

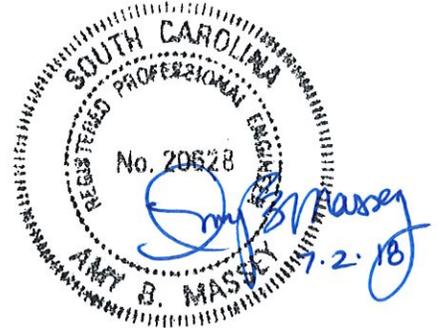
Traffic Impact Analysis for
Branton Development
Dorchester County, South Carolina

Prepared for:

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1.0 Executive Summary

The purpose of this Traffic Impact Analysis (TIA) is to review vehicular traffic impacts as a result of the proposed Branton development. The primary objectives of the study are:

- To estimate trip generation and distribution for the proposed development.
- To perform intersection capacity analyses for the identified study area.
- To determine the potential traffic impacts of the proposed development.
- To develop recommendations for needed roadway and operational improvements to accommodate the proposed development's traffic impacts.

The proposed Branton development is located in Dorchester County, South Carolina along SC 61 between SC 27 and Cypress Hill Lane. As currently envisioned, the proposed development will ultimately consist of the following land uses:

- 180,000 square feet (SF) of office space
- 418,000 SF of retail space
- 100,000 SF of grocery space
- Gas station/convenience market with 20 fueling positions
- 3,166 single family homes
- 767 senior adult homes
- 1,158 townhomes
- 396 apartments
- 100-room hotel
- 1,000-student elementary school

For the purposes of this TIA, orientation of SC 61 is established as east-west through the study area, while SC 27 is established as north-south. Note that at the western intersection of US 17A and SC 61, US 17A is established as north-south. At the eastern intersection of US 17A (Boonehill Road) and SC 61 (Beech Hill Road), US 17A is established as east-west.

The development is anticipated to be completed (built-out) in 2030. Based on the site layout, the proposed development will be accessed along SC 61 at five full movement locations as follows:

- Access 1- westernmost access on north side of SC 61
- Access 2 (north side) aligned with Access 3 (south side)
- Access 4- north side
- Access 5 (north side) aligned with Access 6 (south side)
- Access 7- easternmost access on north side of SC 61 serving school

Through coordination with Dorchester County and South Carolina Department of Transportation (SCDOT) staff, this TIA evaluates the traffic operations under 2018 existing conditions, 2030 background conditions, and 2030 build-out conditions during the AM and PM peak hours at the following intersections in addition to the proposed access points discussed above:

- SC 61 & SC 27
- SC 27 & Carter Road
- SC 61 & Hill Branch Road

- SC 61 & Old Beech Hill Road
- US 17A & SC 61 (west intersection)
- US 17A & SC 61 (east intersection)

Kimley-Horn was retained to determine the potential traffic impacts of this development and identify transportation improvements that may be required to mitigate these impacts in accordance with the traffic study guidelines in the *SCDOT Access and Roadside Management Standards (ARMS)* Manual. This report presents trip generation, distribution, capacity analyses, and recommendations for developer transportation improvements. The specific TIA scope and methodologies were coordinated with County and SCDOT staff, as well as Dorchester School District Two staff.

Based on the capacity analyses and turn-lane warrants, the following transportation improvements are recommended. Note that once developer mitigation is approved, the timing of the improvements would need to be determined.

SC 27 at Carter Road

- Extension of the northbound left-turn lane (assumed to be built by the Bridlewood development) back to the SC 61/SC 27 intersection.

SC 61 at SC 27/Wright Road

- Realignment of the SC 61/SC 27 intersection so that SC 61 (east of SC 27) serves as the major street northbound approach, SC 27 (north of SC 61) serves as the major street southbound approach, and SC 61 (west of SC 27) serves as the minor street eastbound approach.
- Installation of a traffic signal if/when warrants are met.
- Realignment of Wright Road to tee into SC 61 approximately 325 feet west of its current location.
- Construction of an additional northbound and southbound through lane creating two northbound and southbound through lanes.
- Construction of a northbound left-turn lane with storage maximized to the extent feasible and acceptable to SCDOT.
- Construction of a southbound right-turn lane with 100 feet of storage.
- Construction of the eastbound approach to consist of a shared eastbound left-right lane and an eastbound right-turn lane with 225 feet of storage.

SC 61 at Old Beech Hill Road

- Construction of an exclusive westbound left-turn lane with 150 feet of storage.
- Construction of an exclusive northbound right-turn lane with 100 feet of storage.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches. Note that this improvement is a continuation of the improvements recommended at the adjacent intersections.

SC 61 at US 17A (West)

- Realignment of the SC 61/US 17A intersection so that SC 61 (west of US 17A) serves as the major street eastbound approach, US 17A (east of SC 61) serves as the major street westbound approach, and US 17A (south of SC 61) serves as the minor street northbound approach.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches. Note that the westbound approach

of US 17A was recommended to be widened as an improvement in the Summers Corner TIA and therefore is not recommended to be constructed by the Branton development.

- Construction of an eastbound right-turn lane with 200 feet of storage.
- Construction of an additional westbound left-turn lane to create dual westbound left-turn lanes with 775 feet of storage each.
- Construction of a second southbound receiving lane to accommodate the dual westbound left-turn lanes. Note that this segment of US 17A was recommended to be widened as an improvement in the Summers Corner TIA and therefore is not recommended to be constructed by the Branton development.
- Construction of an additional northbound right-turn lane to create dual northbound right-turn lanes with 500 feet of storage on the outer turn lane. Note that this segment of US 17A was recommended to be widened as an improvement in the Summers Corner TIA and therefore the inner northbound right-turn lane is not recommended to be constructed by the Branton development.
- Adjust route signage accordingly with changes to the intersection configuration.

SC 61 at US 17A (East)

- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches. Note that this segment of US 17A was recommended to be widened as an improvement in the Summers Corner TIA and therefore is not recommended to be constructed by the Branton development.
- Reconfiguration of the northbound approach to include an exclusive left-turn lane with storage maximized to the extent feasible and acceptable to SCDOT and a shared left-right lane.

SC 61 at Access 1

- Installation of a traffic signal if/when warrants are met.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of an eastbound left-turn lane with 275 feet of storage.
- Construction of the southbound approach to include an exclusive left-turn lane and an exclusive right-turn lane with 225 feet of storage.

SC 61 at Access 2/Access 3

- Installation of a traffic signal if/when warrants are met.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of dual eastbound left-turn lanes with 225 feet of storage each.
- Construction of an eastbound right-turn lane with 100 feet of storage.
- Construction of dual westbound left-turn lanes with 150 feet of storage each.
- Construction of a westbound right-turn lane with 300 feet of storage.
- Construction of the northbound approach to include an exclusive left-turn lane, an exclusive through lane with 150 feet of storage, and an exclusive right-turn lane with 100 feet of storage.
- Construction of the southbound approach to include dual left-turn lanes with 550 feet of storage on the inner lane, a shared through-right lane with 150 feet of storage, and an exclusive right-turn lane with 150 feet of storage.

SC 61 at Access 4

- Installation of a traffic signal if/when warrants are met.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of an eastbound left-turn lane with 350 feet of storage.
- Construction of the southbound approach to include an exclusive left-turn lane and an exclusive right-turn lane with 350 feet of storage.

SC 61 at Access 5/Access 6

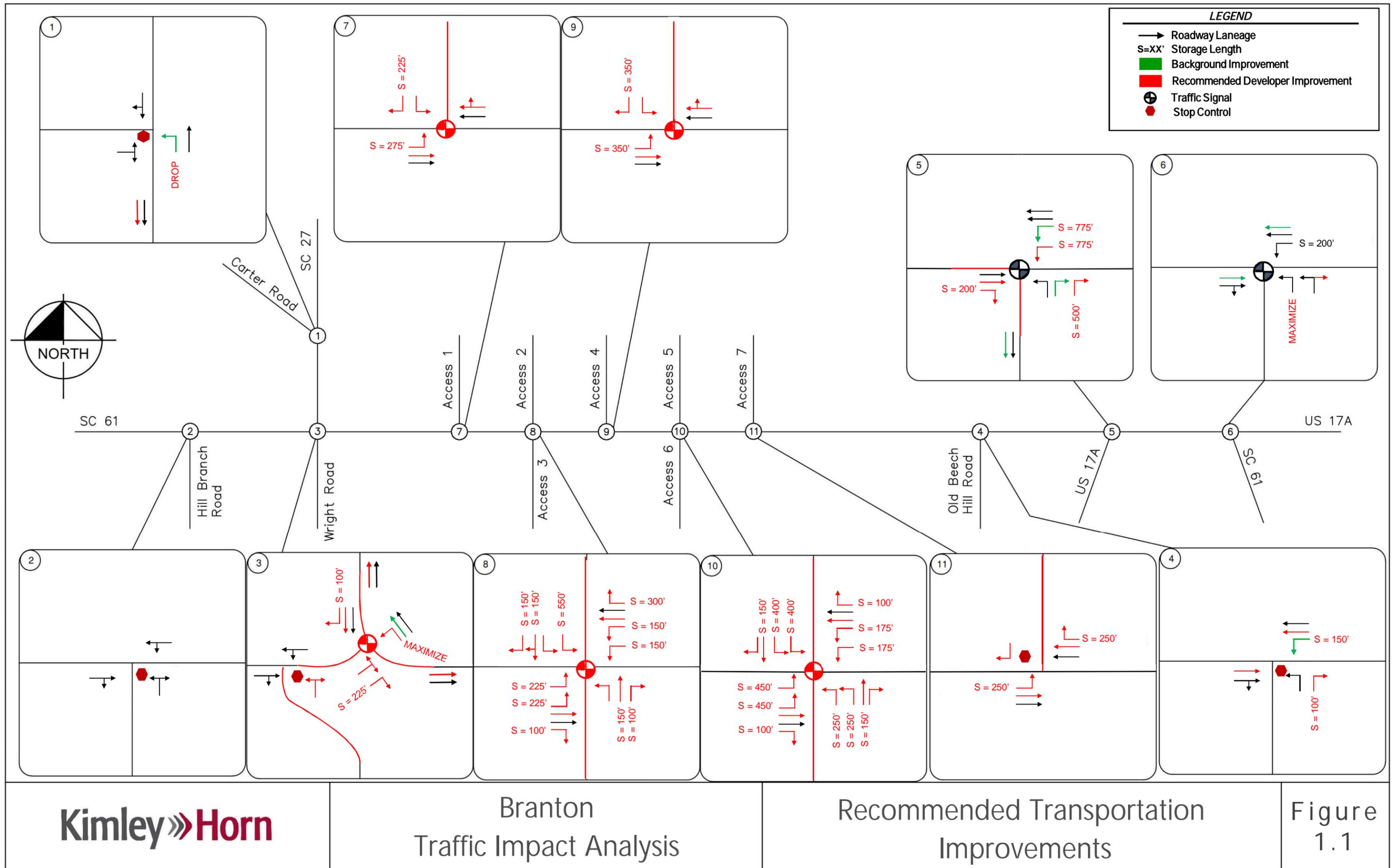
- Installation of a traffic signal if/when warrants are met.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of dual eastbound left-turn lanes with 450 feet of storage each.
- Construction of an eastbound right-turn lane with 100 feet of storage.
- Construction of dual westbound left-turn lanes with 175 feet of storage each.
- Construction of a westbound right-turn lane with 100 feet of storage.
- Construction of the northbound approach to include dual left-turn lanes with 250 feet of storage each, an exclusive through lane with 150 feet of storage, and an exclusive right-turn lane.
- Construction of the southbound approach to include dual left-turn lanes with 400 feet of storage each, an exclusive through lane with 150 feet of storage, and an exclusive right-turn lane.

SC 61 at Access 7

- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of an eastbound left-turn lane with 250 feet of storage.
- Construction of a westbound right-turn lane with 250 feet of storage.
- Construction of the southbound approach to include an exclusive right-turn lane so that the intersection is restricted to a directional crossover.

Note that the speed limit is currently posted at 55 miles per hour (mph) along SC 61 between a point just east of SC 27 and a point just west of US 17A, and then transitions to 45 mph near the SC 27/SC 61 and SC 61/US 17A intersections. Since traffic signals are recommended to be installed throughout the SC 61 corridor, consideration should be given to potentially lowering the speed limit on SC 61 between US 17A and SC 27.

The 2030 build-out recommendations at the study intersections are shown in **Figure 1.1**. The transportation improvements shown on this figure are subject to approval by SCDOT and Dorchester County. All additions and attachments to the State and County roadway system shall be properly permitted, designed and constructed in conformance to standards maintained by the agencies.



2.0 Introduction

The proposed Branton development is located in Dorchester County, South Carolina along SC 61 between SC 27 and Cypress Hill Lane. **Figure 2.1** shows the proposed site layout for the development. As currently envisioned, the proposed development will ultimately consist of the following land uses:

- 180,000 square feet (SF) of office space
- 418,000 SF of retail space
- 100,000 SF of grocery space
- Gas station/convenience market with 20 fueling positions
- 3,166 single family homes
- 767 senior adult homes
- 1,158 townhomes
- 396 apartments
- 100-room hotel
- 1,000-student elementary school

For the purposes of this TIA, orientation of SC 61 is established as east-west through the study area, while SC 27 is established as north-south. Note that at the western intersection of US 17A and SC 61, US 17A is established as north-south. At the eastern intersection of US 17A (Boonehill Road) and SC 61 (Beech Hill Road), US 17A is established as east-west.

The development is anticipated to be completed (built-out) in 2030. Based on the site layout, the proposed development will be accessed along SC 61 at five full movement locations as follows:

- Access 1- westernmost access on north side of SC 61
- Access 2 (north side) aligned with Access 3 (south side)
- Access 4- north side
- Access 5 (north side) aligned with Access 6 (south side)
- Access 7- easternmost access on north side of SC 61

Access 7 is intended to serve the elementary school, which was included in this study to determine the traffic impacts on the adjacent roadways. The site layout, access configuration, and circulation patterns for the elementary school were not considered in this TIA.

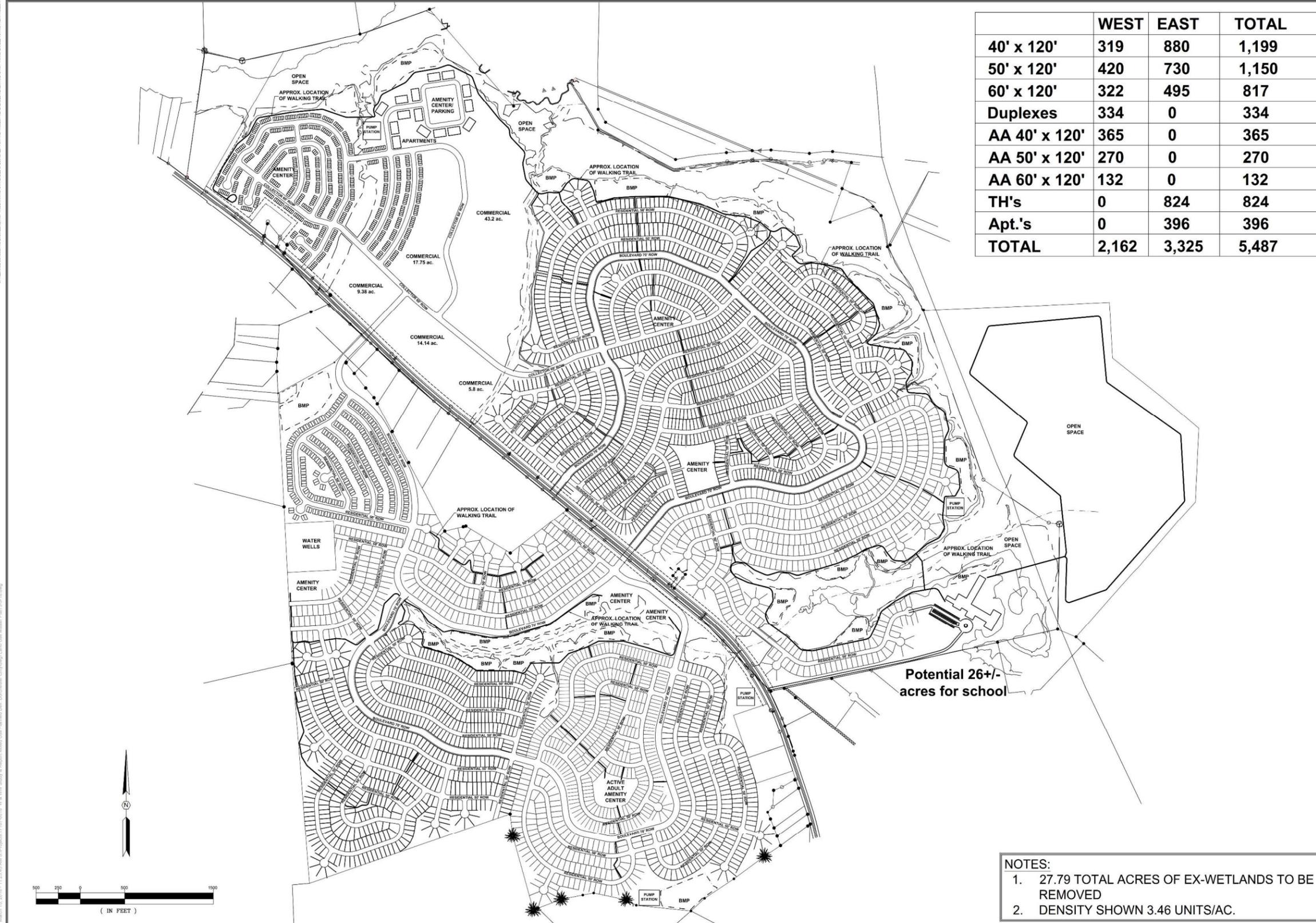
Through coordination with Dorchester County and South Carolina Department of Transportation (SCDOT) staff, this TIA evaluates the traffic operations under 2018 existing conditions, 2030 background conditions, and 2030 build-out conditions during the AM and PM peak hours at the following intersections in addition to the proposed access points discussed above:

- SC 61 & SC 27
- SC 27 & Carter Road
- SC 61 & Hill Branch Road
- SC 61 & Old Beech Hill Road
- US 17A & SC 61 (west intersection)
- US 17A (Boonehill Road) & SC 61 (Beech Hill Road) (east intersection)

Kimley-Horn was retained to determine the potential traffic impacts of this development and identify transportation improvements that may be required to mitigate these impacts in accordance with the traffic study guidelines in the SCDOT Access and Roadside Management Standards (ARMS) Manual. This report presents trip generation, distribution, capacity analyses, and recommendations for developer transportation improvements. The specific TIA scope and methodologies were coordinated with County and SCDOT staff, as well as Dorchester School District Two staff.

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	WEST	EAST	TOTAL
40' x 120'	319	880	1,199
50' x 120'	420	730	1,150
60' x 120'	322	495	817
Duplexes	334	0	334
AA 40' x 120'	365	0	365
AA 50' x 120'	270	0	270
AA 60' x 120'	132	0	132
TH's	0	824	824
Apt.'s	0	396	396
TOTAL	2,162	3,325	5,487

Potential 26+/- acres for school

- NOTES:**
- 27.79 TOTAL ACRES OF EX-WETLANDS TO BE REMOVED
 - DENSITY SHOWN 3.46 UNITS/AC.

REVISION DATE	
APPROVALS	DATE
ENGINEER	
DESIGNER	
TRANSPORTATION	
CHECKED BY	
APPROVED	
ALLIANCE CONSULTING ENGINEERS Allance Consulting Engineers, Inc. 115 Green Chatham, South Carolina 29492-7319 Phone (843) 233-1600 • Fax (843) 203-1601	
BRANTON PLANNED DEVELOPMENT ON SC HIGHWAY 61, IN DORCHESTER COUNTY, SOUTH CAROLINA	
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REFERENCE FILE:	OF
17167_Plan.dwg	12
PROJECT NO.:	
17167-0018	
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Branton Traffic Impact Analysis

Site Layout

Figure 2.1

3.0 Existing Traffic Conditions

Existing traffic conditions were coordinated with Dorchester County and SCDOT staff and collected through field observations and turning-movement counts to establish the existing conditions baseline analysis. A field visit was performed on May 10, 2018 to determine the existing laneage and posted speed limits.

3.1 STUDY AREA

Figure 3.1 shows the study area intersections and the site location, and **Figure 3.2** shows the existing roadway geometry at the study intersections.

The primary roadways in the vicinity of the site are SC 61, SC 27, and US 17A, based on SCDOT's 2010 functional classifications.

