Baseline and Future Year Mobility Conditions

North Carolina Department of Transportation

Strategic Transportation Corridor Vision Plans

Corridor S: Future I-795

Wilson County to I-40 in Sampson County

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1. Overview and Project Background

This memorandum presents base and future year mobility analyses for Corridor S (Future I-795) of the North Carolina Strategic Transportation Corridors (STC).

1.1. Overview of Strategic Transportation Corridors

In 2015, the North Carolina Department of Transportation (NCDOT) identified a network of key multimodal transportation corridors called Strategic Transportation Corridors (STC) to support smart planning, help set long-term investment decisions, and ensure that North Carolina's economic prosperity goals are achieved. The STCs are intended to promote transportation system connectivity, provide high levels of mobility, and improve access to important state and regional activity centers. A key element in the advancement of the STCs is the development of corridor master plan visions.

The purpose of the master plan visions is to:

- identify high-level corridor mobility visions and associated improvement strategies,
- guide improvements and development in a manner that defines a long-term vision and performance level for the corridors, and
- help protect the corridor's key functions as defined in the corridor profiles.

1.2. Corridor Description

Future I-795 is approximately 50 miles in length and spans from Wilson County to Sampson County. Future I-795 is regularly used to transfer freight from Goldsboro to I-95 in Wilson County. The corridor serves as a short reliever to I-95 and is an important part of the Strategic Highway Network (STRAHNET) system as it connects Seymour-Johnson Air Force Base to I-95. Future I-795 provides the link to the economic centers of Wilson and Goldsboro and connects to I-95 and I-40.

Future I-795 is envisioned to support freight service along with safe, reliable travel; to facilitate economic development and safety; and to afford safe, reliable travel as part of the STRAHNET to support Seymour Johnson Air Force Base.

2. Highway Mobility

Highway mobility was analyzed for Future I-795 for existing conditions and future scenarios based on the relationship of travel speed, congestion, and travel time. Existing conditions data was based on NCDOT traffic count data, GIS data, and third-party data (Google Maps satellite and travel time data). Future scenario analysis was based on the N.C. Statewide Travel Demand Model (NCSTM), a Metropolitan Planning Organization (MPO) Travel Demand Model, the Statewide Transportation Improvement Program (STIP), and transportation plans from communities along the corridor.

2.1. Existing Conditions Analysis

Existing conditions analysis was completed using 2018 NCDOT Annual Average Daily Traffic (AADT) Segment Data, 2019 NCDOT Route Characteristics Data, the NCSTM, and third-party data, including Google Maps. The 2015 NCSTM was used as the base year for most existing conditions analyses in this report. For some analyses, 2018 was used as the base year when more recent data was available. This section presents the process of identifying corridor segments and preparing mobility measures.

2.1.1. Definitions of Segments

For analysis of the project corridor, the corridor was divided into "mobility segments." These segments represent sections that are generally homogenous and/or represent a uniform cross-section of roadway. The process of identifying segments included the review of the following attributes along the corridor:

- Major changes in roadway characteristics (cross-section, facility type, lanes)
- NCDOT Division Boundaries
- Interstate Crossings
- MPO Model boundaries
- Urban/rural transition

Segment breaks were not created for every occurrence of these characteristics: for example, small segments were avoided unless it was justified based on the uniqueness of the roadway attributes in that section. Although speed limits were a consideration, other factors were considered more heavily due to the frequency of speed limit changes.

A total of five segments were identified for Future I-795, as shown in **Table 1**. These segments varied in length from 6 miles to 20 miles. Analysis was completed for these segments based on AADT information, NCDOT systems level planning capacities, NCSTM analysis, and MPO model analysis. The Future I-795 alignment is proposed to change based on the list of planned projects. The base year and future year segments are shown on **Figure 1** and Error! Reference source not found..

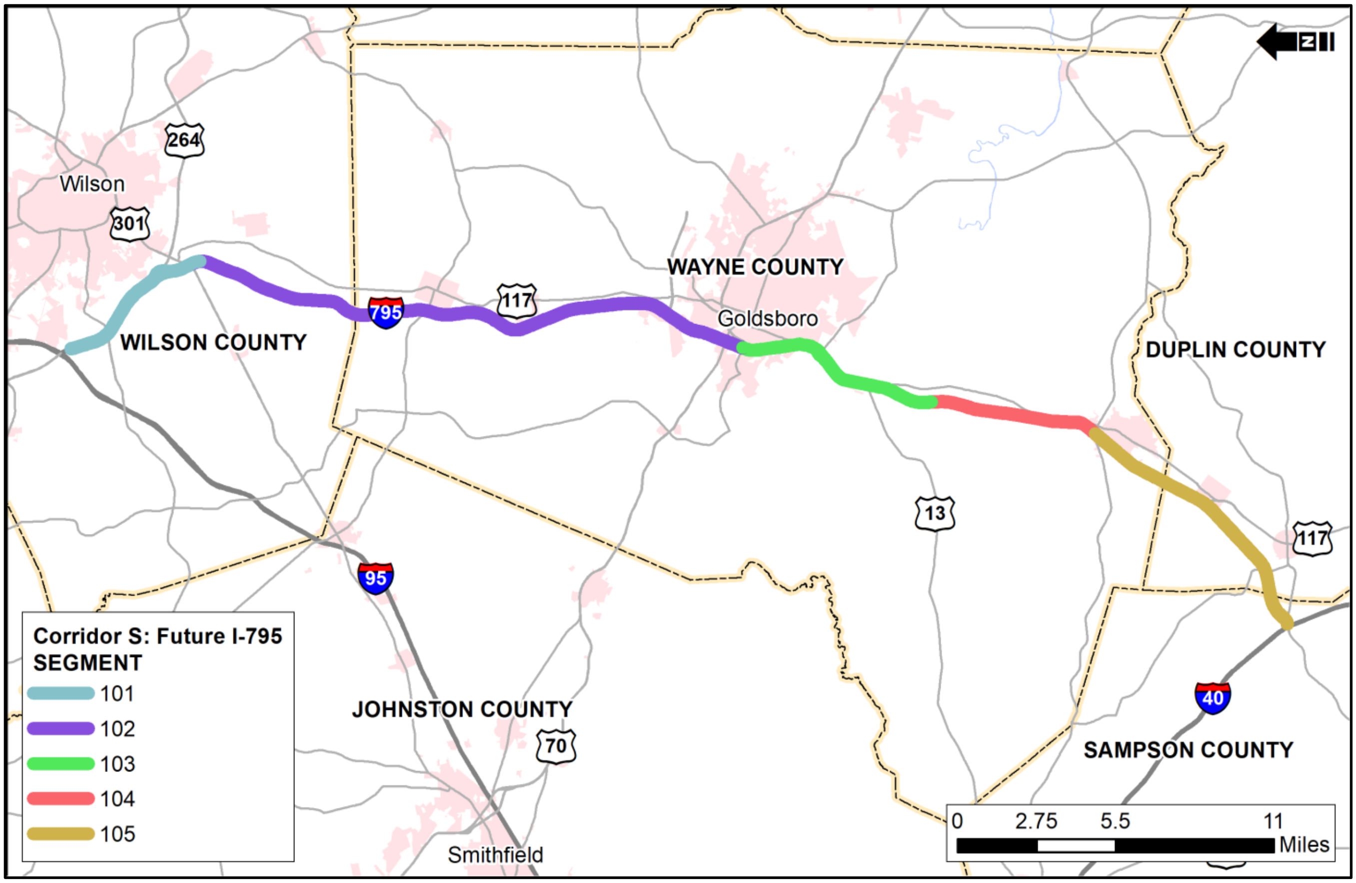


Figure 1. Base Year (2015) Corridor Segments

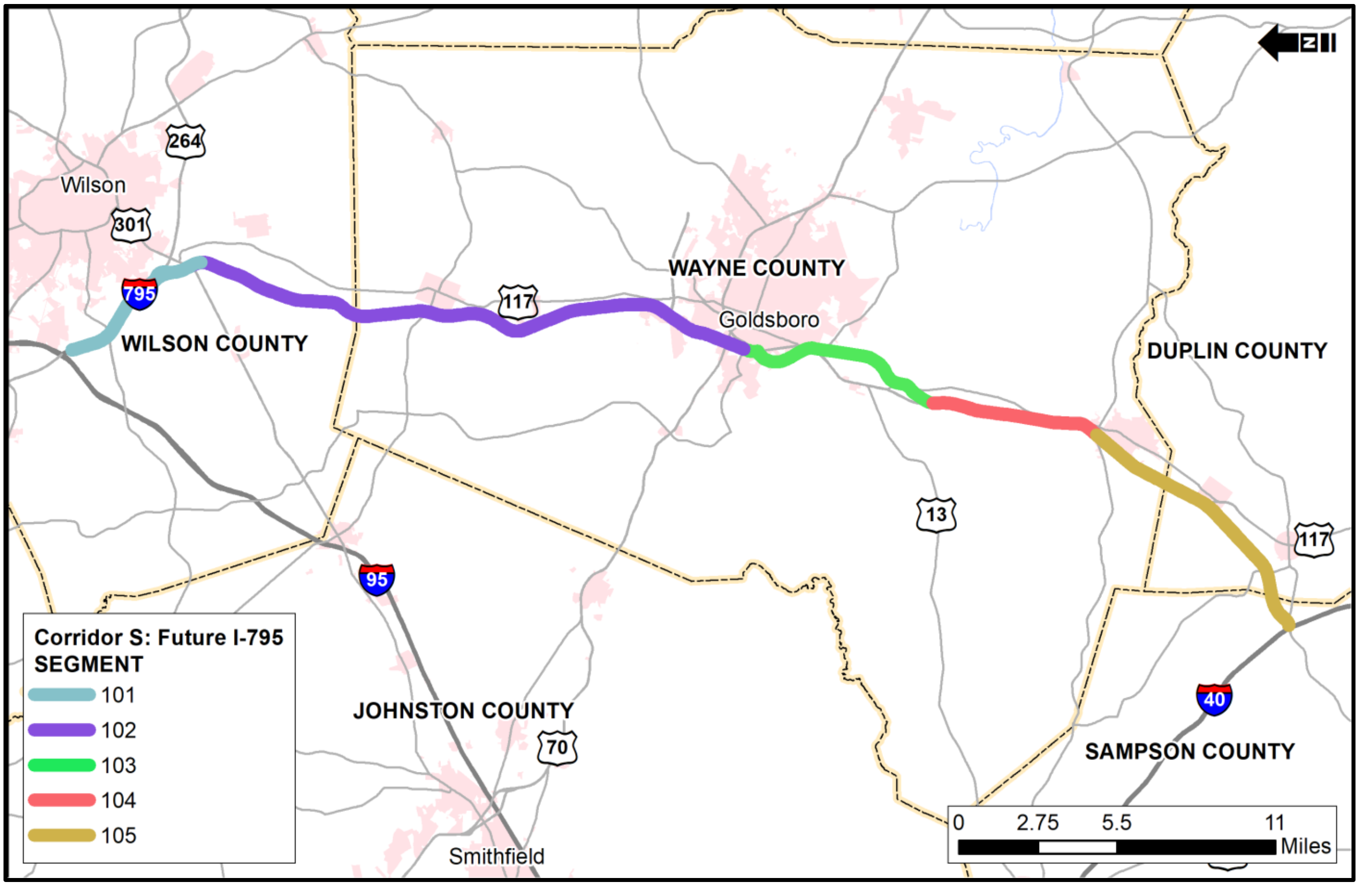


Figure 2. Future Year (2040) Corridor Segments

The 2018 AADT is based on NCDOT AADT segment data, which contains different segments than the mobility segments defined for Future I-795. AADT for the mobility segments was calculated as a weighted average of the 2018 NCDOT AADT data within each segment. The 2018 AADT ranges and average AADT are presented in **Table 1**.

Table 1. Future I-795 Mobility Segments

Segment	From	To	Length (miles)	Division	2018 AADT* Range	Average 2018 AADT
101	I-95	U.S. 301	6	4	12,000 - 34,000	25,200
102	U.S. 301	W Ash St	20	4	17,000 - 18,500	17,600
103	W Ash St	Williamson Farm Rd	7	4	7,700- 32,000	23,200
104	Williamson Farm Rd	N.C. 55	6	4	13,000 - 15,500	14,000
105	N.C. 55	I-40	10	3/4	8,600 - 15,000	10,800

*AADT = Annual Average Daily Traffic

2.1.2. Segment Capacity and Travel Time

Typical planning-level highway capacity was developed for each segment along the corridor using the predominant cross-section representative of each segment. Capacities are based on NCDOT Transportation Planning Division' "Level of Service (LOS) D Standards for Systems Level Planning" (updated October 14, 2011) as shown in Appendix A. Segment facility type, typical number of lanes, area type, percent trucks, terrain, and travel speed were used to identify the daily planning-level capacity for comparison against traffic volumes. Segment capacities are shown in **Table 2**.

Travel times were calculated based on a weighted average of posted speeds for each segment (by length), existing Volume-to-Capacity (V/C) ratios, and a volume-delay curve similar to what is used in the NCSTM. **Table 2** presents the travel time to traverse each segment based on this calculation. As a point of comparison, Google Maps travel times are provided for each segment to provide "observed" ranges based on third party data.

Table 2. Segment Capacity and Travel Times

Segment	Facility Type	Typical Speed (mph)	Lanes	Median Type	Area Type	Planning Capacity	Travel Time	
							Google Maps*	2018 Est.**
101	Freeway	70	4	Divided	Rural	66,200	4-6	5
102	Freeway	70	4	Divided	Rural	66,200	16-20	17
103	Boulevard	50	4	Divided	Suburban	39,700	9-16	9
104	Boulevard	55	4	Divided	Rural	49,000	8-10	6
105	Freeway/ Expressway	55	4	Divided	Rural	56,100	9-11	11

*Google Maps travel times captured during off-peak travel times in March 2020, prior to the COVID-19 Pandemic
**2018 Estimated travel times calculated based on a weighted average of posted speeds for each segment, existing volume-to-capacity ratios, and a volume-delay curve

2.2. Future Scenario Analysis

Future scenario analysis was completed using growth rates developed for the corridor based on historical count data, the NCSTM, and the Goldsboro MPO Travel Demand Model. Two future scenarios were analyzed, both which used the NCSTM Existing plus Committed (E+C) scenario, which incorporates the fiscally constrained projects from the STIP:

- 2040 NCSTM E+C: Existing network plus committed (in the 2020-2029 STIP with either Right-of-Way/Construction funding) corridor projects
- 2040 NCSTM E+C + Metropolitan Transportation Plan (MTP): NCSTM E+C (existing plus committed in STIP) plus fiscally constrained projects included in MTPs. This scenario does not include fiscally unconstrained projects because the funding for the development of the corridor as an interstate has already been allocated.

Typically, these projects are on the corridor itself; however, if the project is on a parallel facility and is of regional significance, it was included in the future scenario analysis. MTPs in the corridor area did not include any projects along Future I-795 although area CTPs include unconstrained projects that reflect the funded projects in the STIP. Therefore, both future year scenarios reflect the same existing and build out scenario. For each scenario, annual growth rates for each segment were prepared to project 2018 AADT to 2040. Using this information, future V/C ratios, travel time, average speed, vehicle-miles traveled (VMT), and vehicle-hours traveled (VHT) were calculated for each segment and the entire corridor. Population and employment growth data along the corridor are in Appendix G (based on the statewide travel demand model) and Appendix H (based on the regional travel demand models).

2.2.1. Committed and Fiscally Constrained Projects

For the 2040 E+C scenario, committed projects are those which are programmed in the 2020-2029 STIP. **Table 3** shows projects included in the 2040 E+C scenario for the Future I-795 corridor. No other fiscally constrained projects along Future I-795 were identified in area MTPs.

Table 3. 2040 E+C STIP Projects

STIP ID	Segment	Counties	Roadway	Location/Description
R-5719	104	Wayne	U.S. 117	Convert at-grade intersection of S.R. 1135 (Country Club Road) and U.S. 117 to an interchange
U-3125	103, 104, 105	Sampson	U.S. 117	Upgrade U.S. 117 to interstate standards from W Ash Street to I-40
U-5796	104	Wayne	U.S. 117	Convert at-grade intersection of S.R. 1120 (O'Berry Road) and U.S. 117 to an interchange

2.2.2. Existing and Future Cross-Sections

With the buildout of the 2040 E+C and 2040 E+C + MTP scenarios, the characteristics of each segment along the corridor change over time, typically resulting in higher throughput capabilities and increased travel speeds. **Table 4** summarizes the facility type, lanes and typical posted speed for 2018, 2040 E+C and 2040 E+C + MTP scenarios. Shaded grey fields indicate a change from existing ("2018 Conditions") to the 2040 scenarios.

Table 4. Volume-to-Capacity Ratios by Scenario

Segment	2018 Conditions			2040 NCSTM E+C			2040 NCSTM E+C + MTP		
	Facility Type	Typical Posted Speed	Lanes	Facility Type	Typical Posted Speed	Lanes	Facility Type	Typical Posted Speed	Lanes
101	Freeway	70	4	Freeway	70	4	Freeway	70	4
102	Freeway	70	4	Freeway	70	4	Freeway	70	4
103	Boulevard	50	4	Freeway	70	4	Freeway	70	4
104	Boulevard	55	4	Freeway	70	4	Freeway	70	4
105	Freeway/ Expressway	55	4	Freeway	70	4	Freeway	70	4

Note: Shaded grey fields indicate a change from 2018 Conditions to 2040 scenarios

2.2.3. Travel Demand Model Analysis

Travel Demand Model analysis was completed using the NCSTM. The most recent NCSTM uses a base year of 2015 and a future year of 2040. Data from this model was used to calculate growth rates. **Table 5** presents NCSTM model output related to volumes and speeds from the 2015 and 2040 E+C network.

Table 5. 2015/2040 NCSTM E+C Comparison

Segment	2015 NCSTM				2040 NCSTM E+C			
	Ave. AADT*	Daily VMT**	Daily VHT***	Ave. Speed (mph)	Ave. AADT	Daily VMT	Daily VHT	Ave. Speed (mph)
101	10,000	128,300	1,800	71	14,000	186,900	1,300	71
102	8,000	383,000	5,500	66	12,000	522,900	7,500	71
103	11,000	173,300	3,400	51	18,000	171,400	3,000	60
104	6,000	77,300	1,400	55	11,000	137,600	2,000	69
105	4,000	80,300	1,500	54	8,000	170,700	1,200	70
Total	**7,800**	**842,200**	**13,600**	**59**	**12,600**	**1,189,500**	**15,000**	**68**

*AADT = Annual Average Daily Traffic; **VMT = Vehicle-Miles Traveled; ***VHT = Vehicle-Hours Traveled

MPO models were also used as part of the Travel Demand Model analysis. For the MPO model, an E+C scenario was not evaluated; rather, the adopted MTPs were utilized for future year analysis. Information from these models was used to support development of growth rates to apply to each segment. **Table 6** shows a comparison of the MPO data. When comparing growth data from the NCSTM and the Goldsboro MPO model, it should be noted that some corridor segments are represented differently between the two models.

Table 6. Base Year and Future Year Scenario, MPO Model Output

				Base Year Data				Future Year Data			
Segment	Travel Demand Model	Base Year	Future Year	Ave. AADT*	Daily VMT**	Daily VHT***	Ave. Speed (mph)	Ave. AADT	Daily VMT	Daily VHT	Ave. Speed (mph)
101†	-	-	-	-	-	-	-	-	-	-	-
102	Goldsboro	2010	2040	5,700	219,000	3,900	55	9,600	326,300	5,900	54
103	Goldsboro	2010	2040	16,100	150,000	4,100	41	6,800	79,700	1,800	45
104	Goldsboro	2010	2040	12,700	76,000	1,600	46	15,400	98,500	2,200	45
105	Goldsboro	2010	2040	9,600	34,900	800	46	15,600	55,900	1,300	44

*AADT = Annual Average Daily Traffic; **VMT = Vehicle-Miles Traveled; ***VHT = Vehicle-Hours Traveled
†Segment 101 is not included in an MPO Model

2.2.4. Projected Growth Rates

Projected growth rates were developed based on AADT data from the NCSTM and the Goldsboro MPO model by corridor segment. **Table 7** shows the projected growth rate for each corridor segment. The STC growth rates are the same in the E+C + MPO and E+C + MTP + MPO scenarios because there are no additional MTP projects.

Table 7. Projected Growth Rates by Segment

	NCSTM/MTP		MPO	STC Growth Rate	
Segment	Annual Growth Rate, 2015-2040 E+C	Annual Growth Rate, 2015-2040 E+C + MTP	Annual Growth Rate	E+C + MPO	E+C + MTP + MPO
101	1.4%	1.4%	-	1.4%	1.4%
102	1.6%	1.6%	1.8%	1.7%	1.7%
103	2.0%	2.0%	-2.8%	-0.4%	-0.4%
104	2.5%	2.5%	0.6%	1.5%	1.5%
105	2.8%	2.8%	1.6%	2.2%	2.2%

2.3. Mobility Measures

While there are many mobility measures that can be considered for each corridor based on quantitative and qualitative data, this mobility analysis is based on the relationship of travel speed, congestion, and travel time. For each scenario, a projected volume was compared against available capacity to estimate the travel time (i.e., V/C ratio). VMT, VHT, and average speed are also presented for each scenario.

2.3.1. Volume-to-Capacity Ratio

The V/C ratio is a representation of a daily planning-level capacity versus an average daily traffic volume. It is not a measure of peak traffic or congestion, but rather an overall measure of the how well the roadway will function over the course of a day. According to the “Level of Service D Standards for Systems Level Planning,” typical capacities shown are the points at which traffic transitions from LOS D to LOS E; therefore, segments with a V/C ratio exceeding 1.0 are considered greater than LOS D (i.e., LOS E or F) in this analysis. **Table 8** presents V/C ratios by scenario. Shaded grey fields indicate a change from existing (“2015 NCSTM”) to the 2040 scenarios.

Table 8. Volume-to-Capacity Ratios by Scenario

Segment	2015 NCSTM			2040 NCSTM E+C			2040 NCSTM E+C + MTP		
	Ave. Vol.	Capacity	Ave. V/C*	Ave. Vol.	Capacity	Ave. V/C	Ave. Vol.	Capacity	Ave. V/C
101	10,500	66,200	0.16	15,290	66,200	0.23	15,290	66,200	0.23
102	8,330	66,200	0.13	12,360	64,700	0.19	12,360	64,700	0.19
103	11,900	39,700	0.30	18,730	63,800	0.29	18,730	63,800	0.30
104	6,510	49,000	0.13	11,340	64,700	0.18	11,340	64,700	0.22
105	4,240	56,100	0.08	8,840	64,700	0.14	8,840	64,700	0.14

*V/C = Volume-to-Capacity ratio
Note: Note: Shaded grey fields indicate a change from 2015 NCSTM to 2040 scenarios

2.3.2. Average Travel Time and Speed

Average travel time and speed are measures of the relationship between the V/C ratio of a segment and its typical travel speed. Volume-delay curves by facility type were used to estimate travel time and speed in the 2018 conditions. These volume-delay curves, based on adjusted NCSTM volume-delay function curves, represent the typical “congested” speed on a daily planning level. **Table 9** shows average travel time and speeds by scenario. Shaded grey fields indicate a change from existing (“2018 Conditions”) to the 2040 scenarios

Table 9. Average Travel Speed and Travel Time by Scenario

Segment	2018 Conditions			2040 NCSTM E+C			2040 NCSTM E+C + MTP		
	Typical Posted Speed (mph)	Ave. Travel Speed (mph)	Ave. Travel Time (min)	Typical Posted Speed (mph)	Ave. Travel Speed (mph)	Ave. Travel Time (min)	Typical Posted Speed (mph)	Ave. Travel Speed (mph)	Ave. Travel Time (min)
101	70	65	5	70	71	5	70	71	5
102	70	67	17	70	71	17	70	71	17
103	50	45	9	70	60	4	70	60	4
104	55	52	6	70	69	5	70	69	5
105	55	53	11	70	70	8	70	70	8
Total Travel Time (min)			**48**			**40**			**40**

Note: Shaded grey fields indicate a change from 2018 Conditions to 2040 scenarios

2.3.3. Vehicle-Miles Traveled and Vehicle-Hours Traveled

VMT and VHT represent overall demand on each segment for each scenario, shown on **Table 10**.

Table 10. VMT and VHT Scenario

Segment	2015 NCSTM		2040 NCSTM E+C		2040 NCSTM E+C + MTP	
	VMT	VHT	VMT	VHT	VMT	VHT
101	128,300	1,800	186,900	1,300	186,900	1,300
102	383,000	5,500	522,900	7,500	522,900	7,500
103	173,300	3,400	171,400	3,000	171,400	3,000
104	77,300	1,400	137,600	2,000	137,600	2,000
105	80,300	1,500	170,700	1,200	170,700	1,200
Total	**842,200**	**13,600**	**1,189,500**	**15,000**	**1,189,500**	**15,000**

*VMT = Vehicle-Miles Traveled; **VHT = Vehicle-Hours Traveled

2.3.4. Highway Mobility Summary

Table 11 presents a summary of highway mobility measures for 2015 NCSTM, 2040 NCSTM E+C, and 2040 NCSTM E+C + MTP. The table shows that in the future year, the corridor serves more travelers at higher speeds with less delay. **Figure 3** presents the key highway mobility measures graphically.

