Interchange Modification Report

Interstate 26 Exit 97 – US 176/Broad River Road

Richland County, SC

Prepared For:

South Carolina Department of Transportation

Prepared By:

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

July 24, 2018

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SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 22070 ROBERT J. DUBNICKA
7-27-2018

STV 100 Years

SOUTH CAROLINA STV INCORPORATED NO. C03318 CERTIFICATE OF AUTHORIZATION

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1
I. Introduction 4
II. Exit 97 - US 176/Broad River Road 6
Existing Conditions 6
Purpose and Need 16
Conceptual Design 16
Intersection Modification Report Applicant 19
III. Study Area 19
Demographics 19
Land Use 20
Transportation System 21
IV. Methodology 21
Scenarios Analyzed 21
Traffic Forecasts 22
Traffic Analysis 23
V. Traffic Volumes 27
Existing 2016 Traffic Volumes 27
2040 Traffic Volumes 27
VI. Traffic Operations 31
Freeway and Ramp Merge/Diverge Segment Analysis 31
Existing and 2040 No Build Intersection Analysis 35
2040 Build Intersection Analysis – Preferred Alternative (Alternative 1) 36
TransModeler Network Analysis 43
VII. Interchange Justification 49
Policy Point 1 49
Policy Point 2 51

LIST OF FIGURES

Figure 1 . Interstate 26 Widening Study Area 5
Figure 2. Existing Interchange 7
Figure 3. Exit 97: Broad River Road at EB Ramps 9
Figure 4. Exit 97: Broad River Road at Westbound Ramps and Central Driveway 9
Figure 5. Exit 97: Broad River Road at Westbound Ramps and South Driveway 10
Figure 6. Exit 97: Eastbound Ramps at Rauch-Metz Road 11
Figure 7. Exit 97: Broad Stone Road at Rauch-Metz Road 12
Figure 8. Exit 97: Broad Stone Road at Broad River Road 12
Figure 9. Exit 97: Westbound Ramps at Julius Richardson Road 13
Figure 10. Exit 97: Broad River Road at Westbound Ramps and North Driveway 15
Figure 11. Exit 97: Broad River Road at West Shady Grove Road 15
Figure 12. Improvement Alternative 1 Diverging Diamond Interchange 17
Figure 13. Improvement Alternative 2 Partial Cloverleaf 18
Figure 14. Improvement Alternative 3 SPUI 18
Figure 15. Existing Peak Hour Turning Movement Volumes 28
Figure 16. 2040 Estimated No-Build Peak Hour Turning Movement Volumes 29
Figure 17. 2040 Estimated Peak Hour Turning Movement Volumes Alternative 1 30
Figure 18. Exit 97 – Broad River Road (US 176) Interchange Intersection LOS Summary 39
Figure 19. Exit 97 – Broad River Road (US 176) Preferred Alternative 42

LIST OF TABLES

Table 1: Population Growth in the I-26 PSA 20
Table 3. Freeway Segment LOS Criteria 24
Table 4. Weaving Segment LOS Criteria 25
Table 5. Merge/Diverge LOS Criteria 25
Table 6. Unsignalized Intersection LOS Criteria 26
Table 7. Signalized Intersection LOS Criteria 26
Table 8 - Freeway Segment Capacity Analysis Results 32
Table 9 - Ramp Merge Capacity Analysis Results 32
Table 10 - Ramp Diverge Capacity Analysis Results 32
Table 11 - Intersection Capacity Analysis Results 38
Table 12- Intersection Capacity Analysis Results - 2040 Base vs 2040 Build Exit 97 40
Table 13 - 2040 Build Intersection Queue Lengths Exit 97 41
Table 14: Basic Freeway Segment Analysis TransModeler Results 47
Table 15: Freeway Merge Analysis TransModeler Results 47
Table 16: Freeway Diverge Analysis TransModeler Results 48

LIST OF APPENDICES

Appendix A - Turning Movement Count Data
Appendix B - HCS Freeway Segment Analysis Outputs
Appendix C - HCS Ramp Merge/Diverge Analysis Outputs
Appendix D - Synchro Intersection Analysis Outputs
Appendix E - TransModeler Freeway Segment Outputs
Appendix F - TransModeler Ramp Merge/Diverge Outputs
Appendix G - Conceptual Signing Plan

EXECUTIVE SUMMARY

The South Carolina Department of Transportation (SCDOT) proposes multiple improvements to the I-26 corridor from mile marker 85 – SC 202 to mile marker 101 – Broad River Road (US 176) designed to increase capacity, upgrade interchanges to meet design requirements, and expand vertical clearance at overpass bridges. Specifically, SCDOT proposes widening I-26 from four to six lanes from Exit 85 – SC 202 to Exit 97 - Broad River Road (US 176) and from four to eight lanes from Exit 97 - Broad River Road (US 176) to Exit 101 - Broad River Road (US 176). Along the project area, interchanges at Exit 85 – SC 202, Exit 91 – Columbia Avenue (S-48), and Exit 97 - Broad River Road (US 176) will be improved to bring them to compliance with design requirements.

