,419	\$ 30,226	\$ 863,525
2049	\$ 347,984	\$ 19,855	\$ 28,019	\$ 423,248	\$ 21,609	\$ 30,495	\$ 871,210
2050	\$ 351,081	\$ 20,031	\$ 28,269	\$ 427,015	\$ 21,802	\$ 30,767	\$ 878,964
2051	\$ 354,206	\$ 20,210	\$ 28,520	\$ 430,815	\$ 21,996	\$ 31,040	\$ 886,787
2052	\$ 357,358	\$ 20,389	\$ 28,774	\$ 434,650	\$ 22,191	\$ 31,317	\$ 894,679
2053	\$ 360,539	\$ 20,571	\$ 29,030	\$ 438,518	\$ 22,389	\$ 31,595	\$ 902,642
2054	\$ 363,747	\$ 20,754	\$ 29,288	\$ 442,421	\$ 22,588	\$ 31,877	\$ 910,675
2055	\$ 366,985	\$ 20,939	\$ 29,549	\$ 446,358	\$ 22,789	\$ 32,160	\$ 918,780
2056	\$ 370,251	\$ 21,125	\$ 29,812	\$ 450,331	\$ 22,992	\$ 32,447	\$ 926,957
2057	\$ 373,546	\$ 21,313	\$ 30,077	\$ 454,339	\$ 23,197	\$ 32,735	\$ 935,207
2058	\$ 376,871	\$ 21,503	\$ 30,345	\$ 458,382	\$ 23,403	\$ 33,027	\$ 943,531
2059	\$ 380,225	\$ 21,694	\$ 30,615	\$ 462,462	\$ 23,611	\$ 33,321	\$ 951,928
2060	\$ 383,609	\$ 21,887	\$ 30,888	\$ 466,578	\$ 23,821	\$ 33,617	\$ 960,400
2061	\$ 387,023	\$ 22,082	\$ 31,163	\$ 470,730	\$ 24,033	\$ 33,916	\$ 968,948
2062	\$ 390,467	\$ 22,279	\$ 31,440	\$ 474,920	\$ 24,247	\$ 34,218	\$ 977,571
2063	\$ 393,943	\$ 22,477	\$ 31,720	\$ 479,147	\$ 24,463	\$ 34,523	\$ 986,272
2064	\$ 397,449	\$ 22,677	\$ 32,002	\$ 483,411	\$ 24,681	\$ 34,830	\$ 995,050
2065	\$ 400,986	\$ 22,879	\$ 32,287	\$ 487,714	\$ 24,901	\$ 35,140	\$ 1,003,906
2066	\$ 404,555	\$ 23,082	\$ 32,574	\$ 492,054	\$ 25,122	\$ 35,453	\$ 1,012,840
2067	\$ 408,155	\$ 23,288	\$ 32,864	\$ 496,433	\$ 25,346	\$ 35,768	\$ 1,021,855
2068	\$ 411,788	\$ 23,495	\$ 33,157	\$ 500,852	\$ 25,571	\$ 36,087	\$ 1,030,949
2069	\$ 415,453	\$ 23,704	\$ 33,452	\$ 505,309	\$ 25,799	\$ 36,408	\$ 1,040,125
2070	\$ 419,150	\$ 23,915	\$ 33,749	\$ 509,807	\$ 26,029	\$ 36,732	\$ 1,049,382
2071	\$ 422,881	\$ 24,128	\$ 34,050	\$ 514,344	\$ 26,260	\$ 37,059	\$ 1,058,721
2072	\$ 426,644	\$ 24,343	\$ 34,353	\$ 518,921	\$ 26,494	\$ 37,389	\$ 1,068,144
2073	\$ 430,442	\$ 24,559	\$ 34,659	\$ 523,540	\$ 26,730	\$ 37,721	\$ 1,077,650
2074	\$ 434,272	\$ 24,778	\$ 34,967	\$ 528,199	\$ 26,968	\$ 38,057	\$ 1,087,241
2075	\$ 438,137	\$ 24,998	\$ 35,278	\$ 532,900	\$ 27,208	\$ 38,396	\$ 1,096,918
2076	\$ 442,037	\$ 25,221	\$ 35,592	\$ 537,643	\$ 27,450	\$ 38,737	\$ 1,106,680
2077	\$ 445,971	\$ 25,445	\$ 35,909	\$ 542,428	\$ 27,694	\$ 39,082	\$ 1,116,530
2078	\$ 449,940	\$ 25,672	\$ 36,229	\$ 547,256	\$ 27,941	\$ 39,430	\$ 1,126,467
2079	\$ 453,945	\$ 25,900	\$ 36,551	\$ 552,126	\$ 28,189	\$ 39,781	\$ 1,136,492
2080	\$ 457,985	\$ 26,131	\$ 36,876	\$ 557,040	\$ 28,440	\$ 40,135	\$ 1,146,607
2081	\$ 462,061	\$ 26,363	\$ 37,204	\$ 561,998	\$ 28,693	\$ 40,492	\$ 1,156,812
2082	\$ 466,173	\$ 26,598	\$ 37,536	\$ 567,000	\$ 28,949	\$ 40,853	\$ 1,167,108
2083	\$ 470,322	\$ 26,835	\$ 37,870	\$ 572,046	\$ 29,206	\$ 41,216	\$ 1,177,495
2084	\$ 474,508	\$ 27,074	\$ 38,207	\$ 577,137	\$ 29,466	\$ 41,583	\$ 1,187,975
2085	\$ 478,731	\$ 27,315	\$ 38,547	\$ 582,274	\$ 29,728	\$ 41,953	\$ 1,198,548