SC 61 is a two-lane roadway classified by SCDOT as a minor arterial, with a posted speed limit of 55 miles per hour (mph) in the vicinity of the site, transitioning to 45 mph near its intersection with SC 27 and also near its intersection of US 17A. Its 2017 SCDOT average daily traffic (ADT) volume is 7,200 vehicles per day (vpd) in the vicinity of the site and 4,300 vpd south of US 17A.

SC 27 is a two-lane major collector with a posted speed limit of 35 mph and 2017 SCDOT ADT of 3,000 vpd.

US 17A is a two-lane minor arterial with a 2017 ADT of 16,200 vpd and 55-mph posted speed limit east of SC 61 (Boonehill Road). It has a 2017 ADT of 9,000 vpd south of SC 61.

3.2 EXISTING TRAFFIC CONDITIONS

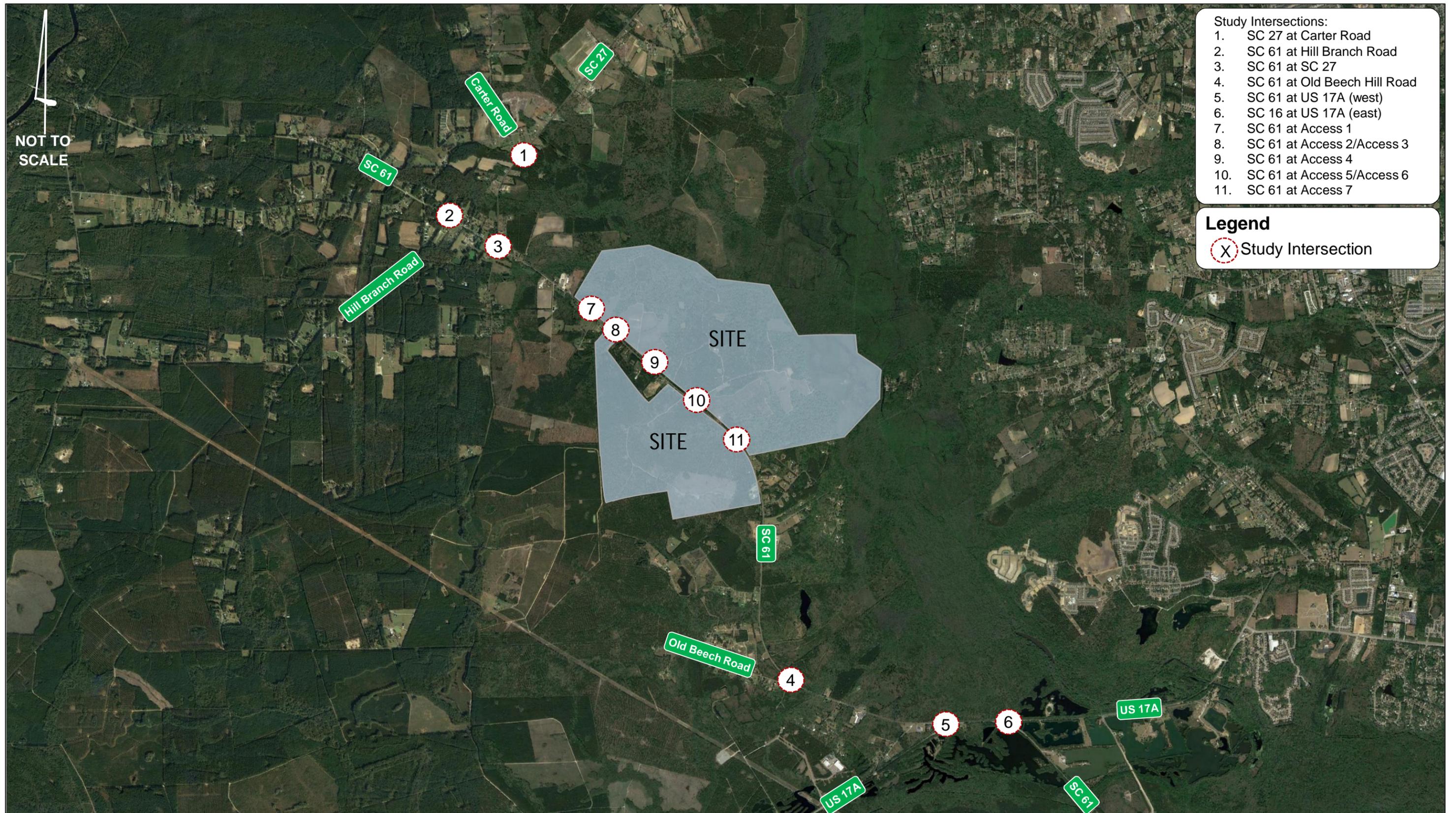
Peak-hour intersection turning-movement, heavy-vehicle, and pedestrian counts were performed by Quality Counts, LLC on Thursday, May 4, 2017 for the AM (7:00-9:00 AM), school dismissal peak (2:00-4:00), and PM (4:00-6:00 PM) peak hours at the following intersections:

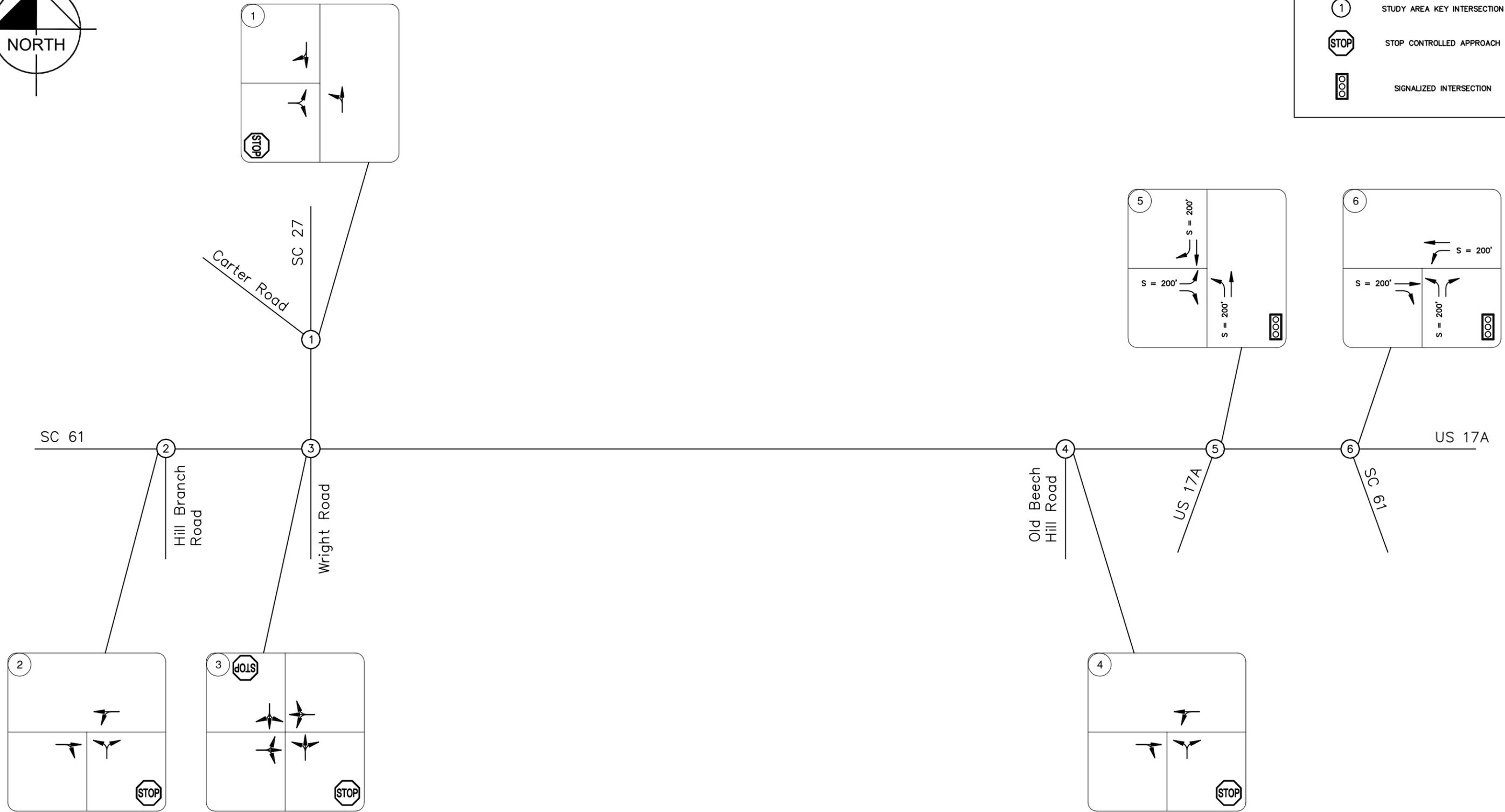
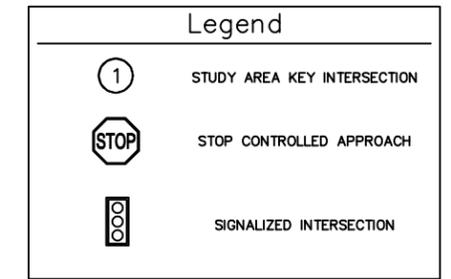
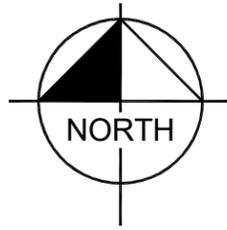
- SC 61 & SC 27
- SC 27 & Carter Road
- SC 61 & Hill Branch Road
- SC 61 & Old Beech Hill Road
- US 17A & SC 61 (west intersection)
- US 17A (Boonehill Road) & SC 61 (Beech Hill Road) (east intersection)

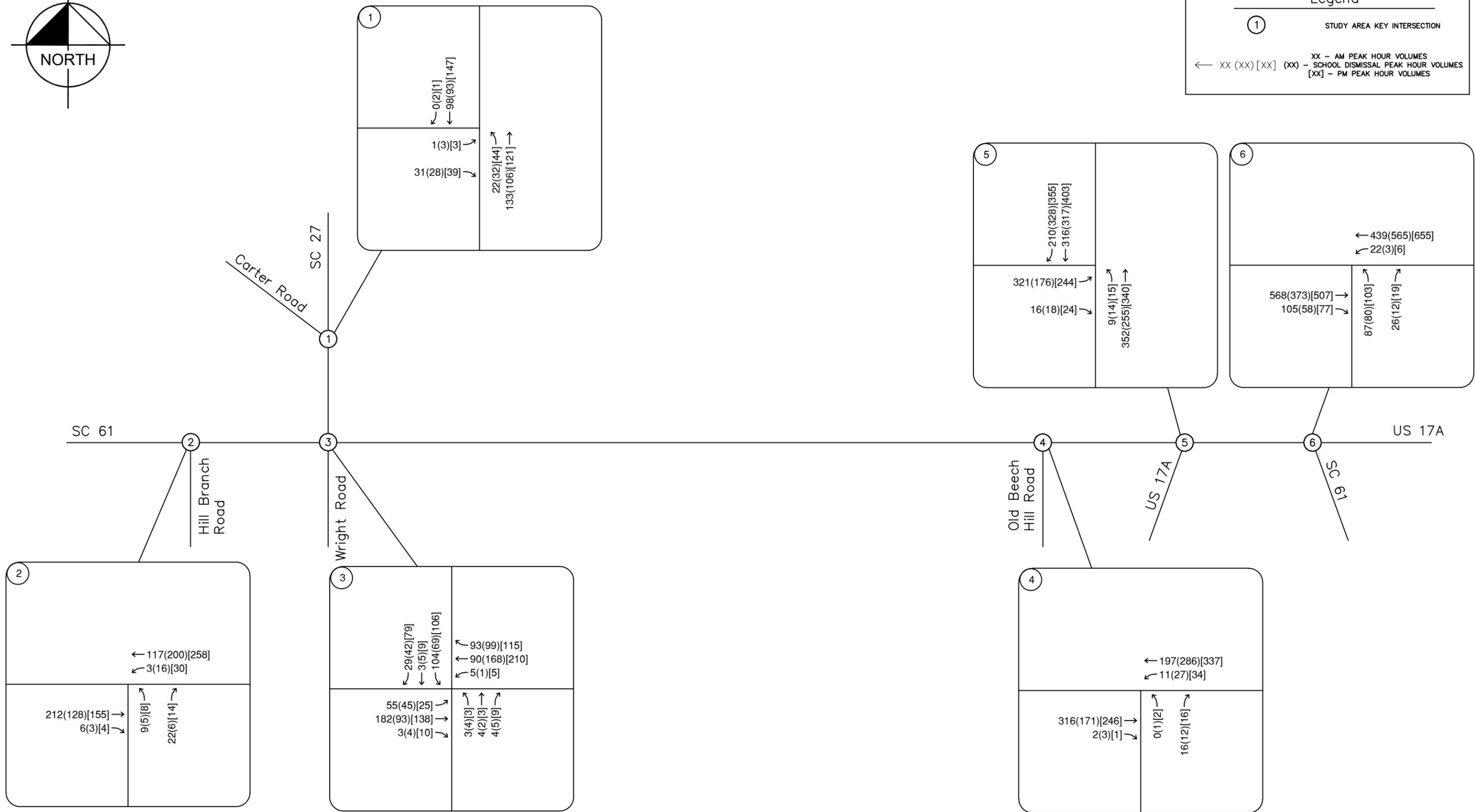
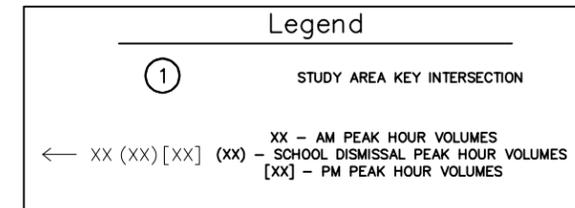
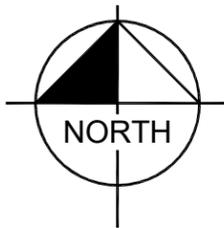
SCDOT guidelines specify that counts should be taken within one year of the TIA submittal; however, SCDOT approved the use of the counts beyond the one-year timeframe for this study. The 2017 traffic volumes were grown by 3% to establish existing 2018 traffic volumes, based on historical annual growth rates described below in Section 4.1, calculated on SC 61 between 2011 and 2016 in the vicinity of the site. Raw peak-hour intersection turning-movement count data is provided in the **Appendix**.

Volume balancing was performed between the intersections of US 17A at SC 61 (west intersection) and US 17A (Boonehill Road) at SC 61 (Beech Hill Road) (east intersection). No volume balancing was performed between the remaining study area intersections due to the presence of driveways and distance between the intersections.

Figure 3.3 illustrates the 2018 existing AM, school dismissal, and PM peak-hour traffic volumes.







4.0 Background Traffic Conditions

Projected background (non-project) traffic is defined as the expected growth or change in traffic volumes on the surrounding roadway network between the year the existing counts were collected and the expected build-out year absent the construction and opening of the proposed project. This includes both non-specific general growth based on historical increase in local traffic volumes (historical background growth) and specific growth in traffic volumes caused by specific approved developments within the relative vicinity of the proposed development.

4.1 HISTORICAL GROWTH TRAFFIC

Historical growth is the increase in existing traffic volumes due to usage increases and non-specific growth throughout the area, and accounts for growth that is independent of specific approved developments. Historical growth traffic is calculated using an annual growth rate, which is applied to the existing traffic volumes up to the future horizon year. A 3% annual growth rate was used in this analysis, calculated on SC 61 between 2011 and 2016 in the vicinity of the site, and approved by County and SCDOT staff. These growth rates were applied to the 2018 existing peak-hour traffic volumes to calculate base 2030 traffic volumes.

4.2 APPROVED OFFSITE DEVELOPMENT TRAFFIC

Bridlewood Farms and Summers Corner were considered as approved offsite developments based on input from SCDOT and Dorchester County staff. The methodology for incorporating approved development trips, coordinated with both SCDOT and County staff, is provided below. Approved development calculations are included in the appendix.

Bridlewood Farms

- The TIA (Compton Engineering Services, LLC, November 2005) provided by SCDOT was used to estimate the number of trips that would travel through the Branton TIA study area intersections. The development is phased with build-out years of 2007 and 2013; therefore, full 2013 build-out site volumes for this study were utilized.
- The TIA analyzed AM and PM peak periods; however, the Branton TIA analyzes AM, school dismissal, and PM peak periods. Therefore, the Bridlewood residential PM peak hour trips were factored to determine school dismissal peak trips. The factor was determined by comparing the school dismissal peak (3-4 PM) and PM peak (5-6 PM) ITE hourly variations for residential land uses.
- Based on review of available March 2017 Google Earth aerial mapping, which aligns approximately with the timeframe the traffic counts were performed, approximately 175 of the proposed 694 single family homes or approximately 25% build-out of the site, is currently built-out.
- The residential distribution developed for the Branton TIA was used to distribute the Bridlewood Farms site trips through the study area.
- It was assumed that the following recommended improvements outlined in the TIA were committed by the developer:
 - Construction of a northbound left-turn lane along SC 27 at Carter Road.
 - Construction of a westbound right-turn lane along SC 61 at SC 27/Wright Road

Summers Corner

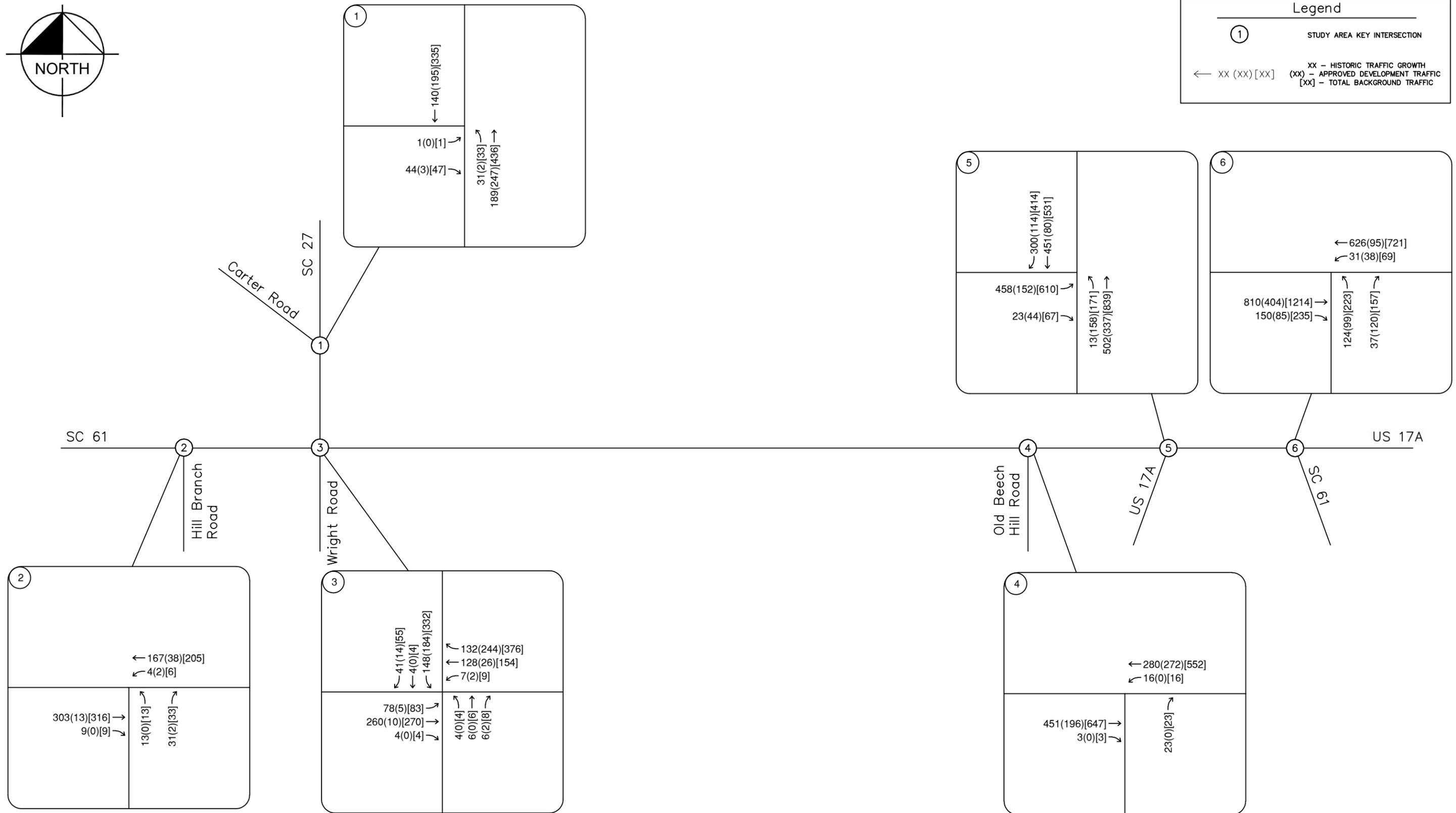
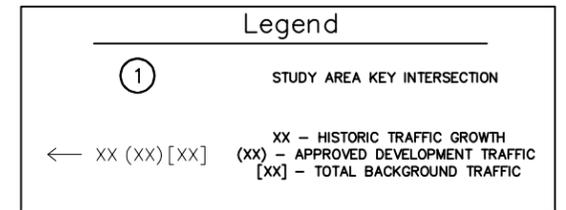
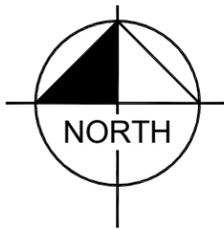
- The TIA (Stantec, March 2014) provided by SCDOT was used to estimate the number of trips that would travel through the Branton TIA study area intersections. There are two phases proposed based on the TIA, with built-out years of 2025 and 2035. An average of the 2025 and 2035 build-out trips from Summers Corner was calculated to determine the 2030 background volumes for this development.
- It was assumed that the recommended improvements outlined in the TIA were committed by the developer.
- Based on review of available March 2017 aerial mapping, which aligns approximately with the timeframe the traffic counts were performed, approximately 58 single-family homes, 5,900 square feet of commercial development, and the elementary school were built-out at the time of the counts. This equates to approximately 2% of the expected 2030 residential development, 5% of the commercial development, and 100% of the elementary school. Note that the 2035 internal capture volumes were not included in the 2030 traffic volumes used in this study.
- The residential, commercial, and school trip distributions developed for the Branton TIA were used to distribute the Summers Corner residential, commercial, and school site trips at study area intersections not included in the Summers Corner TIA.
- The Summers Corner TIA analyzed AM and PM peak periods; however, the Branton TIA analyzes AM, school dismissal, and PM peak periods. Therefore, the Summers Corner PM peak hour trips were factored using the following methodology to estimate school dismissal peak hour trips:
 - The school dismissal (3-4 PM) ITE hourly variations for residential and retail land uses were compared to the PM (5-6 PM) ITE hourly variations for residential and retail land uses to determine what percentage of trips should be applied to the school dismissal peak.
 - A trip generation analysis was performed using the trip generation rates published in *Trip Generation* (Institute of Transportation Engineers, Ninth Edition, 2012) for the peak hour of the generator for a middle school with 750 students (as proposed in Summers Corner). The trip generation was compared to the trip generation performed in the Summers Corner TIA for the middle school, which was developed based on the PM peak hour of the adjacent street traffic, to determine what percentage of trips should be applied to the school dismissal peak.

