

Interchange Modification Report
Interstate 85 Exit 83 – Battleground Road (SC 110)
Spartanburg County, SC

Prepared For:
South Carolina Department of Transportation



Prepared By:

STV Incorporated
140 Stoneridge Drive, Suite 450
Columbia, SC 29210



May 2016



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5-17-2016



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Executive Summary

I-85 is a north-south Interstate highway that begins at I-65 in Montgomery, Alabama. From Montgomery, I-85 runs generally to northeast through Alabama, Georgia, South Carolina, North Carolina and Virginia, where it terminates south of Richmond at I-95 in Petersburg, Virginia. Along its 668 mile length, I-85 provides access to Montgomery, Alabama, Atlanta, Georgia, Greenville and Spartanburg, South Carolina, Charlotte, Greensboro, and Durham, North Carolina, and Petersburg, Virginia.

In South Carolina, I-85 covers about 106 miles, and provides connections to I-385 (outside of Greenville), and I-26 (outside of Spartanburg). Within the study area, I-85 crosses portions of Spartanburg and Cherokee Counties, and provides access to the towns of Cowpens, Gaffney, East Gaffney and Blacksburg. Throughout nearly all of the study area, I-85 currently provides two-lanes in each direction.

The South Carolina Department of Transportation (SCDOT) proposes multiple improvements to the I-85 corridor from mile marker 80 to mile marker 96 designed to increase capacity, upgrade interchanges to meet design requirements, and expand vertical clearance at overpass bridges. Specifically, SCDOT proposes widening I-85 from four to six lanes from Exit 80 – Gossett Road (S-57) in Spartanburg County to the Broad River Bridge, which is 1.5 miles north of Exit 96 – Shelby Highway (SC 18) in Cherokee County. Along the approximately 18-mile project area located within Spartanburg and Cherokee Counties, interchanges at Exit 83 – Battleground Road, Exit 87 – Green River Road, Exit 95 – Pleasant School Road (S-11-82), and Exit 96 – Shelby Highway (SC 18) will be improved to bring them into compliance with design requirements. The frontage road at Exit 90 - Hyatt Street will be reconfigured to improve traffic flow. Lastly, the overpass bridge at Sunny Slope Drive will be replaced by one with greater vertical clearance to meet design standards.

The proposed project has two primary purposes: increase roadway capacity to address the projected increased traffic volumes and improve geometric deficiencies along the mainline and at several interchanges and overpasses in this section of I-85 by bringing them into compliance with current state and federal design standards. The secondary purpose is to improve safety which will be enhanced by improving the geometric design of the facility.

This interchange modification report (IMR) presents information for the proposed interchange modifications at Exit 83 – Battleground Road (SC 110) located in Cowpens, SC. Today, this interchange is an unconventionally oriented diamond interchange. Both the southbound off- and on-ramps are located on the north side of the interchange. The

ramps in both directions are very short, and tie directly into two-way frontage roads running parallel to the mainline freeway lanes. The exit is signed in the northbound and southbound directions with the SC 110 state route shield and the text “Cowpens”.

Information discussed in the report is derived from the following projects reports: *Interstate 85 Widening Traffic Analysis Report: I-85 Widening Project MM 80 to MM 96*, *Accident Analysis Report: I-85 Widening Project MM 80 to MM 96*, and *Interstate 85 Widening and Improvements Mile Marker 80-96 Environmental Assessment*.

Four alternatives were initially developed for Exit 83. Alternative 1 replaces the existing Exit 83 interchange with a full diamond interchange. Alternatives 2-4 replace the existing Exit 83 interchange with partial cloverleaf interchanges. Alternative 2 includes a southbound loop off-ramp located in the northwest quadrant of the interchange, while Alternative 3 includes both the southbound loop off-ramp and a northbound loop off-ramp located in the southeast quadrant of the interchange. Alternative 4, the preferred alternative, consists of a partial cloverleaf and combines features of the other alternatives. In this alternative, the northbound loop off-ramp would be located in the southeast quadrant of the interchange. Other elements of the alternative concept include eliminating the intersections of Battleground Road and Horry Road; Truck Stop Road and the southbound off-ramp; Truck Stop Road and Horry Road/southbound on-ramp; Frontage Road and the northbound off-ramp; and Edgefield Road and the northbound on-ramp. Alternative 4 is also rated as Very Constructible, which means that closures during construction would not affect the entire interchange, only some specific movements. The duration of the closures would be less than a month; typically less than a week. Alternative 4, projected to cost \$23.4 million, would have the least amount of impact to streams and would result in the relocation of two residences and two businesses. Alternative 4 is shown in **Figure E-1**.

Based on the traffic analysis of the preferred Alternative 4, the intersection of Battleground Road at the southbound ramps will be required to be signalized. Based on the projected growth in traffic volumes, the signal installation is predicted to be warranted between 2035 and 2040 when the delay at this intersection would transition from LOS E to **LOS F** on the westbound approach. Under signal control, the intersection is forecast to operate at LOS B or better during the morning and afternoon peak hours.



Source: Design Team

Figure E-1. Preferred Alternative 4

1.0 Introduction

I-85 is a north-south Interstate highway that begins at I-65 in Montgomery, Alabama. From Montgomery, I-85 runs generally to the northeast through Alabama, Georgia, South Carolina, North Carolina and Virginia, where it terminates south of Richmond at I-95 in Petersburg, Virginia. Along its 668 mile length, I-85 provides access to Montgomery, Alabama; Atlanta, Georgia; Greenville and Spartanburg, South Carolina; Charlotte, Greensboro, and Durham, North Carolina; and Petersburg, Virginia.

In South Carolina, I-85 covers about 106 miles, and provides connections to I-385 (outside of Greenville), and I-26 (outside of Spartanburg). Within the study area, I-85 crosses portions of Spartanburg and Cherokee Counties, and provides access to the towns of Cowpens, Gaffney, East Gaffney and Blacksburg. Throughout nearly all of the study area, I-85 currently provides two lanes in each direction.

South of the study area limits, I-85 has four northbound through lanes north of the US 221 interchange (Exit 78). The four-lane section of northbound I-85 narrows to three lanes by merging the rightmost lane approximately 1,800 feet south of the northbound exit ramp to the Gossett Road interchange (Exit 80). The three lane section then merges to a two-lane section beginning approximately at the northbound exit ramp, with the leftmost lane merging in to create a two-lane section approximately 350 feet north of the Gossett Road overpass. The northbound on-ramp from Gossett Road merges into a two-lane mainline section. From this point, northbound I-85 continues through the study area with two lanes.

To the north of the study area, I-85 enters from the north of the Blacksburg Highway interchange (Exit 100) with two southbound lanes. Throughout the study area, the two-lane section is maintained, until it is widened from two to three lanes approaching the Gossett Road (Exit 80) southbound off-ramp at a point approximately 550 feet north of the ramp gore and about one-half mile from the Gossett Road overpass. I-85 continues southbound with three lanes through the Gossett Road interchange towards the US 211 interchange (Exit 78) where it picks up a fourth lane from the southbound on-ramp from US 221.

The posted speed limit throughout most of the I-85 study area is 65 miles per hour. The posted speed limit increases to 70 miles per hour in the southern end of the study area beginning approximately 4,000 feet north of the Gossett Road (Exit 80) overpass.

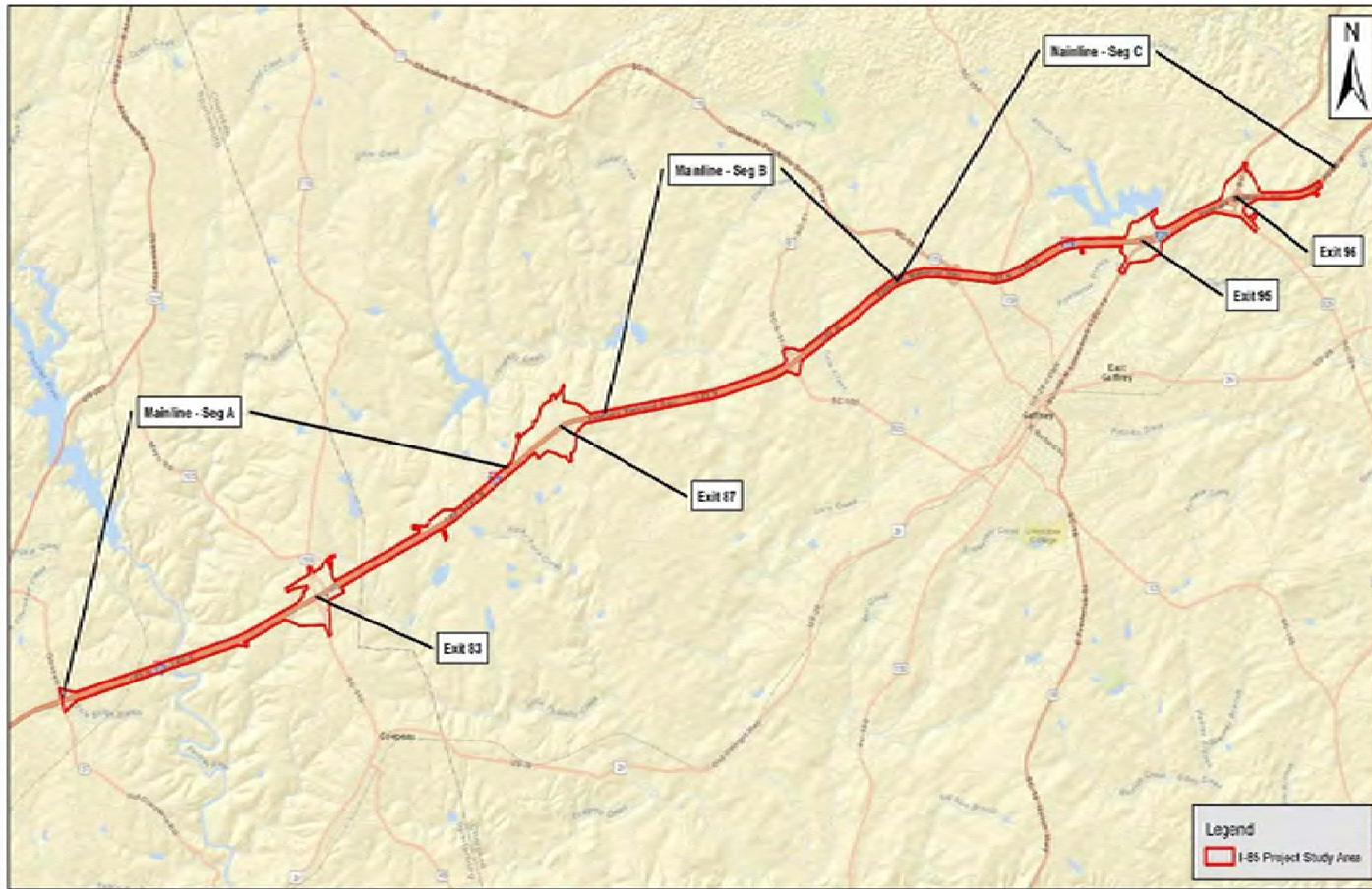
In general, interstate routes can be characterized as having either level, rolling, or mountainous terrain. Along I-85, the interstate grades fluctuate between a maximum -6.32 percent down grade to a maximum 6.00 percent upgrade. Based on these grades, the portion of I-85 within the study area can be characterized as having a *rolling terrain*.

A parallel frontage road system is present at portions of both sides of I-85 throughout the study area.

Information discussed in the report is derived from the following projects reports: *Interstate 85 Widening Traffic Analysis Report: I-85 Widening Project MM 80 to MM 96*, *Accident Analysis Report: I-85 Widening Project MM 80 to MM 96*, and *Interstate 85 Widening and Improvements Mile Marker 80-96 Environmental Assessment*.

1.1 Overall Project

SCDOT is proposing multiple improvements to the I-85 corridor from mile marker 80 to mile marker 96 designed to increase capacity, upgrade interchanges to meet design requirements, and expand vertical clearance at overpass bridges. Specifically, SCDOT proposes widening I-85 from four to six lanes from Exit 80 – Gossett Road (S-57) in Spartanburg County to the Broad River Bridge, which is 1.5 miles north of Exit 96 – Shelby Highway (SC 18) in Cherokee County. Along the approximately 18-mile project area located within Spartanburg and Cherokee Counties, interchanges at Exit 83 – Battleground Road, Exit 87 – Green River Road, Exit 95 – Pleasant School Road (S-11-82), and Exit 96 – Shelby Highway (SC 18) will be improved to bring them into compliance with design requirements. The frontage road at Exit 90 - Hyatt Street will be reconfigured to improve traffic flow. Lastly, the overpass bridge at Sunny Slope Drive will be replaced by one with greater vertical clearance to meet design standards. **Figure 1** depicts the study area for the overall I-85 Widening project.



Source: Design Team

Figure 1. Interstate 85 Widening Study Area

1.2 Exit 83 – Battleground Road (SC 110) Interchange

The interchange is an unconventionally oriented diamond interchange. Both the southbound off- and on-ramps are located on the north side of the interchange. The ramps in both directions are very short, and tie directly into two-way frontage roads running parallel to the mainline freeway lanes.

1.3 Existing Conditions

The section of I-85 in the vicinity of Exit 83 currently consists of a four-lane interstate with a grassed median for most of its length. The existing right-of-way is approximately 100 feet to either side of the center line (200 feet total).

The Exit 83 – Battleground Road (SC 110) interchange is an unconventionally oriented diamond interchange. Both the southbound off- and on-ramps are located on the north side of the interchange. The ramps in both directions are very short and tie directly into two-way frontage roads running parallel to the mainline freeway lanes. The northbound off-ramp, which diverges from northbound I-85 with a 300 feet long tapered deceleration lane, has a length of approximately 335 between the gore point and where westbound Bud Arthur Bridge Road traffic crosses the ramp; right turns can be made from the off-ramp to westbound Bud Arthur Bridge Road approximately 200 feet from the gore point. The northbound on-ramp is approximately 330 feet from its departure from Edgefield Road and merges into I-85 with a 400 feet long parallel acceleration lane (with a parallel length of about 125 feet). The southbound off-ramp is approximately 300 feet long from the gore point to its intersection with Truck Stop Road, and diverges from I-85 with a 450 feet long parallel deceleration lane (with a parallel length of about 200 feet). The southbound on-ramp is approximately 125 feet long from its origin at Truck Stop Road and Horry Road (S-42-21) to the gore on southbound I-85. The ramp merges into I-85 southbound with a 500 feet long parallel acceleration lane (with a parallel length of about 100 feet).

The exit is signed in the northbound and southbound directions with the SC 110 state route shield and the text “Cowpens”. The existing interchange configuration at Exit 83 is shown in **Figure 2**. The northbound off-ramp intersection with Bud Arthur Bridge Road/Frontage Road is shown in **Figure 3**.

To intersect Battleground Road, traffic exiting the off-ramp continues east on Bud Arthur Bridge Road running parallel to northbound I-85, before turning 90 degrees to the south then turning another 90 degrees to the east. At the point where it bends to the left, the separation between the centerlines of the Bud Arthur Bridge Road and Battleground Road is approximately 95 feet.



Source: Figure 16, *Interstate 85 Widening Traffic Analysis Report*

Figure 2. Existing Interchange



Source: Figure 17, *Interstate 85 Widening Traffic Analysis Report*

Figure 3. Exit 83 Northbound Off-Ramp at Frontage Road

The northbound on-ramp is a single lane ramp that begins at the eastern end of Edgefield Road (S-42-1015), which is a two lane, two-way frontage road that runs parallel to I-85. Traffic entering I-85 on this ramp must travel east from Battleground Road on Bud Arthur Bridge Road, and turn left at the stop sign located at the Bud Arthur Bridge Road intersection with Edgefield Road (designated as S-42-22 at this location). Edgefield Road runs to the north towards I-85, bends 90 degrees to the east (designated as S-42-1015) and

runs parallel to northbound I-85 before terminating at the on-ramp. The length of the on-ramp measured from the last driveway on Edgefield Road to the gore point on I-85 is approximately 330 feet. The ramp merges into I-85 with a 400 feet long parallel acceleration lane (with a parallel length of approximately 125 feet).

The northbound off-ramp and on-ramp are separated by approximately 3,650 feet on I-85.

The southbound off-ramp is approximately 300 feet long. The single lane ramp has no posted advisory speed limit. It diverges from southbound I-85 with a 450 feet long parallel deceleration lane (with a parallel length of about 200 feet) and enters directly into Truck Stop Road (S-42-1014), a two-way frontage road that runs parallel to I-85 southbound.

The intersections of the northbound on-ramp with Edgefield Road and the southbound off-ramp with Truck Stop Road are shown in **Figure 4**.



Source: Figure 18, *Interstate 85 Widening Traffic Analysis Report*

Figure 4. Exit 83 Northbound On-Ramp and Southbound Off-Ramp Intersection

The southbound on-ramp begins at the T-intersection of Truck Stop Road and Horry Road (S-42-21), with Truck Stop Road approaching from the east and Horry Road approaching from the north. The west leg of the intersection is the on-ramp to southbound I-85. The ramp is very short. The distance between the intersection and the gore on southbound I-85

is about 125 feet. The ramp merges into I-85 southbound with a 500 feet long parallel acceleration lane (with a parallel length of about 100 feet).

Truck Stop Road approaches the intersection as a two-way roadway. A free-flow right turn movement can be made onto Horry Road. Through traffic from Truck Stop Road heading onto the on-ramp is separated from Horry Road traffic heading onto the on-ramp by a triangular grass island. The Truck Stop Road traffic approaching the on-ramp is controlled by a yield sign, which permits the right turn traffic from Horry Road onto the on-ramp to operate as a free-flow movement. Horry Road traffic approaching the intersection splits at the point of the grass island. The left turn movement onto eastbound Truck Stop Road is controlled by a stop sign, while the right turn movement is a free flow movement onto the on-ramp. The existing intersection configuration of Truck Stop Road and Horry Road is shown, along with the southbound on-ramp, in **Figure 5**.



Source: Figure 19, *Interstate 85 Widening Traffic Analysis Report*

Figure 5. Exit 83 Southbound On-Ramp at Horry Road/Truck Stop Road

Traffic wanting to enter southbound I-85 from Battleground Road must travel east on Phillips Drive, turn right on Horry Road, and then turn right onto the on-ramp at the Horry Road intersection with Truck Stop Road. The southbound off-ramp and on-ramp are separated by 1,560 feet along southbound I-85.

Battleground Road is a two lane roadway with a posted 35 mph speed limit in the vicinity of the interchange. It provides access to the Cowpens National Battlefield, which is located approximately eight miles north of the interchange, as well as the town of Cowpens, which is located approximately two miles south of the interchange. The ramps at Exit 83 do not

intersect directly with Battleground Road. Traffic has to travel to and from Battleground Road along frontage roads with active businesses and public roads with institutional developments to reach the interstate ramps.

There are two main intersections along Battleground Road. Its intersection with Philips Drive is located approximately 900 feet north of I-85. Its intersection with Frontage Road N is located approximately 825 feet south of I-85. Other adjacent intersections are the intersections of Truck Stop Road with Horry Road, Horry Road with Phillips Drive, and Edgefield Road with Frontage Road N.

Truck Stop Road is a two-way, two lane frontage road that begins immediately at the end of the southbound off-ramp, and runs parallel to I-85 to the west for approximately 1,125 feet to the beginning of the southbound on-ramp at its intersection with Horry Road. Truck Stop Road provides access to a few businesses, including a truck stop/restaurant, a peach stand, and a small free-standing restaurant.

Horry Road provides an important connection in the operation of the Exit 83 interchange. It allows traffic exiting southbound I-85 to reach Battleground Road (via Truck Stop Road). Traffic entering southbound I-85 from Battleground Road must access the on-ramp via Horry Road. Horry Road begins at Battleground Road, and runs southeast to its terminus at Truck Stop Road. Its only intersection with public streets between its termini is at Phillips Road, approximately 520 feet south of Battleground Road and 330 feet north of Truck Stop Road. Horry Road runs between the Mountain View Baptist Church and school facilities of the Mountain View Christian Academy.

Phillips Drive is a two lane roadway located east of Battleground Road with a posted speed limit of 25 miles per hour. Phillips Drive continues east and northeast where it becomes Webber Road at the Cherokee County line.

Dewberry Road (S-42-2005) is a two-lane roadway located west of Battleground Road with a posted speed limit of 35 miles per hour. Dewberry Road continues west before bending to the south to run parallel and adjacent to southbound I-85 towards Exit 80.

The roadway depicted on SCDOT maps as Frontage Road N is the extension of Bud Arthur Bridge Road. Street name signs at the various intersections also identify this roadway as

Bud Arthur Bridge Road instead of Frontage Road N. Bud Arthur Bridge Road has a posted 35 miles per hour speed limit, and terminates at its intersection with Edgefield Road.

Edgefield Road (S-42-22) begins at Battleground Road approximately 1,630 feet south of the intersection of Battleground Road and Frontage Road N/Bud Arthur Bridge Road. Edgefield Road is a two lane roadway with a posted 35 miles per hour speed limit. Traffic traveling northbound on Battleground Road is directed by guide signing to Edgefield Road for access to northbound I-85. North of its intersection with Frontage Road N/Bud Arthur Bridge Road, Edgefield Road bends to the east and continues with the route designation of S-42-1015 from Bud Arthur Bridge Road. The two-way section of Edgefield Road ends at the start of the northbound on-ramp to I-85.

The intersection of Battleground Road with Horry Road is an unsignalized intersection with the Horry Road approach controlled by a yield sign. No turn lanes are provided on any of the intersection approaches. The intersection of Battleground Road at Horry Road is shown in **Figure 6**.



Source: Figure 20, *Interstate 85 Widening Traffic Analysis Report*

Figure 6. Exit 83 Battleground Road at Horry Road

The intersection of Battleground Road with Phillips Drive/S-42-2005 is an unsignalized intersection with the approaches of Phillips Drive and S-42-2005 controlled by stop signs. The eastbound approach of S-42-2005 consists of a single lane, which flares out to provide an unstriped, de facto right turn lane. The westbound approach of Phillips Drive has a single shared left turn-through-right turn lane. The northbound approach of Battleground

Road provides a single lane, but includes an opportunity for traffic to turn right approximately 100 feet in advance of the Phillips Drive intersection. The southbound approach of Battleground Road provides a single shared left turn-through-right turn lane. The intersection of Battleground Road at Phillips Drive is shown in **Figure 7**.

The intersection of Horry Road and Phillips Drive is an unsignalized intersection. The Phillips Drive approaches to the intersection are controlled by stop signs. The Horry Road approaches and the westbound Phillips Drive approach each consist of a single lane providing for shared left turn-through-right turn movements. The eastbound approach of Phillips Drive is also a single lane, but right turns to Horry Road (and the I-85 southbound on-ramp) can be made approximately 80 feet ahead of the intersection. The right turn movement is controlled by a Yield sign at Horry Road. The intersection of Horry Road at Phillips Drive is shown in **Figure 7**.



Source: Figure 21, *Interstate 85 Widening Traffic Analysis Report*

Figure 7. Exit 83 Phillips Drive at Battleground Road and Horry Road

The intersection of Battleground Road with Bud Arthur Bridge Road is a signalized intersection. All four approaches consist of single shared lanes with no separate turn lanes provided. The eastbound approach of Bud Arthur Bridge Road turns 90 degrees from south

to east just before its intersection with Battleground Road, leaving only a very short (about 50 feet) section that is perpendicular to Battleground Road.

The intersection of Bud Arthur Bridge Road (S-42-1015) and Edgefield Road is an unsignalized intersection located approximately 500 feet east of the Bud Arthur Bridge Road intersection with Battleground Road. The Bud Arthur Bridge Road approach to the intersection is controlled by a stop sign. All three approaches to this T-intersection consist of single shared lanes with no dedicated turn lanes. The existing configuration of the intersections of the Frontage Road/Bud Arthur Bridge Road with both Battleground Road and Edgefield Road are shown in **Figure 8**.



Source: Figure 22, *Interstate 85 Widening Traffic Analysis Report*

Figure 8. Exit 83 Frontage Road at Battleground Road and Edgefield Road

1.4 Purpose and Need

The proposed project has two primary purposes: increase roadway capacity to address the projected increased traffic volumes and improve geometric deficiencies along the mainline and at several interchanges and overpasses in this section of I-85 by bringing them into compliance with current state and federal design standards. The secondary purpose is to improve safety, which will be enhanced by improving the geometric design of the facility.

The needs for this project were identified through a comprehensive review of previous studies along with the analysis of current data compiled for this study. This includes information in the Traffic Analysis Report and the Accident Analysis Report, as well as

that collected through meetings with SCDOT; federal, state and local agencies; project stakeholders, and the public.

Existing traffic volumes along I-85 at the southern end of the project study area where Exit 83 is located are higher than the current facility can accommodate at an acceptable level of service, particularly during afternoon peak travel times. Peak travel times are considered business rush hours between 7:00 a.m. and 9:00 a.m. and 4:00 p.m. and 6:00 p.m. As traffic increases over time the congestion will also increase.

A high volume of truck traffic further reduces the facility's capacity to carry traffic. The average percentage of large truck traffic for a rural interstate is 24 percent. The percentage of large truck traffic along I-85 through the study area is 25 percent during the morning and afternoon/evening peak hour, which is average for the state. However, during non-peak hours the truck percentage along this segment of I-85 increases to 30 percent. This higher percentage of large truck traffic during the non-peak hours combined with rolling terrain along the corridor contributes to the congestion in the area.

1.5 Conceptual Design

Four alternatives were initially developed for Exit 83 (**Figure 9** through **Figure 12**). Alternative 1 replaces the existing Exit 83 interchange with a full diamond interchange. Alternatives 2-4 replace the existing Exit 83 interchange with a partial cloverleaf interchange. Alternative 2 includes a southbound loop off-ramp located in the northwest quadrant of the interchange, while Alternative 3 adds a northbound loop off-ramp, located in the southeast quadrant of the interchange, to the southbound loop ramp in the northwest quadrant. Alternative 4 includes a northbound loop off-ramp located in the southeast quadrant of the interchange. Each Alternative included relocating the intersection of Battleground Road with Dewberry Road/Phillips Drive to increase its distance from the southbound ramp intersection, relocation and/or realignment of the Bud Arthur Bridge Road intersection with Battleground Road, and connections between Phillips Drive and Truck Stop Road.

Alternative 4, the preferred alternative, combines features of the other alternatives. It includes the southbound diamond ramps, the elimination of the Horry Road intersection with Truck Stop Road, and the construction of a new connection between Truck Stop Road and Phillips Drive from Alternative 1. From Alternative 2, it includes the relocation of the



Source: Design Team

Figure 9. Exit 83 Alternative 1



Source: Design Team

Figure 10. Exit 83 Alternative 2



Source: Design Team

Figure 11. Exit 83 Alternative 3



Source: Design Team

Figure 12. Exit 83 Preferred Alternative 4

Bud Arthur Bridge Road/Frontage Road south of the interchange, northbound loop off-ramp and diamond on-ramp in the southeast quadrant of the interchange, eliminating portions of Edgefield Road to accommodate the new northbound on-ramp, eliminating the connection along Bud Arthur Bridge Road between Battleground Road and Edgefield Road and creating a new connection to the south. Alternative 4 eliminates intersections at Battleground Road and Horry Road; Truck Stop Road and the southbound off-ramp; Truck Stop Road and Horry Road/southbound on-ramp; Frontage Road and the northbound off-ramp; and Edgefield Road and the northbound on-ramp.

The two intersections of Battleground Road at Dewberry Road/Phillips Drive and Phillips Drive at Horry Road would be relocated and the alignment of the approaches would be adjusted. A cul de sac would be placed on the south end of Horry Road. Alternative 4 is also rated as Very Constructible and would have the least amount of impact to streams. Alternative 4 would have the fewest impacts to business: one business located within the partial cloverleaf and another business impacted by the diamond interchange for southbound I-85 ramps. The preferred alternative results in the relocation of two residences; one residence would be impacted by the realignment of Bud Arthur Bridge Road; the other residence would be impacted by the new cloverleaf in the southeastern quadrant. Alternative 4 is projected to cost \$23.4 million.

The interchange configuration alternatives for Exit 83 are summarized in **Table 1**.

Table 1: Interchange Configurations Alternatives			
Location	Current Configuration	Configuration Alternatives	Preferred Configuration
Exit 83: I-85 at Battleground Road (SC110)	Unconventional Diamond Interchange with Short Ramps Intersecting Two-Way Frontage Roads	Diamond	No
		Partial Cloverleaf Type B (NW and SE quadrants)	No
		Diamond with Loop Ramp (NW quadrant)	No
		Diamond with Loop Ramp (SE quadrant)	Yes

1.6 Intersection Modification Report Applicant

The interchange policy is administered by the Federal Highway Administration (FHWA). Therefore, FHWA is required to approve all new access or changes in access points pursuant to this policy.

As the owner and operator of the Interstate System, SCDOT is responsible for submitting a formal request to the FHWA in the form of an IMR that documents the analysis, the rationale for the proposed change in access, and the recommended action.

SCDOT is the sponsoring agency for the I-85 Widening project.

2.0 Study Area

In South Carolina, I-85 covers about 106 miles, and provides connections to I-385 outside of Greenville, and I-26 outside of Spartanburg. Within the study area shown on **Figure 13**, I-85 crosses portions of Spartanburg and Cherokee Counties, and provides access to the towns of Cowpens, Gaffney, East Gaffney and Blacksburg.

2.1 Demographics

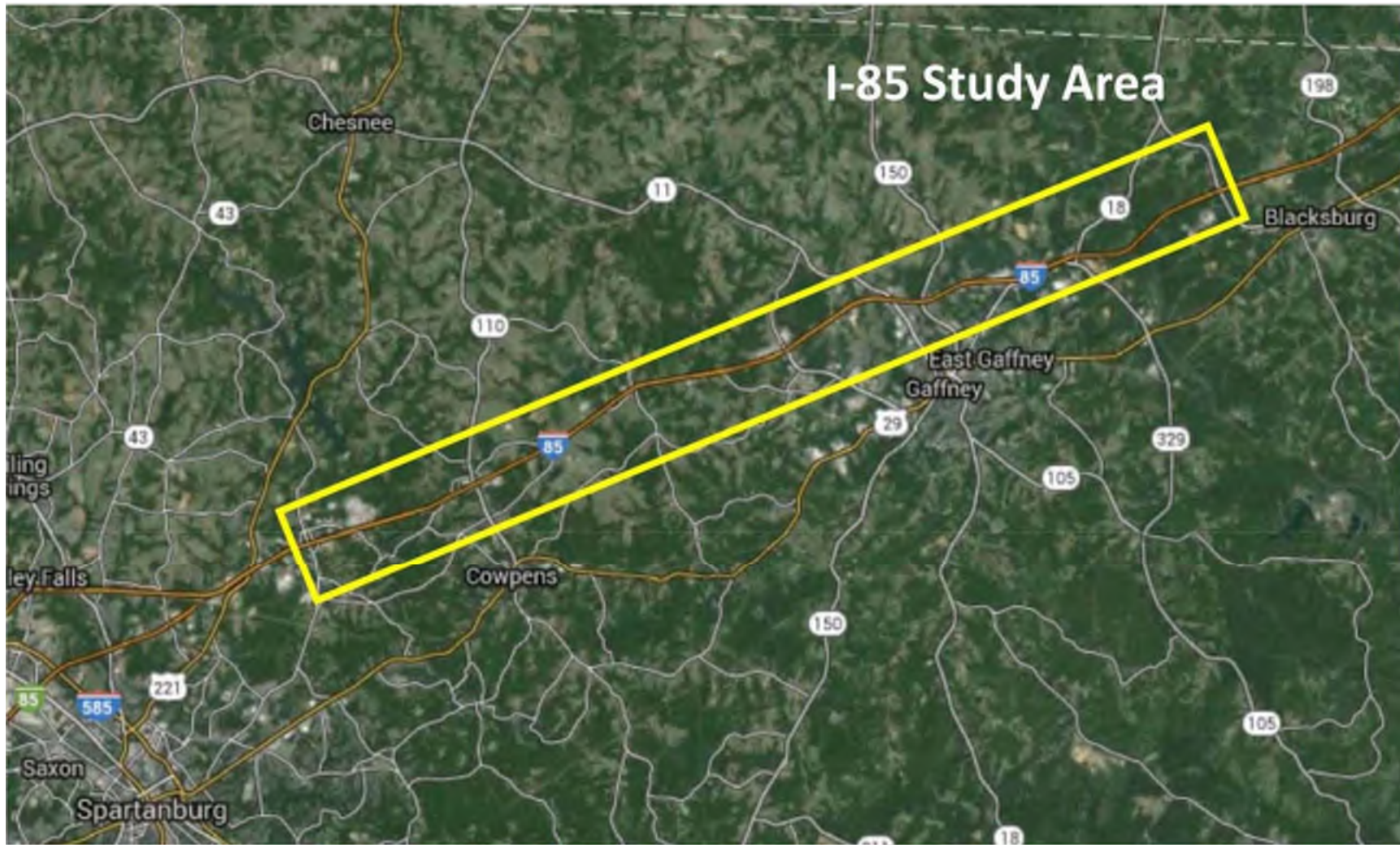
The United States Census Bureau’s decennial data for 2000 and 2010 were used to determine the demographic composition of the State, the two Counties, and the 14 Census tract block groups that fall within the study area. **Table 2** presents race, age, poverty, and growth percentages for South Carolina and Spartanburg and Cherokee Counties.

Table 2: Population Demographic			
	South Carolina	Spartanburg County	Cherokee County
Percent that is white	64.1%	70.1%	74.0%
Percent that is minority	35.9%	29.9%	26.0%
Percent age 65 and Over	13.7%	13.4%	13.4%
*Percent income below poverty level	14.1%	12.3%	13.9%
Percent Change in Population (2000-2010)	15.3%	12.0%	5.3%

Source: Census.gov (2010 data); *Decennial Census 2000 data

Comparisons of the data indicate the percentage minority population in both Spartanburg County (29.9%) and Cherokee County (26.0%) is below the reported State percentage (35.9%). The population age 65 and older is nearly the same when comparing the two counties (13.4%) to South Carolina as a whole (13.7%). The percent of the population with an income below the poverty level is slightly lower for both Spartanburg County (12.3%) and Cherokee County (13.9%) compared to South Carolina (14.1%).

Although both counties experienced population growth between 2000 and 2010, growth in the two counties was less than the 15.3% growth experienced by South Carolina as a whole;



Source: *Interstate 85 Widening Traffic Analysis Report*
Figure 13. Study Area

2.2 Land Use

Spartanburg and Cherokee counties have historically been rural with economies based on agriculture until highway retail uses began to develop near the interstates and major highways in the counties. In 1994, the BMW Plant in Spartanburg opened; the campus sits on over 1,000 acres adjacent to I-85 and has helped transform the region. The Spartanburg County Comprehensive Plan points out that the “pull of I-85 has created an elongated east-west development pattern through the center of the County. As a consequence, most major streets and roads in the area have become high intensity use corridors.” Due to these types of development demands, land uses have been converted from agricultural and open lands to commercial and industrial uses throughout both counties in recent years.

According to the 2010 Census, Cherokee County has approximately 55,000 residents and Spartanburg County has approximately 284,000. The counties have seen a steady increase in population since the 1950’s. Between 2000 and 2010, Cherokee and Spartanburg counties saw five and 12 percent increases in population, respectively. According to the South Carolina Revenue and Fiscal Affairs Office, Cherokee County is expected to continue to see gradual population growth between 2010 and 2030, 3.5 percent while Spartanburg County is expected to see more significant population growth by 2030. **Table 3** presents population growth and projections for the two counties.

Table 3: Population Growth					
County	2000 Population	2010 Population	2030 Population	2000-2010 % Growth	2010-2030 % Growth
Cherokee	52,537	55,342	57,300	5.3%	3.5%
Spartanburg	253,791	284,307	331,200	12.0%	16.5%

Source: http://www.sccommunityprofiles.org/census/proj_c2010.html

Exit 83 is located within the unincorporated area of Spartanburg County and is located approximately 1.2 miles north of the northern corporation limits of the Town of Cowpens. Land uses in the study area surrounding Exit 83 – Battleground Road (SC 110) consist of low-density residential, commercial, light industrial, institutional and open/wooded land. Horry Road runs in between Mountain View Baptist Church and Christian Academy which are located north of the interchange. Builders FirstSource is located in the northwest quadrant. Businesses located along Truck Stop Road in the northeast quadrant are currently accessible directly from the southbound off-ramp. Southeast of the interchange are two businesses and residential development. In the southwest quadrant, there are some

commercial uses currently located on the frontage road, which has direct access on and off the interstate. Farmland and wooded land is located to the north and south of the interchange. Water and sewer services are available at this location.

2.3 *Transportation System*

The Project study area roadway transportation system is part of the I-85 Widening study depicted in **Figure 13**. This region of Spartanburg and Cherokee counties is accessed via I-85, which is a north-south freeway (but physically more northeast-southwest) connecting Charlotte and Atlanta metros.

For this IMR, a focused roadway system was evaluated. It consisted of I-85 mainline, frontage roads and the Exit 83 - Battleground Road (SC 110) interchange. Specifically, I-85 northbound and southbound mainline segments at Exit 83 – Battleground Road (SC 110) were evaluated for traffic conditions during different hours of the day.

It should be noted that this IMR study area is a subset of the broader study area that was analyzed during the *Interstate 85 Widening Traffic Analysis Report*. The I-85 Widening study evaluated the current and future traffic volumes on I-85 mainline and interchanges between mile markers 80 and 96. The focus of the IMR is on I-85 Exit 83 – Battleground Road (SC 110).

3.0 Methodology

3.1 Scenarios Analyzed

In October 2015, STV Incorporated prepared the I-85 Widening Traffic Analysis Report that included the following scenarios:

- Existing Conditions
- 2040 No-Build Conditions
- 2040 Build Conditions

Analyses were performed for existing conditions (existing traffic, intersection traffic control and geometry), 2040 No-Build conditions (2040 traffic, and existing intersection traffic control and geometry) and 2040 Build Alternatives (2040 traffic and modified intersection traffic control and geometry reflecting the reasonable interchange improvement alternative). The Exit 83 alternatives were compared against one another to determine which best met the purpose and need with the least impacts.

The 2040 No-Build Alternative for the Exit 83 interchange represents the existing interchange configuration, intersection traffic control and geometric conditions with no changes to those conditions. Many of the impacts associated with the construction of the interchanges would not occur, but the interchanges would continue to be out of conformance with current state and federal design standards. This would not satisfy the purpose and need for the project.

There were four Reasonable Alternatives developed for Exit 83. These alternatives share many common features. They all would meet the purpose and need for the project by bringing the interchange into compliance with current state and federal design requirements. The safety at the interchange will be improved by providing on and off ramps that separate the interstate traffic from local traffic, and which will be long enough to allow traffic to merge onto the interstate and to store traffic that is exiting the interstate during peak hours. Alternative 4 was recommended as the Preferred Alternative for Exit 83. Alternative 4 combined what were considered to be the best features of the other alternatives. Therefore, the other alternatives were not carried forward in this document and Alternative 4 was analyzed for the 2040 Build Conditions for Exit 83.

The interchanges adjacent to Exit 83 are Exit 80, Exit 82 and Exit 87. Exit 82 – Bud’s Drive, a northbound off-ramp to Bud’s Drive is anticipated to be removed as part of the I-85 widening project. This would make Exit 80 – Gossett Road (S-57) the next adjacent interchange to the south of Exit 83. Exit 80 is located approximately 3.5 miles south of Exit 83. Exit 87 – Green River Road is the next adjacent interchange to the north of Exit

83 and is located approximately 3.7 miles away. The interaction of the modifications proposed at Exit 83 with the adjacent interchanges at Exits 80 and 87 were initially analyzed and are included in the I-85 Widening Traffic Analysis Report.

By replacing the substandard ramps and modifying the existing interchange to meet current design standards, the proposed modified interchange with Battleground Road (SC 110) is anticipated to contribute to an improvement in traffic safety and provide space for the future construction of an additional travel lane in each direction along I-85. The proposed improvements should mitigate the existing factors identified in the Accident Analysis as contributing to a high occurrence of rear-end collisions in the area, including short ramps and merge/diverge areas, as well as a narrow clear zone at and adjacent to the overpass for Battleground Road (SC 110).

The preferred alternative of the interchange design also provides space for the future construction of an additional travel lane in each direction along I-85. Altogether, these design provisions would enhance the operational efficiency and safety of the corridor, thereby increasing capacity and improving levels of service in the long term.

3.2 Traffic Forecasts

A proposed average annual growth rate was estimated based on a comparison of the AADT average annual growth rates (for 1996 and 2013) and the South Carolina Statewide Model (SCSWM) average annual growth rates for each of the segments. This proposed growth rate would be applied to all mainline, ramp and arterial turning movement volumes within the study area to generate the design year peak hour volumes for use in the alternatives analysis. In setting the growth rate, an annual percentage that is comparable to, but higher than the observed growth rates is often desirable so a conservative analysis of future traffic conditions may be attained.

Many of the segments in the study area had estimated growth rates exceeding 1.0 percent per year. Several of the rates estimated using the historic data exceeded 1.25 percent per year. Only the growth rate for the southernmost segment (between Exits 80 and 83) exceeded 1.5 percent per year based on the historic AADT, while the SCSWM projected rate for this segment was approximately 1.0 percent per year. Based on these estimates, an average annual growth rate of 1.5 percent per year was selected to be applied to develop the design year volumes throughout the study area. An annual growth rate of 1.5 percent per year would provide a conservative estimate of future traffic volumes on all freeway segments in the study area. The 1.5 percent year growth rate was applied to the freeway,

ramp, and intersection traffic to develop projections of the 2040 No-Build and 2040 Build Conditions traffic volumes.

3.3 Traffic Analysis

A series of capacity analyses were performed based on the methodologies and guidelines contained in the Transportation Research Board’s publication *HCM 2010 Highway Capacity Manual* (HCM). Various software analysis and simulation packages based on the HCM were used in performing the analyses.

These included:

- a. McTrans’ *HCS 2010* (Version 6.3)
 - Freeway Segments
 - Ramp Merge/Diverge Areas
 - Weaving Segments
- b. Trafficware’s *Synchro* (Version 8.0.806.61)
 - Unsignalized Intersections
 - Signalized Intersections
- c. PTV’s *VISSIM* (Version 7.00-05)
 - Network Simulation
 - Freeway Segments
 - Ramp Merge/Diverge Areas

The analysis methodologies contained in the HCM for the various facility types and users describe the operational conditions in terms of a Level of Service (LOS). The HCM defines LOS as “...a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience. Six LOS are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions and the driver’s perception of those conditions. Safety is not included in the measures that establish service levels.”

The following discussions and tables describe the HCM LOS criteria for the freeway segments, ramp merge/diverge segments, weaving segments, unsignalized intersections and signalized intersections.

The HCM characterizes the capacity of a basic freeway segment “...by three performance measures: density in passenger cars per mile per lane (pc/mi/ln), space mean speed in miles per hour (mi/h), and the ratio of demand flow rate to capacity (v/c). Each of these measures is an indication of how well traffic is being accommodated by the basic freeway segment.” **Table 4** shows the HCM LOS criteria for basic freeway segments. **LOS F** occurs when either the segment density exceeds 45 pc/mi/ln or when the segment v/c ratio exceeds 1.0 (regardless of the segment density).

LOS	Density (pc/mi/ln)
A	<11
B	>11-18
C	>18-26
D	>26-35
E	>35-45
F	>45 v/c>1.0

Source: Table 10 – Interstate 85 Widening Traffic Analysis Report

Weaving segments occur where two or more streams of traffic traveling in the same direction are able to cross each other without traffic control devices. This typically occurs where a merge segment is followed by a diverge segment within less than 2,800 feet. The LOS of a weaving segment is also related to the density of the segment. Regardless of the density, the weaving segment is considered to operate at **LOS F** when the v/c exceeds 1.0. **Table 5** shows the HCM LOS criteria for Freeway Weaving Segments.

LOS	Density (pc/mi/ln)
A	<10
B	>10-20
C	>20-28
D	>28-35
E	>35
F	v/c>1.0

Source: Table 11 – Interstate 85 Widening Traffic Analysis Report

Ramp-freeway junctions occur when merging maneuvers occur (on-ramps) or when diverging maneuvers occur (off-ramps). The operation of these merge and diverge areas

are affected by a number of factors, including the operation of the adjacent freeway segment and the proximity and flow on adjacent ramps. Typically, the influence area of the ramps is 1,500 feet from a diverge point and a merge point. As with freeway segments and weaving segments, the LOS of a merge or diverge area is related to the density of the segment. Regardless of the density, the merge or diverge areas are considered to operate at **LOS F** when the freeway demand exceeds the capacity of the freeway segment (at diverge areas and merge areas), as well as when the ramp demand exceeds the ramp capacity. **Table 6** shows the HCM LOS criteria for Ramp Merge and Diverge areas.

Table 6: Ramp Merge and Diverge Areas LOS Criteria	
LOS	Density (pc/mi/ln)
A	<10
B	>10-20
C	>20-28
D	>28-35
E	>35
F	v/c>1.0

Source: Table 12 – Interstate 85 Widening Traffic Analysis Report

The LOS for unsignalized intersections is based on the average control delay per vehicle. Since major street traffic is seldom controlled by stops signs (except at intersections with all-way stop control or in special circumstances), major street traffic generally will experience virtually no delay. Most of the delay will be encountered by traffic on approaches controlled by stop signs.

Under certain conditions, delay will also be encountered by left turning traffic on the major street waiting for appropriate sized gaps in the opposing traffic flow to complete their turn. Therefore, the delay experienced by stop controlled movements and major street left turns, rather than the entire average intersection delay, are used to identify the critical LOS at these intersections. **Table 7** shows the HCM LOS criteria for unsignalized intersections.

Table 7: Unsignalized Intersection LOS Criteria	
LOS	Delay (sec/veh)
A	<10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

Source: Table 13 – *Interstate 85 Widening Traffic Analysis Report*

The LOS for signalized intersections is based on the average control delay per vehicle. LOS can be identified for the entire intersection, individual intersection approaches, and each movement/lane-group. **Table 8** shows the HCM LOS criteria for signalized intersections.

Table 8: Signalized Intersection LOS Criteria	
LOS	Delay (sec/veh)
A	<10
B	>10-20
C	>20-35
D	>35-55
E	>55-80
F	>80

Source: Table 14 – *Interstate 85 Widening Traffic Analysis Report*

4.0 Traffic Volumes

This section presents the traffic volumes utilized in preparing the IMR for Exit 83. The traffic volumes were first prepared for Existing (2014) conditions, and then for Future (2040) No-Build and Build conditions.

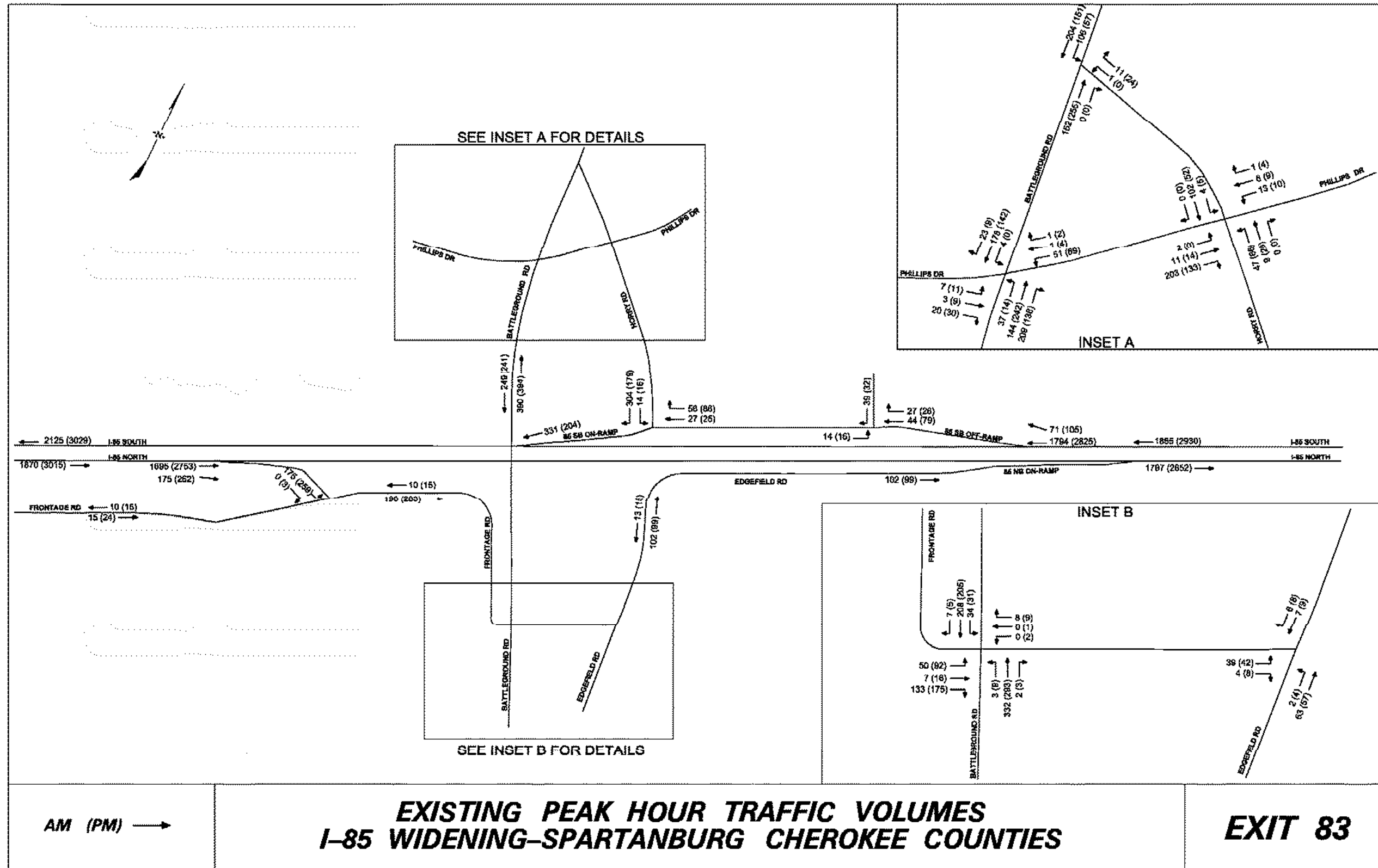
4.1 Existing 2014 Traffic Volumes

Turning movement traffic count data was obtained from SCDOT for a number of ramp termini and other adjacent intersections within the Exit 83 interchange area. Additional

traffic counts were performed to supplement the counts provided by SCDOT. The turning movement count data, which is provided in **Appendix A**, included:

- SCDOT provided counts at:
 - Battleground Road (S-42-110) at Dewberry Road (S-42-2005)/Phillips Drive
 - I-85 Southbound On-Ramp at Truck Stop Road and Horry Road (S-42-21)
 - I-85 Northbound Off-Ramp at Bud Arthur Bridge Road (S-42-737/1013)
- Additional counts performed at:
 - I-85 Southbound Off-Ramp at Truck Stop Road/Truck Plaza Drive
 - Phillips Drive and Horry Road (S-42-21)
 - Battleground Road (S-42-110) at Horry Road (S-42-21)
 - Battleground Road (S-42-110) at Bud Arthur Bridge Road (S-42-1013/1015)
 - Bud Arthur Bridge Road (S-42-1015) at Edgefield Road (S-42-22)
 - I-85 Northbound On-Ramp at Edgefield Road (S-42-1015)/Livestock Nutrition Driveway

The turning movement traffic count data obtained from SCDOT and from the additional counts were evaluated and reviewed. The morning and afternoon peak hour volumes at each of the ramp termini and the adjacent intersections at each interchange were identified and the traffic balanced between intersections. The balanced morning and afternoon peak hour volumes for the Exit 83 interchange are shown in **Figure 14**.

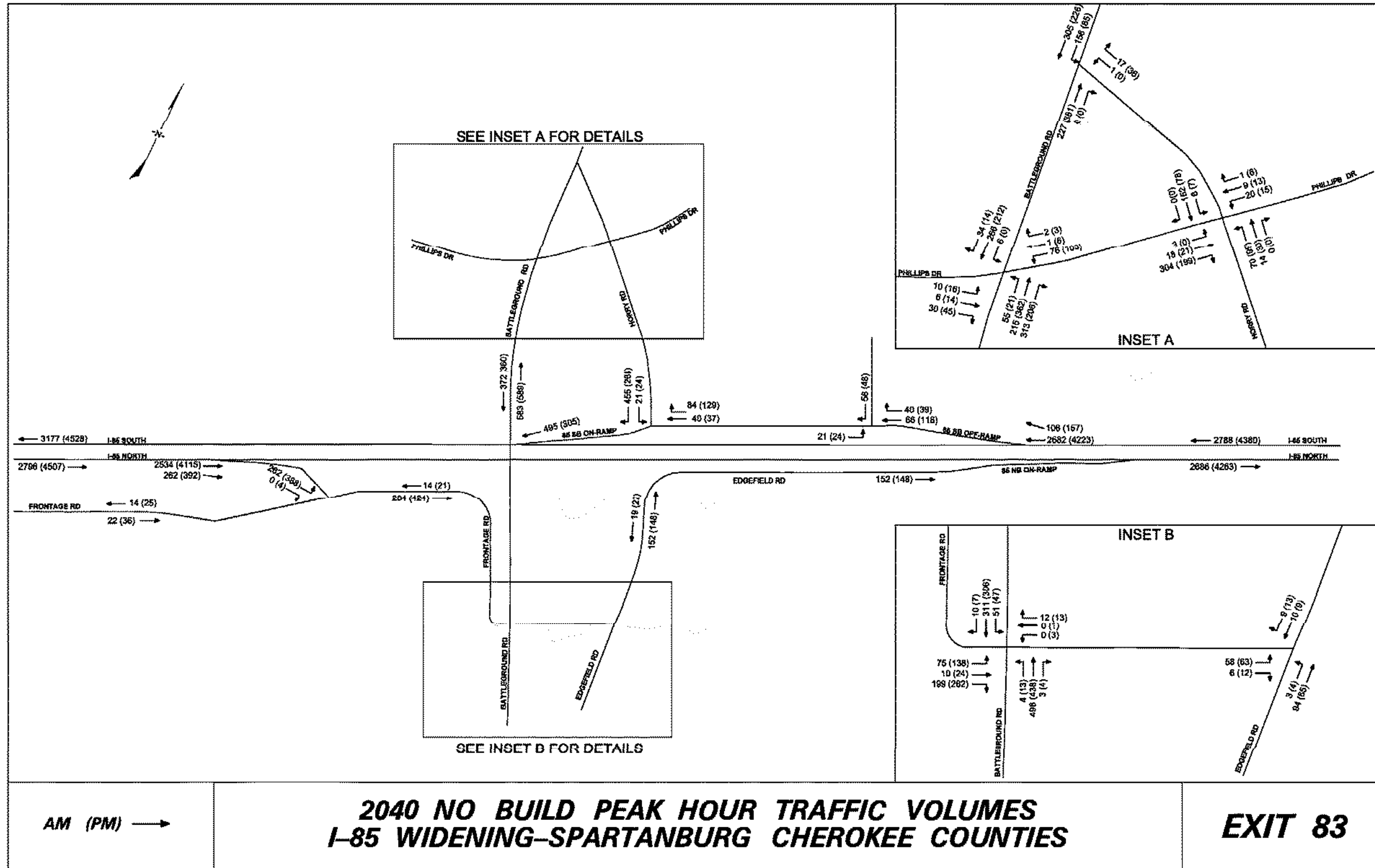


Source: Interstate 85 Widening Traffic Analysis Report
 Figure 14. I-85 Exit 83 – Battleground Road (SC 110) Existing Peak Hour Traffic Volumes

4.2 2040 Traffic Volumes

An annual growth rate of 1.5 percent was applied to the freeway, ramp traffic, and intersection turning movement volumes to develop projections of the 2040 No-Build Design Hour Traffic Volumes. The 2040 estimated peak hour turning movement volumes on the existing (no-build) network at the Exit 83 interchange are shown in **Figure 15**.

2040 Build turning movement volumes were derived from the 2040 No Build network based on ramp locations, re-aligned and relocated intersections. Ramp volumes remained the same, while turning movements were estimated based on the redirection of traffic from the existing roadway configuration to that developed for each of the alternatives. The 2040 estimated peak hour turning movement volumes on the preferred Alternative 4 network at the Exit 83 interchange are shown in **Figure 16**.



Source: Interstate 85 Widening Traffic Analysis Report

Figure 15. I-85 Exit 83 – Battleground Road (SC 110) 2040 No-Build Peak Hour Traffic Volumes

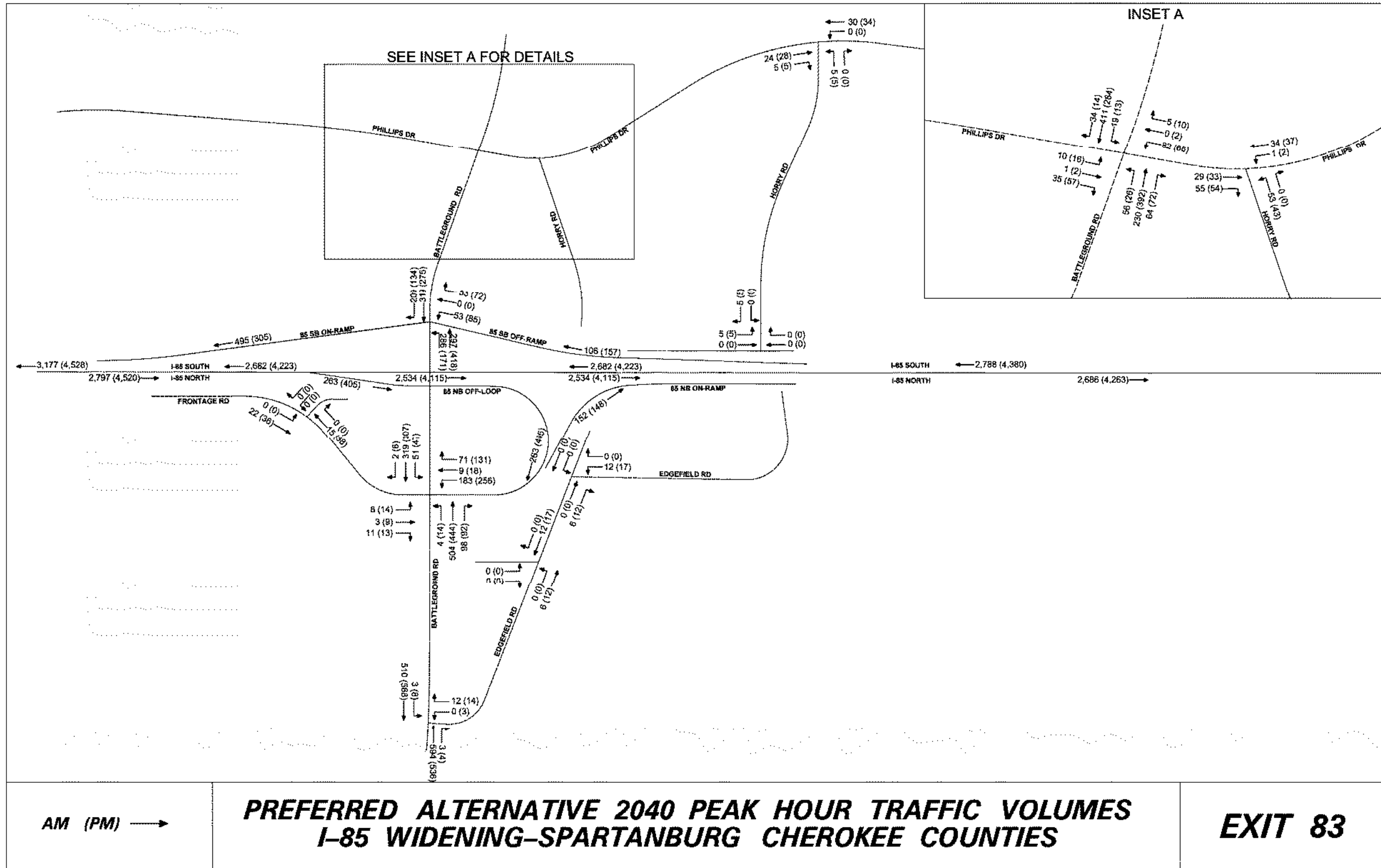


Figure 16. I-85 Exit 83 – Battleground Road (SC 110) 2040 Preferred Alternative Peak Hour Traffic Volumes

5.0 Traffic Operations

5.1 Freeway and Ramp Merge/Diverge Segment Analysis

The analysis of basic freeway segments within the study area were performed for Existing (2014) conditions and for Future (2040) No-Build and Build conditions. The following criteria were identified through discussions with SCDOT and used for various inputs within the freeway segment analysis:

- The 30th highest hour volumes based on the P-132 ATR count station data, balanced through the system, were used for the freeway segment mainline volumes.
- To develop future (2040) traffic volumes, a 1.5 percent annual growth rate was applied to existing volumes in the study area.
- A peak hour factor of 0.90 was used for freeway segments and ramp areas.
- The proportion of trucks and buses traveling on the freeway segments and ramp movements, based on SCDOT data, is 25 percent.
- Based on the grades through the study area, the terrain was set as “Rolling”, instead of “Level” or “Mountainous”.
- Free-flow speed was set at the posted speed limit along the segment.

The existing condition and 2040 No-Build condition analyses were performed using the existing number of freeway lanes present on the segments within the study area. The 2040 Build condition analysis was performed assuming I-85 would provide three lanes in each direction on all segments within the study area. The Basic Freeway Segment Analysis outputs are provided in **Appendix B** and a summary of results is shown in **Table 9**.

The analysis results for the freeway segments for the 2014 Existing Conditions, summarized in **Table 9**, indicate the following:

- During the morning peak hour, all freeway segments operate at LOS C
- During the afternoon peak hour, all freeway segments operate at a LOS E.

With traffic volumes projected to increase within the corridor at an annual rate of 1.5 percent per year, and if I-85 is not widened, the increased traffic volumes traveling on the existing interstate capacity will result in increased density and reductions of freeway segment LOS.

- During the 2040 No-Build morning peak hour:
 - The northbound freeway segments north of Exit 83 will operate at LOS D
 - The northbound freeway segments south of Exit 83 will operate at LOS E
 - The southbound freeway segments north of Exit 83 will operate at LOS E
 - The southbound freeway segments south of Exit 83 will operate at **LOS F**.

- During the 2040 No-Build afternoon peak hour:
 - All freeway segments in both directions of Exits 83 are expected to operate at **LOS F**.

The additional capacity provided by the construction of a third lane in each direction along I-85 will result in a substantial improvement in LOS compared to the 2040 No-Build condition, with LOS results comparable to those experienced under existing conditions. The 2040 Build analysis results indicate that:

- During the 2040 Build Conditions morning peak hour, the freeway segments adjacent to Exit 83 operate at LOS C
- During the 2040 Build Conditions afternoon peak hour, the freeway segments adjacent to Exit 83 operate at LOS E.

The Ramp Merge Analyses outputs are provided in **Appendix B** and the summary results are shown in **Table 10**.

The analysis results for the ramp merge areas, summarized in **Table 10**, indicate the following:

Using the design hour volumes for the morning and afternoon peak hours, the analysis results for the 2014 Existing Conditions indicate that:

- During the morning peak hour, the Exit 83 merge areas at the northbound and southbound ramps operate at LOS C.
- During the afternoon peak hour, the Exit 83 merge areas at the northbound and southbound ramps operate at LOS E.

With traffic volumes projected to increase within the corridor for 2040 No-Build Conditions at an annual rate of 1.5 percent per year, and if I-85 is not widened, the increased traffic volumes traveling on the existing interstate capacity will result in increased density and will reduce of merge area LOS.

- During the 2040 No-Build morning peak hour:
 - The northbound ramp merge at Exit 83 will operate at LOS D
 - The southbound ramp merge at Exit 83 will operate at **LOS F**.
- During the 2040 No-Build afternoon peak hour, the northbound and southbound ramp merge areas at Exit 83 will operate at **LOS F**.

The additional capacity provided by the construction of a third lane in each direction along I-85 will lower densities in the ramp merge areas, resulting in substantial improvement in

LOS compared to the 2040 No-Build condition, with LOS results comparable to those experienced under existing conditions. The 2040 Build analysis results indicate that:

- During the 2040 Build morning peak hour:
 - The northbound ramp merge at Exit 83 will operate at LOS B
 - The southbound ramp merge at Exit 83 will operate at LOS C.
- During the 2040 Build afternoon peak hour, the northbound and southbound ramp merge areas at Exit 83 will operate at LOS D.