ETC = Electronic Class 1= Auto Class 3= Heavy Trucks  
BBM = Bill-By-Mail Class 2= Medium Trucks

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

## **6.5 ALTERNATIVE 4 (PHASE 1 + PHASE 2) ANNUAL TOLL TRANSACTIONS AND COLLECTIBLE TOLL REVENUE ESTIMATES**

Stantec's forecasts of annual toll transactions and collectible toll revenues for Alternative 4 assume that Phase 1 of the CBPE will be open to toll-paying traffic on January 1, 2035, and Phase 2 will open on January 1, 2040.

The estimated daily toll transactions and gross toll revenues were annualized, adjusted for ramp up, further adjusted for toll collectability and used to develop the year-by-year traffic and revenue streams shown in **Table 18** and **Table 19**. Growth for each phase was estimated using the 2025 and 2045 models. Growth was extrapolated after model year 2045 and gradually tapered down throughout the forecast period.

In 2035 (the first year of proposed operation, when only Phase 1 is open), Stantec estimates that the CBPE would record about 0.6 million transactions and \$0.46 million in collectible toll revenue (2025 dollars). In 2045, transactions and collectible toll revenue are estimated to increase to about 6.8 million and \$5.7 million (2025 dollars), respectively.

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Table 18: Alternative 4 (Phase 1+2) Estimated Annual Transactions, by Vehicle and Toll Payment Class, 2035-2085**

FY	ETC Class 1	ETC Class 2	ETC Class 3	BBM Class 1	BBM Class 2	BBM Class 3	Total
2035	336,862	9,610	6,781	264,678	7,551	5,328	630,810
2036	481,469	13,735	9,692	378,297	10,792	7,615	901,601
2037	571,476	16,303	11,504	449,016	12,810	9,039	1,070,147
2038	576,562	16,448	11,606	453,013	12,924	9,119	1,079,671
2039	581,693	16,595	11,709	457,045	13,039	9,200	1,089,280
2040	2,283,669	65,149	45,969	1,794,311	51,188	36,119	4,276,405
2041	3,051,982	87,067	61,435	2,397,986	68,410	48,271	5,715,152
2042	3,533,501	100,804	71,128	2,776,322	79,203	55,886	6,616,845
2043	3,567,423	101,772	71,811	2,802,975	79,964	56,423	6,680,367
2044	3,601,670	102,749	72,500	2,829,884	80,731	56,965	6,744,499
2045	3,636,246	103,735	73,196	2,857,051	81,506	57,511	6,809,246
2046	3,662,427	104,482	73,723	2,877,621	82,093	57,925	6,858,272
2047	3,688,797	105,234	74,254	2,898,340	82,684	58,343	6,907,652
2048	3,715,356	105,992	74,789	2,919,208	83,279	58,763	6,957,387
2049	3,742,107	106,755	75,327	2,940,227	83,879	59,186	7,007,480
2050	3,769,050	107,524	75,870	2,961,396	84,483	59,612	7,057,934
2051	3,787,141	108,040	76,234	2,975,611	84,888	59,898	7,091,812
2052	3,805,319	108,558	76,600	2,989,894	85,296	60,185	7,125,853
2053	3,823,585	109,080	76,967	3,004,245	85,705	60,474	7,160,057
2054	3,841,938	109,603	77,337	3,018,666	86,117	60,765	7,194,425
2055	3,860,379	110,129	77,708	3,033,155	86,530	61,056	7,228,958
2056	3,878,909	110,658	78,081	3,047,714	86,945	61,349	7,263,657
2057	3,897,528	111,189	78,456	3,062,343	87,363	61,644	7,298,523
2058	3,916,236	111,723	78,832	3,077,043	87,782	61,940	7,333,556
2059	3,935,034	112,259	79,211	3,091,812	88,203	62,237	7,368,757
2060	3,953,922	112,798	79,591	3,106,653	88,627	62,536	7,404,127
2061	3,963,412	113,069	79,782	3,114,109	88,840	62,686	7,421,897
2062	3,972,924	113,340	79,973	3,121,583	89,053	62,836	7,439,709
2063	3,982,459	113,612	80,165	3,129,075	89,267	62,987	7,457,565
2064	3,992,017	113,885	80,358	3,136,585	89,481	63,138	7,475,463
2065	4,001,598	114,158	80,551	3,144,112	89,696	63,290	7,493,404
2066	4,011,201	114,432	80,744	3,151,658	89,911	63,442	7,511,388
2067	4,020,828	114,707	80,938	3,159,222	90,127	63,594	7,529,415
2068	4,030,478	114,982	81,132	3,166,804	90,343	63,747	7,547,486
2069	4,040,151	115,258	81,327	3,174,405	90,560	63,900	7,565,600
2070	4,049,848	115,534	81,522	3,182,023	90,777	64,053	7,583,757
2071	4,053,736	115,645	81,600	3,185,078	90,864	64,114	7,591,038
2072	4,057,627	115,756	81,679	3,188,136	90,951	64,176	7,598,325
2073	4,061,523	115,867	81,757	3,191,196	91,039	64,238	7,605,620
2074	4,065,422	115,979	81,835	3,194,260	91,126	64,299	7,612,921
2075	4,069,324	116,090	81,914	3,197,326	91,214	64,361	7,620,229
2076	4,073,231	116,201	81,993	3,200,396	91,301	64,423	7,627,545
2077	4,077,141	116,313	82,071	3,203,468	91,389	64,485	7,634,867
2078	4,081,055	116,425	82,150	3,206,544	91,477	64,547	7,642,197
2079	4,084,973	116,536	82,229	3,209,622	91,564	64,609	7,649,533
2080	4,088,895	116,648	82,308	3,212,703	91,652	64,671	7,656,877
2081	4,090,857	116,704	82,347	3,214,245	91,696	64,702	7,660,552
2082	4,092,821	116,760	82,387	3,215,788	91,740	64,733	7,664,229
2083	4,094,786	116,816	82,427	3,217,332	91,784	64,764	7,667,908
2084	4,096,751	116,872	82,466	3,218,876	91,828	64,795	7,671,589
2085	4,098,718	116,929	82,506	3,220,421	91,872	64,826	7,675,271