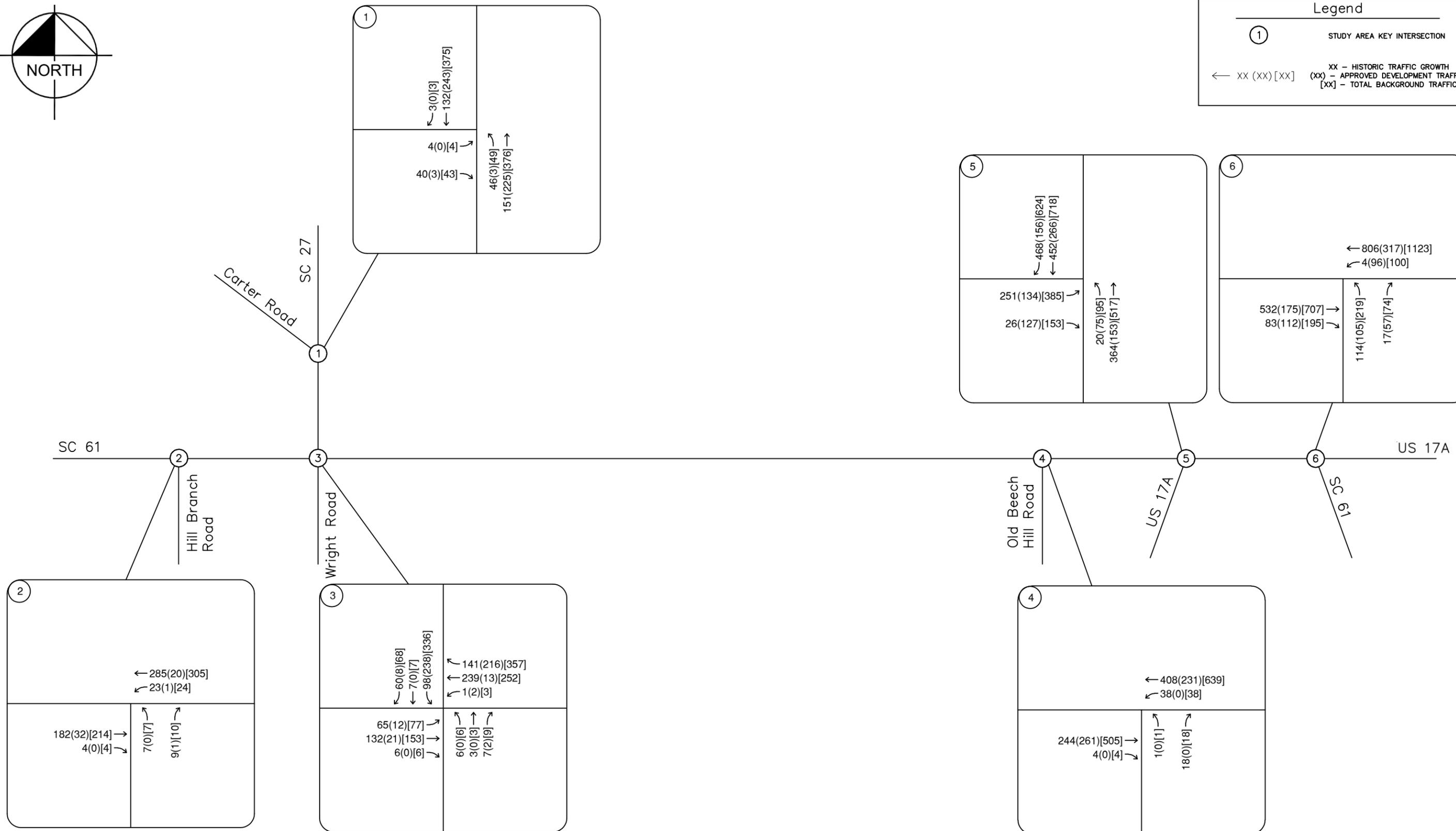
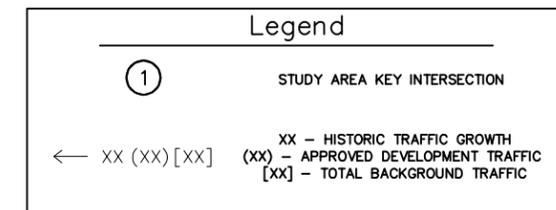
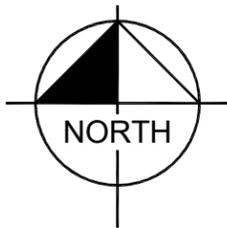
4.3 2030 BACKGROUND TRAFFIC

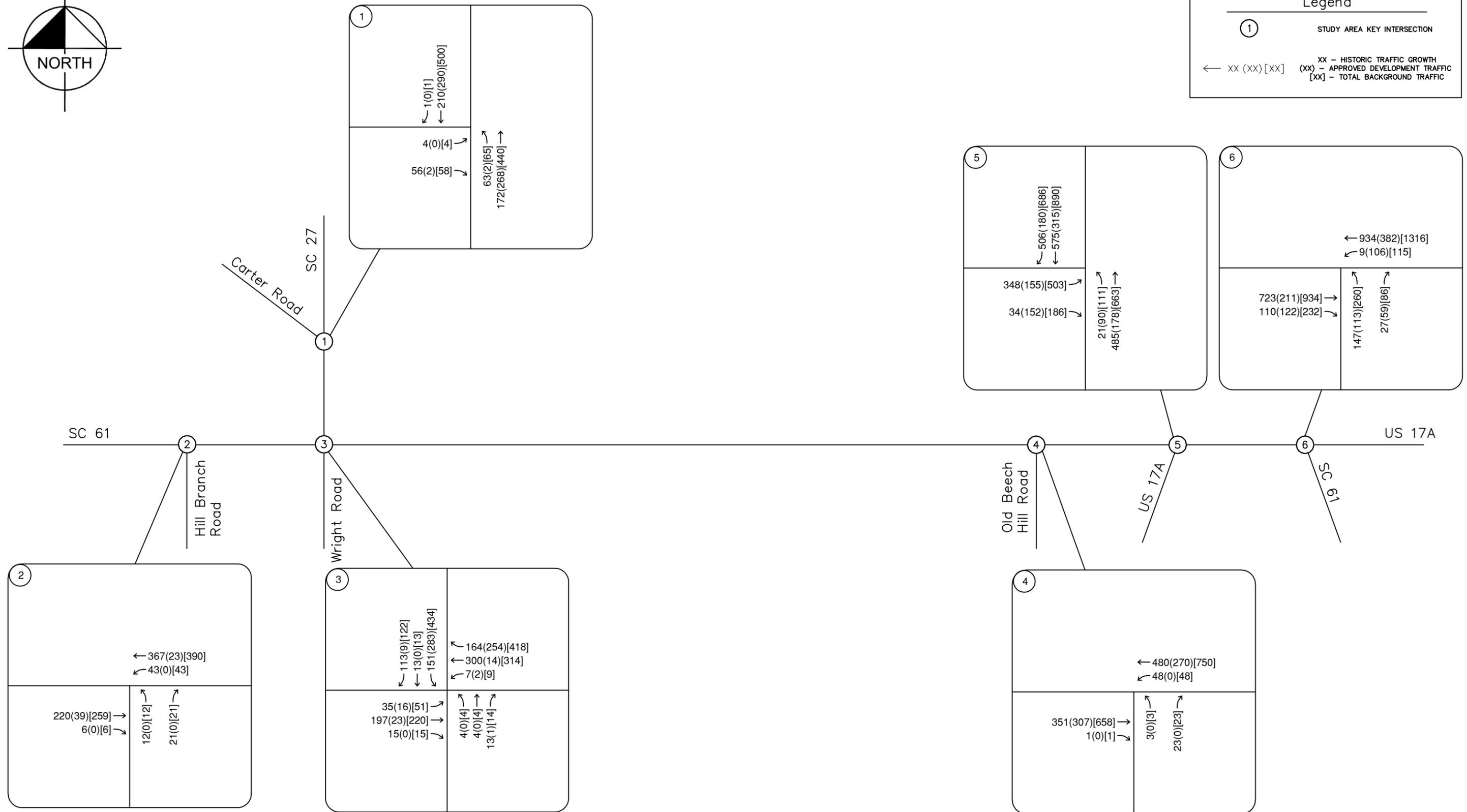
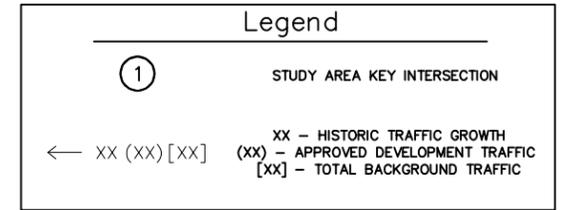
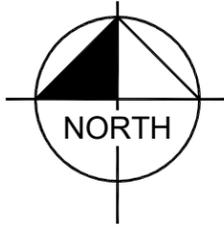
The 2030 background conditions include the historical growth traffic and approved development traffic. **Figures 4.1-4.3** show the 2030 background AM, school dismissal, and PM peak-hour traffic volumes, respectively. Since a 3% annual growth rate was applied over 12 years in addition to the approved development traffic, this analysis could be considered conservative.

4.4 PLANNED TRANSPORTATION PROJECTS

Based on the Summers Corner TIA US 17A is planned to be widened to a four-lane divided section between Berlin G Myers Parkway and Clubhouse Road (per the 2008 Dorchester Comprehensive Plan). However, based on coordination with SCDOT, there has been no indication that the project is funded/scheduled and therefore it was not included in the background and build-out scenarios of this analysis.







5.0 Site Traffic Volume Development

Site traffic developed for this TIA is defined as the vehicle trips expected to be generated and added to the study area by the construction of the proposed development, and the distribution and assignment of that traffic throughout the surrounding network.

5.1 TRAFFIC GENERATION

The traffic generation potential of the proposed development was determined using the trip generation rates published in *Trip Generation* (Institute of Transportation Engineers, Ninth Edition, 2012) for all land uses. Based on the site layout, the proposed development will ultimately consist of the following land uses:

- 180,000 square feet (SF) of office space
- 418,000 SF of retail space
- 100,000 SF of grocery space
- Gas station/convenience market with 20 fueling positions
- 3,166 single family homes
- 767 senior adult homes
- 1,158 townhomes
- 396 apartments
- 100-room hotel
- 1,000-student elementary school

Table 5.1 summarizes the projected trip generation for the proposed development.

Table 5.1 - Trip Generation											
Land Use	Intensity	Daily	AM Peak Hour			School Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out	Total	In	Out
Office Building [ITE 710]*	180,000 SF	2,052	306	269	37	141	44	97	280	48	232
Shopping Center [ITE 820]**	418,000 SF	17,207	373	231	142	1,428	671	757	1,562	750	812
Supermarket [ITE 850]**	100,000 SF	10,224	340	211	129	849	399	450	948	483	465
Gas Station with Convenience Market [ITE 945]**	20 FP	3,256	203	102	101	270	127	143	270	135	135
Single-Family Homes [ITE 210]-	3,166 DU	30,140	2,375	594	1,781	2,170	1,221	949	3,166	1,995	1,171
Senior Adult Detached [ITE 251]^	767 DU	2,823	169	59	110	276	140	136	207	126	81
Townhomes [ITE 230]-	1,158 DU	6,728	510	87	423	484	272	212	602	403	199
Apartments [ITE 220]-	396 DU	2,523	198	40	158	181	102	79	235	153	82
Hotel [ITE 310]-	100 RM	817	53	31	22	59	33	26	60	31	29
Elementary School [ITE 520]^^	1,000 STU	1,290	450	248	202	280	126	154	0	0	0
Subtotal		77,060	4,977	1,872	3,105	6,138	3,135	3,003	7,330	4,124	3,206
Internal Capture											
Office		764	37	27	10	0	0	0	93	42	51
Retail		5,662	65	38	27	0	0	0	575	188	387
Restaurant		0	0	0	0	0	0	0	0	0	0
Cinema/Entertainment		0	0	0	0	0	0	0	0	0	0
Residential		5,488	49	16	33	0	0	0	540	372	168
Hotel		136	11	0	11	0	0	0	14	9	5
Internal Capture		12,050	162	81	81	0	0	0	1,222	611	611
Office Building [ITE 710]*		1,288	269	242	27	141	44	97	187	6	181
Shopping Center [ITE 820]**		14,032	347	215	132	1,428	671	757	1,239	647	589
Supermarket [ITE 850]**		8,338	316	196	120	849	399	450	752	417	338
Gas Station with Convenience Market [ITE 945]**		2,655	189	95	94	270	127	143	214	116	98
Single-Family Homes [ITE 210]-		26,222	2,339	582	1,757	2,170	1,221	949	2,760	1,718	1,043
Senior Adult Detached [ITE 251]^		2,456	166	58	109	276	140	136	180	108	72
Townhomes [ITE 230]-		5,853	502	85	417	484	272	212	525	347	177
Apartments [ITE 220]-		2,195	195	39	156	181	102	79	205	132	73
Hotel [ITE 310]-		681	42	31	11	59	33	26	46	22	24
Elementary School [ITE 520]^^		1,290	450	248	202	280	126	154	0	0	0
Driveway Volumes (Subtotal - Internal Capture)		65,010	4,815	1,791	3,024	6,138	3,135	3,003	6,108	3,513	2,595
Pass-By											
ITE 820 Pass-By - 0% AM / 34% PM		400	0	0	0	0	0	0	400	200	200
ITE 850 Pass-By - 0% AM / 36% PM		244	0	0	0	0	0	0	244	122	122
ITE 945 Pass-By - 62% AM / 56% PM		226	116	58	58	0	0	0	110	55	55
ITE Pass-By		870	116	58	58	0	0	0	754	377	377
Adjacent Street Traffic			1,202			1,149			1,412		
10% Adjacent Street Traffic			380	122	61	61	116	58	142	71	71
Pass-By		258	116	58	58	0	0	0	142	71	71
School Trip Reduction											
School Reduction (45% Walk/Bike/ Bus)		581	203	112	91	126	57	69	0	0	0
School Reduction (45% Assigned to Network)		581	203	112	91	126	57	69	0	0	0
School Trip Reduction		1,162	406	224	182	252	114	138	0	0	0
Net New External Trips											
Office Building [ITE 710]*		1,288	269	242.0	27	141	44	97	187	6	181
Shopping Center [ITE 820]**		13,914	347	214.9	132	1,428	671	757	1,164	609	552
Supermarket [ITE 850]**		8,265	316	196.3	120	849	399	450	706	394	315
Gas Station with Convenience Market [ITE 945]**		2,588	73	37.0	36	270	127	143	193	106	88
Single-Family Homes [ITE 210]-		26,222	2,339	582	1,757	2,170	1,221	949	2,760	1,718	1,043
Senior Adult Detached [ITE 251]^		2,456	166	58	109	276	140	136	180	108	72
Townhomes [ITE 230]-		5,853	502	85	417	484	272	212	525	347	177
Apartments [ITE 220]-		2,195	195	39	156	181	102	79	205	132	73
Hotel [ITE 310]-		681	42	31	11	59	33	26	46	22	24
Elementary School [ITE 520]^^		128	44	24	20	28	12	16	0	0	0
Net New External Trips		63,590	4,293	1,509	2,784	5,886	3,021	2,865	5,966	3,442	2,525
*ITE Hourly Variation Used to Determine Midday Peak Hour Trips (3 pm - 4 pm)											
**ITE Hourly Variation for Shopping Center (820) Used to Determine Midday Peak Hour Trips (3 pm - 4 pm)											
-ITE Hourly Variation for Residential Used to Determine Midday Peak Hour Trips (3 pm - 4 pm)											
^ITE Hourly Variation for Senior Oriented Residential Used to Determine Midday Peak Hour Trips (3 pm - 4 pm)											
^^ITE PM Peak Hour Generator Used to Determine Midday Peak Hour Trips; No School Traffic Assumed to be Included in PM Peak Hour											

Internally captured trips are trips that begin and end within the project site and do not access the external roadway network. The National Cooperative Highway Research Program (NCHRP) Report 684 *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*, produced by the Transportation Research Board, was used to calculate the internal capture for the development. Internal capture was only calculated for the AM and PM peak hours. No internal capture was assumed to occur during the school dismissal peak. Since the proposed site is split across SC 61, internal capture trips were assigned to the study area intersections as appropriate. Internal capture calculations are included in the **Appendix**.

Note that internal capture calculations were performed between the residential and retail land uses. The following assumptions were made when determining the number of internal trips between the school and residential land uses:

- Based on discussion with Dorchester School District Two staff, 0.2 elementary students per household was assumed. Since this site proposes to build 4,720 non-senior dwelling units (3,166 single family, 1,158 Townhomes, and 396 apartments), approximately 945 of the proposed 1,000 students would be expected to live in the neighborhood. For the purposes of this study, 90% of the students were assumed to live within the proposed development.
- The remaining 10% were assumed to be external trips and were assigned to the network based on the school distribution, discussed in Section 5.2.
- For the 90% of school trips internal to the site, assuming an even (50/50) split between students who will bus/walk/bike to school versus car riders, 50% of the 90% (45%) of school trips were subtracted from the trip generation (see line 1 under School Trip Reduction in Table 5.1). The remaining 45% of school trips were assumed to be car riders.
- Of the 45% that are car riders, it is assumed that 50% of the trips will return home after dropping students off at school and 50% will travel to work. These trips were reassigned to the school driveway, then distributed throughout the network based on the residential distribution/assignment (see line 2 under School Trip Reduction in Table 5.1).

Note that these assumptions were coordinated with SCDOT, County, and Dorchester School District Two staff.