The Ramp Diverge Analyses are also provided in **Appendix B** and the summary results are shown in **Table 11**.

The analysis results for the ramp merge areas, summarized in **Table 11**, indicate the following:

Using the design hour volumes for the morning and afternoon peak hours, the analysis results for 2014 Existing Conditions indicate that:

- During the morning peak hour, Exit 83 ramp diverge areas at the northbound and southbound off-ramps operate at LOS C
- During the afternoon peak hour, Exit 83 ramp diverge areas at the northbound and southbound off-ramps operate at LOS E

With traffic volumes projected to increase for 2040 No-Build conditions within the corridor at an annual rate of 1.5 percent per year, and if I-85 is not widened, the increased traffic volumes traveling on the existing interstate capacity will result in increased density and will reduce the diverge area LOS at the off-ramps.

- During the 2040 No-Build morning peak hour, both Exit 83 off-ramp diverge areas will operate at LOS E
- During the 2040 No-Build afternoon peak hour, both Exit 83 off-ramp diverge areas will operate at **LOS F**.

The additional capacity provided by the construction of a third lane in each direction along I-85 will lower densities in the ramp diverge areas, resulting in substantial improvement in LOS compared to the 2040 No-Build condition, with LOS results comparable to those experienced under existing conditions. The 2040 Build analysis results indicate that:

- During the 2040 Build morning peak hour, both Exit 83 off-ramp diverge areas will operate at LOS C
- During the 2040 Build afternoon peak hour:
 - The northbound off-ramp diverge areas at Exit 83 will operate at LOS E
 - The southbound off-ramp diverge areas at Exit 83 will operate at LOS D.

Table 9: Basic Freeway Segment Analysis Results

Direction & Segment	AM Peak Hour						PM Peak Hour					
	2014 Existing		2040 No-Build		2040 Build		2014 Existing		2040 No-Build		2040 Build	
	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density
NB Exit 80-83	-	-	-	-	C ¹	22.3	-	-	-	-	E ¹	43.1
NB Exit 82-83	C	22.0	E	37.3			E	43.1	F	592.1		
NB Exit 83-87	C	21.1	D	34.8	C	21.0	E	38.6	F	201.6	E	38.4
SB Exit 87-83	C	21.9	E	37.1	C	21.8	E	40.7	F	296.1	E	40.4
SB Exit 83-80	C	25.2	F	48.5	C	25.2	E	43.5	F	708.2	E	43.2

¹ - Exit 82 northbound off-ramp removed in 2040 Build Condition; segment runs between Exits 80 and 83

Source: Table 15 – Interstate 85 Widening Traffic Analysis Report

Table 10: Freeway Merge Analysis Results

Direction & Segment	AM Peak Hour						PM Peak Hour					
	2014 Existing		2040 No-Build		2040 Build		2014 Existing		2040 No-Build		2040 Build	
	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density
NB Exit 83	C	22.0	D	34.6	B	17.0	E	36.7	F	53.4	D	28.5
SB Exit 83	C	26.8	F	38.8	C	23.4	E	37.9	F	55.5	D	32.7

Source: Table 17 – Interstate 85 Widening Traffic Analysis Report

Table 11: Freeway Diverge Analysis Results

Direction & Segment	AM Peak Hour						PM Peak Hour					
	2014 Existing		2040 No-Build		2040 Build		2014 Existing		2040 No-Build		2040 Build	
	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density
NB Exit 83	C	26.1	E	38.3	C	25.3	E	41.2	F	60.8	E	37.6
SB Exit 83	C	24.7	E	36.8	C	21.4	E	38.7	F	57.8	D	31.6

Source: Table 18 – Interstate 85 Widening Traffic Analysis Report

5.2 Existing and 2040 No Build Intersection Analysis

Capacity analyses for the signalized and unsignalized intersections at the interchanges within the study area were performed. Analyses were performed for existing conditions (existing traffic, intersection traffic control and geometry) and the 2040 No-Build conditions (2040 traffic, and existing intersection traffic control and geometry)

For unsignalized intersections, the intersection operation is represented by the worst approach delay and LOS of all the stop sign controlled approaches to the intersection. For signalized intersections, the intersection operation is represented by the intersection delay and LOS.

The results of the unsignalized intersection capacity analyses for 2014 existing conditions and the 2040 No-Build conditions for Exit 83 – Battleground Road (SC 110) interchange are shown in **Table 12**. The HCM intersection capacity outputs for each intersection are provided in **Appendix C**.

Under the 2014 Existing Conditions at Exit 83, the signalized intersection of Battleground Road with Frontage Road operates at LOS A during both peak hours. The yield and/or the stop sign controlled approaches at the remaining unsignalized intersections operate at LOS C or better during the morning and afternoon peak hours. No improvements are necessary to provide acceptable LOS under existing conditions.

In general, with the forecast increases in traffic and without improvements to the intersections, delay in the 2040 No-Build analyses can be expected to higher than delay during the Existing Conditions analyses. In some cases, the increases in delay may still result in acceptable LOS being obtained. In other cases, the increases in delay may result in LOS E or **LOS F** conditions. When these results occur, it may be necessary to provide additional capacity (such as constructing separate left and/or right turn lanes) and/or changes in the traffic control to reduce delay and improve the LOS.

Under the 2040 No-Build conditions, the signalized intersection of Battleground Road with Frontage Road is projected to operate at LOS B during both peak hours. The yield and/or the stop sign controlled approaches at the remaining unsignalized intersections are anticipated to operate at LOS D or better during the morning and afternoon peak hours, with the exception of the westbound approach of Phillips Drive at Battleground Road, which is projected to operate at **LOS F** during the afternoon peak hour.

Table 12: Exit 83 – Battleground Road (SC 110) Intersection Capacity Analysis

Intersection Name		2014 Existing Conditions				2040 No-Build Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
8301	Battleground Road (SC 110) at Horry Road (S-42-9725)*	A	9.9	A	10.0	B	10.8	B	11.2
8302	Battleground Road (SC 110) at Phillips Drive*	C	16.7	C	19.9	D	31.7	F	68.1
8303	Phillips Drive at Horry Road*	B	12.2	B	11.6	C	16.8	B	14.5
8304	Truck Stop Road/Horry Road at I-85 SB on ramp*	B	12.1	A	8.1	E	38.3	A	9.8
8305	Truck Stop Road at I-85 SB off-ramp*	A	9.5	A	9.1	A	9.8	A	9.5
8306	Frontage Road N at I-85 NB off-ramp*	B	13.8	C	18.0	C	18.8	D	33.0
8307	Battleground Road (SC 110) at Frontage Road N (S-42-737)	A	8.1	A	9.7	B	11.5	B	15.1
8308	Frontage Road N at Edgefield Road*	A	9.5	A	9.2	A	10.0	A	9.5
8309	Edgefield Road at I-85 NB on-ramp*	A	9.1	A	9.1	A	9.5	A	9.5

* Unsignalized intersection; worst approach LOS and delay reported.

Source: Table 19 – Interstate 85 Widening Traffic Analysis Report

The intersection of Phillips Drive and Battleground Road would require capacity or traffic control improvements, such as the installation of a traffic signal, to provide acceptable LOS during the 2040 No-Build operating conditions if no interchange improvement is made at Exit 83 as part of this project.

The analysis results for the existing and 2040 No-Build conditions at Exit 83 for the Battleground Road (SC 110) interchange intersections are illustrated in **Figure 17**.

5.3 2040 Build Intersection Analysis – Preferred Alternative 4

The Exit 83 – Battleground Road (SC 110) interchange is expected to be modified as part of the I-85 widening project. 2040 Build analyses for the intersections within the Exit 83 interchange area were performed for four alternatives. Alternative 4, which replaces the existing Exit 83 interchange with a partial cloverleaf, including a northbound loop off-ramp located in the southeast quadrant of the interchange, was selected as the preferred alternative.

Other elements of the alternative concept include:

- Eliminating the intersections of
 - Battleground Road and Horry Road
 - Truck Stop Road and the southbound off-ramp
 - Truck Stop Road and Horry Road/southbound on-ramp
 - Frontage Road and the northbound off-ramp
 - Edgefield Road and the northbound on-ramp
- Relocating and adjusting the alignment of the approaches at the intersection of Battleground Road with Dewberry Road/Phillips Drive to the north to increase the spacing between that intersection and the southbound ramp intersection
- Relocating and adjusting the alignment of the approaches at the intersection of Phillips Drive and Horry Road
- Placing a cul de sac on the south end of Horry Road
- Creating a new connection between Phillips Drive and Truck Stop Road to provide alternative access to the businesses fronting Truck Stop Road
- Relocating and separating the Frontage Road intersection so that the west approach of Frontage Road would connect opposite the northbound loop off-ramp while the east approach of Frontage Road would be offset to the south by approximately 1,250 feet to create a separate T-intersection.



Source: Figure 94 Interstate 85 Widening Traffic Analysis Report

Figure 17. Exit 83 – Battleground Road (SC 110) Interchange Intersection LOS Summary

Capacity analyses for the signalized and unsignalized intersections of the Preferred Alternative were performed for the 2040 Final Build conditions which included the 2040 traffic volumes and modified intersection traffic control and geometry to the interchange at Exit 83. The traffic operations analysis of the preferred Alternative 4 identified areas where traffic control improvements were projected to be needed to provide acceptable operating LOS. The results of the unsignalized and signalized intersection capacity analyses for the 2040 Build Preferred Alternative 4 (without additional improvements) are shown in **Table 13**. Table 14 also summarizes the storage length and queuing for 2040 Build Conditions. The conceptual design of Alternative 4 for the Battleground Road (SC 110) interchange intersections and the results of the capacity analyses are illustrated in **Figure 18**.

Under Alternative 4, the signalized intersection of Battleground Road with Edgefield Road operates at LOS A during both peak hours. With the creation of the ramps, this signal may no longer be needed since the northbound off-ramp traffic currently using the Frontage Road to reach Battleground Road is diverted away from this intersection to the new northbound ramp intersection, reducing the minor street volumes. The stop sign controlled approach at this intersection is predicted to operate at LOS B during the morning and afternoon peak hours.

The remaining stop sign controlled approaches at the other unsignalized intersections operate at LOS C or better during the morning and afternoon peak hours, with the exception of the westbound approach of Phillips Road at Battleground Drive, which operates at LOS E during the morning peak hour and LOS D during the afternoon peak hour, and the new southbound off-ramp intersection with Battleground Road, which operates at **LOS F** during the both peak hours.

With the new southbound off-ramp intersection operating at **LOS F** during both peak hours, it is likely that the intersection will be required to be signalized to attain an acceptable LOS. Based on the projected growth in traffic volumes, the signal installation is predicted to be warranted between 2035 and 2040 when the delay at this intersection would transition from LOS E to **LOS F** on the westbound approach. Under signal control, the intersection is forecast to operate at LOS B or better during the 2040 morning and afternoon peak hours.

Table 13: Exit 83 Intersection Capacity Analysis – 2040 No-Build vs 2040 Build (Preferred Alternative)

Intersection Name		2040 No-Build Conditions				2040 Build Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
8301	Battleground Road (SC 110) at Horry Road (S-42-9725)*	B	10.8	B	11.2	Intersection removed.			
8302	Battleground Road (SC 110) at Phillips Drive*	D	31.7	F	68.1	E	38.4	D	32.1
8303	Phillips Drive at Horry Road*	C	16.8	B	14.5	A	9.6	A	9.6
8304	Truck Stop Road/Horry Road at I-85 SB on ramp*	E	38.3	A	9.8	Intersections removed.			
8305	Truck Stop Road at I-85 SB off ramp*	A	9.8	A	9.5				
8306	Frontage Road N at I-85 NB off-ramp*	C	18.8	D	33.0				
8307	Battleground Road (SC 110) at Frontage Road N (S-42-737)**	B	11.5	B	15.1	Intersection combined with I-85 NB ramps.			
8308	Frontage Road N at Edgefield Road*	A	10.0	A	9.5	A	0.0	A	0.0
8309	Edgefield Road at I-85 NB on-ramp*	A	9.5	A	9.5	Intersection removed.			
8310	Battleground Road (SC 110) at I-85 SB ramps*	Intersections added under Build Conditions.				F	68.7	F	52.8
8310	Battleground Road (SC 110) at I-85 SB ramps					B	15.3	B	10.5
8311	Battleground Road (SC 110) at I-85 NB ramps*					C	22.4	D	28.0
8312	Phillips Drive at Unnamed Roadway*					A	8.8	A	8.9
8313	Unnamed Roadway at Unnamed Roadway*					A	7.2	A	7.2
8314	Frontage Road N at Unnamed Roadway*					A	0.0	A	0.0
8315	Battleground Road (SC 110) at Edgefield Road*					B	13.1	B	13.1
8316	Edgefield Road at Unnamed Roadway*					A	8.9	A	8.9

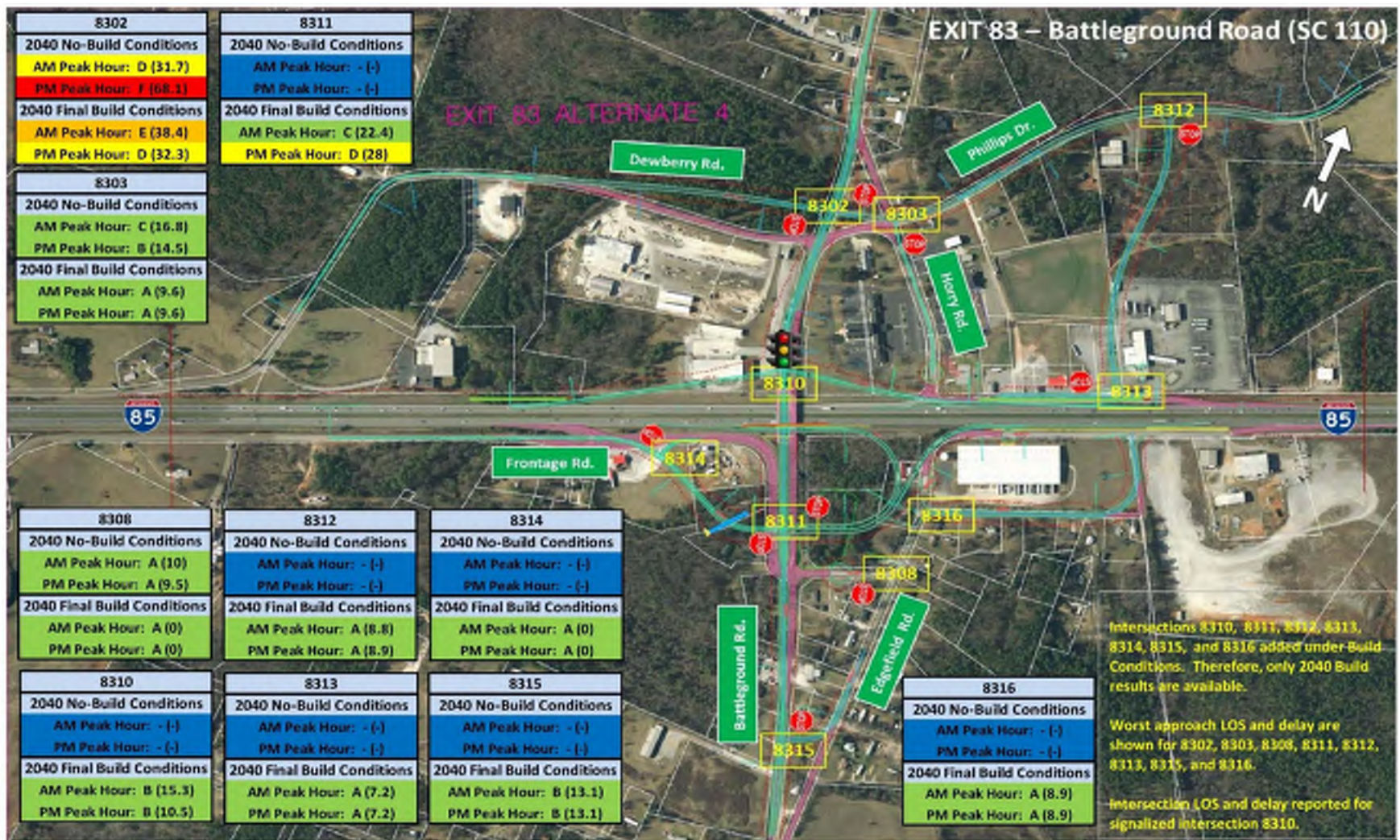
* Unsignalized intersection; worst approach LOS and delay reported.

Source: Table 20 – Interstate 85 Widening Traffic Analysis Report

Table 14: 2040 Build Intersection Queue Lengths

Intersection Name		Movement	2040 Base Conditions	2040 Build Conditions 95 th Percentile Queues (Alternative 4)		Design Storage Length (ft)
				AM Peak	PM Peak	
8302	Battleground Road (SC 110) at Phillips Drive	NBL	Storage bay Added under Build Conditions	5	0	200
		SBL		0	0	200
8310	Battleground Road (SC 110) at I-85 SB ramps	NBL	Intersections added under Build Conditions	120	50	200
		WBR		10	20	150
8311	Battleground Road (SC 110) at I-85 NB ramps*	NBL		0	0	200
		SBL		5	5	200
		WBL		80	140	200
8315	Battleground Road (SC 110) at Edgefield Road*	SBL		0	5	200

Source: Table 28 – Interstate 85 Widening Traffic Analysis Report



Source: Figure 104 Interstate 85 Widening Traffic Analysis Report
Figure 18. Exit 83 – Battleground Road (SC 110) Preferred Alternative 4

5.4 VISSIM Network Analysis

VISSIM, a microscopic behavior-based multi-purpose traffic simulation program, was used to analyze the existing, no-build, and preferred alternative freeway networks. VISSIM simulates traffic operations on freeway segments and provides traffic operational data such as vehicle delay, density, travel speeds, travel times, and queuing at ramp terminals on freeway networks. This software has the ability to evaluate each individual vehicle for every model time step in the simulation and then assigns the appropriate behavior logic according to the traffic operations that the particular vehicle encounters. The *Interstate 85 Widening Traffic Analysis Report* discusses how the microscopic simulation model was developed for the 18-mile interstate section of the project and the processes used based the Federal Highway Administration Traffic Analysis Toolbox.

There are several limitations of using HCS, which is a macroscopic, deterministic model that uses HCM methodologies. The HCS analysis may show differing conditions than existing operations and conditions in the field because it does not consider upstream and downstream traffic impacts and is unable to model interactions between the two. The HCS model is a spot check at a certain location; therefore upstream and downstream operations are not taken into consideration and have no effect on the analyses. This is not the case for actual conditions, as upstream or downstream congestion may have direct impacts at a specific segment causing a ripple effect. The VISSIM simulation model evaluated each segment by taking into consideration vehicle interaction and driver behaviors, as well as the operation impacts for both the upstream and downstream traffic conditions.

The existing condition and 2040 No-Build condition VISSIM analysis was performed using the existing number of freeway lanes present on the segments within the study area, similar to the HCS analysis. The only difference between the existing conditions and No-Build networks is the input volumes. The 2040 no-build condition volumes were developed using the 1.5 percent annual growth rate in traffic.

The Preferred Alternative 4 morning and afternoon VISSIM models for the 18-mile study area of I-85 were developed by modifying the 2040 No-Build models to incorporate the widening of I-85 from two to three lanes in each direction as well as the preferred alternatives for each interchange. Synchro was used to input the recommended signal timing information into the network for the arterial intersections. Each simulation was run for one hour with 20 minutes of seeding time to load the network. 10 repetitions were used for both the AM and PM peak periods.

The Basic Freeway Segment Analysis outputs for the existing conditions, 2040 No-Build conditions, and the Preferred Alternative 4 conditions are provided in **Appendix D** and a summary of results are shown in **Table 15**.

With the widening of I-85 to accommodate the projected increase in traffic volume within the corridor, the increased traffic volumes traveling on the widened interstate capacity will result in the segment densities adjacent to Exit 83 in the 2040 Build condition being comparable to those in existing conditions.

The analysis results for the freeway segment analysis for the 2014 Existing Conditions, summarized in **Table 15**, indicate the following:

- During the morning peak hour, all freeway segments operate at LOS C or better
- During the afternoon peak hour, all freeway segments operate at a LOS D.

With traffic volumes projected to increase within the corridor at an annual rate of 1.5 percent per year, and if I-85 is not widened, the increased traffic volumes traveling on the existing interstate capacity during the 2040 No-Build conditions will result in increased density and reductions of freeway segment LOS.

- During the 2040 No-Build morning peak hour:
 - All freeway segments in both directions of Exits 83 are expected to operate at LOS D or better.
- During the 2040 No-Build afternoon peak hour:
 - The northbound freeway segments north of Exit 83 will operate at LOS E
 - The northbound freeway segments south of Exit 83 will operate at **LOS F**
 - The southbound freeway segments of Exit 83 will operate at LOS E

The additional capacity provided by the construction of a third lane in each direction along I-85 will result in substantial improvement in LOS compared to the 2040 No-Build condition, with LOS results comparable to those experienced under existing conditions.

The 2040 Build analysis results indicate that:

- During the 2040 Build Conditions morning peak hour, the freeway segments adjacent to Exit 83 operate at LOS C or better
- During the 2040 Build Conditions afternoon peak hour, all freeway segments adjacent to Exit 83 operate at LOS D.

The summary of the Ramp Merge Analyses results for the Build condition, compared to the Existing and No-Build conditions are shown in **Table 16**. The outputs for the Final Build condition analyses are provided in **Appendix D**.

With the widening of I-85 to accommodate the projected increase in traffic volume within the corridor, the increased traffic volumes in the Exit 83 merge areas in the 2040 Build condition will have densities comparable to those in existing conditions.

The analysis results for the ramp merge areas, summarized in **Table 16**, indicate the following:

Using the design hour volumes for the morning and afternoon peak hours, the analysis results for the 2014 Existing Conditions indicate that:

- During the morning peak hour, the Exit 83 northbound and southbound ramp merge areas operate at LOS C or better.
- During the afternoon peak hour, the Exit 83 northbound and southbound ramp merge areas operate at LOS D.

With traffic volumes projected to increase within the corridor for 2040 No-Build Conditions at an annual rate of 1.5 percent per year, and if I-85 is not widened, the increased traffic volumes traveling on the existing interstate capacity will result in increased density and will reduce of merge area LOS.

- During the 2040 No-Build morning peak hour, the Exit 83 northbound and southbound ramp merge areas will operate at LOS D.
- During the 2040 No-Build afternoon peak hour,
 - The northbound ramp merge areas at Exit 83 will operate at LOS E
 - The southbound ramp merge areas at Exit 83 will operate at **LOS F**.

The additional capacity provided by the construction of a third lane in each direction along I-85 will lower densities in the ramp merge areas, resulting in substantial improvement in LOS compared to the 2040 No-Build condition, with LOS results comparable to those experienced under existing conditions. The 2040 Build analysis results indicate that:

- During the 2040 Build morning peak hour, the northbound and southbound ramp merge areas at Exit 83 will operate at LOS C or better
- During the 2040 Build afternoon peak hour, the northbound and southbound ramp merge areas at Exit 83 will operate at LOS D.

The summary of the Ramp Diverge Analyses results for the Build condition, compared to the Existing and No-Build conditions are shown in **Table 17**. The outputs for the Final Build condition analyses are provided in **Appendix D**.

With the widening of I-85 to accommodate the projected increase in traffic volume within the corridor, the increased traffic volumes in the Exit 83 diverge areas in the 2040 Build condition will have densities comparable to those in existing conditions.

The analysis results for the ramp diverge areas, summarized in **Table 17**, indicate the following:

Using the design hour volumes for the morning and afternoon peak hours, the analysis results for 2014 Existing Conditions indicate that:

- During the morning peak hour, Exit 83 ramp diverge areas at the northbound and southbound off-ramps operate at LOS C or better
- During the afternoon peak hour, Exit 83 ramp diverge areas at the northbound and southbound off-ramps operate at LOS D.

With traffic volumes projected to increase for 2040 No-Build conditions within the corridor at an annual rate of 1.5 percent per year, and if I-85 is not widened, the increased traffic volumes traveling on the existing interstate capacity will result in increased density and will reduce the diverge area LOS at the off-ramps.

- During the 2040 No-Build morning peak hour, both Exit 83 off-ramp diverge areas will operate at LOS D
- During the 2040 No-Build afternoon peak hour, both Exit 83 off-ramp diverge areas will operate at LOS E.

The additional capacity provided by the construction of a third lane in each direction along I-85 in the 2040 Build Preferred Alternative will lower densities in the ramp diverge areas, resulting in substantial improvement in LOS compared to the 2040 No-Build condition, with LOS results comparable to those experienced under existing conditions. The 2040 Build analysis results indicate that:

- During the 2040 Build morning peak hour, both Exit 83 off-ramp diverge areas will operate at LOS C or better
- During the 2040 Build afternoon peak hour, both Exit 83 off-ramp diverge areas will operate at LOS D

Table 15: Basic Freeway Segment Analysis VISSIM Results

Direction & Segment	AM Peak Hour						PM Peak Hour					
	2014 Existing		2040 No-Build		2040 Build		2014 Existing		2040 No-Build		2040 Build	
	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density
NB Exit 80-83	-	-	-	-	C ¹	18.7	-	-	-	-	D ¹	30.9
NB Exit 82-83	C	18.8	D	29.1			D	31.5	F	46.4		
NB Exit 83-87	B	17.9	D	27.4	C	18.0	D	29.6	E	37.3	D	28.2
SB Exit 87-83	B	16.8	C	25.9	B	16.7	D	28.2	E	40.2	D	28.0
SB Exit 83-80	C	19.2	D	29.8	C	18.8	D	29.0	E	41.5	D	28.5

¹ - Exit 82 northbound off-ramp removed in 2040 Build Condition; segment runs between Exits 80 and 83

Source: Table 29 – Interstate 85 Widening Traffic Analysis Report

Table 16: Freeway Merge Analysis VISSIM Results

Direction & Segment	AM Peak Hour						PM Peak Hour					
	2014 Existing		2040 No-Build		2040 Build		2014 Existing		2040 No-Build		2040 Build	
	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density
NB Exit 83	B	17.4	D	26.7	B	18.5	D	28.8	E	37.2	D	27.8
SB Exit 83	C	18.6	D	33.0	C	19.4	D	29.3	F	61.3	D	28.4

Source: Table 30 – Interstate 85 Widening Traffic Analysis Report

Table 17: Freeway Diverge Analysis VISSIM Results

Direction & Segment	AM Peak Hour						PM Peak Hour					
	2014 Existing		2040 No-Build		2040 Build		2014 Existing		2040 No-Build		2040 Build	
	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density
NB Exit 83	C	18.5	D	28.9	C	19.1	D	31.0	E	45.3	D	29.8
SB Exit 83	B	16.4	D	26.5	B	17.6	D	27.1	E	41.2	D	26.5

Source: Table 31 – Interstate 85 Widening Traffic Analysis Report

6.0 Interchange Justification

A policy statement for justifying the need for additional or modified access to the existing sections of an Interstate System was first published in the Federal Register on October 22, 1990 entitled “Access to the Interstate System”. It was then modified and updated on February 11, 1998 and on August 27, 2009. The objectives of this policy are to ensure that all new or revised access points do not adversely impact the operations and safety of the Interstate System, and all new or revised access points have been vetted through a systematic evaluation process.

In order to explain the intent and requirements of this new policy, FHWA published the Interstate System Access Information Guide in August 2010. This FHWA Guide was followed in preparing the current Interchange Modification Report (IMR) for the I-85/Exit 83 Interchange in Cowpens, SC Spartanburg County, South Carolina.

6.1 Policy Point 1

The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2 (a)).

The section of I-85 analyzed in this study is a major component of the regional network. Travel demand includes commuter traffic and heavy truck traffic that originates in areas adjacent to the interstate as well as through traffic between Charlotte and Atlanta. The analyses shows that existing operating conditions during the afternoon peak hour are approaching capacity of the four lane freeway, and are projected to be over-capacity during the 2040 No-Build condition.

The existing Exit 83 interchange configuration is not in compliance with current state and federal design requirements. Ramps enter and exit directly from two-way frontage roads, increasing the risk of head-on collisions and wrong way movements onto exit ramps. Traffic using the northbound off-ramp is placed into a tangle of lanes at its intersection with the Frontage Road. Similarly, the traffic on the southbound off-ramp enters Truck Stop Road where immediate conflicts with two-way traffic and driveway turning movements are possible. Off-ramp lengths are short, requiring traffic to reduce their speed on the mainline prior to exiting, increasing the potential for rear-end and other types of

collisions. On-ramp lengths are too short to allow traffic to reach mainline speeds prior to merging.

The proposed changes would meet the purpose and need for the project by bringing the interchange into compliance with current state and federal design requirements and to accommodate design year traffic. The safety at the interchange will be improved by providing on- and off-ramps that separate the interstate traffic from local traffic on the adjacent frontage roads. The on-ramps and their acceleration lanes will be long enough to allow traffic to reach freeway speed prior to merging onto the interstate. The off-ramps and their deceleration lanes will be long enough to allow traffic to exit at mainline speed and safely decelerate prior to the ramp terminus as well as provide sufficient vehicle storage during peak hours to keep traffic from backing up into I-85.

On the north side of I-85, the intersection of Phillips Drive and Dewberry Road would be shifted northward to provide sufficient separation between it and the southbound off-ramp intersection to comply with guidelines in the SCDOT *Access and Roadside Management Standards Manual*. To the south of I-85, Frontage Road will be realigned to eliminate the two sharp right angle turns and to intersect opposite the northbound loop off-ramp. The distance between the new northbound loop off-ramp intersection and the next adjacent intersection to the south will be increased by severing the Bud Arthur Road connection between Battleground Road and Edgefield Road, and relocating the access to Edgefield Road further to the south. Additionally, improvements will be made to Dewberry Road, Phillips Drive and a new connection to Truck Stop Road to maintain access to properties in the northeast quadrant of the interchange.

6.2 Policy Point 2

The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).

The intent of Policy Point 2 is to demonstrate that a new access point would be needed in cases where transportation system management or alternative improvements to the existing interstate system would be inadequate.

Transportation System Management (TSM) can include improvements such as carpooling, ramp metering, reversible lanes, mass transit and high-occupancy vehicle (HOV) lanes to maximize the capacity and efficiency of the existing roadway network.

Typically, the TSM alternatives would be implemented to reduce or eliminate the need for new facility construction. However, the TSM alternative would not satisfy the project's Purpose and Need since it would not increase capacity, upgrade an obsolete interchange to meet current design requirements, and expand vertical clearances at overpass bridges. The provision of HOV facilities would still require widening mainline I-85 and constructing the proposed modifications to the existing interchange. Mass transit services in the I-85 corridor do not exist to the extent that transit could provide a reasonable alternative to relieve congestion in either the near term or for design year travel demand. Therefore, TSM strategies would not be effective in relieving delay and congestion, or addressing the Purpose and Need of the project.

Multiple alternatives were analyzed at Exit 83 as outlined in the *Interstate 85 Widening Traffic Report*. The preferred build alternative (Alternative 4) represents the most feasible option for meeting the purpose and need of the project. The Preferred Build Alternative was selected after considering multiple interchange designs, alternate roadway alignments and bridge locations. All alternatives received extensive review and comment at Public Information Meetings.

6.3 Policy Point 3

An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625. 2(a), 655. 603(d) and 771. 111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

The intent of the Policy Point 3 is to require detailed operational and safety analysis of the relevant interstate segments and provide a comparison of the no-build and build conditions that are anticipated to occur through the design year of the project.

The analysis of the interstate facility and Exit 83 is an extension of the previous project-wide traffic operations and safety analysis as summarized in the *I-85 Widening Traffic Analysis Report* and the *I-85 Widening Project MM 80 – MM 96 Accident Analysis Report*.

The analysis of the interstate facility includes the portion of I-85 between the Gossett Road (S-42-57) interchange (Exit 80) and the Green River Road (S-11-19) interchange (Exit 87), including the proposed modification of Battleground Road (S-11-39) interchange (Exit 83). The analysis was performed using methodologies and procedures outlined in the Transportation Research Board's *Highway Capacity Manual* and used the HCS-2010 analysis and VISSIM simulation model software.

The analysis of the 2040 Build condition of the preferred alternative (Alternative 4) illustrates that the project would not have any significant negative impact of the safety and the operation of the facilities within the project area. The analysis shows Interstate 85 mainline operations and ramp merge/diverge areas are estimated to operate at LOS C or better during the 2040 morning peak hour and LOS E or better during the 2040 afternoon peak hour. Without the proposed improvement, the freeway segments and ramp merge/diverge areas would operate between LOS D to **LOS F** during the 2040 No-Build morning peak hour, and at **LOS F** during the 2040 No-Build afternoon peak hour.

Upon completion of the I-85 widening project, the interchanges adjacent to Exit 83 will be located at Exit 80 – Gossett Road (S-57) and Exit 87 – Green River Road. Exit 80 – Gossett Road (S-57) and Exit 87 – Green River Road are expected to be modified as part of the I-85 widening project (Exit 82 – Bud's Drive, a northbound off-ramp to Bud's Drive is anticipated to be removed under Build conditions). Exit 80 – Gossett Road (S-57) is located approximately 3.5 miles south of the Exit 83 interchange. Exit 87 – Green River Road is approximately 3.7 miles north of the Exit 83 interchange. With interchange spacing exceeding 3.5 miles to the next adjacent interchange from Exit 83, there are no anticipated operational concerns related to the spacing between interchanges. Sufficient distance exists between upstream and downstream merging/diverging areas at the adjacent interchanges to eliminate the influence of traffic movements within these areas, and analysis shows the freeway segments are projected to operate at LOS D or better.

The Accident Analysis Report identified possible contributing factors to the high occurrence of rear-end collisions in the area such as the radius of the on-ramp coupled with

a short merge lane (approximately 130 feet full width merge distance) and a narrow clear zone due to the overpass for Battleground Road (SC 110). By replacing the substandard ramps and modifying the existing interchange to meet current design standards, the proposed new interchange with Battleground Road (SC 110) is anticipated to contribute to an improvement in traffic safety.

The preferred alternative of the interchange design also provides space for the future construction of an additional travel lane in each direction along I-85. Altogether, these design provisions would enhance the operational efficiency and safety of the corridor, thereby increasing capacity and improving levels of service in the long term. However, pedestrian facilities are not incorporated into the design due to the rural nature of the interchange area.

6.4 Policy Point 4

The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a) (2), and 655.603 (d)).

The intent of the Policy Point 4 is to require implementation of an interchange design for the new access that allows for all relevant movements for general purpose traffic, whenever feasible.

The existing Battleground Road interchange is an unconventionally oriented diamond interchange that provides for all traffic movements. Because of its unconventional orientation, both the southbound off- and on-ramps are located on the north side of the interchange. Existing ramps are very short and tie directly into two-way frontage roads running parallel to the mainline freeway lanes.

As illustrated in the design concept for the preferred alternative, the proposed modification of Exit 83 would continue to provide full access for all traffic movements. It would shift ramp movements away from the two-way frontage roads directly to intersections with Battleground Road, and provide ramps that meet or exceed current design standards, improving access to Battleground Road (SC 110) and the surrounding roadway network.

6.5 Policy Point 5

The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.

The intent of Policy Point 5 is to ensure consistency of the access request with local and regional plans.

As part of the proposed I-85 widening between mile markers 80 and 96, the proposed project at Exit 83 is consistent with the Spartanburg Area Transportation Study (SPATS) Long Range Transportation Plan and is included in SCDOT's Statewide Transportation Improvement Program (STIP) for Spartanburg and Cherokee Counties. A source of funding for bridge, resurfacing and mainline interstate projects is available through 11 Act 98 of 2013. Act 98 provides an annual appropriation of \$50 million to SCDOT, which in turn transfers an equivalent amount to the South Carolina Transportation Infrastructure Bank (SCTIB) to be utilized to finance an estimated \$550 million of interstate improvements. This I-85 Improvement project is fully funded by approximately \$262 million of the \$550 million SCTIB funds.

6.6 Policy Point 6

In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111.

The intent of Policy Point 6 is to ensure coordinated network study and evaluation of cumulative effects for those cases when multiple new access requests are involved within the same vicinity.

This IMR study area is an extension of the broader study area that was analyzed during the *Interstate 85 Widening Traffic Analysis Report*. The I-85 Widening study evaluated the current and future traffic volumes on I-85 mainline and interchanges between mile markers 80 and 96. The northbound single exit ramp at Exit 82 is expected to be removed as part

of this project. No other known proposed or desired access changes are anticipated in the vicinity of this interchange.

6.7 Policy Point 7

When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d)).

The intent of Policy Point 7 is to ensure coordination and cooperation with relevant stakeholders when the need for interchange is primarily due to new developments.

The analysis assesses the Interstate network and evaluates the improvements required to accommodate the regional growth in traffic. The growth in freeway and local traffic results from incremental changes in land use over time, as represented by the annual growth rate applied to existing traffic to obtain 2040 traffic volumes. The revisions proposed at Exit 83 are not due to a new, expanded or change in current or future development in the vicinity of the interchange.

6.8 Policy Point 8

The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).

The intent of the Policy Point 8 is to ensure that the National Environmental Policy Act (NEPA) process is completed for environmental evaluation.

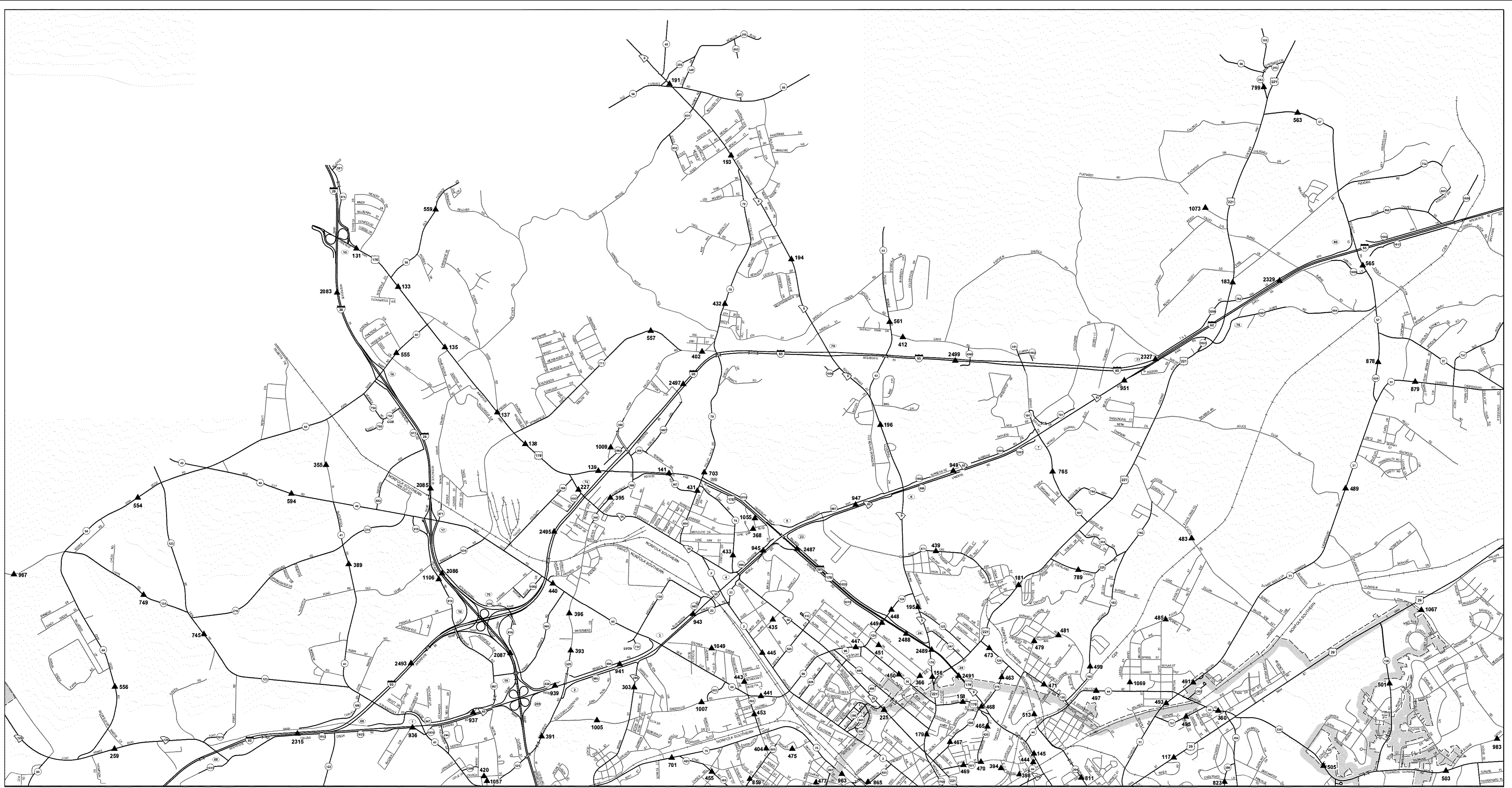
This IMR study area is an extension of the project-wide study that was summarized in the *Interstate 85 Widening Traffic Analysis Report*. That analysis considered the Interstate network, the proposed interstate widening, and proposed interchange modifications throughout the corridor and was developed concurrently with the preparation of the Environmental Assessment for the proposed improvements titled *Interstate Widening and Improvements Mile Marker 80-96*. The Environmental Assessment makes use of the same traffic data and improvement alternatives discussed in the project-wide study, including

the Preferred Alternative at Exit 83, which was included in the Environmental Assessment as Alternative 4.

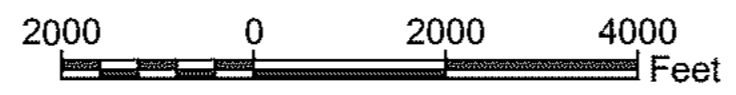
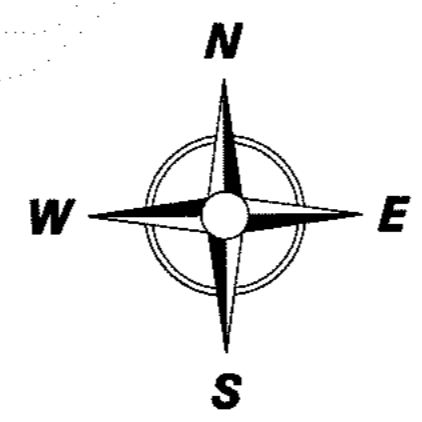
Appendix A

Traffic Volume Data

I-85 Mainline

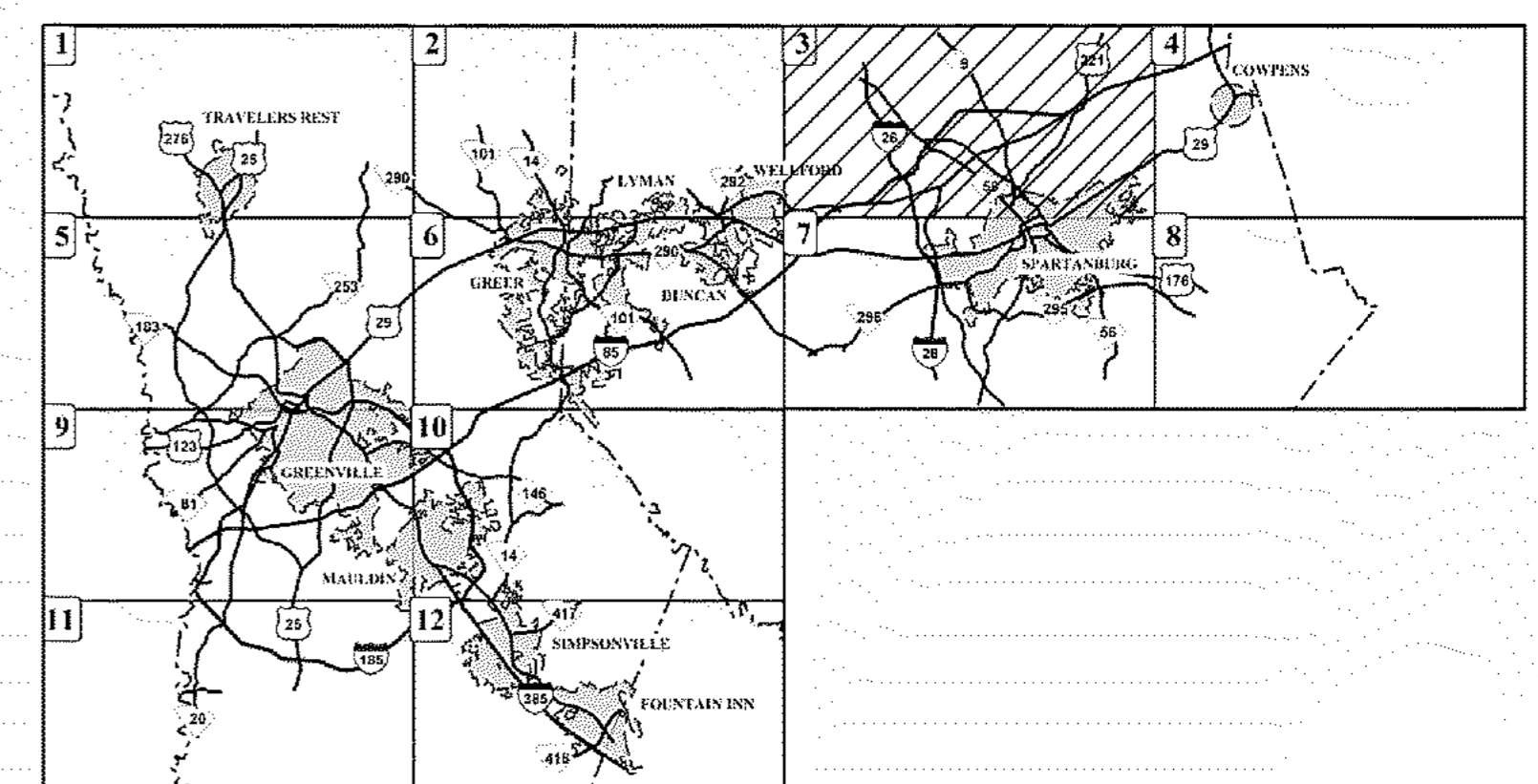


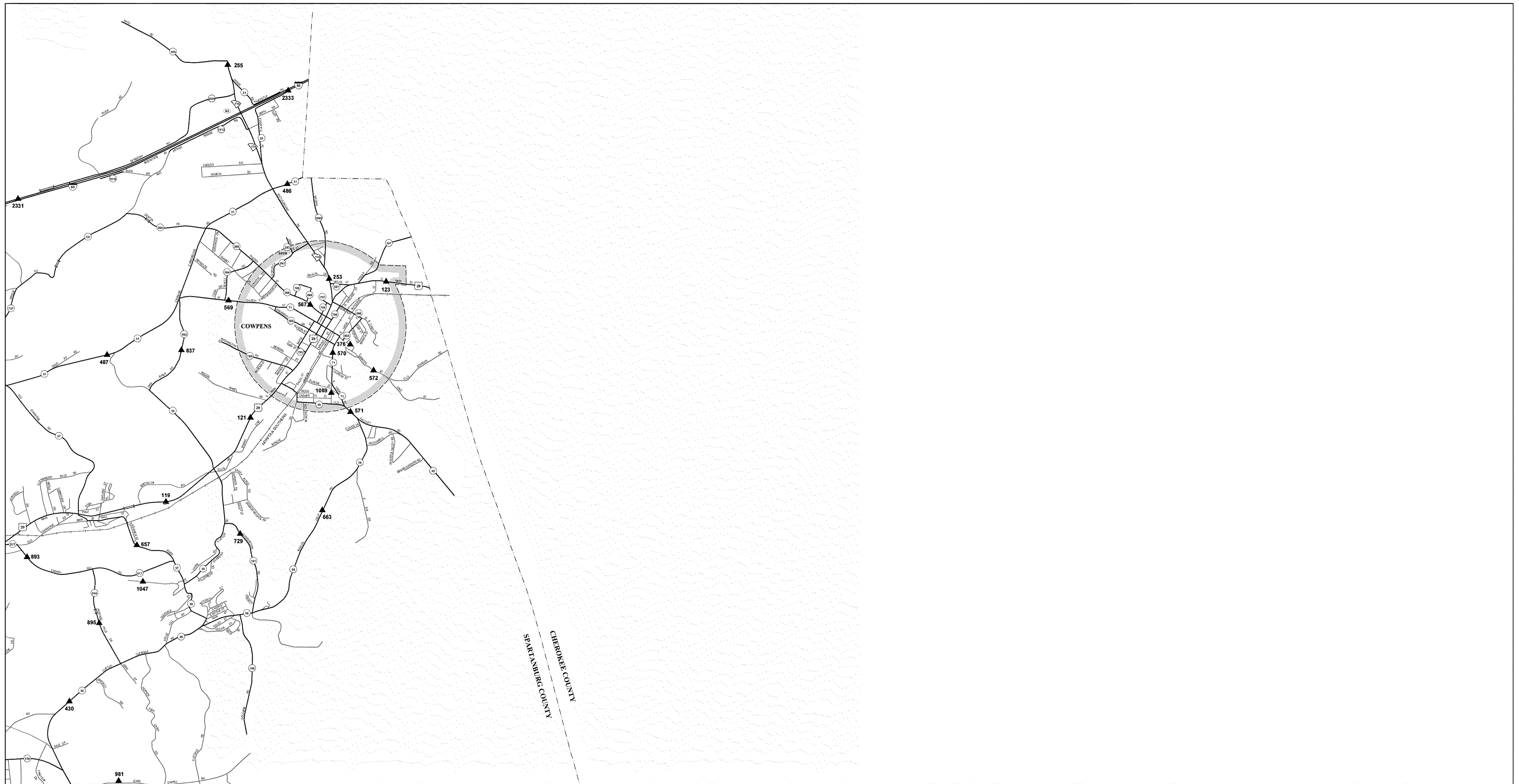
SHEET 3
GREENVILLE - SPARTANBURG
METROPOLITAN AREA
TRAFFIC FLOW MAP
 PREPARED BY
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
 IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
SCDOT




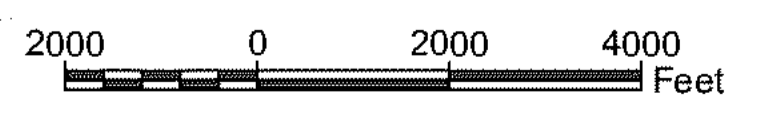
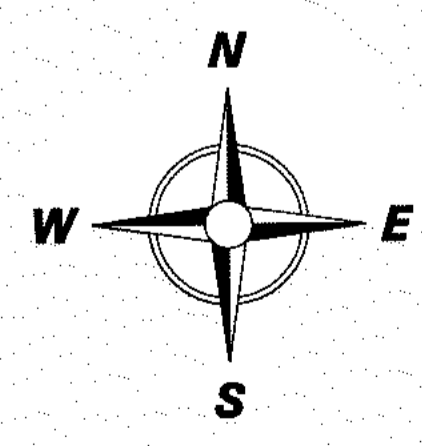
LEGEND

TRANSPORTATION	TRAFFIC	OTHER FEATURES
— State Maintained Roads	111 Station Number	▲ Schools
— Other Roads	▲ Traffic Count Station	— Bridges
SHIELDS		— Railroads
1- I-		— Rivers & Lakes
999 US		— Municipal Boundary
SC		— County Boundary
S-		

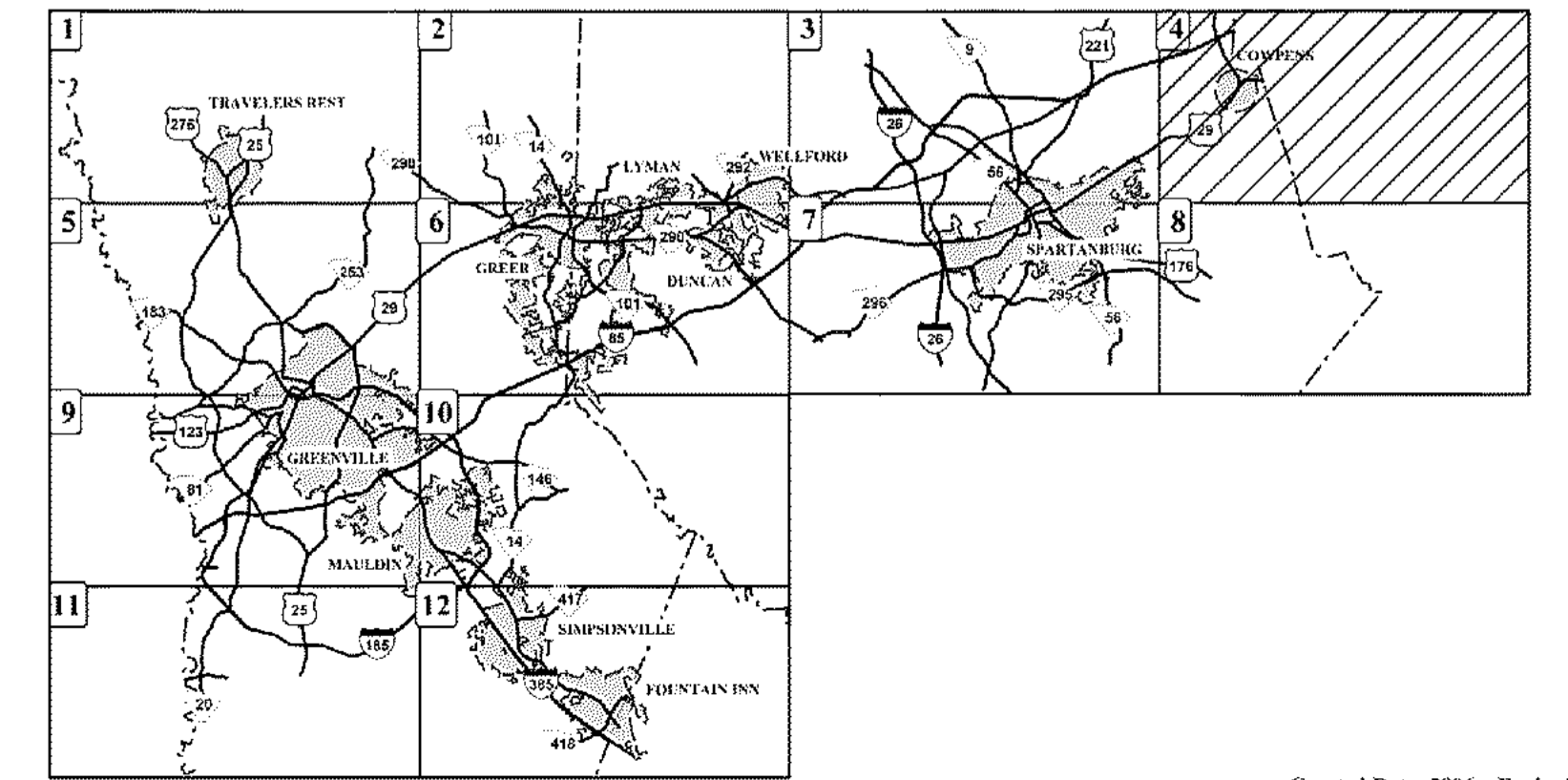




SHEET 4
GREENVILLE - SPARTANBURG
METROPOLITAN AREA
TRAFFIC FLOW MAP
 PREPARED BY
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
 IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION




TRANSPORTATION	TRAFFIC	OTHER FEATURES
State Maintained Roads	111 Station Number	Schools
Other Roads	Traffic Count Station	Bridges
SIELDS		Railroads
I-		Rivers & Lakes
US		Municipal Boundary
SC		County Boundary
S-		



Turning Movement Counts

SC110 at Dewberry Road TMC

File Name : Battleground Rd at Dewberry
 Site Code : TMC
 Start Date : 4/2/2013
 Page No : 2

Start Time	Battleground Rd Northbound					Battleground Rd Southbound					Dewberry Rd Eastbound					Phillips Dr Westbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00																					
07:00	8	35	35	0	78	0	14	2	0	16	0	0	4	0	4	3	0	0	0	3	101
07:15	7	24	42	0	73	1	25	4	0	30	3	2	2	0	7	10	0	0	0	10	120
07:30	8	25	38	0	71	0	21	3	0	24	3	1	6	0	10	8	0	0	0	8	113
07:45	6	29	32	0	67	1	40	4	0	45	1	0	1	0	2	12	1	1	0	14	128
Total Volume	29	113	147	0	289	2	100	13	0	115	7	3	13	0	23	33	1	1	0	35	462
% App. Total	10	39.1	50.9	0		1.7	87	11.3	0		30.4	13	56.5	0		94.3	2.9	2.9	0		
PHF	.906	.807	.875	.000	.926	.500	.625	.813	.000	.639	.583	.375	.542	.000	.575	.688	.250	.250	.000	.625	.902
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	2	49	32	0	83	0	21	0	0	21	3	0	6	0	9	17	3	0	0	20	133
17:15	3	70	43	0	116	0	36	2	0	38	7	5	13	0	25	12	1	1	0	14	193
17:30	2	83	23	0	108	0	17	0	0	17	5	3	7	0	15	16	0	0	0	16	156
17:45	4	60	30	0	94	0	48	2	0	50	2	2	10	0	14	18	5	0	0	23	181
Total Volume	11	262	128	0	401	0	122	4	0	126	17	10	36	0	63	63	9	1	0	73	663
% App. Total	2.7	65.3	31.9	0		0	96.8	3.2	0		27	15.9	57.1	0		86.3	12.3	1.4	0		
PHF	.688	.789	.744	.000	.864	.000	.635	.500	.000	.630	.607	.500	.692	.000	.630	.875	.450	.250	.000	.793	.859

Truck Stop Road at Horry Road and Access to I-85 Southbound On-Ramp

File Name : count made april 3 horry road a truckstop road josh

Site Code : 55555555

Start Date : 4/3/2013

Page No : 1

Groups Printed- Unshifted - Trucks - Buses

Start Time	Ramp onto I-85 Southbound Northbound				Truck Stop Road Southbound			Horry Road Eastbound			Int. Total
	Left	Thru	Right	App. Total	Thru	Right	App. Total	Left	Right	App. Total	
07:00	0	0	0	0	3	11	14	4	28	32	46
07:15	0	0	0	0	4	12	16	1	27	28	44
07:30	0	0	0	0	15	12	27	1	91	92	119
07:45	0	0	0	0	5	13	18	3	43	46	64
Total	0	0	0	0	27	48	75	9	189	198	273
08:00	0	0	0	0	7	19	26	4	42	46	72
08:15	0	0	0	0	4	13	17	3	38	41	58
08:30	0	0	0	0	1	10	11	2	39	41	52
08:45	0	0	0	0	7	9	16	1	37	38	54
Total	0	0	0	0	19	51	70	10	156	166	236
*** BREAK ***											
16:00	0	0	0	0	4	16	20	0	53	53	73
16:15	0	0	0	0	7	21	28	1	46	47	75
16:30	0	0	0	0	5	22	27	5	47	52	79
16:45	0	0	0	0	4	14	18	3	27	30	48
Total	0	0	0	0	20	73	93	9	173	182	275
17:00	0	0	0	0	6	27	33	4	58	62	95
17:15	0	0	0	0	10	12	22	4	36	40	62
17:30	0	0	0	0	6	22	28	5	33	38	66
17:45	0	0	0	0	4	26	30	2	23	25	55
Total	0	0	0	0	26	87	113	15	150	165	278
Grand Total	0	0	0	0	92	259	351	43	668	711	1062
Apprch %	0	0	0		26.2	73.8		6	94		
Total %	0	0	0	0	8.7	24.4	33.1	4	62.9	66.9	
Unshifted	0	0	0	0	75	247	322	41	639	680	1002
% Unshifted	0	0	0	0	81.5	95.4	91.7	95.3	95.7	95.6	94.4
Trucks	0	0	0	0	17	12	29	2	27	29	58
% Trucks	0	0	0	0	18.5	4.6	8.3	4.7	4	4.1	5.5
Buses	0	0	0	0	0	0	0	0	2	2	2
% Buses	0	0	0	0	0	0	0	0	0.3	0.3	0.2

Truck Stop Road at Horry Road and Access to I-85 Southbound On-Ramp

File Name : count made april 3 horry road a truckstop road josh
 Site Code : 55555555
 Start Date : 4/3/2013
 Page No : 2

Start Time	Ramp onto I-85 Southbound Northbound				Truck Stop Road Southbound			Horry Road Eastbound			Int. Total
	Left	Thru	Right	App. Total	Thru	Right	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 07:30											
07:30	0	0	0	0	15	12	27	1	91	92	119
07:45	0	0	0	0	5	13	18	3	43	46	64
08:00	0	0	0	0	7	19	26	4	42	46	72
08:15	0	0	0	0	4	13	17	3	38	41	58
Total Volume	0	0	0	0	31	57	88	11	214	225	313
% App. Total	0	0	0		35.2	64.8		4.9	95.1		
PHF	.000	.000	.000	.000	.517	.750	.815	.688	.588	.611	.658

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 16:15											
16:15	0	0	0	0	7	21	28	1	46	47	75
16:30	0	0	0	0	5	22	27	5	47	52	79
16:45	0	0	0	0	4	14	18	3	27	30	48
17:00	0	0	0	0	6	27	33	4	58	62	95
Total Volume	0	0	0	0	22	84	106	13	178	191	297
% App. Total	0	0	0		20.8	79.2		6.8	93.2		
PHF	.000	.000	.000	.000	.786	.778	.803	.650	.767	.770	.782

I-85 NB Off-ramp at I-85 Frontage Road(Bud Arthur Bridge Road) TMC

File Name : Frontage Rd at I-85 NB off Ram20130428

Site Code : TMC

Start Date : 4/3/2013

Page No : 1

Groups Printed- Unshifted - Trucks - Buses

Start Time	I-85 Frontage Rd(Bud Arthur Bridge Rd) Northbound	I-85 Frontage Rd(Bud Arthur Bridge Road) Southbound	From I-85 Northbund Exit Eastbound		Int. Total
	Thru	Thru	Left	Right	
07:00	2	1	23	0	26
07:15	5	5	24	0	34
07:30	3	1	29	0	33
07:45	0	1	45	0	46
Total	10	8	121	0	139
08:00	1	0	23	0	24
08:15	1	3	33	1	38
08:30	1	6	36	0	43
08:45	2	0	36	0	38
Total	5	9	128	1	143
*** BREAK ***					
16:00	1	3	55	1	60
16:15	4	1	70	2	77
16:30	7	7	43	0	57
16:45	6	2	38	0	46
Total	18	13	206	3	240
17:00	5	2	74	1	82
17:15	2	4	65	2	73
17:30	7	0	77	0	84
17:45	7	3	52	1	63
Total	21	9	268	4	302
Grand Total	54	39	723	8	824
Aprch %	100	100	98.9	1.1	
Total %	6.6	4.7	87.7	1	
Unshifted	54	39	678	8	779
% Unshifted	100	100	93.8	100	94.5
Trucks	0	0	45	0	45
% Trucks	0	0	6.2	0	5.5
Buses	0	0	0	0	0
% Buses	0	0	0	0	0

I-85 NB Off-ramp at I-85 Frontage Road(Bud Arthur Bridge Road) TMC

File Name : Frontage Rd at I-85 NB off Ram20130428

Site Code : TMC

Start Date : 4/3/2013

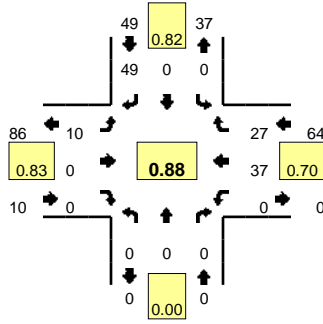
Page No : 2

Start Time	I-85 Frontage Rd(Bud Arthur Bridge Rd) Northbound		I-85 Frontage Rd(Bud Arthur Bridge Road) Southbound		From I-85 Northbound Exit Eastbound			Int. Total
	Thru	App. Total	Thru	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1								
Peak Hour for Entire Intersection Begins at 07:45								
07:45	0	0	1	1	45	0	45	46
08:00	1	1	0	0	23	0	23	24
08:15	1	1	3	3	33	1	34	38
08:30	1	1	6	6	36	0	36	43
Total Volume	3	3	10	10	137	1	138	151
% App. Total	100		100		99.3	0.7		
PHF	.750	.750	.417	.417	.761	.250	.767	.821

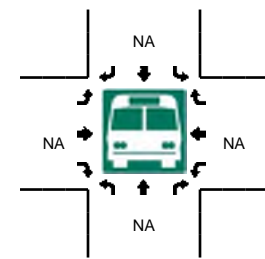
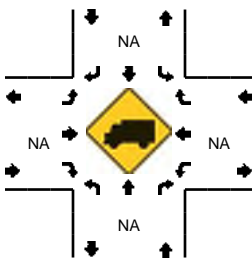
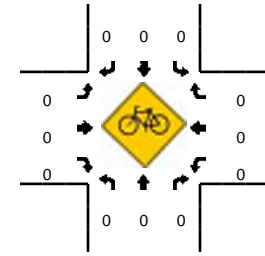
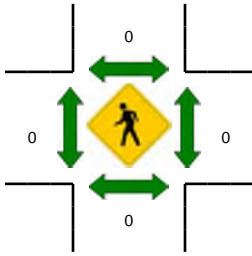
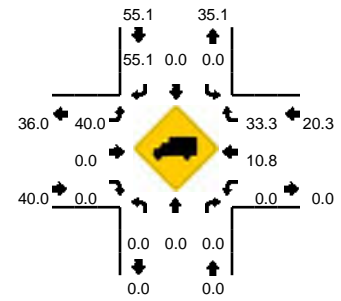
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1								
Peak Hour for Entire Intersection Begins at 17:00								
17:00	5	5	2	2	74	1	75	82
17:15	2	2	4	4	65	2	67	73
17:30	7	7	0	0	77	0	77	84
17:45	7	7	3	3	52	1	53	63
Total Volume	21	21	9	9	268	4	272	302
% App. Total	100		100		98.5	1.5		
PHF	.750	.750	.563	.563	.870	.500	.883	.899

LOCATION: Truck Plaza Dwy -- I-85 SB Off-Ramp
CITY/STATE: Cowpens, SC

QC JOB #: 12896507
DATE: Thu, Sep 25 2014



Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

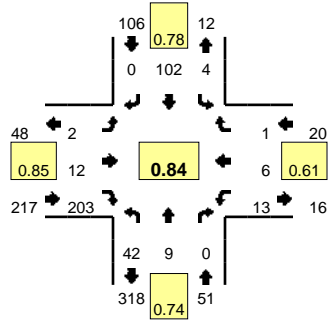


15-Min Count Period Beginning At	Truck Plaza Dwy (Northbound)				Truck Plaza Dwy (Southbound)				I-85 SB Off-Ramp (Eastbound)				I-85 SB Off-Ramp (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	6	0	2	0	0	0	0	8	4	0	20	
7:15 AM	0	0	0	0	0	0	8	0	1	0	0	0	0	13	5	0	27	
7:30 AM	0	0	0	0	0	0	6	0	2	0	0	0	0	18	6	0	32	
7:45 AM	0	0	0	0	0	0	12	0	1	0	0	0	0	5	6	0	24	103
8:00 AM	0	0	0	0	0	0	13	0	3	0	0	0	0	9	1	0	26	109
8:15 AM	0	0	0	0	0	0	9	0	1	0	0	0	0	13	12	0	35	117
8:30 AM	0	0	0	0	0	0	15	0	3	0	0	0	0	9	5	0	32	117
8:45 AM	0	0	0	0	0	0	12	0	3	0	0	0	0	6	9	0	30	123
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	0	36	0	4	0	0	0	0	52	48	0	140	
Heavy Trucks	0	0	0	0	0	0	20	0	4	0	0	0	0	4	12	0	40	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

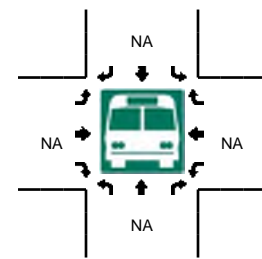
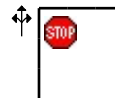
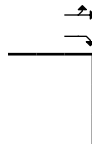
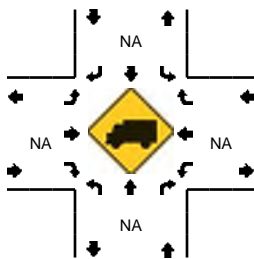
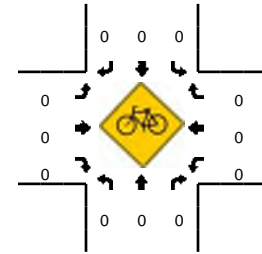
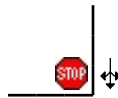
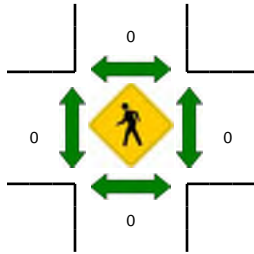
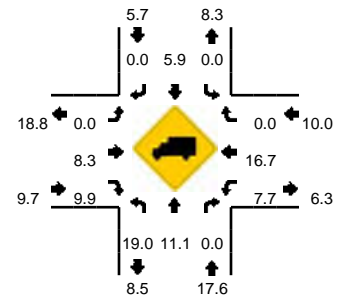
Comments: Try to get best coverage of ramp and driveway/intersection traffic in case driveway volumes along Truck Stop Road are needed.