ETC = Electronic Class 1= Auto Class 3= Heavy Trucks  
BBM = Bill-By-Mail Class 2= Medium Trucks

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Table 19: Alternative 4 Estimated Collectible Revenue, by Vehicle and Toll Payment Class, 2035-2085, \$2025**

FY	ETC Class 1	ETC Class 2	ETC Class 3	BBM Class 1	BBM Class 2	BBM Class 3	Total
2035	\$ 184,432	\$ 10,523	\$ 14,850	\$ 224,322	\$ 11,453	\$ 16,163	\$ 461,743
2036	\$ 263,604	\$ 15,040	\$ 21,225	\$ 320,618	\$ 16,369	\$ 23,101	\$ 659,958
2037	\$ 312,883	\$ 17,852	\$ 25,193	\$ 380,555	\$ 19,429	\$ 27,419	\$ 783,331
2038	\$ 315,668	\$ 18,011	\$ 25,417	\$ 383,942	\$ 19,602	\$ 27,663	\$ 790,303
2039	\$ 318,477	\$ 18,171	\$ 25,643	\$ 387,359	\$ 19,777	\$ 27,909	\$ 797,337
2040	\$ 1,440,916	\$ 82,213	\$ 116,020	\$ 1,752,566	\$ 89,478	\$ 126,273	\$ 3,607,467
2041	\$ 1,925,696	\$ 109,873	\$ 155,054	\$ 2,342,196	\$ 119,582	\$ 168,757	\$ 4,821,158
2042	\$ 2,229,517	\$ 127,208	\$ 179,517	\$ 2,711,730	\$ 138,449	\$ 195,382	\$ 5,581,804
2043	\$ 2,250,921	\$ 128,429	\$ 181,241	\$ 2,737,763	\$ 139,778	\$ 197,257	\$ 5,635,389
2044	\$ 2,272,530	\$ 129,662	\$ 182,981	\$ 2,764,045	\$ 141,120	\$ 199,151	\$ 5,689,489
2045	\$ 2,294,346	\$ 130,907	\$ 184,737	\$ 2,790,580	\$ 142,475	\$ 201,063	\$ 5,744,108
2046	\$ 2,310,865	\$ 131,849	\$ 186,067	\$ 2,810,672	\$ 143,501	\$ 202,511	\$ 5,785,465
2047	\$ 2,327,503	\$ 132,798	\$ 187,407	\$ 2,830,909	\$ 144,534	\$ 203,969	\$ 5,827,121
2048	\$ 2,344,261	\$ 133,755	\$ 188,756	\$ 2,851,292	\$ 145,575	\$ 205,437	\$ 5,869,076
2049	\$ 2,361,140	\$ 134,718	\$ 190,116	\$ 2,871,821	\$ 146,623	\$ 206,916	\$ 5,911,333
2050	\$ 2,378,140	\$ 135,688	\$ 191,484	\$ 2,892,498	\$ 147,678	\$ 208,406	\$ 5,953,895
2051	\$ 2,389,555	\$ 136,339	\$ 192,403	\$ 2,906,382	\$ 148,387	\$ 209,406	\$ 5,982,474
2052	\$ 2,401,025	\$ 136,993	\$ 193,327	\$ 2,920,333	\$ 149,100	\$ 210,412	\$ 6,011,190
2053	\$ 2,412,550	\$ 137,651	\$ 194,255	\$ 2,934,350	\$ 149,815	\$ 211,422	\$ 6,040,043
2054	\$ 2,424,130	\$ 138,312	\$ 195,187	\$ 2,948,435	\$ 150,534	\$ 212,436	\$ 6,069,035
2055	\$ 2,435,766	\$ 138,976	\$ 196,124	\$ 2,962,588	\$ 151,257	\$ 213,456	\$ 6,098,167
2056	\$ 2,447,458	\$ 139,643	\$ 197,066	\$ 2,976,808	\$ 151,983	\$ 214,481	\$ 6,127,438
2057	\$ 2,459,206	\$ 140,313	\$ 198,012	\$ 2,991,097	\$ 152,713	\$ 215,510	\$ 6,156,850
2058	\$ 2,471,010	\$ 140,986	\$ 198,962	\$ 3,005,454	\$ 153,446	\$ 216,545	\$ 6,186,403