Pass-by trips are trips already on the roadway network that turn into the site as they pass by on the adjacent street. Pass-by percentages were calculated for the commercial component of the proposed site based on the equations and data presented in the ITE *Trip Generation Handbook*. Pass-by volumes were limited to ten percent of the adjacent street traffic. Pass-by calculations can be seen in the **Appendix**.

The following assumptions were made in the development of the raw trip generation, as coordinated with SCDOT, County, and Dorchester School District Two staff:

- For the elementary school, the PM peak hour of generator was used to determine the school dismissal peak trips. It was assumed that no school trips would be included in the PM peak hour.
- ITE hourly variation was used to determine the school dismissal peak hour trips for the other land uses.

- The hotel assumes residential variation.
- Supermarket and gas station assume retail variation.
- A midday peak of 3-4 PM was assumed for the hourly variations since 3-4 PM is the midday adjacent street traffic peak.

5.2 SITE TRAFFIC DISTRIBUTION AND ASSIGNMENT

The proposed development's net new external trips for the residential and commercial components were assigned to the surrounding network based on surrounding existing and future land uses and the proposed site layout. A significant portion of the residential traffic would be expected to travel to/from the Ridgeville Commerce Center and the Volvo Manufacturing Facility.

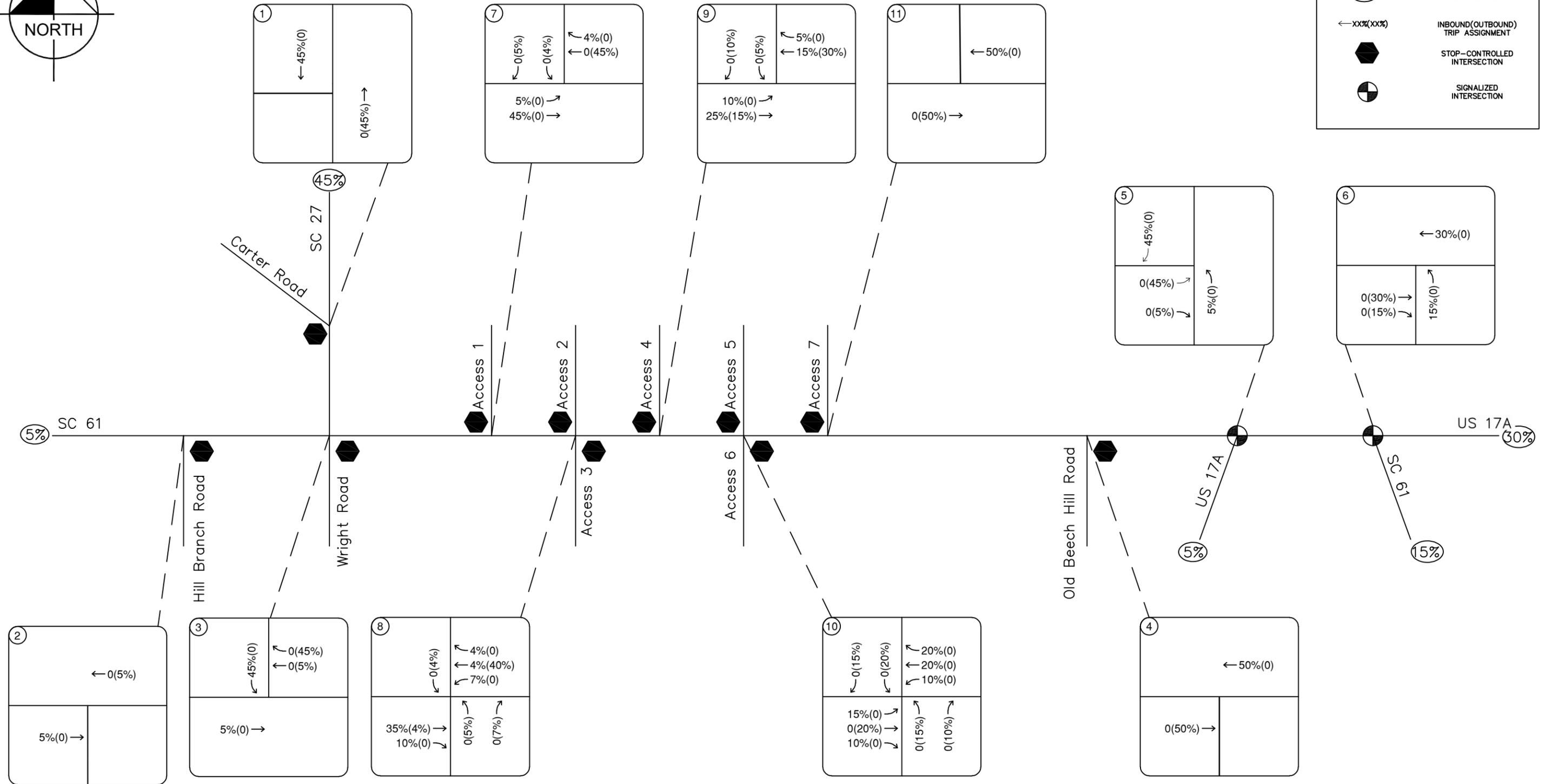
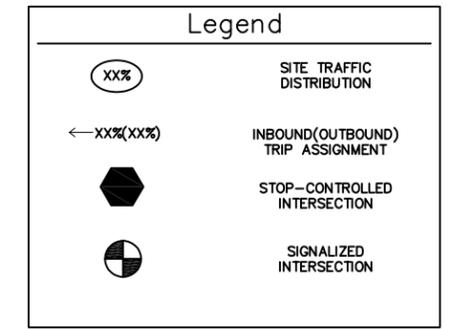
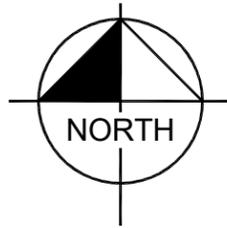
Based on on-line School District information, the new elementary school falls within the Sand Hills Elementary attendance area; therefore, it was assumed that the boundary for the new school is along Old Beech Hill Road.

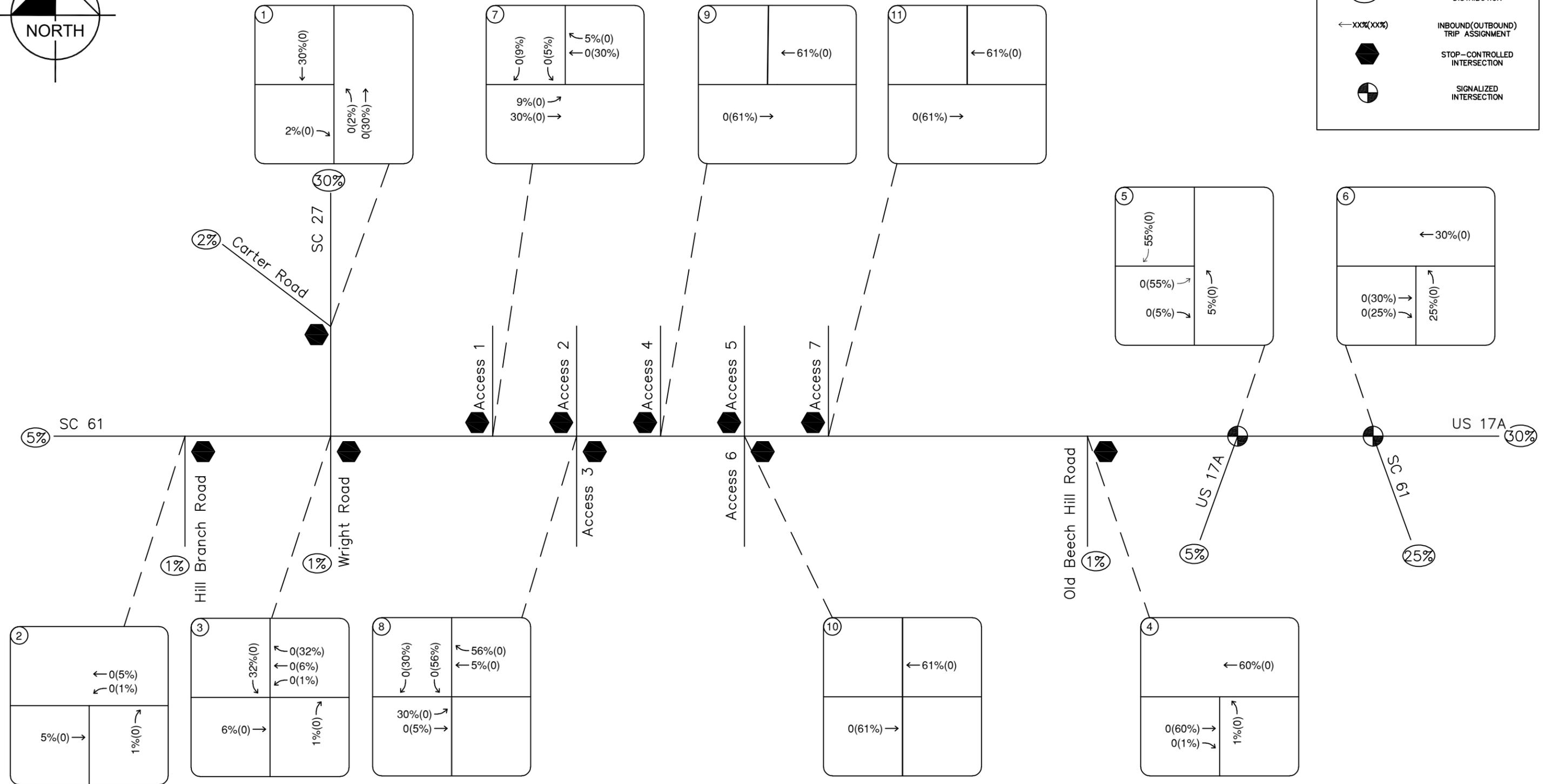
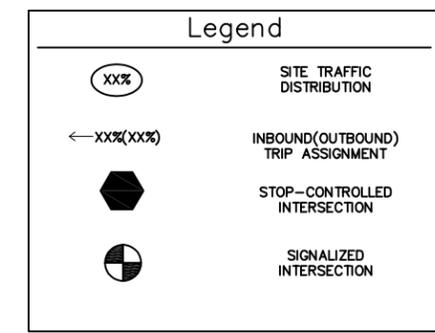
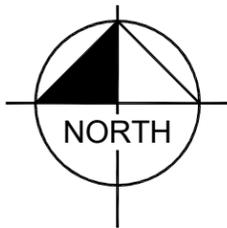
The site traffic distribution and assignment for the residential, commercial, and school are shown in **Figures 5.1 A-C**, which were coordinated with SCDOT, County, and School District staff.

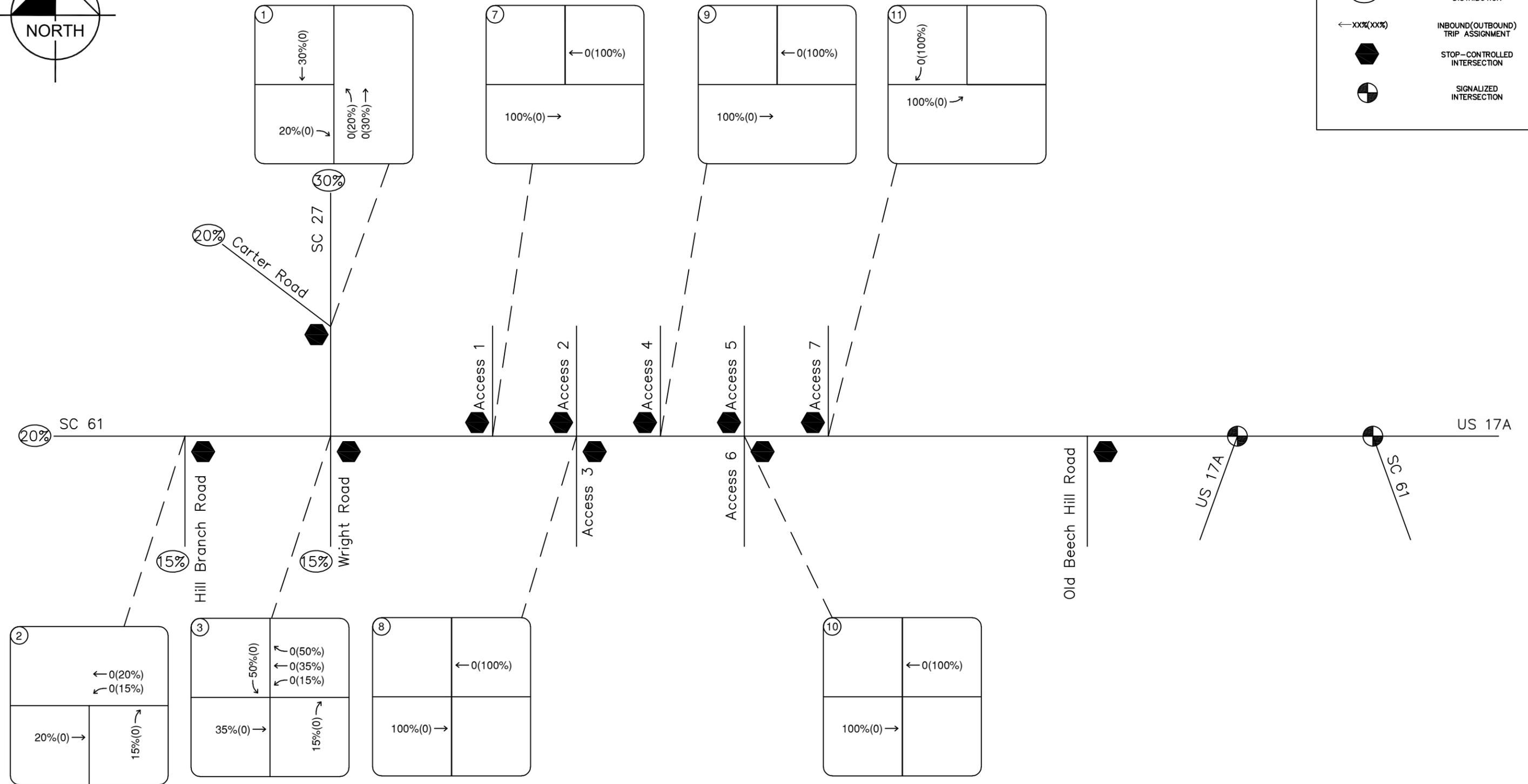
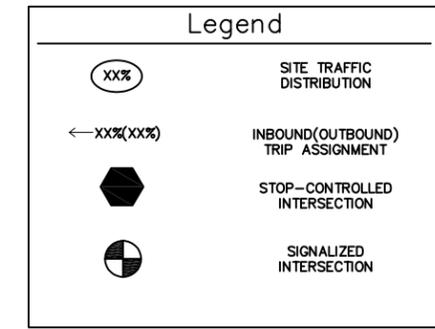
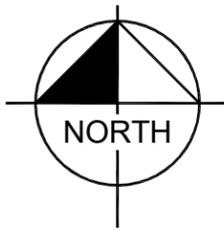
5.3 2030 BUILD-OUT TRAFFIC VOLUMES

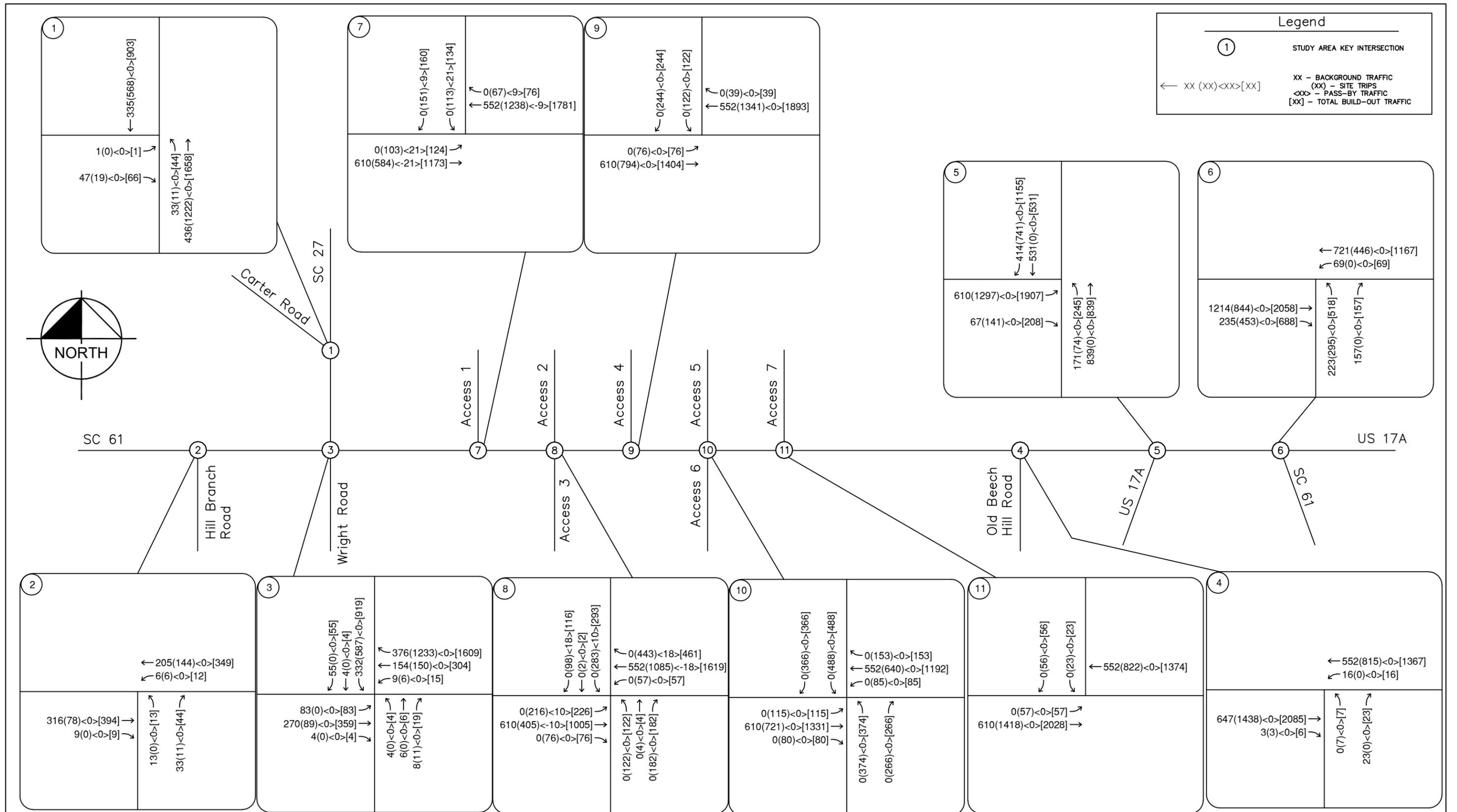
The 2030 build-out traffic volumes include the assignment of the projected site traffic generation and 2030 background traffic volumes. **Figures 5.2-5.4** show the projected 2030 build-out traffic volumes for the AM, school dismissal, and PM peak hours, respectively.