LOCATION: Phillips Dr -- Horry Rd
CITY/STATE: Gaffney, SC

QC JOB #: 12896513
DATE: Thu, Sep 25 2014



Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

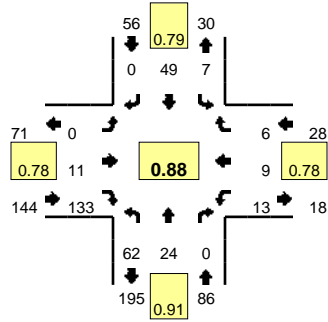


15-Min Count Period Beginning At	Phillips Dr (Northbound)				Phillips Dr (Southbound)				Horry Rd (Eastbound)				Horry Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	8	2	0	0	1	18	0	0	0	1	45	0	2	2	1	0	80	
7:15 AM	9	5	0	0	0	22	0	0	1	5	55	0	5	4	0	0	106	
7:30 AM	16	2	0	0	0	31	0	0	0	4	60	0	4	0	0	0	117	
7:45 AM	9	0	0	0	3	31	0	0	1	2	43	0	2	0	0	0	91	394
8:00 AM	10	2	0	0	2	12	0	0	1	0	43	0	2	3	2	0	77	391
8:15 AM	7	7	0	0	0	13	0	0	1	0	30	0	0	0	0	0	58	343
8:30 AM	9	4	0	0	2	6	0	0	0	0	35	0	2	2	0	0	60	286
8:45 AM	9	1	1	0	1	11	0	0	1	1	19	0	5	0	0	0	49	244
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	64	8	0	0	0	124	0	0	0	16	240	0	16	0	0	0	468	
Heavy Trucks	8	0	0	0	0	4	0	0	0	0	24	0	0	0	0	0	36	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

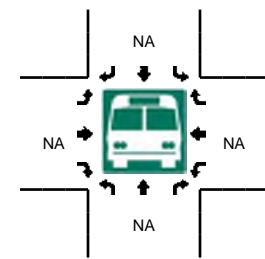
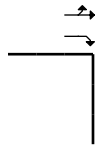
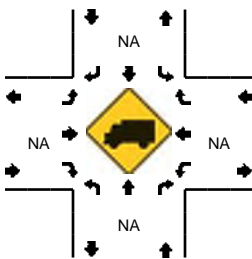
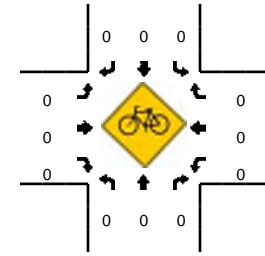
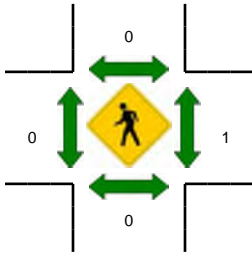
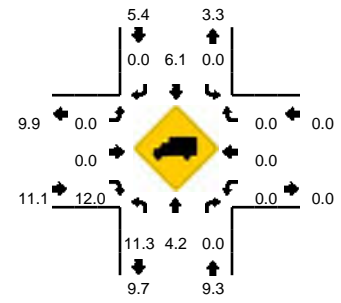
Comments: Make sure to film NBR.

LOCATION: Phillips Dr -- Horry Rd
CITY/STATE: Gaffney, SC

QC JOB #: 12896514
DATE: Thu, Sep 25 2014



Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

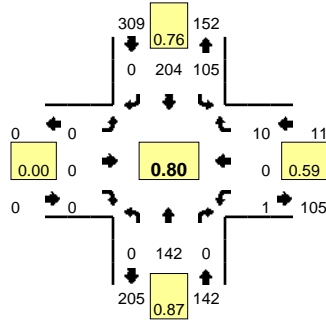


15-Min Count Period Beginning At	Phillips Dr (Northbound)				Phillips Dr (Southbound)				Horry Rd (Eastbound)				Horry Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	15	5	2	0	0	5	0	0	0	4	43	0	1	2	1	0	78	
4:15 PM	15	9	0	0	2	8	0	0	0	2	34	0	4	2	3	0	79	
4:30 PM	15	4	0	0	1	15	0	0	0	4	25	0	3	2	0	0	69	
4:45 PM	13	9	0	0	3	9	0	0	0	2	33	0	3	3	2	0	77	303
5:00 PM	19	2	0	0	1	17	0	0	0	3	41	0	3	2	1	0	89	314
5:15 PM	13	5	0	0	0	11	0	0	0	5	29	0	1	2	1	0	67	302
5:30 PM	9	4	0	0	0	11	0	0	1	3	25	0	0	0	2	0	55	288
5:45 PM	10	3	0	0	2	9	0	0	0	3	20	0	0	3	2	0	52	263
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	76	8	0	0	4	68	0	0	0	12	164	0	12	8	4	0	356	
Heavy Trucks	8	0	0		0	4	0		0	0	20		0	0	0		32	
Pedestrians	0				0				0				0				0	
Bicycles	0				0				0				0				0	
Railroad																		
Stopped Buses																		

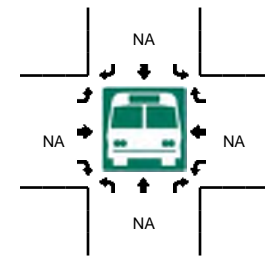
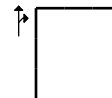
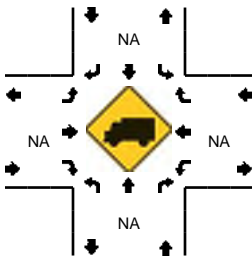
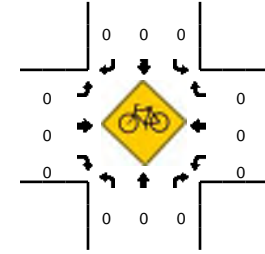
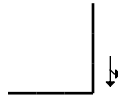
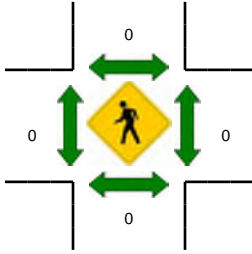
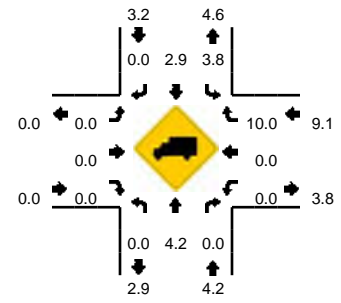
Comments: Make sure to film NBR.

LOCATION: SC 110 -- Horry Rd
CITY/STATE: Cowpens, SC

QC JOB #: 12896511
DATE: Thu, Sep 25 2014



Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM



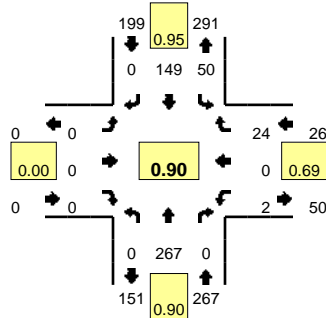
15-Min Count Period Beginning At	SC 110 (Northbound)				SC 110 (Southbound)				Horry Rd (Eastbound)				Horry Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	31	0	0	20	39	0	0	0	0	0	0	0	0	3	0	93	
7:15 AM	0	34	0	0	20	52	0	0	0	0	0	0	0	0	4	0	110	
7:30 AM	0	41	0	0	36	65	0	0	0	0	0	0	1	0	2	0	145	
7:45 AM	0	36	0	0	29	48	0	0	0	0	0	0	0	0	1	0	114	462
8:00 AM	0	27	0	0	16	35	0	0	0	0	0	0	0	0	5	0	83	452
8:15 AM	0	22	0	0	12	17	0	0	0	0	0	0	0	0	8	0	59	401
8:30 AM	0	23	0	0	9	24	0	0	0	0	0	0	0	0	4	0	60	316
8:45 AM	0	25	0	0	11	28	0	0	0	0	0	0	0	0	2	0	66	268

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	164	0	0	144	260	0	0	0	0	0	0	4	0	8	0	580	
Heavy Trucks	0	4	0	0	4	4	0	0	0	0	0	0	0	0	0	0	12	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

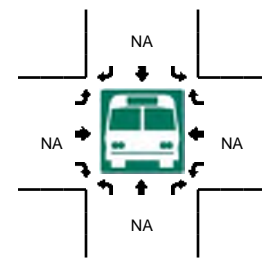
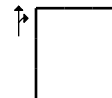
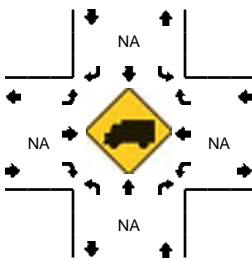
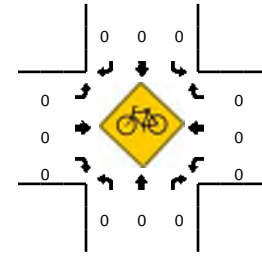
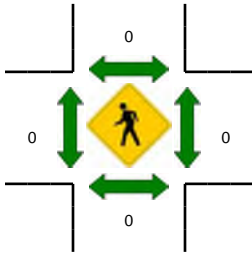
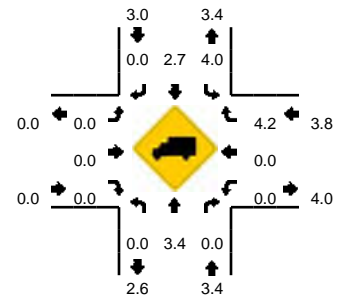
Comments:

LOCATION: SC 110 -- Horry Rd
CITY/STATE: Cowpens, SC

QC JOB #: 12896512
DATE: Thu, Sep 25 2014



Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

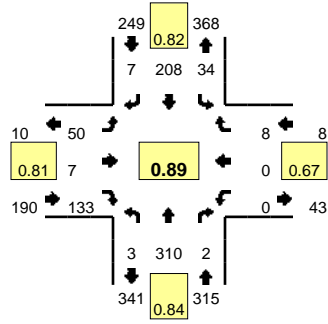


15-Min Count Period Beginning At	SC 110 (Northbound)				SC 110 (Southbound)				Horry Rd (Eastbound)				Horry Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	44	0	0	4	46	0	0	0	0	0	0	1	0	6	0	101	
4:15 PM	0	53	0	0	7	47	0	0	0	0	0	0	1	0	12	0	120	
4:30 PM	0	54	0	0	18	36	0	0	0	0	0	0	0	0	5	0	113	
4:45 PM	0	48	0	0	12	36	0	0	0	0	0	0	0	0	11	0	107	441
5:00 PM	0	78	0	0	16	40	0	0	0	0	0	0	0	0	3	0	137	477
5:15 PM	0	75	0	0	9	39	0	0	0	0	0	0	0	0	5	0	128	485
5:30 PM	0	66	0	0	13	34	0	0	0	0	0	0	2	0	5	0	120	492
5:45 PM	0	62	0	0	9	31	0	0	0	0	0	0	0	0	5	0	107	492
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	312	0	0	64	160	0	0	0	0	0	0	0	0	12	0	548	
Heavy Trucks	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

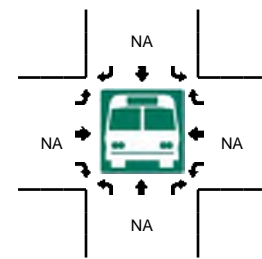
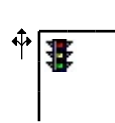
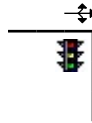
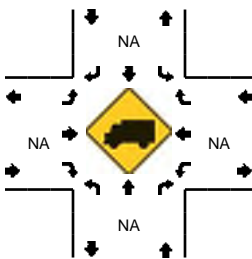
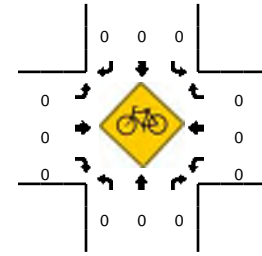
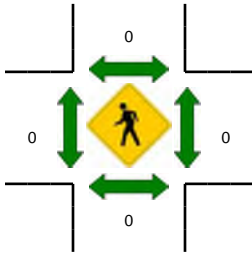
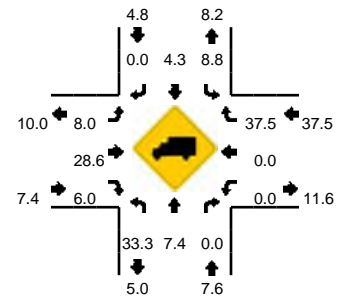
Comments:

LOCATION: SC 110 -- Frontage Rd N
CITY/STATE: Cowpens, SC

QC JOB #: 12896509
DATE: Thu, Sep 25 2014



Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM



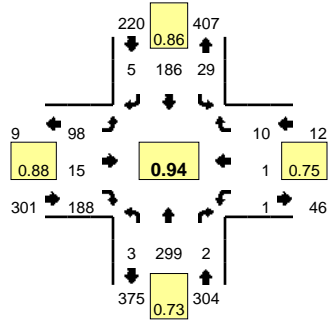
15-Min Count Period Beginning At	SC 110 (Northbound)				SC 110 (Southbound)				Frontage Rd N (Eastbound)				Frontage Rd N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	65	0	0	7	37	2	0	7	1	29	0	0	0	2	0	153	
7:15 AM	0	84	0	0	7	60	0	0	13	1	37	0	0	0	1	0	203	
7:30 AM	0	94	0	0	11	62	3	0	12	3	25	0	0	0	3	0	213	
7:45 AM	0	67	2	0	9	49	2	0	18	2	42	0	0	0	2	0	193	762
8:00 AM	0	54	0	0	7	31	1	0	11	0	36	0	0	0	1	0	141	750
8:15 AM	0	41	0	0	4	25	0	0	16	1	17	0	0	0	1	0	105	652
8:30 AM	0	46	0	0	4	21	1	0	9	0	19	0	0	0	3	0	103	542
8:45 AM	0	33	0	0	7	29	1	0	8	1	16	0	0	0	0	0	95	444

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	376	0	0	44	248	12	0	48	12	100	0	0	0	12	0	852
Heavy Trucks	0	12	0	0	4	8	0	0	4	0	12	0	0	0	4	0	44
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																	
Stopped Buses																	

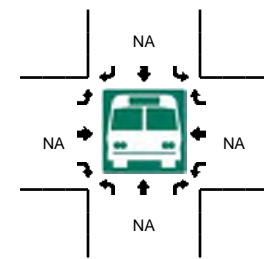
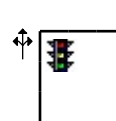
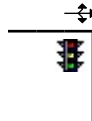
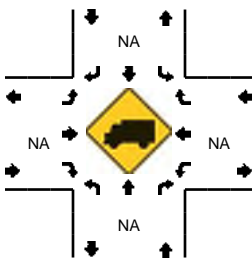
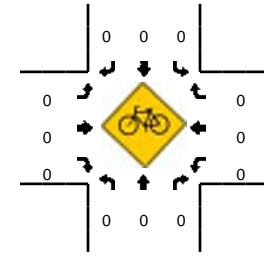
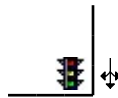
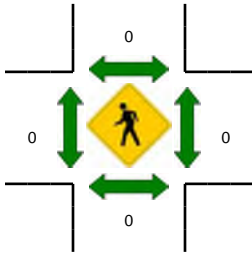
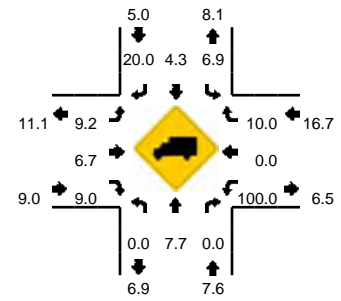
Comments:

LOCATION: SC 110 -- Frontage Rd N
CITY/STATE: Cowpens, SC

QC JOB #: 12896510
DATE: Thu, Sep 25 2014



Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:00 PM -- 5:15 PM



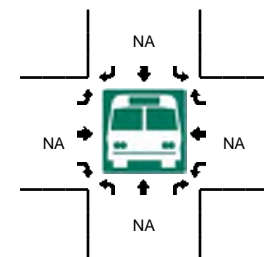
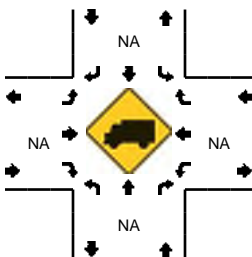
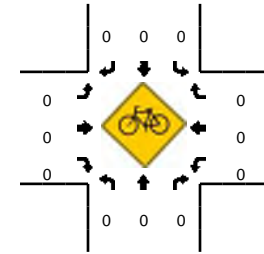
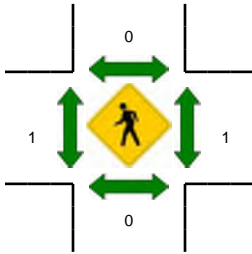
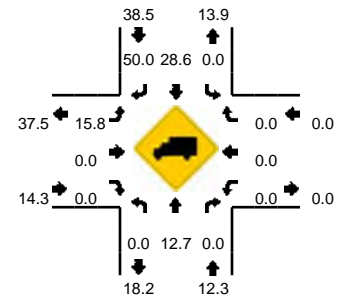
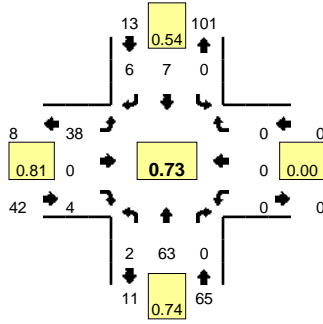
15-Min Count Period Beginning At	SC 110 (Northbound)				SC 110 (Southbound)				Frontage Rd N (Eastbound)				Frontage Rd N (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	51	1	0	7	62	4	0	21	5	38	0	0	0	0	0	190	
4:15 PM	0	71	1	0	8	53	3	0	17	0	31	0	0	0	3	0	187	
4:30 PM	0	61	1	0	10	51	1	0	22	3	38	0	1	0	2	0	190	
4:45 PM	0	63	1	0	5	44	2	0	20	7	57	0	0	1	3	0	203	770
5:00 PM	2	101	1	0	11	52	1	0	24	2	26	0	1	0	1	0	222	802
5:15 PM	0	68	0	0	5	47	1	0	26	4	54	0	0	0	3	0	208	823
5:30 PM	1	67	0	0	8	43	1	0	28	2	51	0	0	0	3	0	204	837
5:45 PM	2	45	0	0	7	38	3	0	31	3	52	0	0	0	0	0	181	815
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	8	404	4	0	44	208	4	0	96	8	104	0	4	0	4	0	888	
Heavy Trucks	0	20	0		8	0	0		4	4	16		4	0	0		56	
Pedestrians		0				0				0				0			0	
Bicycles		0				0				0				0			0	
Railroad																	0	
Stopped Buses																	0	

Comments:

LOCATION: Edgefield Rd -- Frontage Rd
CITY/STATE: Cowpens, SC

QC JOB #: 12896553
DATE: Thu, Sep 25 2014

Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM



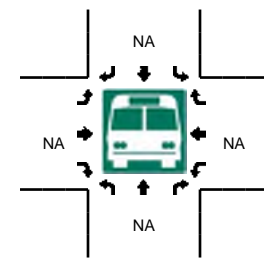
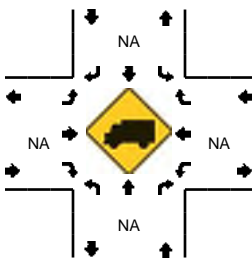
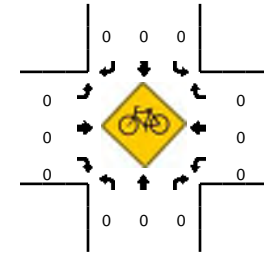
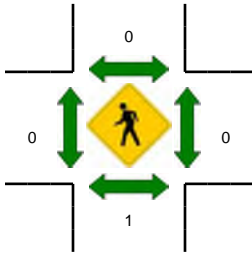
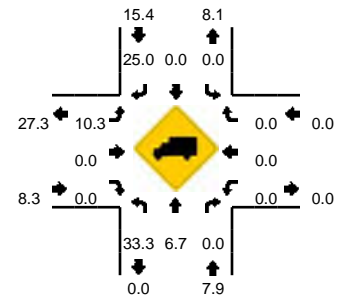
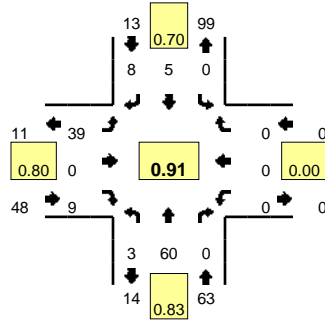
15-Min Count Period Beginning At	Edgefield Rd (Northbound)				Edgefield Rd (Southbound)				Frontage Rd (Eastbound)				Frontage Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	11	0	0	0	1	1	0	8	0	0	0	0	0	0	0	22	
7:15 AM	0	19	0	0	0	2	1	0	6	0	2	0	0	0	0	0	30	
7:30 AM	1	21	0	0	0	4	2	0	13	0	0	0	0	0	0	0	41	
7:45 AM	0	12	0	0	0	0	2	0	11	0	2	0	0	0	0	0	27	120
8:00 AM	0	11	0	0	0	0	1	0	8	0	0	0	0	0	0	0	20	118
8:15 AM	0	10	0	0	0	0	1	0	4	0	1	0	0	0	0	0	16	104
8:30 AM	2	7	0	0	0	0	1	0	4	0	0	0	0	0	0	0	14	77
8:45 AM	0	11	0	0	0	1	0	0	7	0	1	0	0	0	0	0	20	70
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	84	0	0	0	16	8	0	52	0	0	0	0	0	0	0	164	
Heavy Trucks	0	16	0	0	0	8	4	0	4	0	0	0	0	0	0	0	32	
Pedestrians		0				0				4				4			8	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

LOCATION: Edgefield Rd -- Frontage Rd
CITY/STATE: Cowpens, SC

QC JOB #: 12896554
DATE: Thu, Sep 25 2014

Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:45 PM -- 5:00 PM



15-Min Count Period Beginning At	Edgefield Rd (Northbound)				Edgefield Rd (Southbound)				Frontage Rd (Eastbound)				Frontage Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	14	0	0	0	2	0	0	12	0	1	0	0	0	0	0	29	
4:15 PM	1	15	0	0	0	1	2	0	8	0	1	0	0	0	0	0	28	
4:30 PM	0	12	0	0	0	1	2	0	11	0	3	0	0	0	0	0	29	
4:45 PM	1	18	0	0	0	3	2	0	7	0	3	0	0	0	0	0	34	120
5:00 PM	1	15	0	0	0	0	2	0	13	0	2	0	0	0	0	0	33	124
5:15 PM	1	12	0	0	0	2	2	0	9	0	0	0	0	0	0	0	26	122
5:30 PM	1	12	0	0	0	1	2	0	10	0	0	0	0	0	0	0	26	119
5:45 PM	0	17	0	0	0	2	0	0	8	0	1	0	0	0	0	0	28	113
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	72	0	0	0	12	8	0	28	0	12	0	0	0	0	0	136	
Heavy Trucks	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

Appendix B

HCS Freeway and Ramp Merge/Diverge Outputs

Freeway Outputs
Existing AM Peak
I-85 Northbound

HCS 2010: Basic Freeway Segments Release 6.3

STV
 1320 Main Street
 Suite 300
 Columbia, SC 29201
 Phone: 803-724-1430
 E-mail:

Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 NB
 From/To: Exit 82 to Exit 83
 Jurisdiction: Spartantburg County
 Analysis Year: 2014
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	1870	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	519	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1428	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1428	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	22.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.3

STV
 1320 Main Street
 Suite 300
 Columbia, SC 29201
 Phone: 803-724-1430
 E-mail:

Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 NB
 From/To: Exit 83 to Exit 87
 Jurisdiction: Cherokee County
 Analysis Year: 2014
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	1797	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	499	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1373	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1373	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	21.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

I-85 Southbound

HCS 2010: Basic Freeway Segments Release 6.2

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 1320 Main Street
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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 87 to Exit 83
 Jurisdiction: Cherokee County
 Analysis Year: 2014
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	1865	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	518	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1425	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1425	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	21.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.2

STV
 1620 Main Street
 Suite 600
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 Phone: 803-724-1430
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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 83 to Exit 80
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	2125	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	590	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1623	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1623	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.3	mi/h
Number of lanes, N	2	
Density, D	25.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Existing PM Peak
I-85 Northbound

HCS 2010: Basic Freeway Segments Release 6.2

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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 NB
 From/To: Exit 82 to Exit 83
 Jurisdiction: Spartantburg County
 Analysis Year: 2014
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	3015	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	838	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	2303	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	2303	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	53.4	mi/h
Number of lanes, N	2	
Density, D	43.1	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 NB
 From/To: Exit 83 to Exit 87
 Jurisdiction: Cherokee County
 Analysis Year: 2014
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	2852	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	792	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	2179	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	2179	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	56.4	mi/h
Number of lanes, N	2	
Density, D	38.6	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

I-85 Southbound

HCS 2010: Basic Freeway Segments Release 6.2

STV
 1320 Main Street
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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 87 to Exit 83
 Jurisdiction: Cherokee County
 Analysis Year: 2014
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	2930	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	814	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	2238	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	2238	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	55.0	mi/h
Number of lanes, N	2	
Density, D	40.7	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.2

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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 83 to Exit 80
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	3029	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	841	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	2314	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	2314	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	53.2	mi/h
Number of lanes, N	2	
Density, D	43.5	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

No Build AM Peak
I-85 Northbound

HCS 2010: Basic Freeway Segments Release 6.2

STV
 1320 Main Street
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 Phone: 803-724-1430
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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 NB
 From/To: Exit 82 to Exit 83
 Jurisdiction: Spartantburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	2796	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	777	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	2136	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	2136	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	57.3	mi/h
Number of lanes, N	2	
Density, D	37.3	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 NB
 From/To: Exit 83 to Exit 87
 Jurisdiction: Cherokee County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	2686	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	746	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	2052	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	2052	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	59.0	mi/h
Number of lanes, N	2	
Density, D	34.8	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

I-85 Southbound

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 1320 Main Street
 Suite 300
 Columbia, SC 29201
 Phone: 803-724-1430
 E-mail:

Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 87 to Exit 83
 Jurisdiction: Cherokee County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	2788	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	774	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	2130	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	2130	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	57.4	mi/h
Number of lanes, N	2	
Density, D	37.1	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 83 to Exit 80
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	3177	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	883	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	2427	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	2427	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	50.0	mi/h
Number of lanes, N	2	
Density, D	48.5	pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

No Build PM Peak
I-85 Northbound

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 1320 Main Street
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 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 NB
 From/To: Exit 82 to Exit 83
 Jurisdiction: Spartantburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	4507	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1252	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	3443	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	3443	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	5.8	mi/h
Number of lanes, N	2	
Density, D	592.1	pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.2

STV
 1320 Main Street
 Suite 300
 Columbia, SC 29201
 Phone: 803-724-1430
 E-mail:

Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 NB
 From/To: Exit 83 to Exit 87
 Jurisdiction: Cherokee County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	4263	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1184	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	3256	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	3256	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	16.2	mi/h
Number of lanes, N	2	
Density, D	201.6	pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

I-85 Southbound

HCS 2010: Basic Freeway Segments Release 6.2

STV
 1320 Main Street
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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 87 to Exit 83
 Jurisdiction: Cherokee County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	4380	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1217	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	3346	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	3346	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	11.3	mi/h
Number of lanes, N	2	
Density, D	296.1	pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.2

STV
 1620 Main Street
 Suite 600
 Columbia, SC 29201
 Phone: 803-724-1430
 E-mail:

Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 83 to Exit 80
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	4528	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1258	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	3459	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	3459	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	4.9	mi/h
Number of lanes, N	2	
Density, D	708.2	pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

Build AM Peak
I-85 Northbound

STV
 1320 Main Street
 Suite 300
 Columbia, SC 29201
 Phone: 803-724-1430 Fax: 803-724-1201
 E-mail:

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Directi on: I-85 NB
 From/To: Exit 80 to Exit 83
 Jurisdi cti on: Spartantburg County
 Analysis Year: 2040 Build
 Descri pti on: I-85 Wi deni ng

 Flow Inputs and Adjustments

Volume, V	2839	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	789	v
Trucks and buses	25	%
Recreati onal vehi cles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreati onal vehi cle PCE, ER	2.0	
Heavy vehi cle adjustment, fHV	0.727	
Driver populati on factor, fp	1.00	
Flow rate, vp	1084	pc/h/l n

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	4	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi /h
Lane width adjustment, FLW	-	mi /h
Lateral clearance adjustment, FLC	-	mi /h
TRD adjustment	-	mi /h
Free-flow speed, FFS	65.0	mi /h

 LOS and Performance Measures

Flow rate, vp	1084	pc/h/l n
Free-flow speed, FFS	65.0	mi /h
Average passenger-car speed, S	65.0	mi /h
Number of lanes, N	4	
Densi ty, D	16.7	pc/mi /l n
Level of servi ce, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 NB
 From/To: Exit 83 to Exit 87
 Jurisdiction: Cherokee County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	2686	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	746	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1368	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1368	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

I-85 Southbound

HCS 2010: Basic Freeway Segments Release 6.2

STV
 1320 Main Street
 Suite 300
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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 87 to Exit 83
 Jurisdiction: Cherokee County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	2788	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	774	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1420	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1420	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	3	
Density, D	21.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

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 E-mail:

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 87 to Exit 83
 Jurisdiction: Cherokee County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	2788	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	774	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1065	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	4	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, FLW	-	mi/h
Lateral clearance adjustment, FLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1065	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	4	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.2

STV
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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 83 to Exit 80
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	3177	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	883	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1618	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1618	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.3	mi/h
Number of lanes, N	3	
Density, D	25.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

STV
 1320 Main Street
 Suite 300
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 Phone: 803-724-1430 Fax: 803-724-1201
 E-mail:

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: AM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 83 to Exit 80
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	3177	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	883	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1213	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	4	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, FLW	-	mi/h
Lateral clearance adjustment, FLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1213	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	4	
Density, D	18.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

Build PM Peak
I-85 Northbound

STV
 1320 Main Street
 Suite 300
 Columbia, SC 29201
 Phone: 803-724-1430 Fax: 803-724-1201
 E-mail:

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Directi on: I-85 NB
 From/To: Exit 80 to Exit 83
 Jurisdi cti on: Spartantburg County
 Analysis Year: 2040 Build
 Descri pti on: I-85 Wi deni ng

 Flow Inputs and Adjustments

Volume, V	4520	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1256	v
Trucks and buses	25	%
Recreati onal vehi cles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreati onal vehi cle PCE, ER	2.0	
Heavy vehi cle adjustment, fHV	0.727	
Driver populati on factor, fp	1.00	
Flow rate, vp	2302	pc/h/l n

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi /h
Lane width adjustment, FLW	-	mi /h
Lateral clearance adjustment, FLC	-	mi /h
TRD adjustment	-	mi /h
Free-flow speed, FFS	65.0	mi /h

 LOS and Performance Measures

Flow rate, vp	2302	pc/h/l n
Free-flow speed, FFS	65.0	mi /h
Average passenger-car speed, S	53.5	mi /h
Number of lanes, N	3	
Densi ty, D	43.1	pc/mi /l n
Level of servi ce, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

STV
 1320 Main Street
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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Directi on: I-85 NB
 From/To: Exit 80 to Exit 83
 Jurisdi cti on: Spartantburg County
 Analysis Year: 2040 Build
 Descri pti on: I-85 Wi deni ng

 Flow Inputs and Adjustments

Volume, V	4520	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1256	v
Trucks and buses	25	%
Recreati onal vehi cles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreati onal vehi cle PCE, ER	2.0	
Heavy vehi cle adjustment, fHV	0.727	
Driver populati on factor, fp	1.00	
Flow rate, vp	1726	pc/h/l n

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	4	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi /h
Lane width adjustment, FLW	-	mi /h
Lateral clearance adjustment, FLC	-	mi /h
TRD adjustment	-	mi /h
Free-flow speed, FFS	65.0	mi /h

 LOS and Performance Measures

Flow rate, vp	1726	pc/h/l n
Free-flow speed, FFS	65.0	mi /h
Average passenger-car speed, S	63.5	mi /h
Number of lanes, N	4	
Density, D	27.2	pc/mi /l n
Level of servi ce, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

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STV
 1320 Main Street
 Suite 300
 Columbia, SC 29201
 Phone: 803-724-1430
 E-mail:

Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 NB
 From/To: Exit 83 to Exit 87
 Jurisdiction: Cherokee County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	4263	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1184	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	2171	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	2171	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	56.6	mi/h
Number of lanes, N	3	
Density, D	38.4	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 NB
 From/To: Exit 83 to Exit 87
 Jurisdiction: Cherokee County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	4263	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1184	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1628	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	4	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, FLW	-	mi/h
Lateral clearance adjustment, FLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1628	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	64.3	mi/h
Number of lanes, N	4	
Density, D	25.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

I-85 Southbound

HCS 2010: Basic Freeway Segments Release 6.2

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Fax: 803-724-1201

 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 87 to Exit 83
 Jurisdiction: Cherokee County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	4380	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1217	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fhv	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	2231	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, flw	-	mi/h
Lateral clearance adjustment, flc	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	2231	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	55.2	mi/h
Number of lanes, N	3	
Density, D	40.4	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

STV
 1320 Main Street
 Suite 300
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 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 87 to Exit 83
 Jurisdiction: Cherokee County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	4380	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1217	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1673	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	4	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, FLW	-	mi/h
Lateral clearance adjustment, FLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1673	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.9	mi/h
Number of lanes, N	4	
Density, D	26.2	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 83 to Exit 80
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	4528	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1258	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	2306	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, FLW	-	mi/h
Lateral clearance adjustment, FLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	2306	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	53.4	mi/h
Number of lanes, N	3	
Density, D	43.2	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Operational Analysis

Analyst: RJD
 Agency or Company: STV Incorporated
 Date Performed: 12/19/2014
 Analysis Time Period: PM Peak
 Freeway/Direction: I-85 SB
 From/To: Exit 83 to Exit 80
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Flow Inputs and Adjustments

Volume, V	4528	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1258	v
Trucks and buses	25	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.727	
Driver population factor, fp	1.00	
Flow rate, vp	1729	pc/h/ln

 Speed Inputs and Adjustments

Lane width	-	ft
Right-side lateral clearance	-	ft
Total ramp density, TRD	-	ramps/mi
Number of lanes, N	4	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	65.0	mi/h

 LOS and Performance Measures

Flow rate, vp	1729	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	63.5	mi/h
Number of lanes, N	4	
Density, D	27.2	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Merge Outputs
Existing AM Peak
I-85 Northbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1695	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	102	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1695	102		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	471	28		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

Flow rate, vp 2014_EX_AM_NB_Exit_83_On_DS.txt 2590 128 pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 $P = 1.000$ Using Equation 0
 $v_{12} = v_F (P_{FM}) = 2590$ pc/h

Capacity Checks

v_{FO}	Actual 2718	Maximum 4700	LOS F? No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2590$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

v_{R12}	Actual 2718	Max Desirable 4600	Violation? No
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Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 24.1$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.352$
Space mean speed in ramp influence area,	$S_R = 56.9$ mph
Space mean speed in outer lanes,	$S_0 = N/A$ mph
Space mean speed for all vehicles,	$S = 56.9$ mph

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 Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 widening

 Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1695	vph

 On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	102	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

 Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	175	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3650	ft

 Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1695	102	175	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	471	28	49	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

I-85 Southbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 86
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1794	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	65.0	mph
Volume on ramp	661	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1794	661		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	498	92		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

Flow rate, vp 2014_EX_AM_SB_Exit_86_On_DS.txt 2741 414 pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 16-6 or 16-7)}$$

$$P = 1.000 \text{ Using Equation 0}$$

$$v_{12} = v_F (P_{FM}) = 2741 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6155	4700	No
v_6 or v_{av64}	0 pc/h	(Equation 16-14 or 16-17)	
Is v_6 or $v_{av64} > 2700$ pc/h?		No	
Is v_6 or $v_{av64} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2741$		(Equation 16-15, 16-16, 16-18, or 16-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	6155	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00764 v_R + 0.0078 v_{12} - 0.00627 L_A = 26.8$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M = 0.677
Space mean speed in ramp influence area,	S = 56.6 mph
Space mean speed in outer lanes,	S = N/A mph
Space mean speed for all vehicles,	S = 56.6 mph

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-8Y SB
 Junction: Exit 86
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-8Y Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1794	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	65.0	mph
Volume on ramp	661	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	71	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1560	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1794	661	71	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	498	92	20	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

Existing PM Peak
I-85 Northbound

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2753	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	99	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2753	99		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	765	28		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 $P = 1.000$ Using Equation 0
 $v_{12} = v_F (P_{FM}) = 4206$ pc/h

Capacity Checks

v_{FO}	Actual 4330	Maximum 4700	LOS F? No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4206$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

v_{R12}	Actual 4330	Max Desirable 4600	Violation? No
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Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 36.7$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$M_S = 0.589$
Space mean speed in ramp influence area,	$S_R = 51.4$ mph
Space mean speed in outer lanes,	$S_0 = N/A$ mph
Space mean speed for all vehicles,	$S = 51.4$ mph

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2753	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	99	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	262	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3650	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2753	99	262	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	765	28	73	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

I-85 Southbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2825	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	204	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2825	204		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	785	57		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

Flow rate, vp 2014_EX_PM_SB_Exit_83_On_DS.txt 4316 255 pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 $P = 1.000$ Using Equation 0
 $v_{12} = v_F (P_{FM}) = 4316$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4571	4700	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4316$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4571	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 37.9$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$M_S = 0.663$
Space mean speed in ramp influence area,	$S_R = 49.8$ mph
Space mean speed in outer lanes,	$S_0 = N/A$ mph
Space mean speed for all vehicles,	$S = 49.8$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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 Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 Widening

 Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2825	vph

 On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	204	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

 Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	105	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1560	ft

 Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2825	204	105	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	785	57	29	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%			%
Length	mi			mi
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

No Build AM Peak
I-85 Northbound

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2534	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2534	152		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	704	42		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

Flow rate, vp 2040_No-Build_AM_NB_Exit_83_On_DS.txt
3871 190 pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 3871 \text{ pc/h}$

Capacity Checks

	Actual 4061	Maximum 4700	LOS F? No
v_{FO}			
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700 \text{ pc/h}$?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$?		No	
If yes, $v_{12A} = 3871$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual 4061	Max Desirable 4600	Violation? No
v_{R12}			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 34.6 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M = 0.519
Space mean speed in ramp influence area,	S = 53.1 mph
Space mean speed in outer lanes,	S = N/A mph
Space mean speed for all vehicles,	S = 53.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Fax: 803-724-1201

Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2534	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	262	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3650	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2534	152	262	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	704	42	73	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

I-85 Southbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2682	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	495	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2682	495		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	745	138		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

Flow rate, vp 2040_No-Build_AM_SB_Exit_83_On_DS.txt 4097 619 pcph

Estimation of V12 Merge Areas

$$L_{EQ} = \text{(Equation 13-6 or 13-7)}$$

$$P_{FM} = 1.000 \text{ Using Equation 0}$$

$$v_{12} = v_F (P_{FM}) = 4097 \text{ pc/h}$$

Capacity Checks

	Actual 4716	Maximum 4700	LOS F? Yes
v_{FO}			
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4097$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual 4716	Max Desirable 4600	Violation? Yes
v_{R12}			

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 38.8$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M = 0.722
Space mean speed in ramp influence area,	S = 48.4 mph
Space mean speed in outer lanes,	S = N/A mph
Space mean speed for all vehicles,	S = 48.4 mph

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2682	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	495	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	106	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1560	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2682	495	106	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	745	138	29	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%			%
Length	mi			mi
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

No Build PM Peak
I-85 Northbound

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4115	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	148	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4115	148		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1143	41		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4115	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	148	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	392	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3650	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4115	148	392	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1143	41	109	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

I-85 Southbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4223	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	305	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4223	305		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1173	85		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

Flow rate, vp 2040_No-Build_PM_SB_Exit_83_On_DS.txt 6452 381 pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)
 $P = 1.000$ Using Equation 0
 $v_{12} = v_F (P_{FM}) = 6452$ pc/h

Capacity Checks

v_{FO}	Actual 6833	Maximum 4700	LOS F? Yes
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 6452$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

v_{R12}	Actual 6833	Max Desirable 4600	Violation? Yes
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Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 55.5$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	$M_S = 3.905$
Space mean speed in ramp influence area,	$S_R = -24.8$ mph
Space mean speed in outer lanes,	$S_0 = N/A$ mph
Space mean speed for all vehicles,	$S =$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4223	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	305	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	157	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1560	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4223	305	157	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1173	85	44	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

Build AM Peak
I-85 Northbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2534	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	1353	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2534	152		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	704	42		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	3871	190		pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

$$P_{FM} = 0.615 \text{ Using Equation 1}$$

$$v_{12} = v_{F, FM} (P_{FM}) = 2382 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	4061	7050	No
v_3 or v_{av34}	1489 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2382$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4061	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 17.0$ pc/mi /ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M_S = 0.277$	
Space mean speed in ramp influence area,	$S_R = 58.6$	mph
Space mean speed in outer lanes,	$S_0 = 61.4$	mph
Space mean speed for all vehicles,	$S = 59.6$	mph

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2534	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	1353	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	262	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1330	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2534	152	262	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	704	42	73	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3871	190	328	pcph

Estimation of V12 Merge Areas

L = 897.99 (Equation 13-6 or 13-7)

$$P_{FM} = 0.615 \text{ Using Equation 1}$$

$$v_{12} = v_{FM} (P_{FM}) = 2382 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	4061	7050	No
v_3 or v_{av34}	1489 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2382$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4061	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 17.0$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M_S = 0.277$	
Space mean speed in ramp influence area,	$S_R = 58.6$	mph
Space mean speed in outer lanes,	$S_0 = 61.4$	mph
Space mean speed for all vehicles,	$S = 59.6$	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2534	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	1353	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2534	152		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	704	42		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	3871	190		pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ
 $P = 0.194$ Using Equation 4
 $v_{12} = v_{FM} (P) = 751$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	4061	9400	No
v_3 or v_{av34}	1560 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 1548$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	4061	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 10.5$ pc/mi /ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M_S = 0.248$	
Space mean speed in ramp influence area,	$S_R = 59.3$	mph
Space mean speed in outer lanes,	$S_0 = 62.6$	mph
Space mean speed for all vehicles,	$S = 61.1$	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

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Fax: 803-724-1201

Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2534	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	1353	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	262	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1330	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2534	152	262	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	704	42	73	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3871	190	328	pcph

Estimation of V12 Merge Areas

L = 897.99 (Equation 13-6 or 13-7)

EQ
 $P = 0.194$ Using Equation 4
 $v_{12} = v_{F, FM} (P) = 751$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	4061	9400	No
v_3 or v_{av34}	1560 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 1548$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	4061	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 10.5$ pc/mi /ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M_S = 0.248$	
Space mean speed in ramp influence area,	$S_R = 59.3$	mph
Space mean speed in outer lanes,	$S_0 = 62.6$	mph
Space mean speed for all vehicles,	$S = 61.1$	mph

I-85 Southbound

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2682	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	495	vph
Length of first accel/decel lane	950	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2682	495		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	745	138		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	4097	619		pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

$$P_{FM} = \frac{v_{12}}{v_{F0}} = 0.604 \text{ Using Equation 1}$$

$$v_{12} = v_{FM} (P_{FM}) = 2475 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	4716	7050	No
v_3 or v_{av34}	1622 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2475$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4716	4600	No

Level of Service Determination (if not F)

$$Dens\ ity, D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 23.4 \text{ pc/mi /ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.341$	
Space mean speed in ramp influence area,	$S_R = 57.2$	mph
Space mean speed in outer lanes,	$S_0 = 61.0$	mph
Space mean speed for all vehicles,	$S = 58.4$	mph

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2682	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	495	vph
Length of first accel/decel lane	950	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	106	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2325	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2682	495	106	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	745	138	29	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4097	619	133	pcph

Estimation of V12 Merge Areas

L = 859.22 (Equation 13-6 or 13-7)

$$P_{FM} = 0.604 \text{ Using Equation 1}$$

$$v_{12} = v_{FM} (P_{FM}) = 2475 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	4716	7050	No
v_3 or v_{av34}	1622 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2475$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4716	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 23.4$ pc/mi /ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.341$	
Space mean speed in ramp influence area,	$S_R = 57.2$	mph
Space mean speed in outer lanes,	$S_0 = 61.0$	mph
Space mean speed for all vehicles,	$S = 58.4$	mph

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2682	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	495	vph
Length of first accel/decel lane	950	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2682	495		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	745	138		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	4097	619		pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ
 $P = 0.140$ Using Equation 4
 $v_{12} = v_{FM} (P_{FM}) = 575$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	4716	9400	No
v_3 or v_{av34}	1761 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 1638$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	4716	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 16.8$ pc/mi /ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M_S = 0.292$	
Space mean speed in ramp influence area,	$S_R = 58.3$	mph
Space mean speed in outer lanes,	$S_0 = 62.4$	mph
Space mean speed for all vehicles,	$S = 60.4$	mph

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2682	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	495	vph
Length of first accel/decel lane	950	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	106	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2325	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2682	495	106	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	745	138	29	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4097	619	133	pcph

Estimation of V12 Merge Areas

L = 859.22 (Equation 13-6 or 13-7)

EQ
 $P = 0.140$ Using Equation 4
 $v_{12} = v_{FM} (P_{FM}) = 575$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	4716	9400	No
v_3 or v_{av34}	1761 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 1638$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	4716	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 16.8$ pc/mi /ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M_S = 0.292$	
Space mean speed in ramp influence area,	$S_R = 58.3$	mph
Space mean speed in outer lanes,	$S_0 = 62.4$	mph
Space mean speed for all vehicles,	$S = 60.4$	mph

Build PM Peak
I-85 Northbound

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4115	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	148	vph
Length of first accel/decel lane	1353	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4115	148		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1143	41		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	6287	185		pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

$$P_{FM} = 0.615 \text{ Using Equation 1}$$

$$v_{12} = v_{F, FM} (P_{FM}) = 3869 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	6472	7050	No
v_3 or v_{av34}	2418 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3869$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	6472	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 28.5$ pc/mi /ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.451$	
Space mean speed in ramp influence area,	$S_R = 54.6$	mph
Space mean speed in outer lanes,	$S_0 = 57.8$	mph
Space mean speed for all vehicles,	$S = 55.8$	mph

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4115	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	148	vph
Length of first accel/decel lane	1353	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	405	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1330	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4115	148	405	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1143	41	113	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6287	185	506	pcph

Estimation of V12 Merge Areas

L = 1413.94 (Equation 13-6 or 13-7)

$$P_{FM} = 0.610 \text{ Using Equation 2}$$

$$v_{12} = v_{FM} (P_{FM}) = 3835 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	6472	7050	No
v_3 or v_{av34}	2452 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3835$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	6472	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 28.3$ pc/mi /ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.444$	
Space mean speed in ramp influence area,	$S_R = 54.8$	mph
Space mean speed in outer lanes,	$S_0 = 57.6$	mph
Space mean speed for all vehicles,	$S = 55.8$	mph

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 E-mail:

Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4115	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	148	vph
Length of first accel/decel lane	1353	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4115	148		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1143	41		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	6287	185		pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

2040_Bui l d_PM_NB_Exit_83_On_DS_4-Lanes_08122015. txt

$$P_{EQ} = 0.195 \text{ Using Equation 4}$$

$$v_{12} = v_{F, FM} (P_{EQ}) = 1224 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	6472	9400	No
v_3 or v_{av34}	2531 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 2514$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	6472	4600	No

Level of Service Determination (if not F)

$$Dens\ ity, D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 18.0 \text{ pc/mi /ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M_S = 0.284$	
Space mean speed in ramp influence area,	$S_R = 58.5$	mph
Space mean speed in outer lanes,	$S_0 = 60.0$	mph
Space mean speed for all vehicles,	$S = 59.4$	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

STV
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 Phone: 803-724-1430 Fax: 803-724-1201
 E-mail:

Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4115	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	148	vph
Length of first accel/decel lane	1353	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	405	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1330	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4115	148	405	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1143	41	113	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6287	185	506	pcph

Estimation of V12 Merge Areas

L = 1413.94 (Equation 13-6 or 13-7)

2040_Build_PM_NB_Exit_83_On_US_4-Lanes_08122015.txt

$$P_{EQ} = 0.195 \text{ Using Equation 4}$$

$$v_{12} = v_{F, FM} (P_{EQ}) = 1224 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	6472	9400	No
v_3 or v_{av34}	2531 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 2514$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	6472	4600	No

Level of Service Determination (if not F)

$$Density, D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 18.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$M_S = 0.284$	
Space mean speed in ramp influence area,	$S_R = 58.5$	mph
Space mean speed in outer lanes,	$S_0 = 60.0$	mph
Space mean speed for all vehicles,	$S = 59.4$	mph

I-85 Southbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4223	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	305	vph
Length of first accel/decel lane	950	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4223	305		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1173	85		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	6452	381		pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

$$P_{FM} = 0.604 \text{ Using Equation 1}$$

$$v_{12} = v_F(P_{FM}) = 3898 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	6833	7050	No
v_3 or v_{av34}	2554 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3898$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	6833	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 32.7$ pc/mi /ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.536$	
Space mean speed in ramp influence area,	$S_R = 52.7$	mph
Space mean speed in outer lanes,	$S_0 = 56.9$	mph
Space mean speed for all vehicles,	$S = 54.2$	mph

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Fax: 803-724-1201

Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4223	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	305	vph
Length of first accel/decel lane	950	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	157	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2325	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4223	305	157	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1173	85	44	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6452	381	196	pcph

Estimation of V12 Merge Areas

L = 1312.26 (Equation 13-6 or 13-7)

$$P_{FM} = 0.604 \text{ Using Equation 1}$$

$$v_{12} = v_F(P_{FM}) = 3898 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	6833	7050	No
v_3 or v_{av34}	2554 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3898$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	6833	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 32.7$ pc/mi /ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.536$	
Space mean speed in ramp influence area,	$S_R = 52.7$	mph
Space mean speed in outer lanes,	$S_0 = 56.9$	mph
Space mean speed for all vehicles,	$S = 54.2$	mph

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4223	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	305	vph
Length of first accel/decel lane	950	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4223	305		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1173	85		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	6452	381		pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ
 $P = 0.170$ Using Equation 4
 $v_{12} = v_{F, FM} (P) = 1098$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	6833	9400	No
v_3 or v_{av34}	2677 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 2580$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	6833	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 22.4$ pc/mi /ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.330$	
Space mean speed in ramp influence area,	$S_R = 57.4$	mph
Space mean speed in outer lanes,	$S_0 = 59.8$	mph
Space mean speed for all vehicles,	$S = 58.8$	mph

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Merge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4223	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	305	vph
Length of first accel/decel lane	950	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	157	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2325	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4223	305	157	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1173	85	44	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%		%	%
Length	mi		mi	mi
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6452	381	196	pcph

Estimation of V12 Merge Areas

L = 1312.26 (Equation 13-6 or 13-7)

EQ
 $P = 0.170$ Using Equation 4
 $v_{12} = v_{F, FM} (P) = 1098$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{F0}	6833	9400	No
v_3 or v_{av34}	2677 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 2580$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	6833	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 22.4$ pc/mi /ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$M_S = 0.330$	
Space mean speed in ramp influence area,	$S_R = 57.4$	mph
Space mean speed in outer lanes,	$S_0 = 59.8$	mph
Space mean speed for all vehicles,	$S = 58.8$	mph

Diverge Outputs
Existing AM Peak
I-85 Northbound

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1870	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	175	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	102	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3650	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1870	175	102	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	519	49	28	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1870	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	175	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	29	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	5140	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1870	175	29	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	519	49	8	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

I-85 Southbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1865	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	71	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	331	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1560	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1865	71	331	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	518	20	92	v
Trucks and buses	25	25	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	1.000	
Driver population factor, fP	1.00	1.00	1.00	

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 Widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1865	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	71	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1865	71		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	518	20		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

Flow rate, vp 2014_EX_AM_SB_Exit_83_Off_US.txt 2849 89 pcph

Estimation of V12 Diverge Areas

$$L = \text{EQ} \quad (\text{Equation 13-12 or 13-13})$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$v_{12} = v_R + (v_F - v_R) P = 2849 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2849	4700	No
$v_{12} = v_F - v_R$	2760	4700	No
v_R	89	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2849$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2849	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 24.7$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D = 0.436
Space mean speed in ramp influence area,	$S_R = 55.0$ mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$ mph
Space mean speed for all vehicles,	$S = 55.0$ mph

Existing PM Peak
I-85 Northbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

STV
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Fax: 803-724-1201

Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3015	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	262	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	99	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3650	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3015	262	99	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	838	73	28	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3015	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	262	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	53	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	5140	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3015	262	53	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	838	73	15	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

I-85 Southbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-85 Widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2930	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	105	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	204	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1560	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2930	105	204	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	814	29	57	v
Trucks and buses	25	25	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	1.000	
Driver population factor, fP	1.00	1.00	1.00	

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-8Y SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2014
 Description: I-8Y Widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2960	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	65.0	mph
Volume on ramp	105	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2960	105		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	814	29		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

No Build AM Peak
I-85 Northbound

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2796	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	262	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	152	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3650	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2796	262	152	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	777	73	42	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p

190

pcph

Estimation of V_{12} Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 $P_{EQ} = 1.000$ Using Equation 0
 $P_{FD} =$
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 4272$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4272	4700	No
$v_{FO} = v_F - v_R$	3944	4700	No
v_R	328	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12}/2$		No	
If yes, $v_{12A} = 4272$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4272	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 38.3$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$D = 0.458$	
Space mean speed in ramp influence area,	$S_R = 54.5$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 54.5$	mph

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2796	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	262	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	43	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	5140	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2796	262	43	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	777	73	12	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p

54

pcph

Estimation of V_{12} Diverge Areas

$$L = \text{EQ} \quad (\text{Equation 13-12 or 13-13})$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$v_{12} = v_R + (v_F - v_R) P = 4272 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4272	4700	No
$v_{12} = v_F - v_R$	3944	4700	No
v_R	328	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12}/2$		No	
If yes, $v_{12A} = 4272$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4272	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 38.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$D = 0.458$	
Space mean speed in ramp influence area,	$S_R = 54.5$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 54.5$	mph

I-85 Southbound

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2788	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	106	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	495	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1560	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2788	106	495	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	774	29	138	v
Trucks and buses	25	25	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	1.000	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp

550

pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)
 $P = 1.000$ Using Equation 0
 $P_{FD} = v_R + (v_F - v_R) P_{FD} = 4259$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4259	4700	No
$v_{FO} = v_F - v_R$	4126	4700	No
v_R	133	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4259$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4259	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 36.8$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, $D = 0.440$
 Space mean speed in ramp influence area, $S_R = 54.9$ mph
 Space mean speed in outer lanes, $S_0 = N/A$ mph
 Space mean speed for all vehicles, $S = 54.9$ mph

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-8Y SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-8Y Widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2788	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	65.0	mph
Volume on ramp	106	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2788	106		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	774	29		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

Flow rate, v_p

pcph

Estimation of V_{12} Diverge Areas

$L =$ (Equation 16-12 or 16-16)
 $P_{EQ} = 1.000$ Using Equation 0
 $P_{FD} =$
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 4259$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4259	4700	No
$v_{FO} = v_F - v_R$	4126	4700	No
v_R	166	2000	No
v_6 or v_{av64}	0 pc/h	(Equation 16-14 or 16-17)	
Is v_6 or $v_{av64} > 2700$ pc/h?		No	
Is v_6 or $v_{av64} > 1.5 v_{12}/2$		No	
If yes, $v_{12A} = 4259$		(Equation 16-15, 16-16, 16-18, or 16-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4259	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 66.8$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, $D = 0.440$
 Space mean speed in ramp influence area, $S_R = 54.9$ mph
 Space mean speed in outer lanes, $S_0 = N/A$ mph
 Space mean speed for all vehicles, $S = 54.9$ mph

No Build PM Peak
I-85 Northbound

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4507	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	392	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	148	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3650	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4507	392	148	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1252	109	41	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p

185

pcph

Estimation of V_{12} Diverge Areas

$$L = \text{EQ} \quad (\text{Equation 13-12 or 13-13})$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$v_{12} = v_R + (v_F - v_R) P = 6886 \quad \text{pc/h}$$

Capacity Checks

v_{12}	Actual	Maximum	LOS F?
v_{12}	6886	4700	Yes
v_{FO}	6396	4700	Yes
v_R	490	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12}/2$		No	
If yes, $v_{12A} = 6886$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

v_{12}	Actual	Max Desirable	Violation?
v_{12}	6886	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 60.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	$D_S = 0.472$	
Space mean speed in ramp influence area,	$S_R = 54.1$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 54.1$	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Fax: 803-724-1201

Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4507	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	392	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	79	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	5140	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4507	392	79	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1252	109	22	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p

99

pcph

Estimation of V_{12} Diverge Areas

$$L = \text{EQ} \quad (\text{Equation 13-12 or 13-13})$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$v_{12} = v_R + (v_F - v_R) P = 6886 \quad \text{pc/h}$$

Capacity Checks

v_{12}	Actual	Maximum	LOS F?
v_{12}	6886	4700	Yes
v_{FO}	6396	4700	Yes
v_R	490	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12}/2$		No	
If yes, $v_{12A} = 6886$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

v_{12}	Actual	Max Desirable	Violation?
v_{12}	6886	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 60.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	$D_S = 0.472$	
Space mean speed in ramp influence area,	$S_R = 54.1$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 54.1$	mph

I-85 Southbound

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-85 Widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4380	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	157	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	305	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1560	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4380	157	305	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1217	44	85	v
Trucks and buses	25	25	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	1.000	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp

339

pcph

Estimation of V12 Diverge Areas

$$L = \text{EQ} \quad (\text{Equation 13-12 or 13-13})$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$V_{12} = V_R + (V_F - V_R) P = 6692 \quad \text{pc/h}$$

Capacity Checks

$V_{12} = V_F$	Actual	Maximum	LOS F?
$V_{12} = V_F - V_R$	6692	4700	Yes
V_R	6496	4700	Yes
V_3 or v_{av34}	196	2000	No
V_3 or $v_{av34} > 2700$ pc/h?	0 pc/h	(Equation 13-14 or 13-17)	
V_3 or $v_{av34} > 1.5 v_{12}/2$		No	
If yes, $v_{12A} = 6692$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

v_{12}	Actual	Max Desirable	Violation?
	6692	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 57.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	$D = 0.446$	
Space mean speed in ramp influence area,	$S_R = 54.8$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 54.8$	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.2

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Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-8Y SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 No-Build
 Description: I-8Y Widening

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4680	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	65.0	mph
Volume on ramp	157	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4680	1Y7		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1217	44		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		

Flow rate, v_p

pcph

Estimation of V_{12} Diverge Areas

$$L = \text{EQ} \quad (\text{Equation 16-12 or 16-16})$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$v_{12} = v_R + (v_F - v_R) P = 6692 \text{ pc/h}$$

Capacity Checks

v_{12}	Actual	Maximum	LOS F?
v_{12}	6692	4700	Yes
v_{12}	6496	4700	Yes
v_{12}	196	2000	No
v_{12} or v_{12}	0 pc/h	(Equation 16-14 or 16-17)	
Is v_{12} or v_{12}	> 2700 pc/h?	No	
Is v_{12} or v_{12}	> 1.5 $v_{12}/2$	No	
If yes, v_{12}	= 6692	(Equation 16-15, 16-16, 16-18, or 16-19)	

Flow Entering Diverge Influence Area

v_{12}	Actual	Max Desirable	Violation?
v_{12}	6692	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 57.8$ pc/mi/ln
Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	$D = 0.446$	
Space mean speed in ramp influence area,	$S_R = 54.8$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 54.8$	mph

Build AM Peak
I-85 Northbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

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_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 8/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2797	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	263	vph
Length of first accel/decel lane	380	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	152	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1330	ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2797	263	152	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	777	73	42	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4273	329	190	pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$EQ$$

$$P = 0.638 \text{ Using Equation 5}$$

$$v_{12} = v_R + (v_F - v_R) P = 2845 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4273	7050	No
$v_{FO} = v_F - v_R$	3944	7050	No
v_R	329	2000	No
v_3 or v_{av34}	1428 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2845$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2845	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D = 25.3 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.458$	
Space mean speed in ramp influence area,	$S_R = 54.5$	mph
Space mean speed in outer lanes,	$S_O = 69.6$	mph
Space mean speed for all vehicles,	$S = 58.7$	mph