Throughout nearly all of the study area, I-26 currently provides two lanes in each direction. From Exit 82 southeastward, the two lane section is maintained, until it is widened from two to three lanes approaching Exit 101.

The proposed project has two primary purposes: increase roadway capacity to address the projected traffic volumes and improve geometric deficiencies along the mainline and at several interchanges and overpasses in this section of I-26 by bringing them to 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 97 – Broad River Road (US 176), located in Richland County, SC. Today, this interchange is a partial cloverleaf with loop on-ramps and slip ramp off-ramps. Julius Richardson Road intersects the westbound loop ramp and Rauch-Metz Road intersects the eastbound loop ramp.

Information discussed in the report is derived from the following projects reports: *Interstate 26 Widening Traffic Analysis Report: I-26 Widening Project MM 85-MM 101, Accident Analysis Report: I-26 Widening Project MM 85-MM 101,* and *Interstate 26 Widening and Improvements Mile Marker 85-101 Environmental Assessment.*

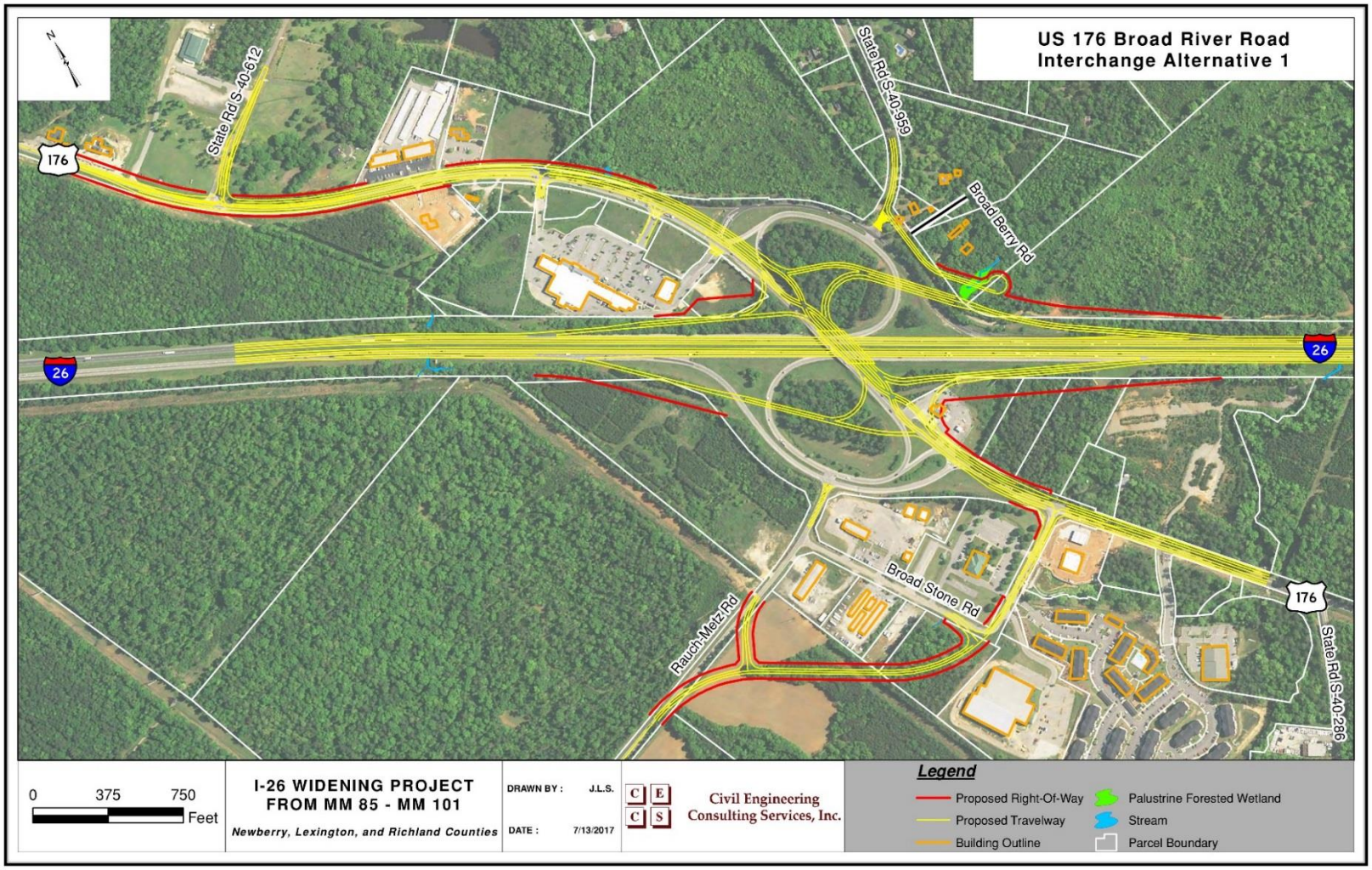
Three alternatives were developed for Exit 97. The three Build alternatives at Exit 97 consist of:

- Alternative 1: Diverging Diamond Interchange (DDI) – the concept would replace the existing interchange with a DDI.
- Alternative 2: Partial Cloverleaf (ParClo) Interchange – this concept would add a westbound on-ramp and eastbound on-ramp to the existing interchange configuration.
- Alternative 3: Single Point Urban Interchange (SPUI) – this concept would replace the existing interchange configuration with a SPUI.

In each of the Exit 97 alternatives, traffic from the existing ramp intersections of Julius Richardson Road and Rauch Metz Road would be redirected to West Shady Grove Road and Broad Stone Road, respectively. The existing ramp intersections with Broad River Road would be eliminated, and Broad River Road would be widened through the interchange area between Broad Stone Road and the main Shopping Center Driveway. The eastbound off-ramp intersection would operate under traffic signal control. The existing traffic signal at the shopping center driveway would be removed and a new signal would be installed at the southern access to the shopping center, and traffic signals would be installed at the Broad River Road intersections with Broad Stone Road and West Shady Grove Road.

Alternative 1, the DDI, was selected as the Preferred Alternative for Exit 97. Alternative 1 would impact the least amount of streams and wetlands, when compared to the other Build alternatives, making this the least environmentally damaging practicable alternative. It also requires the least amount of new right-of-way and has the lowest overall estimated construction cost. The DDI would also reduce congestion and provide a safer interchange, satisfying the project purpose and need. The intersections of Broad River Road and the I-26 ramps would be improved from LOS E or F to LOS C or better. Because of these reasons, Alternative 1 was selected as the Preferred Alternative. Alternative 1 is shown in Figure **E-1**.

Based on the analysis, other improvements to the original concept were made including turn lane lengths, number of approach lanes, number of lanes on Broad River Road, and traffic signal phasing to obtain an acceptable Level of Service (LOS) results.



Source: Figure 84, *Interstate 26 Widening Traffic Analysis Report*

Figure E-1. Preferred Alternative 1

I. Introduction

I-26 is an east-west interstate highway that begins at the junction of U.S. Route 11W and U.S. Route 23 in Kingsport, Tennessee. From this origin, I-26 runs generally southeastward through Tennessee, North Carolina, and South Carolina, where it ends at U.S. Route 17 in Charleston, South Carolina.

Along its nearly 306 mile length, I-26 provides access to Johnson City, Tennessee; Asheville, North Carolina; and Spartanburg, Columbia and Charleston, South Carolina.