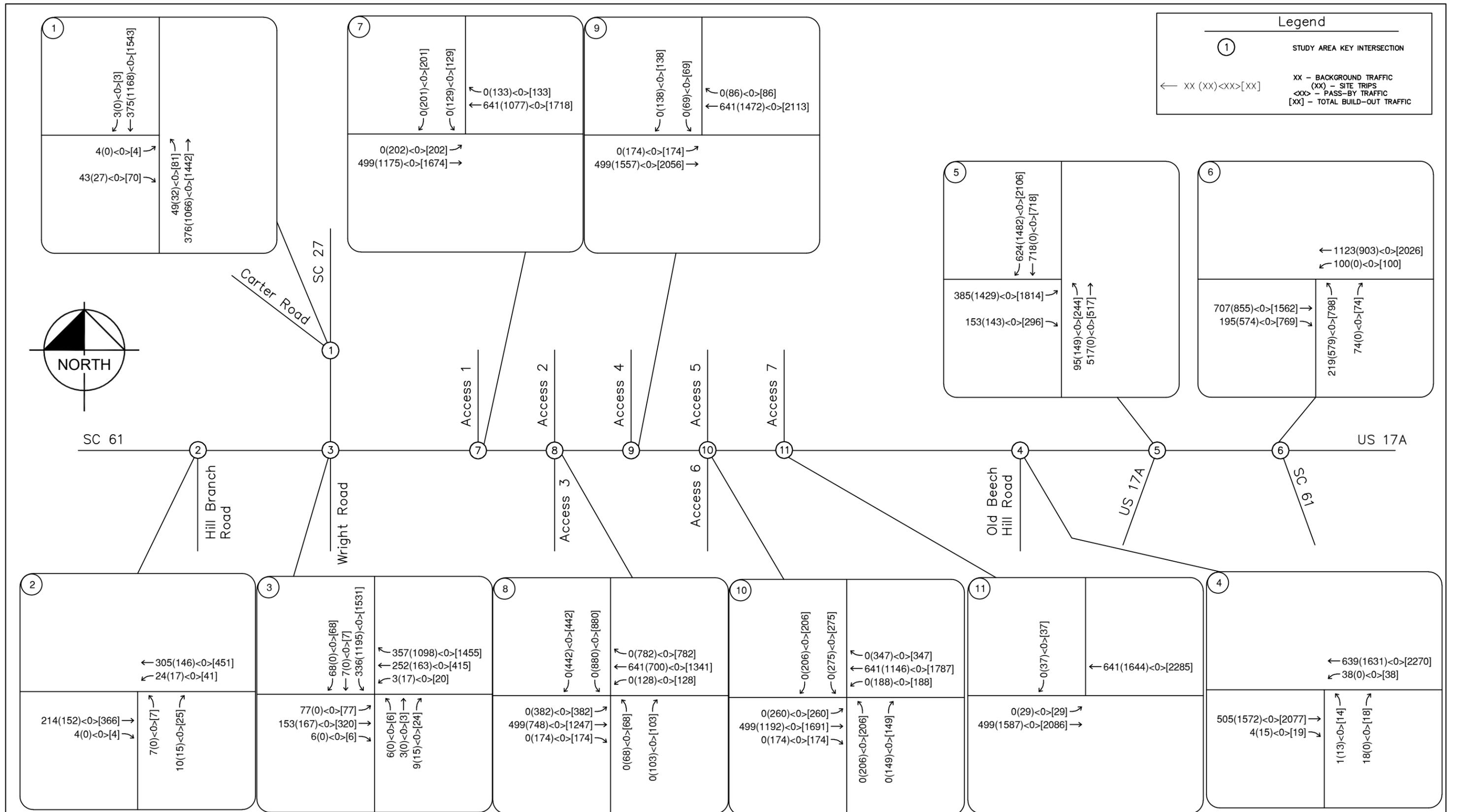
Intersection volume development worksheets for study area intersections are provided in the **Appendix**.

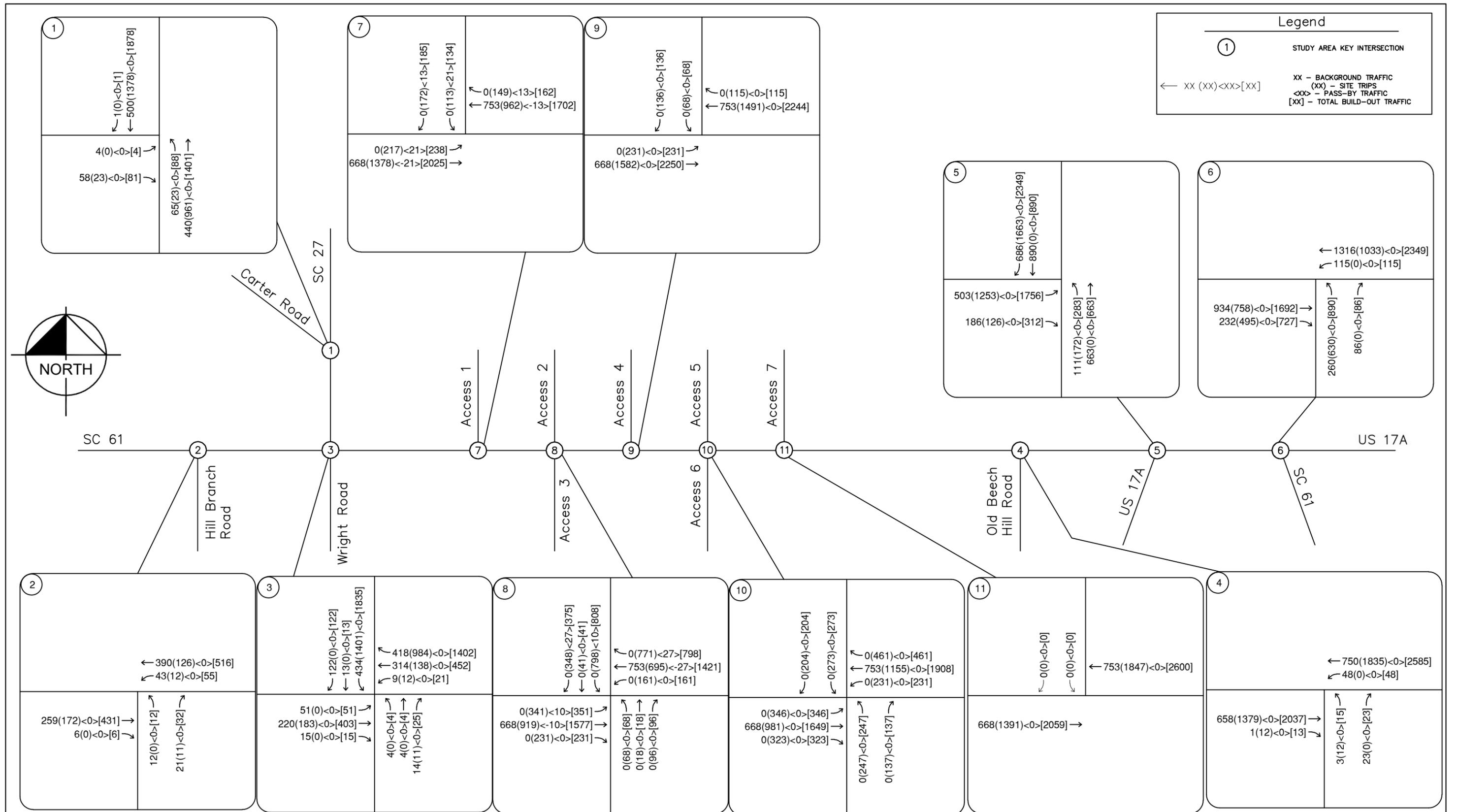












6.0 Capacity Analysis

Capacity analyses were performed for the AM and PM peak hours using the Synchro Version 9 software to determine the operating characteristics at the signalized and stop-controlled intersections of the adjacent street network and to evaluate the impacts of the proposed development. Capacity is defined as the maximum number of vehicles that can pass over a particular road segment, or through a particular intersection, within a specified period of time under prevailing operational, geometric and controlling conditions within a set time duration. The software program uses methodologies contained in the *Highway Capacity Manual* (HCM) to determine the operating characteristics of an intersection.

The *Highway Capacity Manual* (HCM) defines LOS as a “quantitative stratification of a performance measure or measures representing quality of service”, and is used to “translate complex numerical performance results into a simple A-F system representative of travelers’ perceptions of the quality of service provided by a facility or service”. The HCM defines six levels of service, LOS A through LOS F, with A having the best operating conditions from the traveler’s perspective and F having the worst. However, it must be understood that “the LOS letter result hides much of the complexity of facility performance”, and that “the appropriate LOS for a given system element in the community is a decision for local policy makers”. According to the HCM, “for cost, environmental impact, and other reasons, roadways are typically designed not to provide LOS A conditions during peak periods but instead to provide some lower LOS that balances individual travelers’ desires against society’s desires and financial resources. Nevertheless, during low-volume periods of the day, a system element may operate at LOS A.”

LOS for a two-way stop-controlled (TWSC) intersection is determined by the control delay at the side-street approaches, typically during the highest volume periods of the day, the AM and PM peak periods. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. With respect to field measurements, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time the vehicle departs from the stop line. It is typical for stop sign-controlled side streets and driveways intersecting major streets to experience long delays during peak hours, particularly for left-turn movements. The majority of the traffic moving through the intersection on the major street experiences little or no delay.

LOS for signalized intersections is reported for the intersection as a whole, also typically during the highest volume periods of the day, the AM and PM peak periods. One or more movements at an intersection may experience a low level-of-service, while the intersection as a whole may operate acceptably.

Table 6.0-A and **6.0-B** list the LOS control delay thresholds published in the HCM for unsignalized and signalized intersections, respectively, as well as the unsignalized operational descriptions assumed herein.

Table 6.0-A Level-of-Service Control Delay Thresholds for Unsignalized Intersections		
Level-of-Service	Average Control Delay per Vehicle [sec/veh]	
A	≤ 10	Short Delays
B	> 10 – 15	
C	> 15 – 25	
D	> 25 – 35	Moderate Delays
E	> 35 – 50	
F	> 50	Long Delays

Table 6.0-B Level-of-Service Control Delay Thresholds for Signalized Intersections	
Level-of-Service	Control Delay per Vehicle [sec/veh]
A	≤ 10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

Traffic signal plans for the coordinated intersections of US 17A at SC 61 (west) and US 17A at SC 61 (east) were used in the development of the existing conditions Synchro network. Coordination timings were included on the signal plan for the US 17A at SC 61 (east) intersection; therefore, the intersection splits, offset, and cycle length from the signal plan were incorporated into the existing conditions Synchro network. The cycle length for the US 17A at SC 61 (west) intersection was assumed to match the US 17A at SC 61 (east) intersection. Splits and offsets at the US 17A at SC 61 (west) intersection were optimized under existing conditions given the cycle length. The cycle lengths at both coordinated intersections were maintained under background and build-out conditions. Under build-out improved conditions, cycle lengths were optimized. Splits and offsets were optimized in all future year conditions. Note that under build-out improved conditions, signals that are recommended at site driveways were assumed to be coordinated due to high condensability factors and the proximity of the signals. Existing signal geometric plans are included in the **Appendix**.

Under existing conditions, field-observed peak hour factors (PHFs) were used. Given that the Summers Corner development includes an existing elementary and plans to include a future middle school and that the Branton Development plans to include a future elementary school, a weighted PHF was calculated for future year analyses during the AM and school dismissal peak hours assuming field-observed PHFs for existing and historical growth traffic, a PHF of 0.5 for future school traffic, and a PHF of 0.9 for non-school approved development traffic and non-school site trips. A PHF of 0.9 was assumed for future year analyses during the PM peak hour.

Under existing conditions, field-observed heavy-vehicle percentages were used subject to a 2% minimum. Given that the Summers Corner and Bridlewood approved developments and the Branton development are expected to primarily consist of a minor number of heavy-vehicle trips, it was assumed that site traffic would have a lower heavy-vehicle percentage than some of the intersection movements observed in the field. Therefore, under background and build-out conditions, a weighted heavy-vehicle percentage was applied assuming approved development and site traffic consists of two-percent heavy vehicles.

Capacity analyses were performed for the 2018 existing traffic conditions, 2030 background traffic conditions, and 2030 build-out traffic conditions. Mitigation for traffic impacts caused by the proposed development were noted and recommended based on guidance provided in the SCDOT ARMS Manual. When determining the proposed development's traffic impact to the study area intersections, the 2030 background and 2030 build-out conditions were compared.

Synchro LOS results, Synchro 95th percentile queues, and SimTraffic 95th percentile queues are reported in the following subsections. Storage lengths are recommended based primarily on Synchro 95th percentile queue lengths; however, in areas where the Synchro 95th percentile queue is over capacity, storage lengths are recommended considering SimTraffic 95th percentile queues. Capacity analysis and SimTraffic queuing/blocking reports are included in the **Appendix**.

6.1 SC 27 AT CARTER ROAD

Table 6.1 summarizes the LOS, control delay and 95th percentile queue lengths at the unsignalized, full-movement intersection of SC 61 and Carter Road.

Table 6.1 - SC 27 & Carter Road							
Condition	Measure	EB		NB		SB	
		EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour							
2018 Existing	LOS (Delay)	A (9.5)		A (1.2)		A (0.0)	
	Synchro 95th Q	5'	-	3'	-	0'	-
	SimTraffic 95th Q	16'	-	15'	-	0'	-
2030 Background	LOS (Delay)	B (12.4)		A (0.7)		A (0.0)	
	Synchro 95th Q	13'	-	3'	-	0'	-
	SimTraffic 95th Q	23'	-	37'	-	0'	-
2030 Build-out	LOS (Delay)	F (228.4)		A (0.4)		A (0.0)	
	Synchro 95th Q	178'	-	8'	-	0'	-
	SimTraffic 95th Q	1018'	-	12'	-	3439'	-
School Dismissal Peak Hour							
2018 Existing	LOS (Delay)	A (9.4)		A (2.1)		A (0.0)	
	Synchro 95th Q	5'	-	3'	-	0'	-
	SimTraffic 95th Q	23'	-	25'	-	0'	-
2030 Background	LOS (Delay)	B (13.2)		A (1.2)		A (0.0)	
	Synchro 95th Q	10'	-	5'	-	0'	-
	SimTraffic 95th Q	23'	-	43'	-	3'	-
2030 Build-out	LOS (Delay)	F (1120.2)		A (1.2)		A (0.0)	
	Synchro 95th Q	270'	-	30'	-	0'	-
	SimTraffic 95th Q	1198'	-	19'	-	2709'	-
PM Peak Hour							
2018 Existing	LOS (Delay)	A (9.9)		A (2.1)		A (0.0)	
	Synchro 95th Q	10'	-	3'	-	0'	-
	SimTraffic 95th Q	14'	-	37'	-	0'	-
2030 Background	LOS (Delay)	B (13.9)		A (1.1)		A (0.0)	
	Synchro 95th Q	13'	-	5'	-	0'	-
	SimTraffic 95th Q	31'	-	53'	-	79'	-
2030 Build-out	LOS (Delay)	F (1495.5)		A (1.6)		A (0.0)	
	Synchro 95th Q	290'	-	43'	-	0'	-
	SimTraffic 95th Q	957'	-	26'	-	2579'	-

As shown in **Table 6.1**, the stop-controlled eastbound approach of Carter Road currently operates with short delays during each peak hour. Based on the Bridlewood Subdivision TIA, a northbound left-turn lane was warranted at this intersection under full build-out, which was suggested to be constructed in accordance with the *ARMS* Manual. Therefore, based on the SCDOT *ARMS* Manual's minimum storage length for a left-turn lane, a northbound left-turn lane with 150 feet of storage was assumed to be constructed under background and build-out conditions.

With this improvement, the stop-controlled eastbound approach is expected to continue to operate with short delays under background conditions. Upon build-out of the site, the stop-controlled eastbound approach is expected to operate with long delays and queues. To mitigate the increase in delay expected with the addition of site traffic, an exclusive eastbound right-turn lane was considered. With an eastbound right-turn lane, the stop-controlled eastbound approach delay is expected to decrease significantly (between 65% and 75% during each peak hour) while continuing to operate at LOS F. However, given that the SC 27/Carter Road intersection is skewed, sight

distance for eastbound right-turning vehicles may be obstructed by eastbound left-turning vehicles. Therefore, the construction of an exclusive eastbound right-turn lane is not recommended, and the 2030 Build-out Improved scenario does not include it. Capacity analysis results including the eastbound right-turn lane addition are included in the Supplemental Analysis section of the Appendix.

6.2 SC 61 AT HILL BRANCH ROAD

Table 6.2 summarizes the LOS, control delay and 95th percentile queue lengths at the unsignalized intersection of SC 61 and Hill Branch Road.

Table 6.2 - SC 61 & Hill Branch Road							
Condition	Measure	EB		WB		NB	
		EBT	EBR	WBL	WBT	NBL	NBR
AM Peak Hour							
2018 Existing	LOS (Delay)	A (0.0)		A (0.2)		B (10.4)	
	Synchro 95th Q	0'	-	0'	-	5'	-
	SimTraffic 95th Q	0'	-	6'	-	39'	-
2030 Background	LOS (Delay)	A (0.0)		A (0.3)		B (12.1)	
	Synchro 95th Q	0'	-	0'	-	10'	-
	SimTraffic 95th Q	0'	-	11'	-	42'	-
2030 Build-out	LOS (Delay)	A (0.0)		A (0.5)		B (14.0)	
	Synchro 95th Q	0'	-	0'	-	15'	-
	SimTraffic 95th Q	186'	-	10'	-	46'	-
School Dismissal Peak Hour							
2018 Existing	LOS (Delay)	A (0.0)		A (0.9)		B (10.4)	
	Synchro 95th Q	0'	-	3'	-	3'	-
	SimTraffic 95th Q	0'	-	13'	-	25'	-
2030 Background	LOS (Delay)	A (0.0)		A (0.9)		B (12.0)	
	Synchro 95th Q	0'	-	3'	-	3'	-
	SimTraffic 95th Q	0'	-	385'	-	30'	-
2030 Build-out	LOS (Delay)	A (0.0)		A (0.9)		B (14.3)	
	Synchro 95th Q	0'	-	5'	-	8'	-
	SimTraffic 95th Q	0'	-	24'	-	37'	-
PM Peak Hour							
2018 Existing	LOS (Delay)	A (0.0)		A (1.0)		B (11.4)	
	Synchro 95th Q	0'	-	3'	-	5'	-
	SimTraffic 95th Q	0'	-	24'	-	45'	-
2030 Background	LOS (Delay)	A (0.0)		A (0.8)		B (13.1)	
	Synchro 95th Q	0'	-	3'	-	5'	-
	SimTraffic 95th Q	3'	-	31'	-	51'	-
2030 Build-out	LOS (Delay)	A (0.0)		A (0.8)		C (16.8)	
	Synchro 95th Q	0'	-	5'	-	13'	-
	SimTraffic 95th Q	0'	-	25'	-	50'	-

As shown in **Table 6.2**, the stop-controlled northbound approach of Hill Branch Road currently operates with short delays during each peak hour and is expected to continue to operate with short delays during each peak hour under background and build-out conditions. Since the site is not expected to have a significant impact on operations at this intersection, no improvements are recommended for capacity purposes.

6.3 SC 61 AT SC 27/WRIGHT ROAD

Table 6.3 summarizes the LOS, control delay and 95th percentile queue lengths at the currently unsignalized intersection of SC 61 and SC 27.

Table 6.3A - SC 61 & SC 27							
Condition	Measure	EB	WB		NB	SB	Intersection
		EBLTR	WBLT	WBR	NBLTR	SBLTR	LOS (Delay)
AM Peak Hour							
2018 Existing	LOS (Delay)	A (2.0)	A (0.4)		B (14.9)	C (16.0)	-
	Synchro 95th Q	5'	0'	-	5'	40'	
	SimTraffic 95th Q	41'	11'	-	29'	91'	
2030 Background	LOS (Delay)	A (2.0)	A (0.3)		C (18.8)	F (324.3)	-
	Synchro 95th Q	8'	3'	-	10'	720'	
	SimTraffic 95th Q	142'	17'	12'	43'	1176'	
2030 Build-out	LOS (Delay)	A (1.7)	A (0.1)		C (23.1)	F (2623.3)	-
	Synchro 95th Q	8'	3'	-	18'	3105'	
	SimTraffic 95th Q	1936'	29'	35'	287'	3347'	
School Dismissal Peak Hour							
2018 Existing	LOS (Delay)	A (2.9)	A (0.1)		B (12.9)	B (11.9)	-
	Synchro 95th Q	5'	0'	-	5'	25'	
	SimTraffic 95th Q	52'	3'	-	26'	74'	
2030 Background	LOS (Delay)	A (2.9)	A (0.1)		C (16.1)	F (239.6)	-
	Synchro 95th Q	8'	0'	-	10'	673'	
	SimTraffic 95th Q	105'	10'	21'	39'	1470'	
2030 Build-out	LOS (Delay)	A (1.9)	A (0.1)		C (24.4)	F (4645.3)	-
	Synchro 95th Q	8'	3'	-	23'	5313'	
	SimTraffic 95th Q	216'	13'	23'	54'	3176'	
PM Peak Hour							
2018 Existing	LOS (Delay)	A (1.5)	A (0.2)		B (11.9)	B (13.0)	-
	Synchro 95th Q	3'	0'	-	5'	40'	
	SimTraffic 95th Q	42'	3'	-	26'	95'	
2030 Background	LOS (Delay)	A (1.5)	A (0.1)		B (13.2)	F (411.8)	-
	Synchro 95th Q	5'	0'	-	5'	1040'	
	SimTraffic 95th Q	100'	25'	7'	41'	2755'	
2030 Build-out	LOS (Delay)	A (1.0)	A (0.1)		C (16.7)	F (5570.0)	-
	Synchro 95th Q	5'	3'	-	10'	6405'	
	SimTraffic 95th Q	158'	21'	18'	45'	3177'	

As shown in **Table 6.3A**, the stop-controlled northbound and southbound approaches currently operate with short delays during each peak hour. Based on the Bridlewood Subdivision TIA, a westbound right-turn lane was warranted at this intersection under full build-out conditions, which was suggested to be constructed in accordance with the ARMS Manual. Therefore, based on the SCDOT ARMS Manual's minimum storage length for a right-turn lane, a westbound right-turn lane with 100 feet of storage was assumed to be constructed under background and build-out conditions.