Table 11. Highway Mobility Summary

Measure	2015 NCSTM	2040 NCSTM E+C	2040 NCSTM E+C + MTP
Length (Miles)	49	49	49
Average Travel Time (Hours)	0.80	0.66	0.66
Vehicle-Miles Traveled	842,200	1,189,500	1,189,500
Vehicle-Hours Traveled	13,600	15,000	15,000
Annual Average Daily Volume	8,296	13,312	13,312
Average Speed	59	68	68

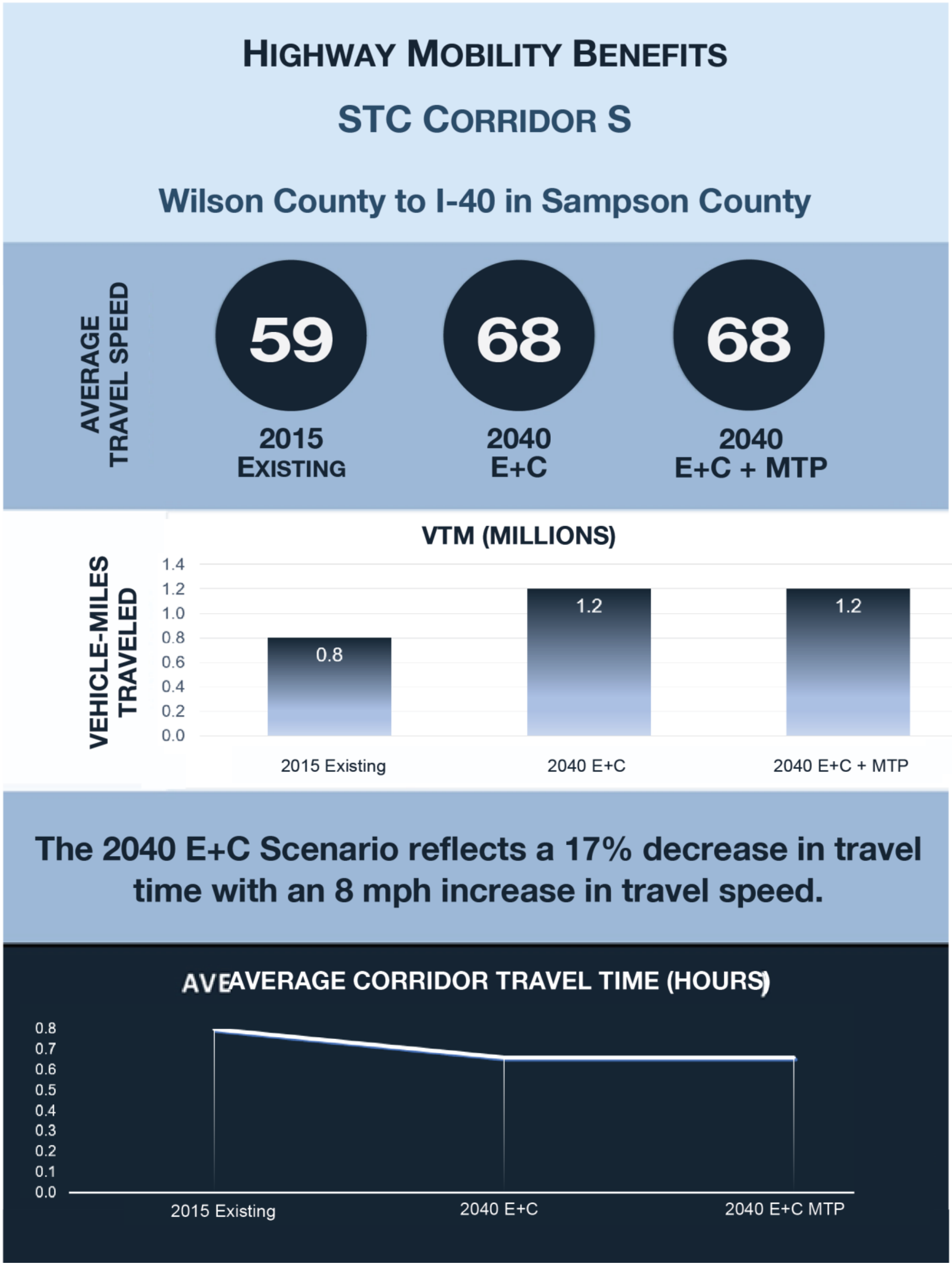


Figure 3. Highway Mobility Summary

2.4. Truck Percentage

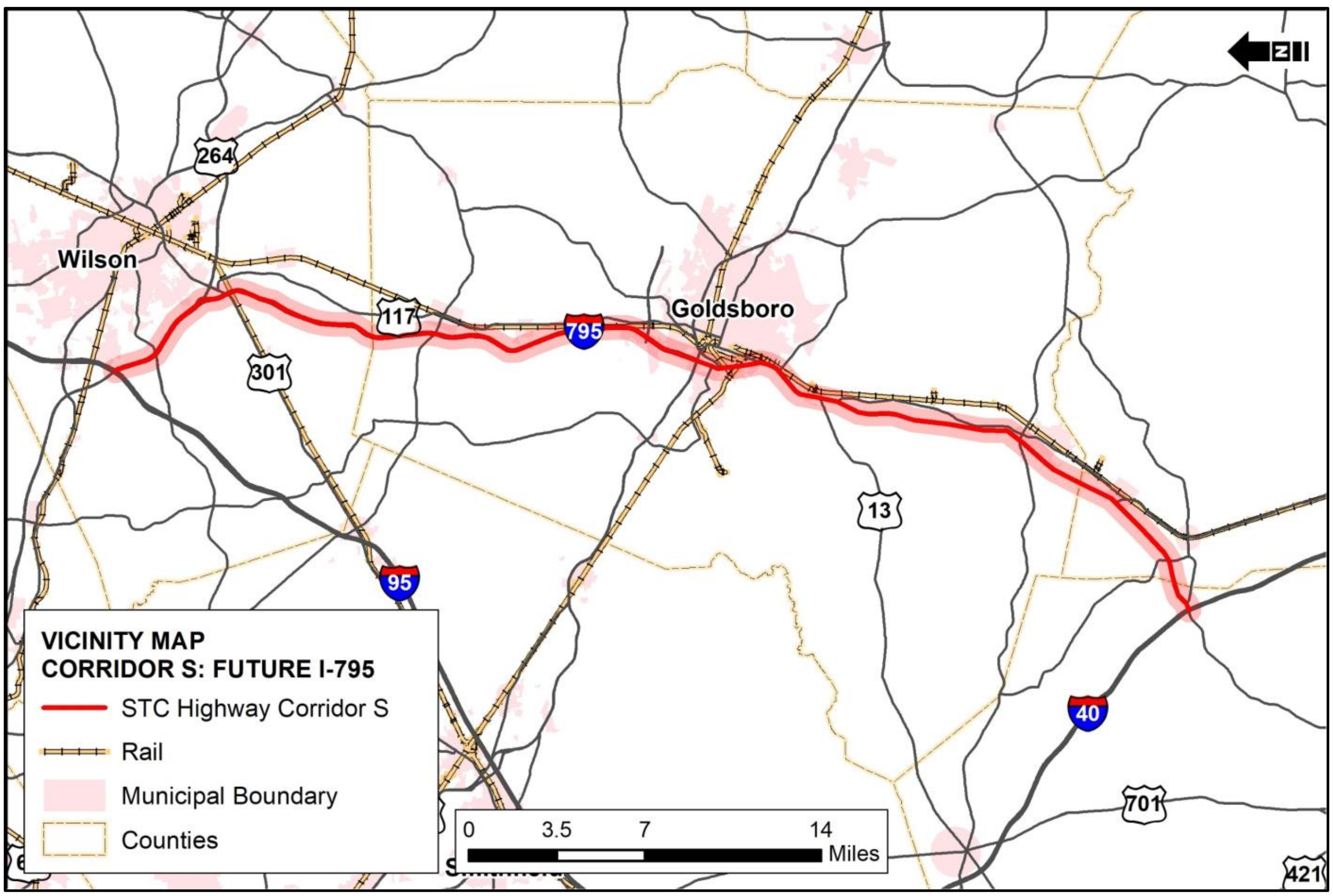
The percent of trucks on the corridor was reviewed using AADT GIS data from NCDOT, which is collected for routes on the National Highway System and the North Carolina Truck Network. Truck percentage data and maps are in Appendix E.

2.5. Electric Charging Stations

Electric charging stations within a 5-mile and 10-mile buffer of the corridor are illustrated on figures in Appendix F.

3. Freight Mobility

Future I-795 runs from I-95 in Wilson County to I-40 in Sampson County. It consists of U.S. 117 south of Goldsboro and the existing I-795 north of Goldsboro as shown in **Figure 4**. Freight mobility into, out of, and within the Future I 795 counties was analyzed using freight flow data downloaded from the North Carolina Freight Flow tool. The freight flow data is presented as volume (tonnage) and value (dollars). It is based on the Federal Highway Administration's (FHWA) Freight Analysis Framework (FAF) Version 4.1 (FAF4.1) with county-level disaggregation processed by Cambridge Systematics for 2012, 2015, and 2045, and it was forecasted to 2045 using FHWA's FAF4.1 origin-destination and commodity growth rates for rail flows.[1]



[1] North Carolina Statewide Multimodal Freight Plan, Freight Flow Tool Reference Guide: https://connect.ncdot.gov/projects/planning/Statewide-Freight-Plan/Documents/Freight_Tool_User_Guide.pdf

Figure 4. Future I-795

Freight flow estimates for Future I-795 include county totals for four counties (Sampson, Duplin, Wayne, and Wilson) within eastern North Carolina. Results are presented for 12 different commodity groups and associated trade partners. Results by trade partners are presented regionally for the United States, at the county level for trade between the corridor and the rest of North Carolina, and at the FAF regional level for all other trade, which includes states, large metropolitan areas, the remainder of states with large metropolitan area(s), and international regions for foreign freight flows.

3.1. Flow Type Totals

Freight flows to, from, and within the Future I-795 counties (including domestic trade and the domestic leg of foreign trade) totaled an estimated 30.3 million tons worth $31.2 billion in 2015, as shown in **Figure 5**. Inbound flows represented a higher percentage of volume compared to value, while outbound flows represented a lower percentage of volume compared with value. Internal flows to the corridor made up only 1 percent of the total volume and of the total value. Flows were forecasted to increase to 43.7 million tons worth $49.6 billion in 2045 (an increase of about 44 and 59 percent, respectively). The differences in growth of volume and value reflect anticipated changes in type of businesses.

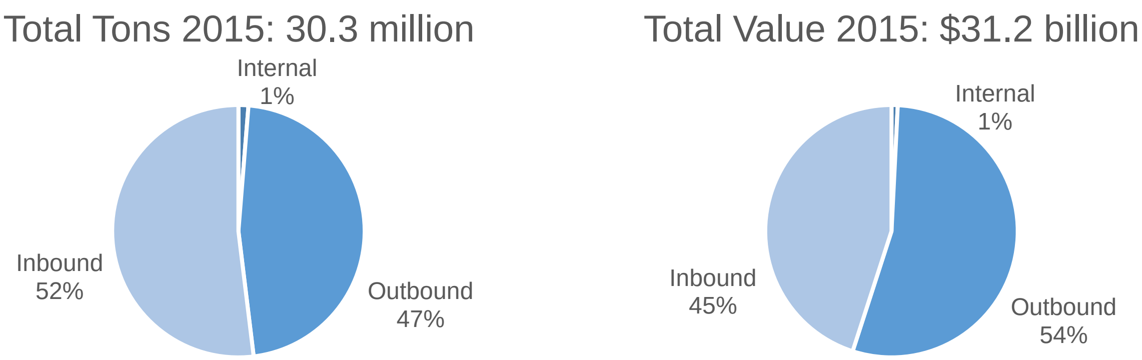


Figure 5. Freight Flow Totals, 2015

3.2. Modal Splits

Trucking dominates the market, moving approximately 89 percent of the corridor's freight and accounting for almost 95 percent of the total value, as shown in **Figure 6** and

Figure 7. Carload rail accounts for about 10 percent of the corridor's freight volume and 3 percent of its value in 2015. The remaining modes carried less than 1 percent of the total freight volume and value each, except air which carried approximately 2 percent of the total freight value. Modal share forecasts for 2045 show little change in terms of volume but indicate a small decrease in air freight value (approximately 2 percent less of modal share) and corresponding increase in truck freight value (approximately 2 percent more of modal share).

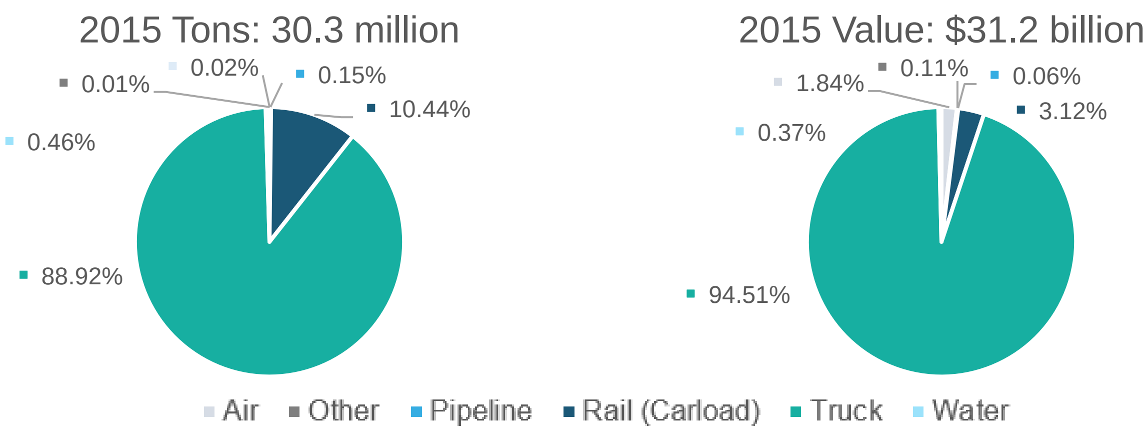


Figure 6. Modal Freight Flows by Volume, 2015

Figure 7. Modal Freight Flows by Value, 2015

3.3. Commodity Comparison, 2015 and 2045

Agriculture and Fish, with about 12.9 million tons, accounted for the largest volume of commodities moving into, out of, and within the corridor counties, as shown in **Figure 8**, of which approximately 55 percent was imported to the region. Aggregates; Raw and Finished Wood Products; and Food, Alcohol, and Tobacco were the next highest commodities by volume in 2015, with each accounting for just over 3.0 million tons. The Machinery, Electric, and Precision Instruments commodity group is forecasted to have the largest increase in volume by 2045 with approximately 145 percent growth. Other commodity groups with high growth forecasts include Chemicals, Pharmaceuticals, Plastics, and Rubber (97 percent), Waste (73 percent), Food, Alcohol, and Tobacco (61 percent), and Mixed Freight (59 percent). Energy Products and Textiles and Leather are the only commodities with an anticipated decrease (17 percent and 10 percent respectively) in volumes by 2045.

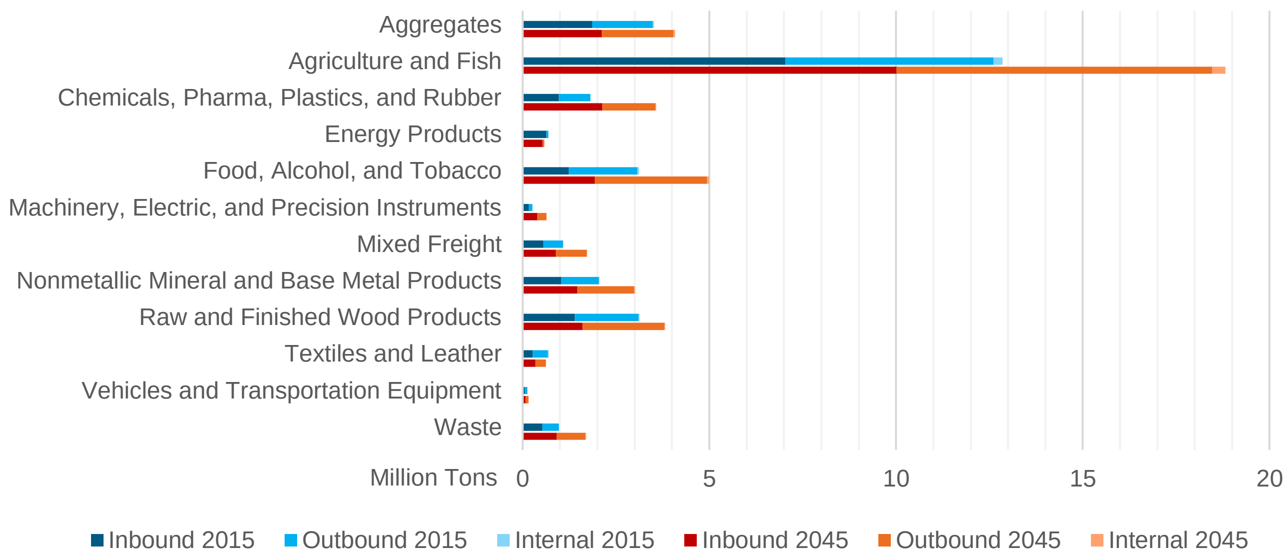


Figure 8. Commodity Volumes, 2015 and 2045

As shown in **Figure 9**, Agriculture and Fish, at more than $9.6 billion in freight, accounted for the largest share of the value of freight in 2015. The next five highest valued commodities all ranged in value traded from between $2.8 billion and $4.8 billion in 2015 and included Chemicals, Pharmaceuticals, Plastics, and Rubber ($4.8 billion), Mixed Freight ($4.1 billion), Textiles and Leather ($3.4 billion), Food, Alcohol, and Tobacco ($3.4 billion), and Machinery, Electric, and Precision Instruments ($2.8 billion). All six of these commodities are forecasted to increase in value by more than 50 percent by 2045, with the exception of Textiles and Leather which is forecasted to decrease by about 5 percent. Other commodities forecasted to experience growth above 50 percent by 2045 are Waste (88 percent) and Nonmetallic Mineral and Base Metal Products (57 percent). Machinery, Electric, and Precision Instruments are forecasted to experience the highest growth by 2045 of all the commodities at 119 percent. The remaining commodities are forecasted to grow as well except for Energy Products, which is forecasted to decrease in value by 4 percent.

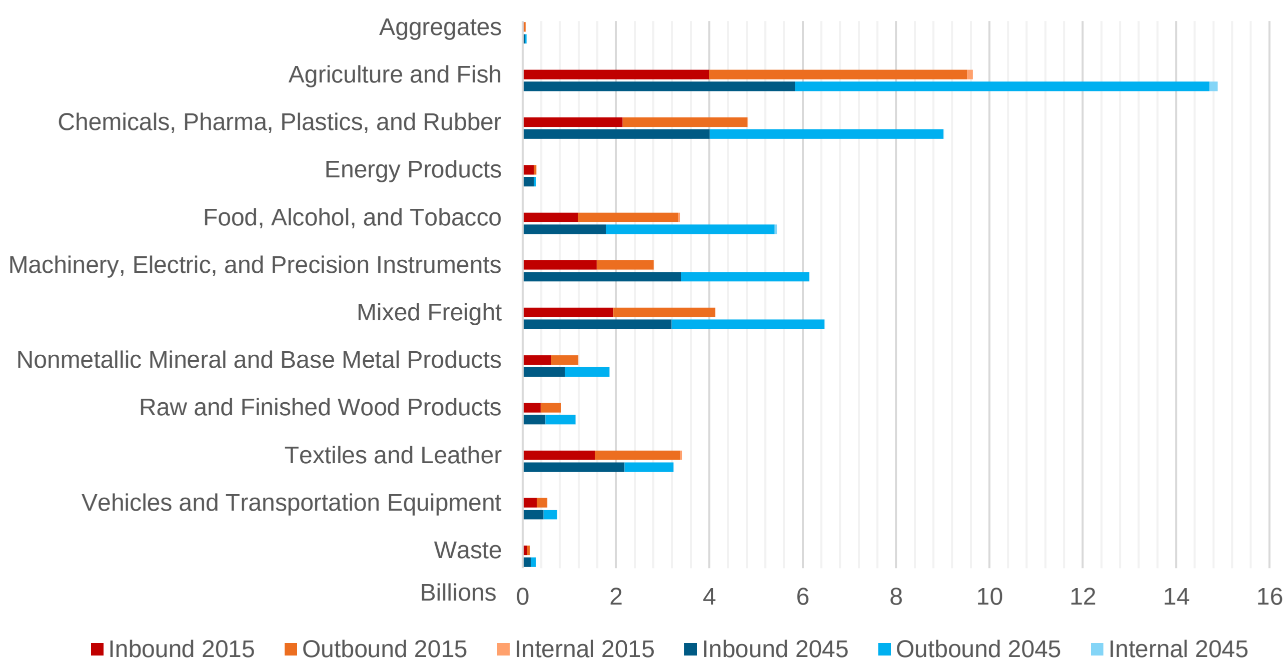


Figure 9. Commodity Values, 2015 and 2045

3.4. Top Trading Partners — by Volume and Value

The Future I-795 Corridor counties traded the largest volume of goods with all the states west of the Mississippi River, identified as the West of the Mississippi River region in **Figure 10**, in 2015 (14.8 million tons). The West of Mississippi River region accounted for almost half of the total tonnage of trade in 2015, as shown in **Table 12**. However, trade with this region only represented $1.8 million in value, which made it the third lowest trading partner representing only 6 percent of the total trade value that year. The largest trade partner by value in 2015 was trade conducted within North Carolina, which represented almost two-thirds of the total value of trade ($20.3 billion). By 2045, the West of the Mississippi River region is still anticipated to be the largest trade partner by volume with just less than half of the total tonnage of freight being traded with that region. Likewise, internal trade within North Carolina is also anticipated to remain the largest trade partner by value and remaining at a level close to two-thirds of the total value of trade. Each of these partners are anticipated to grow proportionally in volume and value of trade by 2045, although the trade volume and value in North Carolina is anticipated to grow at a rate about 50 percent higher than that of the West of the Mississippi River trade volume and value.

Table 12. Top Regional Trading Partners

Region	Tonnage		Value	
	2015	2045	2015	2045
Internal (North Carolina)	3,041,892	4,821,097	$20,341,936,888	$31,807,914,543
Great Lakes	2,273,133	3,345,370	$1,583,464,114	$2,526,252,411
Mideast	1,401,154	1,943,112	$2,457,692,505	$4,469,947,511
New England/New York	4,384,124	6,221,512	$739,582,929	$1,349,088,079
Southeast*	4,417,760	6,436,186	$4,260,058,299	$6,895,488,159
West of the Mississippi River	14,802,709	20,941,332	$1,849,360,149	$2,575,599,513
Total	**30,320,773**	**43,708,610**	**$31,232,094,884**	**$49,624,290,216**

*Freight internal to North Carolina was excluded from totals within the Southeast

Figure 10. Trading Regions

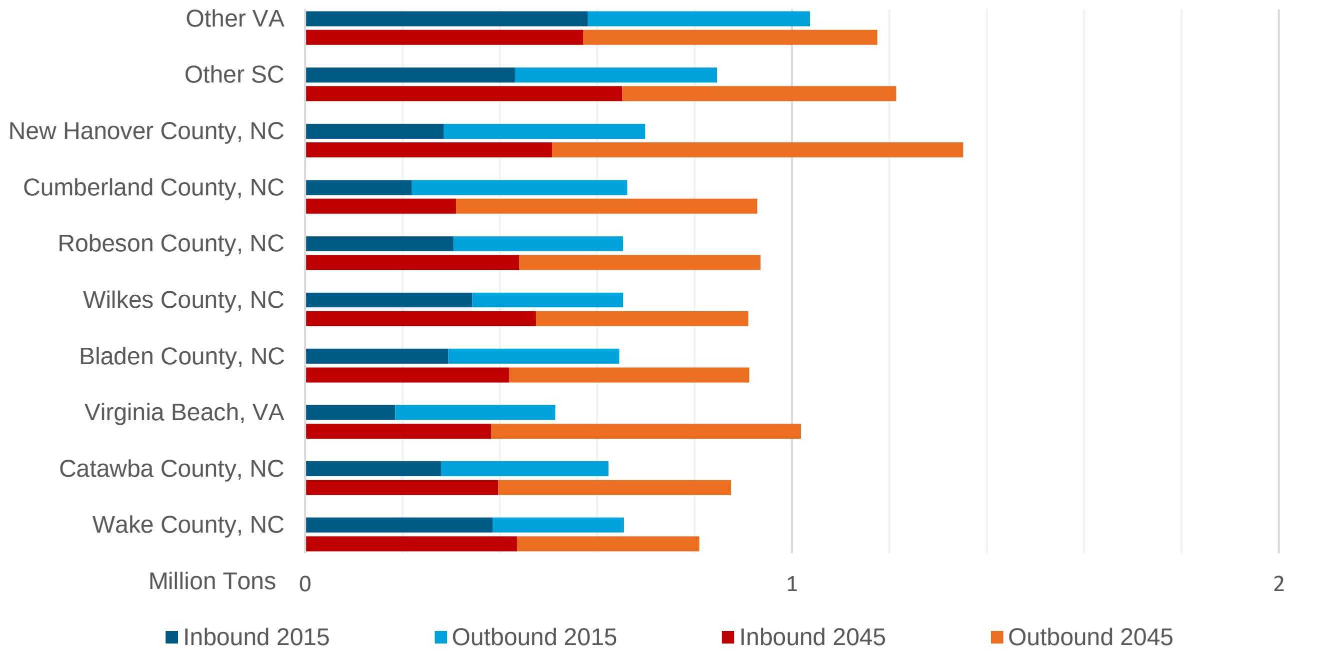


Figure 11 shows the top ten domestic trading partners with the Future I-795 counties by volume by county within NC, metropolitan area, and "other" state FAF region outside of NC. "Other" state FAF regions refer to the remainder of a state trading region which does not include separately analyzed metropolitan areas. The Other Virginia FAF region was the largest trade partners for Future I-795 by volume in 2015 and represented approximately 1.0 million tons of freight. However, New Hanover County, N.C. and the Other South Carolina FAF region are forecasted to grow by 93 percent and 44 percent, respectively, to become the largest trade partners by volume in 2045 at approximately 1.4 million tons and just over 1.2 million tons, respectively. The Other VA FAF region follows very closely at just below 1.2 million tons. The highest level of forecasted growth among the top ten trade partners is in Virginia Beach, VA, which is forecasted to grow by 98 percent to 1.0 million tons in 2045. This large increase in Virginia Beach, VA growth will bring it from the tenth largest trading partner in 2015 to the fourth largest in 2045.

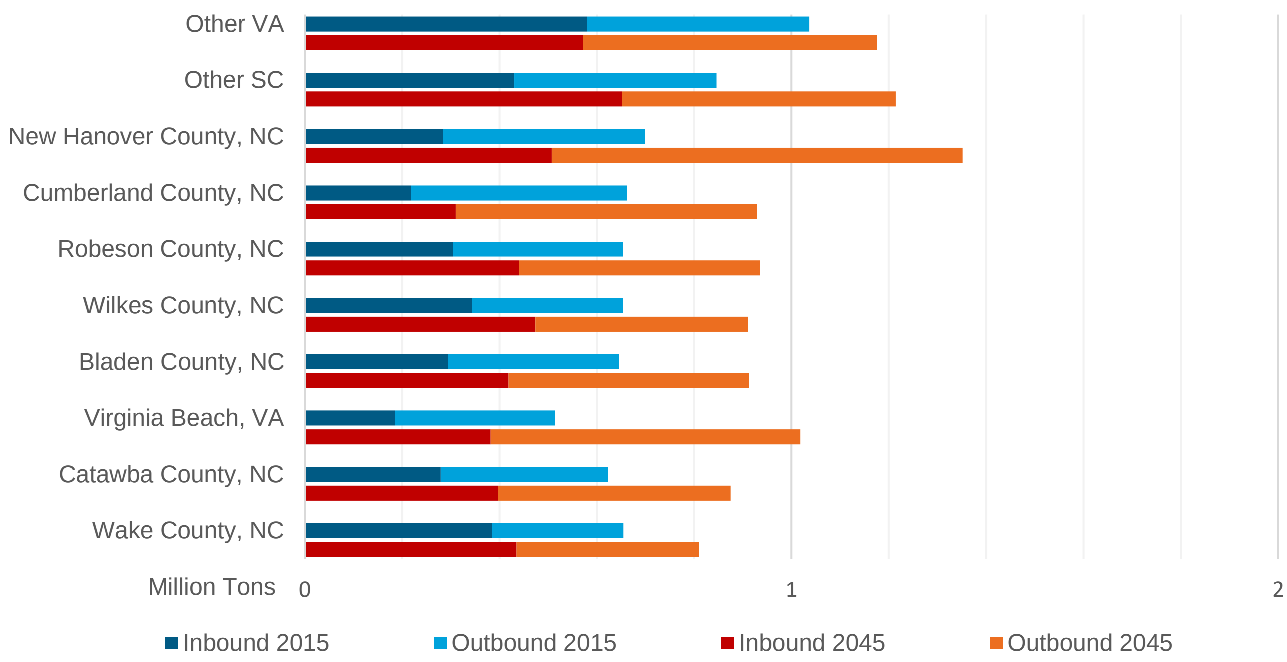


Figure 11. Top Trading Partners by Volume, 2015 and 2045[2]

[2] "Other SC" refers to the remainder of South Carolina not including the Greenville and Charleston metros. "Other VA" refers to the remainder of Virginia not including the Washington, DC, Virginia Beach, and Richmond metros.

Atlanta, GA far outranked the other top ten trade partners by value for Future I-795 in 2015, as shown in **Figure 12**. Atlanta represented more than $1.9 billion of trade in 2015, of which approximately 80 percent was outbound freight. Atlanta freight movements are forecasted to grow by 62 percent in value by 2045 to more than $3.1 billion. Other S.C. and Virginia Beach, VA were the second and third largest trading partners by value in 2015, with approximately $970 million and $920 million in freight trade, respectively. The remaining top ten trade partners by value for Future I-795 ranged between $430 million and $760 million worth of trade in 2015. Charleston, SC, Virginia Beach, VA, and New Hanover County, NC are anticipated to more than double in value by 2045 with growths of 180 percent, 167 percent, and 144 percent, respectively. These large growths make Virginia Beach, VA and New Hanover County, N.C. the projected second and third largest trading partners by value in 2045, with approximately $2.5 billion and $1.7 billion in freight trade, respectively. Other trade partners with high increases in value by 2045 are Los Angeles, CA and Chicago, IL, with growth of 98 percent and 68 percent, respectively.

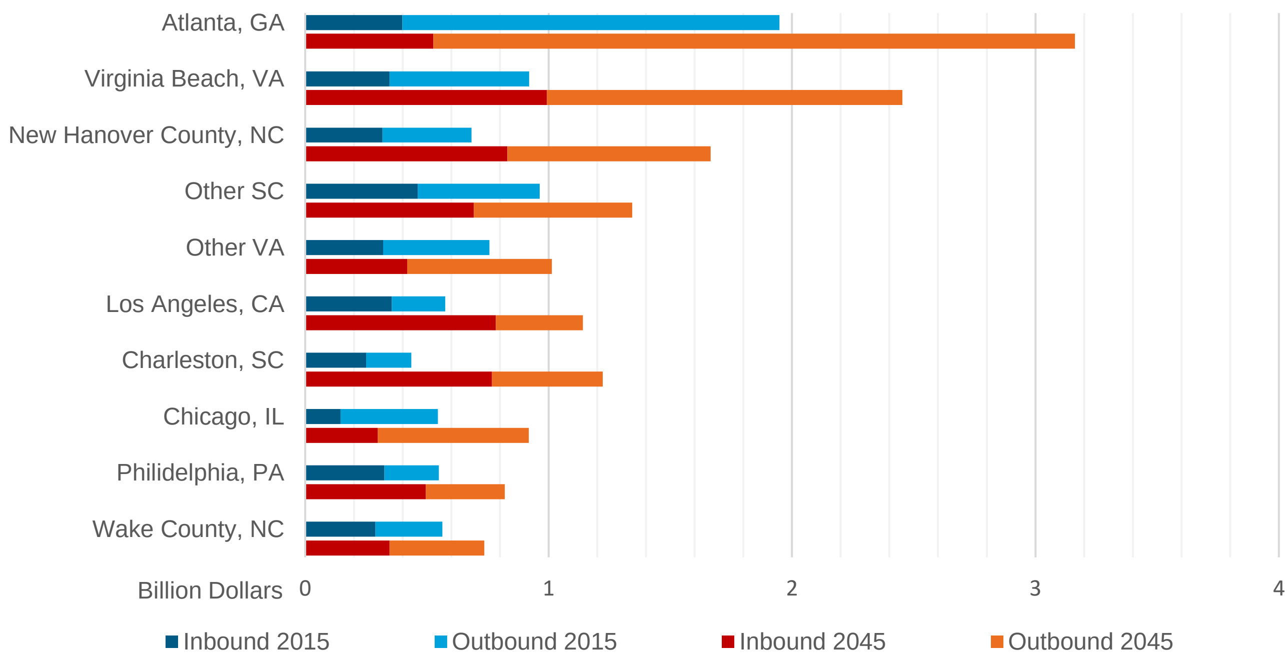


Figure 12. Top Trading Partners by Value, 2015 and 2045[3]

[3] "Other SC" refers to the remainder of South Carolina not including the Greenville and Charleston metros. "Other VA" refers to the remainder of Virginia not including the Washington, DC, Virginia Beach, and Richmond metros.