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_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2797	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	263	vph
Length of first accel/decel lane	380	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2797	263		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	777	73		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	4273	329		pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$EQ$$

$$P = 0.638 \text{ Using Equation 5}$$

$$v_{12} = v_R + (v_F - v_R) P = 2845 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4273	7050	No
$v_{FO} = v_F - v_R$	3944	7050	No
v_R	329	2000	No
v_3 or v_{av34}	1428 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2845$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2845	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D = 25.3$ pc/mi /ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.458$	
Space mean speed in ramp influence area,	$S_R = 54.5$	mph
Space mean speed in outer lanes,	$S_O = 69.6$	mph
Space mean speed for all vehicles,	$S = 58.7$	mph

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_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 8/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2797	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	263	vph
Length of first accel/decel lane	380	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	152	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1330	ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2797	263	152	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	777	73	42	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4273	329	190	pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$P_{EQ} = 0.436 \text{ Using Equation 8}$$

$$v_{12R} = v_{FR} + (v_{FD} - v_{FR}) P_{EQ} = 2049 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_{Fi}$	4273	9400	No
$v_{FO} = v_{FR} - v_{FR}$	3944	9400	No
v_R	329	2000	No
v_3 or v_{av34}	1112 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12R}$?		No	
If yes, $v_{12A} = 2049$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2049	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12R} - 0.009 L_D = 18.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.458$	
Space mean speed in ramp influence area,	$S_R = 54.5$	mph
Space mean speed in outer lanes,	$S_O = 70.9$	mph
Space mean speed for all vehicles,	$S = 61.9$	mph

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_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2797	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	263	vph
Length of first accel/decel lane	380	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2797	263		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	777	73		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	4273	329		pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$P_{FD} = 0.436 \text{ Using Equation 8}$$

$$v_{12R} = v_{FR} + (v_{FR} - v_{FD}) P_{FD} = 2049 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_{Fi}$	4273	9400	No
$v_{FO} = v_{FR} - v_{R}$	3944	9400	No
v_{R}	329	2000	No
$v_{3 \text{ or } v_{av34}}$	1112 pc/h	(Equation 13-14 or 13-17)	
Is $v_{3 \text{ or } v_{av34}} > 2700 \text{ pc/h?}$		No	
Is $v_{3 \text{ or } v_{av34}} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2049$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2049	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 18.5 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.458$	
Space mean speed in ramp influence area,	$S_R = 54.5$	mph
Space mean speed in outer lanes,	$S_O = 70.9$	mph
Space mean speed for all vehicles,	$S = 61.9$	mph

I-85 Southbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

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_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2788	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	106	vph
Length of first accel/decel lane	775	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	495	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2325	ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2788	106	495	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	774	29	138	v
Trucks and buses	25	25	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4259	133	550	pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$EQ$$

$$P = 0.647 \text{ Using Equation 5}$$

$$v_{12} = v_R + (v_F - v_R) P = 2804 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4259	7050	No
$v_{FO} = v_F - v_R$	4126	7050	No
v_R	133	2000	No
v_3 or v_{av34}	1455 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2804$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2804	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D = 21.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.440$	
Space mean speed in ramp influence area,	$S_R = 54.9$	mph
Space mean speed in outer lanes,	$S_O = 69.5$	mph
Space mean speed for all vehicles,	$S = 59.1$	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

STV
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Fax: 803-724-1201

_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2788	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	106	vph
Length of first accel/decel lane	775	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2788	106		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	774	29		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	4259	133		pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$EQ$$

$$P = 0.647 \text{ Using Equation 5}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 2804 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4259	7050	No
$v_{FO} = v_F - v_R$	4126	7050	No
v_R	133	2000	No
v_3 or v_{av34}	1455 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2804$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2804	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D = 21.4 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.440$	
Space mean speed in ramp influence area,	$S_R = 54.9$	mph
Space mean speed in outer lanes,	$S_O = 69.5$	mph
Space mean speed for all vehicles,	$S = 59.1$	mph

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_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2788	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	106	vph
Length of first accel/decel lane	775	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	495	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2325	ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2788	106	495	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	774	29	138	v
Trucks and buses	25	25	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4259	133	550	pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$EQ$$

$$P = 0.436 \text{ Using Equation 8}$$

$$v_{12} = v_R + (v_F - v_R) P = 1932 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4259	9400	No
$v_{FO} = v_F - v_R$	4126	9400	No
v_R	133	2000	No
v_3 or v_{av34}	1163 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 1932$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1932	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D = 13.9 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.440$	
Space mean speed in ramp influence area,	$S_R = 54.9$	mph
Space mean speed in outer lanes,	$S_O = 70.7$	mph
Space mean speed for all vehicles,	$S = 62.5$	mph

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_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: AM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2788	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	106	vph
Length of first accel/decel lane	775	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2788	106		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	774	29		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	4259	133		pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$EQ$$

$$P = 0.436 \text{ Using Equation 8}$$

$$v_{12} = v_R + (v_F - v_R) P = 1932 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4259	9400	No
$v_{FO} = v_F - v_R$	4126	9400	No
v_R	133	2000	No
v_3 or v_{av34}	1163 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 1932$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1932	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D = 13.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	$D_S = 0.440$	
Space mean speed in ramp influence area,	$S_R = 54.9$	mph
Space mean speed in outer lanes,	$S_O = 70.7$	mph
Space mean speed for all vehicles,	$S = 62.5$	mph

Build PM Peak
I-85 Northbound

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Fax: 803-724-1201

 Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 widening

 Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4507	vph

 Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	392	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

 Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	148	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3650	ft

 Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4507	392	148	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1252	109	41	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

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Fax: 803-724-1201

 Diverge Analysis

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 12/26/2014
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

 Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4507	vph

 Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	392	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

 Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	79	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	5140	ft

 Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4507	392	79	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1252	109	22	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	

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_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4520	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	405	vph
Length of first accel/decel lane	380	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	148	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1330	ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4520	405	148	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1256	113	41	v
Trucks and buses	25	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6906	506	185	pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$P_{FD} = 0.436 \text{ Using Equation 8}$$

$$v_{12R} = v_{FR} + (v_{FR} - v_{FD}) P_{FD} = 3296 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_{Fi}$	6906	9400	No
$v_{FO} = v_{FR} - v_{R}$	6400	9400	No
v_{R}	506	2000	No
$v_{3 \text{ or } v_{av34}}$	1805 pc/h	(Equation 13-14 or 13-17)	
Is $v_{3 \text{ or } v_{av34}} > 2700 \text{ pc/h?}$		No	
Is $v_{3 \text{ or } v_{av34}} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3296$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3296	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 29.2 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$D_S = 0.474$	
Space mean speed in ramp influence area,	$S_R = 54.1$	mph
Space mean speed in outer lanes,	$S_O = 68.2$	mph
Space mean speed for all vehicles,	$S = 60.6$	mph

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_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 NB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4520	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	405	vph
Length of first accel/decel lane	380	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4520	405		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1256	113		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	6906	506		pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$EQ$$

$$P = 0.436 \text{ Using Equation 8}$$

$$v_{12} = v_R + (v_F - v_R) P = 3296 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6906	9400	No
$v_{FO} = v_F - v_R$	6400	9400	No
v_R	506	2000	No
v_3 or v_{av34}	1805 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3296$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3296	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D = 29.2$ pc/mi /ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$D_S = 0.474$	
Space mean speed in ramp influence area,	$S_R = 54.1$	mph
Space mean speed in outer lanes,	$S_O = 68.2$	mph
Space mean speed for all vehicles,	$S = 60.6$	mph

I-85 Southbound

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

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_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4380	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	157	vph
Length of first accel/decel lane	775	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	305	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2325	ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4380	157	305	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1217	44	85	v
Trucks and buses	25	25	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6692	196	339	pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$EQ$$

$$P = 0.584 \text{ Using Equation 5}$$

$$v_{12} = v_R + (v_F - v_R) P = 3988 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6692	7050	No
$v_{FO} = v_F - v_R$	6496	7050	No
v_R	196	2000	No
v_3 or v_{av34}	2704 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		Yes	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3992$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3992	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D = 31.6$ pc/mi /ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$D_S = 0.446$	
Space mean speed in ramp influence area,	$S_R = 54.8$	mph
Space mean speed in outer lanes,	$S_O = 64.7$	mph
Space mean speed for all vehicles,	$S = 58.4$	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

STV
 1320 Main Street
 Suite 300
 Columbia, SC 29201
 Phone: 803-724-1430
 E-mail:

Fax: 803-724-1201

_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4380	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	157	vph
Length of first accel/decel lane	775	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4380	157		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1217	44		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	6692	196		pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$EQ$$

$$P = 0.584 \text{ Using Equation 5}$$

$$v_{12} = v_R + (v_F - v_R) P = 3988 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6692	7050	No
$v_{FO} = v_F - v_R$	6496	7050	No
v_R	196	2000	No
v_3 or v_{av34}	2704 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		Yes	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3992$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3992	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D = 31.6 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$D_S = 0.446$	
Space mean speed in ramp influence area,	$S_R = 54.8$	mph
Space mean speed in outer lanes,	$S_O = 64.7$	mph
Space mean speed for all vehicles,	$S = 58.4$	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

STV
 1320 Main Street
 Suite 300
 Columbia, SC 29201
 Phone: 803-724-1430
 E-mail:

Fax: 803-724-1201

_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4380	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	157	vph
Length of first accel/decel lane	775	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	305	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2325	ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4380	157	305	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1217	44	85	v
Trucks and buses	25	25	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	
Heavy vehicle adjustment, fHV	0.727	0.889	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6692	196	339	pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$EQ$$

$$P = 0.436 \text{ Using Equation 8}$$

$$v_{12} = v_R + (v_F - v_R) P = 3028 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6692	9400	No
$v_{FO} = v_F - v_R$	6496	9400	No
v_R	196	2000	No
v_3 or v_{av34}	1832 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3028$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3028	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D = 23.3$ pc/mi /ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.446$	
Space mean speed in ramp influence area,	$S_R = 54.8$	mph
Space mean speed in outer lanes,	$S_O = 68.1$	mph
Space mean speed for all vehicles,	$S = 61.3$	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

STV
 1320 Main Street
 Suite 300
 Columbia, SC 29201
 Phone: 803-724-1430 Fax: 803-724-1201
 E-mail:

_____ Diverge Analysis _____

Analyst: RJD
 Agency/Co.: STV Incorporated
 Date performed: 08/12/2015
 Analysis time period: PM Peak
 Freeway/Dir of Travel: I-85 SB
 Junction: Exit 83
 Jurisdiction: Spartanburg County
 Analysis Year: 2040 Build
 Description: I-85 Widening

_____ Freeway Data _____

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4380	vph

_____ Off Ramp Data _____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	157	vph
Length of first accel/decel lane	775	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4380	157		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1217	44		v
Trucks and buses	25	25		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	1.5		
Recreational vehicle PCE, ER	2.0	1.2		
Heavy vehicle adjustment, fHV	0.727	0.889		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	6692	196		pcph

_____ Estimation of V12 Diverge Areas _____

L = (Equation 13-12 or 13-13)

$$EQ$$

$$P = 0.436 \text{ Using Equation 8}$$

$$v_{12} = v_R + (v_F - v_R) P = 3028 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6692	9400	No
$v_{FO} = v_F - v_R$	6496	9400	No
v_R	196	2000	No
v_3 or v_{av34}	1832 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3028$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3028	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D = 23.3 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D_S = 0.446$	
Space mean speed in ramp influence area,	$S_R = 54.8$	mph
Space mean speed in outer lanes,	$S_O = 68.1$	mph
Space mean speed for all vehicles,	$S = 61.3$	mph

Appendix C

Intersection HCM Synchro Outputs

Existing Exit 83
AM Peak Hour

HCM Unsignalized Intersection Capacity Analysis

8301: Battleground Road & Horry Road

5/18/2015

	↑	↖	↙	↓	↘	↗
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↖			↗		↗
Volume (veh/h)	152	0	106	204	1	11
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	190	0	132	255	1	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			190		710	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			190		710	190
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			90		100	98
cM capacity (veh/h)			1366		351	832
Direction, Lane #	NB 1	SB 1	NW 1			
Volume Total	190	388	15			
Volume Left	0	132	1			
Volume Right	0	0	14			
cSH	1700	1366	746			
Volume to Capacity	0.11	0.10	0.02			
Queue Length 95th (ft)	0	8	2			
Control Delay (s)	0.0	3.3	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.3	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			Err%	ICU Level of Service		H
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8302: Battleground Road & Phillips Drive

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	7	4	20	51	1	1	37	144	209	4	178	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	4	22	57	1	1	41	160	232	4	198	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	579	462	211	602	565	276	198			160		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	579	462	211	602	565	276	198			160		
tC, single (s)	7.2	6.6	6.3	7.3	6.7	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.5	2.2			2.2		
p0 queue free %	98	99	97	84	100	100	97			100		
cM capacity (veh/h)	397	464	800	362	396	719	1363			1425		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	34	59	433	228
Volume Left	8	57	41	4
Volume Right	22	1	232	26
cSH	605	366	1363	1425
Volume to Capacity	0.06	0.16	0.03	0.00
Queue Length 95th (ft)	5	14	2	0
Control Delay (s)	11.3	16.7	1.0	0.2
Lane LOS	B	C	A	A
Approach Delay (s)	11.3	16.7	1.0	0.2
Approach LOS	B	C		

Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization	53.0%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8303: Phillips Drive & Horry Road

5/18/2015



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	4	102	0	47	9	0	2	12	203	13	6	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	5	121	0	56	11	0	2	14	242	15	7	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	11			121			258	254	121	261	254	11
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			121			258	254	121	261	254	11
tC, single (s)	4.2			4.3			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.4			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			96			100	98	73	97	99	100
cM capacity (veh/h)	1583			1372			642	602	898	472	612	1053

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	126	67	258	24
Volume Left	5	56	2	15
Volume Right	0	0	242	1
cSH	1583	1372	872	522
Volume to Capacity	0.00	0.04	0.30	0.05
Queue Length 95th (ft)	0	3	31	4
Control Delay (s)	0.3	6.5	10.9	12.2
Lane LOS	A	A	B	B
Approach Delay (s)	0.3	6.5	10.9	12.2
Approach LOS			B	B

Intersection Summary			
Average Delay		7.5	
Intersection Capacity Utilization	29.7%		ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis
 8304: I-85 SB on-ramp/I-85 SB off-ramp & Horry Road

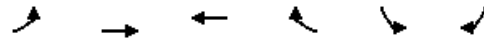
5/18/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↔		↔	
Sign Control		Stop	Yield		Stop	
Volume (vph)	0	0	27	56	14	304
Peak Hour Factor	0.57	0.57	0.57	0.57	0.57	0.57
Hourly flow rate (vph)	0	0	47	98	25	533
Direction, Lane #	WB 1	SB 1				
Volume Total (vph)	146	558				
Volume Left (vph)	0	25				
Volume Right (vph)	98	533				
Hadj (s)	-0.12	-0.48				
Departure Headway (s)	4.9	3.8				
Degree Utilization, x	0.20	0.59				
Capacity (veh/h)	665	928				
Control Delay (s)	9.2	12.1				
Approach Delay (s)	9.2	12.1				
Approach LOS	A	B				
Intersection Summary						
Delay			11.5			
Level of Service			B			
Intersection Capacity Utilization			31.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8305: I-85 SB off-ramp

10/20/2015

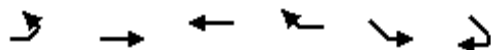


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	14	0	44	27	0	39
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	18	0	55	34	0	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	89				107	72
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	89				107	72
tC, single (s)	4.5				7.0	6.8
tC, 2 stage (s)						
tF (s)	2.6				4.0	3.8
p0 queue free %	99				100	94
cM capacity (veh/h)	1280				763	857
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	18	89	49			
Volume Left	18	0	0			
Volume Right	0	34	49			
cSH	1280	1700	857			
Volume to Capacity	0.01	0.05	0.06			
Queue Length 95th (ft)	1	0	5			
Control Delay (s)	7.9	0.0	9.5			
Lane LOS	A		A			
Approach Delay (s)	7.9	0.0	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization			14.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8306: Frontage Road

5/18/2015



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑	↑		↘	
Volume (veh/h)	0	15	10	0	175	0
Sign Control		Yield	Yield		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	0	20	13	0	230	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	467	461	461	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	467	461	461	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.2	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.3	
p0 queue free %	100	95	97	100	86	
cM capacity (veh/h)	442	428	428	1091	1591	

Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	20	13	230
Volume Left	0	0	230
Volume Right	0	0	0
cSH	428	428	1591
Volume to Capacity	0.05	0.03	0.14
Queue Length 95th (ft)	4	2	13
Control Delay (s)	13.8	13.7	7.6
Lane LOS	B	B	A
Approach Delay (s)	13.8	13.7	7.6
Approach LOS	B	B	

Intersection Summary			
Average Delay		8.4	
Intersection Capacity Utilization		19.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

8307: Battleground Road & Frontage Road

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	50	7	133	0	0	8	3	332	2	34	208	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.9			5.9	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.91			0.86			1.00			1.00	
Flt Protected		0.99			1.00			1.00			0.99	
Satd. Flow (prot)		1544			1255			1725			1757	
Flt Permitted		0.91			1.00			1.00			0.91	
Satd. Flow (perm)		1419			1255			1721			1613	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	56	8	149	0	0	9	3	373	2	38	234	8
RTOR Reduction (vph)	0	114	0	0	7	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	99	0	0	2	0	0	377	0	0	278	0
Heavy Vehicles (%)	10%	10%	10%	31%	31%	31%	10%	10%	10%	7%	7%	7%
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		8.6			8.6			17.6			17.6	
Effective Green, g (s)		8.6			8.6			17.6			17.6	
Actuated g/C Ratio		0.23			0.23			0.47			0.47	
Clearance Time (s)		5.0			5.0			5.9			5.9	
Vehicle Extension (s)		4.0			4.0			2.5			2.5	
Lane Grp Cap (vph)		328			290			816			765	
v/s Ratio Prot					0.00							
v/s Ratio Perm		c0.07						c0.22			0.17	
v/c Ratio		0.30			0.01			0.46			0.36	
Uniform Delay, d1		11.8			11.0			6.6			6.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.7			0.0			0.3			0.2	
Delay (s)		12.5			11.0			6.9			6.4	
Level of Service		B			B			A			A	
Approach Delay (s)		12.5			11.0			6.9			6.4	
Approach LOS		B			B			A			A	

Intersection Summary

HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	37.1	Sum of lost time (s)	10.9
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8308: Edgefield Road & Frontage Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	39	4	2	63	7	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	53	5	3	86	10	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	105	14	18			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	105	14	18			
tC, single (s)	6.6	6.4	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.5	2.3			
p0 queue free %	94	99	100			
cM capacity (veh/h)	851	1019	1524			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	59	89	18			
Volume Left	53	3	0			
Volume Right	5	0	8			
cSH	864	1524	1700			
Volume to Capacity	0.07	0.00	0.01			
Queue Length 95th (ft)	5	0	0			
Control Delay (s)	9.5	0.2	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.5	0.2	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			14.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8309: Edgefield Road/I-85 NB on-ramp

10/20/2015

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑				↘	
Volume (veh/h)	102	0	0	0	13	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	113	0	0	0	14	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			113		113	113
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			113		113	113
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1476		883	939
Direction, Lane #	EB 1	NB 1				
Volume Total	113	14				
Volume Left	0	14				
Volume Right	0	0				
cSH	1700	883				
Volume to Capacity	0.07	0.02				
Queue Length 95th (ft)	0	1				
Control Delay (s)	0.0	9.1				
Lane LOS		A				
Approach Delay (s)	0.0	9.1				
Approach LOS		A				
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			15.4%	ICU Level of Service	A	
Analysis Period (min)			15			

PM Peak Hour

HCM Unsignalized Intersection Capacity Analysis
 8301: Battleground Road & Horry Road

5/18/2015

	↑	↖	↙	↓	↘	↗
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↗			↖		↗
Volume (veh/h)	255	0	57	151	0	24
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	283	0	63	168	0	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			283		578	283
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			283		578	283
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		100	96
cM capacity (veh/h)			1262		449	748
Direction, Lane #	NB 1	SB 1	NW 1			
Volume Total	283	231	27			
Volume Left	0	63	0			
Volume Right	0	0	27			
cSH	1700	1262	748			
Volume to Capacity	0.17	0.05	0.04			
Queue Length 95th (ft)	0	4	3			
Control Delay (s)	0.0	2.5	10.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.5	10.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			31.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
8302: Battleground Road & Phillips Drive

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	11	9	30	69	4	2	14	242	138	0	142	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	14	12	39	90	5	3	18	314	179	0	184	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	636	541	190	675	625	404	184			314		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	636	541	190	675	625	404	184			314		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.2		
p0 queue free %	96	97	95	73	99	100	99			100		
cM capacity (veh/h)	381	442	851	332	387	632	1378			1257		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	65	97	512	196
Volume Left	14	90	18	0
Volume Right	39	3	179	12
cSH	592	339	1378	1257
Volume to Capacity	0.11	0.29	0.01	0.00
Queue Length 95th (ft)	9	29	1	0
Control Delay (s)	11.8	19.9	0.4	0.0
Lane LOS	B	C	A	
Approach Delay (s)	11.8	19.9	0.4	0.0
Approach LOS	B	C		

Intersection Summary			
Average Delay		3.3	
Intersection Capacity Utilization	50.6%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8303: Phillips Drive & Horry Road

5/18/2015



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	5	52	0	66	20	0	0	14	133	10	9	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	7	70	0	89	27	0	0	19	180	14	12	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	27			70			301	289	70	299	289	27
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	27			70			301	289	70	299	289	27
tC, single (s)	4.1			4.2			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	100			94			100	97	81	97	98	99
cM capacity (veh/h)	1580			1457			587	564	962	492	580	1048

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	77	116	199	31
Volume Left	7	89	0	14
Volume Right	0	0	180	5
cSH	1580	1457	902	580
Volume to Capacity	0.00	0.06	0.22	0.05
Queue Length 95th (ft)	0	5	21	4
Control Delay (s)	0.7	6.0	10.1	11.6
Lane LOS	A	A	B	B
Approach Delay (s)	0.7	6.0	10.1	11.6
Approach LOS			B	B

Intersection Summary

Average Delay		7.4		
Intersection Capacity Utilization		27.9%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
 8304: I-85 SB on-ramp/I-85 SB off-ramp & Horry Road

5/18/2015

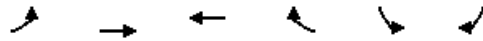


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Yield		Stop	
Volume (vph)	0	0	25	86	16	179
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	0	33	115	21	239
Direction, Lane #	WB 1	SB 1				
Volume Total (vph)	148	260				
Volume Left (vph)	0	21				
Volume Right (vph)	115	239				
Hadj (s)	-0.43	-0.48				
Departure Headway (s)	4.0	3.7				
Degree Utilization, x	0.16	0.27				
Capacity (veh/h)	843	930				
Control Delay (s)	7.8	8.1				
Approach Delay (s)	7.8	8.1				
Approach LOS	A	A				
Intersection Summary						
Delay			8.0			
Level of Service			A			
Intersection Capacity Utilization			25.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8305: I-85 SB off-ramp

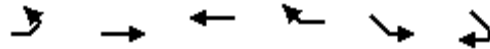
10/20/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	0	79	26	0	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	0	88	29	0	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	117				138	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	117				138	102
tC, single (s)	4.5				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.6				3.7	3.5
p0 queue free %	99				100	96
cM capacity (veh/h)	1253				801	903
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	18	117	36			
Volume Left	18	0	0			
Volume Right	0	29	36			
cSH	1253	1700	903			
Volume to Capacity	0.01	0.07	0.04			
Queue Length 95th (ft)	1	0	3			
Control Delay (s)	7.9	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	7.9	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization		15.7%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
8306: Frontage Road

5/18/2015



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑	↑		↘	
Volume (veh/h)	0	24	15	0	259	3
Sign Control		Yield	Yield		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	30	19	0	328	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	667	658	656	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	667	658	656	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.2	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.3	
p0 queue free %	100	90	94	100	79	
cM capacity (veh/h)	301	308	308	1091	1597	

Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	30	19	332
Volume Left	0	0	328
Volume Right	0	0	4
cSH	308	308	1597
Volume to Capacity	0.10	0.06	0.21
Queue Length 95th (ft)	8	5	19
Control Delay (s)	18.0	17.4	7.8
Lane LOS	C	C	A
Approach Delay (s)	18.0	17.4	7.8
Approach LOS	C	C	

Intersection Summary			
Average Delay		9.1	
Intersection Capacity Utilization		24.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

8307: Battleground Road & Frontage Road

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	92	16	175	2	1	9	9	293	3	31	205	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.9			5.9	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.92			0.90			1.00			1.00	
Flt Protected		0.98			0.99			1.00			0.99	
Satd. Flow (prot)		1572			1522			1788			1760	
Flt Permitted		0.89			0.94			0.99			0.92	
Satd. Flow (perm)		1416			1439			1766			1627	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	17	190	2	1	10	10	318	3	34	223	5
RTOR Reduction (vph)	0	81	0	0	7	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	226	0	0	6	0	0	330	0	0	261	0
Heavy Vehicles (%)	9%	9%	9%	11%	11%	11%	6%	6%	6%	7%	7%	7%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		11.4			11.4			15.2			15.2	
Effective Green, g (s)		11.4			11.4			15.2			15.2	
Actuated g/C Ratio		0.30			0.30			0.41			0.41	
Clearance Time (s)		5.0			5.0			5.9			5.9	
Vehicle Extension (s)		4.0			4.0			2.5			2.5	
Lane Grp Cap (vph)		430			437			715			659	
v/s Ratio Prot												
v/s Ratio Perm		c0.16			0.00			c0.19			0.16	
v/c Ratio		0.52			0.01			0.46			0.40	
Uniform Delay, d1		10.8			9.1			8.2			7.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.5			0.0			0.3			0.3	
Delay (s)		12.3			9.1			8.5			8.2	
Level of Service		B			A			A			A	
Approach Delay (s)		12.3			9.1			8.5			8.2	
Approach LOS		B			A			A			A	

Intersection Summary

HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	37.5	Sum of lost time (s)	10.9
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

8308: Edgefield Road & Frontage Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	42	8	3	57	6	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	49	9	3	66	7	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	85	12	17			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	85	12	17			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	95	99	100			
cM capacity (veh/h)	904	1057	1555			
Direction, Lane #						
	EB 1	NB 1	SB 1			
Volume Total	58	70	17			
Volume Left	49	3	0			
Volume Right	9	0	10			
cSH	925	1555	1700			
Volume to Capacity	0.06	0.00	0.01			
Queue Length 95th (ft)	5	0	0			
Control Delay (s)	9.2	0.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.2	0.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.8			
Intersection Capacity Utilization		15.4%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8309: Edgefield Road/I-85 NB on-ramp

10/20/2015

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑				↘	
Volume (veh/h)	99	0	0	0	15	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	110	0	0	0	17	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			110		110	110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			110		110	110
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1480		887	943
Direction, Lane #	EB 1	NW 1				
Volume Total	110	17				
Volume Left	0	17				
Volume Right	0	0				
cSH	1700	887				
Volume to Capacity	0.06	0.02				
Queue Length 95th (ft)	0	1				
Control Delay (s)	0.0	9.1				
Lane LOS		A				
Approach Delay (s)	0.0	9.1				
Approach LOS		A				
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			15.2%		ICU Level of Service	A
Analysis Period (min)			15			

No Build Exit 83
AM Peak Hour

HCM Unsignalized Intersection Capacity Analysis

8301: Battleground Road & Horry Road

5/18/2015

	↑	↖	↙	↓	↘	↗
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↖			↗		↗
Volume (veh/h)	227	0	158	305	1	17
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	284	0	198	381	1	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			284	1060	284	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			284	1060	284	
tC, single (s)			4.1	6.5	6.3	
tC, 2 stage (s)						
tF (s)			2.2	3.6	3.4	
p0 queue free %			84	99	97	
cM capacity (veh/h)			1261	202	737	
Direction, Lane #	NB 1	SB 1	NW 1			
Volume Total	284	579	22			
Volume Left	0	198	1			
Volume Right	0	0	21			
cSH	1700	1261	642			
Volume to Capacity	0.17	0.16	0.04			
Queue Length 95th (ft)	0	14	3			
Control Delay (s)	0.0	4.0	10.8			
Lane LOS		A	B			
Approach Delay (s)	0.0	4.0	10.8			
Approach LOS			B			
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			Err%	ICU Level of Service		H
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8302: Battleground Road & Phillips Drive

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	10	6	30	76	1	2	55	215	313	6	266	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	7	33	84	1	2	61	239	348	7	296	38
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	866	689	314	899	844	413	296			239		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	866	689	314	899	844	413	296			239		
tC, single (s)	7.2	6.6	6.3	7.3	6.7	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.5	2.2			2.2		
p0 queue free %	96	98	95	61	100	100	95			100		
cM capacity (veh/h)	249	335	699	216	265	600	1255			1334		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	51	88	648	340
Volume Left	11	84	61	7
Volume Right	33	2	348	38
cSH	455	220	1255	1334
Volume to Capacity	0.11	0.40	0.05	0.00
Queue Length 95th (ft)	9	45	4	0
Control Delay (s)	13.9	31.7	1.3	0.2
Lane LOS	B	D	A	A
Approach Delay (s)	13.9	31.7	1.3	0.2
Approach LOS	B	D		

Intersection Summary			
Average Delay		3.9	
Intersection Capacity Utilization	71.0%		ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
8303: Phillips Drive & Horry Road

5/18/2015



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	6	152	0	70	14	0	3	18	304	20	9	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	7	181	0	83	17	0	4	21	362	24	11	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	17			181			385	379	181	389	379	17
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	17			181			385	379	181	389	379	17
tC, single (s)	4.2			4.3			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.4			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			94			99	96	56	92	98	100
cM capacity (veh/h)	1575			1304			514	499	832	290	507	1045

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	188	100	387	36
Volume Left	7	83	4	24
Volume Right	0	0	362	1
cSH	1575	1304	798	342
Volume to Capacity	0.00	0.06	0.49	0.10
Queue Length 95th (ft)	0	5	67	9
Control Delay (s)	0.3	6.7	13.7	16.8
Lane LOS	A	A	B	C
Approach Delay (s)	0.3	6.7	13.7	16.8
Approach LOS			B	C

Intersection Summary			
Average Delay		9.3	
Intersection Capacity Utilization	42.8%		ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis
 8304: I-85 SB on-ramp/I-85 SB off-ramp & Horry Road

5/18/2015

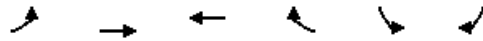


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↔		↔	
Sign Control		Stop	Yield		Stop	
Volume (vph)	0	0	40	84	21	455
Peak Hour Factor	0.57	0.57	0.57	0.57	0.57	0.57
Hourly flow rate (vph)	0	0	70	147	37	798
Direction, Lane #	WB 1	SB 1				
Volume Total (vph)	218	835				
Volume Left (vph)	0	37				
Volume Right (vph)	147	798				
Hadj (s)	-0.12	-0.48				
Departure Headway (s)	5.6	4.1				
Degree Utilization, x	0.34	0.95				
Capacity (veh/h)	630	871				
Control Delay (s)	11.5	38.3				
Approach Delay (s)	11.5	38.3				
Approach LOS	B	E				
Intersection Summary						
Delay			32.8			
Level of Service			D			
Intersection Capacity Utilization			43.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8305: I-85 SB off-ramp

10/20/2015

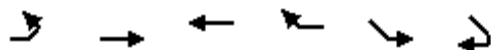


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	21	0	66	40	0	58
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	26	0	82	50	0	72
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	132				160	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	132				160	108
tC, single (s)	4.5				7.0	6.8
tC, 2 stage (s)						
tF (s)	2.6				4.0	3.8
p0 queue free %	98				100	91
cM capacity (veh/h)	1230				703	816
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	26	132	72			
Volume Left	26	0	0			
Volume Right	0	50	72			
cSH	1230	1700	816			
Volume to Capacity	0.02	0.08	0.09			
Queue Length 95th (ft)	2	0	7			
Control Delay (s)	8.0	0.0	9.8			
Lane LOS	A		A			
Approach Delay (s)	8.0	0.0	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			4.0			
Intersection Capacity Utilization			16.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8306: Frontage Road

5/18/2015



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑	↑		↘	
Volume (veh/h)	0	22	14	0	262	0
Sign Control		Yield	Yield		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	0	29	18	0	345	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	699	689	689	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	699	689	689	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.2	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.3	
p0 queue free %	100	90	94	100	78	
cM capacity (veh/h)	284	291	291	1091	1591	

Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	29	18	345
Volume Left	0	0	345
Volume Right	0	0	0
cSH	291	291	1591
Volume to Capacity	0.10	0.06	0.22
Queue Length 95th (ft)	8	5	21
Control Delay (s)	18.8	18.2	7.9
Lane LOS	C	C	A
Approach Delay (s)	18.8	18.2	7.9
Approach LOS	C	C	

Intersection Summary			
Average Delay		9.2	
Intersection Capacity Utilization		24.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

8307: Battleground Road & Frontage Road

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	75	10	199	0	0	12	4	496	3	51	311	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.9			5.9	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.91			0.86			1.00			1.00	
Flt Protected		0.99			1.00			1.00			0.99	
Satd. Flow (prot)		1543			1255			1725			1757	
Flt Permitted		0.91			1.00			1.00			0.88	
Satd. Flow (perm)		1417			1255			1720			1554	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	84	11	224	0	0	13	4	557	3	57	349	11
RTOR Reduction (vph)	0	125	0	0	9	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	194	0	0	4	0	0	563	0	0	415	0
Heavy Vehicles (%)	10%	10%	10%	31%	31%	31%	10%	10%	10%	7%	7%	7%
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		11.8			11.8			19.9			19.9	
Effective Green, g (s)		11.8			11.8			19.9			19.9	
Actuated g/C Ratio		0.28			0.28			0.47			0.47	
Clearance Time (s)		5.0			5.0			5.9			5.9	
Vehicle Extension (s)		4.0			4.0			2.5			2.5	
Lane Grp Cap (vph)		392			347			803			725	
v/s Ratio Prot					0.00							
v/s Ratio Perm		c0.14						c0.33			0.27	
v/c Ratio		0.49			0.01			0.70			0.57	
Uniform Delay, d1		12.9			11.2			9.0			8.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.3			0.0			2.6			0.9	
Delay (s)		14.2			11.2			11.6			9.2	
Level of Service		B			B			B			A	
Approach Delay (s)		14.2			11.2			11.6			9.2	
Approach LOS		B			B			B			A	

Intersection Summary

HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	42.6	Sum of lost time (s)	10.9
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

8308: Edgefield Road & Frontage Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	58	6	3	94	10	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	79	8	4	129	14	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	157	20	26			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	157	20	26			
tC, single (s)	6.6	6.4	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.5	2.3			
p0 queue free %	90	99	100			
cM capacity (veh/h)	794	1011	1514			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	88	133	26			
Volume Left	79	4	0			
Volume Right	8	0	12			
cSH	810	1514	1700			
Volume to Capacity	0.11	0.00	0.02			
Queue Length 95th (ft)	9	0	0			
Control Delay (s)	10.0	0.2	0.0			
Lane LOS	A	A				
Approach Delay (s)	10.0	0.2	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			17.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8309: Edgefield Road/I-85 NB on-ramp

10/20/2015

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑				↘	
Volume (veh/h)	152	0	0	0	19	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	169	0	0	0	21	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			169			169
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			169			169
tC, single (s)			4.1			6.2
tC, 2 stage (s)						
tF (s)			2.2			3.3
p0 queue free %			100			97
cM capacity (veh/h)			1409			821
Direction, Lane #						
	EB 1	NB 1				
Volume Total	169	21				
Volume Left	0	21				
Volume Right	0	0				
cSH	1700	821				
Volume to Capacity	0.10	0.03				
Queue Length 95th (ft)	0	2				
Control Delay (s)	0.0	9.5				
Lane LOS	A					
Approach Delay (s)	0.0	9.5				
Approach LOS	A					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			18.0%	ICU Level of Service	A	
Analysis Period (min)	15					

PM Peak Hour

HCM Unsignalized Intersection Capacity Analysis

8301: Battleground Road & Horry Road

5/18/2015

	↑	↖	↙	↓	↘	↗
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↖			↗		↗
Volume (veh/h)	381	0	85	226	0	36
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	423	0	94	251	0	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			423		863	423
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			423		863	423
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		100	94
cM capacity (veh/h)			1120		294	624
Direction, Lane #	NB 1	SB 1	NW 1			
Volume Total	423	346	40			
Volume Left	0	94	0			
Volume Right	0	0	40			
cSH	1700	1120	624			
Volume to Capacity	0.25	0.08	0.06			
Queue Length 95th (ft)	0	7	5			
Control Delay (s)	0.0	2.9	11.2			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.9	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			43.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8302: Battleground Road & Phillips Drive

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Volume (veh/h)	16	14	45	103	6	3	21	362	206	0	212	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	21	18	58	134	8	4	27	470	268	0	275	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	951	809	284	1010	934	604	275			470		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	951	809	284	1010	934	604	275			470		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.2			2.2		
p0 queue free %	91	94	92	27	97	99	98			100		
cM capacity (veh/h)	228	308	755	184	253	486	1276			1102		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	97	145	765	294
Volume Left	21	134	27	0
Volume Right	58	4	268	18
cSH	428	190	1276	1102
Volume to Capacity	0.23	0.77	0.02	0.00
Queue Length 95th (ft)	22	128	2	0
Control Delay (s)	15.9	68.1	0.6	0.0
Lane LOS	C	F	A	
Approach Delay (s)	15.9	68.1	0.6	0.0
Approach LOS	C	F		

Intersection Summary			
Average Delay		9.1	
Intersection Capacity Utilization		67.7%	ICU Level of Service C
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8303: Phillips Drive & Horry Road

5/18/2015



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	7	78	0	99	30	0	0	21	199	15	13	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	9	105	0	134	41	0	0	28	269	20	18	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	41			105			449	432	105	447	432	41
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	41			105			449	432	105	447	432	41
tC, single (s)	4.1			4.2			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	99			91			100	94	71	94	96	99
cM capacity (veh/h)	1562			1414			447	450	920	325	464	1031

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	115	174	297	46
Volume Left	9	134	0	20
Volume Right	0	0	269	8
cSH	1562	1414	836	425
Volume to Capacity	0.01	0.09	0.36	0.11
Queue Length 95th (ft)	0	8	40	9
Control Delay (s)	0.6	6.2	11.7	14.5
Lane LOS	A	A	B	B
Approach Delay (s)	0.6	6.2	11.7	14.5
Approach LOS			B	B

Intersection Summary			
Average Delay		8.4	
Intersection Capacity Utilization	35.2%		ICU Level of Service
Analysis Period (min)	15		A

HCM Unsignalized Intersection Capacity Analysis
 8304: I-85 SB on-ramp/I-85 SB off-ramp & Horry Road

5/18/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			LT		LT	
Sign Control		Stop	Yield		Stop	
Volume (vph)	0	0	37	129	24	268
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	0	49	172	32	357
Direction, Lane #	WB 1	SB 1				
Volume Total (vph)	221	389				
Volume Left (vph)	0	32				
Volume Right (vph)	172	357				
Hadj (s)	-0.43	-0.48				
Departure Headway (s)	4.3	3.9				
Degree Utilization, x	0.26	0.42				
Capacity (veh/h)	778	885				
Control Delay (s)	8.8	9.8				
Approach Delay (s)	8.8	9.8				
Approach LOS	A	A				
Intersection Summary						
Delay			9.4			
Level of Service			A			
Intersection Capacity Utilization			34.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8305: I-85 SB off-ramp

10/20/2015

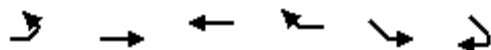


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	24	0	118	39	0	48
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	0	131	43	0	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	174				206	153
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				206	153
tC, single (s)	4.5				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.6				3.7	3.5
p0 queue free %	98				100	94
cM capacity (veh/h)	1189				725	846
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	27	174	53			
Volume Left	27	0	0			
Volume Right	0	43	53			
cSH	1189	1700	846			
Volume to Capacity	0.02	0.10	0.06			
Queue Length 95th (ft)	2	0	5			
Control Delay (s)	8.1	0.0	9.5			
Lane LOS	A		A			
Approach Delay (s)	8.1	0.0	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization		18.6%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

8306: Frontage Road

5/18/2015



Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations		↑	↑		↘	
Volume (veh/h)	0	36	21	0	388	4
Sign Control		Yield	Yield		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	46	27	0	491	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	998	985	982	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	998	985	982	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.2	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.3	
p0 queue free %	100	74	85	100	69	
cM capacity (veh/h)	152	173	174	1091	1597	

Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	46	27	496
Volume Left	0	0	491
Volume Right	0	0	5
cSH	173	174	1597
Volume to Capacity	0.26	0.15	0.31
Queue Length 95th (ft)	25	13	33
Control Delay (s)	33.0	29.4	8.2
Lane LOS	D	D	A
Approach Delay (s)	33.0	29.4	8.2
Approach LOS	D	D	

Intersection Summary			
Average Delay		11.2	
Intersection Capacity Utilization		31.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

8307: Battleground Road & Frontage Road

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	138	24	262	3	1	13	13	438	4	47	306	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.9			5.9	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.92			0.90			1.00			1.00	
Flt Protected		0.98			0.99			1.00			0.99	
Satd. Flow (prot)		1572			1519			1788			1759	
Flt Permitted		0.88			0.93			0.98			0.90	
Satd. Flow (perm)		1413			1432			1761			1596	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	26	285	3	1	14	14	476	4	51	333	8
RTOR Reduction (vph)	0	88	0	0	9	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	373	0	0	9	0	0	493	0	0	391	0
Heavy Vehicles (%)	9%	9%	9%	11%	11%	11%	6%	6%	6%	7%	7%	7%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		17.9			17.9			19.8			19.8	
Effective Green, g (s)		17.9			17.9			19.8			19.8	
Actuated g/C Ratio		0.37			0.37			0.41			0.41	
Clearance Time (s)		5.0			5.0			5.9			5.9	
Vehicle Extension (s)		4.0			4.0			2.5			2.5	
Lane Grp Cap (vph)		520			527			717			650	
v/s Ratio Prot												
v/s Ratio Perm		c0.26			0.01			c0.28			0.24	
v/c Ratio		0.72			0.02			0.69			0.60	
Uniform Delay, d1		13.2			9.8			11.9			11.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		5.0			0.0			2.5			1.3	
Delay (s)		18.2			9.8			14.4			12.6	
Level of Service		B			A			B			B	
Approach Delay (s)		18.2			9.8			14.4			12.6	
Approach LOS		B			A			B			B	

Intersection Summary

HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	48.6	Sum of lost time (s)	10.9
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

8308: Edgefield Road & Frontage Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	63	12	4	85	9	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	73	14	5	99	10	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	126	18	26			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	126	18	26			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	91	99	100			
cM capacity (veh/h)	856	1049	1544			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	87	103	26			
Volume Left	73	5	0			
Volume Right	14	0	15			
cSH	882	1544	1700			
Volume to Capacity	0.10	0.00	0.02			
Queue Length 95th (ft)	8	0	0			
Control Delay (s)	9.5	0.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.5	0.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			4.0			
Intersection Capacity Utilization			18.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8309: Edgefield Road/I-85 NB on-ramp

10/20/2015

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑				↘	
Volume (veh/h)	148	0	0	0	22	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	164	0	0	0	24	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			164			164
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			164			164
tC, single (s)			4.1			6.2
tC, 2 stage (s)						
tF (s)			2.2			3.3
p0 queue free %			100			97
cM capacity (veh/h)			1414			826
						880
Direction, Lane #	EB 1	NB 1				
Volume Total	164	24				
Volume Left	0	24				
Volume Right	0	0				
cSH	1700	826				
Volume to Capacity	0.10	0.03				
Queue Length 95th (ft)	0	2				
Control Delay (s)	0.0	9.5				
Lane LOS		A				
Approach Delay (s)	0.0	9.5				
Approach LOS		A				
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			17.8%	ICU Level of Service	A	
Analysis Period (min)			15			

Build Exit 83
AM Peak Hour
Alternative 1

HCM Unsignalized Intersection Capacity Analysis

8302: Battleground Road & Phillips Drive

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Volume (veh/h)	10	1	35	82	0	5	56	230	64	19	411	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	1	39	91	0	6	62	256	71	21	457	38
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	898	969	476	954	914	291	457			327		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	898	969	476	954	914	291	457			327		
tC, single (s)	7.2	6.6	6.3	7.3	6.7	6.4	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.5	2.3			2.2		
p0 queue free %	95	100	93	53	100	99	94			98		
cM capacity (veh/h)	232	224	565	193	235	705	1083			1216		

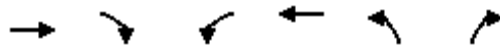
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	51	97	62	327	21	494
Volume Left	11	91	62	0	21	0
Volume Right	39	6	0	71	0	38
cSH	420	201	1083	1700	1216	1700
Volume to Capacity	0.12	0.48	0.06	0.19	0.02	0.29
Queue Length 95th (ft)	10	59	5	0	1	0
Control Delay (s)	14.7	38.4	8.5	0.0	8.0	0.0
Lane LOS	B	E	A		A	
Approach Delay (s)	14.7	38.4	1.4		0.3	
Approach LOS	B	E				

Intersection Summary		
Average Delay		4.9
Intersection Capacity Utilization	48.5%	ICU Level of Service
Analysis Period (min)		15
		A

HCM Unsignalized Intersection Capacity Analysis

8303: Horry Road & Phillips Drive

5/18/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	29	55	1	34	53	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	35	65	1	40	63	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			100		110	67
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			100		110	67
tC, single (s)			4.2		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.7	3.5
p0 queue free %			100		93	100
cM capacity (veh/h)			1456		849	953

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	100	42	63
Volume Left	0	1	63
Volume Right	65	0	0
cSH	1700	1456	849
Volume to Capacity	0.06	0.00	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.2	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.2	9.6
Approach LOS			A

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization	14.9%		ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

8307: Battleground Road & Frontage Road/Edgefield Road

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Volume (vph)	11	1	10	0	0	12	4	590	3	2	500	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.9		5.9	5.9	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frt		0.94			0.86			1.00		1.00	1.00	
Flt Protected		0.98			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1739			1255			1710		1671	1754	
Flt Permitted		1.00			1.00			1.00		0.47	1.00	
Satd. Flow (perm)		1782			1255			1706		822	1754	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	12	1	11	0	0	13	4	663	3	2	562	12
RTOR Reduction (vph)	0	11	0	0	13	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	13	0	0	0	0	0	670	0	2	573	0
Heavy Vehicles (%)	0%	0%	0%	31%	31%	31%	11%	11%	11%	8%	8%	8%
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		1.3			1.3			32.2		32.2	32.2	
Effective Green, g (s)		1.3			1.3			32.2		32.2	32.2	
Actuated g/C Ratio		0.03			0.03			0.73		0.73	0.73	
Clearance Time (s)		5.0			5.0			5.9		5.9	5.9	
Vehicle Extension (s)		4.0			4.0			2.5		2.5	2.5	
Lane Grp Cap (vph)		52			36			1237		596	1272	
v/s Ratio Prot					0.00						0.33	
v/s Ratio Perm		c0.01						c0.39		0.00		
v/c Ratio		0.26			0.01			0.54		0.00	0.45	
Uniform Delay, d1		21.1			20.9			2.8		1.7	2.5	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		3.5			0.2			0.4		0.0	0.2	
Delay (s)		24.6			21.1			3.1		1.7	2.7	
Level of Service		C			C			A		A	A	
Approach Delay (s)		24.6			21.1			3.1			2.7	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	44.4	Sum of lost time (s)	10.9
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8308: Edgefield Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	6	12	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	7	13	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)	1082					
pX, platoon unblocked						
vC, conflicting volume	20	13	13			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	20	13	13			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	997	1067	1605			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	7	13			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1605	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8310: Battleground Road & I-85 SB on-ramp/I-85 SB off-ramp

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↖	↗	↖	↑			↗	↖	
Volume (veh/h)	0	0	0	53	0	53	286	297	0	0	319	209	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	0	0	0	59	0	59	318	330	0	0	354	232	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)						6							
Median type								None		None			
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	1466	1436	471	1436	1320	330	354				330		
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1466	1436	471	1436	1320	330	354				330		
tC, single (s)	7.1	6.5	6.2	7.3	6.7	6.4	4.2				4.1		
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.7	4.2	3.5	2.3				2.2		
p0 queue free %	100	100	100	26	100	91	73				100		
cM capacity (veh/h)	77	98	593	80	105	668	1182				1241		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	118	318	330	587
Volume Left	59	318	0	0
Volume Right	59	0	0	232
cSH	159	1182	1700	1700
Volume to Capacity	0.74	0.27	0.19	0.35
Queue Length 95th (ft)	114	27	0	0
Control Delay (s)	69.3	9.2	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	69.3	4.5	0.0	
Approach LOS	F			

Intersection Summary			
Average Delay		8.2	
Intersection Capacity Utilization	58.7%		ICU Level of Service
Analysis Period (min)		15	B

HCM Unsignalized Intersection Capacity Analysis

8311: Battleground Road & I-85 NB off-ramp/I-85 NB on-ramp

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	71	0	192	0	0	0	0	512	101	51	321	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	79	0	213	0	0	0	0	569	112	57	357	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage (veh)								2				
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1095	1039	357	1308	1095	625	357			569		
vC1, stage 1 conf vol	470	470		625	625							
vC2, stage 2 conf vol	625	569		683	470							
vCu, unblocked vol	1095	1039	357	1308	1095	625	357			569		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)	6.2	5.6		6.1	5.5							
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	78	100	68	100	100	100	100			94		
cM capacity (veh/h)	352	377	676	248	390	485	1213			937		

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	79	213	681	57	357
Volume Left	79	0	0	57	0
Volume Right	0	213	112	0	0
cSH	352	676	1700	937	1700
Volume to Capacity	0.22	0.32	0.40	0.06	0.21
Queue Length 95th (ft)	21	34	0	5	0
Control Delay (s)	18.2	12.8	0.0	9.1	0.0
Lane LOS	C	B		A	
Approach Delay (s)	14.2		0.0	1.2	
Approach LOS	B				

Intersection Summary

Average Delay	3.4
Intersection Capacity Utilization	58.7%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 8312: Phillips Drive

5/18/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	0	24	5	0	30
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	27	6	0	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	63	29			32	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	63	29			32	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	99	100			100	
cM capacity (veh/h)	943	1045			1542	

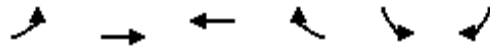
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	32	33
Volume Left	6	0	0
Volume Right	0	6	0
cSH	943	1700	1542
Volume to Capacity	0.01	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	8.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.8	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

8313:

5/18/2015

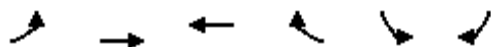


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Sign Control		Stop	Stop		Stop	
Volume (vph)	5	0	0	0	0	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	0	0	0	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	6	0	6			
Volume Left (vph)	6	0	0			
Volume Right (vph)	0	0	6			
Hadj (s)	0.23	0.00	-0.57			
Departure Headway (s)	4.1	3.9	3.3			
Degree Utilization, x	0.01	0.00	0.01			
Capacity (veh/h)	861	913	1070			
Control Delay (s)	7.2	6.9	6.4			
Approach Delay (s)	7.2	0.0	6.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8314: Frontage Road

5/18/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	0	22	15	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	24	17	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	17				41	17
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	17				41	17
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1614				970	1062

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	24	17	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1614	1700	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service A
Analysis Period (min)		15	

PM Peak Hour
Alternative 1

HCM Unsignalized Intersection Capacity Analysis

8302: Battleground Road & Phillips Drive

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Volume (veh/h)	16	2	57	68	2	10	26	392	72	13	284	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	2	63	76	2	11	29	436	80	14	316	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	847	926	323	942	878	476	316			516		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	847	926	323	942	878	476	316			516		
tC, single (s)	7.1	6.5	6.2	7.3	6.7	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.7	4.2	3.5	2.2			2.2		
p0 queue free %	93	99	91	62	99	98	98			99		
cM capacity (veh/h)	267	259	718	201	261	560	1239			1035		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	83	89	29	516	14	331
Volume Left	18	76	29	0	14	0
Volume Right	63	11	0	80	0	16
cSH	510	220	1239	1700	1035	1700
Volume to Capacity	0.16	0.40	0.02	0.30	0.01	0.19
Queue Length 95th (ft)	14	46	2	0	1	0
Control Delay (s)	13.4	32.1	8.0	0.0	8.5	0.0
Lane LOS	B	D	A		A	
Approach Delay (s)	13.4	32.1	0.4		0.4	
Approach LOS	B	D				

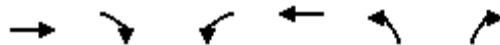
Intersection Summary

Average Delay	4.1
Intersection Capacity Utilization	42.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

8303: Horry Road & Phillips Drive

5/18/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	33	54	2	37	43	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	39	64	2	44	51	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			104		120	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			104		120	71
tC, single (s)			4.2		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.7	3.5
p0 queue free %						
				100	94	100
cM capacity (veh/h)			1416		830	940

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	104	46	51
Volume Left	0	2	51
Volume Right	64	0	0
cSH	1700	1416	830
Volume to Capacity	0.06	0.00	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.4	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.4	9.6
Approach LOS			A

Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization	15.0%		ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

8307: Battleground Road & Frontage Road/Edgefield Road

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↗	↘	
Volume (vph)	23	0	13	3	1	13	13	523	4	8	555	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.9		5.9	5.9	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frt		0.95			0.89			1.00		1.00	0.99	
Flt Protected		0.97			0.99			1.00		0.95	1.00	
Satd. Flow (prot)		1751			1517			1789		1687	1765	
Flt Permitted		1.00			1.00			0.98		0.50	1.00	
Satd. Flow (perm)		1806			1529			1759		890	1765	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	26	0	15	3	1	15	15	588	4	9	624	27
RTOR Reduction (vph)	0	40	0	0	15	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	1	0	0	4	0	0	607	0	9	649	0
Heavy Vehicles (%)	0%	0%	0%	11%	11%	11%	6%	6%	6%	7%	7%	7%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		1.3			1.3			29.8		29.8	29.8	
Effective Green, g (s)		1.3			1.3			29.8		29.8	29.8	
Actuated g/C Ratio		0.03			0.03			0.71		0.71	0.71	
Clearance Time (s)		5.0			5.0			5.9		5.9	5.9	
Vehicle Extension (s)		4.0			4.0			2.5		2.5	2.5	
Lane Grp Cap (vph)		55			47			1248		631	1252	
v/s Ratio Prot											c0.37	
v/s Ratio Perm		0.00			c0.00			0.34		0.01		
v/c Ratio		0.02			0.09			0.49		0.01	0.52	
Uniform Delay, d1		19.7			19.8			2.7		1.8	2.8	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.2			1.2			0.2		0.0	0.3	
Delay (s)		20.0			21.0			2.9		1.8	3.1	
Level of Service		B			C			A		A	A	
Approach Delay (s)		20.0			21.0			2.9			3.1	
Approach LOS		B			C			A			A	

Intersection Summary

HCM 2000 Control Delay	3.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	42.0	Sum of lost time (s)	10.9
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8308: Edgefield Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	12	17	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	13	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				1082		
pX, platoon unblocked						
vC, conflicting volume	32	19	19			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	32	19	19			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	100	100	100			
cM capacity (veh/h)	981	1059	1572			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	13	19			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1572	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		6.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

8310: Battleground Road & I-85 SB on-ramp/I-85 SB off-ramp

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↖	↗	↖	↑			↗	↖	
Volume (veh/h)	0	0	0	85	0	72	171	418	0	0	275	134	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	0	0	0	94	0	80	190	464	0	0	306	149	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)						6							
Median type								None		None			
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	1264	1224	380	1224	1150	464	306				464		
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1264	1224	380	1224	1150	464	306				464		
tC, single (s)	7.1	6.5	6.2	7.3	6.7	6.4	4.1				4.1		
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.7	4.2	3.5	2.2				2.2		
p0 queue free %	100	100	100	26	100	86	85				100		
cM capacity (veh/h)	111	152	667	128	158	568	1250				1092		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	174	190	464	454
Volume Left	94	190	0	0
Volume Right	80	0	0	149
cSH	237	1250	1700	1700
Volume to Capacity	0.74	0.15	0.27	0.27
Queue Length 95th (ft)	127	13	0	0
Control Delay (s)	52.8	8.4	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	52.8	2.4	0.0	
Approach LOS	F			

Intersection Summary			
Average Delay		8.4	
Intersection Capacity Utilization	60.5%		ICU Level of Service
Analysis Period (min)		15	B

HCM Unsignalized Intersection Capacity Analysis
 8311: Battleground Road & I-85 NB off-ramp/I-85 NB on-ramp

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	131	0	274	0	0	0	0	458	101	47	313	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	146	0	304	0	0	0	0	509	112	52	348	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage (veh)								2				
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1017	961	348	1322	1017	565	348			509		
vC1, stage 1 conf vol	452	452		565	565							
vC2, stage 2 conf vol	565	509		757	452							
vCu, unblocked vol	1017	961	348	1322	1017	565	348			509		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)	6.2	5.6		6.1	5.5							
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	62	100	56	100	100	100	100			95		
cM capacity (veh/h)	385	405	686	196	414	524	1178			1026		

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	146	304	621	52	348
Volume Left	146	0	0	52	0
Volume Right	0	304	112	0	0
cSH	385	686	1700	1026	1700
Volume to Capacity	0.38	0.44	0.37	0.05	0.20
Queue Length 95th (ft)	43	57	0	4	0
Control Delay (s)	19.9	14.4	0.0	8.7	0.0
Lane LOS	C	B		A	
Approach Delay (s)	16.2		0.0	1.1	
Approach LOS	C				

Intersection Summary		
Average Delay		5.3
Intersection Capacity Utilization	60.5%	ICU Level of Service B
Analysis Period (min)		15

HCM Unsignalized Intersection Capacity Analysis
8312: Phillips Drive

5/18/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	0	28	5	0	34
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	31	6	0	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	72	34			37	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	72	34			37	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	932	1039			1574	

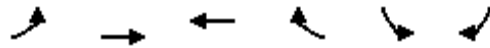
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	37	38
Volume Left	6	0	0
Volume Right	0	6	0
cSH	932	1700	1574
Volume to Capacity	0.01	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

8313:

5/18/2015

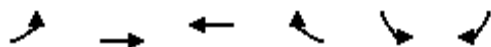


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Sign Control		Stop	Stop		Stop	
Volume (vph)	5	0	0	0	0	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	0	0	0	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	6	0	6			
Volume Left (vph)	6	0	0			
Volume Right (vph)	0	0	6			
Hadj (s)	0.23	0.00	-0.57			
Departure Headway (s)	4.1	3.9	3.3			
Degree Utilization, x	0.01	0.00	0.01			
Capacity (veh/h)	861	913	1070			
Control Delay (s)	7.2	6.9	6.4			
Approach Delay (s)	7.2	0.0	6.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8314: Frontage Road

5/18/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	0	36	38	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	40	42	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	42				82	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	42				82	42
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1580				920	1028

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	40	42	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1580	1700	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service A
Analysis Period (min)		15	

AM Peak Hour
Alternative 2

HCM Unsignalized Intersection Capacity Analysis

8302: Battleground Road & Phillips Drive

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Volume (veh/h)	10	1	35	82	0	5	56	230	64	19	411	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	1	39	91	0	6	62	256	71	21	457	38
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			None		
Median storage (veh)							2					
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	898	969	476	954	914	291	457			327		
vC1, stage 1 conf vol	518	518		416	416							
vC2, stage 2 conf vol	380	451		538	499							
vCu, unblocked vol	898	969	476	954	914	291	457			327		
tC, single (s)	7.2	6.6	6.3	7.3	6.7	6.4	4.2			4.1		
tC, 2 stage (s)	6.2	5.6		6.3	5.7							
tF (s)	3.6	4.1	3.4	3.7	4.2	3.5	2.3			2.2		
p0 queue free %	97	100	93	74	100	99	94			98		
cM capacity (veh/h)	421	399	565	348	386	705	1083			1216		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	51	97	62	327	21	494
Volume Left	11	91	62	0	21	0
Volume Right	39	6	0	71	0	38
cSH	522	359	1083	1700	1216	1700
Volume to Capacity	0.10	0.27	0.06	0.19	0.02	0.29
Queue Length 95th (ft)	8	27	5	0	1	0
Control Delay (s)	12.6	18.7	8.5	0.0	8.0	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	12.6	18.7	1.4		0.3	
Approach LOS	B	C				

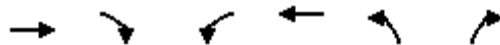
Intersection Summary

Average Delay		3.0				
Intersection Capacity Utilization		48.5%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

8303: Horry Road & Phillips Drive

5/18/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	29	55	1	34	53	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	35	65	1	40	63	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			100		110	67
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			100		110	67
tC, single (s)			4.2		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.7	3.5
p0 queue free %			100		93	100
cM capacity (veh/h)			1456		849	953

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	100	42	63
Volume Left	0	1	63
Volume Right	65	0	0
cSH	1700	1456	849
Volume to Capacity	0.06	0.00	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.2	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.2	9.6
Approach LOS			A

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization	14.9%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8307: Battleground Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	11	11	4	602	502	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	12	4	669	558	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)	6					
Median type				TWLTL	TWLTL	
Median storage (veh)				2	2	
Upstream signal (ft)				738		
pX, platoon unblocked	0.84					
vC, conflicting volume	1242	564	570			
vC1, stage 1 conf vol	564					
vC2, stage 2 conf vol	678					
vCu, unblocked vol	1191	564	570			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.3			
p0 queue free %	97	98	100			
cM capacity (veh/h)	403	529	959			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	24	673	570			
Volume Left	12	4	0			
Volume Right	12	0	12			
cSH	807	959	1700			
Volume to Capacity	0.03	0.00	0.34			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	13.1	0.1	0.0			
Lane LOS	B	A				
Approach Delay (s)	13.1	0.1	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			44.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
8308: Edgefield Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	6	12	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	7	13	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				1114		
pX, platoon unblocked						
vC, conflicting volume	20	13	13			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	20	13	13			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	997	1067	1605			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	7	13			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1605	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8310: Battleground Road & I-85 SB on-ramp

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	53	0	286	297	319	209
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	59	0	318	330	354	232
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage (veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1436	471	354			
vC1, stage 1 conf vol	471					
vC2, stage 2 conf vol	966					
vCu, unblocked vol	1436	471	354			
tC, single (s)	6.6	6.4	4.2			
tC, 2 stage (s)	5.6					
tF (s)	3.7	3.5	2.3			
p0 queue free %	75	100	73			
cM capacity (veh/h)	233	554	1182			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	59	318	330	587		
Volume Left	59	318	0	0		
Volume Right	0	0	0	232		
cSH	233	1182	1700	1700		
Volume to Capacity	0.25	0.27	0.19	0.35		
Queue Length 95th (ft)	24	27	0	0		
Control Delay (s)	25.6	9.2	0.0	0.0		
Lane LOS	D	A				
Approach Delay (s)	25.6	4.5		0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			58.7%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8311: Battleground Road & I-85 NB off-ramp/I-85 NB on-ramp

5/18/2015



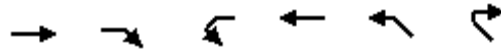
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↖		↘	↕	↕
Volume (veh/h)	71	0	192	0	0	0	0	512	101	51	321	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	79	0	213	0	0	0	0	569	112	57	357	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								TWLTL			TWLTL	
Median storage (veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1095	1151	178	917	1095	625	357			681		
vC1, stage 1 conf vol	470	470		625	625							
vC2, stage 2 conf vol	625	681		292	470							
vCu, unblocked vol	1095	1151	178	917	1095	625	357			681		
tC, single (s)	7.6	6.6	7.0	7.5	6.5	6.9	4.4			4.4		
tC, 2 stage (s)	6.6	5.6		6.5	5.5							
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.4			2.4		
p0 queue free %	75	100	74	100	100	100	100			93		
cM capacity (veh/h)	319	333	818	349	387	428	1104			820		