With this improvement in place, the stop-controlled northbound approach of Wright Road is expected to continue to operate with short delays. The stop-controlled southbound approach of SC 27 is expected to operate with long delays and queues. Upon build-out of the site, the southbound approach delay is expected to increase while continuing to operate at LOS F. The following improvements are recommended to mitigate the increase in delay expected with the addition of site traffic:

- Realignment of the SC 61/SC 27 intersection so that SC 61 (east of SC 27) serves as the major street northbound approach, SC 27 (north of SC 61) serves as the major street southbound approach, and SC 61 (west of SC 27) serves as the minor street eastbound approach.
- Installation of a traffic signal.
- Realignment of Wright Road to tee into SC 61 approximately 325 feet west of its current location.
- Construction of an additional northbound and southbound through lane creating two northbound and southbound through lanes.
- Construction of a northbound left-turn lane with storage maximized to the extent feasible and acceptable to SCDOT.
- Construction of a southbound right-turn lane with 100 feet of storage.
- Construction of the eastbound approach to consist of a shared eastbound left-right lane and an eastbound right-turn lane with 225 feet of storage.

These improvements and associated volume distribution are shown in the images below.

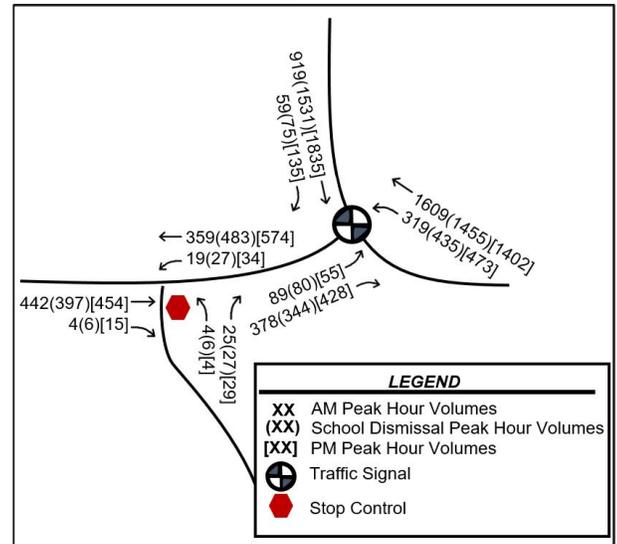


Table 6.3B summarizes the LOS, control delay and 95th percentile queue lengths for this intersection including the improvements shown above.

Table 6.3B - SC 61 & SC 27 Build-out Improved Conditions									
Condition	Measure	EB		NB		SB			Intersection LOS (Delay)
		EBL	EBR	NBL	NBT	SBL	SBT	SBR	
AM Peak Hour									
2030 Build-out Improved	LOS (Delay)	D (35.4)		A (9.1)		B (16.3)			B (14.9)
	Synchro 95th Q	#115'	93'	#157'	233'	-	210'	7'	
	SimTraffic 95th Q	203'	140'	217'	181'	-	199'	60'	
School Dismissal Peak Hour									
2030 Build-out Improved	LOS (Delay)	E (77.1)		B (19.3)		D (41.5)			C (34.9)
	Synchro 95th Q	#172'	143'	#392'	186'	-	#602'	6'	
	SimTraffic 95th Q	304'	255'	424'	158'	-	490'	70'	
PM Peak Hour									
2030 Build-out Improved	LOS (Delay)	C (27.7)		C (29.2)		D (53.2)			D (40.0)
	Synchro 95th Q	#249'	213'	#539'	154'	-	#887'	31'	
	SimTraffic 95th Q	262'	239'	879'	348'	-	358'	81'	

95th percentile volume exceeds capacity, queue may be longer

As shown in **Table 6.3B**, the overall intersection is expected to operate at LOS B during the AM peak hour, LOS C during the school dismissal peak, and LOS D during the PM peak hour.

It should be noted that the northbound left-turn queue is expected to exceed capacity. Based on review of the SimTraffic 95th queue, the northbound left-turn queue is expected to range from 217 feet during the AM peak hour to 879 feet during the PM peak hour. Therefore, it is recommended that the northbound left-turn storage be maximized to the extent feasible and acceptable to SCDOT. To reduce the northbound left-turn queue length, dual left-turn lanes were considered. While the addition of dual left-turn lanes is expected to reduce the northbound left-turn queue length and improve operations at the intersection, dual left-turn lanes would require protected phasing, which may worsen operations for the northbound left-turn movement during non-peak hours when adequate gaps are available for the northbound left-turn movement to turn during a permitted phase. Capacity analysis results for a build-improved scenario with dual northbound left-turn lanes is included in the Supplemental Analysis section of the Appendix. Note that the construction of dual northbound left-turn lanes would require the construction of an additional receiving lane on SC 61, west of SC 27.

Based on a preliminary peak-hour signal warrant assessment (see Appendix) based on Manual on Uniform Traffic Control Devices (MUTCD) criteria, the intersection is expected to meet AM, school dismissal, and PM peak-hour signal warrants. The eastbound minor street approach volumes include 100% of the left-turn volume and 50% of the right-turn volume, since over 80% of the eastbound approach volume is turning right and since a portion of the right-turn volume will be in the same lane as the left-turn volume. Given the recommended laneage configuration, two approach lanes were assumed on each approach. It should be noted that based on a preliminary peak-hour signal warrant assessment the intersection is also expected to meet AM, school dismissal, and PM peak-hour signal warrants under background conditions with the reconfigured geometry.

Given the distance and low coordinatability factor between this signal and the proposed traffic signal at Access 1 (discussed in Section 6.7), this intersection was assumed to operate as uncoordinated. Note that intersection cycle lengths and splits were optimized with the signalization of this intersection. Intersection splits were manually adjusted after optimization to reduce queueing on the eastbound and northbound approaches.

Based on review of the eastbound approach queues, it is recommended that Wright Road be relocated approximately 325 feet west of its existing location. It should be noted that the location of the existing helicopter pad and Dorchester County Fire and Rescue driveway should be considered when determining the future alignment of Wright Road.

If Wright Road is unable to be realigned, then the following improvements are recommended to mitigate the increase in delay expected with the addition of site traffic:

- Construction of triple southbound left-turn lanes.
- Construction of dual westbound right-turn lanes.
- Construction of a westbound left-turn lane.
- Construction of an eastbound left-turn lane.

Table 6.3C summarizes the LOS, control delay and 95th percentile queue lengths for this intersection including the improvements shown above.

Table 6.3C - SC 61 & SC 27 Build-out Improved Conditions without Wright Road Realignment											
Condition	Measure	EB		WB			NB	SB			Intersection
		EBL	EBR	WBL	WBT	WBR	NBLTR	SBL	SBT	SBR	LOS (Delay)
AM Peak Hour											
2030 Build-out Improved	LOS (Delay)	B (16.4)		B (18.0)			E (68.8)	D (54.9)			C (28.5)
	Synchro 95th Q	67'	284'	20'	286'	91'	27'	375'	25'	-	
School Dismissal Peak Hour											
2030 Build-out Improved	LOS (Delay)	C (20.7)		D (38.4)			D (39.1)	D (46.0)			D (39.5)
	Synchro 95th Q	58'	238'	28'	#460'	65'	18'	#450'	0'	-	
PM Peak Hour											
2030 Build-out Improved	LOS (Delay)	C (26.7)		C (25.8)			D (48.6)	D (54.5)			D (38.6)
	Synchro 95th Q	51'	367'	34'	#563'	32'	37'	#648'	36'	-	

95th percentile volume exceeds capacity, queue may be longer

As shown in **Table 6.3C**, with the improvements noted above, the overall intersection is expected to operate at LOS D or better in each peak. It should be noted that the addition of dual westbound right-turn lanes would require the construction of an additional northbound receiving lane on SC 27 and the addition of triple southbound left-turn lanes would require the construction of two additional eastbound receiving lanes on SC 61. Capacity analysis results for this scenario are included in the supplemental analysis section of the **Appendix**.

6.4 SC 61 AT OLD BEECH HILL ROAD

Table 6.4 summarizes the LOS, control delay and 95th percentile queue lengths at the unsignalized intersection of SC 61 at Old Beech Hill Road.

Table 6.4 - SC 61 & Old Beech Hill Road							
Condition	Measure	EB		WB		NB	
		EBT	EBR	WBL	WBT	NBL	NBR
AM Peak Hour							
2018 Existing	LOS (Delay)	A (0.0)		A (0.6)		B (10.9)	
	Synchro 95th Q	0'	-	3'	-	3'	-
	SimTraffic 95th Q	0'	-	15'	-	33'	-
2030 Background	LOS (Delay)	A (0.0)		A (0.4)		C (15.5)	
	Synchro 95th Q	0'	-	3'	-	10'	-
	SimTraffic 95th Q	0'	-	74'	-	42'	-
2030 Build-out	LOS (Delay)	A (0.0)		A (0.5)		F (350.8)	
	Synchro 95th Q	0'	-	15'	-	118'	-
	SimTraffic 95th Q	4'	-	81'	-	42'	-
2030 Build-out Improved	LOS (Delay)	A (0.0)		A (0.6)		F (233.0)	
	Synchro 95th Q	0'	-	18'	-	45'	23'
	SimTraffic 95th Q	0'	-	57'	-	20'	43'
School Dismissal Peak Hour							
2018 Existing	LOS (Delay)	A (0.0)		A (0.8)		B (10.3)	
	Synchro 95th Q	0'	-	3'	-	3'	-
	SimTraffic 95th Q	0'	-	16'	-	23'	-
2030 Background	LOS (Delay)	A (0.0)		A (0.6)		C (15.7)	
	Synchro 95th Q	0'	-	5'	-	8'	-
	SimTraffic 95th Q	0'	-	83'	-	32'	-
2030 Build-out	LOS (Delay)	A (0.0)		A (0.6)		F (8823.5)	
	Synchro 95th Q	0'	-	28'	-	193'	-
	SimTraffic 95th Q	0'	-	52'	-	43'	-
2030 Build-out Improved	LOS (Delay)	A (0.0)		A (0.7)		F (2317.5)	
	Synchro 95th Q	0'	-	28'	-	88'	15'
	SimTraffic 95th Q	5'	-	81'	-	82'	22'
PM Peak Hour							
2018 Existing	LOS (Delay)	A (0.0)		A (0.9)		B (10.7)	
	Synchro 95th Q	0'	-	3'	-	3'	-
	SimTraffic 95th Q	0'	-	29'	-	35'	-
2030 Background	LOS (Delay)	A (0.0)		A (0.6)		C (18.4)	
	Synchro 95th Q	0'	-	5'	-	8'	-
	SimTraffic 95th Q	0'	-	86'	-	40'	-
2030 Build-out	LOS (Delay)	A (0.0)		A (0.5)		F (211.1)*	
	Synchro 95th Q	0'	-	23'	-	88'	-
	SimTraffic 95th Q	0'	-	68'	-	45'	-
2030 Build-out Improved	LOS (Delay)	A (0.0)		A (0.5)		F (2595.0)	
	Synchro 95th Q	0'	-	23'	-	90'	13'
	SimTraffic 95th Q	7'	-	66'	-	101'	25'

*conflicting volume is too high, HCM 2010 does not calculate an accurate delay

As shown in **Table 6.4**, the stop-controlled northbound approach currently operates with short delays and is expected to continue to operate with short delays under background conditions. Upon build-out of the site, the stop-controlled northbound approach is expected to operate with long delays and queues.

It should be noted that during the PM peak hour, based on HCM 2010 reports, the northbound approach is expected to operate at LOS F with 211.1 seconds of delay. However, further evaluation of these results indicates the HCM 2010 function in Synchro version 9 is not accurately calculating the northbound approach delay during the PM peak hour due to the high volume of eastbound and westbound through traffic conflicting with the northbound left-turning traffic. Under PM peak build-out conditions, the conflicting flow rate is expected to be approximately 5250. Based on evaluation of the HCM 2010 when the conflicting flow rate is greater than approximately 5150 under the existing laneage scenario without turn lanes, the potential capacity of the left-turn maneuver decreases to 0 and the approach delay is calculated inaccurately. If the westbound through volume is decreased so that the northbound left-turn movement has a conflicting flow rate of approximately 5150 rather than 5250, as expected during the PM peak hour under build-out conditions for this site, the northbound approach would be expected to operate with over 12,400 seconds of delay. See supplemental analysis section of the Appendix for comparison of the capacity analysis results.

The following improvements are recommended to mitigate the increased delay expected with the addition of site traffic:

- Construction of an exclusive westbound left-turn lane with 150 feet of storage.
- Construction of an exclusive northbound right-turn lane with 100 feet of storage.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches. Note that this improvement is a continuation of the improvements recommended at the adjacent intersections.

With these improvements in place the stop-controlled northbound approach delay is expected to decrease by 33% during the AM peak hour and 74% during the school dismissal peak, while continuing to operate at LOS F. It is typical for stop sign-controlled side streets and driveways intersecting major streets to experience long delays during peak hours, particularly for left-turn movements. The majority of the traffic moving through the intersection on the major street experiences little or no delay. Since the minor street northbound approach is only expected to serve 30 to 38 vehicles during the peak hours, no additional improvements are recommended for capacity purposes.

Per the SCDOT *ARMS* Manual a left-turn lane should have a minimum storage length of 150 feet, and a right-turn lane should have a minimum storage length of 100 feet. The Synchro and SimTraffic 95th percentile queue lengths are expected to be accommodated within the *ARMS* Manual's minimum turn lane lengths.

6.5 SC 61 AT US 17A (WEST)

Table 6.5 summarizes the LOS, control delay and 95th percentile queue lengths at the signalized intersection of SC 61 and US 17A (west).

Table 6.5A - SC 61 & US 17A (west)								
Condition	Measure	EB		NB		SB/WB		Intersection LOS (Delay)
		EBL	EBR	NBL	NBT	SBT	SBR	
AM Peak Hour								
2018 Existing	LOS (Delay)	D (40.4)		A (9.3)		C (21.1)		C (23.0)
	Synchro 95th Q	237'	7'	8'	171'	272'	65'	
	SimTraffic 95th Q	312'	147'	41'	136'	219'	71'	
2030 Background	LOS (Delay)	F (123.4)		D (40.5)		D (52.3)		E (66.0)
	Synchro 95th Q	#616'	22'	#133'	#690'	m#437'	m45'	
	SimTraffic 95th Q	385'	2729'	437'	1527'	879'	358'	
2030 Build-out	LOS (Delay)	F (880.6)		F (88.7)		F (147.8)		F (451.0)
	Synchro 95th Q	#2138'	98'	#240'	#750'	m#271'	m198'	
	SimTraffic 95th Q	457'	1613'	454'	1814'	1727'	399'	
School Dismissal Peak Hour								
2018 Existing	LOS (Delay)	D (38.0)		A (5.4)		A (7.2)		B (12.7)
	Synchro 95th Q	142'	0'	9'	109'	246'	4'	
	SimTraffic 95th Q	184'	59'	44'	103'	158'	67'	
2030 Background	LOS (Delay)	F (88.9)		B (12.9)		C (32.6)		D (40.3)
	Synchro 95th Q	#410'	35'	48'	240'	m#468'	m40'	
	SimTraffic 95th Q	377'	477'	98'	181'	468'	276'	
2030 Build-out	LOS (Delay)	F (874.3)		D (44.8)		F (502.5)		F (578.8)
	Synchro 95th Q	#2049'	145'	#243'	332'	m174'	m506'	
	SimTraffic 95th Q	428'	914'	231'	248'	2232'	367'	
PM Peak Hour								
2018 Existing	LOS (Delay)	D (42.0)		A (7.2)		A (8.8)		B (14.3)
	Synchro 95th Q	194'	17'	10'	138'	331'	44'	
	SimTraffic 95th Q	246'	38'	37'	114'	170'	59'	
2030 Background	LOS (Delay)	F (186.1)		B (14.2)		E (75.8)		F (85.1)
	Synchro 95th Q	#575'	52'	59'	338'	m#487'	m36'	
	SimTraffic 95th Q	370'	2630'	107'	200'	1031'	444'	
2030 Build-out	LOS (Delay)	F (859.5)		E (59.1)		F (592.6)		F (600.1)
	Synchro 95th Q	#1994'	161'	#294'	#524'	m173'	m294'	
	SimTraffic 95th Q	427'	1081'	329'	554'	2002'	367'	

95th percentile volume exceeds capacity, queue may be longer

m volume for 95th percentile queue is metered by upstream signal

As shown in **Table 6.5**, the overall intersection currently operates at LOS C during the AM peak hour and LOS B during the school dismissal and PM peak hours. Under background conditions the overall intersection is expected to operate a LOS E during the AM peak hour, LOS D during the school dismissal peak hour, and LOS F during the PM peak hour. Upon build-out of the site, the overall intersection is expected to operate at LOS F in each peak. The following improvements are recommended to mitigate the increase in delay is expected with the addition of site traffic:

- Realignment of the SC 61/US 17A intersection so that SC 61 (west of US 17A) serves as the major street eastbound approach, US 17A (east of SC 61) serves as the major street westbound approach, and US 17A (south of SC 61) serves as the minor street northbound approach.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches. Note that the westbound approach of US 17A was recommended to be widened as an improvement in the Summers Corner TIA and therefore is not recommended to be constructed by the Branton development.
- Construction of an eastbound right-turn lane with 200 feet of storage.
- Construction of an additional westbound left-turn lane to create dual westbound left-turn lanes with 775 feet of storage each.
- Construction of a second southbound receiving lane to accommodate the dual westbound left-turn lanes. Note that this segment of US 17A was recommended to be widened as an improvement in the Summers Corner TIA and therefore is not recommended to be constructed by the Branton development.
- Construction of an additional northbound right-turn lane to create dual northbound right-turn lanes with 500 feet of storage on the outer turn lane. Note that this segment of US 17A was recommended to be widened as an improvement in the Summers Corner TIA and therefore the inner northbound right-turn lane is not recommended to be constructed by the Branton development.
- Adjust route signage accordingly with changes to the intersection configuration.

These improvements are shown in the image below.



Table 6.5B summarizes the LOS, control delay and 95th percentile queue lengths for this intersection including the improvements listed above.

Table 6.5B - SC 61 & US 17A (west) Build-out Improved Conditions								
Condition	Measure	EB		WB		NB		Intersection
		EBT	EBR	WBL	WBT	NBL	NBR	LOS (Delay)
AM Peak Hour								
2030 Build-out Improved	LOS (Delay)	E (65.3)		B (11.1)		E (69.4)		D (47.2)
	Synchro 95th Q	#1543'	94'	m#519'	m158'	#545'	#743'	
	SimTraffic 95th Q	963'	606'	755'	260'	564'	489'	
School Dismissal Peak Hour								
2030 Build-out Improved	LOS (Delay)	F (83.3)		A (6.5)		E (80.0)		D (44.8)
	Synchro 95th Q	#1376'	162'	m#505'	m510'	#522'	328'	
	SimTraffic 95th Q	1280'	222'	754'	683'	667'	253'	
PM Peak Hour								
2030 Build-out Improved	LOS (Delay)	F (109.7)		A (7.5)		E (64.6)		D (50.0)
	Synchro 95th Q	#1331'	184'	m#455'	m421'	#561'	386'	
	SimTraffic 95th Q	1642'	281'	593'	281'	1084'	274'	

95th percentile volume exceeds capacity, queue may be longer
 m volume for 95th percentile queue is metered by upstream signal

With these improvements in place the overall intersection is expected to operate at LOS D during each peak hour.

It should be noted that the westbound left-turn queue is expected to exceed capacity. Based on review of the SimTraffic 95th queue, the northbound left-turn queue is expected to range from 755 feet during the AM peak hour to 593 feet during the PM peak hour. Therefore, it is recommended that the westbound left-turns provide 775 of storage each. To reduce the westbound left-turn queue length, triple westbound left-turn lanes may be considered; however, this would require the construction of two additional southbound receiving lanes on US 17A south of SC 61. Widening of US 17A may be restricted by the existing bodies of water to the east of US 17A.

It should also be noted that the northbound left-turn queue is expected to exceed capacity during each peak hour and the northbound right-turn queue is expected to exceed capacity during the AM peak hour. Based on review of the SimTraffic 95th percentile queues, 500 feet of storage is recommended on the outer northbound right-turn lane. The inner northbound right-turn lane and northbound left-turn lane are recommended to be continuous.