2059	\$ 2,482,871	\$ 141,663	\$ 199,917	\$ 3,019,880	\$ 154,182	\$ 217,584	\$ 6,216,097
2060	\$ 2,494,789	\$ 142,343	\$ 200,877	\$ 3,034,376	\$ 154,922	\$ 218,628	\$ 6,245,935
2061	\$ 2,500,776	\$ 142,685	\$ 201,359	\$ 3,041,658	\$ 155,294	\$ 219,153	\$ 6,260,925
2062	\$ 2,506,778	\$ 143,027	\$ 201,842	\$ 3,048,958	\$ 155,667	\$ 219,679	\$ 6,275,951
2063	\$ 2,512,794	\$ 143,370	\$ 202,326	\$ 3,056,276	\$ 156,040	\$ 220,206	\$ 6,291,013
2064	\$ 2,518,825	\$ 143,715	\$ 202,812	\$ 3,063,611	\$ 156,415	\$ 220,735	\$ 6,306,112
2065	\$ 2,524,870	\$ 144,059	\$ 203,299	\$ 3,070,963	\$ 156,790	\$ 221,265	\$ 6,321,246
2066	\$ 2,530,930	\$ 144,405	\$ 203,787	\$ 3,078,334	\$ 157,166	\$ 221,796	\$ 6,336,417
2067	\$ 2,537,004	\$ 144,752	\$ 204,276	\$ 3,085,722	\$ 157,544	\$ 222,328	\$ 6,351,625
2068	\$ 2,543,093	\$ 145,099	\$ 204,766	\$ 3,093,127	\$ 157,922	\$ 222,862	\$ 6,366,869
2069	\$ 2,549,196	\$ 145,447	\$ 205,258	\$ 3,100,551	\$ 158,301	\$ 223,396	\$ 6,382,149
2070	\$ 2,555,314	\$ 145,796	\$ 205,750	\$ 3,107,992	\$ 158,681	\$ 223,933	\$ 6,397,466
2071	\$ 2,557,767	\$ 145,936	\$ 205,948	\$ 3,110,976	\$ 158,833	\$ 224,148	\$ 6,403,608
2072	\$ 2,560,223	\$ 146,077	\$ 206,145	\$ 3,113,962	\$ 158,986	\$ 224,363	\$ 6,409,755
2073	\$ 2,562,681	\$ 146,217	\$ 206,343	\$ 3,116,952	\$ 159,138	\$ 224,578	\$ 6,415,909
2074	\$ 2,565,141	\$ 146,357	\$ 206,541	\$ 3,119,944	\$ 159,291	\$ 224,794	\$ 6,422,068
2075	\$ 2,567,603	\$ 146,498	\$ 206,740	\$ 3,122,939	\$ 159,444	\$ 225,010	\$ 6,428,233
2076	\$ 2,570,068	\$ 146,638	\$ 206,938	\$ 3,125,937	\$ 159,597	\$ 225,226	\$ 6,434,404
2077	\$ 2,572,536	\$ 146,779	\$ 207,137	\$ 3,128,938	\$ 159,750	\$ 225,442	\$ 6,440,581
2078	\$ 2,575,005	\$ 146,920	\$ 207,336	\$ 3,131,942	\$ 159,903	\$ 225,658	\$ 6,446,764
2079	\$ 2,577,477	\$ 147,061	\$ 207,535	\$ 3,134,949	\$ 160,057	\$ 225,875	\$ 6,452,953
2080	\$ 2,579,952	\$ 147,202	\$ 207,734	\$ 3,137,958	\$ 160,211	\$ 226,092	\$ 6,459,148
2081	\$ 2,581,190	\$ 147,273	\$ 207,834	\$ 3,139,464	\$ 160,288	\$ 226,200	\$ 6,462,248
2082	\$ 2,582,429	\$ 147,344	\$ 207,933	\$ 3,140,971	\$ 160,364	\$ 226,309	\$ 6,465,350
2083	\$ 2,583,668	\$ 147,414	\$ 208,033	\$ 3,142,479	\$ 160,441	\$ 226,417	\$ 6,468,454
2084	\$ 2,584,909	\$ 147,485	\$ 208,133	\$ 3,143,987	\$ 160,518	\$ 226,526	\$ 6,471,559
2085	\$ 2,586,149	\$ 147,556	\$ 208,233	\$ 3,145,497	\$ 160,596	\$ 226,635	\$ 6,474,665