Direction, Lane #	EB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	292	681	57	178	178
Volume Left	79	0	57	0	0
Volume Right	213	112	0	0	0
cSH	1121	1700	820	1700	1700
Volume to Capacity	0.26	0.40	0.07	0.10	0.10
Queue Length 95th (ft)	26	0	6	0	0
Control Delay (s)	13.4	0.0	9.7	0.0	0.0
Lane LOS	B		A		
Approach Delay (s)	13.4	0.0	1.3		
Approach LOS	B				

Intersection Summary		
Average Delay		3.2
Intersection Capacity Utilization	50.3%	ICU Level of Service
Analysis Period (min)		15
		A

HCM Unsignalized Intersection Capacity Analysis
8312: Phillips Drive

5/18/2015



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	→	↘	←	→	←	↘
Volume (veh/h)	24	5	0	30	5	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	6	0	33	6	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			32		63	29
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			32		63	29
tC, single (s)			4.2		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.4
p0 queue free %			100		99	100
cM capacity (veh/h)			1506		928	1028

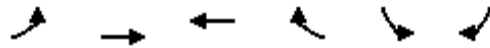
Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	32	33	6
Volume Left	0	0	6
Volume Right	6	0	0
cSH	1700	1506	928
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

8313:

5/18/2015

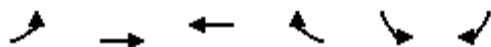


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Sign Control		Stop	Stop		Stop	
Volume (vph)	5	0	0	0	0	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	0	0	0	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	6	0	6			
Volume Left (vph)	6	0	0			
Volume Right (vph)	0	0	6			
Hadj (s)	0.23	0.00	-0.57			
Departure Headway (s)	4.1	3.9	3.3			
Degree Utilization, x	0.01	0.00	0.01			
Capacity (veh/h)	861	913	1070			
Control Delay (s)	7.2	6.9	6.4			
Approach Delay (s)	7.2	0.0	6.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8314: Frontage Road

5/18/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	22	15	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	24	17	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	17				41	17
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	17				41	17
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1614				970	1062

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	24	17	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1614	1700	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service
Analysis Period (min)		15	A

HCM Signalized Intersection Capacity Analysis

8315: Battleground Road & Edgefield Road

5/18/2015



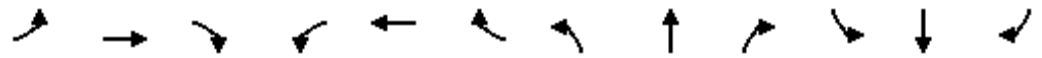
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T		L	R
Volume (vph)	0	12	594	3	3	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.9		5.9	5.9
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.86		1.00		1.00	1.00
Flt Protected	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1411		1711		1671	1759
Flt Permitted	1.00		1.00		0.39	1.00
Satd. Flow (perm)	1411		1711		688	1759
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	13	667	3	3	573
RTOR Reduction (vph)	13	0	0	0	0	0
Lane Group Flow (vph)	0	0	670	0	3	573
Heavy Vehicles (%)	2%	2%	11%	11%	8%	8%
Bus Blockages (#/hr)	31	31	0	0	0	0
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	0.6		32.8		32.8	32.8
Effective Green, g (s)	0.6		32.8		32.8	32.8
Actuated g/C Ratio	0.01		0.72		0.72	0.72
Clearance Time (s)	6.0		5.9		5.9	5.9
Vehicle Extension (s)	3.0		2.5		2.5	2.5
Lane Grp Cap (vph)	18		1238		498	1273
v/s Ratio Prot	c0.00		c0.39			0.33
v/s Ratio Perm					0.00	
v/c Ratio	0.01		0.54		0.01	0.45
Uniform Delay, d1	22.1		2.8		1.7	2.6
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.2		0.4		0.0	0.2
Delay (s)	22.3		3.2		1.7	2.7
Level of Service	C		A		A	A
Approach Delay (s)	22.3		3.2			2.7
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	11.9
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

PM Peak Hour
Alternative 2

HCM Unsignalized Intersection Capacity Analysis
 8302: Battleground Road & Phillips Drive

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Volume (veh/h)	16	2	57	68	2	10	26	392	72	13	284	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	2	63	76	2	11	29	436	80	14	316	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL				None	
Median storage (veh)							2					
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	847	926	323	942	878	476	316			516		
vC1, stage 1 conf vol	352	352		533	533							
vC2, stage 2 conf vol	494	573		409	344							
vCu, unblocked vol	847	926	323	942	878	476	316			516		
tC, single (s)	7.1	6.5	6.2	7.3	6.7	6.4	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.3	5.7							
tF (s)	3.5	4.0	3.3	3.7	4.2	3.5	2.2			2.2		
p0 queue free %	96	99	91	81	99	98	98			99		
cM capacity (veh/h)	455	427	718	389	425	560	1239			1035		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	83	89	29	516	14	331
Volume Left	18	76	29	0	14	0
Volume Right	63	11	0	80	0	16
cSH	629	405	1239	1700	1035	1700
Volume to Capacity	0.13	0.22	0.02	0.30	0.01	0.19
Queue Length 95th (ft)	11	21	2	0	1	0
Control Delay (s)	11.6	16.4	8.0	0.0	8.5	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	11.6	16.4	0.4		0.4	
Approach LOS	B	C				

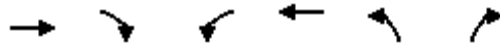
Intersection Summary

Average Delay	2.6
Intersection Capacity Utilization	42.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

8303: Horry Road & Phillips Drive

5/18/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	33	54	2	37	43	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	39	64	2	44	51	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			104		120	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			104		120	71
tC, single (s)			4.2		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.7	3.5
p0 queue free %			100		94	100
cM capacity (veh/h)			1416		830	940

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	104	46	51
Volume Left	0	2	51
Volume Right	64	0	0
cSH	1700	1416	830
Volume to Capacity	0.06	0.00	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.4	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.4	9.6
Approach LOS			A

Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization	15.0%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8307: Battleground Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	23	13	14	536	563	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	14	16	596	626	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)	6					
Median type				TWLTL	TWLTL	
Median storage (veh)				2	2	
Upstream signal (ft)	738					
pX, platoon unblocked	0.89					
vC, conflicting volume	1266	639	652			
vC1, stage 1 conf vol	639					
vC2, stage 2 conf vol	627					
vCu, unblocked vol	1236	639	652			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.3			
p0 queue free %	94	97	98			
cM capacity (veh/h)	399	480	916			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	40	16	596	652
Volume Left	26	16	0	0
Volume Right	14	0	0	27
cSH	625	916	1700	1700
Volume to Capacity	0.06	0.02	0.35	0.38
Queue Length 95th (ft)	5	1	0	0
Control Delay (s)	13.9	9.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.9	0.2		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
8308: Edgefield Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	12	17	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	13	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
				None	None	
Median storage (veh)						
Upstream signal (ft)						
				1114		
pX, platoon unblocked						
vC, conflicting volume	32	19	19			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	32	19	19			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %						
	100	100	100			
cM capacity (veh/h)						
	981	1059	1572			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	13	19
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1572	1700
Volume to Capacity	0.00	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

8310: Battleground Road & I-85 SB on-ramp

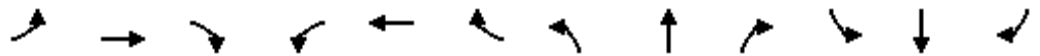
5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	72	0	171	418	275	134
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	80	0	190	464	306	149
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage (veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1224	380	306			
vC1, stage 1 conf vol	380					
vC2, stage 2 conf vol	844					
vCu, unblocked vol	1224	380	306			
tC, single (s)	6.6	6.4	4.1			
tC, 2 stage (s)	5.6					
tF (s)	3.7	3.5	2.2			
p0 queue free %	74	100	85			
cM capacity (veh/h)	314	635	1250			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	80	190	464	454		
Volume Left	80	190	0	0		
Volume Right	0	0	0	149		
cSH	314	1250	1700	1700		
Volume to Capacity	0.26	0.15	0.27	0.27		
Queue Length 95th (ft)	25	13	0	0		
Control Delay (s)	20.4	8.4	0.0	0.0		
Lane LOS	C	A				
Approach Delay (s)	20.4	2.4		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			46.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8311: Battleground Road & I-85 NB off-ramp/I-85 NB on-ramp

5/18/2015

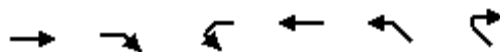


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↖		↘	↕	↖
Volume (veh/h)	131	0	274	0	0	0	0	458	101	47	313	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	146	0	304	0	0	0	0	509	112	52	348	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type								TWLTL			TWLTL	
Median storage (veh)								2			2	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1017	1073	174	843	1017	565	348			621		
vC1, stage 1 conf vol	452	452		565	565							
vC2, stage 2 conf vol	565	621		278	452							
vCu, unblocked vol	1017	1073	174	843	1017	565	348			621		
tC, single (s)	7.6	6.6	7.0	7.5	6.5	6.9	4.3			4.3		
tC, 2 stage (s)	6.6	5.6		6.5	5.5							
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	59	100	63	100	100	100	100			94		
cM capacity (veh/h)	353	362	827	340	411	468	1166			916		
Direction, Lane #	EB 1	NB 1	SB 1	SB 2	SB 3							
Volume Total	450	621	52	174	174							
Volume Left	146	0	52	0	0							
Volume Right	304	112	0	0	0							
cSH	1091	1700	916	1700	1700							
Volume to Capacity	0.41	0.37	0.06	0.10	0.10							
Queue Length 95th (ft)	51	0	5	0	0							
Control Delay (s)	15.2	0.0	9.2	0.0	0.0							
Lane LOS	C		A									
Approach Delay (s)	15.2	0.0	1.2									
Approach LOS	C											
Intersection Summary												
Average Delay			5.0									
Intersection Capacity Utilization			50.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8312: Phillips Drive

5/18/2015

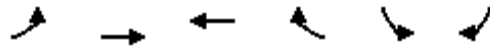


Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	→	↘	↙	←	↖	↗
Volume (veh/h)	28	5	0	34	5	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	31	6	0	38	6	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			37		72	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			37		72	34
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1506		932	1039
Direction, Lane #	EB 1	WB 1	NW 1			
Volume Total	37	38	6			
Volume Left	0	0	6			
Volume Right	6	0	0			
cSH	1700	1506	932			
Volume to Capacity	0.02	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	8.9			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8313:

5/18/2015

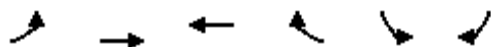


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Sign Control		Stop	Stop		Stop	
Volume (vph)	5	0	0	0	0	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	0	0	0	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	6	0	6			
Volume Left (vph)	6	0	0			
Volume Right (vph)	0	0	6			
Hadj (s)	0.23	0.00	-0.57			
Departure Headway (s)	4.1	3.9	3.3			
Degree Utilization, x	0.01	0.00	0.01			
Capacity (veh/h)	861	913	1070			
Control Delay (s)	7.2	6.9	6.4			
Approach Delay (s)	7.2	0.0	6.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8314: Frontage Road

5/18/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	0	36	38	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	40	42	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	42				82	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	42				82	42
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1580				920	1028

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	40	42	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1580	1700	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

8315: Battleground Road & Edgefield Road

5/18/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T		L	R
Volume (vph)	3	14	536	4	8	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.9		5.9	5.9
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.89		1.00		1.00	1.00
Flt Protected	0.99		1.00		0.95	1.00
Satd. Flow (prot)	1505		1791		1687	1776
Flt Permitted	0.99		1.00		0.43	1.00
Satd. Flow (perm)	1505		1791		759	1776
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	3	16	602	4	9	638
RTOR Reduction (vph)	16	0	0	0	0	0
Lane Group Flow (vph)	3	0	606	0	9	638
Heavy Vehicles (%)	11%	11%	6%	6%	7%	7%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	0.9		32.5		32.5	32.5
Effective Green, g (s)	0.9		32.5		32.5	32.5
Actuated g/C Ratio	0.02		0.72		0.72	0.72
Clearance Time (s)	6.0		5.9		5.9	5.9
Vehicle Extension (s)	3.0		2.5		2.5	2.5
Lane Grp Cap (vph)	29		1284		544	1274
v/s Ratio Prot	c0.00		0.34			c0.36
v/s Ratio Perm					0.01	
v/c Ratio	0.11		0.47		0.02	0.50
Uniform Delay, d1	21.8		2.7		1.8	2.8
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	1.8		0.2		0.0	0.2
Delay (s)	23.6		2.9		1.8	3.0
Level of Service	C		A		A	A
Approach Delay (s)	23.6		2.9			3.0
Approach LOS	C		A			A

Intersection Summary

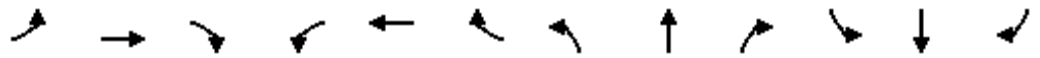
HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	11.9
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

AM Peak Hour
Alternative 3

HCM Unsignalized Intersection Capacity Analysis
 8302: Battleground Road & Phillips Drive

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Volume (veh/h)	10	1	35	82	0	5	56	230	64	19	411	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	1	39	91	0	6	62	256	71	21	457	38
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			None		
Median storage (veh)							2					
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	898	969	476	954	914	291	457			327		
vC1, stage 1 conf vol	518	518		416	416							
vC2, stage 2 conf vol	380	451		538	499							
vCu, unblocked vol	898	969	476	954	914	291	457			327		
tC, single (s)	7.2	6.6	6.3	7.3	6.7	6.4	4.2			4.1		
tC, 2 stage (s)	6.2	5.6		6.3	5.7							
tF (s)	3.6	4.1	3.4	3.7	4.2	3.5	2.3			2.2		
p0 queue free %	97	100	93	74	100	99	94			98		
cM capacity (veh/h)	421	399	565	348	386	705	1083			1216		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	51	97	62	327	21	494
Volume Left	11	91	62	0	21	0
Volume Right	39	6	0	71	0	38
cSH	522	359	1083	1700	1216	1700
Volume to Capacity	0.10	0.27	0.06	0.19	0.02	0.29
Queue Length 95th (ft)	8	27	5	0	1	0
Control Delay (s)	12.6	18.7	8.5	0.0	8.0	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	12.6	18.7	1.4		0.3	
Approach LOS	B	C				

Intersection Summary		
Average Delay		3.0
Intersection Capacity Utilization	48.5%	ICU Level of Service
Analysis Period (min)		15
		A

HCM Unsignalized Intersection Capacity Analysis
 8303: Horry Road & Phillips Drive

5/18/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	24	60	1	29	58	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	29	71	1	35	69	0
Pedestrians					60	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					5	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			160		161	124
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			160		161	124
tC, single (s)			4.2		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.7	3.5
p0 queue free %			100		91	100
cM capacity (veh/h)			1314		753	841

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	100	36	69
Volume Left	0	1	69
Volume Right	71	0	0
cSH	1700	1314	753
Volume to Capacity	0.06	0.00	0.09
Queue Length 95th (ft)	0	0	8
Control Delay (s)	0.0	0.3	10.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	10.3
Approach LOS			B

Intersection Summary			
Average Delay		3.5	
Intersection Capacity Utilization	22.6%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
8308: Edgefield Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	6	12	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	7	13	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)	1191					
pX, platoon unblocked						
vC, conflicting volume	20	13	13			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	20	13	13			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	997	1067	1605			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	7	13			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1605	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8310: Battleground Road & I-85 SB on-ramp

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W		W	U	U	W
Volume (veh/h)	53	53	286	297	319	209
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	59	59	318	330	354	232
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1436	471	354			
vC1, stage 1 conf vol	471					
vC2, stage 2 conf vol	966					
vCu, unblocked vol	1436	471	354			
tC, single (s)	6.6	6.4	4.1			
tC, 2 stage (s)	5.6					
tF (s)	3.7	3.5	2.2			
p0 queue free %	75	89	74			
cM capacity (veh/h)	234	554	1204			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	118	318	330	587
Volume Left	59	318	0	0
Volume Right	59	0	0	232
cSH	329	1204	1700	1700
Volume to Capacity	0.36	0.26	0.19	0.35
Queue Length 95th (ft)	39	27	0	0
Control Delay (s)	21.9	9.1	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	21.9	4.4		0.0
Approach LOS	C			

Intersection Summary			
Average Delay		4.0	
Intersection Capacity Utilization	61.6%		ICU Level of Service B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

8311: Battleground Road & I-85 NB on-ramp

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Volume (veh/h)	8	3	11	183	9	71	4	504	98	51	319	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	3	12	203	10	79	4	560	109	57	354	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				TWLTL
Median storage veh								2				2
Upstream signal (ft)								1229				
pX, platoon unblocked	0.92	0.92		0.92	0.92	0.92				0.92		
vC, conflicting volume	1122	1147	356	1105	1093	614	357			669		
vC1, stage 1 conf vol	469	469		623	623							
vC2, stage 2 conf vol	653	678		482	470							
vCu, unblocked vol	1089	1117	356	1071	1059	539	357			598		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.3			4.3		
tC, 2 stage (s)	6.1	5.5		6.2	5.6							
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	97	99	98	45	97	84	100			93		
cM capacity (veh/h)	293	344	693	369	378	491	1128			842		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	24	203	89	4	669	57	357
Volume Left	9	203	0	4	0	57	0
Volume Right	12	0	79	0	109	0	2
cSH	423	369	475	1128	1700	842	1700
Volume to Capacity	0.06	0.55	0.19	0.00	0.39	0.07	0.21
Queue Length 95th (ft)	5	80	17	0	0	5	0
Control Delay (s)	14.0	26.1	14.3	8.2	0.0	9.6	0.0
Lane LOS	B	D	B	A		A	
Approach Delay (s)	14.0	22.5		0.1		1.3	
Approach LOS	B	C					

Intersection Summary

Average Delay	5.3
Intersection Capacity Utilization	62.6%
ICU Level of Service	B
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis

8315: Battleground Road & Edgefield Road

5/18/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T		R	L
Volume (vph)	0	12	594	3	3	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.9		5.9	5.9
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.86		1.00		1.00	1.00
Flt Protected	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1611		1711		1671	1759
Flt Permitted	1.00		1.00		0.39	1.00
Satd. Flow (perm)	1611		1711		688	1759
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	13	667	3	3	573
RTOR Reduction (vph)	13	0	0	0	0	0
Lane Group Flow (vph)	0	0	670	0	3	573
Heavy Vehicles (%)	2%	2%	11%	11%	8%	8%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	0.6		32.8		32.8	32.8
Effective Green, g (s)	0.6		32.8		32.8	32.8
Actuated g/C Ratio	0.01		0.72		0.72	0.72
Clearance Time (s)	6.0		5.9		5.9	5.9
Vehicle Extension (s)	3.0		2.5		2.5	2.5
Lane Grp Cap (vph)	21		1238		498	1273
v/s Ratio Prot	c0.00		c0.39			0.33
v/s Ratio Perm					0.00	
v/c Ratio	0.01		0.54		0.01	0.45
Uniform Delay, d1	22.1		2.8		1.7	2.6
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.2		0.4		0.0	0.2
Delay (s)	22.2		3.2		1.7	2.7
Level of Service	C		A		A	A
Approach Delay (s)	22.2		3.2			2.7
Approach LOS	C		A			A

Intersection Summary

HCM 2000 Control Delay	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	11.9
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8316: Edgefield Road

5/18/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	0	0	6	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	0	0	7	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3	3			7	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3	3			7	
tC, single (s)	6.7	6.5			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.6			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	939	991			1614	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	13	7	0
Volume Left	13	0	0
Volume Right	0	7	0
cSH	939	1700	1700
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		5.9	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

PM Peak Hour
Alternative 3

HCM Unsignalized Intersection Capacity Analysis

8302: Battleground Road & Phillips Drive

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Volume (veh/h)	16	2	57	68	2	10	26	392	72	13	284	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	2	63	76	2	11	29	436	80	14	316	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL				None	
Median storage (veh)							2					
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	847	926	323	942	878	476	316			516		
vC1, stage 1 conf vol	352	352		533	533							
vC2, stage 2 conf vol	494	573		409	344							
vCu, unblocked vol	847	926	323	942	878	476	316			516		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	99	91	82	100	98	98			99		
cM capacity (veh/h)	456	427	718	409	446	589	1239			1035		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	83	89	29	516	14	331
Volume Left	18	76	29	0	14	0
Volume Right	63	11	0	80	0	16
cSH	629	427	1239	1700	1035	1700
Volume to Capacity	0.13	0.21	0.02	0.30	0.01	0.19
Queue Length 95th (ft)	11	19	2	0	1	0
Control Delay (s)	11.6	15.6	8.0	0.0	8.5	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	11.6	15.6	0.4		0.4	
Approach LOS	B	C				

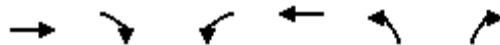
Intersection Summary

Average Delay	2.6
Intersection Capacity Utilization	42.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

8303: Horry Road & Phillips Drive

5/18/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	28	59	2	32	48	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	33	70	2	38	57	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			104		111	68
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			104		111	68
tC, single (s)			4.2		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.7	3.5
p0 queue free %			100		93	100
cM capacity (veh/h)			1416		840	944

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	104	40	57
Volume Left	0	2	57
Volume Right	70	0	0
cSH	1700	1416	840
Volume to Capacity	0.06	0.00	0.07
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.5	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.5	9.6
Approach LOS			A

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization	15.1%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

8308: Edgefield Road

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	12	17	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	13	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				1191		
pX, platoon unblocked						
vC, conflicting volume	32	19	19			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	32	19	19			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	100	100	100			
cM capacity (veh/h)	981	1059	1572			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	13	19			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1572	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		6.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

8310: Battleground Road & I-85 SB on-ramp

5/18/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	72	85	171	418	275	134
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	80	94	190	464	306	149
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1224	380	306			
vC1, stage 1 conf vol	380					
vC2, stage 2 conf vol	844					
vCu, unblocked vol	1224	380	306			
tC, single (s)	6.6	6.4	4.1			
tC, 2 stage (s)	5.6					
tF (s)	3.7	3.5	2.2			
p0 queue free %	74	85	85			
cM capacity (veh/h)	314	635	1250			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	174	190	464	454		
Volume Left	80	190	0	0		
Volume Right	94	0	0	149		
cSH	432	1250	1700	1700		
Volume to Capacity	0.40	0.15	0.27	0.27		
Queue Length 95th (ft)	48	13	0	0		
Control Delay (s)	18.9	8.4	0.0	0.0		
Lane LOS	C	A				
Approach Delay (s)	18.9	2.4		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			3.8			
Intersection Capacity Utilization			51.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8311: Battleground Road & I-85 NB on-ramp

5/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Volume (veh/h)	14	9	0	256	18	131	14	444	92	47	307	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	10	0	284	20	146	16	493	102	52	341	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				TWLTL
Median storage veh								2				2
Upstream signal (ft)								1229				
pX, platoon unblocked	0.99	0.99		0.99	0.99	0.99				0.99		
vC, conflicting volume	1129	1076	344	1026	1028	544	348			596		
vC1, stage 1 conf vol	449	449		576	576							
vC2, stage 2 conf vol	680	627		451	452							
vCu, unblocked vol	1126	1072	344	1022	1024	537	348			588		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.2			4.2		
tC, 2 stage (s)	6.1	5.5		6.2	5.6							
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	93	97	100	27	95	73	99			95		
cM capacity (veh/h)	239	369	703	392	397	532	1178			950		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	26	284	166	16	596	52	348
Volume Left	16	284	0	16	0	52	0
Volume Right	0	0	146	0	102	0	7
cSH	277	392	511	1178	1700	950	1700
Volume to Capacity	0.09	0.73	0.32	0.01	0.35	0.05	0.20
Queue Length 95th (ft)	8	140	35	1	0	4	0
Control Delay (s)	19.3	35.0	15.4	8.1	0.0	9.0	0.0
Lane LOS	C	D	C	A		A	
Approach Delay (s)	19.3	27.8		0.2		1.2	
Approach LOS	C	D					

Intersection Summary			
Average Delay		9.1	
Intersection Capacity Utilization	63.1%		ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis

8315: Battleground Road & Edgefield Road

5/18/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	R
Volume (vph)	3	14	536	4	8	555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.9		5.9	5.9
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.89		1.00		1.00	1.00
Flt Protected	0.99		1.00		0.95	1.00
Satd. Flow (prot)	1638		1791		1687	1776
Flt Permitted	0.99		1.00		0.43	1.00
Satd. Flow (perm)	1638		1791		759	1776
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	3	16	602	4	9	624
RTOR Reduction (vph)	16	0	0	0	0	0
Lane Group Flow (vph)	3	0	606	0	9	624
Heavy Vehicles (%)	2%	2%	6%	6%	7%	7%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	0.9		32.4		32.4	32.4
Effective Green, g (s)	0.9		32.4		32.4	32.4
Actuated g/C Ratio	0.02		0.72		0.72	0.72
Clearance Time (s)	6.0		5.9		5.9	5.9
Vehicle Extension (s)	3.0		2.5		2.5	2.5
Lane Grp Cap (vph)	32		1283		544	1273
v/s Ratio Prot	c0.00		0.34			c0.35
v/s Ratio Perm					0.01	
v/c Ratio	0.10		0.47		0.02	0.49
Uniform Delay, d1	21.8		2.7		1.8	2.8
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	1.4		0.2		0.0	0.2
Delay (s)	23.2		2.9		1.8	3.0
Level of Service	C		A		A	A
Approach Delay (s)	23.2		2.9			3.0
Approach LOS	C		A			A

Intersection Summary

HCM 2000 Control Delay	3.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	45.2	Sum of lost time (s)	11.9
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8316: Edgefield Road

5/18/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	17	0	0	12	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	0	0	13	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	7	7			13	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	7	7			13	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	999	1059			1605	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	19	13	0
Volume Left	19	0	0
Volume Right	0	13	0
cSH	999	1700	1700
Volume to Capacity	0.02	0.01	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.7	0.0	0.0
Approach LOS	A		

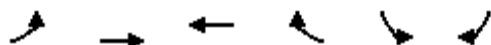
Intersection Summary			
Average Delay		5.1	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

AM Peak Hour
Alternative 4

HCM Unsignalized Intersection Capacity Analysis

8202: Bud Arthur Bridge Road & Buds Drive

7/16/2015





















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶		↶	
Volume (veh/h)	1	19	13	3	0	42
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	1	25	17	4	0	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	21				47	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21				47	19
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	1608				962	1059

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	27	21	56
Volume Left	1	0	0
Volume Right	0	4	56
cSH	1608	1700	1059
Volume to Capacity	0.00	0.01	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.4	0.0	8.6
Lane LOS	A		A
Approach Delay (s)	0.4	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay		4.7	
Intersection Capacity Utilization		13.3%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis
8302: Battleground Road & Phillips Drive

7/16/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	1	35	82	0	5	56	230	64	19	411	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	1	39	91	0	6	62	256	71	21	457	38
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	898	969	476	954	914	291	457			327		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	898	969	476	954	914	291	457			327		
tC, single (s)	7.2	6.6	6.3	7.3	6.7	6.4	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.5	2.3			2.2		
p0 queue free %	95	100	93	53	100	99	94			98		
cM capacity (veh/h)	232	224	565	193	235	705	1083			1216		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	51	97	62	327	21	494						
Volume Left	11	91	62	0	21	0						
Volume Right	39	6	0	71	0	38						
cSH	420	201	1083	1700	1216	1700						
Volume to Capacity	0.12	0.48	0.06	0.19	0.02	0.29						
Queue Length 95th (ft)	10	59	5	0	1	0						
Control Delay (s)	14.7	38.4	8.5	0.0	8.0	0.0						
Lane LOS	B	E	A		A							
Approach Delay (s)	14.7	38.4	1.4		0.3							
Approach LOS	B	E										
Intersection Summary												
Average Delay			4.9									
Intersection Capacity Utilization			48.5%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 8303: Horry Road & Phillips Drive

7/16/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	29	55	1	34	53	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	35	65	1	40	63	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			100		110	67
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			100		110	67
tC, single (s)			4.2		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.7	3.5
p0 queue free %			100		93	100
cM capacity (veh/h)			1456		849	953

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	100	42	63
Volume Left	0	1	63
Volume Right	65	0	0
cSH	1700	1456	849
Volume to Capacity	0.06	0.00	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.2	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.2	9.6
Approach LOS			A

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization	14.9%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
8308: Edgefield Road

7/16/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	6	12	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	7	13	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	20	13	13			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	20	13	13			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	997	1067	1605			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	7	13			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1605	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8310: Battleground Road & I-85 SB on-ramp

7/16/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↖	↗	↖	↑			↗	
Volume (veh/h)	0	0	0	53	0	53	286	297	0	0	319	209
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	59	0	59	318	330	0	0	354	232
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)							6					
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1466	1436	471	1436	1320	330	354			330		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1466	1436	471	1436	1320	330	354			330		
tC, single (s)	7.3	6.5	6.4	7.3	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.5	3.7	4.0	3.5	2.2			2.2		
p0 queue free %	100	100	100	26	100	91	74			100		
cM capacity (veh/h)	69	98	554	80	115	668	1204			1229		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	118	318	330	587
Volume Left	59	318	0	0
Volume Right	59	0	0	232
cSH	160	1204	1700	1700
Volume to Capacity	0.74	0.26	0.19	0.35
Queue Length 95th (ft)	113	27	0	0
Control Delay (s)	68.7	9.1	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	68.7	4.4		0.0
Approach LOS	F			

Intersection Summary			
Average Delay		8.1	
Intersection Capacity Utilization	58.7%		ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

8311: Battleground Road & Frontage Road/I-85 NB on-ramp

7/16/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Volume (veh/h)	8	3	11	183	9	71	4	504	98	51	319	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	3	12	203	10	79	4	560	109	57	354	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				None
Median storage (veh)								2				
Upstream signal (ft)								1104				
pX, platoon unblocked	0.89	0.89		0.89	0.89	0.89				0.89		
vC, conflicting volume	1122	1147	356	1105	1093	614	357			669		
vC1, stage 1 conf vol	469	469		623	623							
vC2, stage 2 conf vol	653	678		482	470							
vCu, unblocked vol	1076	1104	356	1057	1044	508	357			569		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.3			4.3		
tC, 2 stage (s)	6.1	5.5		6.2	5.6							
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	97	99	98	45	97	84	100			93		
cM capacity (veh/h)	294	342	693	370	377	495	1128			837		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	24	203	89	4	669	57	357
Volume Left	9	203	0	4	0	57	0
Volume Right	12	0	79	0	109	0	2
cSH	424	370	479	1128	1700	837	1700
Volume to Capacity	0.06	0.55	0.19	0.00	0.39	0.07	0.21
Queue Length 95th (ft)	5	80	17	0	0	5	0
Control Delay (s)	14.0	26.0	14.2	8.2	0.0	9.6	0.0
Lane LOS	B	D	B	A		A	
Approach Delay (s)	14.0	22.4		0.1		1.3	
Approach LOS	B	C					

Intersection Summary			
Average Delay		5.3	
Intersection Capacity Utilization	62.6%		ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8312: Horry Road & Phillips Drive

7/16/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Volume (veh/h)	24	5	0	30	5	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	6	0	33	6	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			32		63	29
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			32		63	29
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1542		943	1045

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	32	33	6
Volume Left	0	0	6
Volume Right	6	0	0
cSH	1700	1542	943
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.8
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8313: Horry Road

7/16/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Sign Control		Stop	Stop		Stop	
Volume (vph)	5	0	0	0	0	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	0	0	0	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	6	0	6			
Volume Left (vph)	6	0	0			
Volume Right (vph)	0	0	6			
Hadj (s)	0.23	0.00	-0.57			
Departure Headway (s)	4.1	3.9	3.3			
Degree Utilization, x	0.01	0.00	0.01			
Capacity (veh/h)	861	913	1070			
Control Delay (s)	7.2	6.9	6.4			
Approach Delay (s)	7.2	0.0	6.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8314: Frontage Road

7/16/2015













Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Volume (veh/h)	0	22	15	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	24	17	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	17				41	17
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	17				41	17
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1614				975	1068

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	24	17	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1614	1700	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis
 8315: Battleground Road & Edgefield Road

12/10/2015

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	12	594	3	3	510
Future Volume (Veh/h)	0	12	594	3	3	510
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	13	667	3	3	573
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage (veh)			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1248	668			670	
vC1, stage 1 conf vol	668					
vC2, stage 2 conf vol	579					
vCu, unblocked vol	1248	668			670	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.3	
p0 queue free %	100	97			100	
cM capacity (veh/h)	408	458			893	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	13	670	3	573		
Volume Left	0	0	3	0		
Volume Right	13	3	0	0		
cSH	458	1700	893	1700		
Volume to Capacity	0.03	0.39	0.00	0.34		
Queue Length 95th (ft)	2	0	0	0		
Control Delay (s)	13.1	0.0	9.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.1	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			41.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
8316: Edgefield Road

7/16/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Volume (veh/h)	12	0	0	6	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	0	0	7	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3	3			7	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3	3			7	
tC, single (s)	6.7	6.5			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.6			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	939	991			1614	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	13	7	0
Volume Left	13	0	0
Volume Right	0	7	0
cSH	939	1700	1700
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

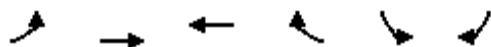
Intersection Summary			
Average Delay		5.9	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

PM Peak Hour
Alternative 4

HCM Unsignalized Intersection Capacity Analysis

8202: Bud Arthur Bridge Road & Buds Drive

7/16/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	1	19	13	3	0	42
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	1	25	17	4	0	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	21				47	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21				47	19
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	1594				962	1059

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	27	21	56
Volume Left	1	0	0
Volume Right	0	4	56
cSH	1594	1700	1059
Volume to Capacity	0.00	0.01	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.4	0.0	8.6
Lane LOS	A		A
Approach Delay (s)	0.4	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay		4.7	
Intersection Capacity Utilization		13.3%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

8302: Battleground Road & Phillips Drive

7/16/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Volume (veh/h)	16	2	57	68	2	10	26	392	72	13	284	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	2	63	76	2	11	29	436	80	14	316	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None				None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	847	926	323	942	878	476	316			516		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	847	926	323	942	878	476	316			516		
tC, single (s)	7.1	6.5	6.2	7.3	6.7	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.7	4.2	3.5	2.2			2.2		
p0 queue free %	93	99	91	62	99	98	98			99		
cM capacity (veh/h)	267	259	718	201	261	560	1239			1035		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	83	89	29	516	14	331
Volume Left	18	76	29	0	14	0
Volume Right	63	11	0	80	0	16
cSH	510	220	1239	1700	1035	1700
Volume to Capacity	0.16	0.40	0.02	0.30	0.01	0.19
Queue Length 95th (ft)	14	46	2	0	1	0
Control Delay (s)	13.4	32.1	8.0	0.0	8.5	0.0
Lane LOS	B	D	A		A	
Approach Delay (s)	13.4	32.1	0.4		0.4	
Approach LOS	B	D				

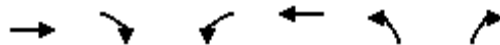
Intersection Summary

Average Delay	4.1
Intersection Capacity Utilization	42.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

8303: Horry Road & Phillips Drive

7/16/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	33	54	2	37	43	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	39	64	2	44	51	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			104		120	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			104		120	71
tC, single (s)			4.2		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.7	3.5
p0 queue free %			100		94	100
cM capacity (veh/h)			1416		830	940

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	104	46	51
Volume Left	0	2	51
Volume Right	64	0	0
cSH	1700	1416	830
Volume to Capacity	0.06	0.00	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.4	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.4	9.6
Approach LOS			A

Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization		15.0%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis
8308: Edgefield Road

7/16/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	12	17	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	13	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	32	19	19			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	32	19	19			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	100	100	100			
cM capacity (veh/h)	981	1059	1572			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	13	19			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1572	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8310: Battleground Road & I-85 SB off-ramp

7/16/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↖	↗	↖	↑			↗	
Volume (veh/h)	0	0	0	85	0	72	171	418	0	0	275	134
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	94	0	80	190	464	0	0	306	149
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						6						
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1264	1224	380	1224	1150	464	306			464		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1264	1224	380	1224	1150	464	306			464		
tC, single (s)	7.1	6.5	6.2	7.3	6.7	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.7	4.2	3.5	2.2			2.2		
p0 queue free %	100	100	100	26	100	86	85			100		
cM capacity (veh/h)	112	153	671	128	158	568	1250			1092		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	174	190	464	454
Volume Left	94	190	0	0
Volume Right	80	0	0	149
cSH	237	1250	1700	1700
Volume to Capacity	0.74	0.15	0.27	0.27
Queue Length 95th (ft)	127	13	0	0
Control Delay (s)	52.8	8.4	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	52.8	2.4		0.0
Approach LOS	F			

Intersection Summary			
Average Delay		8.4	
Intersection Capacity Utilization	46.8%		ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

8311: Battleground Road & Frontage Road/I-85 NB on-ramp

7/16/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Volume (veh/h)	14	9	13	256	18	131	14	444	92	47	307	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	10	14	284	20	146	16	493	102	52	341	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				None
Median storage (veh)								2				
Upstream signal (ft)								1104				
pX, platoon unblocked	0.96	0.96		0.96	0.96	0.96				0.96		
vC, conflicting volume	1129	1076	344	1041	1028	544	348			596		
vC1, stage 1 conf vol	449	449		576	576							
vC2, stage 2 conf vol	680	627		465	452							
vCu, unblocked vol	1112	1057	344	1020	1007	502	348			556		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)	6.2	5.6		6.1	5.5							
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	93	97	98	27	95	73	99			94		
cM capacity (veh/h)	235	360	689	389	401	545	1178			944		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	40	284	166	16	596	52	348
Volume Left	16	284	0	16	0	52	0
Volume Right	14	0	146	0	102	0	7
cSH	348	389	522	1178	1700	944	1700
Volume to Capacity	0.11	0.73	0.32	0.01	0.35	0.06	0.20
Queue Length 95th (ft)	10	142	34	1	0	4	0
Control Delay (s)	16.7	35.6	15.1	8.1	0.0	9.0	0.0
Lane LOS	C	E	C	A		A	
Approach Delay (s)	16.7	28.0		0.2		1.2	
Approach LOS	C	D					

Intersection Summary			
Average Delay		9.3	
Intersection Capacity Utilization	63.1%		ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8312: Horry Road & Phillips Drive

7/16/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↗
Volume (veh/h)	28	5	0	34	5	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	31	6	0	38	6	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			37		72	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			37		72	34
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1536		932	1039

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	37	38	6
Volume Left	0	0	6
Volume Right	6	0	0
cSH	1700	1536	932
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8313: Horry Road

7/16/2015

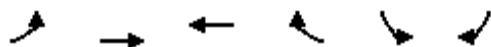


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Sign Control		Stop	Stop		Stop	
Volume (vph)	5	0	0	0	0	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	0	0	0	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	6	0	6			
Volume Left (vph)	6	0	0			
Volume Right (vph)	0	0	6			
Hadj (s)	0.23	0.00	-0.57			
Departure Headway (s)	4.1	3.9	3.3			
Degree Utilization, x	0.01	0.00	0.01			
Capacity (veh/h)	861	913	1070			
Control Delay (s)	7.2	6.9	6.4			
Approach Delay (s)	7.2	0.0	6.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8314: Frontage Road

7/16/2015













Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶		↶	
Volume (veh/h)	0	36	38	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	40	42	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	42				82	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	42				82	42
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1580				920	1028

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	40	42	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1580	1700	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8315: Battleground Road & Edgefield Road

12/10/2015

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	14	536	4	8	568
Future Volume (Veh/h)	3	14	536	4	8	568
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	16	602	4	9	638
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage (veh)			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1260	604			606	
vC1, stage 1 conf vol	604					
vC2, stage 2 conf vol	656					
vCu, unblocked vol	1260	604			606	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	99	97			99	
cM capacity (veh/h)	390	482			948	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	19	606	9	638		
Volume Left	3	0	9	0		
Volume Right	16	4	0	0		
cSH	465	1700	948	1700		
Volume to Capacity	0.04	0.36	0.01	0.38		
Queue Length 95th (ft)	3	0	1	0		
Control Delay (s)	13.1	0.0	8.8	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.1	0.0	0.1			
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			39.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8316: Edgefield Road

7/16/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	17	0	0	12	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	0	0	13	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	7	7			13	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	7	7			13	
tC, single (s)	6.7	6.5			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.6			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	935	987			1605	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	19	13	0
Volume Left	19	0	0
Volume Right	0	13	0
cSH	935	1700	1700
Volume to Capacity	0.02	0.01	0.00
Queue Length 95th (ft)	2	0	0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

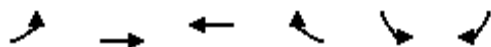
Intersection Summary			
Average Delay		5.2	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

Build Preferred Alternative Exit 83
AM Peak Hour

HCM Unsignalized Intersection Capacity Analysis

8202: Bud Arthur Bridge Road & Buds Drive

8/26/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	19	13	3	0	42
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	1	25	17	4	0	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	21				47	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21				47	19
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	1608				962	1059

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	27	21	56
Volume Left	1	0	0
Volume Right	0	4	56
cSH	1608	1700	1059
Volume to Capacity	0.00	0.01	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.4	0.0	8.6
Lane LOS	A		A
Approach Delay (s)	0.4	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay		4.7	
Intersection Capacity Utilization		13.3%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

8302: Battleground Road & Phillips Drive

8/26/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Volume (veh/h)	10	1	35	82	0	5	56	230	64	19	411	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	1	39	91	0	6	62	256	71	21	457	38
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								885				
pX, platoon unblocked												
vC, conflicting volume	903	969	476	954	952	291	494			327		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	903	969	476	954	952	291	494			327		
tC, single (s)	7.2	6.6	6.3	7.3	6.7	6.4	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.5	2.3			2.2		
p0 queue free %	95	100	93	53	100	99	94			98		
cM capacity (veh/h)	230	224	565	193	223	705	1049			1216		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	51	97	62	327	21	494
Volume Left	11	91	62	0	21	0
Volume Right	39	6	0	71	0	38
cSH	419	201	1049	1700	1216	1700
Volume to Capacity	0.12	0.48	0.06	0.19	0.02	0.29
Queue Length 95th (ft)	10	59	5	0	1	0
Control Delay (s)	14.8	38.4	8.6	0.0	8.0	0.0
Lane LOS	B	E	A		A	
Approach Delay (s)	14.8	38.4	1.4		0.3	
Approach LOS	B	E				

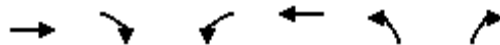
Intersection Summary

Average Delay	4.9
Intersection Capacity Utilization	48.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

8303: Horry Road & Phillips Drive

8/26/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	29	55	1	34	53	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	35	65	1	40	63	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			100		110	67
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			100		110	67
tC, single (s)			4.2		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.7	3.5
p0 queue free %			100		93	100
cM capacity (veh/h)			1456		849	953

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	100	42	63
Volume Left	0	1	63
Volume Right	65	0	0
cSH	1700	1456	849
Volume to Capacity	0.06	0.00	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.2	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.2	9.6
Approach LOS			A

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization	14.9%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
8308: Edgefield Road

8/26/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	6	12	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	7	13	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	20	13	13			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	20	13	13			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	997	1067	1605			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	7	13			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1605	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization		6.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis
 8310: Battleground Road & I-85 SB on-ramp

8/26/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↖	↑			↘	↙
Volume (vph)	0	0	0	53	0	53	286	297	0	0	319	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)					6.0	6.0	6.0	6.0			6.0	
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.95	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1480	1324	1770	1863			1697	
Flt Permitted					0.95	1.00	0.19	1.00			1.00	
Satd. Flow (perm)					1480	1324	360	1863			1697	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	59	0	59	318	330	0	0	354	232
RTOR Reduction (vph)	0	0	0	0	0	52	0	0	0	0	28	0
Lane Group Flow (vph)	0	0	0	0	59	7	318	330	0	0	558	0
Heavy Vehicles (%)	22%	2%	22%	22%	2%	22%	2%	2%	2%	2%	6%	6%
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					4		1	6				2
Permitted Phases				4		4	6					
Actuated Green, G (s)					6.9	6.9	41.9	41.9			24.8	
Effective Green, g (s)					6.9	6.9	41.9	41.9			24.8	
Actuated g/C Ratio					0.11	0.11	0.69	0.69			0.41	
Clearance Time (s)					6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					167	150	505	1283			692	
v/s Ratio Prot							c0.11	0.18			c0.33	
v/s Ratio Perm					0.04	0.01	0.32					
v/c Ratio					0.35	0.04	0.63	0.26			0.81	
Uniform Delay, d1					24.9	24.0	7.6	3.6			15.9	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.3	0.1	2.5	0.1			6.8	
Delay (s)					26.2	24.1	10.1	3.7			22.7	
Level of Service					C	C	B	A			C	
Approach Delay (s)		0.0			25.2			6.8			22.7	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

8311: Battleground Road & Frontage Road/I-85 NB on-ramp

8/26/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Volume (veh/h)	8	3	11	183	9	71	4	504	98	51	319	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	3	12	203	10	79	4	560	109	57	354	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				None
Median storage (veh)								2				
Upstream signal (ft)								1104				827
pX, platoon unblocked	0.89	0.89		0.89	0.89	0.89				0.89		
vC, conflicting volume	1122	1147	356	1105	1093	614	357			669		
vC1, stage 1 conf vol	469	469		623	623							
vC2, stage 2 conf vol	653	678		482	470							
vCu, unblocked vol	1073	1101	356	1054	1041	499	357			561		
tC, single (s)	7.1	6.5	6.2	7.2	6.6	6.3	4.3			4.3		
tC, 2 stage (s)	6.1	5.5		6.2	5.6							
tF (s)	3.5	4.0	3.3	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	97	99	98	45	97	84	100			93		
cM capacity (veh/h)	295	342	693	370	377	497	1128			835		

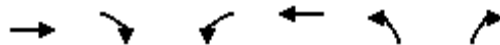
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	24	203	89	4	669	57	357
Volume Left	9	203	0	4	0	57	0
Volume Right	12	0	79	0	109	0	2
cSH	425	370	480	1128	1700	835	1700
Volume to Capacity	0.06	0.55	0.19	0.00	0.39	0.07	0.21
Queue Length 95th (ft)	5	79	17	0	0	5	0
Control Delay (s)	14.0	26.0	14.2	8.2	0.0	9.6	0.0
Lane LOS	B	D	B	A		A	
Approach Delay (s)	14.0	22.4		0.1		1.3	
Approach LOS	B	C					

Intersection Summary			
Average Delay		5.3	
Intersection Capacity Utilization	62.6%		ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

8312: Horry Road & Phillips Drive

8/26/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	24	5	0	30	5	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	6	0	33	6	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			32		63	29
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			32		63	29
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1542		943	1045

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	32	33	6
Volume Left	0	0	6
Volume Right	6	0	0
cSH	1700	1542	943
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.8
Lane LOS	A		
Approach Delay (s)	0.0	0.0	8.8
Approach LOS	A		

Intersection Summary			
Average Delay			0.7
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)			15

HCM Unsignalized Intersection Capacity Analysis

8313: Horry Road

8/26/2015

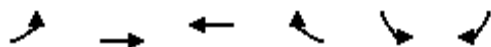


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Sign Control		Stop	Stop		Stop	
Volume (vph)	5	0	0	0	0	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	0	0	0	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	6	0	6			
Volume Left (vph)	6	0	0			
Volume Right (vph)	0	0	6			
Hadj (s)	0.23	0.00	-0.57			
Departure Headway (s)	4.1	3.9	3.3			
Degree Utilization, x	0.01	0.00	0.01			
Capacity (veh/h)	861	913	1070			
Control Delay (s)	7.2	6.9	6.4			
Approach Delay (s)	7.2	0.0	6.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8314: Frontage Road

8/26/2015













Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	0	22	15	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	24	17	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	17				41	17
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	17				41	17
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1614				975	1068

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	24	17	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1614	1700	1700
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8315: Battleground Road & Edgefield Road

12/10/2015

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	12	594	3	3	510
Future Volume (Veh/h)	0	12	594	3	3	510
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	13	667	3	3	573
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage (veh)			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1248	668			670	
vC1, stage 1 conf vol	668					
vC2, stage 2 conf vol	579					
vCu, unblocked vol	1248	668			670	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.3	
p0 queue free %	100	97			100	
cM capacity (veh/h)	408	458			893	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	13	670	3	573		
Volume Left	0	0	3	0		
Volume Right	13	3	0	0		
cSH	458	1700	893	1700		
Volume to Capacity	0.03	0.39	0.00	0.34		
Queue Length 95th (ft)	2	0	0	0		
Control Delay (s)	13.1	0.0	9.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.1	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			41.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8316: Edgefield Road

8/26/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	12	0	0	6	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	0	0	7	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3	3			7	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3	3			7	
tC, single (s)	6.7	6.5			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.6			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	939	991			1614	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	13	7	0
Volume Left	13	0	0
Volume Right	0	7	0
cSH	939	1700	1700
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

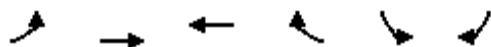
Intersection Summary			
Average Delay		5.9	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

PM Peak Hour

HCM Unsignalized Intersection Capacity Analysis

8202: Bud Arthur Bridge Road & Buds Drive

8/26/2015



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶		↶	
Volume (veh/h)	1	19	13	3	0	42
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	1	25	17	4	0	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	21				47	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21				47	19
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	1594				962	1059

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	27	21	56
Volume Left	1	0	0
Volume Right	0	4	56
cSH	1594	1700	1059
Volume to Capacity	0.00	0.01	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.4	0.0	8.6
Lane LOS	A		A
Approach Delay (s)	0.4	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay		4.7	
Intersection Capacity Utilization		13.3%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

8302: Battleground Road & Phillips Drive

8/26/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Volume (veh/h)	16	2	57	68	2	10	26	392	72	13	284	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	2	63	76	2	11	29	436	80	14	316	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								885				
pX, platoon unblocked	0.93	0.93		0.93	0.93	0.93				0.93		
vC, conflicting volume	858	926	323	942	878	476	316			516		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	811	884	323	902	833	401	316			444		
tC, single (s)	7.1	6.5	6.2	7.3	6.7	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.7	4.2	3.5	2.2			2.2		
p0 queue free %	93	99	91	62	99	98	98			99		
cM capacity (veh/h)	263	255	718	200	259	576	1239			1026		

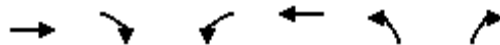
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	83	89	29	516	14	331
Volume Left	18	76	29	0	14	0
Volume Right	63	11	0	80	0	16
cSH	506	219	1239	1700	1026	1700
Volume to Capacity	0.16	0.41	0.02	0.30	0.01	0.19
Queue Length 95th (ft)	15	46	2	0	1	0
Control Delay (s)	13.5	32.3	8.0	0.0	8.6	0.0
Lane LOS	B	D	A		A	
Approach Delay (s)	13.5	32.3	0.4		0.4	
Approach LOS	B	D				

Intersection Summary		
Average Delay		4.1
Intersection Capacity Utilization	42.8%	ICU Level of Service
Analysis Period (min)		15
		A

HCM Unsignalized Intersection Capacity Analysis

8303: Horry Road & Phillips Drive

8/26/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	33	54	2	37	43	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	39	64	2	44	51	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			104		120	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			104		120	71
tC, single (s)			4.2		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.7	3.5
p0 queue free %			100		94	100
cM capacity (veh/h)			1416		830	940

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	104	46	51
Volume Left	0	2	51
Volume Right	64	0	0
cSH	1700	1416	830
Volume to Capacity	0.06	0.00	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.4	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.4	9.6
Approach LOS			A

Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization		15.0%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

8308: Edgefield Road

8/26/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	12	17	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	13	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)	1102					
pX, platoon unblocked						
vC, conflicting volume	32	19	19			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	32	19	19			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	100	100	100			
cM capacity (veh/h)	981	1059	1572			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	13	19			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1572	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	6.7%			ICU Level of Service	A	
Analysis Period (min)	15					

HCM Signalized Intersection Capacity Analysis
 8310: Battleground Road & I-85 SB off-ramp

8/26/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↖	↑			↖	↗
Volume (vph)	0	0	0	85	0	72	171	418	0	0	275	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)					6.0	6.0	6.0	6.0			6.0	
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.96	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1543	1380	1752	1845			1763	
Flt Permitted					0.95	1.00	0.31	1.00			1.00	
Satd. Flow (perm)					1543	1380	567	1845			1763	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	94	0	80	190	464	0	0	306	149
RTOR Reduction (vph)	0	0	0	0	0	69	0	0	0	0	22	0
Lane Group Flow (vph)	0	0	0	0	94	11	190	464	0	0	433	0
Heavy Vehicles (%)	0%	0%	0%	17%	17%	17%	3%	3%	3%	3%	3%	3%
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					4		1	6				2
Permitted Phases				4		4	6					
Actuated Green, G (s)					7.2	7.2	34.5	34.5				21.9
Effective Green, g (s)					7.2	7.2	34.5	34.5				21.9
Actuated g/C Ratio					0.13	0.13	0.64	0.64				0.41
Clearance Time (s)					6.0	6.0	6.0	6.0				6.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0				3.0
Lane Grp Cap (vph)					206	185	509	1185				718
v/s Ratio Prot							0.05	c0.25				c0.25
v/s Ratio Perm					0.06	0.01	0.19					
v/c Ratio					0.46	0.06	0.37	0.39				0.60
Uniform Delay, d1					21.4	20.3	5.2	4.6				12.5
Progression Factor					1.00	1.00	1.00	1.00				1.00
Incremental Delay, d2					1.6	0.1	0.5	0.2				1.4
Delay (s)					23.0	20.4	5.7	4.8				13.9
Level of Service					C	C	A	A				B
Approach Delay (s)		0.0			21.8			5.1				13.9
Approach LOS		A			C			A				B

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	53.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 8311: Battleground Road & Frontage Road/I-85 NB on-ramp

8/26/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Volume (veh/h)	14	9	13	256	18	131	14	444	92	47	307	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	10	14	284	20	146	16	493	102	52	341	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				None
Median storage (veh)								2				
Upstream signal (ft)								1104				827
pX, platoon unblocked	0.95	0.95		0.95	0.95	0.95				0.95		
vC, conflicting volume	1129	1076	344	1041	1028	544	348			596		
vC1, stage 1 conf vol	449	449		576	576							
vC2, stage 2 conf vol	680	627		465	452							
vCu, unblocked vol	1111	1055	344	1018	1005	498	348			551		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.2			4.2		
tC, 2 stage (s)	6.2	5.6		6.1	5.5							
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.3			2.3		
p0 queue free %	93	97	98	27	95	73	99			94		
cM capacity (veh/h)	236	360	689	389	401	546	1178			943		

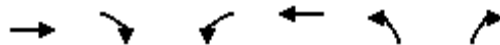
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	40	284	166	16	596	52	348
Volume Left	16	284	0	16	0	52	0
Volume Right	14	0	146	0	102	0	7
cSH	348	389	523	1178	1700	943	1700
Volume to Capacity	0.11	0.73	0.32	0.01	0.35	0.06	0.20
Queue Length 95th (ft)	10	142	34	1	0	4	0
Control Delay (s)	16.7	35.6	15.0	8.1	0.0	9.0	0.0
Lane LOS	C	E	C	A		A	
Approach Delay (s)	16.7	28.0		0.2		1.2	
Approach LOS	C	D					

Intersection Summary			
Average Delay		9.2	
Intersection Capacity Utilization	63.1%		ICU Level of Service B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

8312: Horry Road & Phillips Drive

8/26/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Volume (veh/h)	28	5	0	34	5	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	31	6	0	38	6	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			37		72	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			37		72	34
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1536		932	1039

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	37	38	6
Volume Left	0	0	6
Volume Right	6	0	0
cSH	1700	1536	932
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8313: Horry Road

8/26/2015

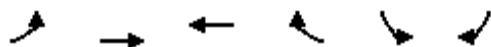


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↷	
Sign Control		Stop	Stop		Stop	
Volume (vph)	5	0	0	0	0	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	0	0	0	0	6
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total (vph)	6	0	6			
Volume Left (vph)	6	0	0			
Volume Right (vph)	0	0	6			
Hadj (s)	0.23	0.00	-0.57			
Departure Headway (s)	4.1	3.9	3.3			
Degree Utilization, x	0.01	0.00	0.01			
Capacity (veh/h)	861	913	1070			
Control Delay (s)	7.2	6.9	6.4			
Approach Delay (s)	7.2	0.0	6.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			6.8			
Level of Service			A			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8314: Frontage Road

8/26/2015













Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	0	36	38	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	40	42	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	42				82	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	42				82	42
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1580				920	1028

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	40	42	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1580	1700	1700
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		6.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 8315: Battleground Road & Edgefield Road

12/10/2015

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	14	536	4	8	568
Future Volume (Veh/h)	3	14	536	4	8	568
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	16	602	4	9	638
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage (veh)			2		2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1260	604			606	
vC1, stage 1 conf vol	604					
vC2, stage 2 conf vol	656					
vCu, unblocked vol	1260	604			606	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	99	97			99	
cM capacity (veh/h)	390	482			948	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	19	606	9	638		
Volume Left	3	0	9	0		
Volume Right	16	4	0	0		
cSH	465	1700	948	1700		
Volume to Capacity	0.04	0.36	0.01	0.38		
Queue Length 95th (ft)	3	0	1	0		
Control Delay (s)	13.1	0.0	8.8	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.1	0.0	0.1			
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			39.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8316: Edgefield Road

8/26/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	17	0	0	12	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	0	0	13	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	7	7			13	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	7	7			13	
tC, single (s)	6.7	6.5			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.6			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	935	987			1605	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	19	13	0
Volume Left	19	0	0
Volume Right	0	13	0
cSH	935	1700	1700
Volume to Capacity	0.02	0.01	0.00
Queue Length 95th (ft)	2	0	0
Control Delay (s)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.9	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		5.2	
Intersection Capacity Utilization		13.3%	ICU Level of Service
Analysis Period (min)		15	A

Appendix D

VISSIM Freeway and Ramp Merge/Diverge Outputs

Freeway Outputs

Calibration Summary - FHWA Criteria

Criterion	Measures	Calibration Acceptance Targets	I-85 Model
GEH¹			
Individual Link Flows (Model vs. Observed)	< 5	>85% of cases	100%
Sum of All Link Flows (Model vs. Observed)	< 4	All Cases	100%
Travel Times (Model vs. Observed)			
Within 15% (or 1 min, if higher) is acceptable; within 5 mph is		>85% of cases	100% (100%)
Visual Audits			
Visually Acceptable Speed-Flow Relationship		To Analyst's Satisfaction	Yes
Bottlenecks			
Visually Acceptable Queuing		To Analyst's Satisfaction	Yes

¹ GEH is a universal measure to compare simulation input and output data.