3.5. Foreign Trade

Foreign trade freight flows of 783,000 tons only represented approximately 3 percent of the corridor's total flows in 2015 and is forecasted to more than triple in volume (200 percent increase) and become more than 5 percent of the total volume (2.4 million tons) by 2045. The $4.8 billion worth of foreign trade in 2015 is forecasted to grow by 58 percent to $7.6 billion by 2045. Foreign trade flows account for approximately 15 percent of the total value in both 2015 and 2045.

As shown in **Figure 13**, tonnage of foreign trade in 2015 is dominated by water with 83 percent of freight being moved on the water and trucking and carload rail ranking second and third at 11 percent and 5 percent, respectively. As shown in

Figure 14, modal shares of foreign trade by value in 2015 are also dominated by water which accounts for 73 percent of the total value, with truck freight ranking second at 19 percent.

The modal share by volume forecasted between 2015 and 2045 remains relatively the same with a small relative decrease in carload rail freight (5 to 4 percent) and an increase in water freight (83 to 84 percent). The modal share by value is also forecasted to increase for water (73 to 78 percent) but decrease in in air freight (6 to less than 1 percent).

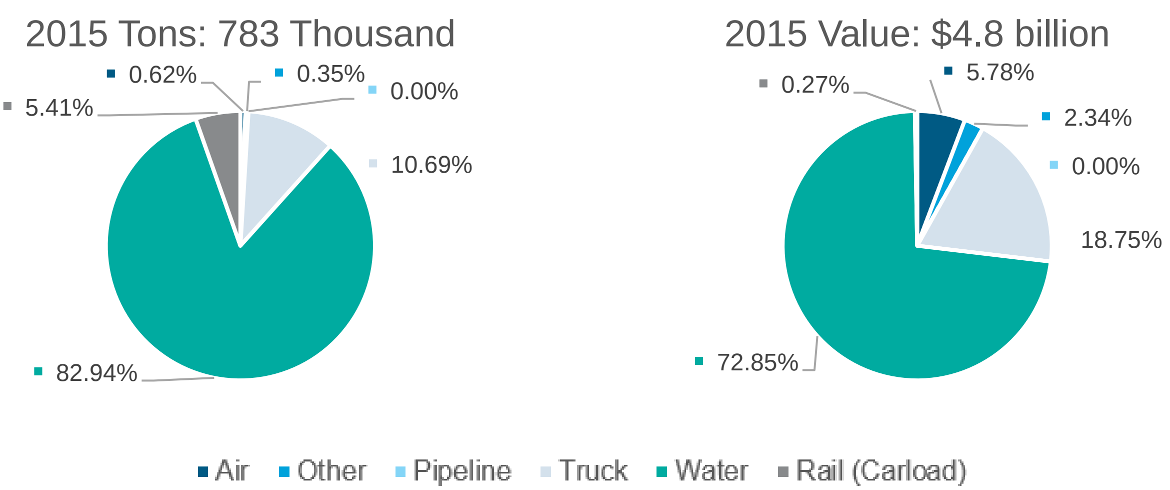


Figure 13. Foreign Trade Freight Flows by Mode and Volume, 2015

Figure 14. Foreign Trade Freight Flows by Mode and Value, 2015

Agriculture and Fish was the top foreign traded commodity group by volume in 2015 with more than 264,000 tons, which represented 34 percent of the total foreign trade volume, as shown in **Figure 15**. By 2045 it is forecasted to increase to about 860,000 tons (225 percent increase), which would be about 37 percent of the total foreign trade by volume. Chemicals, Pharmaceuticals, Plastics, and Rubber was the second highest volume of foreign traded commodity with about 144,000 tons traded in 2015 and is forecasted to grow 151 percent by 2045. By 2045, the other commodities are forecasted to grow in volume by more than 130 percent and up to 420 percent, with the exception of Aggregates and Energy Products which are forecasted to increase by only 16 percent and decline by 94 percent, respectively. Agriculture and Fish and Chemicals, Pharmaceuticals, Plastics, and Rubber are projected to remain as the top two foreign trade commodities by volume in 2045.

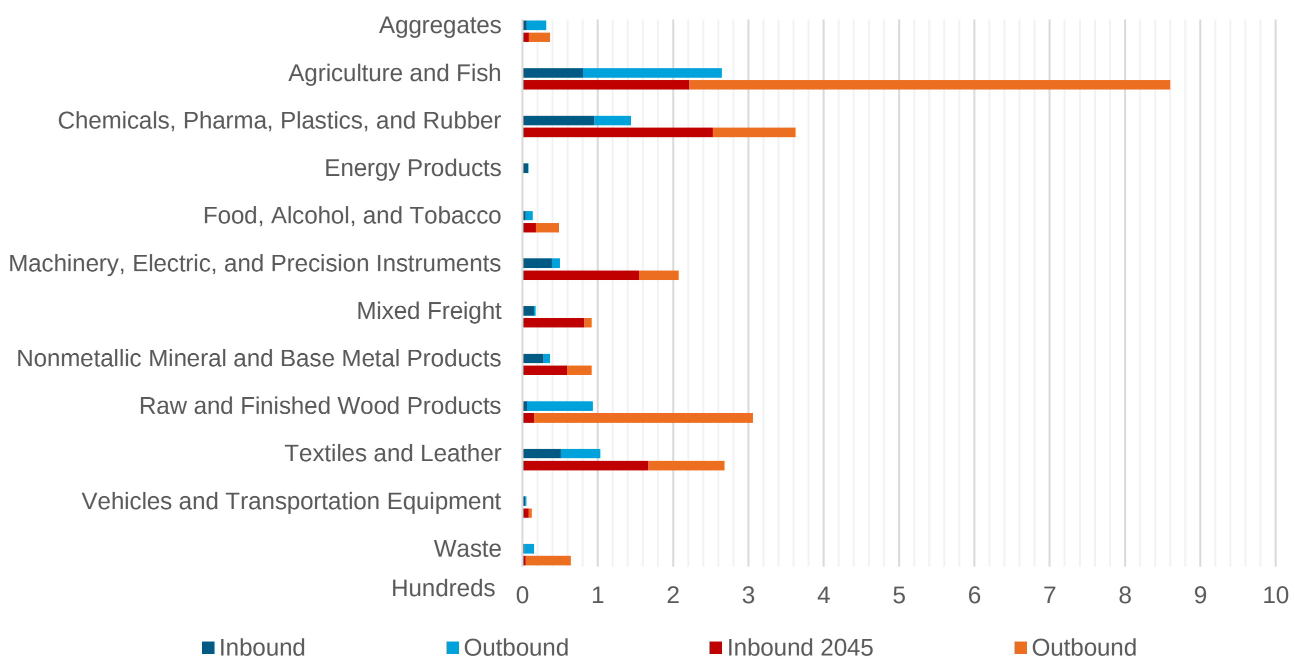


Figure 15. Foreign Trade Commodity Volumes, 2015 and 2045

By value, Machinery, Electric, and Precisions Instruments accounted for 24 percent, the largest proportion, of the total value of foreign trade value with $627 million, as shown in **Figure 16**. By 2045, the same commodity group is forecasted to account for 25 percent of the total value of foreign trade with almost $1.9 billion (203 percent growth). Textiles and Leather, Agriculture and Fish, and Chemicals, Pharmaceuticals, Plastics and Rubber closely followed as the next highest traded commodities by value in 2015 at $574 million, $545 million, and $475 million, respectively. These three commodities are forecasted to grow in value by 166 percent to $1.5 billion, 223 percent to $1.8 billion, and 144 percent to $1.2 billion, respectively, by 2045. The other trade commodities are anticipated to grow in value by more than 110 percent, and as much as 280 percent by 2045 with the exception of Aggregates and Energy products, which are forecasted to increase by 45 percent and decrease by 94 percent, respectively, by 2045.

The corridor's foreign trade exports accounted for the majority of foreign trade volume in both 2015 and 2045 at 57 percent (444,000 tons and 1.4 million tons). However, the corridor's foreign trade imports accounted for the majority of foreign trade value at 57 percent ($1,5 billion and $4.3 billion).

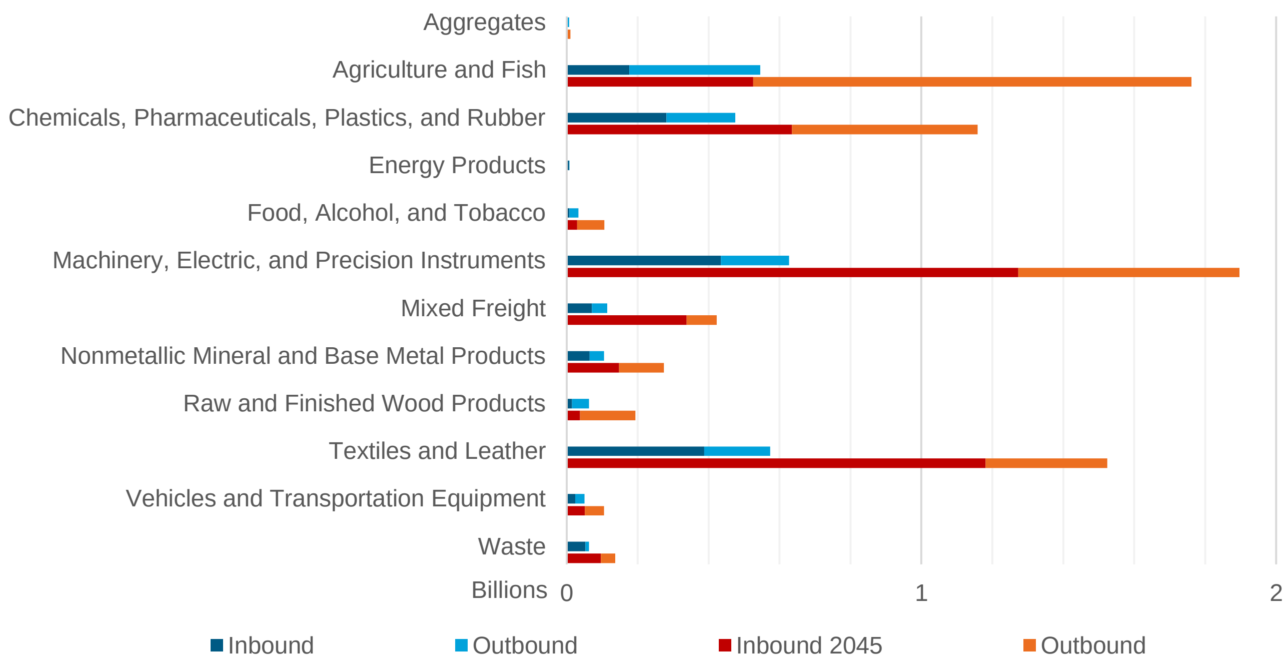


Figure 16. Foreign Trade Commodity Values, 2015 and 2045

Eastern Asia was the corridor's top foreign trade partner by volume in 2015 with about 213,000 tons, or 27 percent of the total foreign trade volume, as shown in **Figure 17**. Eastern Asia is also forecasted to be the top trade partner by volume in 2045 with 702,000 tons (30 percent of the total volume). Europe ranked second by volume in 2015 with 152,000 tons and is forecasted to remain at that position in the rankings in 2045 with almost 420,000 tons. However, Mexico, Africa, and Southeast Asia and Oceania are forecasted to have the largest increases in freight volumes by 2045 with more than a 230 percent increase each.

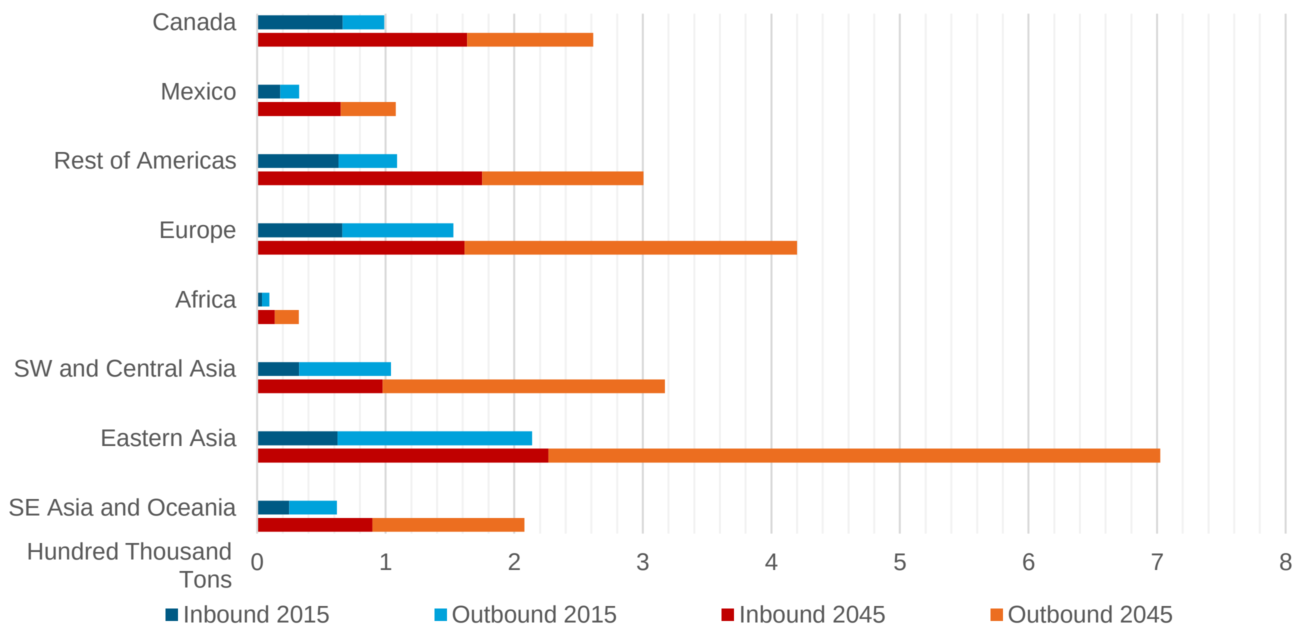


Figure 17. Foreign Trade Partners by Volume, 2015 and 2045

In 2015, Eastern Asia and Europe were also the top ranked trade partners by value, worth about $766 million and $538 million, respectively. By 2045, the value of goods is forecasted to grow to $2.1 billion for Eastern Asia and $1.6 billion for Europe, as shown in **Figure 18**. Canada, Southwest and Central Asia, Mexico, and Africa are all forecasted to have the highest increases in value by 2045 with more than 200 percent growth, resulting in $806 million, $658 million, $702 million, and $169 million, respectively.

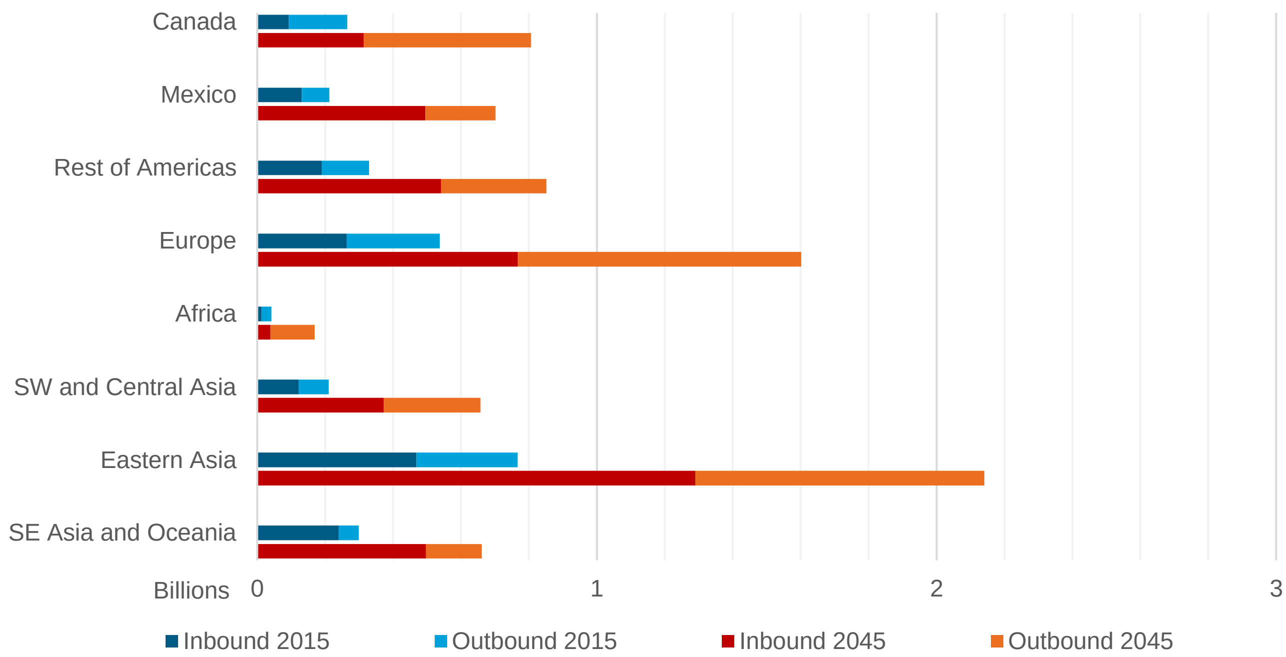


Figure 18. Foreign Trade Partners by Value, 2015 and 2045

4. Highway Safety and Environmental Resiliency

Future I-795 is a key multimodal transportation corridor with a principal mobility expectation to provide safe and reliable travel.

4.1. Corridor Safety

NCDOT planning level safety scoring data from 2015-2019 was analyzed along Future I-795 to identify areas of potential safety concern. Safety scores are based on three components: the class density ratio, the severity index, and the critical crash rate ratio.[4] The points from the three safety score components are averaged. Section safety scores are grouped into three point ranges where higher scores are considered to have the poorer highway safety performance. **Table 13** shows the number of miles along Future I-795 by safety score. Maps of the planning level safety scores along Future I-795 are included in Appendix B.

Table 13. Planning Level Section Safety Scores along Future I-795 from 2015-2019

Section Safety Score**	Length of Corridor per Safety Score (miles)*
0 to 33	10.3
33 to 66	20.8
66 to 100	15.5
Less than 60% Mileposted***	0.0

*Section safety scores were calculated on existing roadways for the portion of the corridor that is not yet existing or under construction.
**Higher scores are considered to have poorer highway safety performance.
***Routes having a mileposted crash percentage of 60% or lower were not scored.

4.2. Corridor Resiliency

The resiliency of Future I-795 is critical to achieving the goal of providing safe and reliable travel. The resiliency is defined by the corridor's ability to continue to provide service during natural disasters and weather events and to recover from crashes, accidents, and other safety concerns in a timely manner.

Environmental resiliency along the corridor was analyzed using North Carolina Flood Risk Information System (FRIS) floodplain data, historic flood events catalogued in the NCDOT Drive N.C. database from 2011 to 2019, and road inundation incidents. A summary of the FRIS flood zones are shown in **Table 14** by the miles of the corridor that are within the floodway, 100-year floodplain, and the 500-year floodplain. Of the corridor's entire length of 49 miles (259,944 feet) only about 9 miles (46,849 feet) are within flood zones. Maps of the flood zones along Future I-795 are included in Appendix C.

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[4] **Class Density Ratio**: The crash density of the study area versus the average crash density of similar facilities.
Severity Index: A measure of the severity of a crash or series of crashes. Locations with a high severity index have higher than average injury rates and/or more severe injuries.
Critical Crash Rate Ratio: The actual crash rate for the study area versus the critical crash rate.

Table 14. Flood Zone Summary

Flood Zone	Length of Corridor in Flood Zone (feet)
Floodway	10,501.9
100-Year Floodplain	33,158.4
500-Year Floodplain	3,189.1
Total	**46,849.4**

Note: total corridor length: 259,944 feet
**Inclusive of floodway*
***Inclusive of floodway and 100-year floodplain*

Roadway flood incidents that occurred along Future I-795 are shown in **Table 15.** Flood Incident Summary. A total of 15 flood incidents were recorded along Future I-795 from 2011 to 2019. These incidents were caused primarily by Hurricanes Matthew and Florence and resulted in impassable road conditions and instances where afflicted segments of the corridor were closed. Maps of the flood incidents along Future I-795 are included in Appendix C.

Table 15. Flood Incident Summary

Incident ID	County	Route	Date	Road Condition	Incident Type	Event Name
492560	Wayne	U.S.117	10/8/2016	Road Impassable	Weather Event	Hurrricane Matthew
492561	Wayne	U.S.117	10/8/2016	Road Impassable	Weather Event	Hurricane Matthew
492563	Wayne	U.S.117	10/8/2016	Road Impassable	Weather Event	Hurrricane Matthew
492606	Wayne	U.S.117	10/8/2016	Road Impassable	Weather Event	Hurricane Matthew
492729	Wayne	I-795	10/8/2016	Road Closed	Weather Event	Hurricane Matthew
492757	Wayne	U.S.117	10/8/2016	Road Impassable	Weather Event	Hurrricane Matthew
492758	Wayne	U.S.117	10/8/2016	Road Impassable	Weather Event	Hurrricane Matthew
492778	Wilson	I-795	10/9/2016	Road Impassable	Weather Event	Hurricane Matthew
492867	Duplin	U.S.117	10/9/2016	Road Closed	Weather Event	Hurricane Matthew
493402	Wayne	U.S.117	10/10/2016	Road Impassable	Weather Event	Hurrricane Matthew
494287	Wayne	I-795	10/15/2016	Road Closed	Weather Event	Hurricane Matthew
505124	Wilson	I-795	4/25/2017	Road Closed	Weather Event	4/24-4/25 2017 Flooding
505332	Wilson	I-795	4/27/2017	Road Closed with Detour	Weather Event	4/24-4/25 2017 Flooding
544413	Wayne	U.S.117	9/17/2018	Road Impassable	Weather Event	Hurricane Florence
545197	Wayne	U.S.117	9/20/2018	Road Closed	Weather Event	Hurricane Florence

*Flood incidents were collected on existing roadways for the portion of the corridor that is not yet existing or under construction.

In addition to the historic flood incidents, road inundation incidents were analyzed along Future I-795 by segment. Segments were defined by clusters of data points for the "100" recurrence interval. Recurrence intervals are the estimated average time between when inundation events caused by flooding are likely to occur; this metric is used for risk analysis. Lower recurrence intervals typically correspond to greater risks of inundation. Road inundation incidents were analyzed at the 10, 25, 50, and 100-year recurrence intervals. **Table 16** summarizes the road inundation incidents by each recurrence intervals' average and maximum depths—where depth is the measure of water flooding a roadway—and the length of the corridor inundated, all per segment. The total of each recurrence interval is also included in the table. Maps of the road inundation incidents that display the segments along the corridor are included in Appendix C.

Table 16. Road Inundation Incident Summary

Recurrence Interval**	Route*	Average Depth of Inundation (ft)***	Maximum Depth	Linear Feet Inundated (ft)	Percent of Corridor Inundated
Segment 1					
10	N/A	N/A	N/A	N/A	N/A
25	N/A	N/A	N/A	N/A	N/A
50	I-795	1.2	1.8	500	0.19%
100	I-795	2.2	3.1	600	0.23%
Segment 2					
10	N/A	N/A	N/A	N/A	N/A
25	I-795	0.7	1.4	400	0.15%
50	I-795	1.3	2.6	800	0.31%
100	I-795	1.9	3.7	1075	0.41%
Segment 3					
10	N/A	N/A	N/A	N/A	N/A
25	N/A	N/A	N/A	N/A	N/A
50	N/A	N/A	N/A	N/A	N/A
100	N.C. 581 & U.S. 13	0.6	0.9	890	0.34%
Segment 4					
10	N/A	N/A	N/A	N/A	N/A
25	N/A	N/A	N/A	N/A	N/A
50	N/A	N/A	N/A	N/A	N/A
100	U.S. 13	1.3	1.3	50	0.02%
Segment 5					
10	N/A	N/A	N/A	N/A	N/A
25	U.S. 13	0.3	0.3	300	0.12%
50	U.S. 13	1.2	1.7	900	0.35%
100	U.S. 13	1.7	3.1	1900	0.73%

*Road inundation incidents were collected on existing roadways for the portion of the corridor that is not yet existing or under construction.
**Gray represents each segment's design frequency as defined in Table 7-1 of the NCDOT Guidelines for Drainage Studies and Hydraulic Design, included in Appendix D.
***"N/A" indicates that there are no road inundation incidents in a given recurrence interval in the segment.

Table 17. Road Inundation Incident Summary (Continued)

Recurrence Interval**	Route*	Average Depth of Inundation (ft)***	Maximum Depth	Linear Feet Inundated (ft)	Percent of Corridor Inundated
Segment 6					
10	N/A	N/A	N/A	N/A	N/A
25	U.S. 13	0.1	0.2	150	0.06%
50	N.C. 581 & U.S. 13	1.1	1.5	2100	0.81%
100	N.C. 581 & U.S. 13	2.4	3.0	2450	0.94%
Segment 7					
10	N/A	N/A	N/A	N/A	N/A
25	N/A	N/A	N/A	N/A	N/A
50	N/A	N/A	N/A	N/A	N/A
100	U.S. 13	0.1	0.1	2	0.00%
Segment 8					
10	N/A	N/A	N/A	N/A	N/A
25	N/A	N/A	N/A	N/A	N/A
50	U.S. 117	0.4	0.6	250	0.10%
100	U.S.117	0.7	1.1	350	0.13%
Total					
10	N/A	N/A	N/A	N/A	N/A
25	N/A	0.4	1.4	850	0.33%
50	N/A	1.0	2.6	4550	1.75%
100	N/A	1.3	3.7	7317	2.81%

*Road inundation incidents were collected on existing roadways for the portion of the corridor that is not yet existing or under construction.
**Gray represents each segment's design frequency as defined in Table 7-1 of the NCDOT Guidelines for Drainage Studies and Hydraulic Design, included in Appendix D.
***"N/A" indicates that there are no road inundation incidents in a given recurrence interval in the segment.

Appendix A

NCDOT Level of Service D Standards for Systems and Level Planning

Level of Service D Standards for Systems Level Planning

Updated 10/14/2011

Level of Service A

Driver Comfort: High

Maximum Density:

12 passenger cars per mile per lane

Level of Service B

Driver Comfort: High

Maximum Density:

20 passenger cars per mile per lane

Level of Service C

Driver Comfort: Some Tension

Maximum Density:

30 passenger cars per mile per lane

Level of Service D

Driver Comfort: Poor

Maximum Density:

42 passenger cars per mile per lane

Level of Service E

Driver Comfort: Extremely Poor

Maximum Density:

67 passenger cars per mile per lane

Level of Service F

Driver Comfort: The lowest

Maximum Density:

More than 67 passenger cars per mile per lane

General Disclaimer

The Level of Service D Standards for Systems Level Planning was derived from the 2005 North Carolina Level of Service (NCLOS) Version 2.1 Program developed by the Institute for Transportation Research and Education (ITRE) at North Carolina State University. The NCLOS Program is based on the 2000 Highway Capacity Manual, published by the Transportation Research Board (TRB).

These standards are intended for **systems level planning only**. Many assumptions are made and documented in the development of these standards.

CTP FACILITY TYPES

FREEWAYS represent a multi-lane divided facility with complete access control (interchanges only and no traffic signals).

EXPRESSWAYS represent a multi-lane divided facility with a high level of access control (interchanges, limited at-grade intersections, right-in/right out access, and no traffic signals).

BOULEVARDS represent a typically divided facility with moderate access control (at-grade intersections, right-in/right out access, and traffic signals at major intersections).

OTHER MAJOR THOROUGHFARES represent undivided facilities with four or more lanes (US and NC routes may have less than 4 lanes). These facilities typically have low access control (at-grade intersections, access to development, and traffic signals at major and some minor intersections).

MINOR THOROUGHFARES represent a 2-to-3 lane undivided facility that is not signed as a US or NC route. These facilities typically have low access control (at-grade intersections, access to development, and traffic signals at major and minor intersections).

NCLOS (HCM) FACILITY TYPES

FREEWAYS (Freeways) represent a multi-lane divided facility with complete access control (interchanges only and no traffic signals).

EXPRESSWAYS (Multi-lane Highways) represent a multi-lane divided facility with a high level of access control (interchanges, limited at-grade intersections, right-in/right out access, and no traffic signals).

BOULEVARDS (Arterials, 25-55 MPH) represent a typically divided facility with moderate access control (at-grade intersections, right-in/right out access, and traffic signals at major intersections).

OTHER MAJOR THOROUGHFARES (Arterials, 25-55 MPH) represent undivided facilities with four or more lanes (US and NC routes may have less than 4 lanes). These facilities typically have low access control (at-grade intersections, access to development, and traffic signals at major and some minor intersections). These facilities are typically within an urban or suburban area (e.g. within a municipality or ETJ).

MINOR THOROUGHFARES (Arterials 25-55 MPH) represent a 2-to-3 lane undivided facility that is not signed as a US or NC route. These facilities typically have low access control (at-grade intersections, access to development, and traffic signals at major and minor intersections). These facilities are typically within an urban or suburban area (e.g. within a municipality or ETJ).