ETC = Electronic Class 1= Auto Class 3= Heavy Trucks  
BBM = Bill-By-Mail Class 2= Medium Trucks

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

## **6.6 ALTERNATIVE 4A (PHASE 1 + PHASE 2) ANNUAL TRANSACTIONS AND GROSS TOLL REVENUE ESTIMATES**

The annual forecast for Alternative 4A for the CBPE was developed using the same process as Alternative 4. Phase 1 of the CBPE was assumed to open to toll-paying traffic on January 1, 2035, and Phase 2 to open on January 1, 2040.

The estimated daily toll transactions and gross toll revenues were annualized, adjusted for ramp up, further adjusted for toll collectability and used to develop the year-by-year traffic and revenue streams for Alternative 4A. **Table 20** and **Table 21** displays the annual estimated trips and revenue for Alternative 4A. Growth for each phase was estimated using the 2025 and 2045 models. Growth was extrapolated after model year 2045 and was gradually tapered down throughout the forecast period

In 2035 (the first year of proposed operation), Stantec estimates that the CBPE would record about 0.6 million transactions and \$0.46 million in collectible toll revenue (2025 dollars), same as Alternate 4 for Phase 1. In 2045, transactions and collectible toll revenue are estimated to increase to 9.4 million and \$8.2 million (2025 dollars), respectively. For alternative 4A, the 2045 transactions are about 38 percent and collectible toll revenue about 43 percent higher, respectively, as compared to Alternative 4 because the corridor is 40 percent longer and has an additional toll gantry location.

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Table 20: Alternative 4A Estimated Annual Transactions, by Vehicle and Toll Payment Class, 2035-2085**