As previously noted, the Summers Corner TIA identified the planned US 17A widening as a recommended improvement for this intersection. Based on coordination with SCDOT, there has been no indication that the project is funded/scheduled and therefore it was not included in the background and build-out scenarios of this analysis. However, given that the need for this improvement was identified as part of a prior development's TIA, it is not recommended that the Branton Development be responsible for widening US 17A to a four-lane section.

Note that intersection cycle lengths, splits, and offsets were optimized with the reconfiguration of this intersection under build-out improved conditions. Cycle lengths, offsets, and splits were then manually adjusted after optimization to improve intersection operations.

6.6 SC 61 AT US 17A (EAST)

Table 6.6 summarizes the LOS, control delay and 95th percentile queue lengths at the signalized intersection of SC 61 and US 17A (east).

Table 6.6 - SC 61 & US 17A (east)								
Condition	Measure	EB		WB		NB		Intersection LOS (Delay)
		EBT	EBR	WBL	WBT	NBL	NBR	
AM Peak Hour								
2018 Existing	LOS (Delay)	C (26.6)		B (12.8)		C (27.0)		C (21.8)
	Synchro 95th Q	#458'	9'	9'	191'	70'	9'	
	SimTraffic 95th Q	374'	132'	48'	265'	88'	46'	
2030 Background	LOS (Delay)	F (175.0)		B (10.9)		F (122.1)		F (117.7)
	Synchro 95th Q	m#894'	m6'	17'	310'	#238'	32'	
	SimTraffic 95th Q	2160'	490'	95'	188'	349'	654'	
2030 Build-out	LOS (Delay)	F (556.9)		F (82.6)		F (306.4)		F (392.0)
	Synchro 95th Q	m#826'	m0'	21'	#1002'	#596'	32'	
	SimTraffic 95th Q	1944'	495'	313'	2517'	357'	4970'	
2030 Build-out Improved	LOS (Delay)	D (38.8)		C (30.5)		F (118.0)		D (49.2)
	Synchro 95th Q	m#1555'	m58'	78'	453'	#526'	-	
	SimTraffic 95th Q	832'	337'	245'	310'	563'	587'	
School Dismissal Peak Hour								
2018 Existing	LOS (Delay)	C (24.0)		C (25.6)		C (24.6)		C (24.9)
	Synchro 95th Q	285'	0'	3'	285'	69'	8'	
	SimTraffic 95th Q	197'	28'	45'	325'	89'	22'	
2030 Background	LOS (Delay)	B (18.5)		D (41.5)		E (61.1)		D (35.5)
	Synchro 95th Q	m437'	m0'	29'	#903'	#239'	25'	
	SimTraffic 95th Q	432'	215'	253'	1011'	239'	124'	
2030 Build-out	LOS (Delay)	F (383.1)		F (458.9)		F (495.0)		F (431.8)
	Synchro 95th Q	m#536'	m0'	46'	#2032'	#927'	34'	
	SimTraffic 95th Q	364'	192'	304'	4595'	351'	4114'	
2030 Build-out Improved	LOS (Delay)	A (1.2)		D (54.5)		E (74.9)		C (34.5)
	Synchro 95th Q	m492'	m3'	#165'	#1426'	#668'	-	
	SimTraffic 95th Q	375'	151'	321'	1035'	679'	676'	
PM Peak Hour								
2018 Existing	LOS (Delay)	C (26.8)		C (26.0)		C (23.2)		C (26.1)
	Synchro 95th Q	#405'	m4'	6'	369'	84'	13'	
	SimTraffic 95th Q	217'	27'	23'	327'	99'	34'	
2030 Background	LOS (Delay)	E (76.5)		F (102.7)		E (64.0)		F (87.8)
	Synchro 95th Q	m#652'	m3'	63'	#1146'	#294'	39'	
	SimTraffic 95th Q	629'	356'	364'	6248'	299'	230'	
2030 Build-out	LOS (Delay)	F (466.5)		F (602.2)		F (587.9)		F (543.8)
	Synchro 95th Q	m#690'	m0'	65'	#2433'	#1047'	50'	
	SimTraffic 95th Q	629'	340'	318'	6704'	350'	4657'	
2030 Build-out Improved	LOS (Delay)	A (6.3)		F (113.9)		F (102.6)		E (67.5)
	Synchro 95th Q	m462'	m6'	#199'	#1731'	#762'	-	
	SimTraffic 95th Q	431'	145'	1459'	4731'	1767'	1765'	

95th percentile volume exceeds capacity, queue may be longer
 m volume for 95th percentile queue is metered by upstream signal

As shown in **Table 6.6**, the overall intersection currently operates at LOS C during each peak hour. Under background conditions the overall intersection is expected to operate a LOS F during the AM and PM peak hours and LOS D during the school dismissal peak hour. Upon build-out of the site, the overall intersection is expected to operate at LOS F in each peak. The following improvements are recommended to mitigate the increase in delay expected with the addition of site traffic:

- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches. Note that this segment of US 17A was recommended to be widened as an improvement in the Summers Corner TIA and therefore is not recommended to be constructed by the Branton development.
- Reconfiguration of the northbound approach to include an exclusive left-turn lane with storage maximized to the extent feasible and acceptable to SCDOT and a shared left-right lane.

With these improvements in place the overall intersection is expected to operate at LOS D during the AM peak hour, LOS C during the school dismissal peak and LOS E during the PM peak hour.

It should be noted that the northbound left-turn queue is expected to exceed capacity during each peak hour under build-out improved conditions. Based on review of the SimTraffic 95th percentile queue, the northbound left-turn queue is expected to range from 563 feet during the AM peak hour to 1767 feet during the PM peak hour. Therefore, it is recommended that the northbound left-turn storage be maximized to the extent feasible and acceptable to SCDOT given the existing bodies of water on both sides of SC 61. To reduce the northbound left-turn queue length, an exclusive northbound right-turn lane was considered along with the dual northbound left-turn lanes. With this improvement, the overall intersection delay is not expected to decrease significantly and the northbound left-turn queue is still expected to exceed capacity. Capacity analysis results for a build-improved scenario with dual northbound left-turn lanes and an exclusive northbound right-turn lane is included in the Supplemental Analysis section of the Appendix.

Since dual northbound left-turn lanes and an exclusive northbound right-turn lane are not expected to provide a significant benefit to the overall intersection, the construction of an additional westbound through lane to create three westbound through lanes was considered. With this improvement in place the westbound approach and overall intersection delay is expected to decrease significantly; however, this allows more westbound through traffic to reach the US 17A/SC 61 (west) intersection, which would otherwise be metered by the US 17A/SC 61 (east) intersection. Based on review of the SimTraffic simulation, this causes the westbound left-turn queue at the US 17A/SC 61 (west) to be longer than expected when the movement is metered. Capacity analysis results for a build-improved scenario with triple westbound through lanes is included in the Supplemental Analysis section of the Appendix.

It should also be noted that the westbound left-turn queue is expected to exceed capacity during the school dismissal and PM peak hours. Based on review of the SimTraffic reports, the westbound left-turn queue is expected to range from 321 feet during the school dismissal peak to 1459 feet during the PM peak hour. Note that the build improved SimTraffic simulation does not include storage lengths on the turn lanes so that the storage needed for each movement could be determined without being affected by spill-back or starvation. However, without storage on the westbound left-turn lane at this intersection, the SimTraffic simulation showed that vehicles traveling westbound through were using the westbound left-turn lane to bypass the westbound

through queues, then stopping in the westbound left-turn lane to merge back into the westbound through lanes, which in turn causes the westbound left-turning vehicles to queue behind the vehicles waiting to merge. Based on observation of the SimTraffic simulation with storage on the westbound left-turn lane, a shorter queue was observed. Therefore, the existing 200 feet of storage on the westbound left-turn lane is expected to accommodate the Synchro 95th percentile queue lengths.

As previously noted, the Summers Corner TIA identified the planned US 17A widening as a recommended improvement for this intersection. Based on coordination with SCDOT, there has been no indication that the project is funded/scheduled and therefore it was not included in the background and build-out scenarios of this analysis. However, given that the need for this improvement was identified as part of a prior development's TIA, it is not recommended that the Branton Development be responsible for widening US 17A to a four-lane section.

Note that intersection cycle lengths, splits, and offsets were optimized with the reconfiguration of the US 17A (west) intersection under build-out improved conditions. Cycle lengths, offsets, and splits were then manually adjusted after optimization to improve intersection operations.

6.7 SC 61 AT ACCESS 1

Table 6.7 summarizes the LOS, control delay and 95th percentile queue lengths at the proposed intersection of SC 61 and Access 1.

Table 6.7 - SC 61 & Access 1								
Condition	Measure	EB		WB		SB		Intersection LOS (Delay)
		EBL	EBT	WBT	WBR	SBL	SBR	
AM Peak Hour								
2030 Build-out	LOS (Delay)	A (3.3)		A (0.0)		F (1902.7)		-
	Synchro 95th Q	78'	-	0'	-	900'	-	
	SimTraffic 95th Q	596'	-	0'	-	2547'	-	
2030 Build-out Improved	LOS (Delay)	A (4.7)		A (4.1)		E (62.1)		A (9.1)
	Synchro 95th Q	158'	184'	112'	-	220'	207'	
	SimTraffic 95th Q	178'	136'	254'	-	219'	154'	
School Dismissal Peak Hour								
2030 Build-out	LOS (Delay)	A (6.6)		A (0.0)		F (33989.3)		-
	Synchro 95th Q	173'	-	0'	-	1203'	-	
	SimTraffic 95th Q	1827'	-	5'	-	2779'	-	
2030 Build-out Improved	LOS (Delay)	A (7.4)		A (3.1)		D (50.7)		A (8.9)
	Synchro 95th Q	#231'	266'	m80'	-	#210'	212'	
	SimTraffic 95th Q	245'	147'	281'	-	204'	175'	
PM Peak Hour								
2030 Build-out	LOS (Delay)	A (9.6)		A (0.0)		F (82875.7)		-
	Synchro 95th Q	243'	-	0'	-	1173'	-	
	SimTraffic 95th Q	918'	-	3'	-	1758'	-	
2030 Build-out Improved	LOS (Delay)	A (8.3)		A (1.1)		E (69.1)		A (9.7)
	Synchro 95th Q	#344'	453'	m903'	-	#248'	217'	
	SimTraffic 95th Q	258'	174'	209'	-	267'	146'	

95th percentile volume exceeds capacity, queue may be longer
 m volume for 95th percentile queue is metered by upstream signal

As shown in **Table 6.7**, the stop-controlled southbound approach is expected to operate at LOS F during each peak hour. Therefore, the following improvements are recommended:

- Installation of a traffic signal.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of an eastbound left-turn lane with 275 feet of storage.
- Construction of an exclusive southbound right-turn lane with 225 feet of storage.

With these improvements in place the overall intersection is expected to operate at LOS A during each peak hour. Note that the eastbound left-turn queue is expected to exceed capacity during the school dismissal and PM peak hours. Based on review of the SimTraffic 95th percentile queue lengths, 275 feet of storage is recommended for the eastbound left-turn lane.

Based on a preliminary peak-hour signal warrant assessment (see Appendix), the intersection is expected to meet AM, school dismissal, and PM peak-hour signal warrants. The eastbound and westbound approach volumes include 100% of the left-turn volume and 0% of the right-turn volume.

Given the recommended laneage configuration, two approach lanes were assumed on each approach.

Given the distance and high coordinatability factors between this signal and the other signalized site driveways, the recommended traffic signals at the site driveways were assumed to operate in a coordinated system. Note that intersection cycle lengths and splits were optimized with the signalization of this intersection. Cycle lengths, offsets, and splits were then manually adjusted after optimization to improve intersection operations.

It should be noted that this intersection is located approximately 1,000 feet west of the recommended traffic signal at Access 2/3. If it is determined that a traffic signal cannot be installed at Access 1 due to its proximity to Access 2/3, the left-turning traffic entering and exiting Access 1 would be expected to redistribute to the recommended traffic signal at Access 2/Access 3. Assuming that half of the left-turn volume into and out of the site is redistributed to Access 2/Access 3, the stop-controlled southbound approach of Access 1 is expected to operate with long delays in each peak hour. Additionally, the overall intersection LOS at Access 2/Access 3 is expected to drop one level-of-service in each peak hour when compared to the build-out improved scenario shown in **Table 6.8**. Triple southbound left-turn lanes would be needed for the overall intersection of Access 2/3 to operate at LOS D or better under build-out improved conditions without traffic signals at Access 1 and Access 4. Note that in this scenario, it was assumed that Access 2/3 would not be coordinated with the recommended traffic signal at Access 5/6 due to distance and low coordinatability factors. See the supplemental analysis section of the **Appendix** for capacity analysis results.

6.8 SC 61 AT ACCESS 2/ACCESS 3

Table 6.8 summarizes the LOS, control delay and 95th percentile queue lengths at the proposed intersection of SC 61 and Access 2/Access 3.

Table 6.8 - SC 61 & Access 2/3														
Condition	Measure	EB			WB			NB			SB			Intersection LOS (Delay)
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM Peak Hour														
2030 Build-out	LOS (Delay)	C (30.8)			A (0.3)			*			*			-
	Synchro 95th Q	328'	-	-	10'	-	-	*	*	*	*	*	*	
	SimTraffic 95th Q	977'	-	-	2694'	-	-	3254'	-	-	3026'	-	-	
2030 Build-out Improved	LOS (Delay)	C (26.8)			A (3.1)			E (55.2)			E (66.1)			C (20.5)
	Synchro 95th Q	#190'	286'	m2'	m35'	627'	m0'	182'	17'	96'	#228'	51'	7'	
	SimTraffic 95th Q	159'	212'	32'	60'	283'	93'	222'	18'	137'	210'	64'	67'	
School Dismissal Peak Hour														
2030 Build-out	LOS (Delay)	F (111.9)			A (1.1)			*			*			-
	Synchro 95th Q	813'	-	-	40'	-	-	*	*	*	*	*	*	
	SimTraffic 95th Q	1280'	-	-	910'	-	-	3013'	-	-	2517'	-	-	
2030 Build-out Improved	LOS (Delay)	E (58.5)			D (53.3)			D (40.3)			D (54.1)			D (54.8)
	Synchro 95th Q	218'	390'	m25'	m63'	m#734'	m0'	86'	-	79'	#550'	69'	106'	
	SimTraffic 95th Q	190'	303'	58'	90'	468'	313'	91'	-	120'	964'	464'	244'	
PM Peak Hour														
2030 Build-out	LOS (Delay)	F (88.1)			A (2.5)			*			*			-
	Synchro 95th Q	753'	-	-	98'	-	-	*	*	*	*	*	*	
	SimTraffic 95th Q	1126'	-	-	801'	-	-	2948'	-	-	2519'	-	-	
2030 Build-out Improved	LOS (Delay)	E (73.3)			C (33.8)			D (50.5)			D (46.8)			D (51.3)
	Synchro 95th Q	m#301'	#1093'	m55'	m81'	m#817'	m279'	80'	45'	86'	#516'	170'	129'	
	SimTraffic 95th Q	215'	437'	66'	214'	877'	441'	98'	41'	125'	530'	196'	171'	

95th percentile volume exceeds capacity, queue may be longer
 m volume for 95th percentile queue is metered by upstream signal
 *Computation not defined

As shown in **Table 6.8**, the delay for the stop-controlled northbound and southbound approaches of Access 2 and 3 cannot be calculated. Therefore, the following improvements are recommended to improve operations at this intersection:

- Installation of a traffic signal.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of dual eastbound left-turn lanes with 225 feet of storage each.
- Construction of an eastbound right-turn lane with 100 feet of storage.
- Construction of dual westbound left-turn lanes with 150 feet of storage each.
- Construction of a westbound right-turn lane with 300 feet of storage.
- Construction of the northbound approach to include an exclusive left-turn lane, an exclusive through lane with 150 feet of storage, and an exclusive right-turn lane with 100 feet of storage.
- Construction of the southbound approach to include dual left-turn lanes with 550 feet of storage on the inner lane, a shared through-right lane with 150 feet of storage and an exclusive right-turn lane with 150 feet of storage.

With these improvements in place the overall intersection is expected to operate at LOS C during the AM peak hour, and LOS D during the school dismissal and PM peak hours. Note that the eastbound and southbound left-turn queues are expected to exceed capacity. Based on review of

the SimTraffic 95th percentile queue lengths, 225 feet of storage is recommended for the eastbound left-turn lane and 550 feet of storage is recommended for the inner southbound left-turn lane. Note that that the second southbound left-turn lane is recommended to be continuous.

Based on a preliminary peak-hour signal warrant assessment (see Appendix), the intersection is expected to meet AM, school dismissal, and PM peak-hour signal warrants. The eastbound and westbound approach volumes include 100% of the left-turn volume and 0% of the right-turn volume. Given the recommended laneage configuration, two approach lanes were assumed on each approach. Note that a full signal warrant study would need to be performed to determine whether MUTCD criteria are met.

Given the distance and high coordinatability factors between this signal and the other signalized site driveways, the recommended traffic signals at the site driveways were assumed to operate in a coordinated system. Note that intersection cycle lengths and splits were optimized with the signalization of this intersection. Cycle lengths, offsets, and splits were then manually adjusted after optimization to improve intersection operations.

6.9 SC 61 AT ACCESS 4

Table 6.9 summarizes the LOS, control delay and 95th percentile queue lengths at the proposed intersection of SC 61 and Access 4.

Table 6.9 - SC 61 & Access 4								
Condition	Measure	EB		WB		SB		Intersection
		EBL	EBT	WBT	WBR	SBL	SBR	LOS (Delay)
AM Peak Hour								
2030 Build-out	LOS (Delay)	A (1.4)		A (0.0)		F (2900.3)		-
	Synchro 95th Q	40'	-	0'	-	1175'	-	
	SimTraffic 95th Q	993'	-	0'	-	3278'	-	
2030 Build-out Improved	LOS (Delay)	A (0.8)		A (4.8)		E (75.5)		A (9.9)
	Synchro 95th Q	m82'	90'	m509'	-	#240'	340'	
	SimTraffic 95th Q	111'	94'	337'	-	227'	289'	
School Dismissal Peak Hour								
2030 Build-out	LOS (Delay)	A (9.7)		A (0.0)		F (2269.0)		-
	Synchro 95th Q	223'	-	0'	-	670'	-	
	SimTraffic 95th Q	665'	-	3'	-	1117'	-	
2030 Build-out Improved	LOS (Delay)	A (4.1)		B (13.2)		D (47.9)		B (10.4)
	Synchro 95th Q	m#125'	m562'	#1134'	-	109'	162'	
	SimTraffic 95th Q	344'	147'	423'	-	111'	143'	
PM Peak Hour								
2030 Build-out	LOS (Delay)	D (31.1)		A (0.0)		F (2779.9)		-
	Synchro 95th Q	433'	-	0'	-	680'	-	
	SimTraffic 95th Q	2532'	-	4'	-	2399'	-	
2030 Build-out Improved	LOS (Delay)	A (6.3)		B (18.5)		E (56.8)		B (14.0)
	Synchro 95th Q	m212'	m246'	#1491'	-	#134'	184'	
	SimTraffic 95th Q	369'	141'	424'	-	125'	171'	

95th percentile volume exceeds capacity, queue may be longer
 m volume for 95th percentile queue is metered by upstream signal

As shown in **Table 6.9**, the stop-controlled southbound approach of Access 4 is expected to operate at LOS F during each peak hour. Therefore, the following improvements are recommended:

- Installation of a traffic signal.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of an eastbound left-turn lane with 350 feet of storage.
- Construction of the southbound approach to include an exclusive left-turn lane and an exclusive right-turn lane with 350 feet of storage.

With these improvements in place the overall intersection is expected to operate at LOS A during the AM peak hour and LOS B during the school dismissal and PM peak hours. Note that the eastbound left-turn queue is expected to exceed capacity during the school dismissal peak hour. Based on review of the SimTraffic 95th percentile queue lengths where Synchro capacity was exceeded, 350 feet of storage is recommended for the eastbound left-turn lane.

Based on a preliminary peak-hour signal warrant assessment (see Appendix), the intersection is only expected to meet AM peak-hour signal warrants. The eastbound and westbound approach volumes included 100% of the left-turn volume and 0% of the right-turn volume. Given the recommended laneage configuration, two approach lanes were assumed on each approach. Note

that a full signal warrant study would need to be performed to determine whether MUTCD criteria are met.