RURAL 2-LANE HIGHWAY (Two-Lane Highway, 55 MPH ONLY) represents a 2-lane undivided facility outside of a municipality or ETJ. These facilities have a 55 MPH posted speed limit, have low access control with numerous driveways and no traffic signals. These facilities are classified in a CTP as **other major thoroughfares** if they are a **US or NC route** or **minor thoroughfares** if they are a **secondary or local** route.

AREA TYPE

RURAL represents an area outside a municipality or Extraterritorial Jurisdiction (ETJ).

SUBURBAN represents an area within a municipality or ETJ that is not within a Central Business District (CBD) or areas immediately surrounding a CBD.

URBAN represents an area that is within a CBD or areas immediately surrounding a CBD.

LEVEL OF SERVICE D VALUES

MINIMUM CAPACITY VALUES represents conditions/inputs that result in a worst-case Level of Service D for a given facility. This lower value represents worst-case conditions in available data for a given region (Higher K/D Factors, Lower Peak Hour Factor, poor road conditions, etc.).

STANDARD CAPACITY VALUES represents an average Level of Service D for a given facility. This default value is an average of available data for a given region.

MAXIMUM CAPACITY VALUES represents conditions/inputs that result in a best-case Level of Service D for a given facility. This higher value represents best-case conditions in available data for a given region (Lower K/D Factors, Higher Peak Hour Factor, etc.).

These assumptions may not pertain to all systems level planning work; therefore, separate analysis may need to be conducted on a case-by-case basis.

These standards are **not** intended for project specific or corridor analysis. Separate analysis would be required for these types of projects.

Volumes shown represent the point at which traffic transitions from LOS D to LOS E.

Level of Service D Standards for Freeways *

COASTAL	2 Lanes Per Direction				3 Lanes Per Direction				4 Lanes Per Direction		
	Urban	Suburban	Rural		Urban	Suburban	Rural		Urban	Suburban	Rural
0-5% Trucks	**67400**	**66900**	**67900**		**102000**	**101300**	**101800**		**137300**	**136200**	**135700**
6-10% Trucks	**65700**	**65400**	**66200**		**99600**	**98900**	**99400**		**134000**	**133000**	**132500**
11-15% Trucks	**64200**	**63800**	**64700**		**97300**	**96600**	**97100**		**130900**	**129900**	**129400**
16-20% Trucks	**62800**	**62400**	**63200**		**95100**	**94400**	**94900**		**127900**	**126900**	**126500**
21-25% Trucks	**61400**	**61000**	**61800**		**9300**	**92300**	**92700**		**125100**	**124100**	**123700**
26-30% Trucks	**60000**	**59700**	**60500**		**90900**	**90300**	**90700**		**122400**	**121400**	**121000**
31-35% Trucks	**58800**	**58400**	**59200**		**89000**	**88400**	**88800**		**119800**	**118800**	**118400**

PIEDMONT	2 Lanes Per Direction				3 Lanes Per Direction				4 Lanes Per Direction		
	Urban	Suburban	Rural		Urban	Suburban	Rural		Urban	Suburban	Rural
0-5% Trucks	**61700**	**61400**	**62200**		**93500**	**92900**	**93300**		**125800**	**124900**	**124400**
6-10% Trucks	**60300**	**59900**	**60700**		**91300**	**90700**	**91100**		**122800**	**121900**	**121500**
11-15% Trucks	**58900**	**58500**	**59300**		**89200**	**88600**	**89000**		**120000**	**119100**	**118600**
16-20% Trucks	**57500**	**57200**	**58000**		**87100**	**86500**	**87000**		**117300**	**116400**	**115900**
21-25% Trucks	**56300**	**55900**	**56700**		**85200**	**84600**	**85000**		**114700**	**113800**	**113400**
26-30% Trucks	**55000**	**54700**	**55400**		**83400**	**82800**	**83200**		**112200**	**111300**	**110900**
31-35% Trucks	**53900**	**53500**	**54300**		**81600**	**81000**	**81400**		**109800**	**108900**	**108500**

MOUNTAIN (Level Terrain)	2 Lanes Per Direction				3 Lanes Per Direction				4 Lanes Per Direction		
	Urban	Suburban	Rural		Urban	Suburban	Rural		Urban	Suburban	Rural
0-5% Trucks	**56100**	**61400**	**62200**		**85000**	**92900**	**93300**		**114400**	**124900**	**124400**
6-10% Trucks	**54800**	**59900**	**60700**		**83000**	**90700**	**91100**		**111700**	**121900**	**121500**
11-15% Trucks	**53500**	**58500**	**59300**		**81100**	**88600**	**89000**		**109100**	**119100**	**118600**
16-20% Trucks	**52300**	**57200**	**58000**		**79200**	**86500**	**87000**		**106600**	**116400**	**115900**
21-25% Trucks	**51100**	**55900**	**56700**		**77500**	**84600**	**85000**		**104200**	**113800**	**113400**
26-30% Trucks	**50000**	**54700**	**55400**		**75800**	**82800**	**83200**		**102000**	**111300**	**110900**
31-35% Trucks	**49000**	**53500**	**54300**		**74200**	**81000**	**81400**		**99800**	**108900**	**108500**

MOUNTAIN (Rolling Terrian)	2 Lanes Per Direction				3 Lanes Per Direction				4 Lanes Per Direction		
	Urban	Suburban	Rural		Urban	Suburban	Rural		Urban	Suburban	Rural
0-5% Trucks	**53500**	**58500**	**59300**		**81100**	**88600**	**89000**		**109100**	**119100**	**118600**
6-10% Trucks	**50000**	**54700**	**55400**		**75800**	**82800**	**83200**		**102000**	**111300**	**110900**
11-15% Trucks	**47000**	**51400**	**52100**		**71100**	**77700**	**78100**		**95700**	**104500**	**104100**
16-20% Trucks	**44300**	**48400**	**49000**		**67000**	**73200**	**73600**		**90200**	**98500**	**98100**
21-25% Trucks	**41800**	**45700**	**46400**		**63400**	**69200**	**69600**		**85300**	**93100**	**92700**
26-30% Trucks	**39700**	**43400**	**44000**		**60100**	**65700**	**66000**		**80900**	**88300**	**87900**
31-35% Trucks	**37700**	**41200**	**41800**		**57100**	**62400**	**62700**		**76900**	**83900**	**83600**

Uses "Freeways" Facility Type in NCLOS
*** Assumes Regional K and D Factor Averages**

See Appendix A1 for HCM 2000 Freeway Equations
Use Appendix A2: Coastal Freeway Inputs for adjustments
Use Appendix A3: Piedmont Freeway Inputs for adjustments
Use Appendix A4: Mountain (Level) Freeway Inputs for adjustments
Use Appendix A5: Mountain (Rolling) Freeway Inputs for adjustments

NOTE: Truck percentage occurs within the peak hour, not a daily truck percentage

Level of Service D Standards for Expressways *

COASTAL	2 Lanes Per Direction			3 Lanes Per Direction			4 Lanes Per Direction		
	Urban	Suburban	Rural	Urban	Suburban	Rural	Urban	Suburban	Rural
0-5% Trucks	**47500**	**58500**	**58800**	**71200**	**87700**	**88300**	**95000**	**117000**	**117700**
6-10% Trucks	**46400**	**57100**	**57400**	**69500**	**85600**	**86200**	**92700**	**114200**	**114900**
11-15% Trucks	**45300**	**55800**	**56100**	**67900**	**83700**	**84200**	**90600**	**111500**	**112200**
16-20% Trucks	**44200**	**54500**	**54800**	**66400**	**81800**	**82200**	**88500**	**109000**	**109700**
21-25% Trucks	**43300**	**53300**	**53600**	**64900**	**79900**	**80400**	**86500**	**106600**	**107200**
26-30% Trucks	**42300**	**52100**	**52400**	**63500**	**78200**	**78700**	**84700**	**104300**	**104900**
31-35% Trucks	**41400**	**51000**	**51300**	**62100**	**76500**	**77000**	**82900**	**102100**	**102700**

PIEDMONT	2 Lanes Per Direction			3 Lanes Per Direction			4 Lanes Per Direction		
	Urban	Suburban	Rural	Urban	Suburban	Rural	Urban	Suburban	Rural
0-5% Trucks	**47500**	**58500**	**58800**	**71200**	**87700**	**88300**	**95000**	**117000**	**117700**
6-10% Trucks	**46400**	**57100**	**57400**	**69500**	**85600**	**86200**	**92700**	**114200**	**114900**
11-15% Trucks	**45300**	**55800**	**56100**	**67900**	**83700**	**84200**	**90600**	**111500**	**112200**
16-20% Trucks	**44200**	**54500**	**54800**	**66400**	**81800**	**82200**	**88500**	**109000**	**109700**
21-25% Trucks	**43300**	**53300**	**53600**	**64900**	**79900**	**80400**	**86500**	**106600**	**107200**
26-30% Trucks	**42300**	**52100**	**52400**	**63500**	**78200**	**78700**	**84700**	**104300**	**104900**
31-35% Trucks	**41400**	**51000**	**51300**	**62100**	**76500**	**77000**	**82900**	**102100**	**102700**

MOUNTAIN (Level Terrain)	2 Lanes Per Direction			3 Lanes Per Direction			4 Lanes Per Direction		
	Urban	Suburban	Rural	Urban	Suburban	Rural	Urban	Suburban	Rural
0-5% Trucks	**47500**	**53200**	**58800**	**71200**	**79800**	**88300**	**95000**	**106400**	**117700**
6-10% Trucks	**46400**	**51900**	**57400**	**69500**	**77900**	**86200**	**92700**	**103800**	**114900**
11-15% Trucks	**45300**	**50700**	**56100**	**67900**	**76100**	**84200**	**90600**	**101400**	**112200**
16-20% Trucks	**44200**	**49500**	**54800**	**66400**	**74300**	**82200**	**88500**	**99100**	**109700**
21-25% Trucks	**43300**	**48400**	**53600**	**64900**	**72700**	**80400**	**86500**	**96900**	**107200**
26-30% Trucks	**42300**	**47400**	**52400**	**63500**	**71100**	**78700**	**84700**	**94800**	**104900**
31-35% Trucks	**41400**	**46400**	**51300**	**62100**	**69600**	**77000**	**82900**	**92800**	**102700**

MOUNTAIN (Rolling Terrian)	2 Lanes Per Direction			3 Lanes Per Direction			4 Lanes Per Direction		
	Urban	Suburban	Rural	Urban	Suburban	Rural	Urban	Suburban	Rural
0-5% Trucks	**41200**	**50700**	**56100**	**61700**	**76100**	**84200**	**82300**	**101400**	**112200**
6-10% Trucks	**38500**	**47400**	**52400**	**57700**	**71100**	**78700**	**77000**	**94800**	**110400**
11-15% Trucks	**36100**	**44500**	**49200**	**54200**	**66700**	**73900**	**72200**	**89000**	**98500**
16-20% Trucks	**34000**	**41900**	**46400**	**51100**	**62900**	**69600**	**68100**	**83900**	**92800**
21-25% Trucks	**32200**	**39600**	**43900**	**48300**	**59500**	**65800**	**64400**	**79300**	**87700**
26-30% Trucks	**30500**	**37600**	**41600**	**45800**	**56400**	**62400**	**61000**	**75200**	**83200**
31-35% Trucks	**29000**	**35700**	**39600**	**43500**	**53600**	**59300**	**58000**	**71500**	**79100**

Uses "Multi-lane Highways" Facility Type in NCLOS
*** Assumes Regional K and D Factor Averages**

See Appendix B1 for HCM 2000 Multi-lane Highway Equations
Use Appendix B2: Coastal Expressway Inputs for adjustments
Use Appendix B3: Piedmont Expressway Inputs for adjustments
Use Appendix B4: Mountain (Level) Expressway Inputs for adjustments
Use Appendix B5: Mountain (Rolling) Expressway Inputs for adjustments

NOTE: Truck percentage occurs within the peak hour, not a daily truck percentage

Level of Service D Standards for Boulevards *

COASTAL	1 Lane Per Direction				2 Lanes Per Direction				3 Lanes Per Direction		
	Urban	Suburban	Rural		Urban	Suburban	Rural		Urban	Suburban	Rural
55 MPH	**21600**	**21900**	**24500**		**43300**	**43900**	**49000**		**64900**	**65800**	**73500**
45 MPH	**18900**	**19800**	**23600**		**38100**	**39700**	**47200**		**57200**	**59600**	**70800**
35 MPH	**14000**	**16900**			**28100**	**34300**			**42200**	**51700**	
25 MPH	**12500**				**25400**				**38400**		

PIEDMONT	1 Lane Per Direction				2 Lanes Per Direction				3 Lanes Per Direction		
	Urban	Suburban	Rural		Urban	Suburban	Rural		Urban	Suburban	Rural
55 MPH	**19900**	**20200**	**22600**		**40000**	**40500**	**45200**		**59900**	**60700**	**67900**
45 MPH	**17500**	**18300**	**21800**		**35100**	**36600**	**43600**		**52800**	**55000**	**65400**
35 MPH	**14000**	**15600**			**28100**	**31600**			**42200**	**47700**	
25 MPH	**12500**				**25400**				**38400**		

MOUNTAIN	1 Lane Per Direction				2 Lanes Per Direction				3 Lanes Per Direction		
	Urban	Suburban	Rural		Urban	Suburban	Rural		Urban	Suburban	Rural
55 MPH	**21600**	**21900**	**22300**		**43300**	**43900**	**44500**		**64900**	**65800**	**66800**
45 MPH	**18900**	**20700**	**21400**		**38100**	**41400**	**42900**		**57200**	**62100**	**64400**
35 MPH	**14000**	**18500**			**28100**	**37400**			**42200**	**56400**	
25 MPH	**12500**				**25400**				**38400**		

Uses "Principal Arterials" Facility Type in NCLOS
*** Assumes Regional K and D Factor Averages**

See Appendix C1 for HCM Urban Arterial Equations
Use Appendix C2: Coastal Boulevard Inputs for adjustments
Use Appendix C3: Piedmont Boulevard Inputs for adjustments
Use Appendix C4: Mountain Boulevard Inputs for adjustments

NOTE: Inputs assume 12-foot lanes. To adjust lane-width downward, subtract 3.33% per foot of pavement and round to the nearest hundred

Coastal Level of Service D Standards for Other Major Thoroughfares *

55 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	15100	15800	16400		16600	17200	17800
11 foot lanes	14600	15300	15900		16100	16600	17200
10 foot lanes	14100	14700	15300		15500	16100	16600
9 foot lanes	13600	14200	14800		15000	15500	16000
45 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	13200	13800	14600		14500	14900	16000
11 foot lanes	12800	13300	14100		14000	14400	15500
10 foot lanes	12300	12900	13600		13500	13900	15000
9 foot lanes	11900	12420	13140		13050	13400	14400
35 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	11100	12600			12700	14000	
11 foot lanes	10700	12200			12300	13500	
10 foot lanes	10400	11800			11900	13100	
9 foot lanes	10000	11300			11400	12600	
25 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	11000				12700		
11 foot lanes	10600				12300		
10 foot lanes	10300				11900		
9 foot lanes	9900				11400		

Uses "Principal Arterials" Facility Type in NCLOS

*** Decrease in Lane Width Capacity calculated via 2000 Highway Capacity Manual lane-width adjustment factor for saturation flow rate**

See Appendix D1 for HCM 2000 Urban Arterial Equations
Use Appendix D2: Coastal Major Thoroughfare Inputs for adjustments

NOTE: Lane Width is adjusted downward by 3.33% per less foot of pavement and rounded to the nearest hundred

Coastal Level of Service D Standards for Other Major Thoroughfares *

55 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	30400	31600	32800		33300	34500	35700
11 foot lanes	29400	30600	31700		32200	33400	34500
10 foot lanes	29400	29500	30600		31100	32200	33300
9 foot lanes	27400	28400	29500		30000	31100	32100
45 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	26700	27600	29300		29000	29900	32000
11 foot lanes	25900	26700	28300		28000	28900	30900
10 foot lanes	25000	25800	27300		27100	27900	29900
9 foot lanes	24000	24800	26400		26100	26900	29000
35 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	22200	25500			24300	28100	
11 foot lanes	21500	24700			23500	27200	
10 foot lanes	20700	23800			22700	26200	
9 foot lanes	20000	23000			21900	25300	
25 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	22100				24200		
11 foot lanes	21400				23400		
10 foot lanes	20500				22600		
9 foot lanes	19900				21800		

Uses "Principal Arterials" Facility Type in NCLOS

*** Decrease in Lane Width Capacity calculated via 2000 Highway Capacity Manual lane-width adjustment factor for saturation flow rate**

See Appendix D1 for HCM 2000 Urban Arterial Equations
Use Appendix D2: Coastal Major Thoroughfare Inputs for adjustments

NOTE: Lane Width is adjusted downward by 3.33% per less foot of pavement and rounded to the nearest hundred

Piedmont Level of Service D Standards
for Other Major Thoroughfares *

55 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	12900	14600	15100		14200	15900	16500
11 foot lanes	12500	14100	14600		13700	15400	16000
10 foot lanes	12000	13600	14100		13300	14800	15400
9 foot lanes	11600	13100	13600		12800	14300	14900
45 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	12200	12700	14600		13300	13800	16000
11 foot lanes	11800	12300	14100		12900	13300	15500
10 foot lanes	11400	11900	13600		12400	12900	14900
9 foot lanes	11000	11400	13100		12000	12400	14400
35 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	11100	11600			12700	12900	
11 foot lanes	10700	11200			12300	12500	
10 foot lanes	10400	10800			11900	12000	
9 foot lanes	10000	10400			11400	11600	
25 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	11000				12700		
11 foot lanes	10600				12300		
10 foot lanes	10300				11900		
9 foot lanes	9900				11400		

Uses "Principal Arterials" Facility Type in NCLOS

*** Decrease in Lane Width Capacity calculated via 2000 Highway Capacity Manual lane-width adjustment factor for saturation flow rate**

See Appendix D1 for HCM 2000 Urban Arterial Equations
Use Appendix D3: Piedmont Major Thoroughfare Inputs for adjustments

NOTE: Lane Width is adjusted downward by 3.33% per less foot of pavement

Piedmont Level of Service D Standards for Other Major Thoroughfares *

55 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	25800	29100	30200		28400	31800	33000
11 foot lanes	24900	28100	29200		27500	30800	31900
10 foot lanes	24100	27200	28200		26500	29700	30800
9 foot lanes	23200	26200	27200		25600	28600	29700
45 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	24600	25500	29300		26800	27600	32000
11 foot lanes	23800	24700	28300		25900	26700	31000
10 foot lanes	23000	23800	27300		25000	25800	29900
9 foot lanes	22100	23000	26400		24100	24800	28800
35 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	22200	23500			24300	26000	
11 foot lanes	21500	22700			23500	25100	
10 foot lanes	20700	21900			22700	24300	
9 foot lanes	20000	21200			21900	23400	
25 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	22100				24200		
11 foot lanes	21400				23400		
10 foot lanes	20600				22600		
9 foot lanes	19900				21800		

Uses "Principal Arterials" Facility Type in NCLOS

*** Decrease in Lane Width Capacity calculated via 2000 Highway Capacity Manual lane-width adjustment factor for saturation flow rate**

See Appendix D1 for HCM 2000 Urban Arterial Equations
Use Appendix D3: Piedmont Major Thoroughfare Inputs for adjustments

NOTE: Lane Width is adjusted downward by 3.33% per less foot of pavement and rounded to the nearest hundred

Mountain Level of Service D Standards for Other Major Thoroughfares *

55 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	14000	14600	15100		15300	15900	16500
11 foot lanes	13500	14100	14600		14800	15400	16000
10 foot lanes	13100	13600	14100		14300	14800	15400
9 foot lanes	12600	13100	13600		13800	14300	14900
45 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	12200	12700	14600		13300	13800	16000
11 foot lanes	11800	12300	14100		12900	13300	15500
10 foot lanes	11400	11900	13600		12400	12900	14900
9 foot lanes	11000	11400	13100		12000	12400	14400
35 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	11000	11600			12700	12900	
11 foot lanes	10600	11200			12300	12500	
10 foot lanes	10300	10800			11900	12000	
9 foot lanes	9900	10400			11400	11600	
25 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	11000				12700		
11 foot lanes	10600				12300		
10 foot lanes	10300				11900		
9 foot lanes	9900				11400		

Uses "Principal Arterials" Facility Type in NCLOS

*** Decrease in Lane Width Capacity calculated via 2000 Highway Capacity Manual lane-width adjustment factor for saturation flow rate**

See Appendix D1 for HCM 2000 Urban Arterial Equations
Use Appendix D4: Mountains Major Thoroughfare Inputs for adjustments

NOTE: Lane Width is adjusted downward by 3.33% per less foot of pavement and rounded to the nearest hundred

Mountain Level of Service D Standards for Other Major Thoroughfares *

55 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	28000	29100	30200		30800	31800	33000
11 foot lanes	27100	28100	29200		29800	30800	31900
10 foot lanes	26100	27200	28200		28700	29700	30800
9 foot lanes	25200	26200	27200		27700	28600	29700
45 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	24600	25500	29300		26800	27600	32000
11 foot lanes	23800	24700	28300		25900	26700	30900
10 foot lanes	23000	23800	27300		25000	25800	29900
9 foot lanes	22100	23000	26400		24100	24800	28800
35 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	22200	23500			24300	26000	
11 foot lanes	21500	22700			23500	25400	
10 foot lanes	20700	21900			22700	24300	
9 foot lanes	20000	21200			21900	23400	
25 MPH	2 Lanes Per Direction				2 Lanes Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	22100				24200		
11 foot lanes	21400				23400		
10 foot lanes	20600				22600		
9 foot lanes	19900				21800		

Uses "Principal Arterials" Facility Type in NCLOS

*** Decrease in Lane Width Capacity calculated via 2000 Highway Capacity Manual lane-width adjustment factor for saturation flow rate**

See Appendix D1 for HCM 2000 Urban Arterial Equations
Use Appendix D4: Mountains Major Thoroughfare Inputs for adjustments

NOTE: Lane Width is adjusted downward by 3.33% per less foot of pavement

Coastal Level of Service D Standards for Minor Thoroughfares *

55 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	15100	15800	16400		16600	17200	17800
11 foot lanes	14600	15300	15900		16100	16600	17200
10 foot lanes	14100	14700	15300		15500	16100	16600
9 foot lanes	13600	14200	14800		14900	15500	16000

45 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	12700	13300	14600		14200	14300	16000
11 foot lanes	12300	12900	14100		13700	13800	15500
10 foot lanes	11900	12400	13600		13300	13300	14900
9 foot lanes	11400	12000	13100		12800	12900	14400

35 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	10500	11000			11500	13700	
11 foot lanes	10200	10600			11100	13300	
10 foot lanes	9800	10300			10700	12800	
9 foot lanes	9500	9900			10400	12300	

25 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	10000				11300		
11 foot lanes	9700				10900		
10 foot lanes	9300				10500		
9 foot lanes	9000				10200		

Uses "Principal Arterials" and "Minor Arterials" Facility Types in NCLOS

*** Decrease in Lane Width Capacity calculated via 2000 Highway Capacity Manual lane-width adjustment factor for saturation flow rate**

See Appendix E1 for HCM 2000 Urban Arterial Equations
Use Appendix E2: Coastal Minor Thoroughfare Inputs for adjustments

NOTE: Lane Width is adjusted downward by 3.33% per less foot of pavement

Piedmont Level of Service D Standards
for Minor Thoroughfares *

55 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	12900	14600	15100		14200	15900	16500
11 foot lanes	12500	14100	14600		13700	15400	16000
10 foot lanes	12000	13600	14100		13300	14800	15400
9 foot lanes	11600	13100	13600		12800	14300	14900

45 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	11700	12200	14600		13100	13200	16000
11 foot lanes	11300	11800	14100		12700	12800	15500
10 foot lanes	10900	11400	13600		12200	12300	14900
9 foot lanes	10500	11000	13100		11800	11900	14400

35 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	10200	10200			11700	12700	
11 foot lanes	9900	9900			11300	12300	
10 foot lanes	9500	9500			10900	11900	
9 foot lanes	9200	9200			10500	11400	

25 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	10000				11300		
11 foot lanes	9700				10900		
10 foot lanes	9300				10500		
9 foot lanes	9000				10200		

Uses "Principal Arterials" and "Minor Arterials" Facility Types in NCLOS

*** Decrease in Lane Width Capacity calculated via 2000 Highway Capacity Manual lane-width adjustment factor for saturation flow rate**

See Appendix E1 for HCM 2000 Urban Arterial Equations
Use Appendix E3: Piedmont Minor Thoroughfare Inputs for adjustments

NOTE: Lane Width is adjusted downward by 3.33% per less foot of pavement

Mountain Level of Service D Standards
for Minor Thoroughfares *

55 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	14000	14600	15100		15300	15900	16500
11 foot lanes	13500	14100	14600		14800	15400	16000
10 foot lanes	13100	13600	14100		14300	14800	15400
9 foot lanes	12600	13100	13600		13800	14300	14900

45 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	11700	12200	14600		13100	13200	16000
11 foot lanes	11300	11800	14100		12700	12800	15500
10 foot lanes	10900	11400	13600		12200	12300	14900
9 foot lanes	10500	11000	13100		11800	11900	14400

35 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	10200	10200			11500	12700	
11 foot lanes	9900	9900			11100	12300	
10 foot lanes	9500	9500			10700	11900	
9 foot lanes	9200	9200			10400	11400	

25 MPH	1 Lane Per Direction				1 Lane Per Direction WCLTL		
	Urban	Suburban	Rural		Urban	Suburban	Rural
12 foot lanes	10000				11300		
11 foot lanes	9700				10900		
10 foot lanes	9300				10500		
9 foot lanes	9000				10200		

Uses "Principal Arterials" and "Minor Arterials" Facility Types in NCLOS

*** Decrease in Lane Width Capacity calculated via 2000 Highway Capacity Manual lane-width adjustment factor for saturation flow rate**

See Appendix E1 for HCM 2000 Urban Arterial Equations
Use Appendix E4: Mountain Minor Thoroughfare Inputs for adjustments

NOTE: Lane Width is adjusted downward by 3.33% per less foot of pavement

Level of Service D Standards for Rural 2-Lane Highways

Coastal 2-Lane Highway Standard	COASTAL		
	Minimum	Standard	Maximum
12-Foot Lanes	10500	12700*	14700*#
11-Foot Lanes	10000		
10-Foot Lanes	9200	12000	
9-Foot Lanes	7700	10700	

Piedmont 2-Lane Highway Standard	PIEDMONT		
	Minimum	Standard	Maximum
12-Foot Lanes	10300	12400*	14300*#
11-Foot Lanes	9900		
10-Foot Lanes	9000	11800	
9-Foot Lanes	7500	10500	

Mountain 2-Lane Highway Standard	MOUNTAINS (Level)		
	Minimum	Standard	Maximum
12-Foot Lanes	10200	12100*	14000*#
11-Foot Lanes	9800		
10-Foot Lanes	8800	11700	
9-Foot Lanes	7400	10300	

Mountain 2-Lane Highway Standard	MOUNTAINS (Rolling)		
	Minimum	Standard	Maximum
12-Foot Lanes	9600	12100*	14000*#
11-Foot Lanes	9100		
10-Foot Lanes	8200	11100	
9-Foot Lanes	6300	9800	

Uses "2-Lane Highways" Facility Type in NCLOS

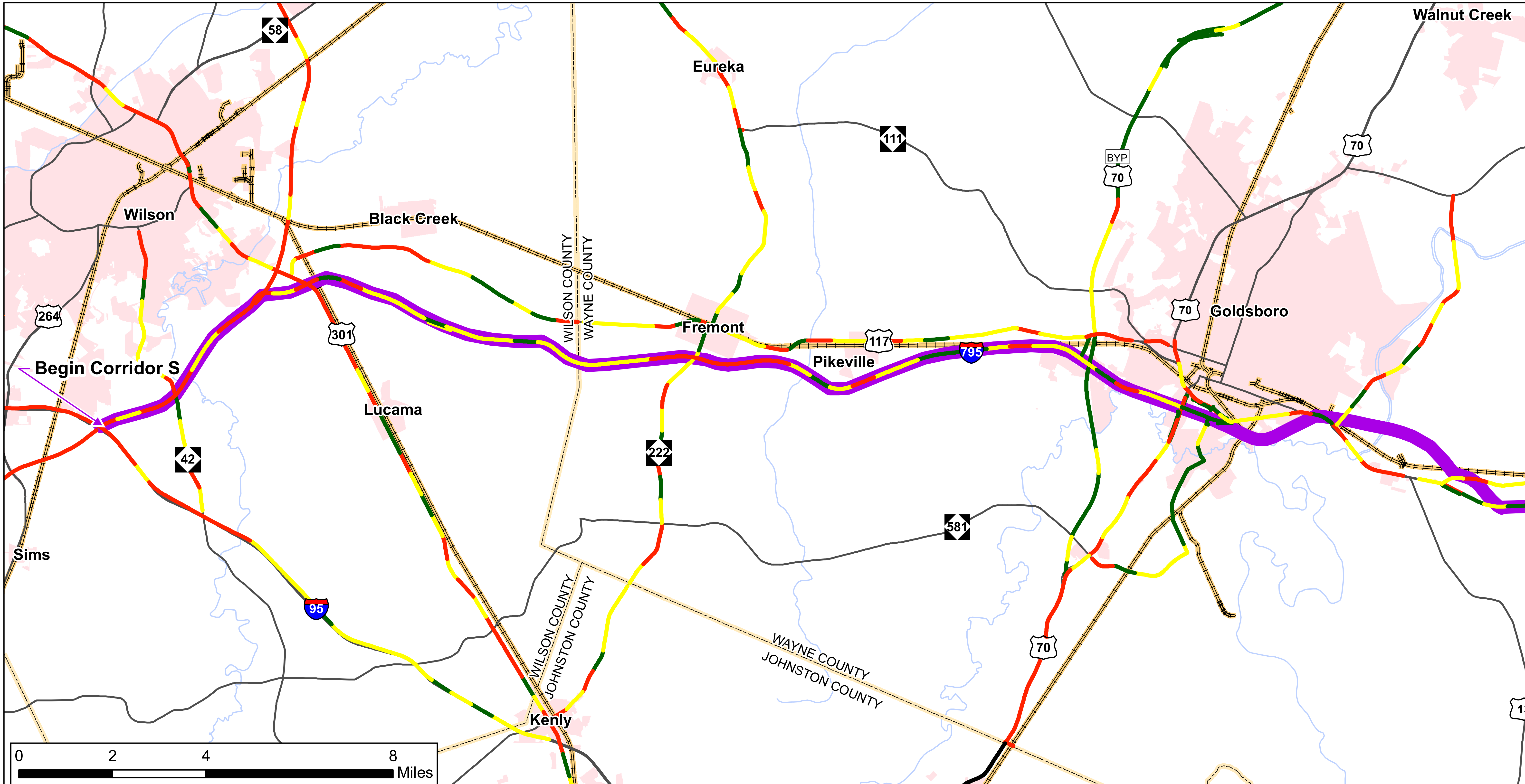
*** All capacities calculated based on HCM 2000 procedures using HCS software. Under some conditions, two-lane highway capacity is not affected by lane width. This occurs where capacity is governed by Percent Time Spent Following rather than by Average Travel Speed.**

 # Best-case/Maximum conditions are less likely to occur where lane widths are below 11 feet. Use caution before selecting "Maximum" values for 9-ft or 10-ft lanes.