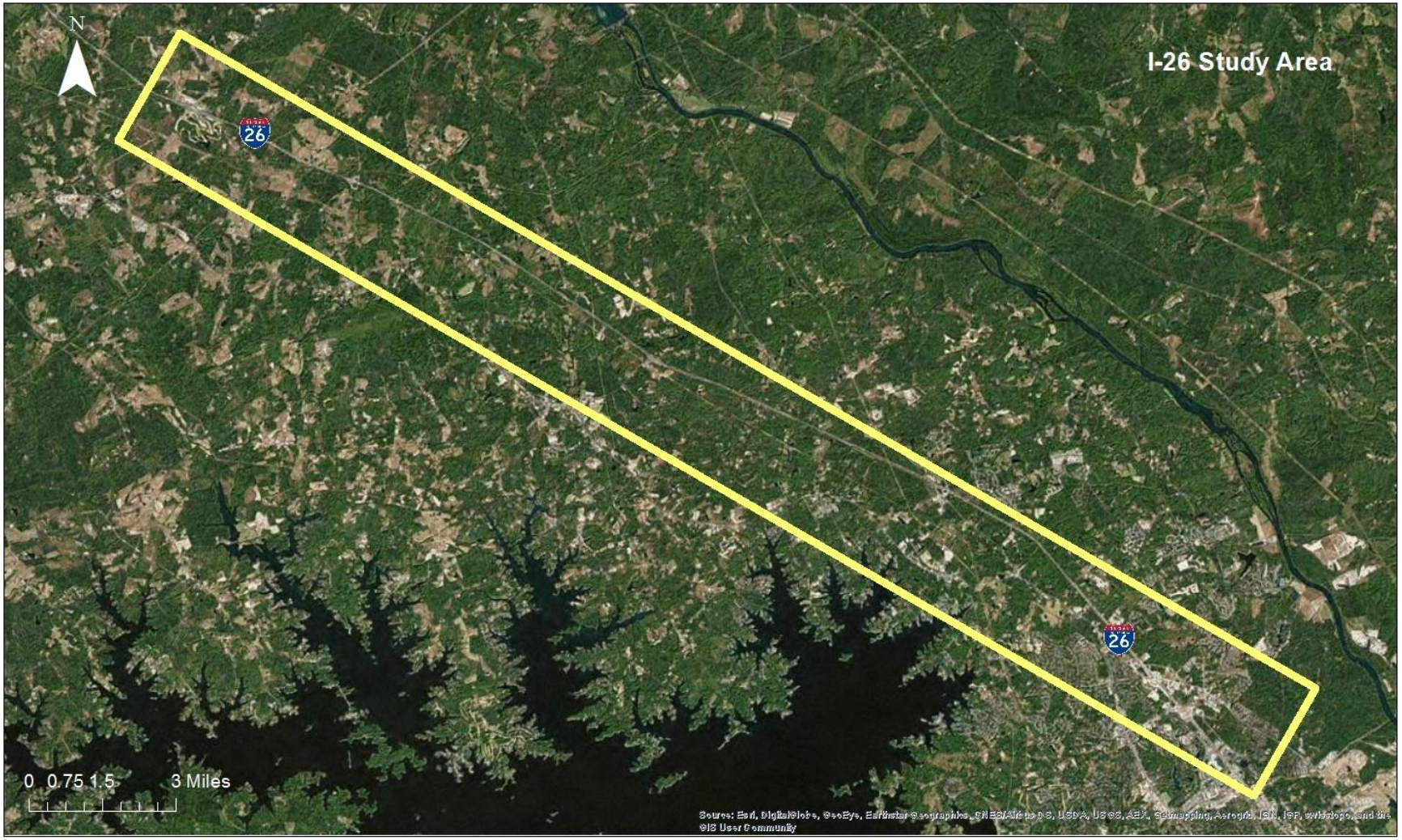
In South Carolina, I-26 covers about 221 miles, and provides connections to I-95 south of Providence, to I-77 south of Cayce, to I-20 west of Columbia, and to I-85 north-west of Spartanburg. The portion of I-26 under study in the *Interstate 26 Widening Traffic Analysis Report: I-26 Widening Project MM 85-MM 101* is located west of Columbia, generally between Exit 82 and Exit 102. Exit 85 is located on the west end of the study area.

In the vicinity of Exit 97, I-26 currently provides two lanes in each direction. The posted speed limit on I-26 in the vicinity of Exit 97 is 70 miles per hour.

In general, interstate routes can be characterized as having either level, rolling, or mountainous terrain. Consistent with the Mainline Study, the portion of I-26 adjacent to Exit 97 is characterized as having a rolling terrain.

Information discussed in the report is derived from the following projects reports: *Interstate 26 Widening Traffic Analysis Report: I-26 Widening Project MM 85 to MM 101 (Mainline Study), Accident Analysis Report: I-26 Widening Project MM 85 to MM 101 (Accident Analysis), and Interstate 26 Widening and Improvements Mile Marker 85-101 Environmental Assessment*.

The I-26 Mainline Study evaluated multiple improvements to the I-26 corridor designed to increase capacity, upgrade interchanges to meet design requirements, and expand vertical clearance at overpass bridges and/or replace them. The study considered widening I-26 from two to three lanes from approximately 1.6 miles west of Exit 85 to about 2,200 feet west of Exit 101 and examined modifications to interchanges at Exit 85 (SC 202), Exit 91 (S-32-48/Columbia Avenue) and Exit 97 (US 176/Broad River Road). To provide sufficient coverage to prepare interchange modification reports, the I-26 Mainline Study included the existing interchanges at Exits 82, 101 and 102. **Figure 1** depicts the study area for the overall I-26 Widening project.



Source: Figure 12, *Interstate 26 Widening Traffic Analysis Report*

Figure 1 . Interstate 26 Widening Study Area

II. Exit 97 - US 176/Broad River Road

Exit 97 is a partial cloverleaf interchange with loop on-ramps in the northeast and southwest quadrants. The existing configuration of the Exit 97 interchange is shown in **Figure 2**.