For hourly flows: $GEH = \sqrt{\frac{(E - V)^2}{0.5(E + V)}}$

V = input volume
E = output volume from the model

GEH Statistic Interpretation	
GEH < 5.0	Acceptable
5.0 ≤ GEH ≤ 10.0	May warrant investigation
GEH > 10.0	High probability of error

Location	Existing AM			Existing PM			NB AM			NB PM		
	Volume	Density (PC/M/L)	LOS	Volume	Density (PC/M/L)	LOS	Volume	Density (PC/M/L)	LOS	Volume	Density (PC/M/L)	LOS
Northbound I-581												
Exit 80 Off-Ramp (Diverge)												
Lane One	803	18.1	C	1185	23.2	C	1196	28.1	D	1340	129.4	F
Lane Two	722	16.4	B	1124	22.1	C	1042	24.6	C	1240	130.3	F
Lane Three	509	11.5	B	868	17.0	B	804	18.6	C	1339	115.6	F
Average	2035	15.9	B	3177	21.1	C	3043	24.4	C	3918	125.0	F
From Exit 80 Off-Ramp to Lane Merge (3 Lanes)												
Lane One	753	17.1	B	1382	27.6	D	1188	27.9	D	1882	94.2	F
Lane Two	971	22.2	C	1489	30.5	D	1365	32.7	D	1336	110.7	F
Lane Three	26	0.5	A	84	1.9	A	67	1.6	A	431	65.3	F
Average	1749	19.7	C	2955	28.3	D	2620	29.7	D	3648	96.8	F
From Lane Merge to Exit 80 On-Ramp (2 Lanes)												
Lane One	814	18.5	C	1469	29.6	D	1280	30.1	D	2024	60.3	F
Lane Two	935	21.6	C	1490	31.1	D	1338	32.5	D	1628	62.7	F
Average	1749	20.1	C	2958	30.4	D	2618	31.4	D	3652	61.4	F
From Exit 80 On-Ramp (Merge)												
Lane One	35	0.8	A	25	0.5	A	65	1.5	A	46	1.0	A
Lane Two	883	19.8	C	1495	30.0	D	1355	31.9	D	1961	49.3	F
Lane Three	969	22.4	C	1520	31.3	D	1406	34.1	D	1772	52.5	F
Average	1887	20.8	C	3040	30.4	D	2826	32.3	D	3779	50.2	F
From Exit 80 On-Ramp to Exit 82 Off-Ramp												
Lane One	944	21.6	C	1531	31.4	D	1426	33.9	D	1918	41.4	E
Lane Two	945	22.5	C	1516	31.7	D	1404	34.3	D	1869	42.9	E
Average	1889	22.1	C	3047	31.5	D	2830	34.1	D	3786	42.2	E
Exit 82 Off-Ramp (Diverge)												
Lane One	29	0.7	A	51	1.1	A	42	1.1	A	64	1.3	A
Lane Two	912	21.6	C	1479	30.8	D	1340	34.0	D	1831	38.6	E
Lane Three	907	22.0	C	1507	31.6	D	1383	35.3	E	1876	40.8	E
Average	1847	21.5	C	3037	30.7	D	2765	34.1	D	3770	39.1	E
From Exit 82 Off-Ramp to Exit 83 Off-Ramp												
Lane One	981	23.2	C	1542	32.4	D	1432	35.1	E	1888	40.4	E
Lane Two	878	20.9	C	1457	30.6	D	1351	33.1	D	1833	39.7	E
Average	1859	22.1	C	2999	31.5	D	2784	34.1	D	3720	40.1	E
Exit 83 Off-Ramp (Diverge)												
Lane One	865	21.6	C	1391	30.4	D	1274	33.3	D	1716	38.5	E
Lane Two	919	21.9	C	1496	31.5	D	1399	34.4	D	1868	40.8	E
Average	1784	21.8	C	2887	31.0	D	2673	33.9	D	3584	39.7	E
From Exit 83 Off-Ramp to Exit 83 On-Ramp												
Lane One	793	18.8	C	1325	27.6	D	1189	28.9	D	1651	34.9	D
Lane Two	891	21.1	C	1414	29.6	D	1330	32.1	D	1748	37.5	E
Average	1684	20.0	C	2739	28.6	D	2519	30.6	D	3399	36.2	E
Exit 83 On-Ramp (Merge)												
Lane One	41	1.6	A	55	4.9	A	73	4.1	A	94	17.8	B
Lane Two	852	20.3	C	1328	28.3	D	1248	30.9	D	1614	37.0	E
Lane Three	890	21.3	C	1426	30.1	D	1343	33.1	D	1802	40.4	E
Average	1783	20.4	C	2808	28.8	D	2664	31.3	D	3510	38.2	E
From Exit 83 On-Ramp to Exit 87 Off-Ramp												
Lane One	901	21.0	C	1418	29.5	D	1342	31.9	D	1768	38.1	E
Lane Two	884	20.8	C	1413	29.7	D	1323	32.1	D	1769	38.3	E
Average	1785	20.9	C	2831	29.6	D	2665	32.0	D	3537	38.2	E
Exit 87 Off-Ramp (Diverge)												
Lane One	65	1.8	A	127	2.9	A	97	2.6	A	158	3.6	A
Lane Two	845	19.7	C	1318	27.3	D	1261	30.1	D	1647	34.8	D
Lane Three	870	20.5	C	1379	28.7	D	1304	31.9	D	1727	36.6	E
Average	1780	19.4	C	2824	26.9	D	2663	30.0	D	3533	34.3	D
From Exit 87 Off-Ramp to Exit 87 On-Ramp												
Lane One	846	19.5	C	1324	27.3	D	1263	29.8	D	1659	34.8	D
Lane Two	857	20.2	C	1355	28.1	D	1285	31.1	D	1688	35.6	E
Average	1703	19.8	C	2679	27.7	D	2548	30.4	D	3347	35.2	E
Exit 87 On-Ramp (Merge)												
Lane One	49	3.9	A	35	7.2	A	81	13.7	B	50	19.3	C
Lane Two	866	20.6	C	1321	28.3	D	1277	32.0	D	1642	36.5	E
Lane Three	867	20.6	C	1358	28.5	D	1313	32.7	D	1703	37.0	E
Average	1781	20.1	C	2714	28.1	D	2671	31.8	D	3396	36.5	E
From Exit 87 On-Ramp to Exit 90 Off-Ramp												
Lane One	920	21.1	C	1390	29.1	D	1350	32.1	D	1723	37.0	E
Lane Two	860	20.0	C	1345	28.2	D	1323	31.7	D	1697	36.6	E
Average	1780	20.6	C	2736	28.6	D	2673	31.9	D	3419	36.8	E
Exit 90 Off-Ramp (Diverge)												
Lane One	796	18.6	C	1211	26.2	D	1137	28.7	D	1477	33.1	D
Lane Two	798	18.5	C	1297	28.1	D	1259	31.4	D	1649	37.0	E
Lane Three	555	12.8	B	1039	27.0	D	854	23.3	C	1585	73.9	F
Average	2149	17.1	B	3546	27.1	D	3250	28.3	D	4711	48.2	F
From Exit 90 Off-Ramp to Exit 90 On-Ramp												
Lane One	663	15.0	B	1077	22.1	C	976	22.9	C	1344	28.1	D
Lane Two	754	17.2	B	1205	24.7	C	1150	27.0	D	1498	31.5	D
Average	1417	16.2	B	2282	23.5	C	2126	25.1	C	2842	29.9	D
Exit 90 On-Ramp (Merge)												
Lane One	77	3.0	A	151	9.6	A	131	10.0	A	182	22.5	C
Lane Two	725	16.9	B	1156	25.9	C	1040	26.4	D	1377	33.4	D
Lane Three	756	17.4	B	1287	27.1	D	1170	28.4	D	1629	36.5	E
Average	1558	16.5	B	2593	25.5	C	2340	26.5	D	3187	34.4	D
From Exit 90 On-Ramp to Exit 92 Off-Ramp												
Lane One	827	18.2	C	1320	26.7	D	1211	27.6	D	1616	33.6	D
Lane Two	766	17.2	B	1277	25.9	C	1174	27.0	D	1585	33.4	D
Average	1593	17.7	B	2597	26.3	D	2385	27.3	D	3202	33.5	D

Location	Existing AM			Existing PM			NB AM			NB PM		
Exit 92 Off-Ramp (Diverge)												
Lane One	168	4.1	A	217	4.8	A	250	6.3	A	267	5.9	A
Lane Two	663	14.6	B	1134	22.4	C	982	22.2	C	1400	28.0	D
Lane Three	764	17.0	B	1241	24.7	C	1152	26.0	D	1537	31.4	D
Average	1595	14.6	B	2592	22.0	C	2384	22.4	C	3203	27.8	D
From Exit 92 Off-Ramp to Exit 92 On-Ramp (Chesnee Highway SB)												
Lane One	646	14.0	B	1130	22.0	C	972	21.4	C	1410	27.6	D
Lane Two	741	16.5	B	1197	23.8	C	1105	24.8	C	1471	29.8	D
Average	1388	15.3	B	2328	22.9	C	2077	23.2	C	2881	28.7	D
Exit 92 On-Ramp (Merge) (Chesnee Highway SB)												
Lane One	22	0.6	A	21	0.5	A	43	1.1	A	38	1.0	A
Lane Two	722	15.7	B	1170	23.0	C	1060	23.6	C	1448	29.0	D
Lane Three	740	16.5	B	1201	24.0	C	1121	25.2	C	1495	30.5	D
Average	1484	15.9	B	2392	23.3	C	2224	24.0	C	2981	29.4	D
From Exit 92 On-Ramp (Chesnee Highway SB) to Exit 92 On-Ramp (Chesnee Highway NB)												
Lane One	757	16.3	B	1205	23.7	C	1119	24.7	C	1495	30.1	D
Lane Two	730	16.2	B	1190	23.7	C	1108	24.9	C	1490	30.6	D
Average	1487	16.2	B	2395	23.7	C	2227	24.8	C	2985	30.4	D
Exit 92 On-Ramp (Merge) (Chesnee Highway NB)												
Lane One	15	0.3	A	38	0.7	A	29	0.5	A	64	1.1	A
Lane Two	804	16.9	B	1280	24.7	C	1194	25.6	C	1608	31.9	D
Lane Three	766	16.8	B	1259	24.9	C	1154	25.5	C	1584	32.4	D
Average	1585	16.7	B	2577	24.5	C	2377	25.2	C	3256	31.5	D
From Exit 92 On-Ramp (Chesnee Highway NB) to Exit 95 Off-Ramp												
Lane One	807	17.0	B	1308	25.2	C	1207	25.9	C	1650	32.3	D
Lane Two	779	16.8	B	1274	25.2	C	1170	25.6	C	1601	32.5	D
Average	1585	16.9	B	2582	25.2	C	2377	25.8	C	3251	32.4	D
Exit 95 Off-Ramp (Diverge)												
Lane One	104	3.5	A	76	2.3	A	156	5.1	A	96	2.8	A
Lane Two	728	15.9	B	1256	25.2	C	1064	24.4	C	1569	32.4	D
Lane Three	753	16.3	B	1240	24.7	C	1156	26.0	D	1571	32.4	D
Average	1585	15.3	B	2571	24.3	C	2376	23.9	C	3235	31.5	D
From Exit 95 Off-Ramp to Exit 96 Off-Ramp												
Lane One	731	15.6	B	1260	24.5	C	1095	23.9	C	1588	31.3	D
Lane Two	704	15.1	B	1215	23.9	C	1062	23.7	C	1528	30.7	D
Average	1434	15.3	B	2475	24.2	C	2156	23.8	C	3116	31.0	D
Exit 96 Off-Ramp (Diverge)												
Lane One	128	3.0	A	186	4.1	A	196	4.8	A	234	5.1	A
Lane Two	598	13.0	B	1078	21.0	C	894	19.9	C	1369	26.9	D
Lane Three	693	14.8	B	1213	23.7	C	1042	23.2	C	1510	30.1	D
Average	1419	13.0	B	2477	21.1	C	2132	20.1	C	3113	26.8	D
From Exit 96 Off-Ramp to Exit 96 On-Ramp												
Lane One	582	12.6	B	1076	20.6	C	882	19.4	C	1376	26.4	D
Lane Two	686	14.6	B	1165	22.6	C	1025	22.6	C	1442	28.6	D
Average	1268	13.7	B	2241	21.6	C	1906	21.1	C	2818	27.5	D
Exit 96 On-Ramp (Merge)												
Lane One	40	1.1	A	58	2.1	A	71	2.3	A	101	4.7	A
Lane Two	644	14.1	B	1115	22.1	C	960	21.6	C	1391	28.4	D
Lane Three	720	15.3	B	1213	23.8	C	1075	23.6	C	1548	31.4	D
Average	1404	14.4	B	2386	22.5	C	2107	22.0	C	3040	29.2	D
From Exit 96 On-Ramp to Exit 98 On-Ramp												
Lane One	664	13.7	B	1177	22.5	C	1028	21.7	C	1503	29.5	D
Lane Two	745	15.7	B	1215	23.7	C	1081	23.4	C	1538	31.0	D
Average	1408	14.8	B	2392	23.2	C	2109	22.6	C	3041	30.3	D
Exit 98 On-Ramp (Merge)												
Lane One	687	14.2	B	1189	22.6	C	1063	22.2	C	1515	29.4	D
Lane Two	723	15.2	B	1201	23.4	C	1045	22.6	C	1522	30.1	D
Average	1410	14.7	B	2390	23.0	C	2108	22.4	C	3037	29.7	D
From Exit 98 On-Ramp to Exit 98 Off-Ramp												
Lane One	694	14.3	B	1195	22.8	C	1067	22.4	C	1523	29.6	D
Lane Two	723	15.3	B	1199	23.2	C	1048	22.5	C	1520	30.2	D
Average	1417	14.8	B	2394	23.0	C	2115	22.4	C	3042	29.9	D
Exit 98 Off-Ramp (Diverge)												
Lane One	18	0.6	A	4	0.1	A	27	0.9	A	5	0.2	A
Lane Two	665	13.9	B	1186	22.8	C	1009	21.8	C	1516	29.7	D
Lane Three	734	15.5	B	1200	23.3	C	1073	23.1	C	1521	30.2	D
Average	1417	14.6	B	2391	23.0	C	2110	22.2	C	3042	29.9	D
From Exit 98 Off-Ramp to Exit 100 Off-Ramp												
Lane One	714	14.9	B	1207	23.3	C	1069	22.9	C	1534	30.2	D
Lane Two	676	14.2	B	1177	22.8	C	998	21.2	C	1496	29.7	D
Average	1390	14.6	B	2384	23.0	C	2067	22.1	C	3030	29.9	D
Exit 100 Off-Ramp (Diverge)												
Lane One	136	4.6	A	97	3.0	A	202	7.0	A	125	3.8	A
Lane Two	542	12.2	B	1056	21.9	C	803	19.5	C	1341	28.9	D
Lane Three	713	15.0	B	1224	24.2	C	1060	23.1	C	1551	31.7	D
Average	1391	12.9	B	2377	22.3	C	2065	20.1	C	3017	29.3	D
From Exit 100 Off-Ramp to Exit 100 On-Ramp												
Lane One	508	10.6	A	1053	20.4	C	776	16.8	B	1347	26.7	D
Lane Two	679	14.2	B	1183	22.9	C	987	20.8	C	1490	29.7	D
Average	1187	12.6	B	2236	21.7	C	1762	19.1	C	2837	28.3	D
Exit 100 On-Ramp (Merge)												
Lane One	12	14.2	B	14	0.3	A	22	20.8	C	23	0.5	A
Lane Two	545	11.5	B	1092	20.9	C	834	18.5	C	1396	27.2	D
Lane Three	677	14.5	B	1177	22.6	C	980	21.1	C	1485	29.2	D
Average	1234	13.2	B	2283	21.7	C	1836	19.9	C	2904	28.0	D

Location	Existing AM			Existing PM			NB AM			NB PM		
	Volume	Density (PC/M/L)	LOS	Volume	Density (PC/M/L)	LOS	Volume	Density (PC/M/L)	LOS	Volume	Density (PC/M/L)	LOS
Southbound I-581												
Exit 100 Off-Ramp (Diverge)												
Lane One	667	15.2	B	1186	23.6	C	978	23.5	C	1777	43.1	E
Lane Two	679	15.5	B	1180	23.7	C	1038	24.4	C	1765	43.8	E
Average	1346	15.4	B	2366	23.7	C	2015	23.9	C	3542	43.5	E
From Exit 100 Off-Ramp to Exit 100 On-Ramp												
Lane One	652	14.6	B	1162	22.6	C	961	22.4	C	1743	38.3	E
Lane Two	668	15.1	B	1181	23.2	C	1016	23.7	C	1764	38.8	E
Average	1320	14.8	B	2343	22.9	C	1977	23.0	C	3507	38.6	E
Exit 100 On-Ramp (Merge)												
Lane One	20	0.5	A	44	1.1	A	37	0.9	A	82	2.1	A
Lane Two	681	15.6	B	1179	23.7	C	1003	23.7	C	1783	40.6	E
Lane Three	740	17.3	B	1298	26.3	D	1118	27.0	D	1907	42.8	E
Average	1441	16.2	B	2521	24.7	C	2158	25.0	C	3773	40.8	E
From Exit 100 On-Ramp to Exit 96 Off-Ramp												
Lane One	719	16.4	B	1255	25.2	C	1078	25.7	C	1877	50.2	F
Lane Two	725	17.0	B	1269	25.8	C	1083	26.3	D	1891	50.4	F
Average	1444	16.7	B	2524	25.5	C	2161	26.0	D	3767	50.3	F
Exit 96 Off-Ramp (Diverge)												
Lane One	692	16.3	B	1237	25.4	C	1026	26.1	D	1806	70.0	F
Lane Two	732	17.0	B	1265	25.8	C	1104	27.0	D	1875	70.4	F
Average	1424	16.7	B	2503	25.6	C	2130	26.6	D	3681	70.2	F
From Exit 96 Off-Ramp to Exit 96 On-Ramp												
Lane One	652	15.1	B	1177	24.0	C	981	23.8	C	1730	76.6	F
Lane Two	732	16.9	B	1270	25.9	C	1089	25.9	C	1863	74.2	F
Average	1384	16.1	B	2447	25.0	C	2070	24.9	C	3593	75.4	F
Exit 96 On-Ramp (Merge)												
Lane One	647	15.1	B	1153	24.5	C	955	24.0	C	1624	83.1	F
Lane Two	744	17.3	B	1301	26.9	D	1126	26.9	D	1976	73.2	F
Average	1391	16.3	B	2454	25.8	C	2081	25.5	C	3600	77.6	F
From Exit 96 On-Ramp to Exit 95 Off-Ramp												
Lane One	787	17.8	B	1316	26.9	D	1176	28.3	D	1920	47.4	F
Lane Two	778	17.8	B	1323	27.3	D	1165	27.9	D	1933	47.8	F
Average	1566	17.8	B	2639	27.1	D	2341	28.1	D	3853	47.6	F
Exit 95 Off-Ramp (Diverge)												
Lane One	762	17.1	B	1309	26.3	D	1128	27.7	D	1903	40.9	E
Lane Two	777	17.6	B	1306	26.6	D	1165	27.8	D	1916	41.5	E
Average	1539	17.3	B	2615	26.5	D	2293	27.7	D	3819	41.2	E
From Exit 95 Off-Ramp to Exit 95 On-Ramp												
Lane One	688	15.3	B	1248	24.9	C	1042	23.9	C	1835	38.7	E
Lane Two	771	17.5	B	1296	26.3	D	1131	26.4	D	1881	40.1	E
Average	1459	16.5	B	2543	25.6	C	2173	25.2	C	3716	39.4	E
Exit 95 On-Ramp (Merge)												
Lane One	30	0.9	A	46	1.6	A	50	1.7	A	90	5.4	A
Lane Two	724	16.5	B	1260	25.5	C	1072	26.2	D	1802	40.7	E
Lane Three	795	18.3	C	1339	27.3	D	1179	28.4	D	1972	43.3	E
Average	1548	17.1	B	2646	26.0	C	2300	26.8	D	3864	41.2	E
From Exit 95 On-Ramp to Exit 92 Off-Ramp												
Lane One	767	17.4	B	1348	27.2	D	1156	27.4	D	1955	42.2	E
Lane Two	784	17.9	B	1306	26.5	D	1154	27.5	D	1918	41.0	E
Average	1551	17.7	B	2655	26.8	D	2311	27.5	D	3873	41.6	E
Exit 92 Off-Ramp (Diverge)												
Lane One	142	4.6	A	199	5.2	A	214	7.3	A	284	7.5	A
Lane Two	482	13.3	B	1112	23.5	C	786	24.3	C	1660	36.9	E
Lane Three	927	22.0	C	1341	27.4	D	1316	33.9	D	1924	40.7	E
Average	1551	17.7	B	2651	24.1	C	2316	28.2	D	3868	36.6	E
From Exit 92 Off-Ramp to Exit 92 On-Ramp (Chesnee Highway NB)												
Lane One	483	11.7	B	1100	22.2	C	809	21.2	C	1667	34.7	D
Lane Two	871	20.1	C	1285	25.9	C	1215	29.5	D	1826	38.1	E
Average	1353	17.1	B	2386	24.1	C	2024	26.2	D	3493	36.5	E
Exit 92 On-Ramp (Merge) (Chesnee Highway NB)												
Lane One	20	0.5	A	56	1.3	A	40	0.9	A	118	3.2	A
Lane Two	575	13.0	B	1172	23.6	C	930	22.1	C	1723	37.7	E
Lane Three	863	19.7	C	1345	27.0	D	1208	28.5	D	1934	41.5	E
Average	1458	16.8	B	2573	24.9	C	2177	25.3	C	3774	38.6	E
From Exit 92 On-Ramp (Chesnee Highway NB) to Exit 92 On-Ramp (Chesnee Highway SB)												
Lane One	607	13.1	B	1219	24.1	C	996	22.7	C	1826	39.8	E
Lane Two	856	19.4	C	1357	27.4	D	1193	27.9	D	1954	43.5	E
Average	1463	16.8	B	2577	25.8	C	2189	25.6	C	3780	41.7	E
Exit 92 On-Ramp (Merge) (Chesnee Highway SB)												
Lane One	10	0.2	A	14	0.3	A	18	0.3	A	25	0.5	A
Lane Two	650	13.7	B	1262	24.7	C	1049	23.2	C	1897	39.7	E
Lane Three	837	18.9	C	1358	27.2	D	1174	27.1	D	1946	42.3	E
Average	1497	16.5	B	2634	25.8	C	2241	25.0	C	3868	40.7	E
From Exit 92 On-Ramp (Chesnee Highway SB) to Exit 90 Off-Ramp												
Lane One	746	15.7	B	1317	26.0	C	1157	25.2	C	1951	41.9	E
Lane Two	767	17.0	B	1317	26.1	D	1107	24.8	C	1913	41.5	E
Average	1513	16.4	B	2634	26.0	D	2264	25.0	C	3864	41.7	E

Location	Existing AM			Existing PM			NB AM			NB PM		
Exit 90 Off-Ramp (Diverge)												
Lane One	547	16.5	B	1044	27.6	D	877	26.4	D	1692	47.5	F
Lane Two	903	20.5	C	1510	31.0	D	1284	30.2	D	2049	48.0	F
Average	1450	19.0	C	2554	29.6	D	2161	28.6	D	3741	47.8	F
From Exit 90 Off-Ramp to Exit 90 On-Ramp												
Lane One	485	11.0	B	984	21.1	C	788	18.5	C	1641	49.9	F
Lane Two	855	18.9	C	1427	28.9	D	1212	27.3	D	1892	53.3	F
Average	1340	16.1	B	2411	25.7	C	2000	23.8	C	3532	51.7	F
Exit 90 On-Ramp (Merge)												
Lane One	555	12.8	B	1039	27.0	D	854	23.3	C	1585	73.9	F
Lane Two	835	18.8	C	1433	32.0	D	1224	29.5	D	1992	70.1	F
Average	1390	16.4	B	2472	29.9	D	2077	27.0	D	3577	71.8	F
From Exit 90 On-Ramp to Exit 87 Off-Ramp												
Lane One	846	16.9	B	1445	27.9	D	1307	27.0	D	1967	41.2	E
Lane Two	896	18.8	C	1470	29.1	D	1308	28.2	D	1952	41.6	E
Average	1743	17.9	B	2915	28.5	D	2615	27.6	D	3919	41.4	E
Exit 87 Off-Ramp (Diverge)												
Lane One	29	0.9	A	43	1.3	A	46	1.5	A	57	1.9	A
Lane Two	820	16.8	B	1371	27.6	D	1232	26.6	D	1854	41.7	E
Lane Three	878	18.2	C	1495	29.4	D	1317	28.5	D	1993	42.4	E
Average	1727	17.2	B	2909	28.1	D	2595	27.1	D	3904	41.5	E
From Exit 87 Off-Ramp to Exit 87 On-Ramp												
Lane One	820	16.4	B	1375	26.6	D	1240	25.7	C	1869	39.7	E
Lane Two	873	18.0	C	1468	28.7	D	1301	27.7	D	1946	41.1	E
Average	1693	17.2	B	2844	27.7	D	2541	26.7	D	3815	40.4	E
Exit 87 On-Ramp (Merge)												
Lane One	42	0.9	A	31	0.8	A	79	2.1	A	55	1.7	A
Lane Two	820	16.4	B	1409	27.2	D	1200	25.2	C	1899	41.4	E
Lane Three	853	17.6	B	1491	29.0	D	1290	27.6	D	1989	42.6	E
Average	1715	16.6	B	2932	27.8	D	2569	25.7	C	3942	41.4	E
From Exit 87 On-Ramp to Exit 83 Off-Ramp												
Lane One	950	18.8	C	1468	28.1	D	1420	29.3	D	1981	40.2	E
Lane Two	916	18.6	C	1465	28.3	D	1370	28.6	D	1966	40.2	E
Average	1866	18.7	C	2933	28.2	D	2790	28.9	D	3947	40.2	E
Exit 83 Off-Ramp (Diverge)												
Lane One	52	1.5	A	77	2.2	A	77	2.3	A	106	3.0	A
Lane Two	881	18.5	C	1364	26.9	D	1307	30.0	D	1843	41.5	E
Lane Three	925	19.1	C	1480	28.6	D	1392	30.6	D	1973	43.0	E
Average	1858	18.3	C	2921	27.1	D	2777	29.6	D	3922	41.2	E
From Exit 83 Off-Ramp to Exit 83 On-Ramp												
Lane One	879	17.8	B	1372	26.3	D	1309	28.3	D	1852	50.5	F
Lane Two	910	18.5	C	1449	27.8	D	1365	28.8	D	1932	50.7	F
Average	1789	18.2	C	2820	27.1	D	2673	28.5	D	3785	50.6	F
Exit 83 On-Ramp (Merge)												
Lane One	128	5.8	A	105	7.4	A	241	22.6	C	197	20.1	C
Lane Two	936	21.4	C	1326	28.4	D	1317	38.1	E	1749	69.2	F
Lane Three	1035	21.8	C	1567	31.5	D	1579	37.6	E	2088	65.2	F
Average	2099	20.6	C	2998	29.3	D	3137	36.6	E	4034	64.8	F
From Exit 83 On-Ramp to Exit 80 Off-Ramp												
Lane One	1048	21.0	C	1502	28.5	D	1588	33.1	D	2027	41.9	E
Lane Two	1068	21.6	C	1520	29.5	D	1568	33.0	D	2025	42.1	E
Average	2116	21.3	C	3022	29.0	D	3155	33.1	D	4052	42.0	E
Exit 80 Off-Ramp (Diverge)												
Lane One	237	6.1	A	420	8.2	A	432	10.9	A	694	13.8	B
Lane Two	663	14.2	B	1177	20.8	C	1030	22.6	C	1471	27.7	D
Lane Three	1146	22.7	C	1379	25.3	C	1592	33.4	D	1812	34.8	D
Average	2046	18.0	B	2975	21.1	C	3055	26.6	D	3977	28.5	D
Exit 80 Off-Ramp to Exit 80 On-Ramp (Gossett Road NB)												
Lane One	394	8.1	A	651	11.6	B	724	14.4	B	1044	18.8	C
Lane Two	641	11.8	B	1086	18.6	C	972	18.3	C	1360	24.0	C
Lane Three	927	17.6	B	1164	20.9	C	1233	24.1	C	1469	27.1	D
Average	1962	13.8	B	2902	17.9	B	2928	19.8	C	3873	23.8	C
Exit 80 On-Ramp (Gossett Road NB) (Merge)												
Lane One	64	1.6	A	32	0.7	A	117	3.2	A	58	1.3	A
Lane Two	579	11.7	B	820	14.4	B	922	18.6	C	1222	21.8	C
Lane Three	712	13.2	B	1100	19.0	C	1086	20.6	C	1408	25.1	C
Lane Four	796	15.4	B	1071	19.3	C	1076	21.3	C	1360	25.3	C
Average	2151	13.2	B	3023	17.7	B	3200	19.6	C	4048	23.8	C
Exit 80 On-Ramp (Gossett Road NB) to Exit 80 On-Ramp (Gossett Road SB)												
Lane One	640	12.2	B	883	15.1	B	1030	19.9	C	1290	22.6	C
Lane Two	791	14.5	B	1079	18.7	C	1164	22.3	C	1383	24.7	C
Lane Three	832	16.1	B	1038	18.8	C	1169	23.2	C	1344	25.1	C
Average	2262	14.4	B	3000	17.7	B	3363	21.9	C	4018	24.2	C
Exit 80 On-Ramp (Merge)												
Lane One	12	0.3	A	35	1.6	A	20	1.0	A	57	4.8	A
Lane Two	660	12.5	B	920	16.0	B	1050	20.1	C	1302	23.5	C
Lane Three	794	14.5	B	1095	19.0	C	1164	21.9	C	1435	25.7	C
Lane Three	797	15.4	B	1018	18.5	C	1125	22.4	C	1323	24.7	C
Average	2263	14.1	B	3067	17.7	B	3359	21.4	C	4118	24.3	C

Merge/Diverge Outputs Existing AM Peak

80001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,286	2,282	-4	0.1	Y	A	0	0
	Approach	2,286	2,282	-4	0.1	Y	A	0.2	0
SB: I-85 SB On-Ramp	Through	28	28	0	0.0	Y	A	2	0
	Approach	28	28	0	0.0	Y	A	1.5	0
Overall	-	2,314	2,310	-4	0.1	Y	A	1.5	-

80002: Interstate 85 at SB On-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,974	1,963	-11	0.2	Y	A	0	0
	Approach	1,974	1,963	-11	0.2	Y	A	0.4	0
SB: I-85 SB Off-Ramp	Through	312	317	5	0.3	Y	A	1	0
	Approach	312	317	5	0.3	Y	A	0.6	0
Overall	-	2,286	2,280	-6	0.1	Y	A	0.6	-

80003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,974	1,961	-13	0.3	Y	A	2	0
	Approach	1,974	1,961	-13	0.3	Y	A	1.8	0
SB: I-85 SB Off-Ramp	Through	151	148	-3	0.2	Y	A	6	0
	Approach	151	148	-3	0.2	Y	A	6.5	0
Overall	-	2,125	2,109	-16	0.3	Y	A	6.5	-

80004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,758	1,749	-9	0.2	Y	A	0	13
	Approach	1,758	1,749	-9	0.2	Y	A	0.1	13
NB: I-85 NB Off-Ramp	Through	300	308	8	0.5	Y	A	0	13
	Approach	300	308	8	0.5	Y	A	0.5	13
Overall	-	2,058	2,057	-1	0.0	Y	A	0.5	-

80005: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,758	1,749	-9	0.2	Y	A	0	0
	Approach	1,758	1,749	-9	0.2	Y	A	0.3	0
NB: I-85 NB On-Ramp	Through	141	140	-1	0.1	Y	A	0	0
	Approach	141	140	-1	0.1	Y	A	0.3	0
Overall	-	1,899	1,889	-10	0.2	Y	A	0.3	-

82001: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,870	1,860	-10	0.2	Y	A	0	0
	Approach	1,870	1,860	-10	0.2	Y	A	0.4	0
NB: I-85 NB Off-Ramp	Through	29	29	0	0.0	Y	A	0	0
	Approach	29	29	0	0.0	Y	A	0.0	0
Overall	-	1,899	1,889	-10	0.2	Y	A	0.4	-

83001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,794	1,788	-6	0.1	Y	A	0	0
	Approach	1,794	1,788	-6	0.1	Y	A	0.4	0
SB: I-85 SB Off-Ramp	Through	331	330	-1	0.0	Y	A	2	8
	Approach	331	330	-1	0.0	Y	A	1.9	8
Overall	-	2,125	2,118	-7	0.1	Y	A	1.9	-

83002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,794	1,791	-3	0.1	Y	A	0	0
	Approach	1,794	1,791	-3	0.1	Y	A	0.5	0
SB: I-85 SB Off-Ramp	Through	71	74	3	0.4	Y	A	4	0
	Approach	71	74	3	0.4	Y	A	3.9	0
Overall	-	1,865	1,865	0	0.0	Y	A	3.9	-

83003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,695	1,684	-11	0.3	Y	A	0	35
	Approach	1,695	1,684	-11	0.3	Y	A	0.3	35
NB: I-85 NB Off-Ramp	Through	175	175	0	0.0	Y	A	2	35
	Approach	175	175	0	0.0	Y	A	2.3	35
Overall	-	1,870	1,859	-11	0.3	Y	A	2.3	-

83004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,695	1,684	-11	0.3	Y	A	0	0
	Approach	1,695	1,684	-11	0.3	Y	A	0.3	0
NB: I-85 NB On-Ramp	Through	102	100	-2	0.2	Y	A	2	0
	Approach	102	100	-2	0.2	Y	A	1.7	0
Overall	-	1,797	1,784	-13	0.3	Y	A	1.7	-

87001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,701	1,699	-2	0.0	Y	A	0	0
	Approach	1,701	1,699	-2	0.0	Y	A	0.4	0
SB: I-85 SB Off-Ramp	Through	164	165	1	0.1	Y	A	1	0
	Approach	164	165	1	0.1	Y	A	0.6	0
Overall	-	1,865	1,864	-1	0.0	Y	A	0.6	-

87002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,701	1,696	-5	0.1	Y	A	0	0
	Approach	1,701	1,696	-5	0.1	Y	A	0.3	0
SB: I-85 SB Off-Ramp	Through	47	45	-2	0.2	Y	A	4	0
	Approach	47	45	-2	0.2	Y	A	3.7	0
Overall	-	1,748	1,741	-7	0.2	Y	A	3.7	-

87003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,721	1,704	-17	0.4	Y	A	1	0
	Approach	1,721	1,704	-17	0.4	Y	A	0.5	0
NB: I-85 NB Off-Ramp	Through	76	79	3	0.3	Y	A	2	0
	Approach	76	79	3	0.3	Y	A	2.3	0
Overall	-	1,797	1,783	-14	0.3	Y	A	2.3	-

87004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,721	1,704	-17	0.4	Y	A	0	0
	Approach	1,721	1,704	-17	0.4	Y	A	0.3	0
NB: I-85 NB On-Ramp	Through	84	80	-4	0.4	Y	A	1	0
	Approach	84	80	-4	0.4	Y	A	0.5	0
Overall	-	1,805	1,784	-21	0.5	Y	A	0.5	-

90001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,342	1,339	-3	0.1	Y	A	0	0
	Approach	1,342	1,339	-3	0.1	Y	A	0.4	0
SB: I-85 SB On-Ramp	Through	406	408	2	0.1	Y	A	3	159
	Approach	406	408	2	0.1	Y	A	2.8	159
Overall	-	1,748	1,747	-1	0.0	Y	A	2.8	-

90002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,342	1,340	-2	0.1	Y	A	1	0
	Approach	1,342	1,340	-2	0.1	Y	A	1.3	0
SB: I-85 SB Off-Ramp	Through	173	175	2	0.2	Y	A	4	0
	Approach	173	175	2	0.2	Y	A	3.5	0
Overall	-	1,515	1,515	0	0.0	Y	A	3.5	-

90003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,435	1,417	-18	0.5	Y	A	0	0
	Approach	1,435	1,417	-18	0.5	Y	A	0.3	0
NB: I-85 NB Off-Ramp	Through	370	362	-8	0.4	Y	A	1	0
	Approach	370	362	-8	0.4	Y	A	0.5	0
Overall	-	1,805	1,779	-26	0.6	Y	A	0.5	-

90004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,435	1,415	-20	0.5	Y	A	0	0
	Approach	1,435	1,415	-20	0.5	Y	A	0.3	0
NB: I-85 NB On-Ramp	Through	177	176	-1	0.1	Y	A	3	0
	Approach	177	176	-1	0.1	Y	A	2.7	0
Overall	-	1,612	1,591	-21	0.5	Y	A	2.7	-

92001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,463	1,462	-1	0.0	Y	A	1	0
	Approach	1,463	1,462	-1	0.0	Y	A	0.6	0
SB: I-85 SB Off-Ramp	Through	52	51	-1	0.2	Y	A	0	0
	Approach	52	51	-1	0.2	Y	A	0.3	0
Overall	-	1,515	1,513	-2	0.1	Y	A	0.6	-

92002: Interstate 85 at SB On-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,358	1,353	-5	0.1	Y	A	1	0
	Approach	1,358	1,353	-5	0.1	Y	A	0.6	0
SB: I-85 SB Off-Ramp	Through	105	110	5	0.5	Y	A	0	0
	Approach	105	110	5	0.5	Y	A	0.2	0
Overall	-	1,463	1,463	0	0.0	Y	A	0.6	-

92003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,358	1,353	-5	0.1	Y	A	2	23
	Approach	1,358	1,353	-5	0.1	Y	A	1.7	23
SB: I-85 SB Off-Ramp	Through	186	197	11	0.8	Y	A	4	23
	Approach	186	197	11	0.8	Y	A	4.5	23
Overall	-	1,544	1,550	6	0.2	Y	A	4.5	-

92004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,406	1,388	-18	0.5	Y	A	0	0
	Approach	1,406	1,388	-18	0.5	Y	A	0.3	0
NB: I-85 NB Off-Ramp	Through	206	209	3	0.2	Y	A	1	0
	Approach	206	209	3	0.2	Y	A	1.1	0
Overall	-	1,612	1,597	-15	0.4	Y	A	1.1	-

92005: Interstate 85 at NB On-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,406	1,389	-17	0.5	Y	A	0	0
	Approach	1,406	1,389	-17	0.5	Y	A	0.2	0
NB: I-85 NB On-Ramp	Through	103	98	-5	0.5	Y	A	0	0
	Approach	103	98	-5	0.5	Y	A	0.0	0
Overall	-	1,509	1,487	-22	0.6	Y	A	0.2	-

92006: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,509	1,488	-21	0.5	Y	A	0	0
	Approach	1,509	1,488	-21	0.5	Y	A	0.2	0
NB: I-85 NB On-Ramp	Through	101	98	-3	0.3	Y	A	0	0
	Approach	101	98	-3	0.3	Y	A	0.2	0
Overall	-	1,610	1,586	-24	0.6	Y	A	0.2	-

95001: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,456	1,434	-22	0.6	Y	A	0	0
	Approach	1,456	1,434	-22	0.6	Y	A	0.3	0
NB: I-85 NB Off-Ramp	Through	154	151	-3	0.2	Y	A	3	0
	Approach	154	151	-3	0.2	Y	A	3.2	0
Overall	-	1,610	1,585	-25	0.6	Y	A	3.2	-

95002: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,457	1,461	4	0.1	Y	A	0	0
	Approach	1,457	1,461	4	0.1	Y	A	0.3	0
SB: I-85 SB On-Ramp	Through	87	92	5	0.5	Y	A	1	0
	Approach	87	92	5	0.5	Y	A	0.6	0
Overall	-	1,544	1,553	9	0.2	Y	A	0.6	-

95003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,457	1,459	2	0.0	Y	A	0	0
	Approach	1,457	1,459	2	0.0	Y	A	0.1	0
SB: I-85 SB Off-Ramp	Through	109	106	-3	0.3	Y	A	1	0
	Approach	109	106	-3	0.3	Y	A	0.7	0
Overall	-	1,566	1,565	-1	0.0	Y	A	0.7	-

96001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,384	1,383	-1	0.0	Y	A	0	0
	Approach	1,384	1,383	-1	0.0	Y	A	0.2	0
SB: I-85 SB Off-Ramp	Through	182	180	-2	0.1	Y	A	2	73
	Approach	182	180	-2	0.1	Y	A	2.2	73
Overall	-	1,566	1,563	-3	0.1	Y	A	2.2	-

96002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,384	1,385	1	0.0	Y	A	0	0
	Approach	1,384	1,385	1	0.0	Y	A	0.2	0
SB: I-85 SB Off-Ramp	Through	59	60	1	0.1	Y	A	2	0
	Approach	59	60	1	0.1	Y	A	2.1	0
Overall	-	1,443	1,445	2	0.1	Y	A	2.1	-

96003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,292	1,269	-23	0.6	Y	A	0	0
	Approach	1,292	1,269	-23	0.6	Y	A	0.4	0
NB: I-85 NB Off-Ramp	Through	164	166	2	0.2	Y	A	1	0
	Approach	164	166	2	0.2	Y	A	1.3	0
Overall	-	1,456	1,435	-21	0.5	Y	A	1.3	-

96004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,292	1,268	-24	0.7	Y	A	0	0
	Approach	1,292	1,268	-24	0.7	Y	A	0.3	0
NB: I-85 NB On-Ramp	Through	138	139	1	0.1	Y	A	1	0
	Approach	138	139	1	0.1	Y	A	0.5	0
Overall	-	1,430	1,407	-23	0.6	Y	A	0.5	-

98004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,430	1,410	-20	0.5	Y	A	0	0
	Approach	1,430	1,410	-20	0.5	Y	A	0.1	0
NB: I-85 NB On-Ramp	Through	7	7	0	0.0	Y	A	3	20
	Approach	7	7	0	0.0	Y	A	3.1	20
Overall	-	1,437	1,417	-20	0.5	Y	A	3.1	-

98003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,437	1,389	-48	1.3	Y	A	0	0
	Approach	1,437	1,389	-48	1.3	Y	A	0.2	0
NB: I-85 NB Off-Ramp	Through	28	29	1	0.2	Y	A	3	0
	Approach	28	29	1	0.2	Y	A	3.5	0
Overall	-	1,465	1,418	-47	1.2	Y	A	3.5	-

10001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,322	1,323	1	0.0	Y	A	0	0
	Approach	1,322	1,323	1	0.0	Y	A	0.4	0
SB: I-85 SB Off-Ramp	Through	121	120	-1	0.1	Y	A	0	0
	Approach	121	120	-1	0.1	Y	A	0.5	0
Overall	-	1,443	1,443	0	0.0	Y	A	0.5	-

10002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,322	1,320	-2	0.1	Y	A	0	78
	Approach	1,322	1,320	-2	0.1	Y	A	0.3	78
SB: I-85 SB Off-Ramp	Through	56	57	1	0.1	Y	A	1	78
	Approach	56	57	1	0.1	Y	A	0.7	78
Overall	-	1,378	1,377	-1	0.0	Y	A	0.7	-

10003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,201	1,187	-14	0.4	Y	A	0	0
	Approach	1,201	1,187	-14	0.4	Y	A	0.3	0
NB: I-85 NB Off-Ramp	Through	208	203	-5	0.3	Y	A	4	0
	Approach	208	203	-5	0.3	Y	A	3.5	0
Overall	-	1,409	1,390	-19	0.5	Y	A	3.5	-

10004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,201	1,188	-13	0.4	Y	A	0	0
	Approach	1,201	1,188	-13	0.4	Y	A	0.1	0
NB: I-85 NB On-Ramp	Through	58	56	-2	0.3	Y	A	0	0
	Approach	58	56	-2	0.3	Y	A	0.1	0
Overall	-	1,259	1,244	-15	0.4	Y	A	0.1	-

Existing PM Peak

80001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,040	3,021	-19	0.3	Y	A	0	0
	Approach	3,040	3,021	-19	0.3	Y	A	0.3	0
SB: I-85 SB On-Ramp	Through	69	71	2	0.2	Y	A	4	0
	Approach	69	71	2	0.2	Y	A	4.2	0
Overall	-	3,109	3,092	-17	0.3	Y	A	4.2	-

80002: Interstate 85 at SB On-Ramp Loop									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,918	2,900	-18	0.3	Y	A	0	0
	Approach	2,918	2,900	-18	0.3	Y	A	0.4	0
SB: I-85 SB Off-Ramp	Through	122	126	4	0.4	Y	A	0	0
	Approach	122	126	4	0.4	Y	A	0.4	0
Overall	-	3,040	3,026	-14	0.3	Y	A	0.4	-

80003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,918	2,903	-15	0.3	Y	A	1	0
	Approach	2,918	2,903	-15	0.3	Y	A	0.9	0
SB: I-85 SB Off-Ramp	Through	111	108	-3	0.3	Y	A	2	0
	Approach	111	108	-3	0.3	Y	A	2.5	0
Overall	-	3,029	3,011	-18	0.3	Y	A	2.5	-

80004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,977	2,956	-21	0.4	Y	A	0	47
	Approach	2,977	2,956	-21	0.4	Y	A	0.4	47
NB: I-85 NB Off-Ramp	Through	237	238	1	0.1	Y	A	1	47
	Approach	237	238	1	0.1	Y	A	1.0	47
Overall	-	3,214	3,194	-20	0.4	Y	A	1.0	-

80005: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,977	2,960	-17	0.3	Y	A	1	0
	Approach	2,977	2,960	-17	0.3	Y	A	1.0	0
NB: I-85 NB On-Ramp	Through	91	88	-3	0.3	Y	A	0	0
	Approach	91	88	-3	0.3	Y	A	0.3	0
Overall	-	3,068	3,048	-20	0.4	Y	A	1.0	-

82001: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,015	2,997	-18	0.3	Y	A	0	0
	Approach	3,015	2,997	-18	0.3	Y	A	0.5	0
NB: I-85 NB Off-Ramp	Through	53	51	-2	0.3	Y	A	0	0
	Approach	53	51	-2	0.3	Y	A	0.4	0
Overall	-	3,068	3,048	-20	0.4	Y	A	0.5	-

83001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,825	2,819	-6	0.1	Y	A	1	5
	Approach	2,825	2,819	-6	0.1	Y	A	0.8	5
SB: I-85 SB Off-Ramp	Through	204	208	4	0.3	Y	A	7	0
	Approach	204	208	4	0.3	Y	A	6.7	0
Overall	-	3,029	3,027	-2	0.0	Y	A	6.7	-

83002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,825	2,821	-4	0.1	Y	A	1	0
	Approach	2,825	2,821	-4	0.1	Y	A	0.8	0
SB: I-85 SB Off-Ramp	Through	105	110	5	0.5	Y	A	4	0
	Approach	105	110	5	0.5	Y	A	4.2	0
Overall	-	2,930	2,931	1	0.0	Y	A	4.2	-

83003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,753	2,738	-15	0.3	Y	A	1	14
	Approach	2,753	2,738	-15	0.3	Y	A	0.5	14
NB: I-85 NB Off-Ramp	Through	262	260	-2	0.1	Y	A	3	14
	Approach	262	260	-2	0.1	Y	A	2.6	14
Overall	-	3,015	2,998	-17	0.3	Y	A	2.6	-

83004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,753	2,739	-14	0.3	Y	A	1	0
	Approach	2,753	2,739	-14	0.3	Y	A	0.6	0
NB: I-85 NB On-Ramp	Through	99	95	-4	0.4	Y	A	8	0
	Approach	99	95	-4	0.4	Y	A	8.3	0
Overall	-	2,852	2,834	-18	0.3	Y	A	8.3	-

87001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,839	2,847	8	0.2	Y	A	1	0
	Approach	2,839	2,847	8	0.2	Y	A	0.9	0
SB: I-85 SB Off-Ramp	Through	91	88	-3	0.3	Y	A	1	0
	Approach	91	88	-3	0.3	Y	A	1.5	0
Overall	-	2,930	2,935	5	0.1	Y	A	1.5	-

87002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,839	2,850	11	0.2	Y	A	1	0
	Approach	2,839	2,850	11	0.2	Y	A	0.8	0
SB: I-85 SB Off-Ramp	Through	66	67	1	0.1	Y	A	4	0
	Approach	66	67	1	0.1	Y	A	4.3	0
Overall	-	2,905	2,917	12	0.2	Y	A	4.3	-

87003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,702	2,677	-25	0.5	Y	A	1	0
	Approach	2,702	2,677	-25	0.5	Y	A	1.0	0
NB: I-85 NB Off-Ramp	Through	150	153	3	0.3	Y	A	2	0
	Approach	150	153	3	0.3	Y	A	2.5	0
Overall	-	2,852	2,830	-22	0.4	Y	A	2.5	-

87004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,702	2,681	-21	0.4	Y	A	1	0
	Approach	2,702	2,681	-21	0.4	Y	A	0.5	0
NB: I-85 NB On-Ramp	Through	65	61	-4	0.5	Y	C	15	0
	Approach	65	61	-4	0.5	Y	C	15.5	0
Overall	-	2,767	2,742	-25	0.5	Y	C	15.5	-

90001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,410	2,410	0	0.0	Y	A	1	37
	Approach	2,410	2,410	0	0.0	Y	A	1.3	37
SB: I-85 SB Off-Ramp	Through	495	505	10	0.4	Y	A	10	354
	Approach	495	505	10	0.4	Y	A	9.9	354
Overall	-	2,905	2,915	10	0.2	Y	A	9.9	-

90002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,410	2,411	1	0.0	Y	A	2	181
	Approach	2,410	2,411	1	0.0	Y	A	1.6	181
SB: I-85 SB Off-Ramp	Through	226	226	0	0.0	Y	A	4	181
	Approach	226	226	0	0.0	Y	A	3.8	181
Overall	-	2,636	2,637	1	0.0	Y	A	3.8	-

90003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,306	2,281	-25	0.5	Y	A	1	337
	Approach	2,306	2,281	-25	0.5	Y	A	0.9	337
NB: I-85 NB Off-Ramp	Through	461	462	1	0.0	Y	A	1	337
	Approach	461	462	1	0.0	Y	A	1.0	337
Overall	-	2,767	2,743	-24	0.5	Y	A	1.0	-

90004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,306	2,284	-22	0.5	Y	A	1	0
	Approach	2,306	2,284	-22	0.5	Y	A	0.8	0
NB: I-85 NB On-Ramp	Through	314	317	3	0.2	Y	A	6	0
	Approach	314	317	3	0.2	Y	A	6.3	0
Overall	-	2,620	2,601	-19	0.4	Y	A	6.3	-

92001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,576	2,574	-2	0.0	Y	A	1	0
	Approach	2,576	2,574	-2	0.0	Y	A	0.9	0
SB: I-85 SB Off-Ramp	Through	60	59	-1	0.1	Y	A	1	0
	Approach	60	59	-1	0.1	Y	A	0.6	0
Overall	-	2,636	2,633	-3	0.1	Y	A	0.9	-

92002: Interstate 85 at SB On-Ramp Loop									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,381	2,386	5	0.1	Y	A	1	0
	Approach	2,381	2,386	5	0.1	Y	A	0.5	0
SB: I-85 SB Off-Ramp	Through	195	193	-2	0.1	Y	A	0	0
	Approach	195	193	-2	0.1	Y	A	0.3	0
Overall	-	2,576	2,579	3	0.1	Y	A	0.5	-

92003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,381	2,386	5	0.1	Y	A	1	68
	Approach	2,381	2,386	5	0.1	Y	A	0.9	68
SB: I-85 SB Off-Ramp	Through	261	271	10	0.6	Y	A	3	68
	Approach	261	271	10	0.6	Y	A	2.9	68
Overall	-	2,642	2,657	15	0.3	Y	A	2.9	-

92004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,352	2,328	-24	0.5	Y	A	1	0
	Approach	2,352	2,328	-24	0.5	Y	A	0.6	0
NB: I-85 NB Off-Ramp	Through	268	267	-1	0.1	Y	A	1	0
	Approach	268	267	-1	0.1	Y	A	1.3	0
Overall	-	2,620	2,595	-25	0.5	Y	A	1.3	-

92005: Interstate 85 at NB On-Ramp Loop									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,352	2,328	-24	0.5	Y	A	1	0
	Approach	2,352	2,328	-24	0.5	Y	A	0.6	0
NB: I-85 NB On-Ramp	Through	73	67	-6	0.7	Y	A	1	0
	Approach	73	67	-6	0.7	Y	A	0.6	0
Overall	-	2,425	2,395	-30	0.6	Y	A	0.6	-

92006: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,425	2,393	-32	0.6	Y	A	0	0
	Approach	2,425	2,393	-32	0.6	Y	A	0.4	0
NB: I-85 NB On-Ramp	Through	181	184	3	0.2	Y	A	0	0
	Approach	181	184	3	0.2	Y	A	0.2	0
Overall	-	2,606	2,577	-29	0.6	Y	A	0.4	-

95001: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,494	2,473	-21	0.4	Y	A	1	0
	Approach	2,494	2,473	-21	0.4	Y	A	0.6	0
NB: I-85 NB Off-Ramp	Through	112	109	-3	0.3	Y	A	3	0
	Approach	112	109	-3	0.3	Y	A	3.3	0
Overall	-	2,606	2,582	-24	0.5	Y	A	3.3	-

95002: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,536	2,545	9	0.2	Y	A	1	0
	Approach	2,536	2,545	9	0.2	Y	A	0.5	0
SB: I-85 SB On-Ramp	Through	106	106	0	0.0	Y	A	2	0
	Approach	106	106	0	0.0	Y	A	1.7	0
Overall	-	2,642	2,651	9	0.2	Y	A	1.7	-

95003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,536	2,543	7	0.1	Y	A	0	10
	Approach	2,536	2,543	7	0.1	Y	A	0.3	10
SB: I-85 SB Off-Ramp	Through	94	95	1	0.1	Y	A	1	10
	Approach	94	95	1	0.1	Y	A	0.8	10
Overall	-	2,630	2,638	8	0.2	Y	A	0.8	-

96001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,437	2,446	9	0.2	Y	A	0	8
	Approach	2,437	2,446	9	0.2	Y	A	0.4	8
SB: I-85 SB Off-Ramp	Through	193	190	-3	0.2	Y	A	6	104
	Approach	193	190	-3	0.2	Y	A	6.1	104
Overall	-	2,630	2,636	6	0.1	Y	A	6.1	-

96002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,437	2,448	11	0.2	Y	A	0	8
	Approach	2,437	2,448	11	0.2	Y	A	0.4	8
SB: I-85 SB Off-Ramp	Through	82	85	3	0.3	Y	A	2	8
	Approach	82	85	3	0.3	Y	A	1.9	8
Overall	-	2,519	2,533	14	0.3	Y	A	1.9	-

96003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,263	2,242	-21	0.4	Y	A	1	0
	Approach	2,263	2,242	-21	0.4	Y	A	0.6	0
NB: I-85 NB Off-Ramp	Through	231	238	7	0.5	Y	A	2	0
	Approach	231	238	7	0.5	Y	A	1.5	0
Overall	-	2,494	2,480	-14	0.3	Y	A	1.5	-

96004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,263	2,241	-22	0.5	Y	A	1	0
	Approach	2,263	2,241	-22	0.5	Y	A	0.6	0
NB: I-85 NB On-Ramp	Through	150	150	0	0.0	Y	A	2	0
	Approach	150	150	0	0.0	Y	A	2.3	0
Overall	-	2,413	2,391	-22	0.4	Y	A	2.3	-

98004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,413	2,390	-23	0.5	Y	A	0	0
	Approach	2,413	2,390	-23	0.5	Y	A	0.3	0
NB: I-85 NB On-Ramp	Through	6	6	0	0.0	Y	A	6	34
	Approach	6	6	0	0.0	Y	A	6.1	34
Overall	-	2,419	2,396	-23	0.5	Y	A	6.1	-

98003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,419	2,384	-35	0.7	Y	A	0	0
	Approach	2,419	2,384	-35	0.7	Y	A	0.5	0
NB: I-85 NB Off-Ramp	Through	7	7	0	0.0	Y	A	4	0
	Approach	7	7	0	0.0	Y	A	3.7	0
Overall	-	2,426	2,391	-35	0.7	Y	A	3.7	-

10001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,340	2,345	5	0.1	Y	A	1	0
	Approach	2,340	2,345	5	0.1	Y	A	0.8	0
SB: I-85 SB Off-Ramp	Through	179	177	-2	0.1	Y	A	1	6
	Approach	179	177	-2	0.1	Y	A	0.6	6
Overall	-	2,519	2,522	3	0.1	Y	A	0.8	-

10002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,340	2,342	2	0.0	Y	A	0	122
	Approach	2,340	2,342	2	0.0	Y	A	0.5	122
SB: I-85 SB Off-Ramp	Through	58	58	0	0.0	Y	A	1	122
	Approach	58	58	0	0.0	Y	A	1.3	122
Overall	-	2,398	2,400	2	0.0	Y	A	1.3	-

10003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,269	2,238	-31	0.7	Y	A	1	14
	Approach	2,269	2,238	-31	0.7	Y	A	0.7	14
NB: I-85 NB Off-Ramp	Through	143	143	0	0.0	Y	A	4	14
	Approach	143	143	0	0.0	Y	A	3.8	14
Overall	-	2,412	2,381	-31	0.6	Y	A	3.8	-

10004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,269	2,236	-33	0.7	Y	A	0	0
	Approach	2,269	2,236	-33	0.7	Y	A	0.3	0
NB: I-85 NB On-Ramp	Through	47	47	0	0.0	Y	A	0	0
	Approach	47	47	0	0.0	Y	A	0.1	0
Overall	-	2,316	2,283	-33	0.7	Y	A	0.3	-

No Build AM Peak

80001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,417	3,387	-30	0.5	Y	A	0	0
	Approach	3,417	3,387	-30	0.5	Y	A	0.4	0
SB: I-85 SB On-Ramp	Through	42	41	-1	0.2	Y	A	4	0
	Approach	42	41	-1	0.2	Y	A	4.1	0
Overall	-	3,459	3,428	-31	0.5	Y	A	4.1	-

80002: Interstate 85 at SB Off-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,951	2,927	-24	0.4	Y	A	1	0
	Approach	2,951	2,927	-24	0.4	Y	A	0.6	0
SB: I-85 SB Off-Ramp	Through	466	465	-1	0.0	Y	A	1	0
	Approach	466	465	-1	0.0	Y	A	1.0	0
Overall	-	3,417	3,392	-25	0.4	Y	A	1.0	-

80003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,951	2,929	-22	0.4	Y	A	2	0
	Approach	2,951	2,929	-22	0.4	Y	A	2.4	0
SB: I-85 SB Off-Ramp	Through	226	221	-5	0.3	Y	A	7	0
	Approach	226	221	-5	0.3	Y	A	6.8	0
Overall	-	3,177	3,150	-27	0.5	Y	A	6.8	-

80004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,628	2,620	-8	0.2	Y	A	1	115
	Approach	2,628	2,620	-8	0.2	Y	A	0.6	115
NB: I-85 NB Off-Ramp	Through	448	456	8	0.4	Y	A	1	115
	Approach	448	456	8	0.4	Y	A	1.4	115
Overall	-	3,076	3,076	0	0.0	Y	A	1.4	-

80005: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,628	2,619	-9	0.2	Y	A	1	0
	Approach	2,628	2,619	-9	0.2	Y	A	0.9	0
NB: I-85 NB On-Ramp	Through	211	211	0	0.0	Y	A	0	0
	Approach	211	211	0	0.0	Y	A	0.4	0
Overall	-	2,839	2,830	-9	0.2	Y	A	0.9	-

82001: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,796	2,784	-12	0.2	Y	A	1	0
	Approach	2,796	2,784	-12	0.2	Y	A	0.9	0
NB: I-85 NB Off-Ramp	Through	43	42	-1	0.2	Y	A	0	0
	Approach	43	42	-1	0.2	Y	A	0.0	0
Overall	-	2,839	2,826	-13	0.2	Y	A	0.9	-

83001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,682	2,671	-11	0.2	Y	A	1	71
	Approach	2,682	2,671	-11	0.2	Y	A	1.5	71
SB: I-85 SB Off-Ramp	Through	495	492	-3	0.1	Y	A	9	49
	Approach	495	492	-3	0.1	Y	A	8.8	49
Overall	-	3,177	3,163	-14	0.2	Y	A	8.8	-

83002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,682	2,676	-6	0.1	Y	A	1	76
	Approach	2,682	2,676	-6	0.1	Y	A	1.2	76
SB: I-85 SB Off-Ramp	Through	106	109	3	0.3	Y	A	4	76
	Approach	106	109	3	0.3	Y	A	4.3	76
Overall	-	2,788	2,785	-3	0.1	Y	A	4.3	-

83003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,534	2,520	-14	0.3	Y	A	1	70
	Approach	2,534	2,520	-14	0.3	Y	A	0.7	70
NB: I-85 NB Off-Ramp	Through	262	263	1	0.1	Y	A	2	70
	Approach	262	263	1	0.1	Y	A	2.3	70
Overall	-	2,796	2,783	-13	0.2	Y	A	2.3	-

83004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,534	2,515	-19	0.4	Y	A	1	0
	Approach	2,534	2,515	-19	0.4	Y	A	0.6	0
NB: I-85 NB On-Ramp	Through	152	152	0	0.0	Y	A	4	0
	Approach	152	152	0	0.0	Y	A	4.4	0
Overall	-	2,686	2,667	-19	0.4	Y	A	4.4	-

87001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,543	2,545	2	0.0	Y	A	1	0
	Approach	2,543	2,545	2	0.0	Y	A	0.9	0
SB: I-85 SB Off-Ramp	Through	245	244	-1	0.1	Y	A	2	0
	Approach	245	244	-1	0.1	Y	A	1.5	0
Overall	-	2,788	2,789	1	0.0	Y	A	1.5	-

87002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,543	2,547	4	0.1	Y	A	1	0
	Approach	2,543	2,547	4	0.1	Y	A	0.7	0
SB: I-85 SB Off-Ramp	Through	70	71	1	0.2	Y	A	4	0
	Approach	70	71	1	0.2	Y	A	4.0	0
Overall	-	2,613	2,618	5	0.1	Y	A	4.0	-

87003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,572	2,549	-23	0.5	Y	A	1	0
	Approach	2,572	2,549	-23	0.5	Y	A	1.2	0
NB: I-85 NB Off-Ramp	Through	114	116	2	0.2	Y	A	3	0
	Approach	114	116	2	0.2	Y	A	2.6	0
Overall	-	2,686	2,665	-21	0.4	Y	A	2.6	-

87004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,572	2,545	-27	0.5	Y	A	1	0
	Approach	2,572	2,545	-27	0.5	Y	A	0.7	0
NB: I-85 NB On-Ramp	Through	126	126	0	0.0	Y	A	1	0
	Approach	126	126	0	0.0	Y	A	1.2	0
Overall	-	2,698	2,671	-27	0.5	Y	A	1.2	-

90001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,006	2,002	-4	0.1	Y	A	1	19
	Approach	2,006	2,002	-4	0.1	Y	A	1.0	19
SB: I-85 SB On-Ramp	Through	607	613	6	0.2	Y	A	7	367
	Approach	607	613	6	0.2	Y	A	7.0	367
Overall	-	2,613	2,615	2	0.0	Y	A	7.0	-

90002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,006	2,000	-6	0.1	Y	A	2	69
	Approach	2,006	2,000	-6	0.1	Y	A	1.6	69
SB: I-85 SB Off-Ramp	Through	259	259	0	0.0	Y	A	4	212
	Approach	259	259	0	0.0	Y	A	3.6	212
Overall	-	2,265	2,259	-6	0.1	Y	A	3.6	-

90003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,145	2,126	-19	0.4	Y	A	1	212
	Approach	2,145	2,126	-19	0.4	Y	A	0.9	212
NB: I-85 NB Off-Ramp	Through	553	547	-6	0.3	Y	A	1	212
	Approach	553	547	-6	0.3	Y	A	1.5	212
Overall	-	2,698	2,673	-25	0.5	Y	A	1.5	-

90004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,145	2,125	-20	0.4	Y	A	1	0
	Approach	2,145	2,125	-20	0.4	Y	A	0.8	0
NB: I-85 NB On-Ramp	Through	265	264	-1	0.1	Y	A	8	0
	Approach	265	264	-1	0.1	Y	A	7.6	0
Overall	-	2,410	2,389	-21	0.4	Y	A	7.6	-

92001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,187	2,190	3	0.1	Y	A	1	0
	Approach	2,187	2,190	3	0.1	Y	A	1.1	0
SB: I-85 SB Off-Ramp	Through	78	76	-2	0.3	Y	A	1	0
	Approach	78	76	-2	0.3	Y	A	0.5	0
Overall	-	2,265	2,266	1	0.0	Y	A	1.1	-

92002: Interstate 85 at SB On-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,030	2,024	-6	0.1	Y	A	1	0
	Approach	2,030	2,024	-6	0.1	Y	A	1.1	0
SB: I-85 SB Off-Ramp	Through	157	160	3	0.2	Y	A	0	0
	Approach	157	160	3	0.2	Y	A	0.3	0
Overall	-	2,187	2,184	-3	0.1	Y	A	1.1	-

92003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,030	2,024	-6	0.1	Y	A	3	110
	Approach	2,030	2,024	-6	0.1	Y	A	2.8	110
SB: I-85 SB Off-Ramp	Through	278	290	12	0.7	Y	A	6	110
	Approach	278	290	12	0.7	Y	A	5.6	110
Overall	-	2,308	2,314	6	0.1	Y	A	5.6	-

92004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,102	2,077	-25	0.5	Y	A	1	0
	Approach	2,102	2,077	-25	0.5	Y	A	0.6	0
NB: I-85 NB Off-Ramp	Through	308	307	-1	0.1	Y	A	1	0
	Approach	308	307	-1	0.1	Y	A	1.4	0
Overall	-	2,410	2,384	-26	0.5	Y	A	1.4	-

92005: Interstate 85 at NB On-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,102	2,077	-25	0.5	Y	A	0	0
	Approach	2,102	2,077	-25	0.5	Y	A	0.3	0
NB: I-85 NB On-Ramp	Through	154	150	-4	0.3	Y	A	0	0
	Approach	154	150	-4	0.3	Y	A	0.1	0
Overall	-	2,256	2,227	-29	0.6	Y	A	0.3	-

92006: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,256	2,226	-30	0.6	Y	A	0	0
	Approach	2,256	2,226	-30	0.6	Y	A	0.4	0
NB: I-85 NB On-Ramp	Through	151	150	-1	0.0	Y	A	0	0
	Approach	151	150	-1	0.0	Y	A	0.4	0
Overall	-	2,407	2,376	-31	0.6	Y	A	0.4	-

95001: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,176	2,153	-23	0.5	Y	A	1	0
	Approach	2,176	2,153	-23	0.5	Y	A	0.7	0
NB: I-85 NB Off-Ramp	Through	231	224	-7	0.5	Y	A	3	0
	Approach	231	224	-7	0.5	Y	A	3.3	0
Overall	-	2,407	2,377	-30	0.6	Y	A	3.3	-

95002: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,178	2,173	-5	0.1	Y	A	1	19
	Approach	2,178	2,173	-5	0.1	Y	A	0.7	19
SB: I-85 SB On-Ramp	Through	130	132	2	0.2	Y	A	1	0
	Approach	130	132	2	0.2	Y	A	1.4	0
Overall	-	2,308	2,305	-3	0.1	Y	A	1.4	-

95003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,178	2,176	-2	0.1	Y	A	0	170
	Approach	2,178	2,176	-2	0.1	Y	A	0.5	170
SB: I-85 SB Off-Ramp	Through	163	155	-8	0.6	Y	A	1	170
	Approach	163	155	-8	0.6	Y	A	0.8	170
Overall	-	2,341	2,331	-10	0.2	Y	A	0.8	-

96001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,069	2,070	1	0.0	Y	A	0	0
	Approach	2,069	2,070	1	0.0	Y	A	0.4	0
SB: I-85 SB Off-Ramp	Through	272	272	0	0.0	Y	A	5	109
	Approach	272	272	0	0.0	Y	A	4.5	109
Overall	-	2,341	2,342	1	0.0	Y	A	4.5	-

96002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,069	2,070	1	0.0	Y	A	1	0
	Approach	2,069	2,070	1	0.0	Y	A	0.7	0
SB: I-85 SB Off-Ramp	Through	88	92	4	0.4	Y	A	2	0
	Approach	88	92	4	0.4	Y	A	2.5	0
Overall	-	2,157	2,162	5	0.1	Y	A	2.5	-

96003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,931	1,906	-25	0.6	Y	A	1	0
	Approach	1,931	1,906	-25	0.6	Y	A	0.8	0
NB: I-85 NB Off-Ramp	Through	245	252	7	0.5	Y	A	2	0
	Approach	245	252	7	0.5	Y	A	1.8	0
Overall	-	2,176	2,158	-18	0.4	Y	A	1.8	-

96004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,931	1,904	-27	0.6	Y	A	1	0
	Approach	1,931	1,904	-27	0.6	Y	A	0.6	0
NB: I-85 NB On-Ramp	Through	207	207	0	0.0	Y	A	1	0
	Approach	207	207	0	0.0	Y	A	1.1	0
Overall	-	2,138	2,111	-27	0.6	Y	A	1.1	-

98004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,138	2,107	-31	0.7	Y	A	0	0
	Approach	2,138	2,107	-31	0.7	Y	A	0.2	0
NB: I-85 NB On-Ramp	Through	10	10	0	0.0	Y	A	4	29
	Approach	10	10	0	0.0	Y	A	4.4	29
Overall	-	2,148	2,117	-31	0.7	Y	A	4.4	-

98003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,148	2,066	-82	1.8	Y	A	0	0
	Approach	2,148	2,066	-82	1.8	Y	A	0.4	0
NB: I-85 NB Off-Ramp	Through	42	43	1	0.2	Y	A	3	0
	Approach	42	43	1	0.2	Y	A	3.5	0
Overall	-	2,190	2,109	-81	1.7	Y	A	3.5	-

10001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,976	1,980	4	0.1	Y	A	1	22
	Approach	1,976	1,980	4	0.1	Y	A	1.0	22
SB: I-85 SB Off-Ramp	Through	181	178	-3	0.2	Y	A	1	21
	Approach	181	178	-3	0.2	Y	A	0.7	21
Overall	-	2,157	2,158	1	0.0	Y	A	1.0	-

10002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,976	1,976	0	0.0	Y	A	1	132
	Approach	1,976	1,976	0	0.0	Y	A	0.5	132
SB: I-85 SB Off-Ramp	Through	84	85	1	0.1	Y	A	1	132
	Approach	84	85	1	0.1	Y	A	1.0	132
Overall	-	2,060	2,061	1	0.0	Y	A	1.0	-