See Appendix F1 for HCM 2000 2-Lane Highway Equations
Use Appendix F2: Coastal Rural 2-Lane Highway Inputs for adjustments
Use Appendix F3: Piedmont Rural 2-Lane Highway Inputs for adjustments
Use Appendix F4: Mountain (Level) Rural 2-Lane Highway Inputs for adjustments
Use Appendix F5: Mountain (Rolling) Rural 2-Lane Highway Inputs for adjustments

Appendix B

Safety Data



NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

JULY 2021

Source: NCOneMap, NCDOT GIS, ESRI

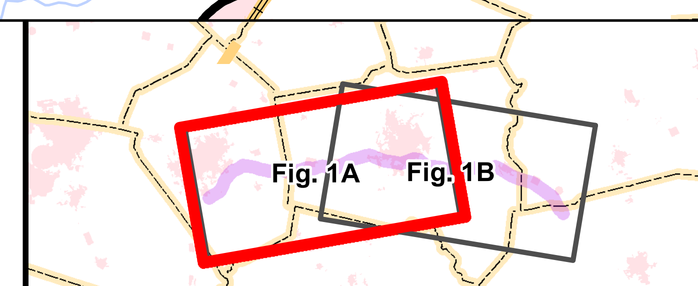
Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Rivers/Streams

Section Safety Scores (2015 - 2019)*

- 0 to 33
- 33 to 66
- 66 to 100
- Less than 60% Mileposted

- Major Water Bodies
- Municipal Boundary
- Counties

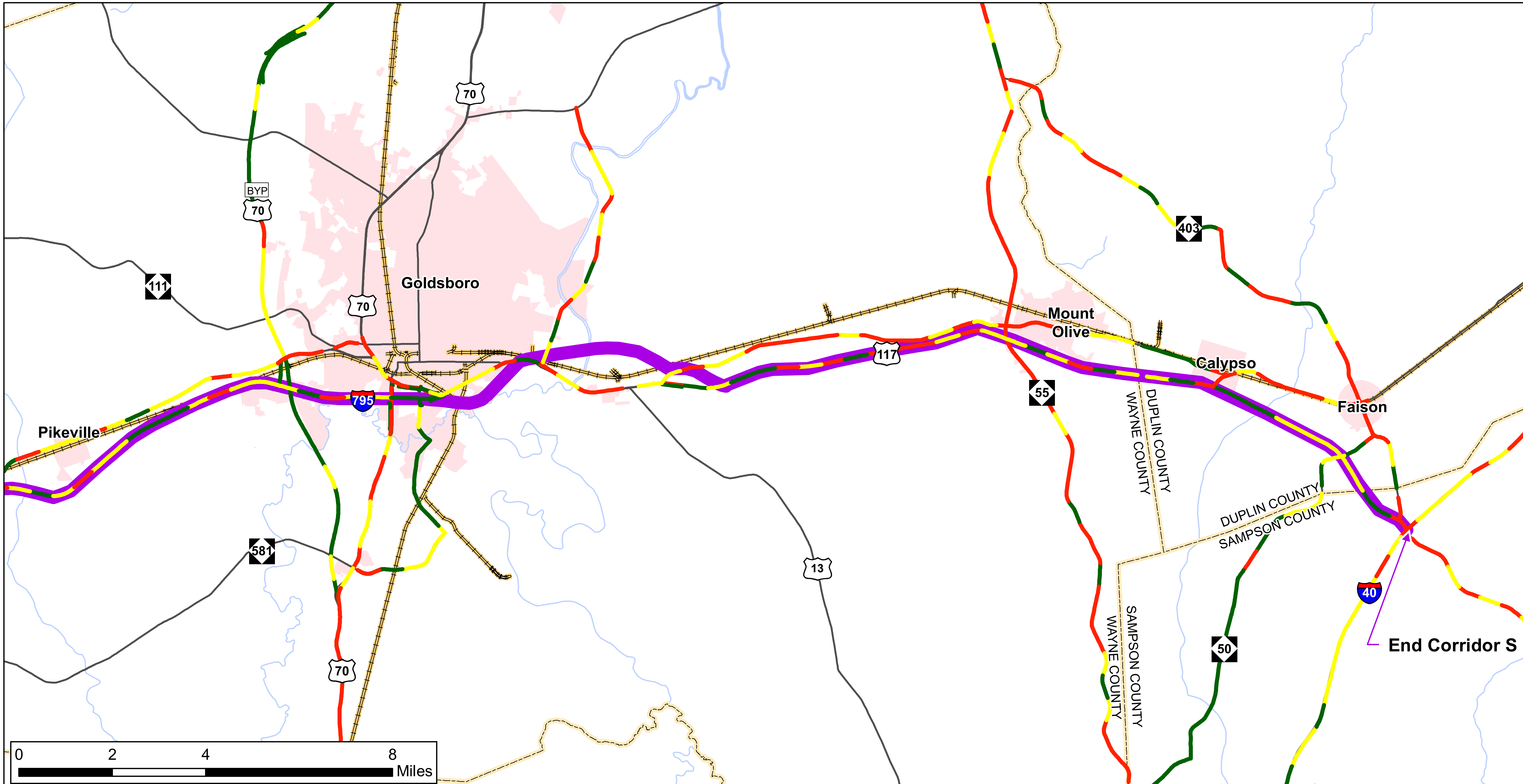


CORRIDOR S: SAFETY MAP

FUTURE I-795

FIGURE 1A: I-95/I-795 TO GOLDSBORO

*Safety scores are based on three components: the class density ratio, the severity index, and the critical crash rate ratio. The points are averaged and grouped into three point ranges where higher scores are considered to have the poorer highway safety performance. Routes having a mileposted crash percentage of 60% or lower were not scored.
Safety data is only displayed on STC Corridor P and relevant crossroads and parallel routes.



NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

JULY 2021

Source: NCOneMap, NCDOT GIS, ESRI

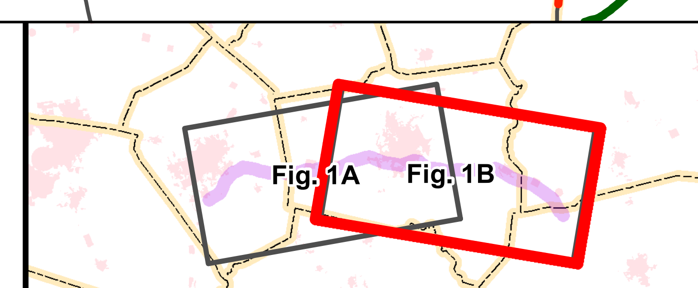
Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Rivers/Streams

Section Safety Scores (2015 - 2019)*

- 0 to 33
- 33 to 66
- 66 to 100
- Less than 60% Mileposted

- Major Water Bodies
- Municipal Boundary
- Counties



CORRIDOR S: SAFETY MAP

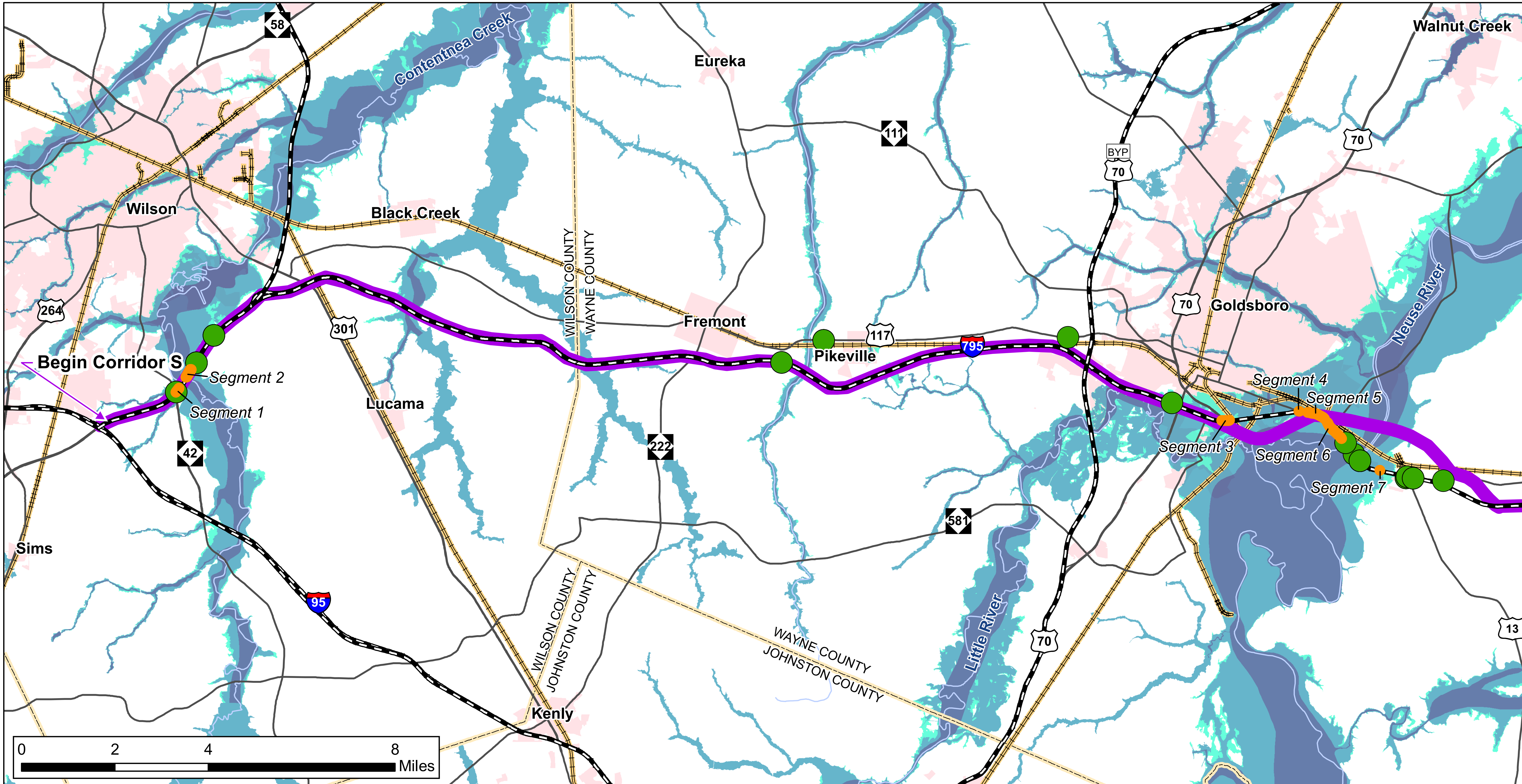
FUTURE I-795

FIGURE 1B: GOLDSBORO TO I-40

*Safety scores are based on three components: the class density ratio, the severity index, and the critical crash rate ratio. The points are averaged and grouped into three point ranges where higher scores are considered to have the poorer highway safety performance.
Routes having a mileposted crash percentage of 60% or lower were not scored.
Safety data is only displayed on STC Corridor P and relevant crossroads and parallel routes.

Appendix C

Resiliency Data



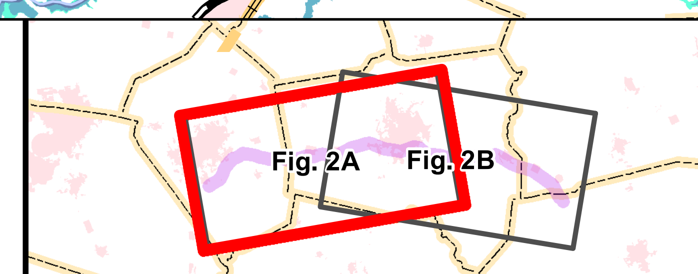
NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

JULY 2021

Source: NCOneMap, NCDOT GIS, ESRI

Legend

- STC Highway Corridor S
- Evacuation Route
- Interstate
- U.S./N.C. Route
- Rail
- Major Rivers/Streams
- Flood Incident*
- **Road Inundation Incident****
- 100- Year Storm Event Incident
- Major Water Bodies
- 500-Year Floodplain
- 100-Year Floodplain
- Floodway
- Municipal Boundary
- Counties



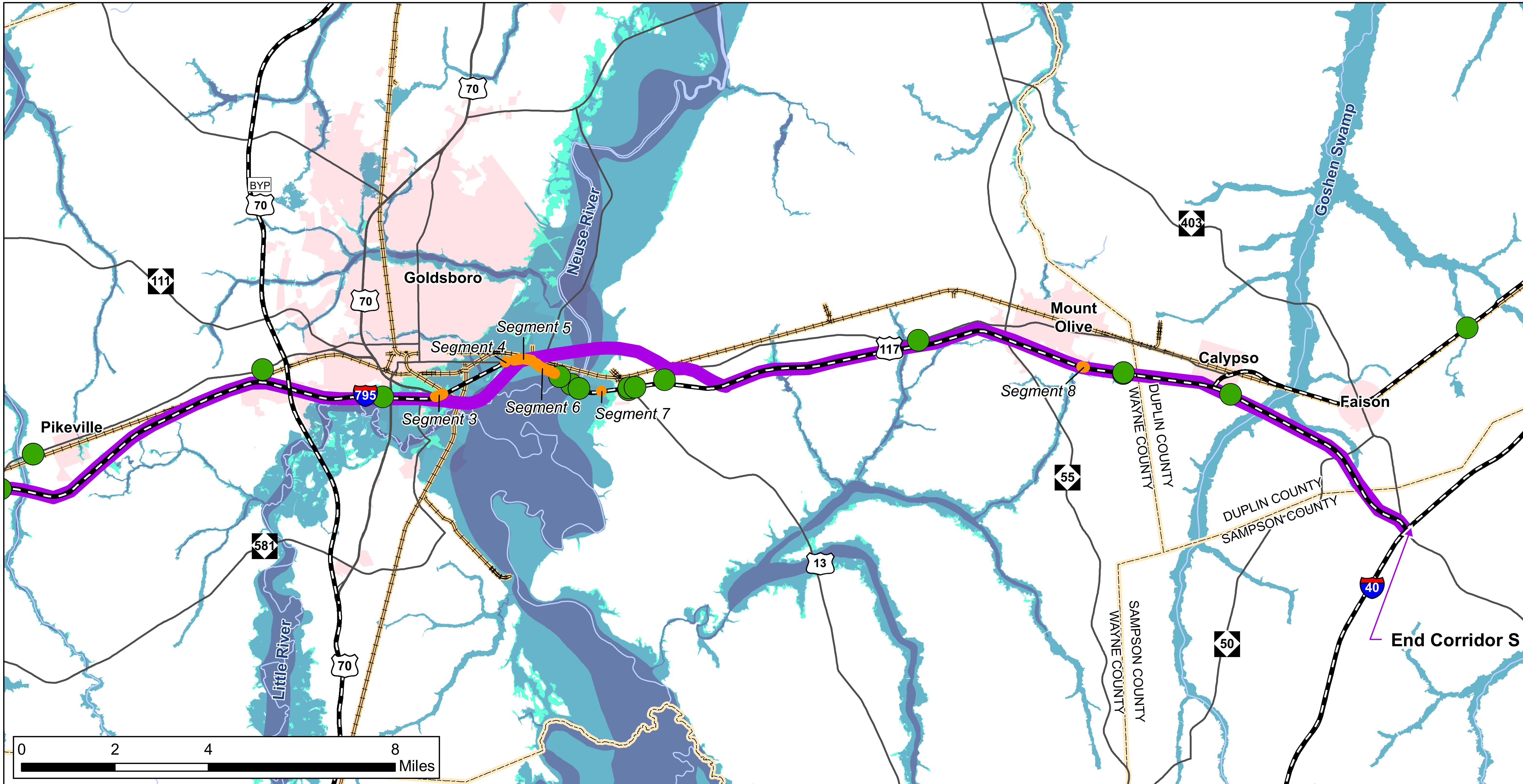
CORRIDOR S: RESILIENCY MAP

FUTURE I-795

FIGURE 2A: I-95/I-795 TO GOLDSBORO

*Flood Incidents represent historic flood events catalogued in the NCDOT Drive N.C. database from 2011-2019.

**Road Inundation Incidents are displayed at the 100-year recurrence interval. Segments are defined based on clusters of 100-year recurrence interval incidents. Road Inundation Incidents displayed on this map are those only within 10 miles of the Corridor.



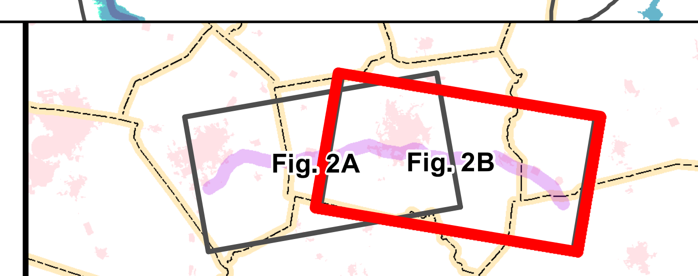
NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

JULY 2021

Source: NCOneMap, NCDOT GIS, ESRI

Legend

- STC Highway Corridor S
- Evacuation Route
- Interstate
- U.S./N.C. Route
- Rail
- Major Rivers/Streams
- Flood Incident*
- **Road Inundation Incident****
- 100- Year Storm Event Incident
- Major Water Bodies
- 500-Year Floodplain
- 100-Year Floodplain
- Floodway
- Municipal Boundary
- Counties



CORRIDOR S: RESILIENCY MAP

FUTURE I-795

FIGURE 2B: GOLDSBORO TO I-40

*Flood Incidents represent historic flood events catalogued in the NCDOT Drive N.C. database from 2011-2019.

**Road Inundation Incidents are displayed at the 100-year recurrence interval. Segments are defined based on clusters of 100-year recurrence interval incidents. Road Inundation Incidents displayed on this map are those only within 10 miles of the Corridor.

Appendix D

NCDOT Guidelines for Drainage Studies and Hydraulic Design Chapter 7

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

GUIDELINES FOR DRAINAGE STUDIES AND HYDRAULIC DESIGN

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STATE HYDRAULICS ENGINEER

NOVEMBER 21, 2016

7 HYDROLOGY

7.1 Introduction

The hydrologic analysis phase involves the determination of discharge rates and volumes of runoff that drainage facilities will be required to convey. Acceptable hydrologic methods for highway drainage studies and applicable criteria for their use are discussed in this chapter. When the project site involves a FEMA-regulated stream, discharge methods and values provided in the effective published Flood Insurance Study (FIS) report should be used for determining compliance with National Flood Insurance Program (NFIP) regulations (29). (This may result in the need for additional hydraulic modeling to meet NCDOT design criteria, so there may be both a model for NFIP compliance as well as a design model for the NCDOT project.) The results from any hydrological procedure should be calibrated with historical site information. The design engineer should also consider potential future land use changes within a watershed over the life of a roadway structure and include this effect when estimating design discharges.

7.2 Drainage Area Determination

There are a variety of sources for obtaining drainage area data, including USGS topographic contour maps, published lists of drainage areas from study reports (such as FEMA Flood Insurance Studies and USGS water data reports), archived NCDOT Bridge and Culvert Survey and Hydraulic Design Reports (BSR, CSR; Appendix E), digital elevation data (such as Light Detection and Ranging, or LiDAR, data), and the relatively new USGS StreamStats web-based GIS application for North Carolina, which utilizes Digital Elevation Models (DEMs) based on LiDAR data and a combination of local resolution stream data and National Hydrography Datasets (NHD) for automated computation of drainage areas (and other basin characteristics). Drainage areas should be verified during project field review. The design engineer of record is responsible for verifying the accuracy of the drainage area regardless of the method used to obtain it.

7.2.1 USGS StreamStats

StreamStats is a web-based GIS application (http://water.usgs.gov/osw/streamstats/north_carolina.html) that was released by USGS in 2012. It allows users to easily obtain streamflow statistics, basin characteristics, etc., for USGS gage data collection stations and for user-selected ungaged locations. The application will delineate the drainage area at user-selected stream locations. The website includes comprehensive instructions and associated help files (including *Getting Started* and *Quick Tour* links). Users are advised to review and familiarize themselves with this information before attempting to use the application.

7.2.2 USGS Quadrangle Maps

USGS topographic mapping is available through the *National Map Viewer* website http://nationalmap.gov. Additionally, a GIS web map service (WMS) called USA_Topo_Maps provides a base map of national coverage of USGS topographic contour mapping.

7.2.3 Digital Elevation Data

Several sources of digital elevation data are available. The primary and most current, accurate, and readily available data is in the MicroStation TIN (triangular irregular network) file (supplied by NCDOT Location & Surveys and Photogrammetry Units) for the specific project area. However, this coverage is often inadequate for hydrologic studies, so it may need to be supplemented with other digital elevation data sources, such as LiDAR coverage or USGS Digital Elevation Models. Further details on each of these are discussed below.

7.2.3.1 MicroStation TIN Files

NCDOT's Location and Surveys Unit and Photogrammetry Unit collaborate to produce the final survey files for NCDOT projects, including planimetric mapping, digital terrain models (DTMs), and associated TIN files. The DTM file is first generated from processing the raw survey data; then, the DTM file is used to generate a TIN file to represent the existing ground surface. Often, the original TIN files provided for a project do not provide adequate geographical coverage for hydrologic analyses (e.g. offsite drainage), so supplemental digital elevation data may be used to generate additional TIN file coverage that can be merged with the original TIN.

7.2.3.2 LiDAR Data

One supplemental source of digital elevation data available in North Carolina is the statewide Light Detection and Ranging (LiDAR) coverage that was developed for the NC Floodplain Mapping Program (FMP). The entire state has been mapped using LiDAR techniques to collect digital elevation data. These data and corresponding metadata are available for download, and can be accessed from FMP's website (http://www.ncfloodmaps.com).

7.2.3.3 USGS Digital Elevation Models and Local Government Topographic Data

Digital elevation model (DEM) data are available from the USGS National Elevation Dataset (NED). Procedures on how these data can be downloaded are provided on the *National Map Viewer* website (see 7.2.2). These DEMs may prove most useful for areas in bordering states; however, within the state, NC FMP's LiDAR coverage will likely be more current, higher resolution, and accurate than that available from the NED. Additionally, large municipalities and some counties have developed topographic and elevation data which may be publically available for use in drainage area determination.

7.2.4 Archived NCDOT Bridge and Culvert Survey and Hydraulic Design Reports

There are thousands of bridge and culvert design reports archived at the Hydraulics Unit (hardcopies and PDF electronic copies). They provide valuable hydrologic and hydraulic information, such as drainage area size, as well as discharge rates and associated computed water surface elevations, methods used for computations, flood history records, etc. Information provided on these reports are only as accurate as methods and technology available as of the date of the report. It is the design engineer's responsibility to verify the information on the report before relying on it.

7.2.5 FEMA Flood Insurance Studies

FEMA Flood Insurance Study (FIS) reports' Summary of Discharges Tables are a good source for drainage areas and associated computed discharges for the FEMA hydraulic models. (See Section 7.4.1 for more information.)

7.3 Peak Discharge Design Frequency

Design frequency for NCDOT drainage structures is determined based on the roadway classification, traffic volume, level of service, flooding potential to properties, maintenance cost, etc. A summary of design frequencies that are typically used for NCDOT roadway drainage facilities is provided in Table 7-1. Consideration for site-specific conditions, such as upstream or downstream potential property impacts, existing level of service provided, length of time a temporary detour will be in place, etc. may warrant exceptions to these and should be discussed and agreed upon, preferably during the pre-design review.

<table>
<tr><td rowspan="3">ROADWAY CLASSIFICATION</td><td colspan="4">FREQUENCY (years)</td></tr>
<tr><td rowspan="2">Bridges, Culverts and Cross Pipes</td><td colspan="2">Storm Drain System</td><td rowspan="2">Ditches</td></tr>
<tr><td>On Grade</td><td>At Sags (without relief)</td></tr>
<tr><td>Major Arterials (e.g. Interstates, US, NC Routes)</td><td>50</td><td>10</td><td>50</td><td>10</td></tr>
<tr><td>Minor Arterials, Collectors, and Local Roads</td><td>25</td><td>10</td><td>25</td><td>10</td></tr>
<tr><td>Temporary/Detours</td><td>10</td><td>-</td><td>-</td><td>10</td></tr>
</table>

Table 7-1 Design Frequency

7.4 Peak Discharge Estimates

The design engineer should select from a number of acceptable peak discharge methods, depending upon the site's watershed characteristics. Table 7-2 lists peak discharge methods which are acceptable for NCDOT hydrologic studies. It also references the NCDOT Highway Hydrologic Charts (digitally corrected reproduction of the 1973 State Highway Commission Charts), which are applicable for limited use as discussed in Section 7.4.4 and Appendix C. It is the hydraulic engineer's responsibility to apply sound engineering judgment and to provide documented justification of methods used. Reported discharges should be expressed to two significant figures for 0.1 cfs to 10,000 cfs, and if higher, to three significant figures (examples: round 135.22 to 140; round 13,522 to 13,500), unless specifying discharges cited identically from a published FEMA Flood Insurance Study report.

Feature \ Hydrologic Methods	FIS (for NFIP compliance)	USGS Methods	Rational Method (up to 20 ac)	NCDOT Hwy. Hydrologic Charts	NRCS Method (for routing)
Bridges	X	X			X
Culverts	X	X			X
Storm Drain Systems			X	X	X
Cross Pipes (≤ 72 in. dia.)	X	X	X	X	X
Gutter Spread			X		
Ditches and Channels	X	X	X	X	
BMP Devices			X		X
Natural Stream Design	X	X	X		X
Storage Facilities					X
Floodplain Impacts	X	X			X

Table 7-2 Peak Discharge Method Selection

7.4.1 FEMA Flood Insurance Study

If a project study site is on a FEMA-regulated stream that is included in a published effective FEMA FIS, then the discharges specified in the FIS Summary of Discharges table should be used in the hydraulic model to demonstrate FEMA regulatory compliance. Those streams which were studied by detailed methods will typically list computed discharges for the 10- , 50 - , 100-, and 500-year recurrence intervals. Streams studied by limited detailed methods will only list the 100-year discharge.

Copies of effective FIS reports can be viewed and downloaded online from NC Floodplain Mapping Program's (NC FMP) website (http://www.ncfloodmaps.com).

7.4.2 USGS Stream Gage Analysis

Precedence should be given to analysis of the published stream gage data records when a USGS gage exists at or near the study site. Published North Carolina flood frequency statistics from continuous record USGS gages are available from the Flood-Frequency Statistics USGS Gaged Sites web link (http://nc.water.usgs.gov/flood/floodstats/gaged/index.html) on the NCDOT Hydraulics Unit website (https://connect.ncdot.gov/resources/hydro/pages/default.aspx).

7.4.2.1 Peak Discharge Estimation at Gaged Site

The above USGS website provides three types of statistical peak discharge estimates. The first is computed by fitting the recorded annual regulated peak flows to the log-Pearson Type III distribution using a localized computed sample skew. A second estimate that is provided is computed from the appropriate regionalized regression equation developed for the hydrologic area of the gage station location. The third, and presumably most accurate and reliable estimate provided combines the results of the first two into a weighted estimate for that gage station. Details on how these estimates are computed are discussed in USGS report SIR 2009-5158 (4). This report also discusses how flood-frequency peak discharge estimates at gaged sites can be adjusted (by transposition) to ungaged sites, as summarized in the following guidance.