FY	ETC Class 1	ETC Class 2	ETC Class 3	BBM Class 1	BBM Class 2	BBM Class 3	Total
2035	336,862	9,610	6,781	264,678	7,551	5,328	630,810
2036	481,469	13,735	9,692	378,297	10,792	7,615	901,601
2037	571,476	16,303	11,504	449,016	12,810	9,039	1,070,147
2038	576,562	16,448	11,606	453,013	12,924	9,119	1,079,671
2039	581,693	16,595	11,709	457,045	13,039	9,200	1,089,280
2040	3,059,578	87,284	61,588	2,403,954	68,580	48,391	5,729,374
2041	4,169,462	118,947	83,930	3,276,006	93,458	65,945	7,807,747
2042	4,864,103	138,764	97,913	3,821,796	109,029	76,931	9,108,535
2043	4,910,799	140,096	98,853	3,858,485	110,075	77,670	9,195,977
2044	4,957,942	141,441	99,802	3,895,526	111,132	78,416	9,284,258
2045	5,005,539	142,798	100,760	3,932,923	112,199	79,168	9,373,387
2046	5,041,579	143,827	101,485	3,961,240	113,007	79,738	9,440,876
2047	5,077,878	144,862	102,216	3,989,761	113,820	80,312	9,508,850
2048	5,114,439	145,905	102,952	4,018,488	114,640	80,891	9,577,314
2049	5,151,263	146,956	103,693	4,047,421	115,465	81,473	9,646,270
2050	5,188,352	148,014	104,440	4,076,562	116,297	82,060	9,715,723
2051	5,213,256	148,724	104,941	4,096,130	116,855	82,454	9,762,359
2052	5,238,279	149,438	105,445	4,115,791	117,416	82,849	9,809,218
2053	5,263,423	150,155	105,951	4,135,547	117,979	83,247	9,856,302
2054	5,288,688	150,876	106,459	4,155,397	118,546	83,647	9,903,613
2055	5,314,073	151,600	106,970	4,175,343	119,115	84,048	9,951,150
2056	5,339,581	152,328	107,484	4,195,385	119,686	84,452	9,998,916
2057	5,365,211	153,059	108,000	4,215,523	120,261	84,857	10,046,910
2058	5,390,964	153,794	108,518	4,235,757	120,838	85,264	10,095,136
2059	5,416,841	154,532	109,039	4,256,089	121,418	85,674	10,143,592
2060	5,442,841	155,274	109,562	4,276,518	122,001	86,085	10,192,281
2061	5,455,904	155,647	109,825	4,286,782	122,294	86,291	10,216,743
2062	5,468,998	156,020	110,089	4,297,070	122,587	86,498	10,241,263
2063	5,482,124	156,395	110,353	4,307,383	122,881	86,706	10,265,842
2064	5,495,281	156,770	110,618	4,317,721	123,176	86,914	10,290,480
2065	5,508,470	157,146	110,883	4,328,083	123,472	87,123	10,315,177
2066	5,521,690	157,523	111,150	4,338,471	123,768	87,332	10,339,934
2067	5,534,942	157,901	111,416	4,348,883	124,065	87,541	10,364,750
2068	5,548,226	158,280	111,684	4,359,320	124,363	87,752	10,389,625
2069	5,561,542	158,660	111,952	4,369,783	124,662	87,962	10,414,560
2070	5,574,889	159,041	112,220	4,380,270	124,961	88,173	10,439,555
2071	5,588,241	159,194	112,328	4,384,475	125,081	88,258	10,449,577
2072	5,585,598	159,346	112,436	4,388,684	125,201	88,343	10,459,609
2073	5,590,960	159,499	112,544	4,392,898	125,321	88,427	10,469,650
2074	5,596,328	159,653	112,652	4,397,115	125,441	88,512	10,479,701
2075	5,601,700	159,806	112,760	4,401,336	125,562	88,597	10,489,761
2076	5,607,078	159,959	112,868	4,405,561	125,682	88,682	10,499,831
2077	5,612,461	160,113	112,977	4,409,791	125,803	88,767	10,509,911
2078	5,617,849	160,266	113,085	4,414,024	125,924	88,853	10,520,001
2079	5,623,242	160,420	113,194	4,418,261	126,045	88,938	10,530,100
2080	5,628,640	160,574	113,302	4,422,503	126,166	89,023	10,540,209
2081	5,631,342	160,651	113,357	4,424,626	126,226	89,066	10,545,268
2082	5,634,045	160,729	113,411	4,426,750	126,287	89,109	10,550,330
2083	5,636,749	160,806	113,466	4,428,874	126,347	89,152	10,555,394
2084	5,639,455	160,883	113,520	4,431,000	126,408	89,194	10,560,461
2085	5,642,162	160,960	113,575	4,433,127	126,469	89,237	10,565,530

ETC = Electronic Class 1= Auto Class 3= Heavy Trucks  
BBM = Bill-By-Mail Class 2= Medium Trucks

Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study

**Table 21: Alternate 4A Estimated Collectible Revenue, by Vehicle and Toll Payment Class, 2035-2085, \$2025**

FY	ETC Class 1	ETC Class 2	ETC Class 3	BBM Class 1	BBM Class 2	BBM Class 3	Total
2035	\$ 184,432	\$ 10,523	\$ 14,850	\$ 224,322	\$ 11,453	\$ 16,163	\$ 461,743
2036	\$ 263,604	\$ 15,040	\$ 21,225	\$ 320,618	\$ 16,369	\$ 23,101	\$ 659,958
2037	\$ 312,883	\$ 17,852	\$ 25,193	\$ 380,555	\$ 19,429	\$ 27,419	\$ 783,331
2038	\$ 315,668	\$ 18,011	\$ 25,417	\$ 383,942	\$ 19,602	\$ 27,663	\$ 790,303
2039	\$ 318,477	\$ 18,171	\$ 25,643	\$ 387,359	\$ 19,777	\$ 27,909	\$ 797,337
2040	\$ 2,002,669	\$ 114,265	\$ 161,252	\$ 2,435,818	\$ 124,362	\$ 185,902	\$ 5,024,269
2041	\$ 2,729,152	\$ 155,715	\$ 219,747	\$ 3,319,429	\$ 169,476	\$ 253,340	\$ 6,846,859
2042	\$ 3,183,835	\$ 181,657	\$ 256,358	\$ 3,872,453	\$ 197,711	\$ 295,547	\$ 7,987,561
2043	\$ 3,214,400	\$ 183,401	\$ 258,819	\$ 3,909,629	\$ 199,609	\$ 298,384	\$ 8,064,241
2044	\$ 3,245,258	\$ 185,162	\$ 261,303	\$ 3,947,161	\$ 201,525	\$ 301,248	\$ 8,141,658
2045	\$ 3,276,413	\$ 186,940	\$ 263,812	\$ 3,985,054	\$ 203,460	\$ 304,140	\$ 8,219,818
2046	\$ 3,300,003	\$ 188,286	\$ 265,711	\$ 4,013,746	\$ 204,925	\$ 306,330	\$ 8,279,000
2047	\$ 3,323,763	\$ 189,641	\$ 267,624	\$ 4,042,645	\$ 206,400	\$ 308,536	\$ 8,338,609
2048	\$ 3,347,694	\$ 191,007	\$ 269,551	\$ 4,071,752	\$ 207,886	\$ 310,757	\$ 8,398,647
2049	\$ 3,371,797	\$ 192,382	\$ 271,492	\$ 4,101,069	\$ 209,383	\$ 312,995	\$ 8,459,118
2050	\$ 3,396,074	\$ 193,767	\$ 273,447	\$ 4,130,597	\$ 210,890	\$ 315,248	\$ 8,520,023
2051	\$ 3,412,375	\$ 194,697	\$ 274,759	\$ 4,150,423	\$ 211,903	\$ 316,761	\$ 8,560,919
2052	\$ 3,428,755	\$ 195,632	\$ 276,078	\$ 4,170,345	\$ 212,920	\$ 318,282	\$ 8,602,012
2053	\$ 3,445,213	\$ 196,571	\$ 277,403	\$ 4,190,363	\$ 213,942	\$ 319,810	\$ 8,643,301
2054	\$ 3,461,750	\$ 197,514	\$ 278,735	\$ 4,210,477	\$ 214,969	\$ 321,345	\$ 8,684,789
2055	\$ 3,478,366	\$ 198,462	\$ 280,073	\$ 4,230,687	\$ 216,001	\$ 322,887	\$ 8,726,476
2056	\$ 3,495,062	\$ 199,415	\$ 281,417	\$ 4,250,994	\$ 217,037	\$ 324,437	\$ 8,768,363
2057	\$ 3,511,839	\$ 200,372	\$ 282,768	\$ 4,271,399	\$ 218,079	\$ 325,994	\$ 8,810,451
2058	\$ 3,528,695	\$ 201,334	\$ 284,125	\$ 4,291,902	\$ 219,126	\$ 327,559	\$ 8,852,742
2059	\$ 3,545,633	\$ 202,300	\$ 285,489	\$ 4,312,503	\$ 220,178	\$ 329,131	\$ 8,895,235
2060	\$ 3,562,652	\$ 203,271	\$ 286,860	\$ 4,333,203	\$ 221,235	\$ 330,711	\$ 8,937,932
2061	\$ 3,571,203	\$ 203,759	\$ 287,548	\$ 4,343,603	\$ 221,766	\$ 331,505	\$ 8,959,383
2062	\$ 3,579,773	\$ 204,248	\$ 288,238	\$ 4,354,027	\$ 222,298	\$ 332,300	\$ 8,980,885
2063	\$ 3,588,365	\$ 204,738	\$ 288,930	\$ 4,364,477	\$ 222,831	\$ 333,098	\$ 9,002,440
2064	\$ 3,596,977	\$ 205,230	\$ 289,623	\$ 4,374,952	\$ 223,366	\$ 333,897	\$ 9,024,045
2065	\$ 3,605,610	\$ 205,722	\$ 290,318	\$ 4,385,452	\$ 223,902	\$ 334,699	\$ 9,045,703
2066	\$ 3,614,263	\$ 206,216	\$ 291,015	\$ 4,395,977	\$ 224,440	\$ 335,502	\$ 9,067,413
2067	\$ 3,622,937	\$ 206,711	\$ 291,714	\$ 4,406,527	\$ 224,978	\$ 336,307	\$ 9,089,175
2068	\$ 3,631,633	\$ 207,207	\$ 292,414	\$ 4,417,103	\$ 225,518	\$ 337,114	\$ 9,110,989
2069	\$ 3,640,348	\$ 207,704	\$ 293,115	\$ 4,427,704	\$ 226,059	\$ 337,923	\$ 9,132,855
2070	\$ 3,649,085	\$ 208,203	\$ 293,819	\$ 4,438,330	\$ 226,602	\$ 338,734	\$ 9,154,774
2071	\$ 3,652,588	\$ 208,403	\$ 294,101	\$ 4,442,591	\$ 226,820	\$ 339,060	\$ 9,163,562
2072	\$ 3,656,095	\$ 208,603	\$ 294,383	\$ 4,446,856	\$ 227,037	\$ 339,385	\$ 9,172,359
2073	\$ 3,659,605	\$ 208,803	\$ 294,666	\$ 4,451,125	\$ 227,255	\$ 339,711	\$ 9,181,165
2074	\$ 3,663,118	\$ 209,003	\$ 294,949	\$ 4,455,398	\$ 227,473	\$ 340,037	\$ 9,189,979
2075	\$ 3,666,635	\$ 209,204	\$ 295,232	\$ 4,459,675	\$ 227,692	\$ 340,364	\$ 9,198,801
2076	\$ 3,670,155	\$ 209,405	\$ 295,515	\$ 4,463,956	\$ 227,910	\$ 340,690	\$ 9,207,632
2077	\$ 3,673,678	\$ 209,606	\$ 295,799	\$ 4,468,242	\$ 228,129	\$ 341,017	\$ 9,216,471
2078	\$ 3,677,205	\$ 209,807	\$ 296,083	\$ 4,472,531	\$ 228,348	\$ 341,345	\$ 9,225,319
2079	\$ 3,680,735	\$ 210,009	\$ 296,367	\$ 4,476,825	\$ 228,567	\$ 341,672	\$ 9,234,176
2080	\$ 3,684,268	\$ 210,210	\$ 296,652	\$ 4,481,123	\$ 228,787	\$ 342,000	\$ 9,243,040
2081	\$ 3,686,037	\$ 210,311	\$ 296,794	\$ 4,483,274	\$ 228,897	\$ 342,165	\$ 9,247,477
2082	\$ 3,687,806	\$ 210,412	\$ 296,937	\$ 4,485,426	\$ 229,007	\$ 342,329	\$ 9,251,916
2083	\$ 3,689,576	\$ 210,513	\$ 297,079	\$ 4,487,579	\$ 229,116	\$ 342,493	\$ 9,256,357
2084	\$ 3,691,347	\$ 210,614	\$ 297,222	\$ 4,489,733	\$ 229,226	\$ 342,658	\$ 9,260,800
2085	\$ 3,693,119	\$ 210,715	\$ 297,364	\$ 4,491,888	\$ 229,336	\$ 342,822	\$ 9,265,245