Existing Conditions

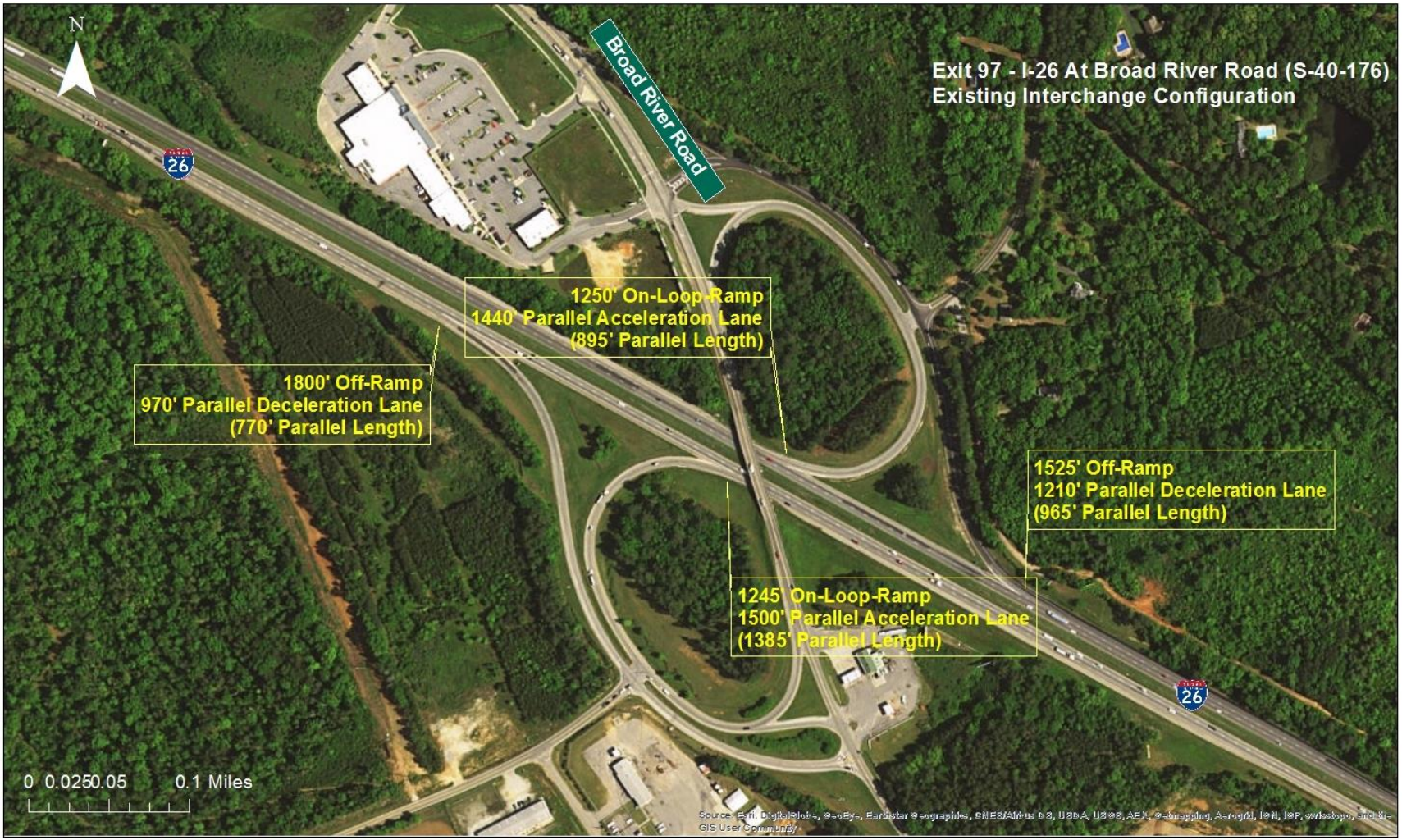
The existing configuration of Exit 97 Exit 97 was constructed in the early 1970s. The section of I-26 in the vicinity of Exit 97 currently consists of a four-lane interstate with a grassed median for all of its length.

The westbound off-ramp is approximately 1,525 feet long with a 1,210 feet long parallel deceleration lane (with a parallel length of approximately 965 feet). The off-ramp has a 35 mph posted advisory speed limit.

The westbound loop on-ramp is a single lane ramp that begins at the signalized off-ramp intersection. The loop on-ramp is approximately 1,250 feet long and merges into I-26 with a 1,440 feet long parallel acceleration lane (with a parallel length of approximately 895 feet). The ramp accepts the southbound left turn from a separate left turn lane on Broad River Road, and northbound right turn traffic from Broad River. The lanes for these two movements are separated by a grass island, with the southbound left turn traffic from Broad River Road controlled by a yield sign at the merge with the northbound right turn traffic from Broad River Road. The intersection with Julius Richardson Road is located approximately 775 feet from the signalized ramp intersection on Broad River Road.

The westbound loop off-ramp and on-ramp are separated by approximately 710 feet on westbound I-26.

The eastbound off-ramp is approximately 1,800 feet long with a 970 feet long parallel deceleration lane (with a parallel length of approximately 770 feet). The off-ramp has a 35 mph posted advisory speed limit. In the middle of the ramp, traffic can make a right turn to Rauch-Metz Road (S-40-385) or it can proceed straight until the end of the ramp. At the end of the off-ramp, traffic can make a left turn to “Peak” and “Pomaria” or make a right turn to “Irmo” and “Ballentine”. Near the end, the off-ramp widens from a single lane to provide a separate left turn lane and a separate right turn lane with approximately 200 feet of storage that are separated from each other by a concrete island. Both movements are controlled by the STOP signs. The stop lines are set back 25-35 feet from the edge of Broad River Road.