7.4.2.2 Peak Discharge Estimation at Ungaged Site near Gaged Site

If the study site is not located at the location of a reference stream gage station on the same stream, and the drainage area at the study location is within fifty percent (50%) of that of the reference gage station, it is acceptable to adjust (or transposition) the discharge from the gage station to compute discharge estimates at the study location. The recommended method for peak discharge transposition is detailed in USGS report SIR 2009-5158 (4). This method is not recommended if the difference in drainage areas between the two locations is greater than fifty percent (50%). If the ungaged site is located between two gaged stations on the same stream, two peak discharge estimates can be made using the above procedure and hydrologic judgment applied to determine which is the more appropriate of the two.

7.4.2.3 Peak Discharge Estimation at Ungaged Site

In 2012, USGS launched the North Carolina StreamStats application website. In addition to the recommended use of this application for its automated drainage area delineation capabilities (see 7.2.1), this application is also recommended for use in computing discharges from USGS regression equations at ungaged sites. Rural discharge estimates are computed from the rural regional regression equations presented in SIR 2009-5158 (4). Urban and small rural basin discharge estimates are computed from the regression equations presented in reports SIR 2014-5030 (62), WRI 96-4084 (5), or USGS Fact Sheet 007-00 (63), as applicable. In the event that the StreamStats website is unavailable, refer to guidance in the referenced reports.

7.4.3 Rational Method

The Rational Method estimates the peak discharge (Q) in cubic feet per second (cfs) as a function of drainage area (A) in acres, mean rainfall intensity (I) in inches per hour (for a duration equal to the time of concentration, t_c), and a dimensionless runoff coefficient (C). The Rational Formula is Q = CIA.

NRCS methods (49) for calculating t_c should be used. Minimum value for t_c should be 10 minutes. An upper limit of 20 acres drainage area is recommended for applicability of this method.

7.4.3.1 Rational Runoff Coefficient

The value of the runoff coefficient (C) increases with the imperviousness of the surface cover. Table 7-3 provides some commonly used values for various surface types (7). The higher values in the ranges shown should be used when the terrain slope is steep. Less permeable soils warrant higher range C values. Likewise, areas such as grassed medians and berms behind curb and gutter may also warrant higher C value because of reduced permeability due to soil compaction performed during construction.

TYPE OF SURFACE	C
Pavement	0.7 - 0.9
Gravel surfaces	0.4 - 0.6
Industrial areas	0.5 - 0.9
Residential (Single-family)	0.3 - 0.5
Residential (Apartments, etc.)	0.5 - 0.7
Grassed, steep slopes	0.3 - 0.4
Grassed, flat slopes	0.2 - 0.3
Woods / Forest	0.1 - 0.2

Table 7-3 Typical Rational Runoff Coefficients

7.4.3.2 Rainfall Intensity

Rainfall intensity (I) data can be obtained from the NOAA Atlas 14 published report (47) and corresponding Precipitation Frequency Data Server (PFDS) website, where "I" values are tabulated for a range of durations and storm event frequencies at user-selected locations. In the PFDS table, the duration which is closest to the computed time of concentration (t_c) value will be used to obtain the corresponding "I" value to use in the Rational Formula. A minimum t_c of ten (10) minutes should be used.

The website to access the PFDS is: http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html
See Appendix Q for an example of how to use the PFDS to find rainfall intensity values for a given project location.

Intensity values in GEOPAK Drainage (68) are hard coded into the Drainage Library and may not exactly match the NOAA Atlas 14 values for a given location, but should be relatively close. For routine storm drain system design, use the intensity values generated within GEOPAK Drainage.

7.4.4 NCDOT Highway Hydrologic Charts

The NCDOT Highway Hydrologic Charts, corrected and digitally reproduced from the 1973 State Highway Commission charts, are provided in Appendix C. They should primarily be used for sizing of small pipes.

7.4.5 NRCS Method – Storage Routing

Natural Resources Conservation Service (NRCS, formerly Soil Conservation Service) methods, presented in TR-55 (49) and TR-20 (48), are recommended for hydrographic storage routing. The TR-55 manual presents simplified hydrologic procedures for estimating flood hydrographs and peak discharges in small watersheds. The model begins with a rainfall uniformly imposed on the watershed over a specified time. Mass rainfall is then converted to mass runoff by using a runoff curve number (CN) which is based on soil type, land cover, impervious area, surface storage, infiltration rate, etc. Runoff is then converted to a hydrograph to develop peak discharges applying hydrograph routing procedures, runoff travel time, etc. TR-20 provides computer-aided hydrologic analyses for estimating flood hydrograph peak discharges in both small and large watersheds. For current soils data, the NRCS Web Soil Survey website is recommended (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm). Public domain software programs available from the Army Corps of Engineers Hydraulic Engineering Center (HEC) or NRCS are acceptable to perform hydrograph calculations and routing. Other hydrograph methods supported by FHWA and AASHTO (1,2,7) may be used with approval of the State Hydraulics Engineer.

7.5 Accuracy of Hydrologic Estimates

The USGS scientists used various statistical methods to perform hydrologic analysis to develop regression equations for estimating peak discharges for both gaged and ungaged sites. It takes into account the complex geomorphic system of precipitation, evaporation, evapotranspiration, infiltration, overland flow, impoundments, channel flow, etc. The hydrologic analysis is not an exact science. The accuracy of the estimated discharges may vary significantly depending on location and other contributing factors. For example, the average standard error for the 10-year peak discharge in the Piedmont region is 25%; whereas, it is 73% for the 500-year peak discharge in the Sand Hills region (62).

It can be argued that some hydrologic methods are more accurate than others; however, estimated discharges should be calibrated to locally observed or measured events. Methods should be applied within their limits of applicability and with understanding of the underlying assumptions and hydrologic principles supporting them. While detailed hydrologic analysis is not practicable and would be beyond the scope expected in normal NCDOT hydraulic engineering practice, the design engineer is encouraged to calibrate the results from any hydrologic procedure to historical data. For bridge hydraulic analysis (see Chapter 8), these NCDOT *Guidelines* recommend that comparison be made to at least one historical occurrence.

Appendix E

Truck Transportation Data

Table of Contents

Tables

Figures

Freight Demand and Destination Data

Freight demand and destination data was derived from three sources, detailed below.

1. **STC activity centers** – NCDOT guidelines for the STC contain categories of landmarks, destinations, and major hubs identified as "activity centers." These activity centers include destinations and land uses that will likely have higher demand for trucks than other destinations, including military bases, major airports, colleges/universities, and hospitals, among others. These activity centers were identified because of their dependence on the corridor for the shipping and receiving of goods via trucks, among other things.
2. **Stakeholder organizations** – The NCDOT project team developed a list of stakeholder organizations, including rail and freight representatives, economic development groups, and major employers with 500 or more employees. The stakeholder organizations that have a large facility were included as a freight destination.
3. **Additional freight intensive land uses** – Other land uses that would have higher demand for truck traffic, such as factories and distribution centers, were identified along the corridor through a desktop review of satellite imagery.

Freight destinations within 25 miles of the corridor were mapped (see **Figure 3A-3B**) and are listed in **Table E-1**.

Table E-1. Freight Demand and Destination Data – Corridor S

Location Name	Type	Source*
Wilson County		
Bridgestone Firestone	Manufacturing/Distribution Center	2
Wilson Medical Center	Hospital/Medical Center	2
Alliance One International Inc	Manufacturing/Distribution Center	3
Refresco Beverages	Manufacturing/Distribution Center	3
Collins Aerospace	Industrial/Business Park	3
Wayne County		
Seymour Johnson Airforce Base	Military Camp	1
Cherry Hospital	Hospital/Medical Center	3
Wayne UNC Health Care	Hospital/Medical Center	3
University of Mount Olive	College/University	2
O'Berry Neuro-Medical Treatment Center	Hospital/Medical Center	3
Case Farms Goldsboro Division	Manufacturing/Distribution Center	2
Seymour Johnson Air Force Base Education Center and Library	Military Camp	1
Alliance One International Inc	Manufacturing/Distribution Center	3
Best Distributing Company	Manufacturing/Distribution Center	3
Southern Pine Sawmill	Factory	3
Smithfield Packing Co Inc	Factory	2
Sampson County		
Sampson Community College	College/University	2
Enviva Pellets Sampson, LLC	Manufacturing/Distribution Center	3
Duplin County		
House of Raeford Farms Inc	Factory	2
Bay Valley Foods	Factory	3

**Note: The source number corresponds to the following types of freight destinations:*

1. *STC Activity Centers*
2. *Stakeholder organizations*
3. *Additional freight intensive uses*

Truck Parking Data

Truck drivers are required to have a 30-minute break every 8 hours and to stop driving after 14 consecutive hours due to federal hours of service (HOS) requirements. While helping to improve safety, these requirements often result in drivers searching for parking at predictable time intervals, typically at night. This puts a strain on key freight corridors that have insufficient truck parking relative to demand. When drivers can't find spaces at designated truck parking areas, they are faced with the following options:

- Parking in unauthorized and unsafe locations, such as abandoned parking lots or on freeway shoulders, that put personal safety of the driver at risk, or
- Continuing driving and run the risk of getting a citation for driving past the maximum allowable hours of service or driving while fatigued and getting into a harmful accident.

Table E-2 shows truck parking supply and availability along the corridor. Data was gathered as part of the North Carolina Truck Parking Study (January 2017). The table includes the name of the truck parking facility, the County, whether it is publicly or privately owned, and the number of spaces at the facility. For each facility, truck parking utilization is shown in **Figures 3A-3B** and in the table below. Truck parking facilities with "full utilization" are those that are fully occupied at least Monday through Friday.

Table E-2. Truck Parking Facility Data – Corridor S

Location Name	Address	Facility Type	Number of Spaces	Utilization[1]
Wilson County				
Kangaroo Express	4940 Raleigh Rd Pkwy W, Wilson, NC 27896	Private	10	Full Utilization
Wayne County				
Downeast Truck Stop	2600 US-117, Goldsboro, NC 27530	Private	20	Available Spaces
Kangaroo Express	2035 US Hwy 70 W, Goldsboro, NC 27530	Private	12	Full Utilization

[1] Based on 2017 Truck Parking Study

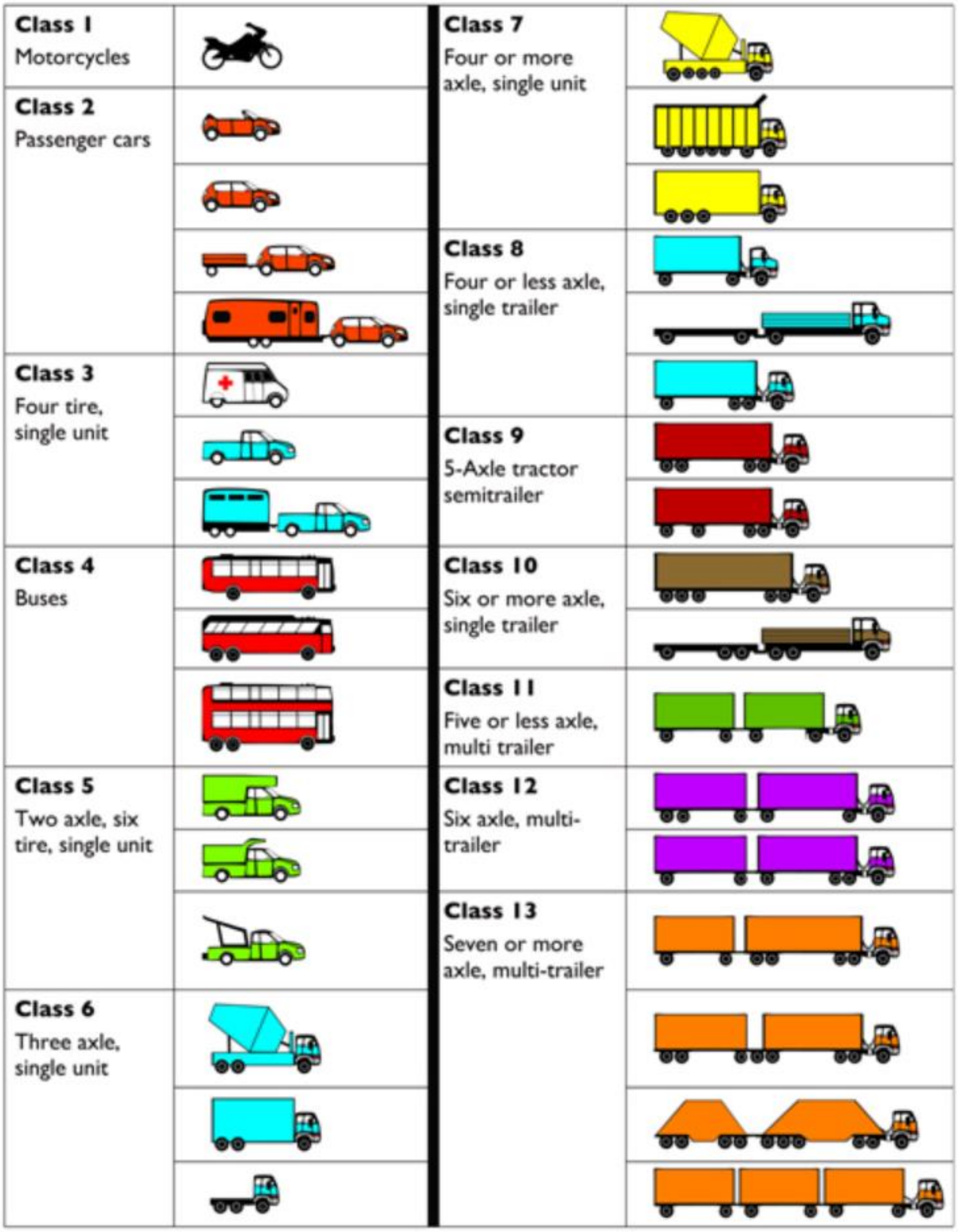
Truck Percentage Data

This appendix presents 2015 and 2019 truck percentage data for Corridor S of the North Carolina STC. Truck percentage data in Error! Reference source not found. is presented using the Annual Average Daily Traffic (AADT) GIS data the from N CDOT and is organized numerically by Route ID within each county. Route IDs correspond to individual segments of the roadway and are used by NCDOT to collect and organize traffic data; the Route IDs used for this report are based on the 2019 Route IDs and milepost segment limits. 2015 AADT and truck percentage data is included for the corresponding 2019 Route ID where it is available. The AADT data represent all vehicles counted for each Route ID, and the total truck percentages include both Single Unit trucks (FHWA Class 4 – 7) and Multi Unit Trucks (FHWA Class 8 – 13) (see Error! R eference source not found.**Table E-4** for examples of each vehicle class). Truck data is only collected on segments of routes included in the National Highway System (NHS) and the North Carolina Truck Network. Truck percentage data on parallel corridors is included for locations where AADT data is not available on the STC corridor. Truck percentages (based on 2019 data) are shown in **Figures 3A-3B**.

Table E-3. Truck Percentage – 2019 and 2015 Annual Average Daily Traffic

Route ID	Route	Beginning Milepost	End Milepost	2015 Annual Average Daily Traffic (AADT)	2015 Total Truck Percentage	2019 Annual Average Daily Traffic (AADT)	2019 Total Truck Percentage	Change in Truck Percentage from 2015 to 2019
Wilson County								
10000795098	Interstate 795	0	2.544	17000	0.11%	17000	0.09%	-0.02%
10000795098	Interstate 795	2.544	6.235	17000	0.11%	17500	0.09%	-0.02%
10000795098	Interstate 795	6.813	7.6	11000	0.11%	6200	0.11%	0.00%
10000795098	Interstate 795	7.6	8.448	32000	0.13%	35500	0.10%	-0.03%
10000795098	Interstate 795	8.448	10.145	31000	0.13%	34500	0.10%	-0.03%
10000795098	Interstate 795	10.145	11.907	28000	0.13%	31500	0.10%	-0.03%
Wayne County								
10000795096	Interstate 795	0	2.193	17000	0.11%	17000	0.12%	0.01%
10000795096	Interstate 795	2.193	7.085	18000	0.11%	18500	0.09%	-0.02%
10000795096	Interstate 795	7.085	11.046	18000	0.11%	18000	0.09%	-0.02%
10000795096	Interstate 795	11.046	13.551	17000	0.11%	17000	0.09%	-0.02%
37000581096	NC-581	0	0.62	16000	0.00%	17000	0.14%	0.14%
20000117096	US-117	0	0.32	12000	0.13%	12500	0.15%	0.02%
20000117096	US-117	0.32	1.19	12000	0.13%	12000	0.15%	0.02%
20000117096	US-117	1.19	1.97	12000	0.13%	12500	0.15%	0.02%
20000117096	US-117	1.97	2.937	14000	0.13%	10500	0.15%	0.02%
20000117096	US-117	2.937	4.846	15000	0.10%	13000	0.14%	0.04%
20000117096	US-117	4.846	6.906	18000	0.10%	13500	0.14%	0.04%
20000117096	US-117	6.906	10.496	16000	0.10%	15500	0.14%	0.04%
30000581096	NC-581	8.378	8.88	16000	0.12%	17000	0.14%	0.02%
20000117096	US-117	10.496	11.206	17000	0.09%	18000	0.11%	0.02%
20000013096	US-13	15.86	16.865	24000	0.08%	24000	0.08%	0.00%
20000013096	US-13	16.865	17.899	31000	0.08%	30500	0.08%	0.00%
20000013096	US-13	17.899	18.793	28000	0.09%	31000	0.08%	-0.01%
20000013096	US-13	18.793	19.826	27000	0.09%	26000	0.11%	0.02%
20000013096	US-13	19.826	20.216	33000	0.09%	32000	0.11%	0.02%
Duplin County								
27000117031	US-117	0	0.859	8300	0.17%	9600	0.18%	0.01%
27000117031	US-117	0.859	4	7100	0.16%	8900	0.18%	0.01%
20000117031	US-117	32.564	33.594	11000	0.13%	11000	0.15%	0.02%
20000117031	US-117	33.594	34.204	11000	0.13%	11000	0.15%	0.02%
Sampson County								
27000117082	US-117	0	0.289	11000	0.18%	12000	0.16%	-0.02%
27000117082	US-117	0.289	1.308	8300	0.17%	9600	0.18%	0.01%

Table E-4. Federal Highway Administration Vehicle Classification Definitions



Class 1	Motorcycles
Class 2	Passenger cars
Class 3	Four tire, single unit
Class 4	Buses
Class 5	Two axle, six tire, single unit
Class 6	Three axle, single unit
Class 7	Four or more axle, single unit
Class 8	Four or less axle, single trailer
Class 9	5-Axle tractor semitrailer
Class 10	Six or more axle, single trailer
Class 11	Five or less axle, multi trailer
Class 12	Six axle, multi-trailer
Class 13	Seven or more axle, multi-trailer

Source: “FHWA Traffic Monitoring Guide. Appendix C: Vehicle Types” (2014)

NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

MARCH 2022

Source: NCOneMap, NCDOT GIS, ESRI

Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Water Bodies
- Municipal Boundary
- Counties

Truck Percentage (2019)*

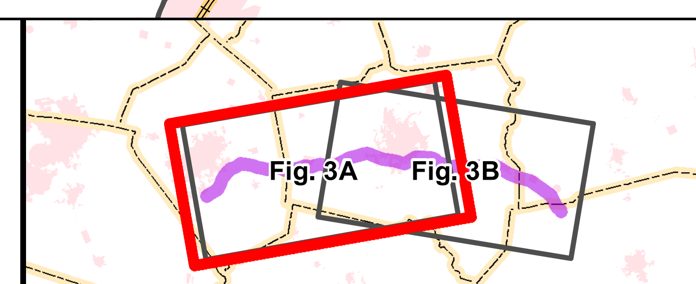
- 0%
- 0 - 12%
- 12 - 15%
- 15 - 18%

Truck Parking Utilization**

- Facility with No Utilization
- Facility with Available Spaces
- Facility with Full Utilization

Freight Destinations

- Manufacturing /Distribution Center
- Factory
- Industrial/Business Park
- Other



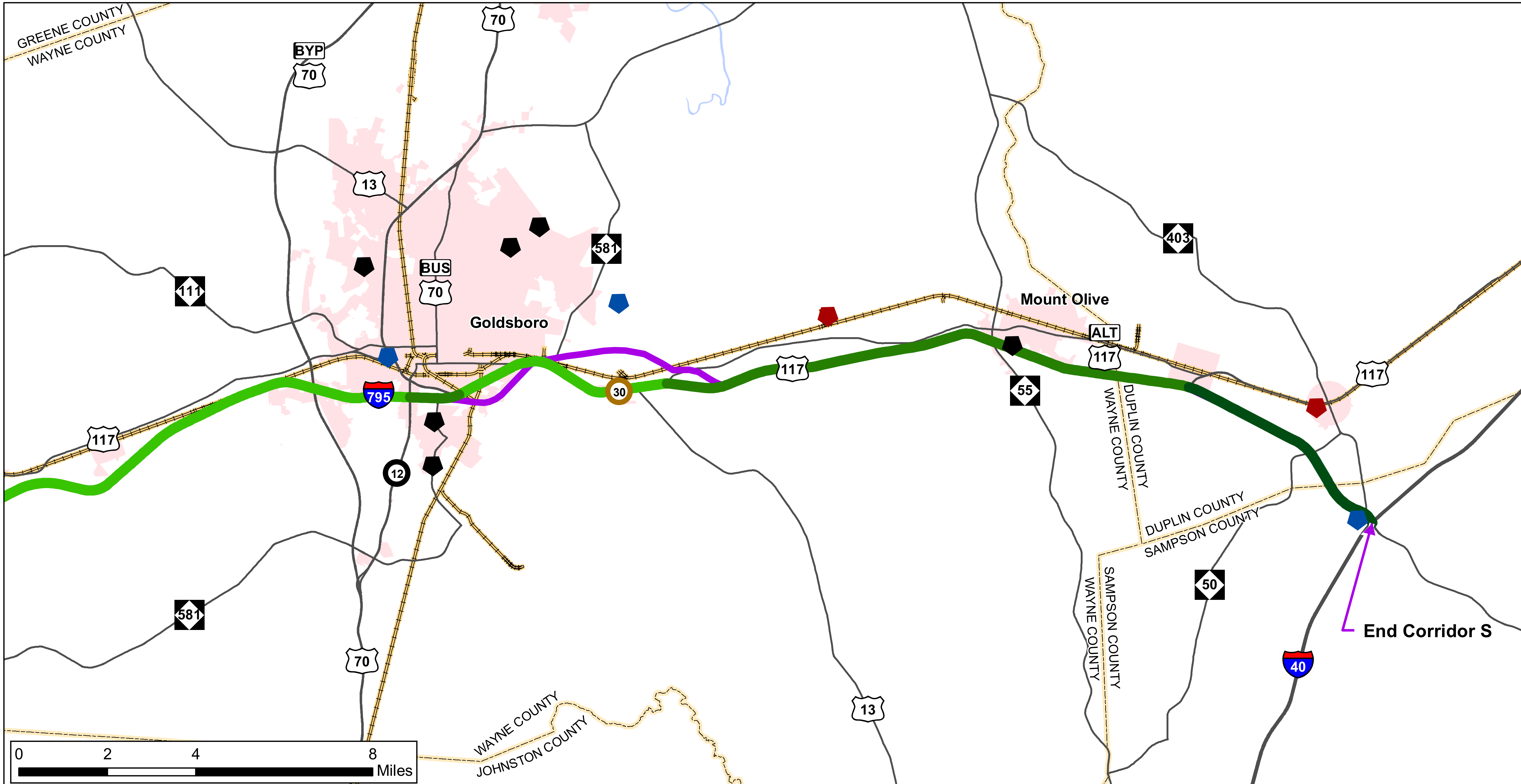
CORRIDOR S: TRUCK TRANSPORTATION DATA

FIGURE 3A: I-95/I-795 TO GOLDSBORO

*Truck percentage data is shown on parallel corridors in locations where it is not available for the STC corridor because it is not open to traffic yet

**The number shown within the circle refers to the total number of truck parking spaces at that parking facility

***Other category for Activity Centers includes colleges/universities, military camps, hospitals/medical centers, and airports



NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

MARCH 2022

Source: NCOneMap, NCDOT GIS, ESRI

Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Water Bodies
- Municipal Boundary
- Counties

Truck Percentage (2019)*

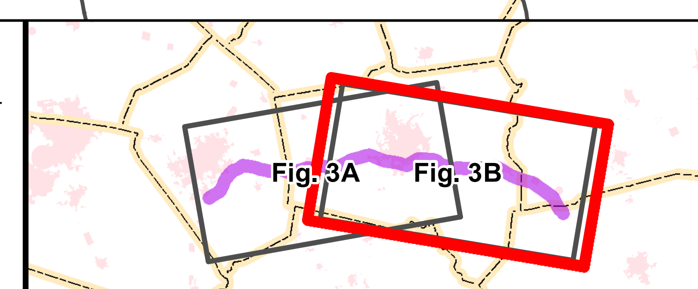
- 0%
- 0 - 12%
- 12 - 15%
- 15 - 18%

Truck Parking Utilization**

- Facility with No Utilization
- Facility with Available Spaces
- Facility with Full Utilization

Freight Destinations

- Manufacturing /Distribution Center
- Factory
- Industrial/Business Park
- Other



CORRIDOR S: TRUCK TRANSPORTATION DATA

FIGURE 3B: GOLDSBORO TO I-40

*Truck percentage data is shown on parallel corridors in locations where it is not available for the STC corridor because it is not open to traffic yet

**The number shown within the circle refers to the total number of truck parking spaces at that parking facility

***Other category for Activity Centers includes colleges/universities, military camps, hospitals/medical centers, and airports

Appendix F

Electric Charging Stations

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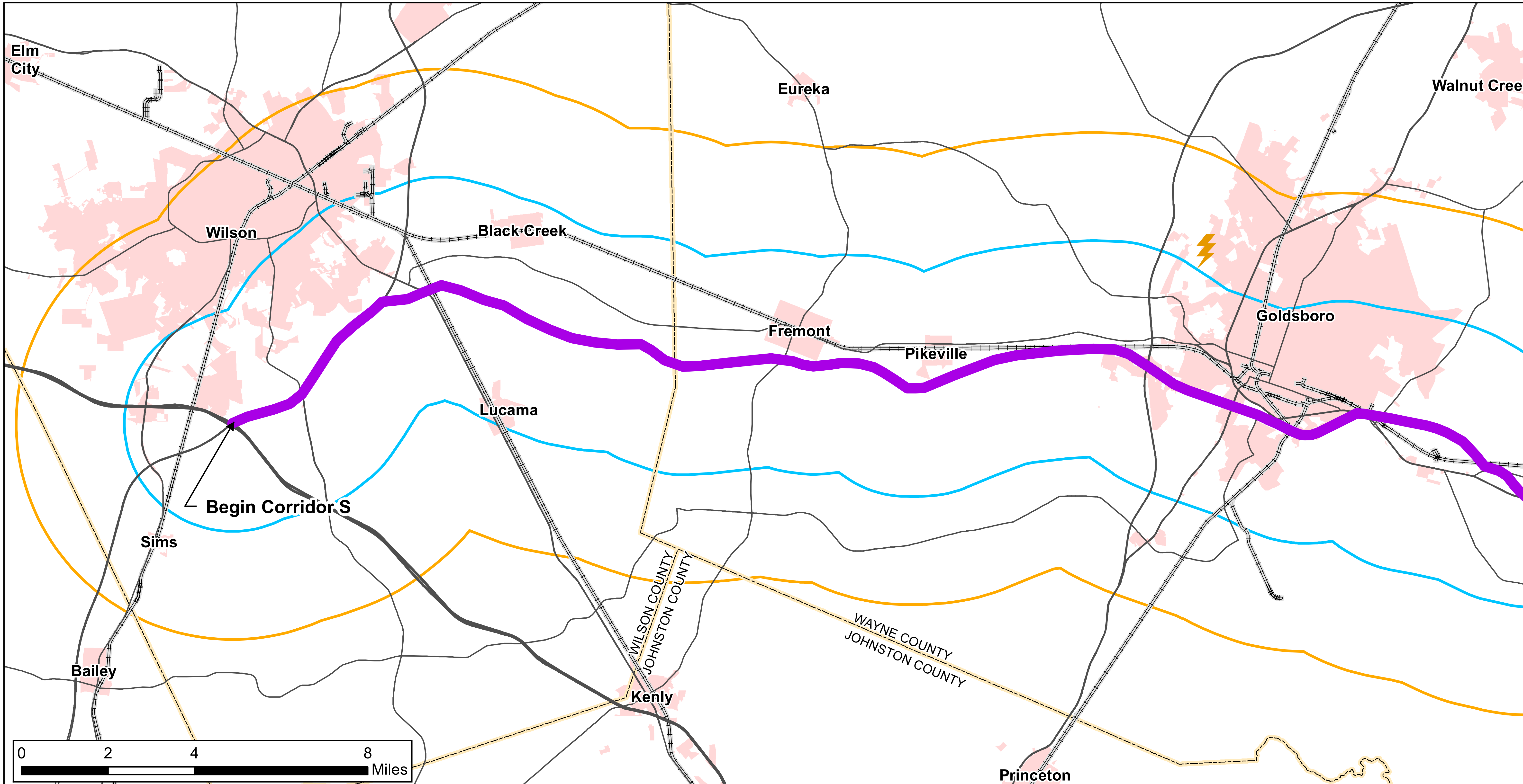