10003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,795	1,765	-30	0.7	Y	A	1	0
	Approach	1,795	1,765	-30	0.7	Y	A	0.7	0
NB: I-85 NB Off-Ramp	Through	311	300	-11	0.6	Y	A	4	0
	Approach	311	300	-11	0.6	Y	A	3.9	0
Overall	-	2,106	2,065	-41	0.9	Y	A	3.9	-

10004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,795	1,762	-33	0.8	Y	A	0	0
	Approach	1,795	1,762	-33	0.8	Y	A	0.2	0
NB: I-85 NB On-Ramp	Through	87	88	1	0.1	Y	A	0	0
	Approach	87	88	1	0.1	Y	A	0.1	0
Overall	-	1,882	1,850	-32	0.7	Y	A	0.2	-

No Build PM Peak

80001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,544	4,048	-496	7.6	N	A	0	0
	Approach	4,544	4,048	-496	7.6	N	A	0.4	0
SB: I-85 SB On-Ramp	Through	103	105	2	0.2	Y	A	9	0
	Approach	103	105	2	0.2	Y	A	8.6	0
Overall	-	4,647	4,153	-494	7.4	N	A	8.6	-

80002: Interstate 85 at SB On-Ramp Loop									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,362	3,866	-496	7.7	N	A	1	0
	Approach	4,362	3,866	-496	7.7	N	A	0.6	0
SB: I-85 SB Off-Ramp	Through	182	184	2	0.1	Y	A	1	0
	Approach	182	184	2	0.1	Y	A	0.6	0
Overall	-	4,544	4,050	-494	7.5	N	A	0.6	-

80003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,362	3,877	-485	7.6	N	A	1	0
	Approach	4,362	3,877	-485	7.6	N	A	1.5	0
SB: I-85 SB Off-Ramp	Through	166	141	-25	2.0	Y	A	3	0
	Approach	166	141	-25	2.0	Y	A	3.1	0
Overall	-	4,528	4,018	-510	7.8	N	A	3.1	-

80004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,450	3,648	-802	12.6	N	C	25	1,709
	Approach	4,450	3,648	-802	12.6	N	C	24.9	1,709
NB: I-85 NB Off-Ramp	Through	354	292	-62	3.4	Y	C	23	1,709
	Approach	354	292	-62	3.4	Y	C	23.4	1,709
Overall	-	4,804	3,940	-864	13.1	N	C	24.9	-

80005: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,450	3,651	-799	12.6	N	A	6	142
	Approach	4,450	3,651	-799	12.6	N	A	6.0	142
NB: I-85 NB On-Ramp	Through	136	138	2	0.2	Y	A	1	0
	Approach	136	138	2	0.2	Y	A	0.9	0
Overall	-	4,586	3,789	-797	12.3	N	A	6.0	-

82001: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,507	3,720	-787	12.3	N	A	1	19
	Approach	4,507	3,720	-787	12.3	N	A	0.8	19
NB: I-85 NB Off-Ramp	Through	79	64	-15	1.8	Y	A	1	19
	Approach	79	64	-15	1.8	Y	A	0.7	19
Overall	-	4,586	3,784	-802	12.4	N	A	0.8	-

83001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,223	3,775	-448	7.1	N	A	7	1,094
	Approach	4,223	3,775	-448	7.1	N	A	6.6	1,094
SB: I-85 SB Off-Ramp	Through	305	295	-10	0.6	Y	C	16	18
	Approach	305	295	-10	0.6	Y	C	15.9	18
Overall	-	4,528	4,070	-458	7.0	N	C	15.9	-

83002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,223	3,786	-437	6.9	N	A	2	54
	Approach	4,223	3,786	-437	6.9	N	A	1.9	54
SB: I-85 SB Off-Ramp	Through	157	149	-8	0.6	Y	A	4	54
	Approach	157	149	-8	0.6	Y	A	4.5	54
Overall	-	4,380	3,935	-445	6.9	N	A	4.5	-

83003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,115	3,399	-716	11.7	N	A	1	118
	Approach	4,115	3,399	-716	11.7	N	A	0.8	118
NB: I-85 NB Off-Ramp	Through	392	321	-71	3.8	Y	A	3	118
	Approach	392	321	-71	3.8	Y	A	2.7	118
Overall	-	4,507	3,720	-787	12.3	N	A	2.7	-

83004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,115	3,399	-716	11.7	N	A	1	5
	Approach	4,115	3,399	-716	11.7	N	A	1.1	5
NB: I-85 NB On-Ramp	Through	148	141	-7	0.6	Y	C	21	0
	Approach	148	141	-7	0.6	Y	C	20.6	0
Overall	-	4,263	3,540	-723	11.6	N	C	20.6	-

87001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,244	3,820	-424	6.7	N	A	2	0
	Approach	4,244	3,820	-424	6.7	N	A	2.2	0
SB: I-85 SB Off-Ramp	Through	136	126	-10	0.9	Y	A	3	0
	Approach	136	126	-10	0.9	Y	A	2.9	0
Overall	-	4,380	3,946	-434	6.7	N	A	2.9	-

87002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,244	3,825	-419	6.6	N	A	2	0
	Approach	4,244	3,825	-419	6.6	N	A	1.6	0
SB: I-85 SB Off-Ramp	Through	98	89	-9	0.9	Y	A	5	0
	Approach	98	89	-9	0.9	Y	A	4.6	0
Overall	-	4,342	3,914	-428	6.7	N	A	4.6	-

87003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,039	3,349	-690	11.4	N	A	1	0
	Approach	4,039	3,349	-690	11.4	N	A	1.4	0
NB: I-85 NB Off-Ramp	Through	224	191	-33	2.3	Y	A	3	0
	Approach	224	191	-33	2.3	Y	A	2.6	0
Overall	-	4,263	3,540	-723	11.6	N	A	2.6	-

87004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,039	3,346	-693	11.4	N	A	1	0
	Approach	4,039	3,346	-693	11.4	N	A	0.8	0
NB: I-85 NB On-Ramp	Through	97	80	-17	1.8	Y	D	27	0
	Approach	97	80	-17	1.8	Y	D	26.9	0
Overall	-	4,136	3,426	-710	11.5	N	D	26.9	-

90001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,602	3,526	-76	1.3	Y	A	8	1,028
	Approach	3,602	3,526	-76	1.3	Y	A	7.6	1,028
SB: I-85 SB On-Ramp	Through	740	400	-340	14.2	N	F	154	1,354
	Approach	740	400	-340	14.2	N	F	154.4	1,354
Overall	-	4,342	3,926	-416	6.5	N	F	154.4	-

90002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,602	3,533	-69	1.2	Y	A	3	608
	Approach	3,602	3,533	-69	1.2	Y	A	3.1	608
SB: I-85 SB Off-Ramp	Through	339	331	-8	0.4	Y	A	5	608
	Approach	339	331	-8	0.4	Y	A	4.9	608
Overall	-	3,941	3,864	-77	1.2	Y	A	4.9	-

90003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,447	2,842	-605	10.8	N	A	1	440
	Approach	3,447	2,842	-605	10.8	N	A	1.3	440
NB: I-85 NB Off-Ramp	Through	689	572	-117	4.7	Y	A	1	440
	Approach	689	572	-117	4.7	Y	A	1.4	440
Overall	-	4,136	3,414	-722	11.7	N	A	1.4	-

90004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,447	2,847	-600	10.7	N	A	1	0
	Approach	3,447	2,847	-600	10.7	N	A	1.4	0
NB: I-85 NB On-Ramp	Through	469	352	-117	5.8	N	C	16	5
	Approach	469	352	-117	5.8	N	C	15.8	5
Overall	-	3,916	3,199	-717	12.0	N	C	15.8	-

92001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,851	3,778	-73	1.2	Y	A	2	0
	Approach	3,851	3,778	-73	1.2	Y	A	2.4	0
SB: I-85 SB Off-Ramp	Through	90	89	-1	0.1	Y	A	1	0
	Approach	90	89	-1	0.1	Y	A	1.2	0
Overall	-	3,941	3,867	-74	1.2	Y	A	2.4	-

92002: Interstate 85 at SB On-Ramp Loop									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,559	3,494	-65	1.1	Y	A	1	0
	Approach	3,559	3,494	-65	1.1	Y	A	0.9	0
SB: I-85 SB Off-Ramp	Through	292	288	-4	0.2	Y	A	0	0
	Approach	292	288	-4	0.2	Y	A	0.4	0
Overall	-	3,851	3,782	-69	1.1	Y	A	0.9	-

92003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,559	3,493	-66	1.1	Y	A	1	0
	Approach	3,559	3,493	-66	1.1	Y	A	1.4	0
SB: I-85 SB Off-Ramp	Through	390	384	-6	0.3	Y	A	3	0
	Approach	390	384	-6	0.3	Y	A	3.2	0
Overall	-	3,949	3,877	-72	1.2	Y	A	3.2	-

92004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,516	2,880	-636	11.2	N	A	1	0
	Approach	3,516	2,880	-636	11.2	N	A	0.8	0
NB: I-85 NB Off-Ramp	Through	400	328	-72	3.8	Y	A	1	0
	Approach	400	328	-72	3.8	Y	A	1.4	0
Overall	-	3,916	3,208	-708	11.9	N	A	1.4	-

92005: Interstate 85 at NB On-Ramp Loop									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,516	2,881	-635	11.2	N	A	1	0
	Approach	3,516	2,881	-635	11.2	N	A	0.9	0
NB: I-85 NB On-Ramp	Through	109	104	-5	0.5	Y	A	1	0
	Approach	109	104	-5	0.5	Y	A	1.0	0
Overall	-	3,625	2,985	-640	11.1	N	A	1.0	-

92006: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,625	2,986	-639	11.1	N	A	1	0
	Approach	3,625	2,986	-639	11.1	N	A	0.6	0
NB: I-85 NB On-Ramp	Through	270	271	1	0.1	Y	A	0	0
	Approach	270	271	1	0.1	Y	A	0.2	0
Overall	-	3,895	3,257	-638	10.7	N	A	0.6	-

95001: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,728	3,111	-617	10.5	N	A	1	0
	Approach	3,728	3,111	-617	10.5	N	A	0.9	0
NB: I-85 NB Off-Ramp	Through	167	137	-30	2.4	Y	A	3	0
	Approach	167	137	-30	2.4	Y	A	3.4	0
Overall	-	3,895	3,248	-647	10.8	N	A	3.4	-

95002: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,791	3,716	-75	1.2	Y	A	1	99
	Approach	3,791	3,716	-75	1.2	Y	A	1.3	99
SB: I-85 SB On-Ramp	Through	158	154	-4	0.4	Y	A	7	0
	Approach	158	154	-4	0.4	Y	A	7.3	0
Overall	-	3,949	3,870	-79	1.3	Y	A	7.3	-

95003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,791	3,715	-76	1.2	Y	A	1	64
	Approach	3,791	3,715	-76	1.2	Y	A	0.8	64
SB: I-85 SB Off-Ramp	Through	140	138	-2	0.2	Y	A	1	64
	Approach	140	138	-2	0.2	Y	A	1.1	64
Overall	-	3,931	3,853	-78	1.3	Y	A	1.1	-

96001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,643	3,588	-55	0.9	Y	A	8	1,474
	Approach	3,643	3,588	-55	0.9	Y	A	8.0	1,474
SB: I-85 SB Off-Ramp	Through	288	269	-19	1.1	Y	C	21	325
	Approach	288	269	-19	1.1	Y	C	21.4	325
Overall	-	3,931	3,857	-74	1.2	Y	C	21.4	-

96002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,643	3,597	-46	0.8	Y	A	7	1,557
	Approach	3,643	3,597	-46	0.8	Y	A	7.1	1,557
SB: I-85 SB Off-Ramp	Through	123	124	1	0.1	Y	A	7	1,557
	Approach	123	124	1	0.1	Y	A	7.1	1,557
Overall	-	3,766	3,721	-45	0.7	Y	A	7.1	-

96003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,383	2,819	-564	10.1	N	A	1	0
	Approach	3,383	2,819	-564	10.1	N	A	0.8	0
NB: I-85 NB Off-Ramp	Through	345	298	-47	2.6	Y	A	2	0
	Approach	345	298	-47	2.6	Y	A	1.6	0
Overall	-	3,728	3,117	-611	10.4	N	A	1.6	-

96004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,383	2,820	-563	10.1	N	A	1	0
	Approach	3,383	2,820	-563	10.1	N	A	0.8	0
NB: I-85 NB On-Ramp	Through	224	226	2	0.1	Y	A	4	0
	Approach	224	226	2	0.1	Y	A	4.3	0
Overall	-	3,607	3,046	-561	9.7	N	A	4.3	-

98004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,607	3,037	-570	9.9	N	A	0	0
	Approach	3,607	3,037	-570	9.9	N	A	0.4	0
NB: I-85 NB On-Ramp	Through	9	9	0	0.0	Y	B	12	51
	Approach	9	9	0	0.0	Y	B	11.7	51
Overall	-	3,616	3,046	-570	9.9	N	B	11.7	-

98003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,616	3,035	-581	10.1	N	A	1	0
	Approach	3,616	3,035	-581	10.1	N	A	0.7	0
NB: I-85 NB Off-Ramp	Through	10	7	-3	1.0	Y	A	4	0
	Approach	10	7	-3	1.0	Y	A	3.9	0
Overall	-	3,626	3,042	-584	10.1	N	A	3.9	-

10001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,498	3,512	14	0.2	Y	A	3	0
	Approach	3,498	3,512	14	0.2	Y	A	3.0	0
SB: I-85 SB Off-Ramp	Through	268	264	-4	0.2	Y	A	2	18
	Approach	268	264	-4	0.2	Y	A	2.2	18
Overall	-	3,766	3,776	10	0.2	Y	A	3.0	-

10002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,498	3,506	8	0.1	Y	A	2	521
	Approach	3,498	3,506	8	0.1	Y	A	2.2	521
SB: I-85 SB Off-Ramp	Through	87	85	-2	0.2	Y	A	4	521
	Approach	87	85	-2	0.2	Y	A	3.8	521
Overall	-	3,585	3,591	6	0.1	Y	A	3.8	-

10003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,392	2,838	-554	9.9	N	A	1	30
	Approach	3,392	2,838	-554	9.9	N	A	1.0	30
NB: I-85 NB Off-Ramp	Through	214	185	-29	2.1	Y	A	4	30
	Approach	214	185	-29	2.1	Y	A	3.8	30
Overall	-	3,606	3,023	-583	10.1	N	A	3.8	-

10004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday PM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,392	2,836	-556	10.0	N	A	0	0
	Approach	3,392	2,836	-556	10.0	N	A	0.4	0
NB: I-85 NB On-Ramp	Through	70	68	-2	0.2	Y	A	0	0
	Approach	70	68	-2	0.2	Y	A	0.1	0
Overall	-	3,462	2,904	-558	9.9	N	A	0.4	-

Build AM Peak

80001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,417	3,381	-36	0.6	Y		0	0
	Approach	3,417	3,381	-36	0.6	Y		0.3	0
SB: I-85 SB On-Ramp	Through	42	41	-1	0.2	Y		4	0
	Approach	42	41	-1	0.2	Y		3.9	0
Overall	-	3,459	3,422	-37	0.6	Y		3.9	-

80002: Interstate 85 at SB Off-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,951	2,931	-20	0.4	Y		0	0
	Approach	2,951	2,931	-20	0.4	Y		0.5	0
SB: I-85 SB Off-Ramp	Through	466	458	-8	0.4	Y		1	0
	Approach	466	458	-8	0.4	Y		0.8	0
Overall	-	3,417	3,389	-28	0.5	Y		0.8	-

80003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,951	2,932	-19	0.4	Y		0	0
	Approach	2,951	2,932	-19	0.4	Y		0.5	0
SB: I-85 SB Off-Ramp	Through	226	225	-1	0.1	Y		2	0
	Approach	226	225	-1	0.1	Y		1.6	0
Overall	-	3,177	3,157	-20	0.4	Y		1.6	-

80004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,586	2,648	62	1.2	Y		0	63
	Approach	2,586	2,648	62	1.2	Y		0.5	63
NB: I-85 NB Off-Ramp	Through	490	428	-62	2.9	Y		1	63
	Approach	490	428	-62	2.9	Y		1.3	63
Overall	-	3,076	3,076	0	0.0	Y		1.3	-

80005: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,586	2,646	60	1.2	Y		0	0
	Approach	2,586	2,646	60	1.2	Y		0.4	0
NB: I-85 NB On-Ramp	Through	211	211	0	0.0	Y		0	0
	Approach	211	211	0	0.0	Y		0.3	0
Overall	-	2,797	2,857	60	1.1	Y		0.4	-

83001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,682	2,678	-4	0.1	Y		0	0
	Approach	2,682	2,678	-4	0.1	Y		0.2	0
SB: I-85 SB Off-Ramp	Through	495	493	-2	0.1	Y		0	0
	Approach	495	493	-2	0.1	Y		0.3	0
Overall	-	3,177	3,171	-6	0.1	Y		0.3	-

83002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,682	2,680	-2	0.0	Y		1	0
	Approach	2,682	2,680	-2	0.0	Y		0.7	0
SB: I-85 SB Off-Ramp	Through	106	110	4	0.4	Y		2	0
	Approach	106	110	4	0.4	Y		2.0	0
Overall	-	2,788	2,790	2	0.0	Y		2.0	-

83003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,534	2,584	50	1.0	Y		0	0
	Approach	2,534	2,584	50	1.0	Y		0.5	0
NB: I-85 NB Off-Ramp	Through	263	270	7	0.4	Y		3	0
	Approach	263	270	7	0.4	Y		2.8	0
Overall	-	2,797	2,854	57	1.1	Y		2.8	-

83004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,534	2,583	49	1.0	Y		0	0
	Approach	2,534	2,583	49	1.0	Y		0.3	0
NB: I-85 NB On-Ramp	Through	152	154	2	0.2	Y		0	0
	Approach	152	154	2	0.2	Y		0.3	0
Overall	-	2,686	2,737	51	1.0	Y		0.3	-

87001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,543	2,540	-3	0.1	Y		2	0
	Approach	2,543	2,540	-3	0.1	Y		1.6	0
SB: I-85 SB Off-Ramp	Through	245	248	3	0.2	Y		1	0
	Approach	245	248	3	0.2	Y		0.9	0
Overall	-	2,788	2,788	0	0.0	Y		1.6	-

87002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,543	2,537	-6	0.1	Y		2	0
	Approach	2,543	2,537	-6	0.1	Y		2.2	0
SB: I-85 SB Off-Ramp	Through	70	70	0	0.0	Y		4	0
	Approach	70	70	0	0.0	Y		4.2	0
Overall	-	2,613	2,607	-6	0.1	Y		4.2	-

87003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,572	2,606	34	0.7	Y		0	0
	Approach	2,572	2,606	34	0.7	Y		0.3	0
NB: I-85 NB Off-Ramp	Through	114	120	6	0.6	Y		1	0
	Approach	114	120	6	0.6	Y		1.3	0
Overall	-	2,686	2,726	40	0.8	Y		1.3	-

87004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,572	2,604	32	0.6	Y		0	0
	Approach	2,572	2,604	32	0.6	Y		0.4	0
NB: I-85 NB On-Ramp	Through	126	130	4	0.4	Y		0	0
	Approach	126	130	4	0.4	Y		0.4	0
Overall	-	2,698	2,734	36	0.7	Y		0.4	-

90001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,006	2,000	-6	0.1	Y		0	0
	Approach	2,006	2,000	-6	0.1	Y		0.2	0
SB: I-85 SB On-Ramp	Through	607	606	-1	0.0	Y		3	35
	Approach	607	606	-1	0.0	Y		3.1	35
Overall	-	2,613	2,606	-7	0.1	Y		3.1	-

90002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,006	2,002	-4	0.1	Y		1	0
	Approach	2,006	2,002	-4	0.1	Y		0.7	0
SB: I-85 SB Off-Ramp	Through	259	258	-1	0.1	Y		5	0
	Approach	259	258	-1	0.1	Y		5.2	0
Overall	-	2,265	2,260	-5	0.1	Y		5.2	-

90003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,145	2,178	33	0.7	Y		1	0
	Approach	2,145	2,178	33	0.7	Y		0.7	0
NB: I-85 NB Off-Ramp	Through	553	561	8	0.3	Y		5	0
	Approach	553	561	8	0.3	Y		5.1	0
Overall	-	2,698	2,739	41	0.8	Y		5.1	-

90004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,145	2,178	33	0.7	Y		0	0
	Approach	2,145	2,178	33	0.7	Y		0.3	0
NB: I-85 NB On-Ramp	Through	265	274	9	0.5	Y		1	0
	Approach	265	274	9	0.5	Y		0.7	0
Overall	-	2,410	2,452	42	0.9	Y		0.7	-

92001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,187	2,185	-2	0.0	Y		1	0
	Approach	2,187	2,185	-2	0.0	Y		0.9	0
SB: I-85 SB Off-Ramp	Through	78	76	-2	0.2	Y		0	0
	Approach	78	76	-2	0.2	Y		0.5	0
Overall	-	2,265	2,261	-4	0.1	Y		0.9	-

92002: Interstate 85 at SB On-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,030	2,024	-6	0.1	Y		1	6
	Approach	2,030	2,024	-6	0.1	Y		1.1	6
SB: I-85 SB Off-Ramp	Through	157	159	2	0.2	Y		0	0
	Approach	157	159	2	0.2	Y		0.3	0
Overall	-	2,187	2,183	-4	0.1	Y		1.1	-

92003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,030	2,022	-8	0.2	Y		2	133
	Approach	2,030	2,022	-8	0.2	Y		2.4	133
SB: I-85 SB Off-Ramp	Through	278	290	12	0.7	Y		6	133
	Approach	278	290	12	0.7	Y		5.9	133
Overall	-	2,308	2,312	4	0.1	Y		5.9	-

92004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,102	2,140	38	0.8	Y		0	0
	Approach	2,102	2,140	38	0.8	Y		0.2	0
NB: I-85 NB Off-Ramp	Through	308	306	-2	0.1	Y		1	0
	Approach	308	306	-2	0.1	Y		1.2	0
Overall	-	2,410	2,446	36	0.7	Y		1.2	-

92005: Interstate 85 at NB On-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,102	2,140	38	0.8	Y		0	0
	Approach	2,102	2,140	38	0.8	Y		0.2	0
NB: I-85 NB On-Ramp	Through	154	150	-4	0.3	Y		0	0
	Approach	154	150	-4	0.3	Y		0.3	0
Overall	-	2,256	2,290	34	0.7	Y		0.3	-

92006: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,256	2,289	33	0.7	Y		0	0
	Approach	2,256	2,289	33	0.7	Y		0.3	0
NB: I-85 NB On-Ramp	Through	151	150	-1	0.1	Y		0	0
	Approach	151	150	-1	0.1	Y		0.4	0
Overall	-	2,407	2,439	32	0.7	Y		0.4	-

95001: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,176	2,206	30	0.6	Y		0	16
	Approach	2,176	2,206	30	0.6	Y		0.4	16
NB: I-85 NB Off-Ramp	Through	231	230	-1	0.1	Y		0	16
	Approach	231	230	-1	0.1	Y		0.4	16
Overall	-	2,407	2,436	29	0.6	Y		0.4	-

95002: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,178	2,179	1	0.0	Y		0	0
	Approach	2,178	2,179	1	0.0	Y		0.3	0
SB: I-85 SB On-Ramp	Through	130	126	-4	0.4	Y		0	0
	Approach	130	126	-4	0.4	Y		0.2	0
Overall	-	2,308	2,305	-3	0.1	Y		0.3	-

95003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,178	2,184	6	0.1	Y		0	0
	Approach	2,178	2,184	6	0.1	Y		0.1	0
SB: I-85 SB Off-Ramp	Through	163	160	-3	0.2	Y		0	0
	Approach	163	160	-3	0.2	Y		0.3	0
Overall	-	2,341	2,344	3	0.1	Y		0.3	-

96001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,069	2,072	3	0.1	Y		0	0
	Approach	2,069	2,072	3	0.1	Y		0.3	0
SB: I-85 SB Off-Ramp	Through	272	272	0	0.0	Y		0	0
	Approach	272	272	0	0.0	Y		0.2	0
Overall	-	2,341	2,344	3	0.1	Y		0.3	-

96002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	2,069	2,071	2	0.0	Y		1	29
	Approach	2,069	2,071	2	0.0	Y		0.9	29
SB: I-85 SB Off-Ramp	Through	88	92	4	0.4	Y		1	29
	Approach	88	92	4	0.4	Y		1.1	29
Overall	-	2,157	2,163	6	0.1	Y		1.1	-

96003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,030	2,038	8	0.2	Y		1	85
	Approach	2,030	2,038	8	0.2	Y		0.6	85
NB: I-85 NB Off-Ramp	Through	245	258	13	0.8	Y		1	85
	Approach	245	258	13	0.8	Y		0.9	85
Overall	-	2,275	2,296	21	0.4	Y		0.9	-

96004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	2,030	2,036	6	0.1	Y		1	7
	Approach	2,030	2,036	6	0.1	Y		0.5	7
NB: I-85 NB On-Ramp	Through	118	124	6	0.5	Y		0	0
	Approach	118	124	6	0.5	Y		0.3	0
Overall	-	2,148	2,160	12	0.3	Y		0.5	-

10001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,976	1,980	4	0.1	Y		1	6
	Approach	1,976	1,980	4	0.1	Y		1.0	6
SB: I-85 SB Off-Ramp	Through	181	179	-2	0.1	Y		1	21
	Approach	181	179	-2	0.1	Y		0.8	21
Overall	-	2,157	2,159	2	0.0	Y		1.0	-

10002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	1,976	1,976	0	0.0	Y		1	132
	Approach	1,976	1,976	0	0.0	Y		0.5	132
SB: I-85 SB Off-Ramp	Through	84	85	1	0.1	Y		1	132
	Approach	84	85	1	0.1	Y		1.0	132
Overall	-	2,060	2,061	1	0.0	Y		1.0	-

10003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,795	1,838	43	1.0	Y		1	49
	Approach	1,795	1,838	43	1.0	Y		1.3	49
NB: I-85 NB Off-Ramp	Through	311	313	2	0.1	Y		4	49
	Approach	311	313	2	0.1	Y		4.3	49
Overall	-	2,106	2,151	45	1.0	Y		4.3	-

10004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	1,795	1,836	41	1.0	Y		0	0
	Approach	1,795	1,836	41	1.0	Y		0.3	0
NB: I-85 NB On-Ramp	Through	87	88	1	0.1	Y		0	0
	Approach	87	88	1	0.1	Y		0.1	0
Overall	-	1,882	1,924	42	1.0	Y		0.3	-

Build PM Peak

80001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,544	4,497	-47	0.7	Y		2	19
	Approach	4,544	4,497	-47	0.7	Y		2.1	19
SB: I-85 SB On-Ramp	Through	103	104	1	0.1	Y		9	335
	Approach	103	104	1	0.1	Y		9.4	335
Overall	-	4,647	4,601	-46	0.7	Y		9.4	-

80002: Interstate 85 at SB On-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,362	4,312	-50	0.8	Y		1	0
	Approach	4,362	4,312	-50	0.8	Y		1.1	0
SB: I-85 SB Off-Ramp	Through	182	192	10	0.7	Y		2	521
	Approach	182	192	10	0.7	Y		2.2	521
Overall	-	4,544	4,504	-40	0.6	Y		2.2	-

80003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,362	4,312	-50	0.8	Y		1	0
	Approach	4,362	4,312	-50	0.8	Y		1.1	0
SB: I-85 SB Off-Ramp	Through	166	160	-6	0.5	Y		3	109
	Approach	166	160	-6	0.5	Y		2.6	109
Overall	-	4,528	4,472	-56	0.8	Y		2.6	-

80004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,384	4,391	7	0.1	Y		9	0
	Approach	4,384	4,391	7	0.1	Y		9.4	0
NB: I-85 NB Off-Ramp	Through	420	423	3	0.1	Y		0	0
	Approach	420	423	3	0.1	Y		0.4	0
Overall	-	4,804	4,814	10	0.1	Y		9.4	-

80005: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,384	4,388	4	0.1	Y		1	0
	Approach	4,384	4,388	4	0.1	Y		0.9	0
NB: I-85 NB On-Ramp	Through	136	139	3	0.3	Y		0	0
	Approach	136	139	3	0.3	Y		0.0	0
Overall	-	4,520	4,527	7	0.1	Y		0.9	-

83001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,223	4,208	-15	0.2	Y		0	0
	Approach	4,223	4,208	-15	0.2	Y		0.3	0
SB: I-85 SB Off-Ramp	Through	305	307	2	0.1	Y		1	0
	Approach	305	307	2	0.1	Y		0.7	0
Overall	-	4,528	4,515	-13	0.2	Y		0.7	-

83002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,223	4,206	-17	0.3	Y		3	109
	Approach	4,223	4,206	-17	0.3	Y		2.6	109
SB: I-85 SB Off-Ramp	Through	157	168	11	0.9	Y		1	0
	Approach	157	168	11	0.9	Y		0.9	0
Overall	-	4,380	4,374	-6	0.1	Y		2.6	-

83003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,115	4,126	11	0.2	Y		2	109
	Approach	4,115	4,126	11	0.2	Y		1.7	109
NB: I-85 NB Off-Ramp	Through	405	403	-2	0.1	Y		4	669
	Approach	405	403	-2	0.1	Y		3.8	669
Overall	-	4,520	4,529	9	0.1	Y		3.8	-

83004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,115	4,126	11	0.2	Y		3	669
	Approach	4,115	4,126	11	0.2	Y		2.8	669
NB: I-85 NB On-Ramp	Through	148	148	0	0.0	Y		1	0
	Approach	148	148	0	0.0	Y		1.1	0
Overall	-	4,263	4,274	11	0.2	Y		2.8	-

87001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,244	4,247	3	0.0	Y		0	0
	Approach	4,244	4,247	3	0.0	Y		0.2	0
SB: I-85 SB Off-Ramp	Through	136	138	2	0.2	Y		1	0
	Approach	136	138	2	0.2	Y		1.1	0
Overall	-	4,380	4,385	5	0.1	Y		1.1	-

87002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	4,244	4,248	4	0.1	Y		1	0
	Approach	4,244	4,248	4	0.1	Y		1.2	0
SB: I-85 SB Off-Ramp	Through	98	97	-1	0.1	Y		0	0
	Approach	98	97	-1	0.1	Y		0.4	0
Overall	-	4,342	4,345	3	0.0	Y		1.2	-

87003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,039	3,915	-124	2.0	Y		1	11
	Approach	4,039	3,915	-124	2.0	Y		0.7	11
NB: I-85 NB Off-Ramp	Through	224	222	-2	0.1	Y		1	0
	Approach	224	222	-2	0.1	Y		0.6	0
Overall	-	4,263	4,137	-126	1.9	Y		0.7	-

87004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	4,039	3,909	-130	2.1	Y		1	0
	Approach	4,039	3,909	-130	2.1	Y		0.5	0
NB: I-85 NB On-Ramp	Through	97	97	0	0.0	Y		1	11
	Approach	97	97	0	0.0	Y		0.9	11
Overall	-	4,136	4,006	-130	2.0	Y		0.9	-

90001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,602	3,601	-1	0.0	Y		1	0
	Approach	3,602	3,601	-1	0.0	Y		0.5	0
SB: I-85 SB On-Ramp	Through	740	744	4	0.1	Y		4	0
	Approach	740	744	4	0.1	Y		3.5	0
Overall	-	4,342	4,345	3	0.0	Y		3.5	-

90002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,602	3,603	1	0.0	Y		1	0
	Approach	3,602	3,603	1	0.0	Y		0.9	0
SB: I-85 SB Off-Ramp	Through	339	336	-3	0.2	Y		5	0
	Approach	339	336	-3	0.2	Y		4.5	0
Overall	-	3,941	3,939	-2	0.0	Y		4.5	-

90003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,447	3,345	-102	1.8	Y		1	0
	Approach	3,447	3,345	-102	1.8	Y		1.0	0
NB: I-85 NB Off-Ramp	Through	689	670	-19	0.7	Y		2	0
	Approach	689	670	-19	0.7	Y		1.7	0
Overall	-	4,136	4,015	-121	1.9	Y		1.7	-

90004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,447	3,343	-104	1.8	Y		1	0
	Approach	3,447	3,343	-104	1.8	Y		0.7	0
NB: I-85 NB On-Ramp	Through	469	476	7	0.3	Y		1	0
	Approach	469	476	7	0.3	Y		0.9	0
Overall	-	3,916	3,819	-97	1.6	Y		0.9	-

92001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,851	3,849	-2	0.0	Y		1	0
	Approach	3,851	3,849	-2	0.0	Y		0.9	0
SB: I-85 SB Off-Ramp	Through	90	89	-1	0.1	Y		1	0
	Approach	90	89	-1	0.1	Y		0.7	0
Overall	-	3,941	3,938	-3	0.0	Y		0.9	-

92002: Interstate 85 at SB On-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,559	3,558	-1	0.0	Y		6	809
	Approach	3,559	3,558	-1	0.0	Y		6.0	809
SB: I-85 SB Off-Ramp	Through	292	293	1	0.1	Y		1	0
	Approach	292	293	1	0.1	Y		0.6	0
Overall	-	3,851	3,851	0	0.0	Y		6.0	-

92003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,559	3,557	-2	0.0	Y		1	0
	Approach	3,559	3,557	-2	0.0	Y		1.4	0
SB: I-85 SB Off-Ramp	Through	390	392	2	0.1	Y		5	0
	Approach	390	392	2	0.1	Y		4.7	0
Overall	-	3,949	3,949	0	0.0	Y		4.7	-

92004: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,516	3,429	-87	1.5	Y		0	0
	Approach	3,516	3,429	-87	1.5	Y		0.5	0
NB: I-85 NB Off-Ramp	Through	400	387	-13	0.7	Y		0	0
	Approach	400	387	-13	0.7	Y		0.0	0
Overall	-	3,916	3,816	-100	1.6	Y		0.5	-

92005: Interstate 85 at NB On-Ramp Loop									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,516	3,428	-88	1.5	Y		1	0
	Approach	3,516	3,428	-88	1.5	Y		0.7	0
NB: I-85 NB On-Ramp	Through	109	105	-4	0.4	Y		1	0
	Approach	109	105	-4	0.4	Y		0.5	0
Overall	-	3,625	3,533	-92	1.5	Y		0.7	-

92006: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,625	3,531	-94	1.6	Y		1	0
	Approach	3,625	3,531	-94	1.6	Y		0.7	0
NB: I-85 NB On-Ramp	Through	270	271	1	0.1	Y		0	0
	Approach	270	271	1	0.1	Y		0.4	0
Overall	-	3,895	3,802	-93	1.5	Y		0.7	-

95001: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,728	3,633	-95	1.6	Y		10	0
	Approach	3,728	3,633	-95	1.6	Y		9.7	0
NB: I-85 NB Off-Ramp	Through	167	161	-6	0.5	Y		1	2
	Approach	167	161	-6	0.5	Y		1.1	2
Overall	-	3,895	3,794	-101	1.6	Y		9.7	-

95002: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,791	3,803	12	0.2	Y		0	0
	Approach	3,791	3,803	12	0.2	Y		0.4	0
SB: I-85 SB On-Ramp	Through	158	152	-6	0.5	Y		3	0
	Approach	158	152	-6	0.5	Y		2.8	0
Overall	-	3,949	3,955	6	0.1	Y		2.8	-

95003: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,791	3,802	11	0.2	Y		0	0
	Approach	3,791	3,802	11	0.2	Y		0.3	0
SB: I-85 SB Off-Ramp	Through	140	142	2	0.2	Y		0	0
	Approach	140	142	2	0.2	Y		0.5	0
Overall	-	3,931	3,944	13	0.2	Y		0.5	-

96001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,643	3,665	22	0.4	Y		0	0
	Approach	3,643	3,665	22	0.4	Y		0.3	0
SB: I-85 SB Off-Ramp	Through	288	276	-12	0.7	Y		0	0
	Approach	288	276	-12	0.7	Y		0.2	0
Overall	-	3,931	3,941	10	0.2	Y		0.3	-

96002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,643	3,663	20	0.3	Y		0	31
	Approach	3,643	3,663	20	0.3	Y		0.4	31
SB: I-85 SB Off-Ramp	Through	123	125	2	0.2	Y		0	31
	Approach	123	125	2	0.2	Y		0.3	31
Overall	-	3,766	3,788	22	0.4	Y		0.4	-

96003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,514	3,294	-220	3.8	Y		0	0
	Approach	3,514	3,294	-220	3.8	Y		0.1	0
NB: I-85 NB Off-Ramp	Through	345	313	-32	1.8	Y		0	0
	Approach	345	313	-32	1.8	Y		0.3	0
Overall	-	3,859	3,607	-252	4.1	N		0.3	-

96004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,514	3,297	-217	3.7	Y		0	0
	Approach	3,514	3,297	-217	3.7	Y		0.2	0
NB: I-85 NB On-Ramp	Through	102	102	0	0.0	Y		0	0
	Approach	102	102	0	0.0	Y		0.5	0
Overall	-	3,616	3,399	-217	3.7	Y		0.5	-

10001: Interstate 85 at SB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,498	3,511	13	0.2	Y		6	233
	Approach	3,498	3,511	13	0.2	Y		6.0	233
SB: I-85 SB Off-Ramp	Through	268	267	-1	0.1	Y		9	233
	Approach	268	267	-1	0.1	Y		9.2	233
Overall	-	3,766	3,778	12	0.2	Y		9.2	-

10002: Interstate 85 at SB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
SB: Interstate 85	Through	3,498	3,506	8	0.1	Y		19	596
	Approach	3,498	3,506	8	0.1	Y		18.6	596
SB: I-85 SB Off-Ramp	Through	87	85	-2	0.2	Y		13	596
	Approach	87	85	-2	0.2	Y		12.8	596
Overall	-	3,585	3,591	6	0.1	Y		18.6	-

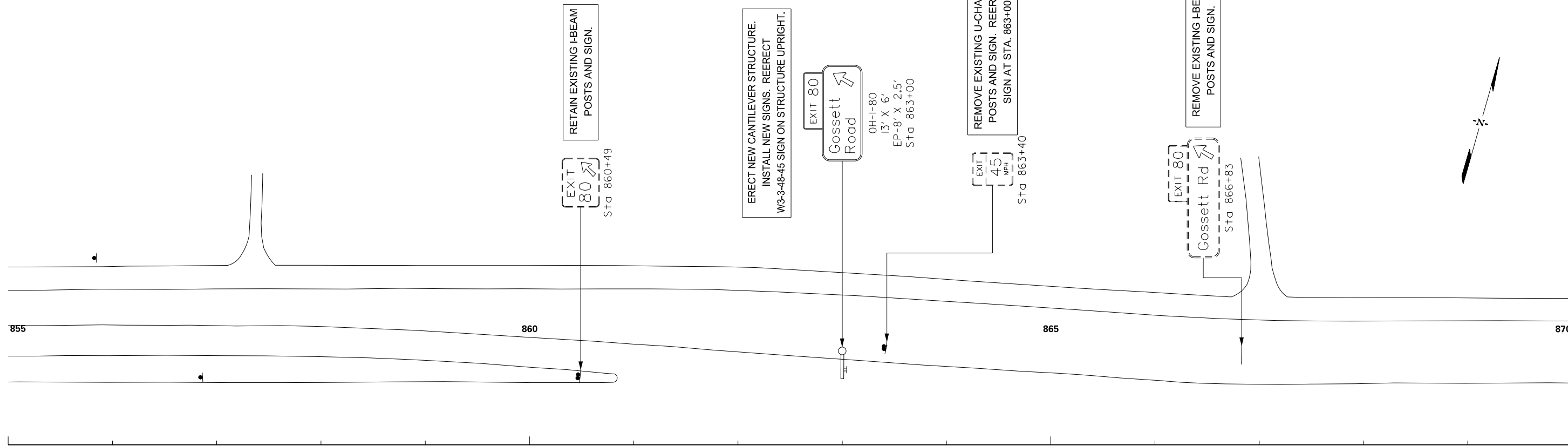
10003: Interstate 85 at NB Off-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,392	3,173	-219	3.8	Y		0	261
	Approach	3,392	3,173	-219	3.8	Y		0.0	261
NB: I-85 NB Off-Ramp	Through	214	207	-7	0.5	Y		23	233
	Approach	214	207	-7	0.5	Y		22.7	233
Overall	-	3,606	3,380	-226	3.8	Y		22.7	-

10004: Interstate 85 at NB On-Ramp									
Approach	Movement	Weekday AM							
		Input Volume	Output Volume	Difference	GEH Value	Acceptable	LOS	Delay	MaxQueue
NB: Interstate 85	Through	3,392	3,169	-223	3.9	Y		6	313
	Approach	3,392	3,169	-223	3.9	Y		6.1	313
NB: I-85 NB On-Ramp	Through	70	69	-1	0.1	Y		6	169
	Approach	70	69	-1	0.1	Y		5.7	169
Overall	-	3,462	3,238	-224	3.9	Y		6.1	-

Appendix E

Exit 83 Signing Plan

FED. RD. DIST. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN1

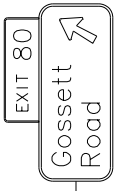


RETAIN EXISTING I-BEAM POSTS AND SIGN.



Sta 860+49

ERECT NEW CANTILEVER STRUCTURE. INSTALL NEW SIGNS. REERECT W3-3-48-45 SIGN ON STRUCTURE UPRIGHT.



OH-1-80
13' X 6'
EP-8' X 2.5'
Sta 863+00

REMOVE EXISTING U-CHANNEL POSTS AND SIGN. REERECT SIGN AT STA. 863+00.

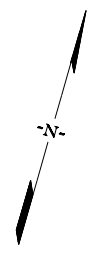


Sta 863+40

REMOVE EXISTING I-BEAM POSTS AND SIGN.



Sta 866+83



MATCHLINE STA. 870+00 SEE SHEET NO. SN2

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
7			
6			
5			
4			
3			
2			
1			

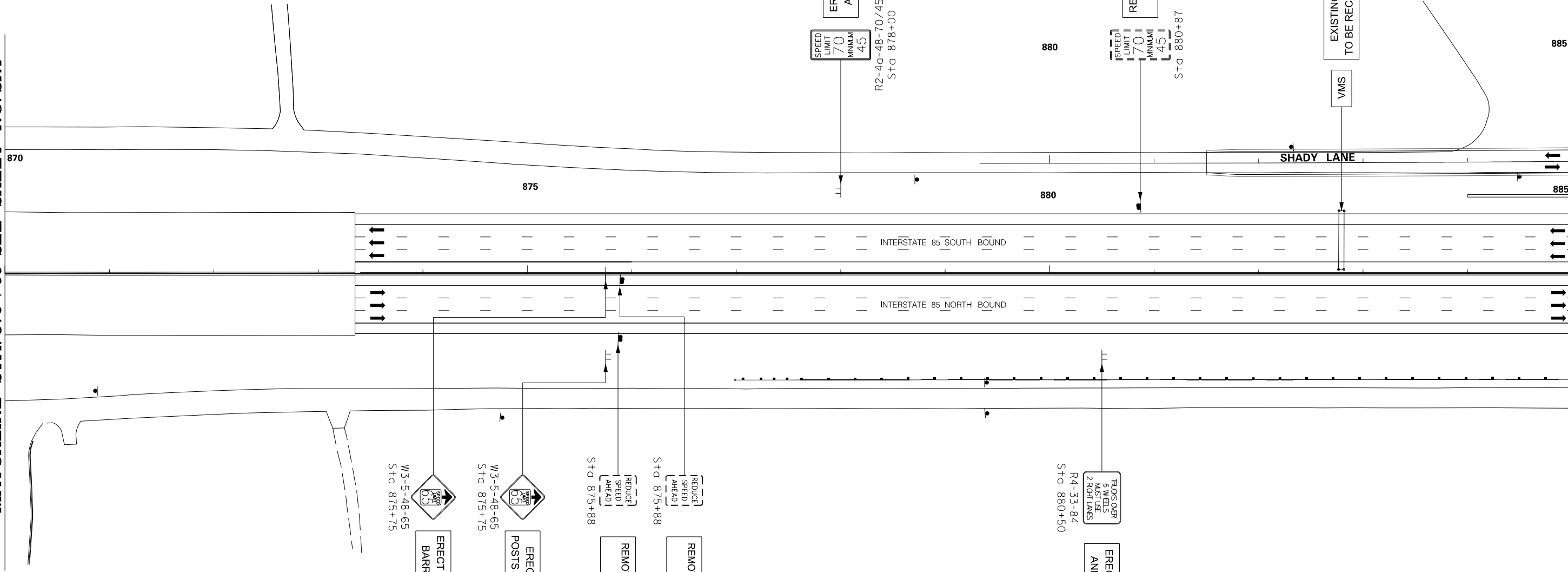
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

INTERSTATE 85 MILE MARKER 90-97

X:\3286900\41416.0\XXXXX (SCDOT Number)\traffic\sheets from STV\SHT_SNI.dgn
2/17/2016

MATCHLINE STA. 870 + 00 SEE SHEET NO. SN1



MATCHLINE STA. 885 + 00 SEE SHEET NO. SN3

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
7			
6			
5			
4			
3			
2			
1			

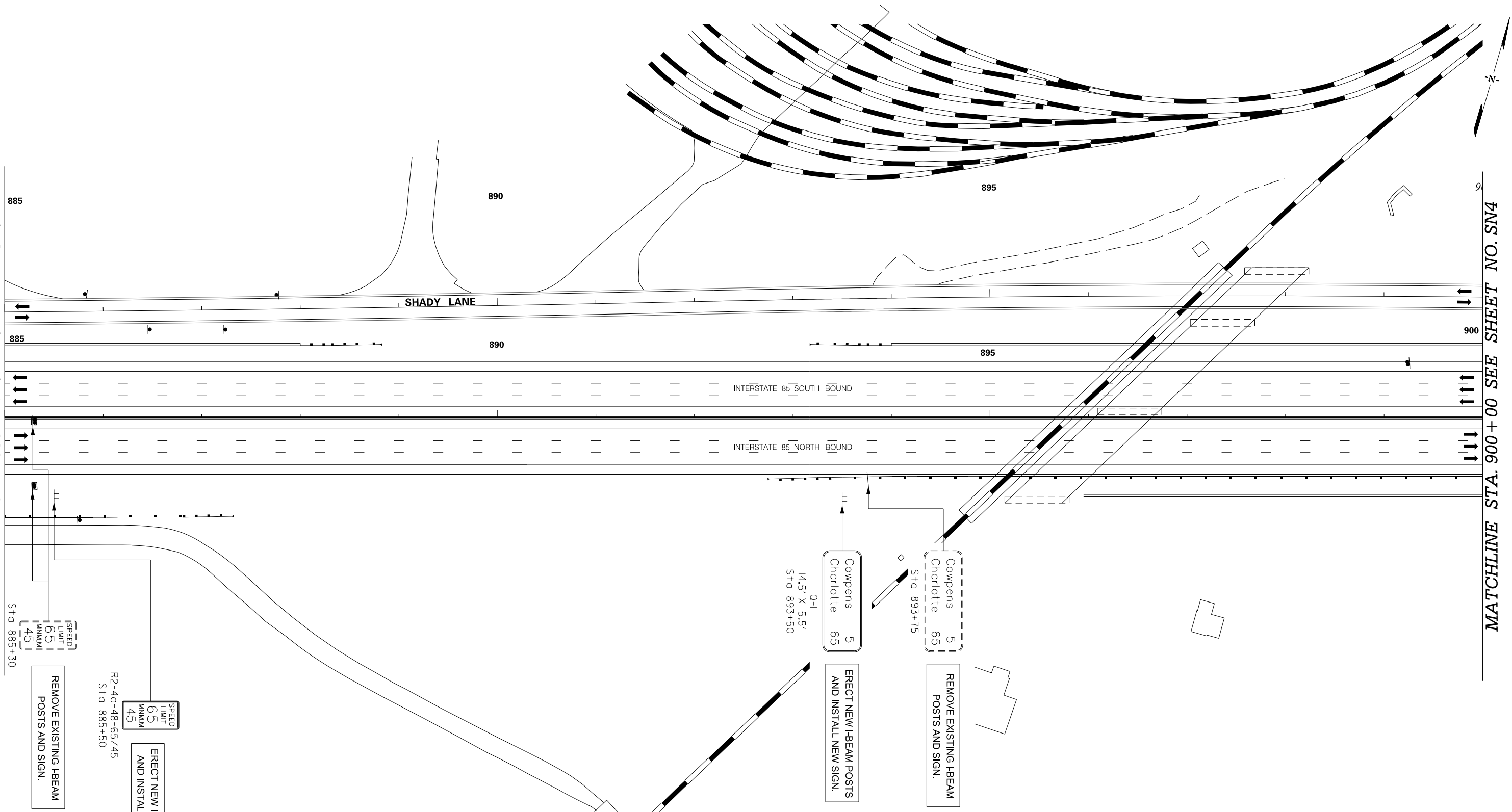
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

INTERSTATE 85 MILE MARKER 90-97

MATCHLINE STA. 885 + 00 SEE SHEET NO. SN2

MATCHLINE STA. 900 + 00 SEE SHEET NO. SN4

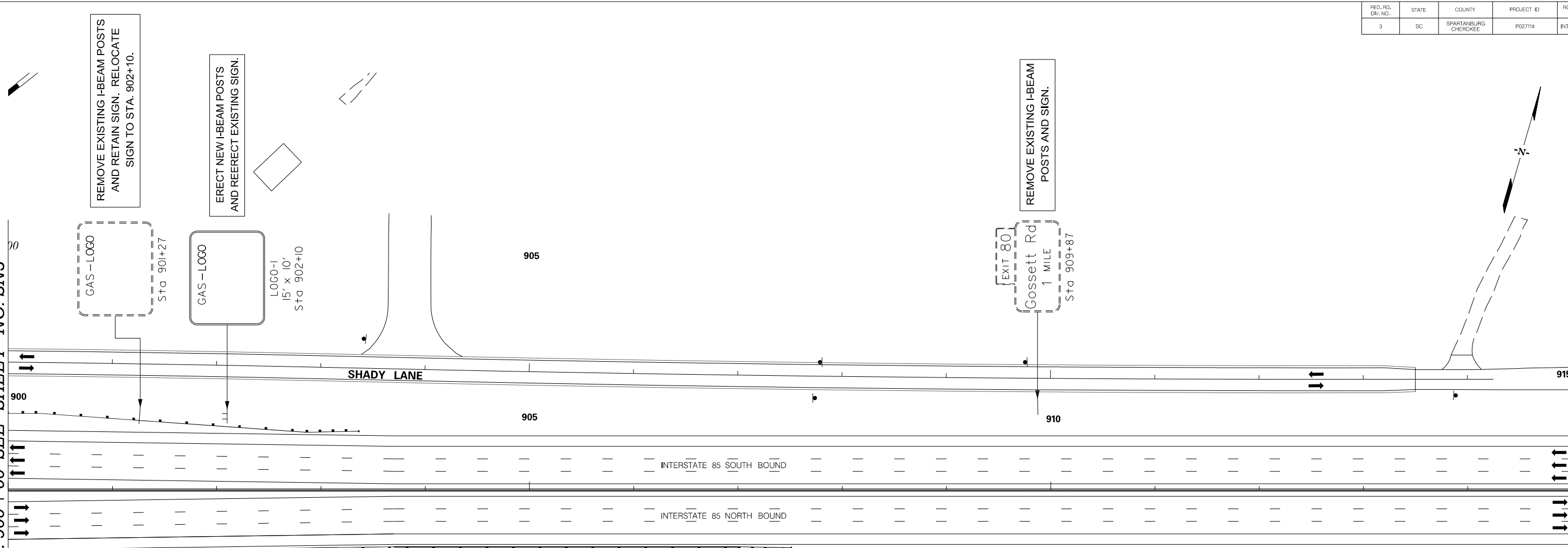


<p>PRELIMINARY NOT FOR CONSTRUCTION</p> <p>SCALE: 1" = 50'</p>	7				<p>SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85</p> <p>PLAN SHEET</p> <p>INTERSTATE 85 MILE MARKER 90-97</p>
	6				
	5				
4					
3					
2					
1					
REV. NO.	BY	DATE	DESCRIPTION OF REVISION		

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN4

MATCHLINE STA. 900+00 SEE SHEET NO. SN3

MATCHLINE STA. 915+00 SEE SHEET NO. SN5



<p>PRELIMINARY NOT FOR CONSTRUCTION</p>	7				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85
	6				
	5				PLAN SHEET
	4				INTERSTATE 85 MILE MARKER 90-97
	3				
	2				
	1				
	REV. NO.	BY	DATE	DESCRIPTION OF REVISION	

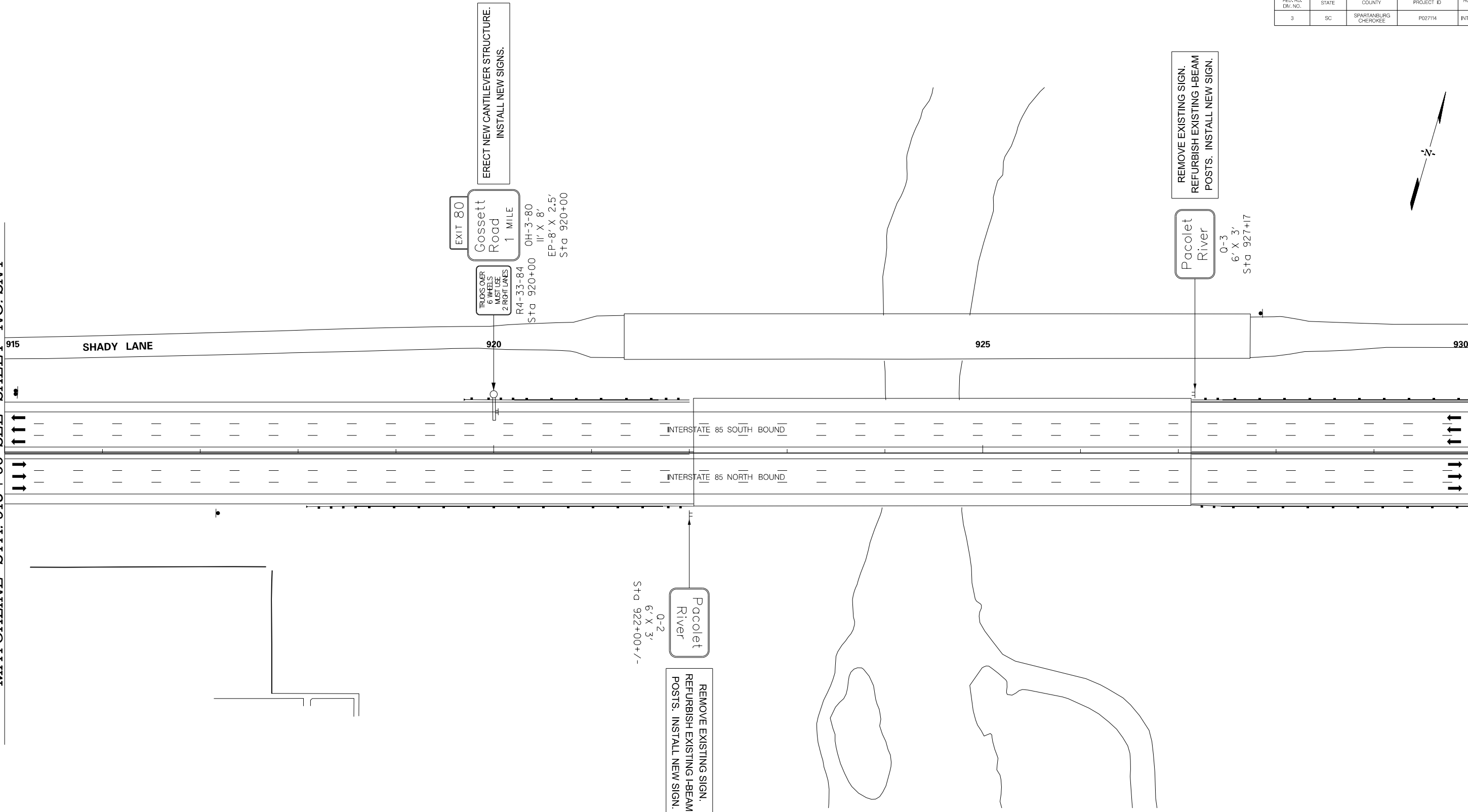
SCALE: 1" = 50'

X:\3286900\41416.0\XXXXX (SCDOT Number)\traffic\sheets from STV\SHT_SN4.dgn 2/17/2016

FED. RD. DIST. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN5

MATCHLINE STA. 915+00 SEE SHEET NO. SN4

MATCHLINE STA. 930+00 SEE SHEET NO. SN6



ERECT NEW CANTILEVER STRUCTURE.
INSTALL NEW SIGNS.

EXIT 80
Gossett Road
1 MILE

TRUCKS OVER
6 WHEELS
MUST USE
2 RIGHT LANES

R4-33-84
Sta 920+00
OH-3-80
11' X 8'
EP-8' X 2.5'
Sta 920+00

REMOVE EXISTING SIGN.
REFURBISH EXISTING I-BEAM
POSTS. INSTALL NEW SIGN.

Pacolet River
0-3
6' X 3'
Sta 927+17

REMOVE EXISTING SIGN.
REFURBISH EXISTING I-BEAM
POSTS. INSTALL NEW SIGN.

0-2
6' X 3'
Sta 922+00 +/-

Pacolet River

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
7			
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SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

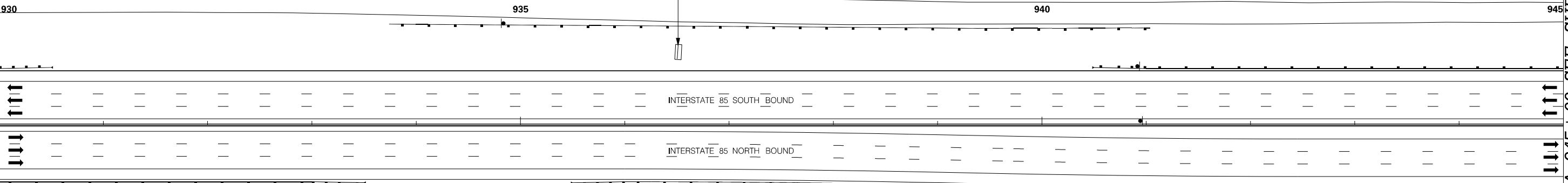
INTERSTATE 85 MILE MARKER 90-97

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2/17/2016

FED. RD. DIST. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN6

MATCHLINE STA. 930 + 00 SEE SHEET NO. SN5

MATCHLINE STA. 945 + 00 SEE SHEET NO. SN7

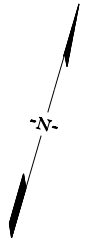


REMOVE EXISTING I-BEAM POSTS AND SIGN.

NOTICE TRUCK RESTRICTION 1 MILE AHEAD STA. 936+51

EXIT 82 Bud Arthur Bridge Rd 1 MILE STA. 930+24

REMOVE EXISTING I-BEAM POSTS AND SIGN.



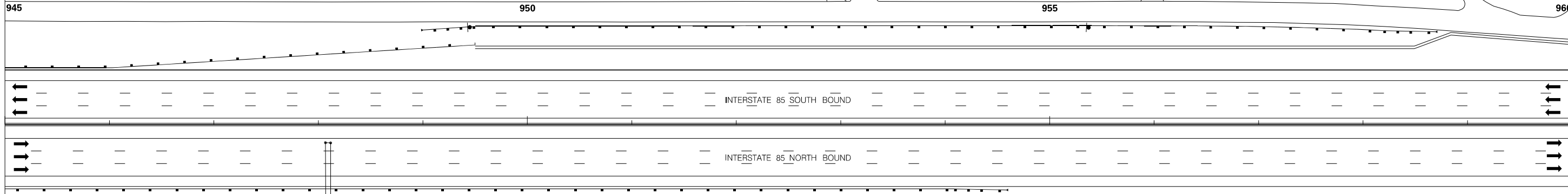
<p>PRELIMINARY NOT FOR CONSTRUCTION</p>	7				<p>SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85</p> <p>PLAN SHEET</p> <p>INTERSTATE 85 MILE MARKER 90-97</p>
	6				
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SCALE: 1" = 50'		REV. NO.	BY	DATE	DESCRIPTION OF REVISION

X:\3286900\41416.01\XXXXX (SCDOT Number)\traffic\sheets from STV\SHI..SN6.dgn 2/17/2016

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN7

MATCHLINE STA. 945 + 00 SEE SHEET NO. SN6

MATCHLINE STA. 960 + 00 SEE SHEET NO. SN8



PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

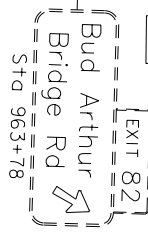
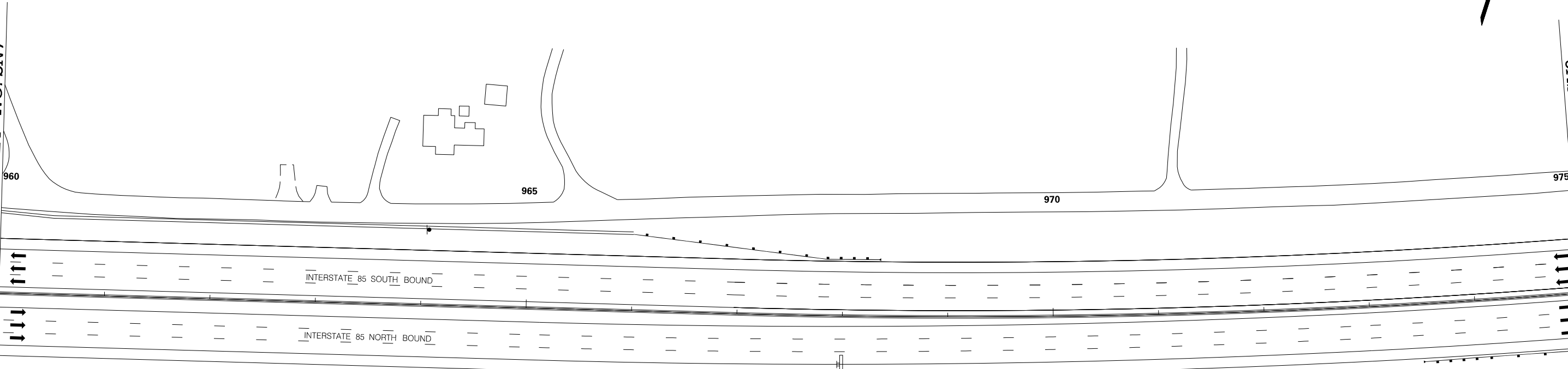
INTERSTATE 85 MILE MARKER 90-97

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2/17/2016

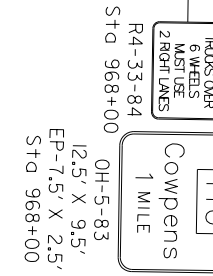
FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SNB

MATCHLINE STA. 960+00 SEE SHEET NO. SN7

MATCHLINE STA. 975+00 SEE SHEET NO. SN9



REMOVE EXISTING I-BEAM POSTS AND SIGN.



ERECT NEW CANTILEVER STRUCTURE. INSTALL NEW SIGNS.



REMOVE EXISTING I-BEAM POSTS AND SIGN.

NOTE: SIGN OH-6 IS NOT USED.

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

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REV. NO.	BY	DATE	DESCRIPTION OF REVISION	

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

INTERSTATE 85 MILE MARKER 90-97

X:\3286900\41416.01\XXXXX (SCDOT Number)\traffic\sheets from STV\SHT_SNB.dgn
2/17/2016

FED. RD. DIST. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN9

MATCHLINE STA. 975+00 SEE SHEET NO. SN8

MATCHLINE STA. 990+00 SEE SHEET NO. SN10

ERECT NEW I-BEAM POSTS AND INSTALL NEW SIGN.

Gossett Rd
Spartanburg
Greenville

2
9
37

0-4
16.5' X 7'
Sta 981+00

EXIT 83

1101

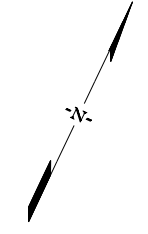
Cowpens
3/4 MILE

Sta 981+99

REMOVE EXISTING I-BEAM POSTS AND SIGNS.