Source: Figure 12, *Interstate 26 Widening Traffic Analysis Report*

***Figure 2*. Existing Interchange**

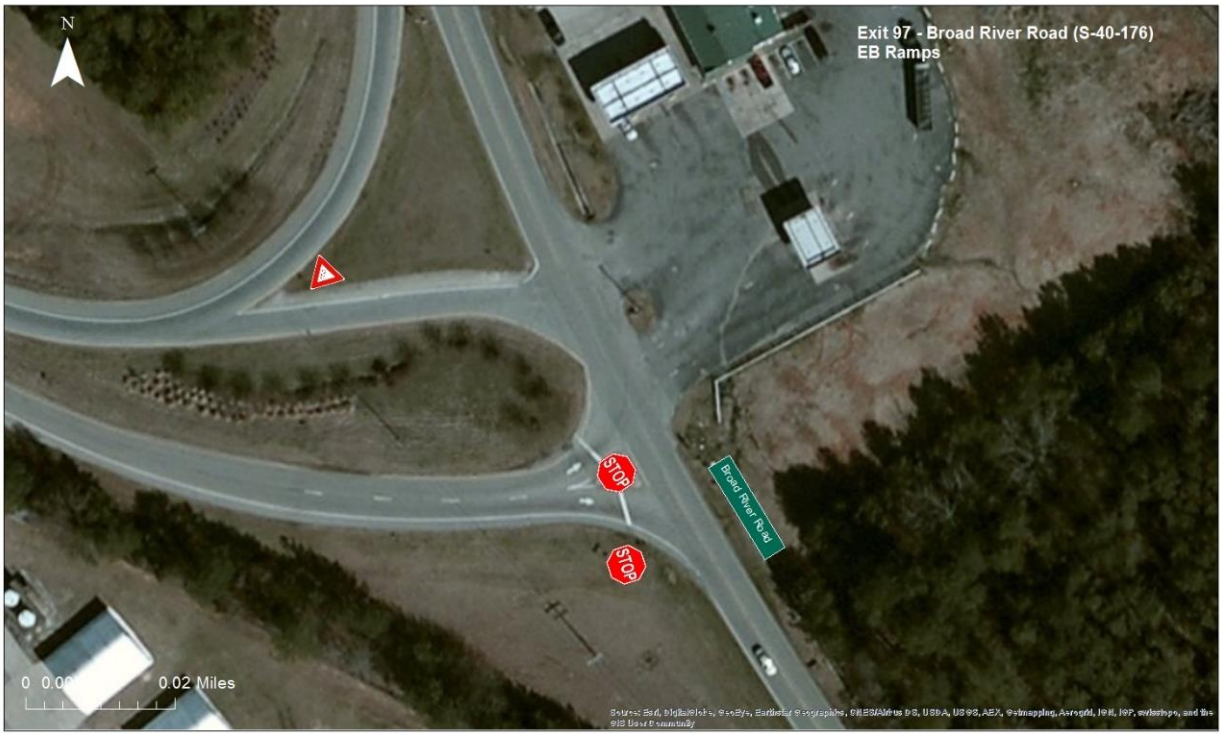
The eastbound on-ramp is a single lane loop ramp approximately 1,245 feet long that merges into I-26 with a 1,500 feet long parallel acceleration lane (with a parallel length of approximately 1,385 feet). The ramp accepts the southbound right turn and the northbound left turn traffic from Broad River Road along with eastbound left turn traffic from Rauch-Metz Road. The northbound left turn traffic from Broad River Road has a yield sign at the merge with the southbound right turn traffic from Broad River Road. The Rauch-Metz Road approach is controlled by a STOP sign.

The eastbound off-ramp and loop on-ramp are separated by approximately 905 feet.

The exit is signed "176" using the route shield, along with the text "Peak" in the westbound direction. In the eastbound direction, the route shield "176" is shown along with the text "Ballentine" and "White Rock".

Broad River Road to the north of the interchange is a two lane roadway with a posted 45 mph speed limit. As Broad River Road approaches the interchange, separate right turn lanes are provided to the north and center driveway to the shopping center. At the signalized intersection with the westbound off-ramp, Broad River Road provides separate southbound left turn, through and right turn lanes. The southbound left turn lane provides 270 feet of storage and the southbound right turn lane provides 175 feet of storage. In the northbound direction at this signal, Broad River Road provides separate left turn with 140 feet of storage, and a separate through lane; the right turn movement to the westbound loop on-ramp diverges from northbound Broad River Road approximately 240 feet to the south of the stop line with a 130 feet long diverging taper. The Broad River Road bridge crossing I-26 is two lanes wide. At the eastbound ramp intersection, southbound of Broad River Road provides a single through lane; the right turn lane to the eastbound loop on-ramp diverges approximately 250 north of where northbound traffic turns left onto the ramp. No separate turn lanes are provided to separate traffic turning left onto the eastbound loop on-ramp from the northbound through traffic on Broad River Road.