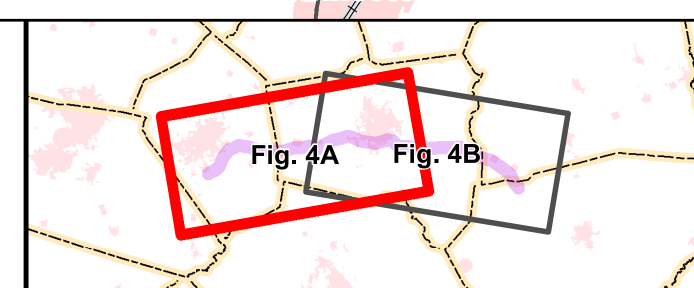
NC STRATEGIC TRANSPORTATION CORRIDORS (STC)

FEBRUARY 2022

Source: NCOneMap, NCDOT GIS, ESRI, Plug-In NC

Legend

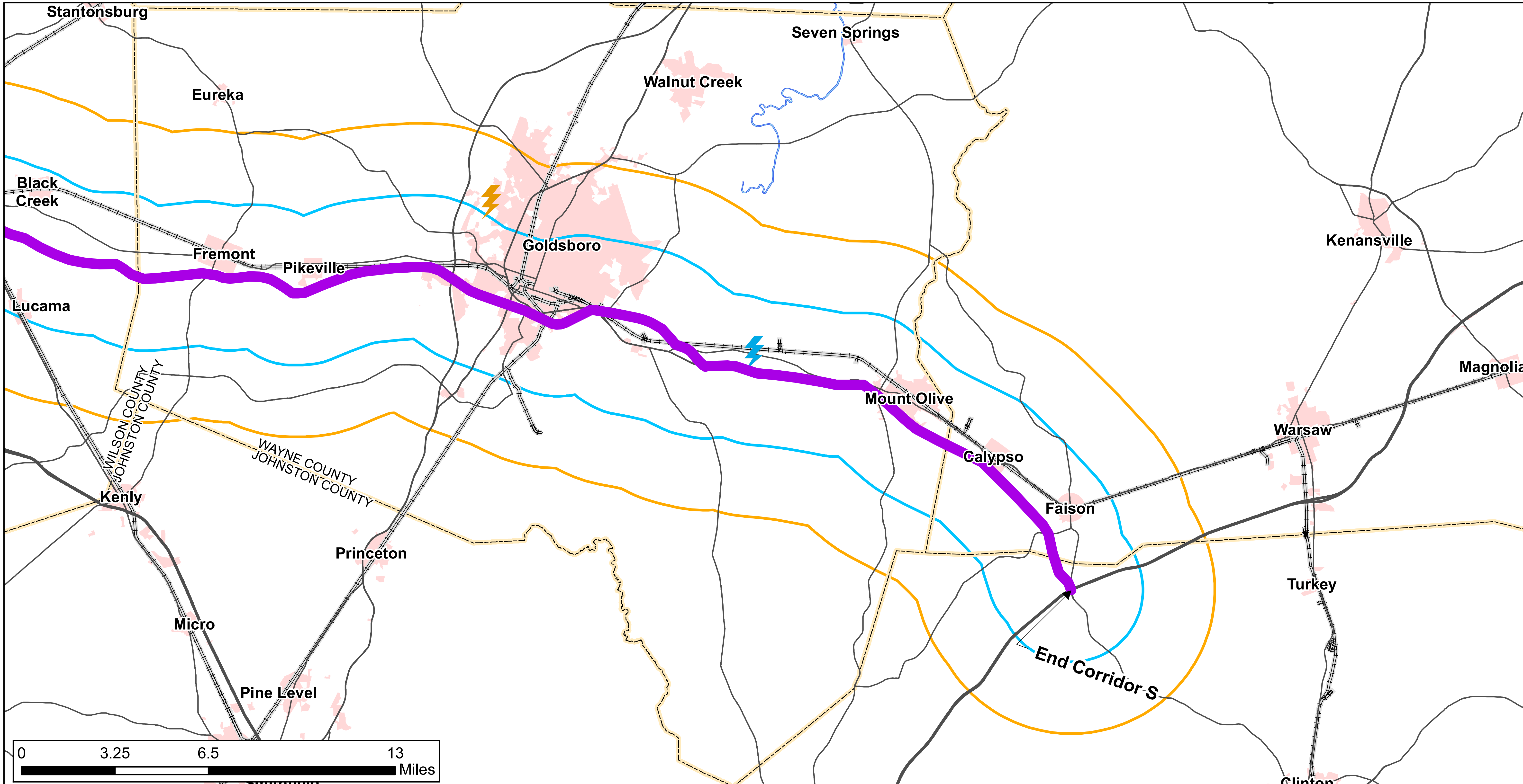
- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Municipal Boundary
- Counties
- Charging Stations Within 10 miles
- 5 Mile STC Buffer
- 10 Mile STC Buffer



CORRIDOR S: ELECTRIC CHARGING STATIONS

FIGURE 4A: I-95/I-795 TO GOLDSBORO

This map is accurate as of October 2021. For updated charging station locations and location addresses, please visit https://pluginnc.com/find-a-charging-station/



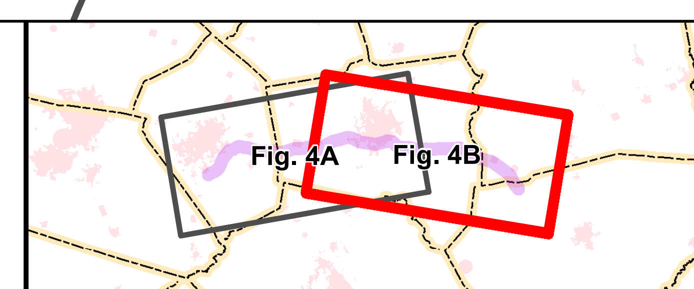
NC STRATEGIC TRANSPORTATION CORRIDORS (STC)

FEBRUARY 2022

Source: NCOneMap, NCDOT GIS, ESRI, Plug-In NC

Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Water Bodies
- Municipal Boundary
- Counties
- Charging Stations Within 5 miles
- Charging Stations Within 10 miles
- 5 Mile STC Buffer
- 10 Mile STC Buffer



CORRIDOR S: ELECTRIC CHARGING STATIONS

FIGURE 4B: GOLDSBORO TO I-40

This map is accurate as of October 2021. For updated charging station locations and location addresses, please visit https://pluginnc.com/find-a-charging-station/

Appendix G

Population and Employment Growth Data
Statewide Model

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Population and Employment Growth

This appendix presents base and future year population and employment growth for Corridor S of the North Carolina Strategic Transportation Corridors (STC). The following data is collected using the Traffic Analysis Zones (TAZ) of the North Carolina Statewide Model and is organized numerically by TAZ Number. TAZ within a 2-mile buffer area on both sides of the corridor were used to capture population and employment totals.

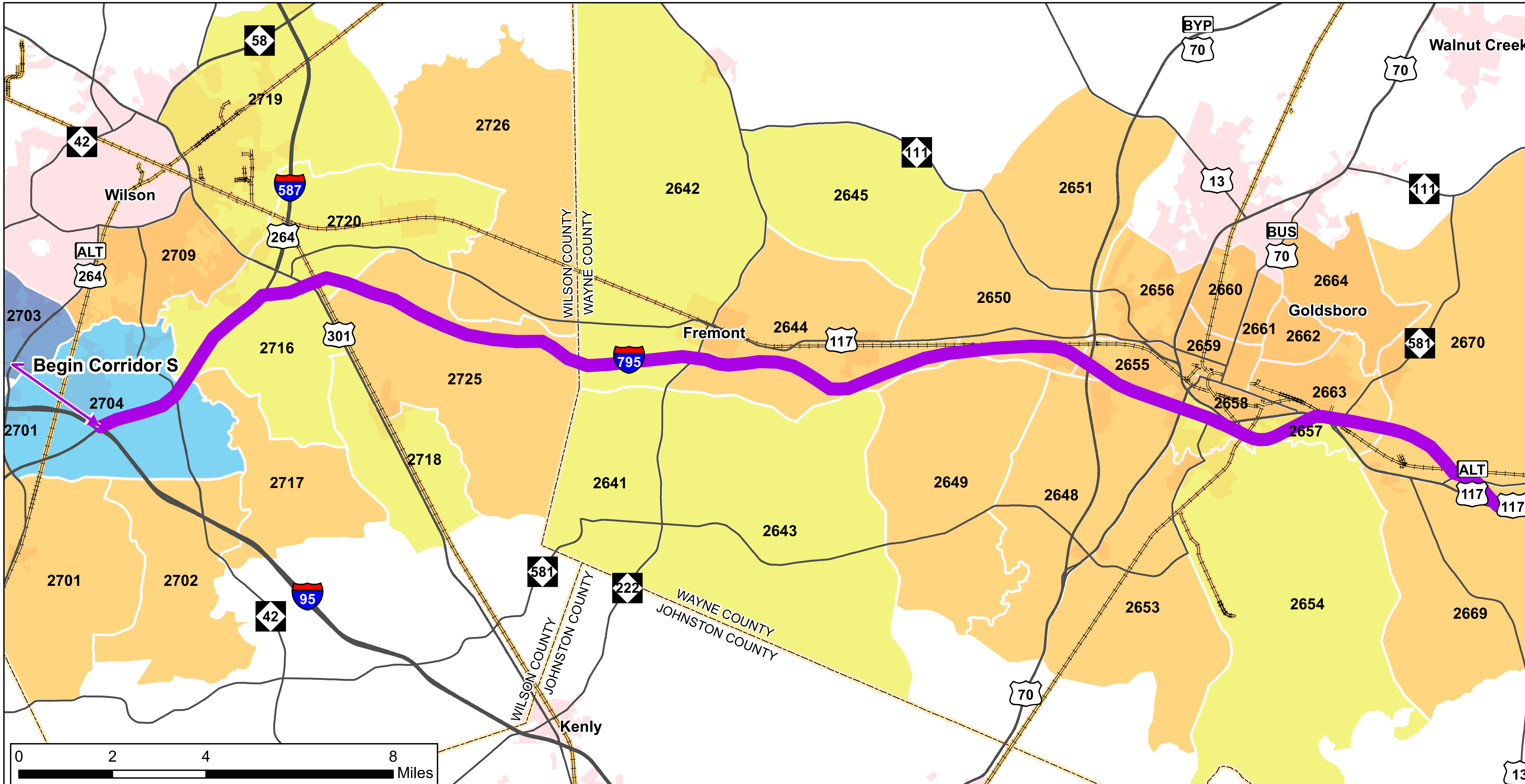
Table G-1. Population and Employment Growth – Statewide Model Traffic Analysis Zone

TAZ Number	Population in 2015	Population in 2040	Annual Population Growth (2015-2040)	Total Number of Employed Persons in 2015	Total Number of Employed Persons in 2040	Annual Employment Growth (2015-2040)
771	1,543	1,748	0.5%	253	334	1.1%
772	832	980	0.7%	1,622	2,136	1.1%
773	4,066	4,879	0.7%	612	806	1.1%
777	2,271	2,396	0.2%	1,981	2,607	1.1%
2262	1,176	1,212	0.1%	483	554	0.6%
2266	2,096	2,156	0.1%	834	957	0.6%
2273	2,282	2,517	0.4%	153	176	0.6%
2641	521	563	0.3%	52	60	0.6%
2642	1,899	2,056	0.3%	467	597	1.0%
2643	3,388	3,649	0.3%	268	332	0.9%
2644	3,166	3,504	0.4%	1,146	1,500	1.1%
2645	751	797	0.2%	189	229	0.8%
2648	2,141	2,556	0.7%	1,295	1,569	0.8%
2649	7,860	8,675	0.4%	309	398	1.0%
2650	2,281	2,577	0.5%	196	246	0.9%
2651	2,290	2,577	0.5%	71	88	0.9%
2653	5,711	6,356	0.4%	2,216	2,812	1.0%
2654	4,138	4,375	0.2%	1,983	2,419	0.8%
2655	823	962	0.6%	1,266	1,530	0.8%
2656	2,950	3,322	0.5%	2,746	3,315	0.8%
2657	178	184	0.1%	885	1,072	0.8%
2658	2,003	2,272	0.5%	1,490	1,801	0.8%
2659	3,174	3,651	0.6%	6,145	7,420	0.8%
2660	4,296	4,939	0.6%	2,538	3,068	0.8%
2661	1,930	2,200	0.5%	350	424	0.8%
2662	4,638	5,280	0.5%	221	270	0.8%
2663	1,874	2,124	0.5%	2,218	2,680	0.8%
2664	2,446	2,942	0.7%	6,769	8,178	0.8%
2669	6,865	7,534	0.4%	733	963	1.1%
2670	7,826	8,739	0.4%	2,716	3,535	1.1%

(Continued on next page)

Table G-1. Population and Employment Growth – Statewide Model Traffic Analysis Zone (Continued)

2674	1,729	1,891	0.4%	574	704	0.8%
2675	5,691	6,139	0.3%	1,257	1,557	0.9%
2677	4,647	5,185	0.4%	3,745	4,575	0.8%
2701	2,410	2,850	0.7%	394	466	0.7%
2702	1,000	1,167	0.6%	662	782	0.7%
2703	4,732	6,695	1.4%	1,740	2,054	0.7%
2704	1,296	1,621	0.9%	2,088	2,465	0.7%
2709	6,563	7,559	0.6%	8,044	9,491	0.7%
2716	1,292	1,397	0.3%	280	331	0.7%
2717	588	654	0.4%	17	20	0.7%
2718	1,300	1,341	0.1%	252	298	0.7%
2719	4,021	4,193	0.2%	3,331	3,931	0.7%
2720	1,837	1,961	0.3%	483	570	0.7%
2725	2,230	2,457	0.4%	539	636	0.7%
2726	701	772	0.4%	77	92	0.7%



NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

FEBRUARY 2022

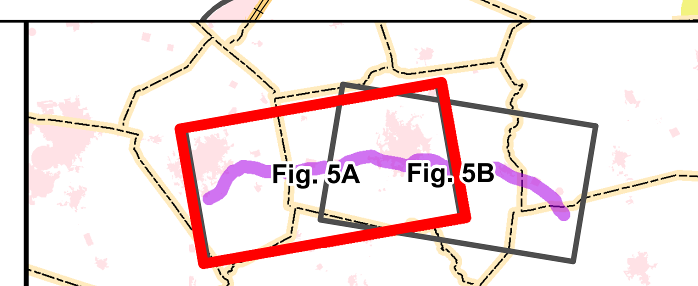
Source: NCOneMap, NCDOT GIS, ESRI

Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Water Bodies
- Municipal Boundary
- Counties

Annual Population Growth (2015-2040)

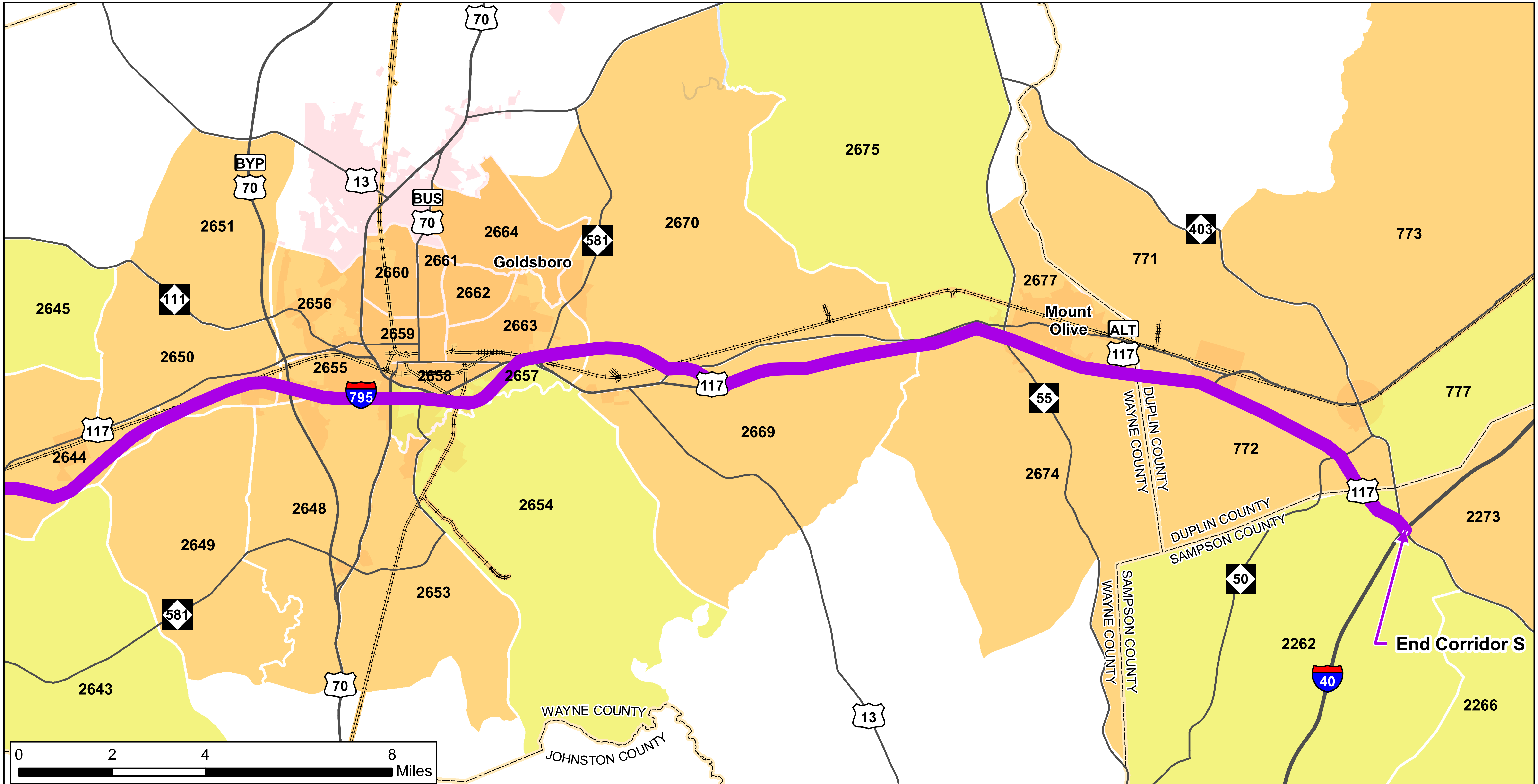
- 0.0% - 0.35%
- 0.35% - 0.7%
- 0.7% - 1.05%
- 1.05% - 1.4%



CORRIDOR S: POPULATION GROWTH - STATEWIDE MODEL TRAFFIC ANALYSIS ZONES

FIGURE 5A: I-95/I-795 TO GOLDSBORO

TAZ Number on the map correlates to TAZ Number in Appendix F of the Mobility Analysis Report. Additional population and employment data can be found in the data tables.
*TAZ Number is the 1-4 digit solid, bold number in map.



NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

FEBRUARY 2022

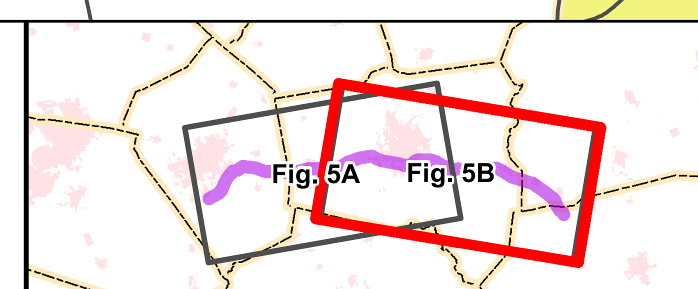
Source: NCOneMap, NCDOT GIS, ESRI

Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Water Bodies
- Municipal Boundary
- Counties

Annual Population Growth (2015-2040)

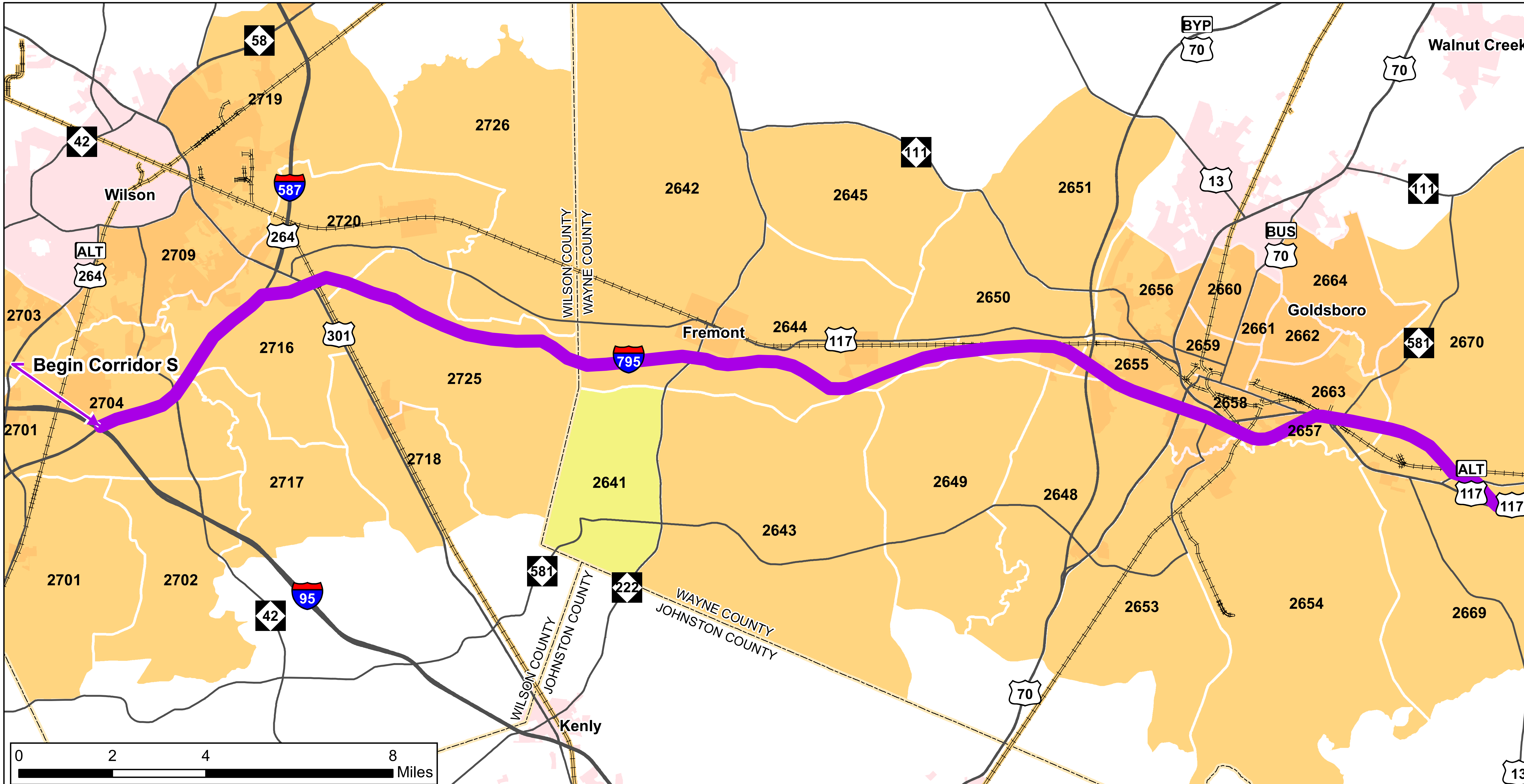
- 0.0% - 0.35%
- 0.35% - 0.7%



CORRIDOR S: POPULATION GROWTH - STATEWIDE MODEL TRAFFIC ANALYSIS ZONES

FIGURE 5B: GOLDSBORO TO I-40

TAZ Number on the map correlates to TAZ Number in Appendix F of the Mobility Analysis Report. Additional population and employment data can be found in the data tables.
*TAZ Number is the 1-4 digit solid, bold number in map.



NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

FEBRUARY 2022

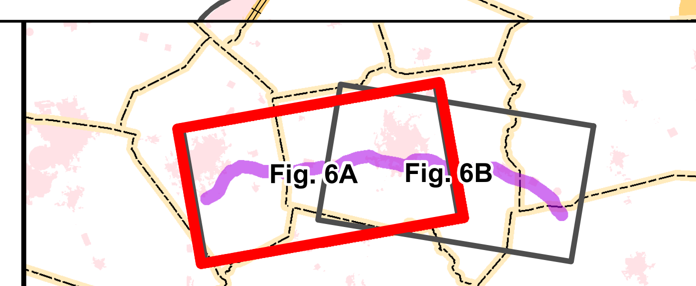
Source: NCOneMap, NCDOT GIS, ESRI

Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Water Bodies
- Municipal Boundary
- Counties

Annual Employment Growth (2015-2040)

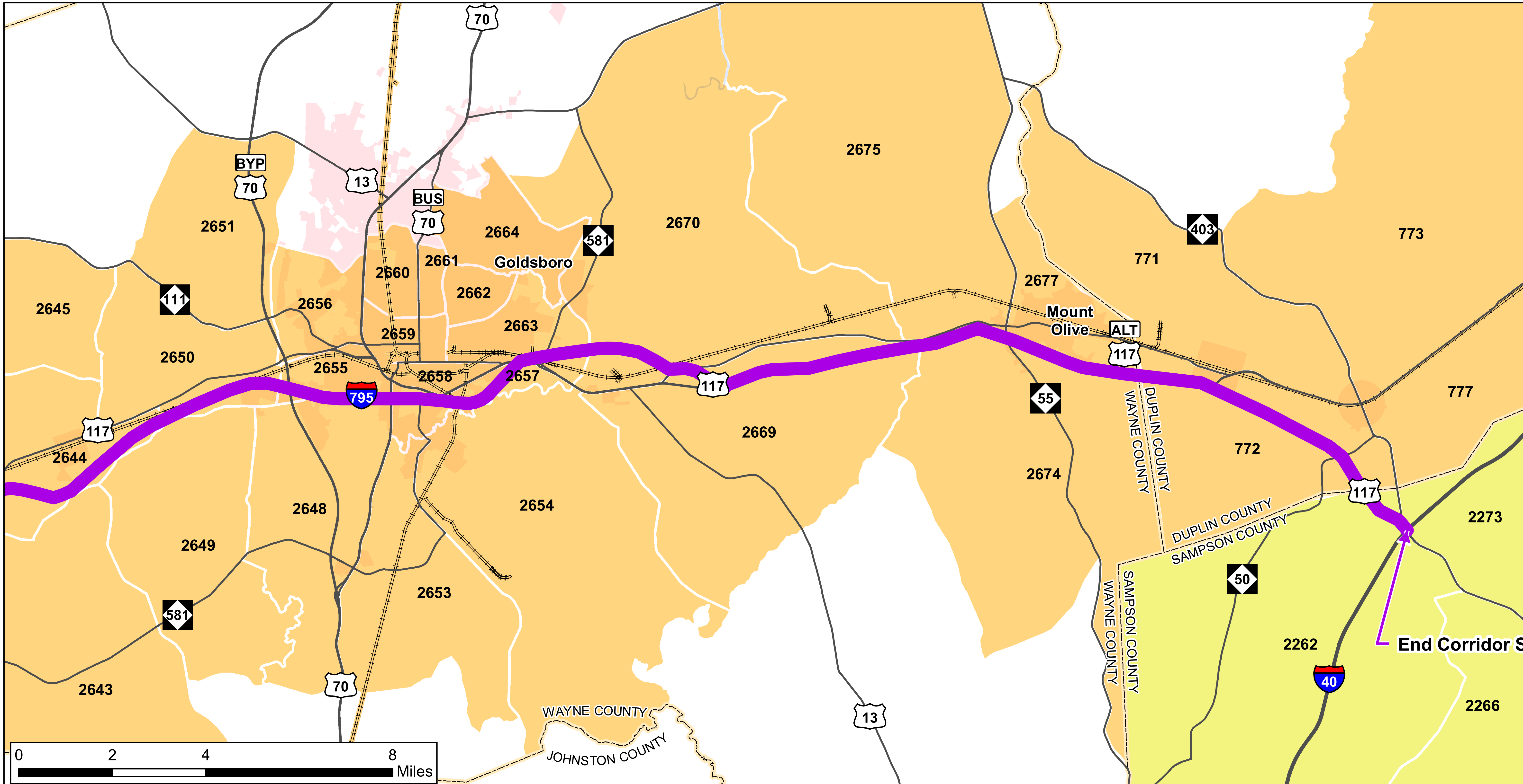
- 0.6%-0.85%
- 0.85% - 1.1%



CORRIDOR S: EMPLOYMENT GROWTH - STATEWIDE MODEL TRAFFIC ANALYSIS ZONES

FIGURE 6A: I-95/I-795 TO GOLDSBORO

TAZ Number on the map correlates to TAZ Number in Appendix F of the Mobility Analysis Report. Additional population and employment data can be found in the data tables.
*TAZ Number is the 1-4 digit solid, bold number in map.



NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

FEBRUARY 2022

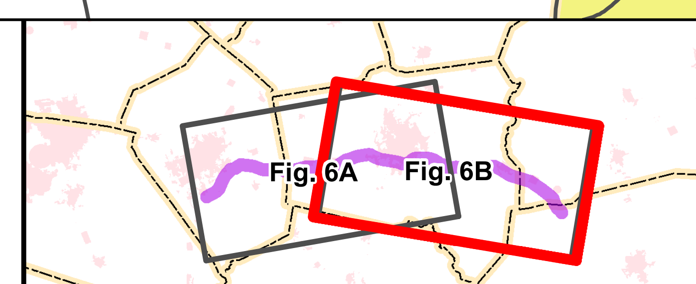
Source: NCOneMap, NCDOT GIS, ESRI

Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Water Bodies
- Municipal Boundary
- Counties

Annual Employment Growth (2015-2040)

- 0.6%-0.85%
- 0.85% - 1.1%



CORRIDOR S: EMPLOYMENT GROWTH - STATEWIDE MODEL TRAFFIC ANALYSIS ZONES

FIGURE 6B: GOLDSBORO TO I-40

TAZ Number on the map correlates to TAZ Number in Appendix F of the Mobility Analysis Report. Additional population and employment data can be found in the data tables.

*TAZ Number is the 1-4 digit solid, bold number in map.

Appendix H

Population and Employment Growth Data
Regional Models

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Population and Employment Growth

This appendix presents base and future year population and employment growth for Corridor S of the North Carolina Strategic Transportation Corridors (STC). The following data is collected using the Goldsboro Regional Traffic Analysis Zone (TAZ) and is organized numerically by TAZ Number. TAZs within a 2-mile buffer area on both sides of the corridor were used to capture population and employment totals.

Table H-1. Population and Employment Growth – Goldsboro Regional Model Traffic Analysis Zone

TAZ Number	Population in 2010	Population in 2040	Annual Population Growth (2010-2040)	Total Number of Employed Persons in 2010	Total Number of Employed Persons in 2040	Annual Employment Growth (2010-2040)
1	254	318	0.8%	115	134	0.5%
2	357	447	0.8%	135	157	0.5%
4	118	148	0.8%	83	96	0.5%
5	734	918	0.8%	124	144	0.5%
6	616	771	0.8%	91	106	0.5%
7	70	88	0.8%	243	282	0.5%
8	448	561	0.8%	183	213	0.5%
9	513	642	0.8%	872	1,013	0.5%
10	124	155	0.8%	441	512	0.5%
14	963	1,205	0.8%	37	43	0.5%
15	739	925	0.8%	22	27	0.7%
16	458	573	0.8%	151	175	0.5%
17	427	534	0.8%	94	109	0.5%
18	197	247	0.8%	575	668	0.5%
19	20	25	0.8%	383	445	0.5%
20	735	920	0.8%	275	319	0.5%
21	942	1,179	0.8%	589	684	0.5%
22	168	210	0.8%	12	14	0.5%
23	227	284	0.8%	335	388	0.5%
31	1,157	1,448	0.8%	66	78	0.6%
32	335	419	0.8%	558	648	0.5%
33	44	55	0.8%	0	0	0.0%
35	12	13	0.3%	381	442	0.5%
36	76	83	0.3%	317	368	0.5%
37	5	5	0.0%	414	482	0.5%
38	0	0	0.0%	17	20	0.5%
39	185	231	0.7%	141	164	0.5%
40	299	374	0.8%	355	412	0.5%
41	833	1,042	0.8%	303	353	0.5%
42	1,294	1,619	0.8%	671	778	0.5%
43	215	269	0.8%	597	692	0.5%
44	351	439	0.8%	35	41	0.5%
45	842	1,054	0.8%	30	35	0.5%
47	623	745	0.6%	3	4	1.0%
63	491	588	0.6%	7	9	0.8%
64	124	148	0.6%	1,100	1,376	0.8%

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Table H-2. Population and Employment Growth – Goldsboro Regional Model Traffic Analysis Zone (Continued)

TAZ Number	Population in 2010	Population in 2040	Annual Population Growth (2010-2040)	Total Number of Employed Persons in 2010	Total Number of Employed Persons in 2040	Annual Employment Growth (2010-2040)
65	2,264	2,709	0.6%	37	46	0.7%
66	280	335	0.6%	136	171	0.8%
67	2,354	2,817	0.6%	210	263	0.8%
68	410	491	0.6%	54	68	0.8%
69	811	970	0.6%	105	131	0.7%
72	957	1,145	0.6%	52	67	0.9%
73	61	67	0.3%	72	84	0.5%
74	30	33	0.3%	957	1,111	0.5%
75	398	476	0.6%	990	1,240	0.8%
76	1,108	1,386	0.8%	248	288	0.5%
81	974	1,219	0.8%	512	595	0.5%
97	289	316	0.3%	477	554	0.5%
98	283	354	0.8%	256	298	0.5%
101	92	115	0.8%	89	103	0.5%
106	409	489	0.6%	33	41	0.7%
107	463	554	0.6%	150	188	0.8%
108	2,135	2,555	0.6%	25	31	0.7%
109	1	1	0.0%	0	0	0.0%
110	415	519	0.8%	119	138	0.5%
112	4	5	0.8%	800	930	0.5%
115	55	60	0.3%	3	3	0.0%
118	280	350	0.8%	6	7	0.5%
121	52	57	0.3%	19	22	0.5%
122	370	463	0.8%	15	17	0.4%
123	546	683	0.8%	15	17	0.4%
124	1,179	1,475	0.8%	22	26	0.6%
127	163	204	0.8%	168	195	0.5%
128	427	534	0.8%	670	778	0.5%
130	354	443	0.8%	52	60	0.5%
131	418	523	0.8%	88	102	0.5%
132	56	70	0.8%	719	835	0.5%
133	13	16	0.7%	275	319	0.5%
137	92	115	0.8%	254	295	0.5%
139	213	267	0.8%	79	92	0.5%
140	149	186	0.7%	120	139	0.5%

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Table H-3. Population and Employment Growth – Goldsboro Regional Model Traffic Analysis Zone (Continued)

TAZ Number	Population in 2010	Population in 2040	Annual Population Growth (2010-2040)	Total Number of Employed Persons in 2010	Total Number of Employed Persons in 2040	Annual Employment Growth (2010-2040)
143	3	4	1.0%	42	49	0.5%
144	543	650	0.6%	4	5	0.8%
145	1,032	1,235	0.6%	46	59	0.8%
147	633	757	0.6%	109	136	0.7%
148	129	161	0.7%	29	34	0.5%
151	135	162	0.6%	31	40	0.9%
152	554	663	0.6%	114	144	0.8%
153	20	25	0.8%	729	846	0.5%
154	149	186	0.7%	227	264	0.5%
155	89	97	0.3%	2	2	0.0%
156	245	307	0.8%	4	5	0.8%
157	928	1,110	0.6%	61	76	0.7%
158	153	183	0.6%	77	96	0.7%
159	795	951	0.6%	223	280	0.8%
200	0	0	0.0%	0	0	0.0%
201	0	0	0.0%	0	0	0.0%
205	0	0	0.0%	0	0	0.0%
206	0	0	0.0%	0	0	0.0%
207	0	0	0.0%	0	0	0.0%
208	0	0	0.0%	0	0	0.0%
209	0	0	0.0%	0	0	0.0%
211	4	77	10.4%	0	0	0.0%
213	0	0	0.0%	0	0	0.0%
214	0	0	0.0%	0	0	0.0%
215	0	0	0.0%	0	0	0.0%
216	0	0	0.0%	0	0	0.0%
217	0	0	0.0%	0	0	0.0%
218	0	0	0.0%	0	0	0.0%
219	0	0	0.0%	0	0	0.0%
220	0	0	0.0%	0	0	0.0%
223	0	0	0.0%	0	0	0.0%
224	0	0	0.0%	0	0	0.0%
232	0	0	0.0%	0	0	0.0%
233	0	0	0.0%	0	0	0.0%
234	0	0	0.0%	0	0	0.0%

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Table H-4. Population and Employment Growth – Goldsboro Regional Model Traffic Analysis Zone (Continued)

TAZ Number	Population in 2010	Population in 2040	Annual Population Growth (2010-2040)	Total Number of Employed Persons in 2010	Total Number of Employed Persons in 2040	Annual Employment Growth (2010-2040)
235	0	0	0.0%	0	0	0.0%
236	0	0	0.0%	0	0	0.0%
239	0	0	0.0%	0	0	0.0%
241	80	88	0.3%	8	9	0.4%
242	107	117	0.3%	0	0	0.0%
243	179	224	0.8%	18	21	0.5%
251	223	244	0.3%	8	9	0.4%
254	57	62	0.3%	0	0	0.0%
255	36	45	0.8%	0	0	0.0%
257	126	158	0.8%	323	375	0.5%
258	32	38	0.6%	9	11	0.7%
259	73	80	0.3%	0	0	0.0%
260	124	136	0.3%	11	13	0.6%
261	83	104	0.8%	82	94	0.5%
271	64	70	0.3%	8	9	0.4%
275	70	84	0.6%	60	75	0.8%
278	8	878	17.0%	0	63	15.0%
281	30	36	0.6%	9	11	0.7%
282	147	161	0.3%	3	3	0.0%
283	198	217	0.3%	2	2	0.0%
285	243	291	0.6%	178	223	0.8%
286	709	887	0.8%	16	20	0.8%
287	234	293	0.8%	148	172	0.5%
288	362	453	0.8%	480	557	0.5%
289	279	305	0.3%	27	31	0.5%
290	491	537	0.3%	25	29	0.5%
291	136	149	0.3%	20	23	0.5%
293	436	477	0.3%	11	13	0.5%
298	108	118	0.3%	2	2	0.0%
301	71	89	0.8%	63	73	0.5%
302	534	584	0.3%	53	63	0.6%
303	166	199	0.6%	352	440	0.8%
311	73	87	0.6%	45	56	0.7%
312	143	156	0.3%	18	21	0.5%

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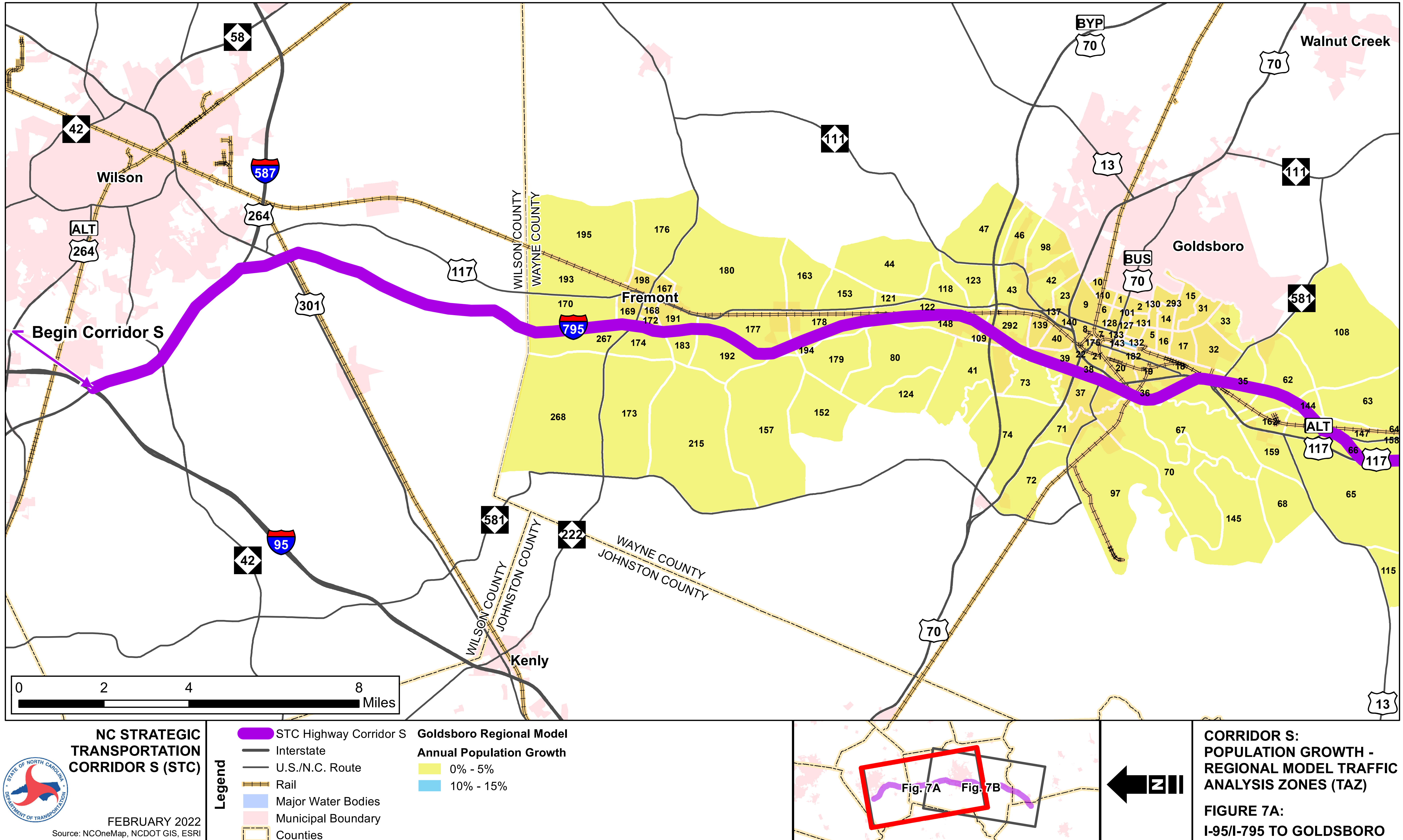
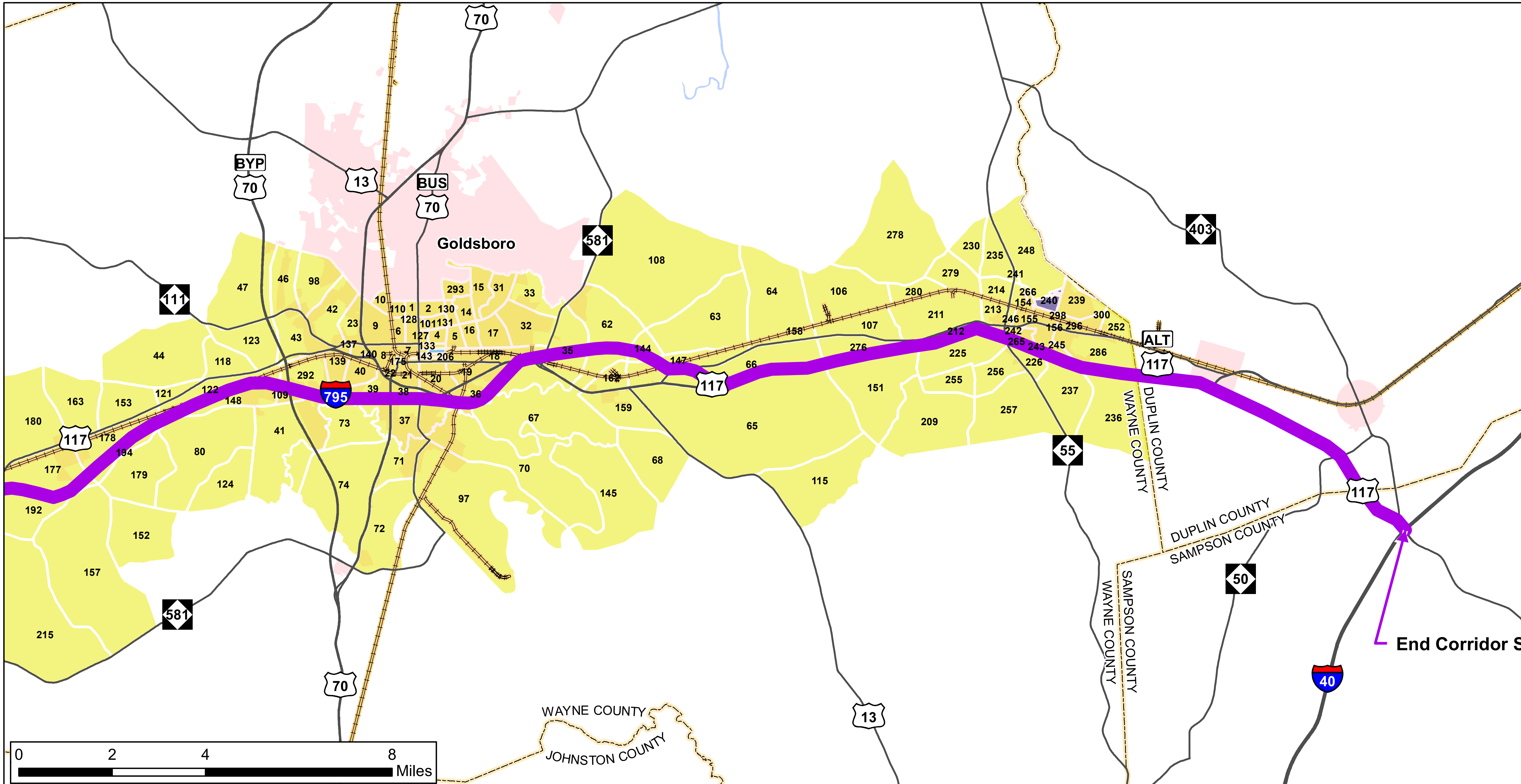
Table H-5. Population and Employment Growth – Goldsboro Regional Model Traffic Analysis Zone (Continued)

TAZ Number	Population in 2010	Population in 2040	Annual Population Growth (2010-2040)	Total Number of Employed Persons in 2010	Total Number of Employed Persons in 2040	Annual Employment Growth (2010-2040)
313	40	48	0.6%	7	9	0.8%
314	191	209	0.3%	13	15	0.5%
322	313	342	0.3%	11	13	0.6%
324	167	209	0.8%	10	12	0.6%
325	740	810	0.3%	137	159	0.5%
326	538	589	0.3%	8	9	0.4%
332	0	0	0.0%	0	0	0.0%
338	247	309	0.8%	65	75	0.5%
339	37	44	0.6%	103	129	0.8%



No regional models were available in other segments of the corridor. TAZ Number on the map correlates to TAZ Number in Appendix G of the Mobility Analysis Report. Additional population and employment data can be found in the data tables.
*TAZ Number is the 1-4 digit solid, bold number in map. Goldsboro Annual Growth is 2010-2040.



NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

FEBRUARY 2022

Source: NCOneMap, NCDOT GIS, ESRI

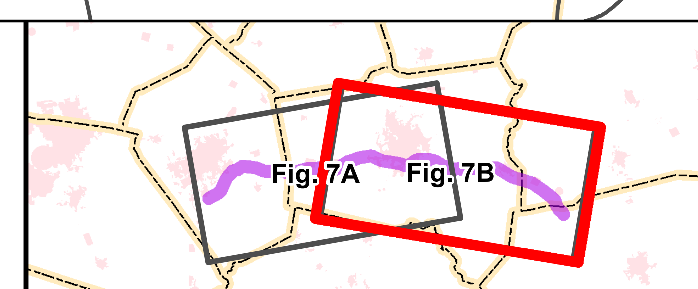
Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Water Bodies
- Municipal Boundary
- Counties

Goldsboro Regional Model

Annual Population Growth

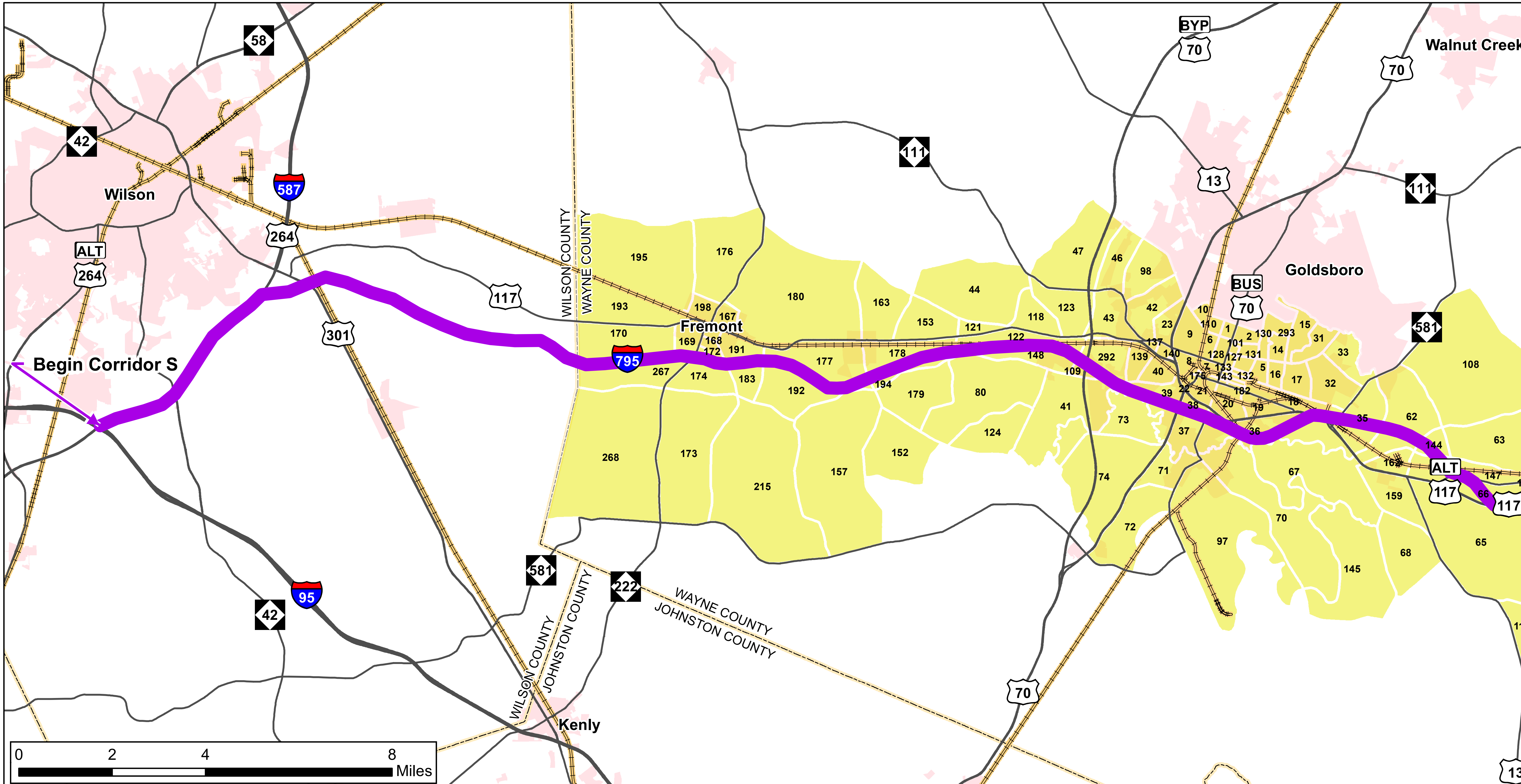
- 0% - 5%
- 10% - 15%
- 15% - 20%



CORRIDOR S: POPULATION GROWTH - REGIONAL MODEL TRAFFIC ANALYSIS ZONES (TAZ)

FIGURE 7B: GOLDSBORO TO I-40

No regional models were available in other segments of the corridor. TAZ Number on the map correlates to TAZ Number in Appendix G of the Mobility Analysis Report. Additional population and employment data can be found in the data tables.
*TAZ Number is the 1-4 digit solid, bold number in map. Goldsboro Annual Growth is 2010-2040.



NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

FEBRUARY 2022

Source: NCOneMap, NCDOT GIS, ESRI

Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Water Bodies
- Municipal Boundary
- Counties

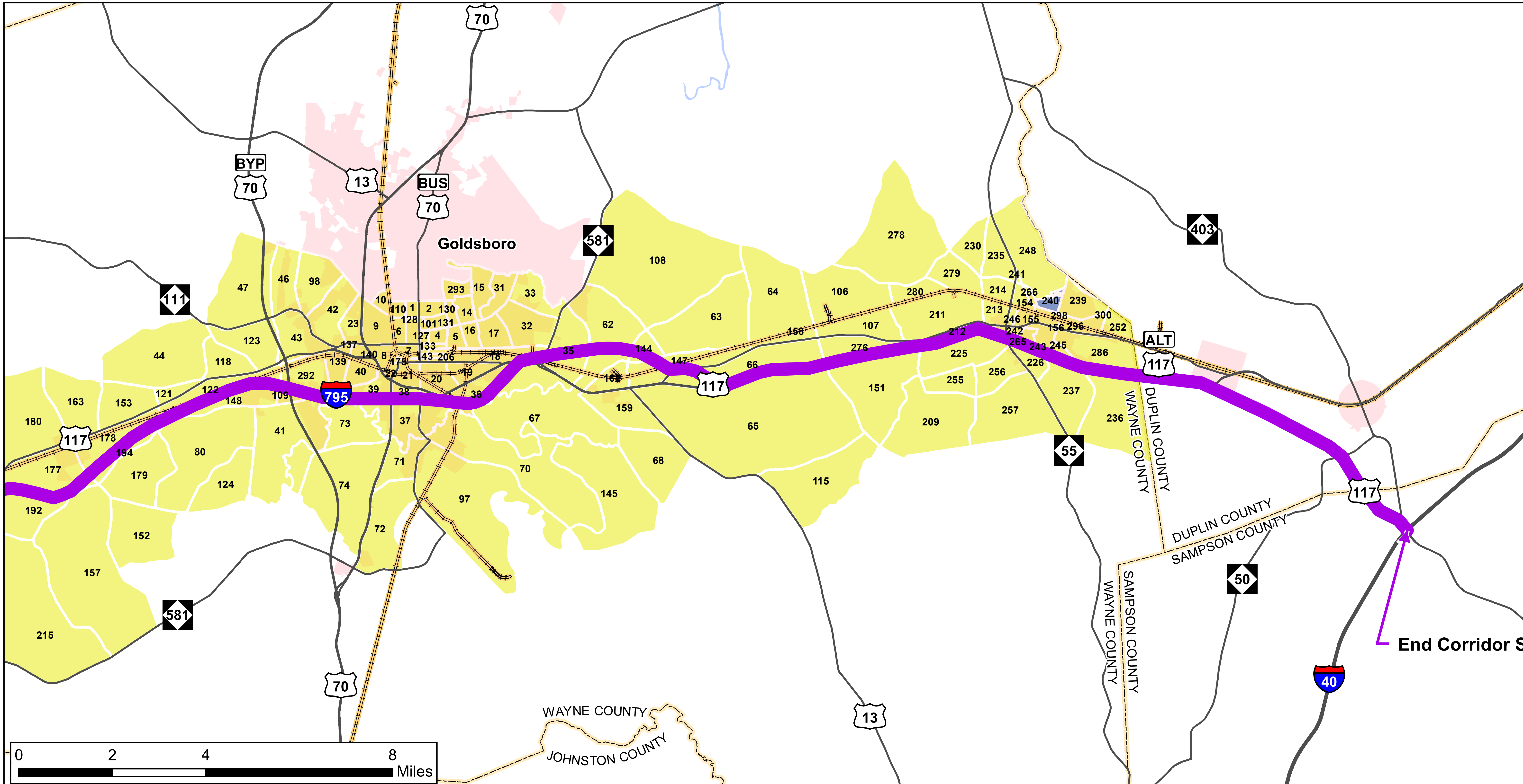
Goldsboro Regional Model Annual Employment Growth

- 0% - 3.75%

CORRIDOR S: EMPLOYMENT GROWTH - REGIONAL MODEL TRAFFIC ANALYSIS ZONES (TAZ)

FIGURE 8A: I-95/I-795 TO GOLDSBORO

No regional models were available in other segments of the corridor. TAZ Number on the map correlates to TAZ Number in Appendix G of the Mobility Analysis Report. Additional population and employment data can be found in the data tables.
*TAZ Number is the 1-4 digit solid, bold number in map. Goldsboro Annual Growth is 2010-2040.



NC STRATEGIC TRANSPORTATION CORRIDOR S (STC)

FEBRUARY 2022

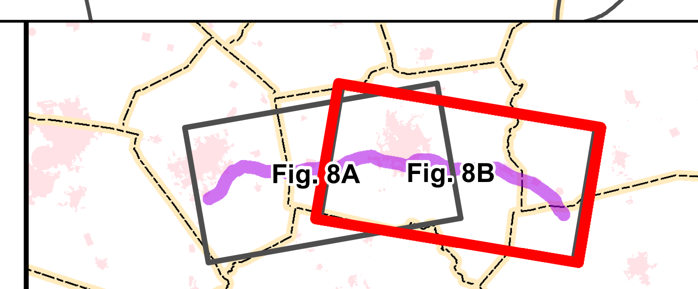
Source: NCOneMap, NCDOT GIS, ESRI

Legend

- STC Highway Corridor S
- Interstate
- U.S./N.C. Route
- Rail
- Major Water Bodies
- Municipal Boundary
- Counties

Goldsboro Regional Model Annual Employment Growth

- 0% - 3.75%
- 11.25% - 15.0%



CORRIDOR S: EMPLOYMENT GROWTH - REGIONAL MODEL TRAFFIC ANALYSIS ZONES (TAZ)

FIGURE 8B: GOLDSBORO TO I-40

No regional models were available in other segments of the corridor. TAZ Number on the map correlates to TAZ Number in Appendix G of the Mobility Analysis Report. Additional population and employment data can be found in the data tables.
*TAZ Number is the 1-4 digit solid, bold number in map. Goldsboro Annual Growth is 2010-2040.