INTERSTATE 85 SOUTH BOUND

INTERSTATE 85 NORTH BOUND



PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
7			
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SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

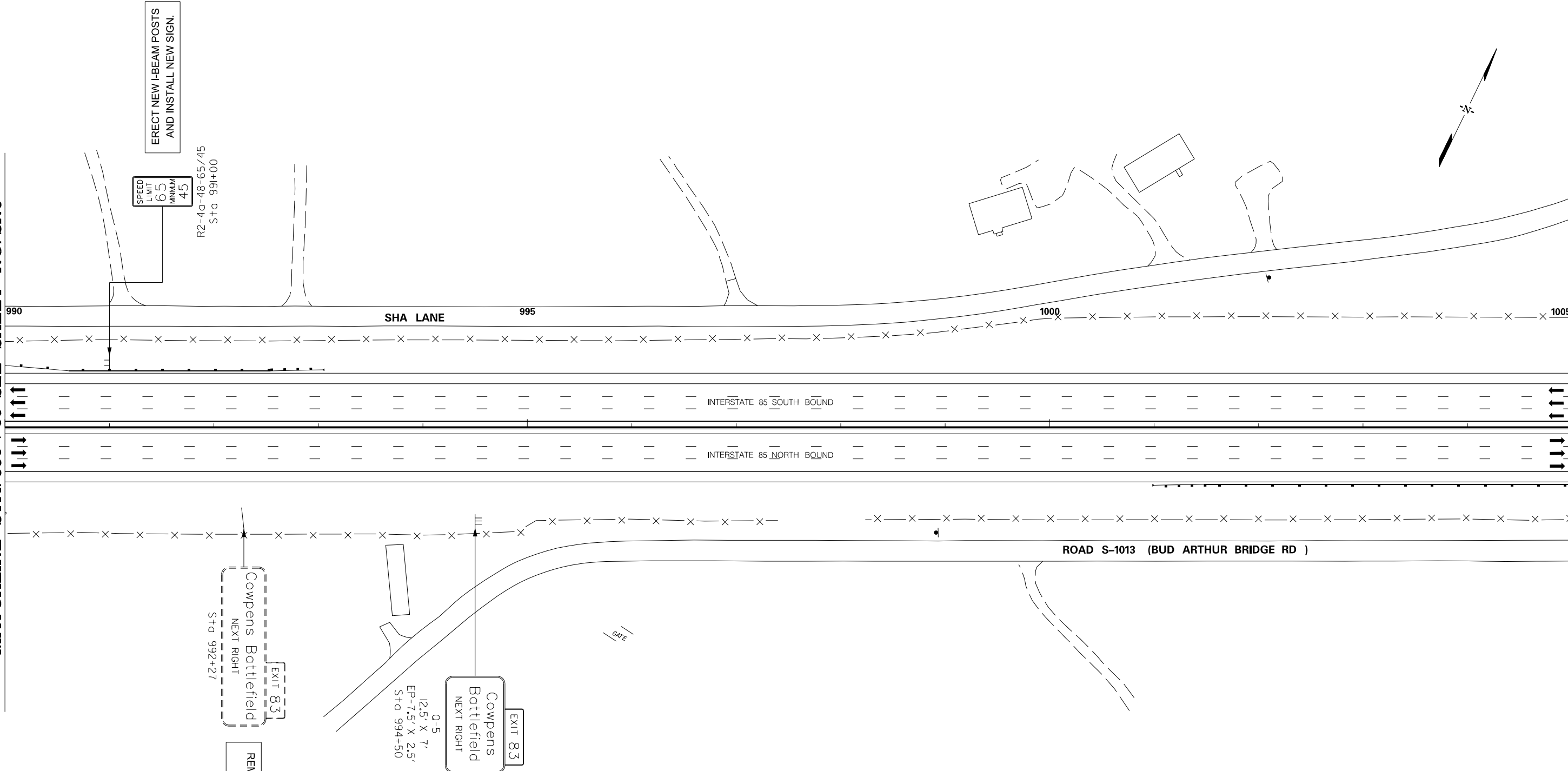
INTERSTATE 85 MILE MARKER 90-97

X:\3286900\41416.0\XXXXX (SCDOT Number)\traffic\sheets from STV\SHT_SN9.dgn
2/17/2016

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P02714	INTERSTATE 85	SN10

MATCHLINE STA. 990 + 00 SEE SHEET NO. SN9

MATCHLINE STA. 1005 + 00 SEE SHEET NO. SN11



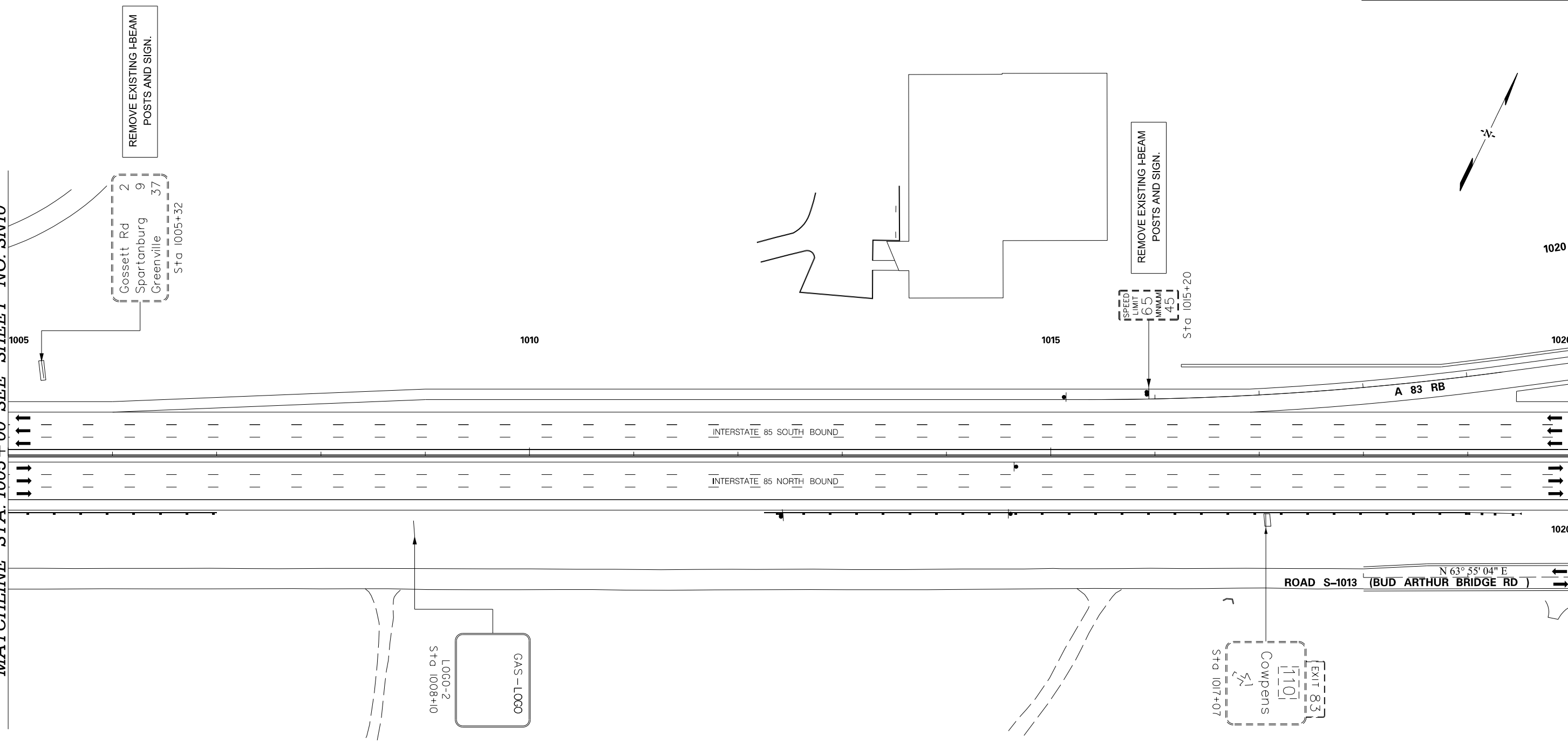
<p>PRELIMINARY NOT FOR CONSTRUCTION</p>	7				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85 PLAN SHEET INTERSTATE 85 MILE MARKER 90-97
	6				
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	1				
	REV. NO.	BY	DATE	DESCRIPTION OF REVISION	

SCALE: 1" = 50'

X:\3286900\41416.0\XXXXX (SCDOT Number)\traffic\sheets from STV\SHI_SN10.dgn 2/17/2016

MATCHLINE STA. 1005 + 00 SEE SHEET NO. SN10

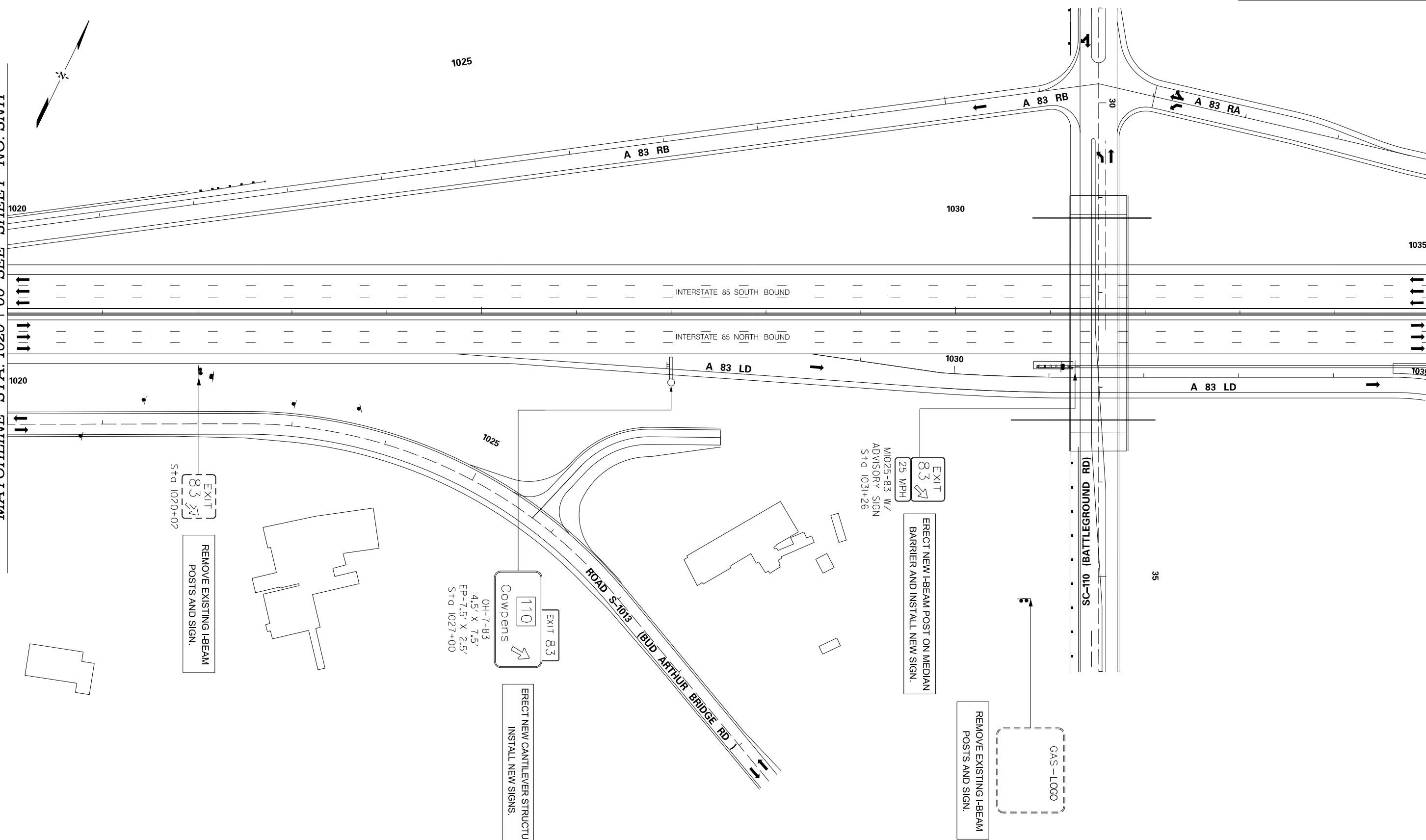
MATCHLINE STA. 1020 + 00 SEE SHEET NO. SN12



<p>PRELIMINARY NOT FOR CONSTRUCTION</p>	7				<p>SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85</p> <p>PLAN SHEET</p> <p>INTERSTATE 85 MILE MARKER 90-97</p>
	6				
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SCALE: 1" = 50'	REV. NO.	BY	DATE	DESCRIPTION OF REVISION	

MATCHLINE STA. 1020 + 00 SEE SHEET NO. SN11

MATCHLINE STA. 1035 + 00 SEE SHEET NO. SN13



<p>PRELIMINARY NOT FOR CONSTRUCTION</p>		7				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85 PLAN SHEET INTERSTATE 85 MILE MARKER 90-97
		6				
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SCALE: 1" = 50'	REV. NO.	BY	DATE	DESCRIPTION OF REVISION		

X:\3286900\41416.0\XXXXX (SCDOT Number)\traffic\sheets from STV\SH1_SNI2.dgn 2/17/2016

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P02714	INTERSTATE 85	SN13

SHEET NO. SN12

MATCHLINE STA. 1035 + 00 SEE

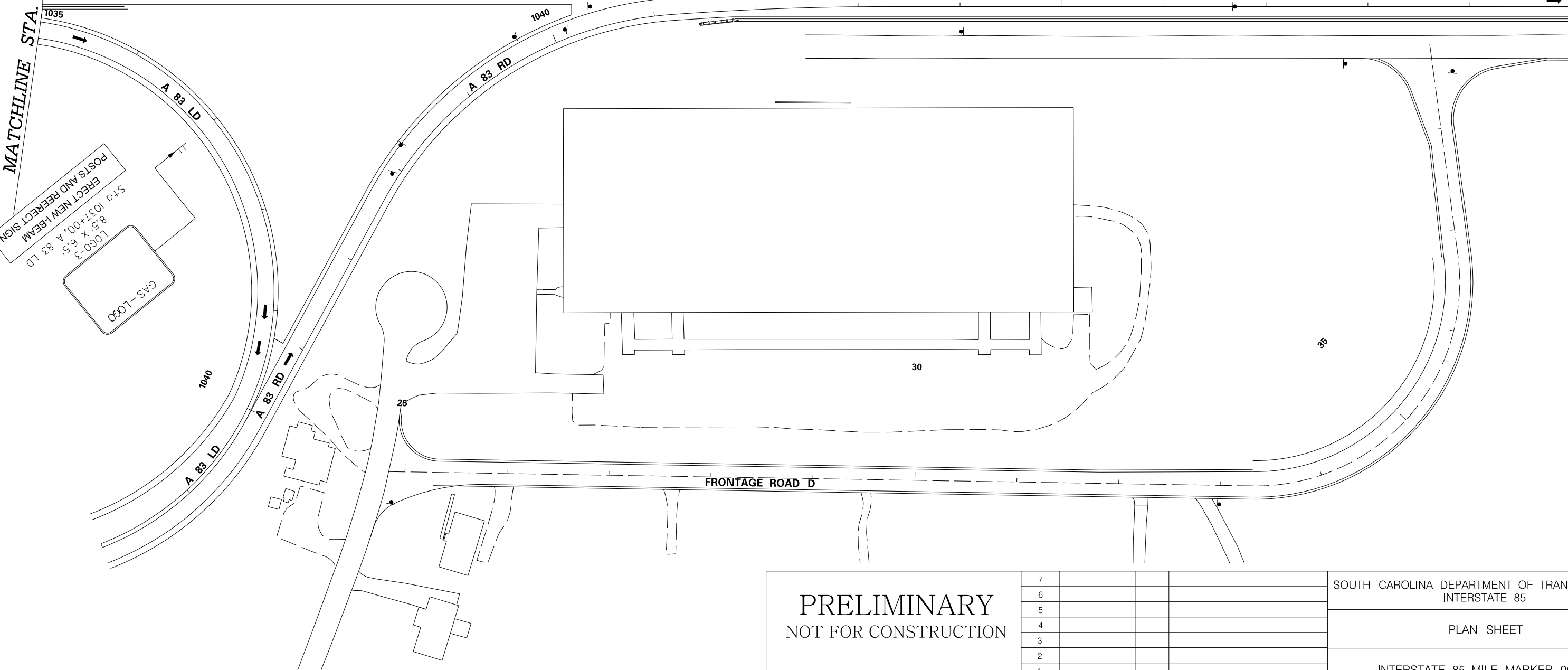
MATCHLINE STA. 1050 + 00 SEE SHEET NO. SN14

ERECT NEW I-BEAM POSTS AND INSTALL NEW SIGN.
EXIT 83
M1025-83
Sta 1037+77

ERECT NEW SIGN BRIDGE. INSTALL NEW SIGNS.

EXIT 83
110
Cowpens
OH-8-83
14.5' X 7.5'
EP-7.5' X 2.5'
Sta 1042+50

ERECT NEW I-BEAM POSTS AND REERECT SIGN.
Sta 1037+00, A 83 LD
LOGO-3
8.5' X 6.5'
GAS-LOGO



PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

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REV. NO.	BY	DATE	DESCRIPTION OF REVISION	

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

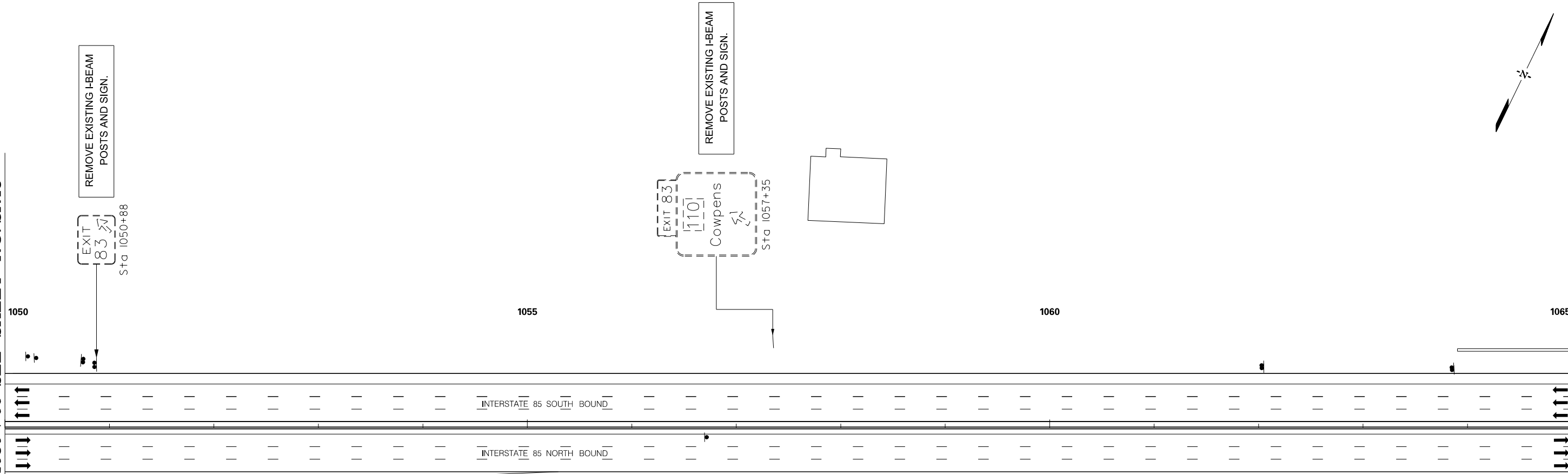
INTERSTATE 85 MILE MARKER 90-97

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2/17/2016

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN14

MATCHLINE STA. 1050 + 00 SEE SHEET NO. SN13

MATCHLINE STA. 1065 + 00 SEE SHEET NO. SN15



PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

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REV. NO.	BY	DATE	DESCRIPTION OF REVISION	

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

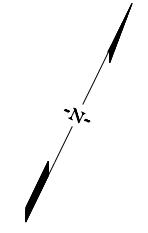
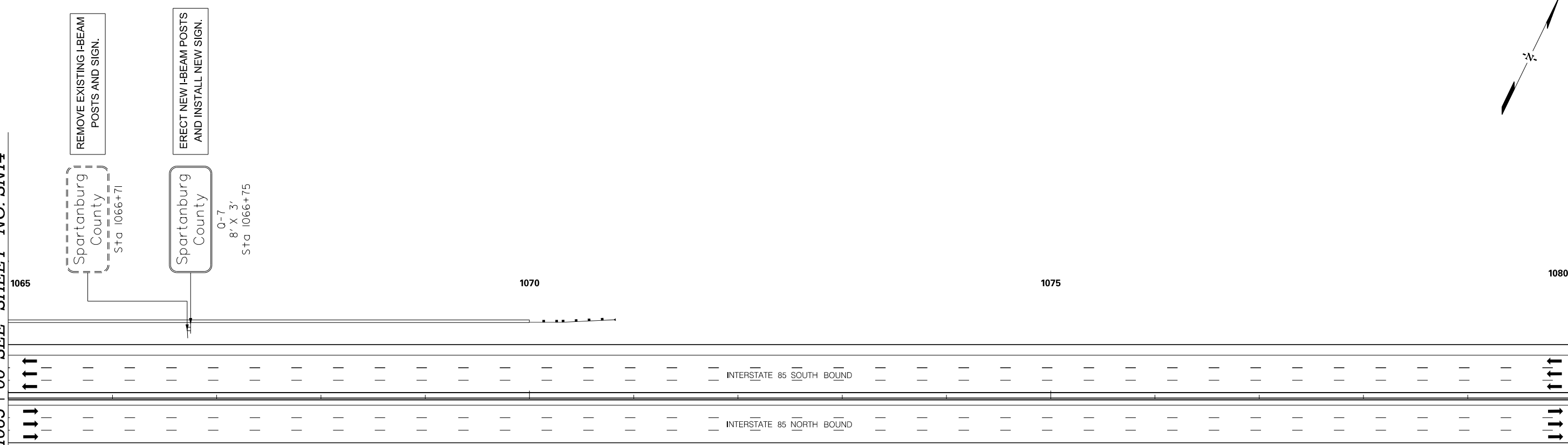
INTERSTATE 85 MILE MARKER 90-97

X:\3286900\41416.0\XXXXX (SCDOT Number)\traffic\sheets from STV\SHT_SN14.dgn
2/17/2016

FED. RD. DIST. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN15

MATCHLINE STA. 1065 + 00 SEE SHEET NO. SN14

MATCHLINE STA. 1080 + 00 SEE SHEET NO. SN16



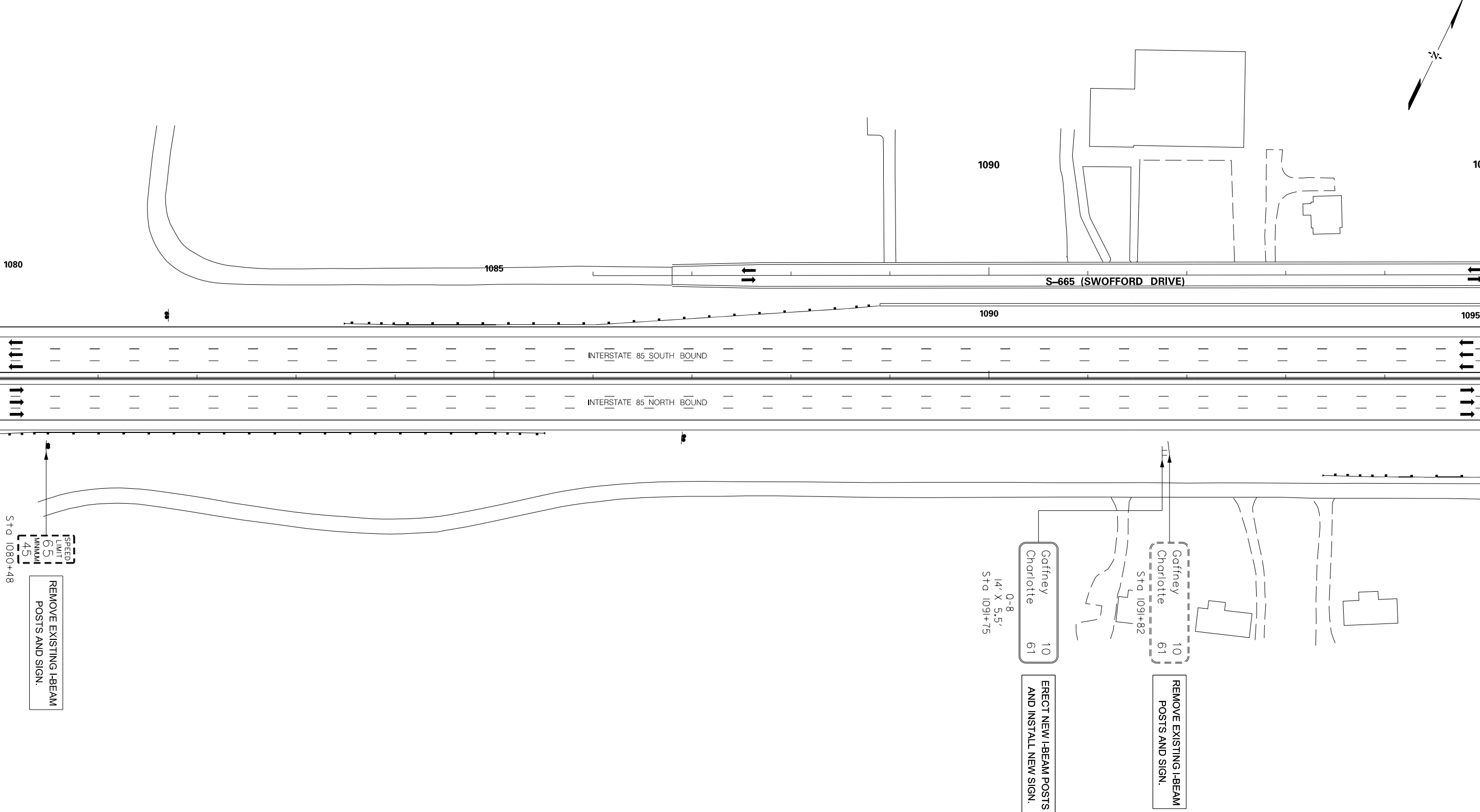
<p>PRELIMINARY NOT FOR CONSTRUCTION</p>	7				<p>SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85</p> <p>PLAN SHEET</p> <p>INTERSTATE 85 MILE MARKER 90-97</p>
	6				
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SCALE: 1" = 50'	REV. NO.	BY	DATE	DESCRIPTION OF REVISION	

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2/17/2016

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN16

MATCHLINE STA. 1080 + 00 SEE SHEET NO. SN15

MATCHLINE STA. 1095 + 00 SEE SHEET NO. SN17



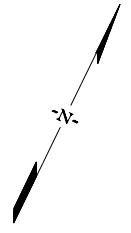
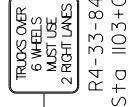
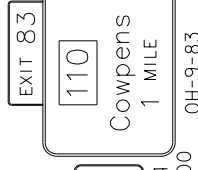
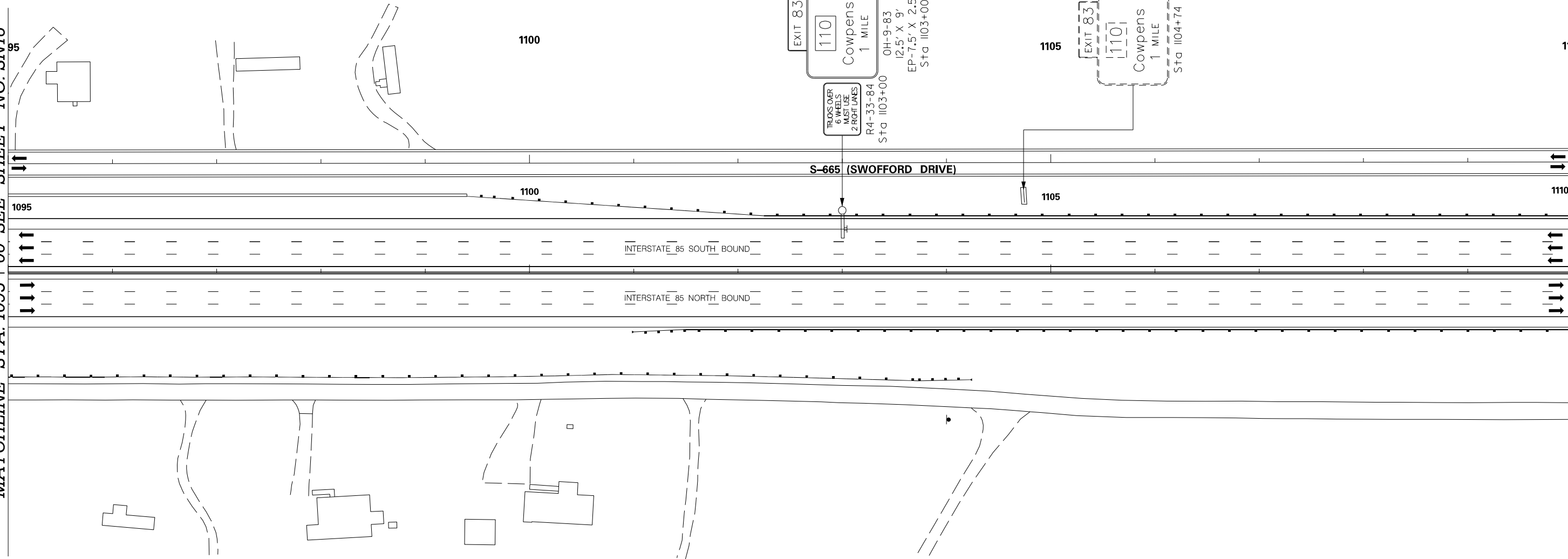
<p>PRELIMINARY NOT FOR CONSTRUCTION</p> <p>SCALE: 1" = 50'</p>	7				<p>SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85</p> <p>PLAN SHEET</p> <p>INTERSTATE 85 MILE MARKER 90-97</p>
	6				
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REV. NO.	BY	DATE	DESCRIPTION OF REVISION		

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FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN17

MATCHLINE STA. 1095 + 00 SEE SHEET NO. SN16

MATCHLINE STA. 1110 + 00 SEE SHEET NO. SN18



PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

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REV. NO.	BY	DATE	DESCRIPTION OF REVISION	

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

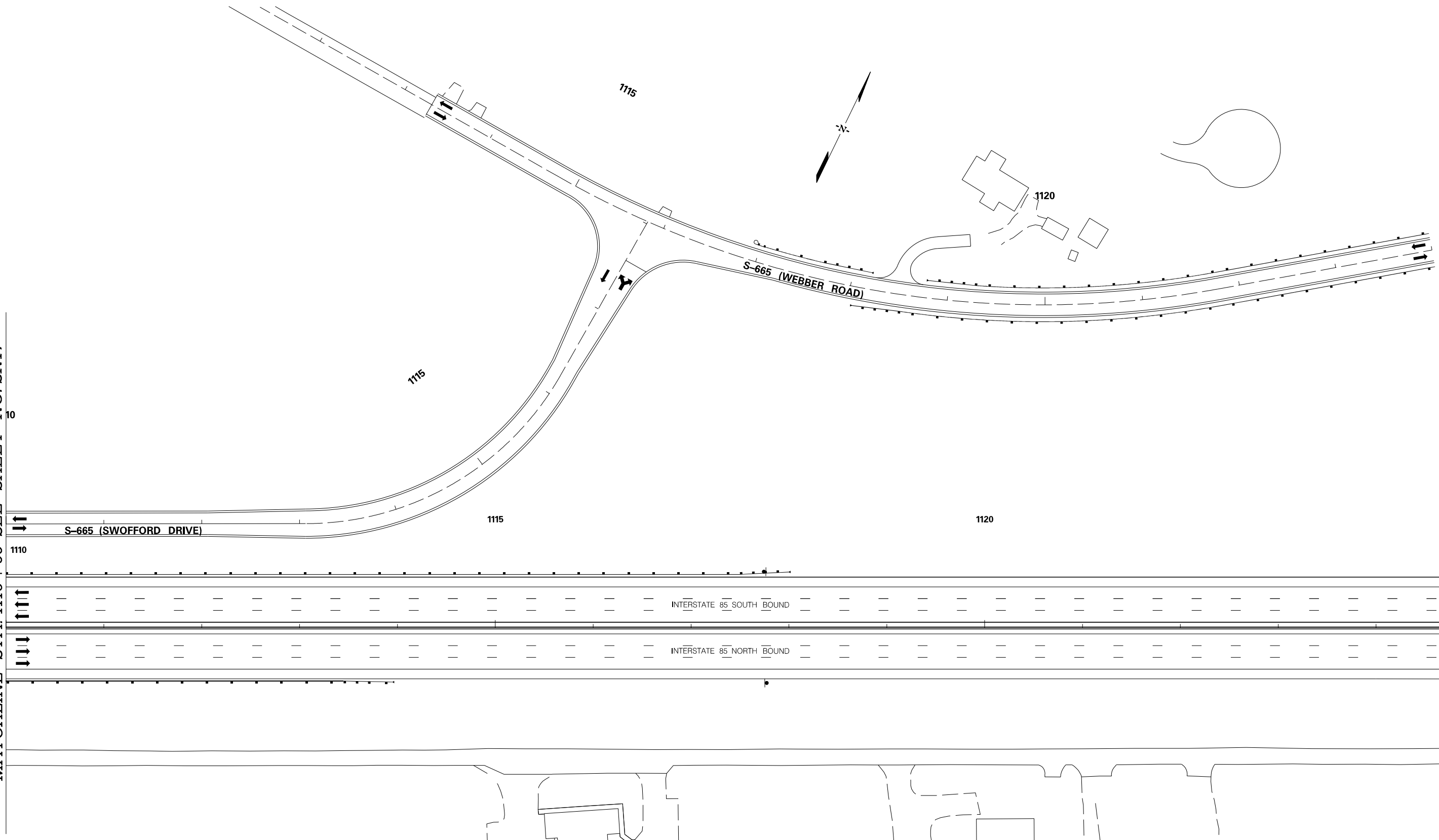
INTERSTATE 85 MILE MARKER 90-97

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FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN18

MATCHLINE STA. 1110 + 00 SEE SHEET NO. SN17

MATCHLINE STA. 1125 + 00 SEE SHEET NO. SN19



1110

↑↑

S-665 (SWOFFORD DRIVE)

1115

1115

1115

S-665 (WEBBER ROAD)

1120

1120

1125

INTERSTATE 85 SOUTH BOUND

INTERSTATE 85 NORTH BOUND

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

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REV. NO.	BY	DATE	DESCRIPTION OF REVISION	

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

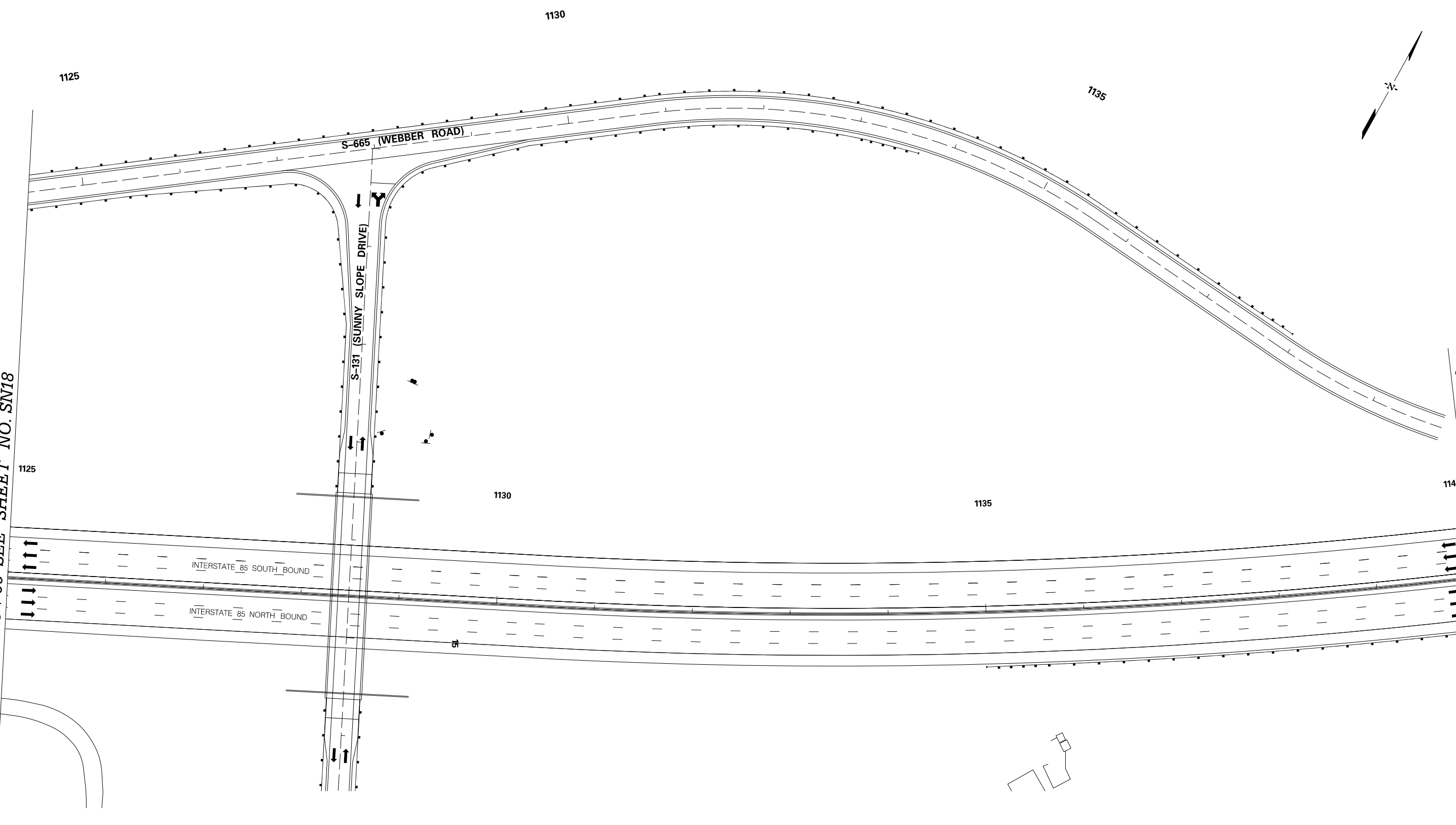
INTERSTATE 85 MILE MARKER 90-97

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2/17/2016

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN19

MATCHLINE STA. 1125+00 SEE SHEET NO. SN18

MATCHLINE STA. 1140+00 SEE SHEET NO. SN20



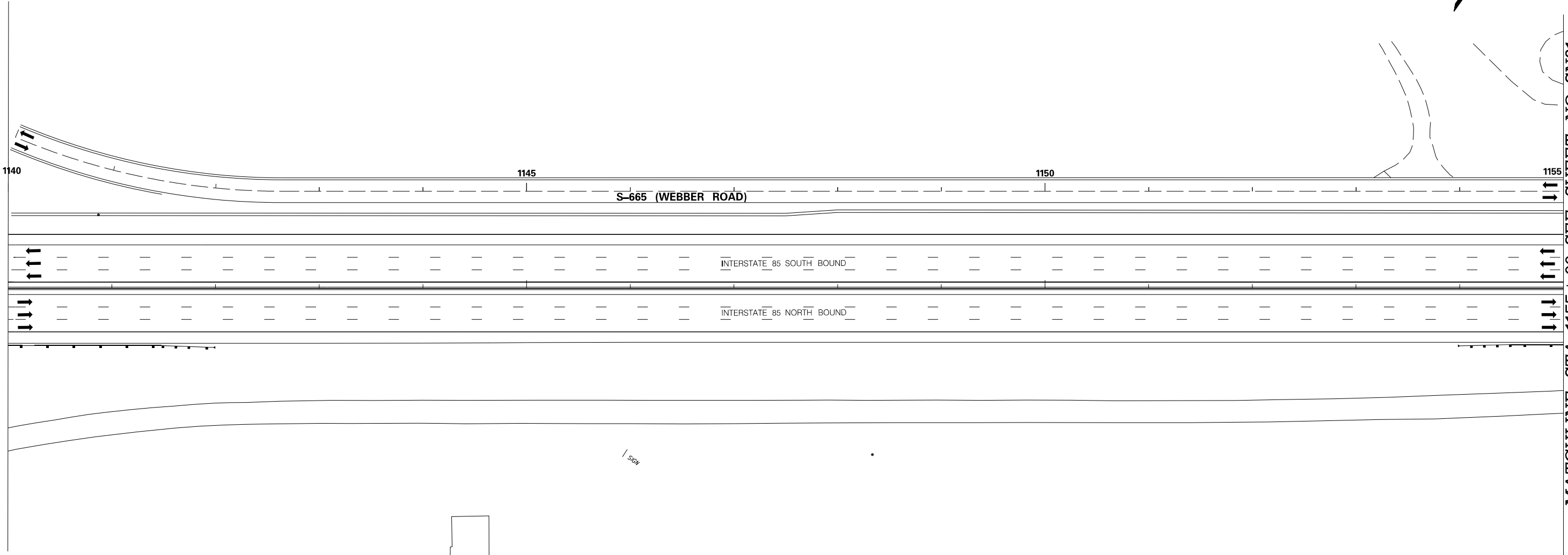
<p>PRELIMINARY NOT FOR CONSTRUCTION</p>	7				<p>SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85</p> <p>PLAN SHEET</p> <p>INTERSTATE 85 MILE MARKER 90-97</p>
	6				
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SCALE: 1" = 50'	REV. NO.	BY	DATE	DESCRIPTION OF REVISION	

X:\3286900\41416.0\XXXXX (SCDOT Number)\traffic\sheets from STV\SHT_SNI9.dgn
2/17/2016

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN20

MATCHLINE STA. 1140 + 00 SEE SHEET NO. SN19

MATCHLINE STA. 1155 + 00 SEE SHEET NO. SN21

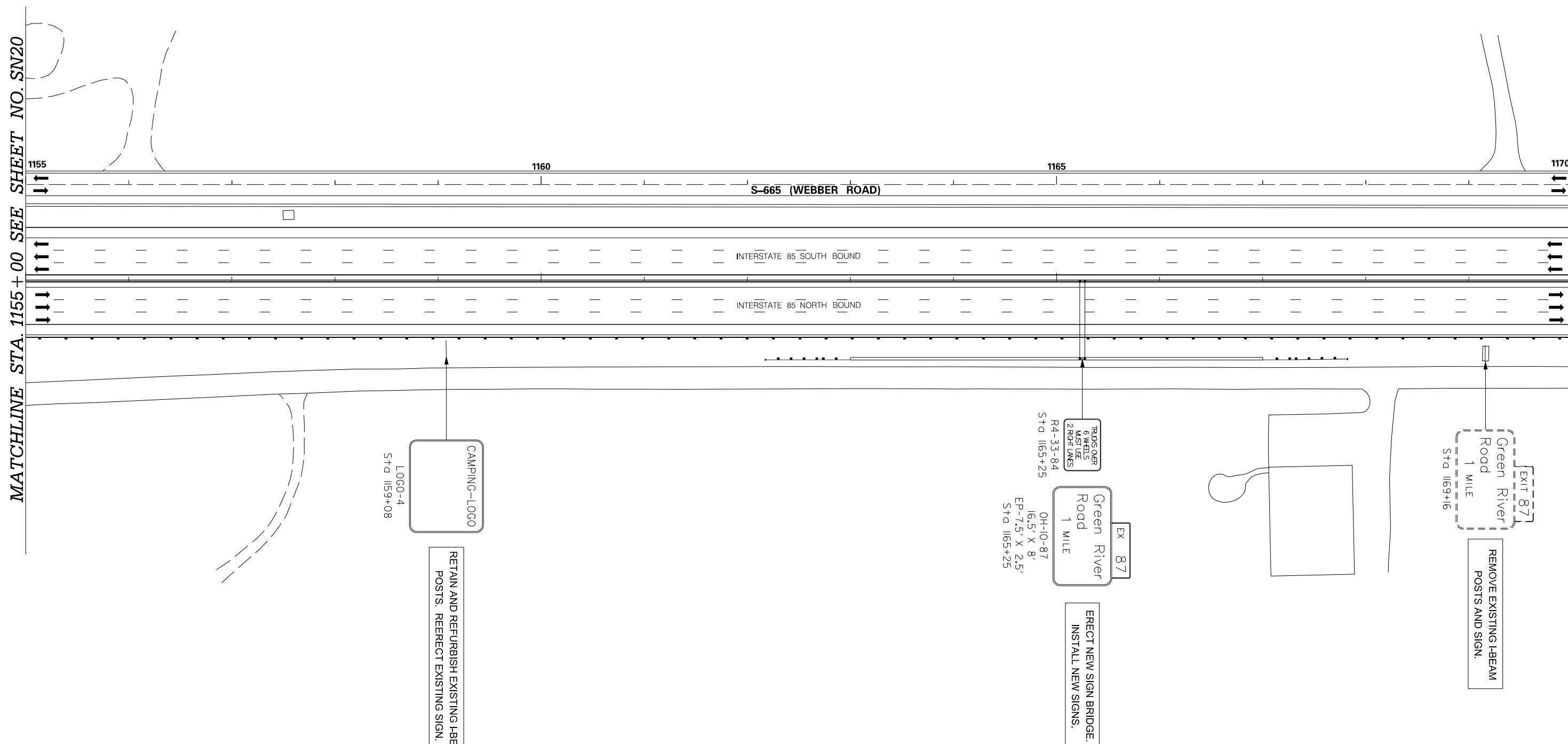


<p>PRELIMINARY NOT FOR CONSTRUCTION</p>	7				<p>SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85</p> <p>PLAN SHEET</p> <p>INTERSTATE 85 MILE MARKER 90-97</p>
	6				
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	REV. NO.	BY	DATE	DESCRIPTION OF REVISION	

SCALE: 1" = 50'

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FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN21



MATCHLINE STA. 1155 + 00 SEE SHEET NO. SN20

MATCHLINE STA. 1170 + 00 SEE SHEET NO. SN22

<p>PRELIMINARY NOT FOR CONSTRUCTION</p>		7				SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85 PLAN SHEET INTERSTATE 85 MILE MARKER 90-97
		6				
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REV. NO.	BY	DATE	DESCRIPTION OF REVISION			

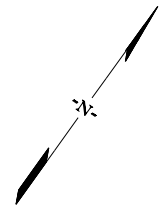
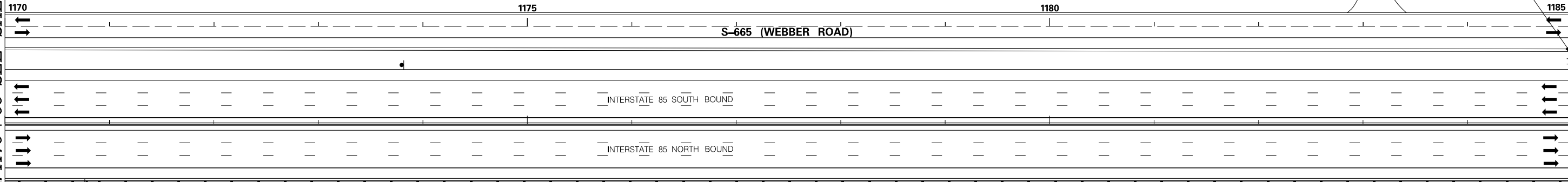
SCALE: 1" = 50'

X:\3286900\41416.0\XXXXX (SCDOT Number)\traffic\sheets from STV\SHI_SN21.dgn 2/17/2016

FED. RD. DIST. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	SPARTANBURG CHEROKEE	P027114	INTERSTATE 85	SN22

MATCHLINE STA. 1170 + 00 SEE SHEET NO. SN21

MATCHLINE STA. 1185 + 00 SEE SHEET NO. SN23



ERECT NEW I-BEAM POSTS
AND INSTALL NEW SIGN.

Spartanburg 12
Greenville 40

0-9
16.5' X 5.5'
Sta 1185+00

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
7			
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SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

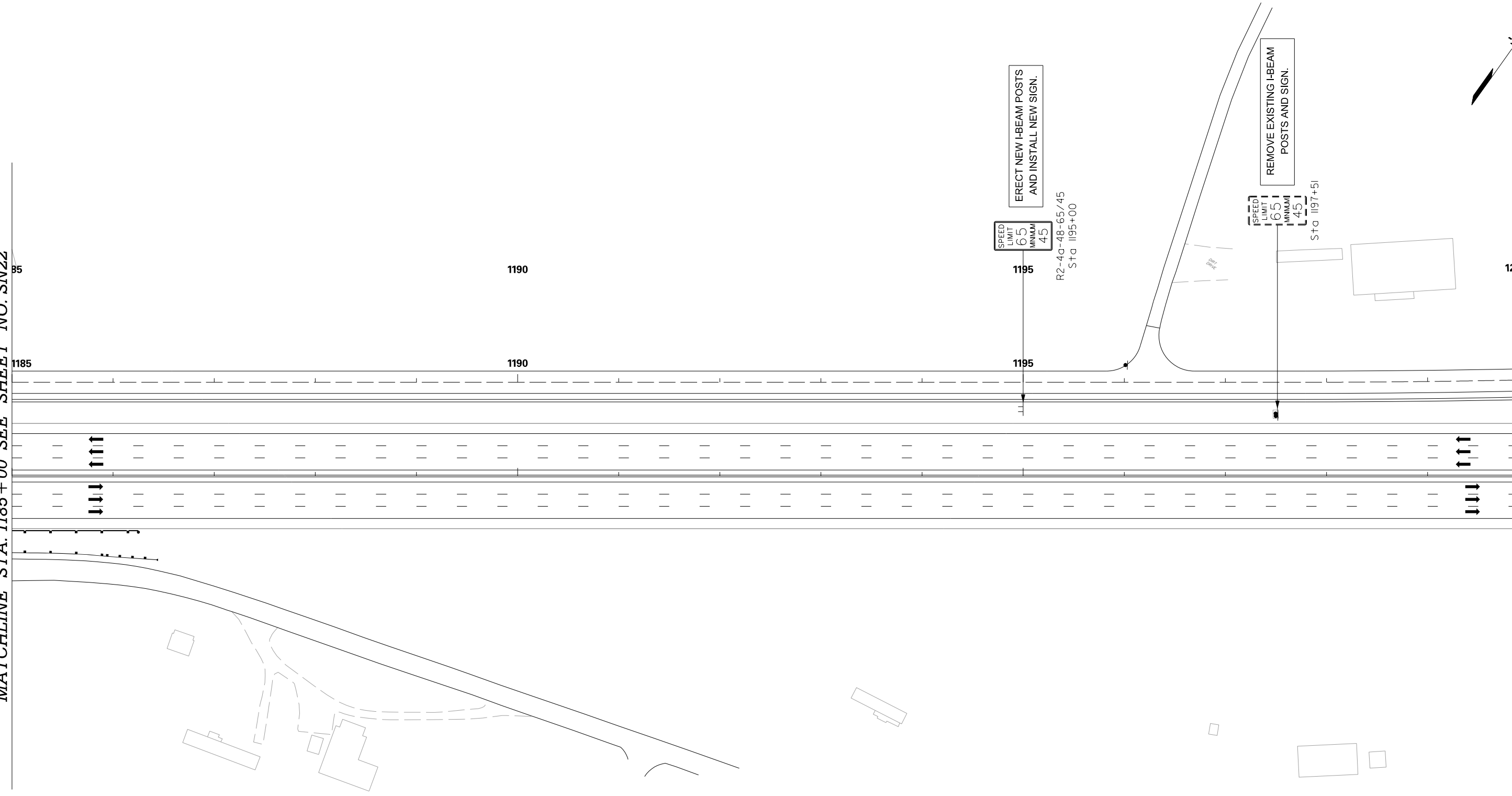
INTERSTATE 85 MILE MARKER 90-97

X:\3286900\41416.0\XXXXX (SCDOT Number)\traffic\sheets from STV\SHT..SN22.dgn
2/17/2016

FED. RD. DIST. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	CHEROKEE	P027114	INTERSTATE 85	SN23

MATCHLINE STA. 1185 + 00 SEE SHEET NO. SN22

MATCHLINE STA. 1200 + 00 SEE SHEET NO. SN24



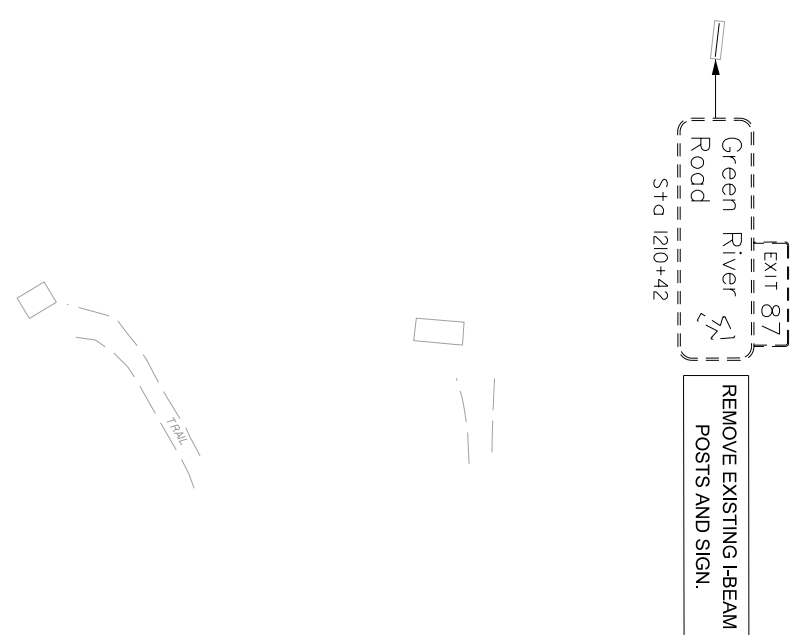
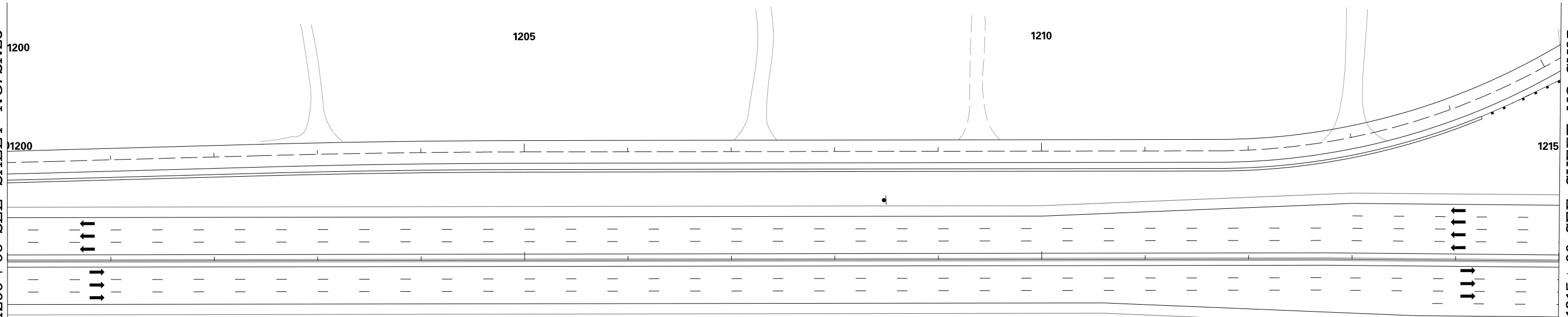
<p>PRELIMINARY NOT FOR CONSTRUCTION</p> <p>SCALE: 1" = 50'</p>	7				<p>SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85</p> <p>PLAN SHEET</p> <p>INTERSTATE 85 MILE MARKER 86-90</p>
	6				
	5				
	4				
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	1				
REV. NO.	BY	DATE	DESCRIPTION OF REVISION		

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2/17/2016

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	CHEROKEE	P027114	INTERSTATE 85	SN24

MATCHLINE STA. 1200 + 00 SEE SHEET NO. SN23

MATCHLINE STA. 1215 + 00 SEE SHEET NO. SN25

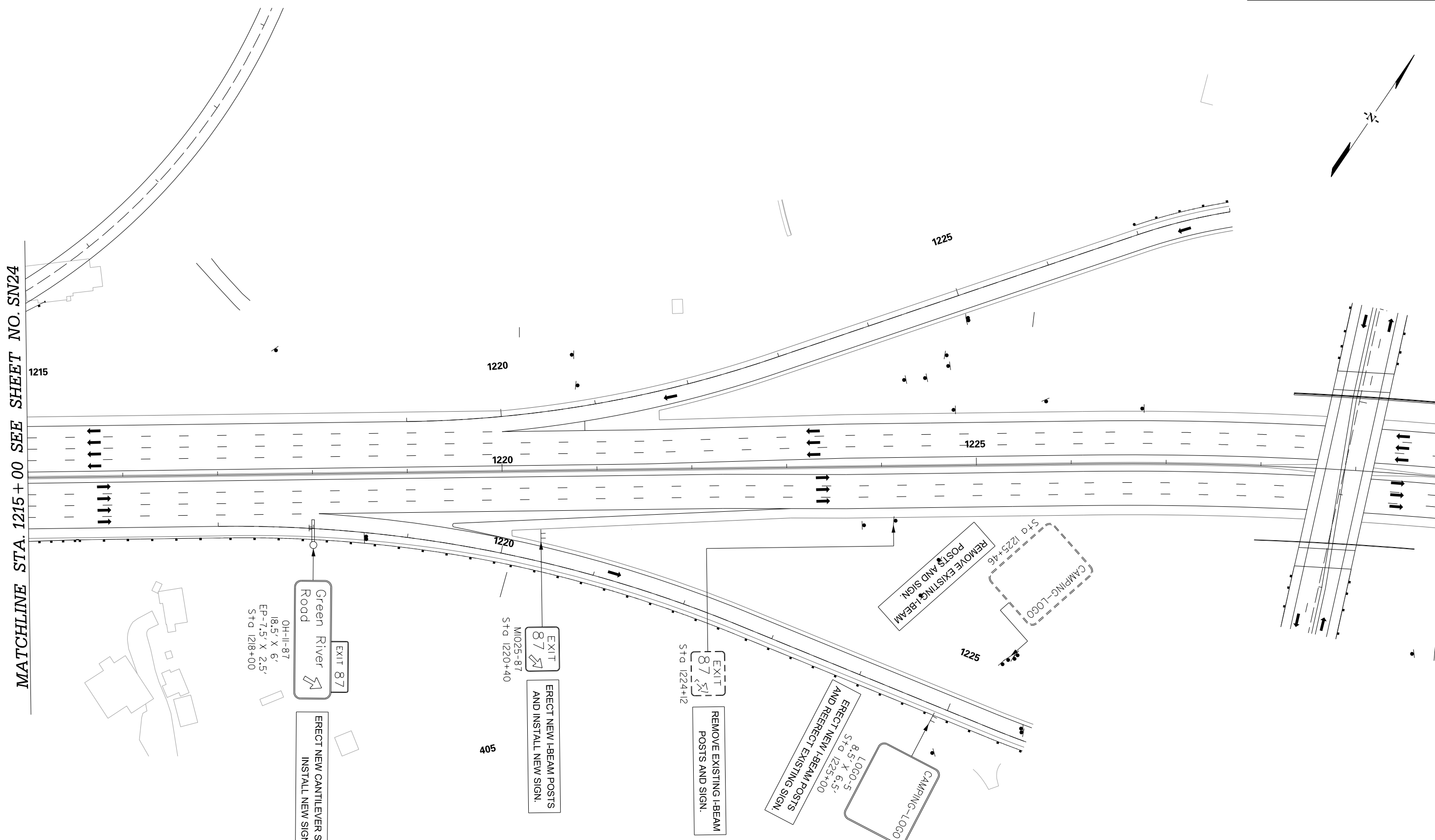


<p>PRELIMINARY NOT FOR CONSTRUCTION</p> <p>SCALE: 1" = 50'</p>	7				<p>SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85</p> <p>PLAN SHEET</p> <p>INTERSTATE 85 MILE MARKER 86-90</p>
	6				
	5				
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	1				
REV. NO.	BY	DATE	DESCRIPTION OF REVISION		

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2/17/2016

MATCHLINE STA. 1215 + 00 SEE SHEET NO. SN24

MATCHLINE STA. 1230 + 00
SEE SHEET NO. SN26



PRELIMINARY
NOT FOR CONSTRUCTION

SCALE: 1" = 50'

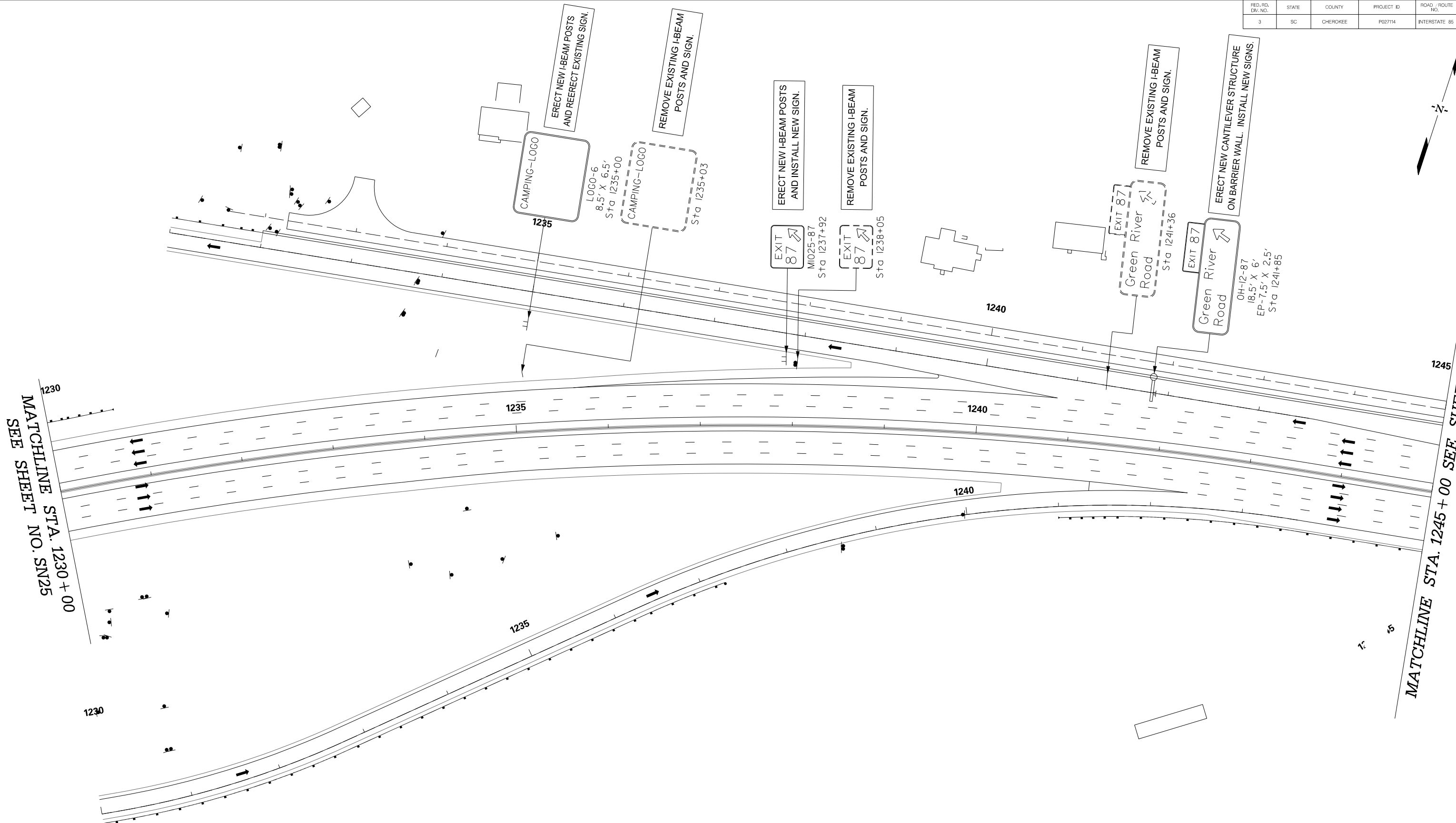
REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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1			

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
INTERSTATE 85

PLAN SHEET

INTERSTATE 85 MILE MARKER 86-90

FED. RD. DIST. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	CHEROKEE	P02714	INTERSTATE 85	SN26



MATCHLINE STA. 1230 + 00
SEE SHEET NO. SN25

MATCHLINE STA. 1245 + 00 SEE SHEET NO. SN27

<p>PRELIMINARY NOT FOR CONSTRUCTION</p> <p>SCALE: 1" = 50'</p>	7				<p>SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION INTERSTATE 85</p> <p>PLAN SHEET</p> <p>INTERSTATE 85 MILE MARKER 86-90</p>
	6				
	5				
	4				
	3				
	2				
	1				
REV. NO.	BY	DATE	DESCRIPTION OF REVISION		

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2/17/2016