ETC = Electronic Class 1= Auto Class 3= Heavy Trucks  
BBM = Bill-By-Mail Class 2= Medium Trucks

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

## 7.0 ANALYSIS LIMITATIONS, RESTRICTIONS, AND DISCLAIMERS

To increase the confidence in these Level 1 forecasts, a traffic data collection program would be needed to better define the speeds, capacities, and congested areas in the corridor. Additional tasks such as a detailed socio-economic review and the use of a calibrated toll diversion model would increase the confidence in these forecasts to a Level 2 or Level 3 traffic and revenue forecast.

The purpose of this Level 1 analysis was to prepare initial estimates of potential toll revenue and toll traffic for comparison purposes among a set of project configurations for the tolled Carolina Bays Parkway Extension in Brunswick County, North Carolina. The numbers provided in this document are considered conceptual 'Level 1' estimates based on only readily available data, including existing count data from NCDOT (North Carolina Department of Transportation) and existing modeling tools. This study did not include independent assessments of population and employment growth, in-depth origin-destination studies, verification of travel times, or an independent assessment of the values of time which are key elements for toll diversion analysis.

This analysis was prepared for use as a preliminary conceptual financial feasibility assessment and is not to be used for any other purpose including any financing decisions.

It is Stantec's opinion that the sketch-level traffic and toll revenue forecasts presented are reasonable for this level of study and have been prepared in accordance with accepted industry-wide practices. However, as should be expected with any forecast, it is important to note the following assumptions, which, in our opinion, are reasonable:

- This study presents the highlighted results of Stantec's consideration of the information available as of the date hereof and the application of Stantec's experience and professional judgment to that information. It is not a guarantee of any future events or trends.
- The traffic and toll revenue estimates will be subject to future economic and social conditions, demographic developments, and regional transportation construction activities that cannot be predicted with certainty.
- The estimates contained in this document, while presented with numeric specificity, are based on a number of estimates and assumptions, which, though considered reasonable to us, are inherently subject to economic and competitive uncertainties and contingencies, many of which will be beyond Stantec's control and that of the North Carolina Turnpike Authority and cannot be predicted with certainty. In many instances, a broad range of alternative assumptions could be considered reasonable. Any changes in the assumptions used could result in material differences in estimated outcomes.

In Stantec's opinion, the assumptions underlying the study provide a reasonable basis for the analysis. However, any financial projection is subject to uncertainties. Inevitably, some assumptions used to develop the projections will not be realized, and unanticipated events and circumstances may occur. There are likely to be differences between the projections and actual results, and those differences

**Reference: Carolina Bays Parkway Extension Level 1 Traffic and Revenue Study**

may be material. Because of these uncertainties, Stantec makes no guaranty or warranty with respect to the projections in this study.

This document, and the opinions, analysis, evaluations, or recommendations contained herein are for the sole use and benefit of the contracting parties. There are no intended third-party beneficiaries, and Stantec Consulting Services Inc. (and its affiliates) shall have no liability whatsoever to any third parties for any defect, deficiency, error, or omission in any statement contained in or in any way related to this document or the services provided.

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