The eastbound ramp intersection is shown in **Figure 3**. The westbound ramp intersections are shown in **Figure 4** and in **Figure 5**.



Source: Figure 21, *Interstate 26 Widening Traffic Analysis Report*

Figure 3. Exit 97: Broad River Road at EB Ramps

Source: Figure 22, Interstate 26 Widening Traffic Analysis Report

Figure 4. Exit 97: Broad River Road at Westbound Ramps and Central Driveway

Source: Figure 23, Interstate 26 Widening Traffic Analysis Report

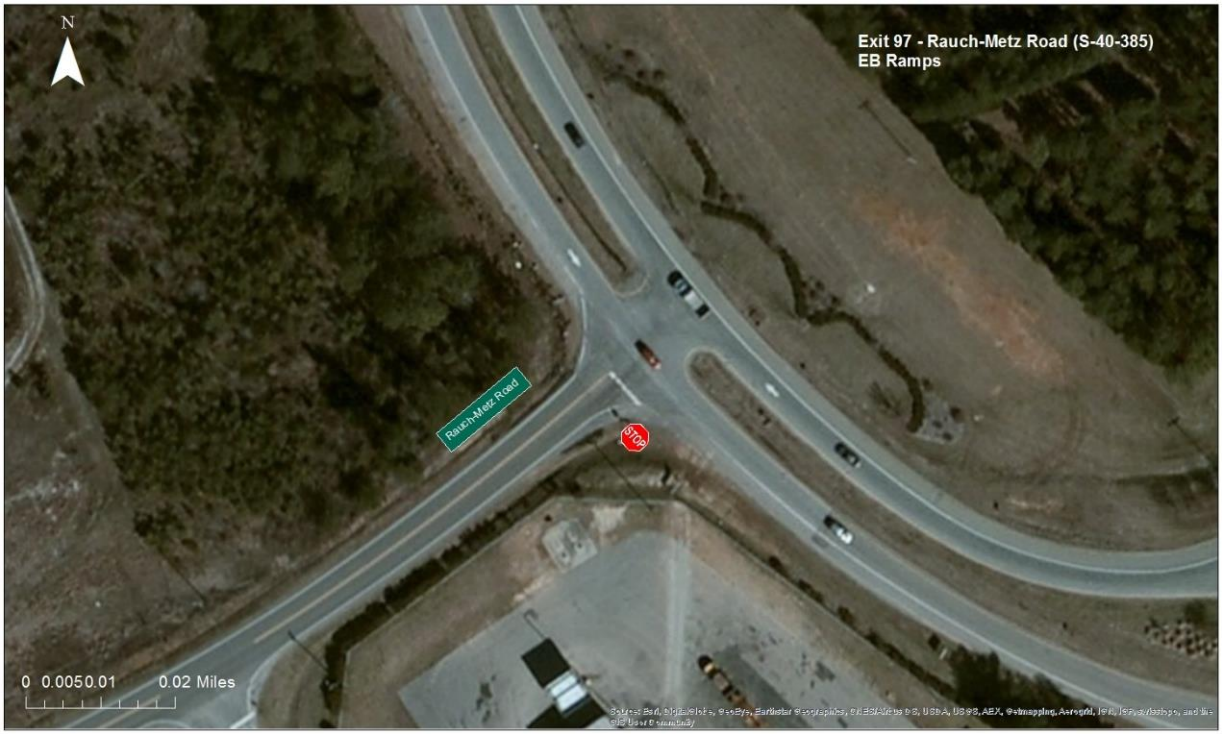
Figure 5. Exit 97: Broad River Road at Westbound Ramps and South Driveway

Adjacent intersections

Seven intersections are located in the vicinity of the interchange. These are:

- Eastbound Ramps and Rauch-Metz Road (S-40-385)
- Broad Stone Road (S-40-2805) and Rauch-Metz Road
- Broad Stone Road with Broad River Road
- Westbound Ramps with Julius Richardson Road (S-40-959)
- Broad River Road and South Shopping Center Driveway/Westbound ramps
- Broad River Road and Center Shopping Center Driveway
- Broad River Road and North Shopping Center Driveway
- Broad River Road and West Shady Grove Road

The intersection of eastbound ramps with Rauch-Metz Road (S-40-385) is located in the southwestern quadrant of the interchange approximately 1,165 feet southeast from gore point of eastbound off-ramp. The intersection of eastbound ramps with Rauch-Metz Road (S-40-385) is an unsignalized intersection with the approach of Rauch-Metz Road controlled by a STOP sign. Rauch-Metz Road is an undivided two lane road with 45 mph posted speed limit. The existing configuration of the eastbound ramps with Rauch-Metz Road is shown in **Figure 6**.