Given the distance and high coordinatability factors between this signal and the other signalized site driveways, the recommended traffic signals at the site driveways were assumed to operate in a coordinated system. Note that intersection cycle lengths and splits were optimized with the signalization of this intersection. Cycle lengths, offsets, and splits were then manually adjusted after optimization to improve intersection operations.

It should be noted that this intersection is located approximately 1,000 feet west of the recommended traffic signal at Access 5/6. If it is determined that a traffic signal cannot be installed at Access 4 due to its proximity to Access 5/6, the left-turning traffic entering and exiting Access 4 would be expected to redistribute to the recommended traffic signals at Access 2/Access 3 and Access 5/Access 6. Assuming that half of the left-turn volume out of the site is redistributed to Access 5/Access 6, and half of the left-turn volume into the site is redistributed evenly between Access 2/3 and Access 5/6, the stop-controlled southbound approach of Access 9 would be expected to operate with long delays in each peak hour. Note that during the PM peak hour, with the adjacent signals and additional through lanes on SC 61, the stop-controlled southbound approach delay computation is not defined. Additionally, the overall intersection LOS at Access 2/3 is expected to drop one level-of-service in each peak hour and the overall intersection LOS at Access 5/6 is expected to drop one level-of-service during the school dismissal and PM peak hours when compared to the build-out improved scenarios shown in **Table 6.8** and **Table 6.10**. Triple southbound left-turn lanes would be needed for the overall intersection of Access 2/3 to operate at LOS D or better under build-out improved conditions without traffic signals at Access 1 and Access 4. Note that in this scenario, it was assumed that the recommended traffic signal at Access 2/3 would not be coordinated with the recommended traffic signal at Access 5/6 due to distance and low coordinatability factors. See the supplemental analysis section of the **Appendix** for capacity analysis results.

6.10 SC 61 AT ACCESS 5/ACCESS 6

Table 6.10 summarizes the LOS, control delay and 95th percentile queue lengths at the proposed intersection of SC 61 and Access 5/Access 6.

Table 6.10 - SC 61 & Access 5/6														
Condition	Measure	EB			WB			NB			SB			Intersection LOS (Delay)
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM Peak Hour														
2030 Build-out	LOS (Delay)	A (1.3)			A (1.0)			*			*			-
	Synchro 95th Q	33'	-	-	25'	-	-	*	*	*	*	*	*	
	SimTraffic 95th Q	1121'	-	-	1450'	-	-	3921'	-	-	4174'	-	-	
2030 Build-out Improved	LOS (Delay)	C (22.5)			D (38.7)			F (80.3)			F (90.1)			D (48.5)
	Synchro 95th Q	m93'	427'	m3'	73'	565'	30'	251'	-	#330'	332'	-	#581'	
	SimTraffic 95th Q	67'	278'	23'	70'	374'	54'	207'	91'	659'	292'	-	759'	
School Dismissal Peak Hour														
2030 Build-out	LOS (Delay)	D (32.1)			A (5.3)			*			*			-
	Synchro 95th Q	433'	-	-	170'	-	-	*	*	*	*	*	*	
	SimTraffic 95th Q	1174'	-	-	2007'	-	-	4222'	-	-	4721'	-	-	
2030 Build-out Improved	LOS (Delay)	C (22.6)			C (33.7)			D (54.5)			E (72.5)			C (34.1)
	Synchro 95th Q	m#185'	525'	m27'	114'	567'	38'	#142'	-	85'	#216'	-	#213'	
	SimTraffic 95th Q	333'	198'	41'	101'	265'	85'	151'	-	118'	394'	1'	407'	
PM Peak Hour														
2030 Build-out	LOS (Delay)	F (102.7)			B (10.7)			*			*			-
	Synchro 95th Q	810'	-	-	270'	-	-	*	*	*	*	*	*	
	SimTraffic 95th Q	1311'	-	-	2356'	-	-	4163'	-	-	4694'	-	-	
2030 Build-out Improved	LOS (Delay)	B (13.3)			D (39.2)			E (72.7)			E (75.5)			C (34.1)
	Synchro 95th Q	m#271'	451'	m0'	158'	794'	77'	#206'	-	98'	#237'	-	#232'	
	SimTraffic 95th Q	437'	224'	73'	121'	319'	125'	251'	-	129'	287'	1'	552'	

95th percentile volume exceeds capacity, queue may be longer
m volume for 95th percentile queue is metered by upstream signal
*Computation not defined

As shown in Table 6.10, the delay for the stop-controlled northbound and southbound approaches of Access 5 and 6 cannot be calculated. Therefore, the following improvements are recommended:

- Installation of a traffic signal.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of dual eastbound left-turn lanes with 450 feet of storage each.
- Construction of an eastbound right-turn lane with 100 feet of storage.
- Construction of dual westbound left-turn lanes with 175 feet of storage each.
- Construction of a westbound right-turn lane with 100 feet of storage.
- Construction of the northbound approach to include dual left-turn lanes with 250 feet of storage each, an exclusive through lane with 150 feet of storage, and an exclusive right-turn lane.
- Construction of the southbound approach to include dual left-turn lanes with 400 feet of storage each, an exclusive through lane with 150 feet of storage and an exclusive right-turn lane.

With these improvements in place the overall intersection is expected to operate at LOS D during the AM peak hour and LOS C during the school dismissal and PM peak hours. Note that the eastbound, northbound, and southbound left-turn queues are expected to exceed capacity. Based on review of the SimTraffic 95th percentile queue lengths, 450 feet of storage is recommended for

the dual eastbound left-turn lanes, 275 feet of storage is recommended for the dual northbound left-turn lanes, and 400 feet of storage is recommended for the dual southbound left-turn lanes.

Based on a preliminary peak-hour signal warrant assessment (see Appendix), the intersection is expected to meet AM, school dismissal, and PM peak-hour signal warrants. The eastbound and westbound approach volumes included 100% of the left-turn volume and 0% of the right-turn volume. Given the recommended laneage configuration, two approach lanes were assumed on each approach. Note that a full signal warrant study would need to be performed to determine whether MUTCD criteria are met.

Given the distance and high coordinatability factors between this signal and the other signalized site driveways, the recommended traffic signals at the site driveways were assumed to operate in a coordinated system. Note that intersection cycle lengths and splits were optimized with the signalization of this intersection. Cycle lengths, offsets, and splits were then manually adjusted after optimization to improve intersection operations.

6.11 SC 61 AT ACCESS 7

Table 6.11 summarizes the LOS, control delay and 95th percentile queue lengths at the proposed intersection of SC 61 and Access 7.

Table 6.11 - SC 61 & Access 7							
Condition	Measure	EB		WB		SB	
		EBL	EBT	WBT	WBR	SBL	SBR
AM Peak Hour							
2030 Build-out	LOS (Delay)	A (0.8)		A (0.0)		F (7389.4)	
	Synchro 95th Q	28'	-	0'	-	533'	-
	SimTraffic 95th Q	188'	-	851'	-	313'	-
2030 Build-out Improved	LOS (Delay)	A (0.8)		A (0.0)		F (900.8)	
	Synchro 95th Q	28'	-	0'	-	180'	35'
	SimTraffic 95th Q	67'	-	0'	-	135'	69'
SCHOOL Peak Hour							
2030 Build-out	LOS (Delay)	A (0.8)		A (0.0)		F (759.5)	
	Synchro 95th Q	35'	-	0'	-	205'	-
	SimTraffic 95th Q	103'	-	584'	-	108'	-
2030 Build-out Improved	LOS (Delay)	A (0.9)		A (0.0)		E (46.0)	
	Synchro 95th Q	35'	-	0'	-	0'	55'
	SimTraffic 95th Q	104'	-	0'	-	0'	134'
PM Peak Hour							
2030 Build-out	LOS (Delay)	A (0.0)		A (0.0)		A (0.0)	
	Synchro 95th Q	0'	-	0'	-	0'	-
	SimTraffic 95th Q	0'	-	2763'	-	0'	-
2030 Build-out Improved	LOS (Delay)	A (0.0)		A (0.0)		A (0.0)	
	Synchro 95th Q	0'	-	0'	-	0'	-
	SimTraffic 95th Q	0'	-	0'	-	0'	-

As previously noted, Access 7 is intended to serve the elementary school, which was included in this study to determine the traffic impacts on the adjacent roadways. The site layout, access configuration, and circulation patterns for the elementary school were not considered in this TIA.

As shown in **Table 6.11**, the stop-controlled elementary school driveway is expected to operate a LOS F during the AM and school dismissal peak hour. As previously noted, school trips were not assigned during the PM peak hour; therefore, delays are not expected at this intersection during non-school peaks. The following improvements are recommended to improve operations at the proposed elementary school driveway:

- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of an eastbound left-turn lane with 250 feet of storage.
- Construction of a westbound right-turn lane with 250 feet of storage.

With these improvements in place the stop-controlled southbound approach delay is expected to decrease significantly while continuing to operate at LOS F during the AM peak hour. Given that 900 seconds of delay is still expected exiting the school in the AM peak hour, a traffic signal was considered at this intersection. Based on preliminary peak-hour signal warrant analysis, this

intersection is not expected to meet the peak-hour warrant in the AM, school dismissal, or PM peak hours. Therefore, the intersection would not be likely to warrant a traffic signal, should a full signal warrant study be conducted.

Under stop-controlled conditions, limited gaps are available for vehicles to turn left out of the school driveway due to the high volume of through traffic on SC 61 during the AM peak hour. Therefore, it is recommended that this intersection be restricted to directional crossover to reduce expected queueing on the school site driveway. Vehicles turning left onto SC 61 from Access 7 would be expected to reroute through the neighborhood to turn left at the proposed traffic signal at Access 5/Access 6.

As a directional crossover, an eastbound left-turn lane with 250 feet of storage is recommended based on the *ARMS* manual minimum left-turn lane length for roadway widening adjacent to school sites. Although westbound right-turn traffic was not assigned into the school based on the methodology described in Section 5.1, it is reasonable to assume some vehicles may arrive to the school in this direction, particularly during the school dismissal peak. Therefore, based on the *ARMS* manual a right-turn lane with 250 feet of storage is recommended to accommodate vehicles turning westbound right into the school driveway.

7.0 Auxiliary Turn Lane Warrants

Warrants for additional turn-lane improvements for unsignalized intersections beyond those necessary for capacity were determined based on a review of the figures 15.5A and 15.5F found on pages 15.5 (3) and 15.5 (8) in the *2003 SCDOT Highway Design Manual*. The results of the warrants for left and right-turn lanes under 2030 background and build-out conditions are summarized by intersection below and included in the **Appendix**.

2030 Background Conditions

SC 27 at Carter Road

- A northbound left-turn lane should be considered.

SC 61 at Hill Branch Road

- A westbound left-turn lane should be considered.

SC 61 at Old Beech Hill Road

- A westbound left-turn lane should be considered.

2030 Build-out Conditions

SC 27 at Carter Road

- A northbound left-turn lane should be considered.

SC 61 at Hill Branch Road

- A westbound left-turn lane should be considered.

SC 61 at Old Beech Hill Road

- A westbound left-turn lane should be considered.

SC 61 at Access 7

- An eastbound left-turn lane should be considered.

8.0 Conclusions

Based on the capacity analyses and turn-lane warrants, the following mitigations are recommended. Note that once developer mitigation is approved, the timing of the improvements would need to be determined.

SC 27 at Carter Road

- Extension of the northbound left-turn lane (assumed to be built by the Bridlewood development) back to the SC 61/SC 27 intersection.

SC 61 at SC 27/Wright Road

- Realignment of the SC 61/SC 27 intersection so that SC 61 (east of SC 27) serves as the major street northbound approach, SC 27 (north of SC 61) serves as the major street southbound approach, and SC 61 (west of SC 27) serves as the minor street eastbound approach.
- Installation of a traffic signal if/when warrants are met.
- Realignment of Wright Road to tee into SC 61 approximately 325 feet west of its current location.
- Construction of an additional northbound and southbound through lane creating two northbound and southbound through lanes.
- Construction of a northbound left-turn lane with storage maximized to the extent feasible and acceptable to SCDOT.
- Construction of a southbound right-turn lane with 100 feet of storage.
- Construction of the eastbound approach to consist of a shared eastbound left-right lane and an eastbound right-turn lane with 225 feet of storage.

SC 61 at Old Beech Hill Road

- Construction of an exclusive westbound left-turn lane with 150 feet of storage.
- Construction of an exclusive northbound right-turn lane with 100 feet of storage.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches. Note that this improvement is a continuation of the improvements recommended at the adjacent intersections.

SC 61 at US 17A (West)

- Realignment of the SC 61/US 17A intersection so that SC 61 (west of US 17A) serves as the major street eastbound approach, US 17A (east of SC 61) serves as the major street westbound approach, and US 17A (south of SC 61) serves as the minor street northbound approach.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches. Note that the westbound approach of US 17A was recommended to be widened as an improvement in the Summers Corner TIA and therefore is not recommended to be constructed by the Branton development.
- Construction of an eastbound right-turn lane with 200 feet of storage.
- Construction of an additional westbound left-turn lane to create dual westbound left-turn lanes with 775 feet of storage each.
- Construction of a second southbound receiving lane to accommodate the dual westbound left-turn lanes. Note that this segment of US 17A was recommended to be widened as an

improvement in the Summers Corner TIA and therefore is not recommended to be constructed by the Branton development.

- Construction of an additional northbound right-turn lane to create dual northbound right-turn lanes with 500 feet of storage on the outer turn lane. Note that this segment of US 17A was recommended to be widened as an improvement in the Summers Corner TIA and therefore the inner northbound right-turn lane is not recommended to be constructed by the Branton development.
- Adjust route signage accordingly with changes to the intersection configuration.

SC 61 at US 17A (East)

- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches. Note that this segment of US 17A was recommended to be widened as an improvement in the Summers Corner TIA and therefore is not recommended to be constructed by the Branton development.
- Reconfiguration of the northbound approach to include an exclusive left-turn lane with storage maximized to the extent feasible and acceptable to SCDOT, and a shared left-right lane.

SC 61 at Access 1

- Installation of a traffic signal if/when warrants are met.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of an eastbound left-turn lane with 275 feet of storage.
- Construction of an exclusive southbound right-turn lane with 225 feet of storage.

SC 61 at Access 2/Access 3

- Installation of a traffic signal if/when warrants are met.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of dual eastbound left-turn lanes with 225 feet of storage each.
- Construction of an eastbound right-turn lane with 100 feet of storage.
- Construction of dual westbound left-turn lanes with 150 feet of storage each.
- Construction of a westbound right-turn lane with 300 feet of storage.
- Construction of the northbound approach to include an exclusive left-turn lane, an exclusive through lane with 150 feet of storage, and an exclusive right-turn lane with 100 feet of storage.
- Construction of the southbound approach to include dual left-turn lanes with 550 feet of storage on the inner lane, a shared through-right lane with 150 feet of storage, and an exclusive right-turn lane with 150 feet of storage.

SC 61 at Access 4

- Installation of a traffic signal if/when warrants are met.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of an eastbound left-turn lane with 350 feet of storage.
- Construction of the southbound approach to include an exclusive left-turn lane and an exclusive right-turn lane with 350 feet of storage.

SC 61 at Access 5/Access 6

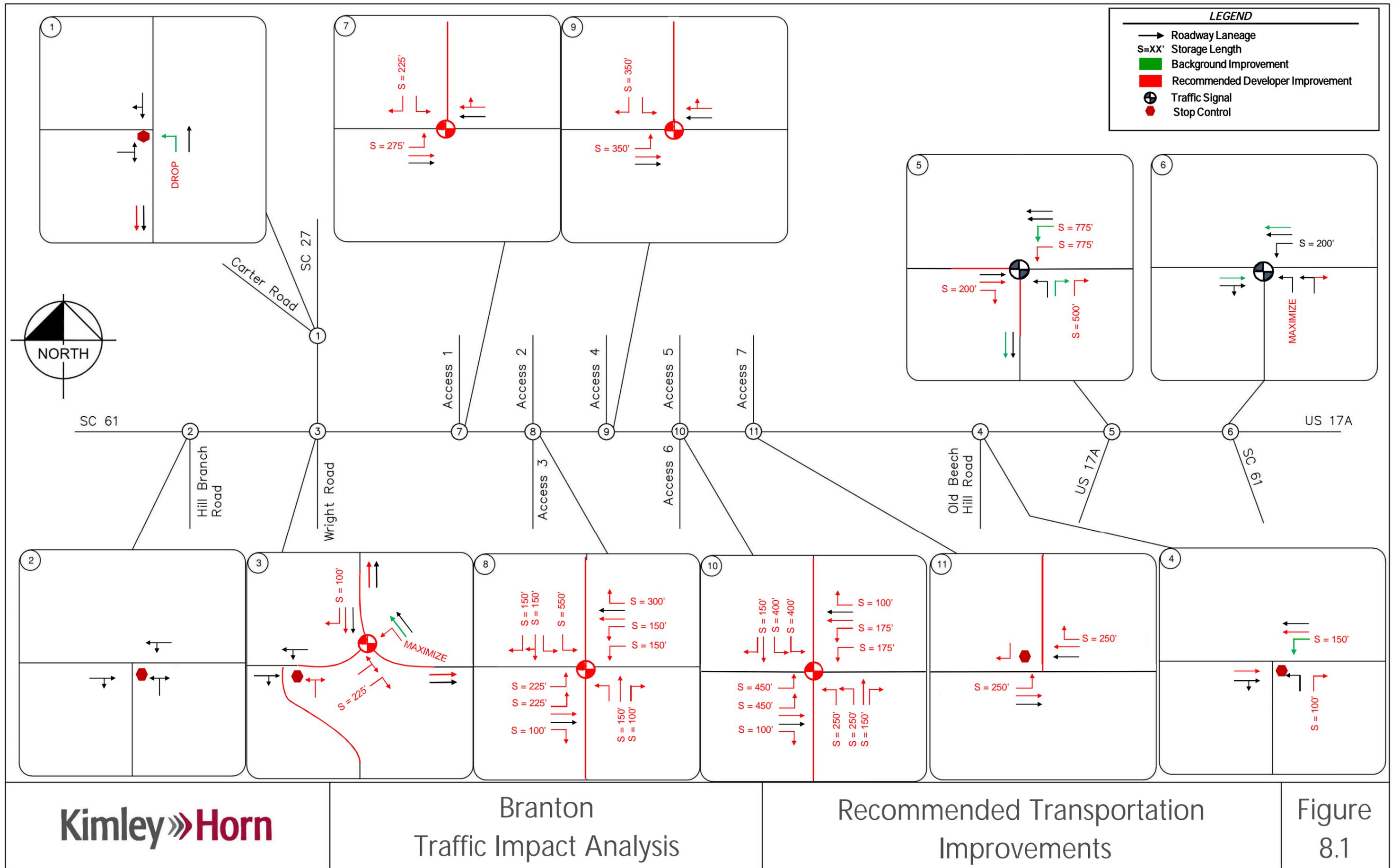
- Installation of a traffic signal if/when warrants are met.
- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of dual eastbound left-turn lanes with 450 feet of storage each.
- Construction of an eastbound right-turn lane with 100 feet of storage.
- Construction of dual westbound left-turn lanes with 175 feet of storage each.
- Construction of a westbound right-turn lane with 100 feet of storage.
- Construction of the northbound approach to include dual left-turn lanes with 250 feet of storage each, an exclusive through lane with 150 feet of storage, and an exclusive right-turn lane.
- Construction of the southbound approach to include dual left-turn lanes with 400 feet of storage each, an exclusive through lane with 150 feet of storage, and an exclusive right-turn lane.

SC 61 at Access 7

- Construction of an additional eastbound and westbound through lane creating a four-lane section on the eastbound and westbound approaches.
- Construction of an eastbound left-turn lane with 250 feet of storage.
- Construction of a westbound right-turn lane with 250 feet of storage.
- Construction of the southbound approach to include an exclusive right-turn lane so that the intersection is restricted to a directional crossover

Note that the speed limit is currently 55 mph along SC 61 between a point just east of SC 27 and a point just west of US 17A and then transitions to 45 mph near the SC 27/SC 61 and SC 61/US 17A intersections. Since traffic signals are recommended to be installed throughout the SC 61 corridor, consideration should be given to potentially lowering the speed limit on SC 61 between US 17A and SC 27.

The build-out laneage at the study intersections are shown in **Figure 8.1**. The laneage shown on this figure are subject to approval by SCDOT and the Dorchester County. Auxiliary turn lanes, not needed for capacity reasons, are subject to requirement by SCDOT. All additions and attachments to the State and County roadway system shall be properly permitted, designed and constructed in conformance to standards maintained by the agencies.



APPENDIX