Source: Figure 24, Interstate 26 Widening Traffic Analysis Report

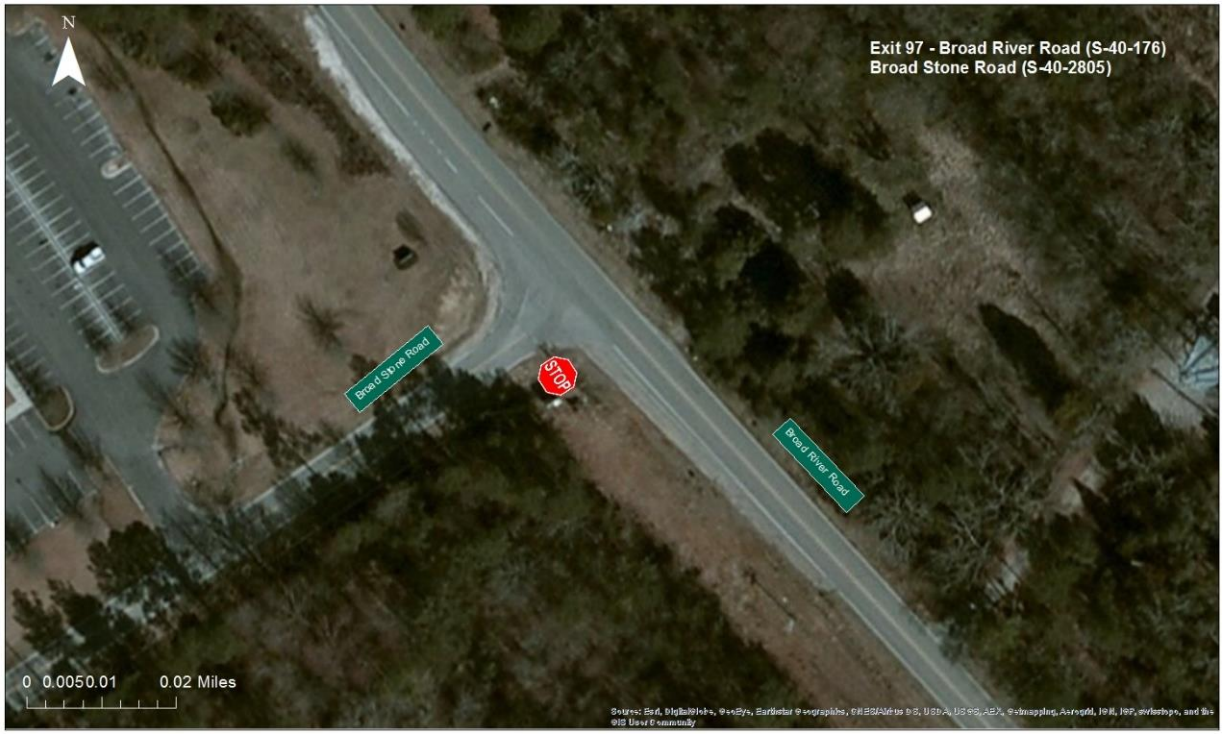
Figure 6. Exit 97: Eastbound Ramps at Rauch-Metz Road

The intersection of Broad Stone Road (S-40-2805) with Rauch-Metz Road is located in the southwestern quadrant of the interchange approximately 310 feet from the intersection of eastbound ramps with Rauch-Metz Road. The intersection of Broad Stone Road (S-40-2805) with Rauch-Metz Road is an unsignalized intersection with the approach of Broad Stone Road controlled by the STOP sign. Broad Stone Road is an undivided two lane road without posted speed limit, however, it has a 15 mph advisory speed at the curves. The existing configuration of Broad Stone Road with Rauch-Metz Road intersection is shown in **Figure 7**.

The intersection of Broad Stone Road with Broad River Road is located in the southern end of the interchange area approximately 1,395 feet from the middle of I-26 and Broad River Road intersection. The intersection of Broad Stone Road with Broad River Road is an unsignalized intersection with the approach of Broad Stone Road controlled by the STOP sign. Broad Stone Road is an undivided two lane road without posted speed limit, however, it has a 15 mph advisory speed at the curves. At the intersection with Broad River Road, Broad Stone Road with has right turn lane with 260 feet of storage and a 185 feet long taper. The existing configuration of Broad Stone Road with Broad River Road intersection is shown in **Figure 8**.

Source: Figure 25, Interstate 26 Widening Traffic Analysis Report

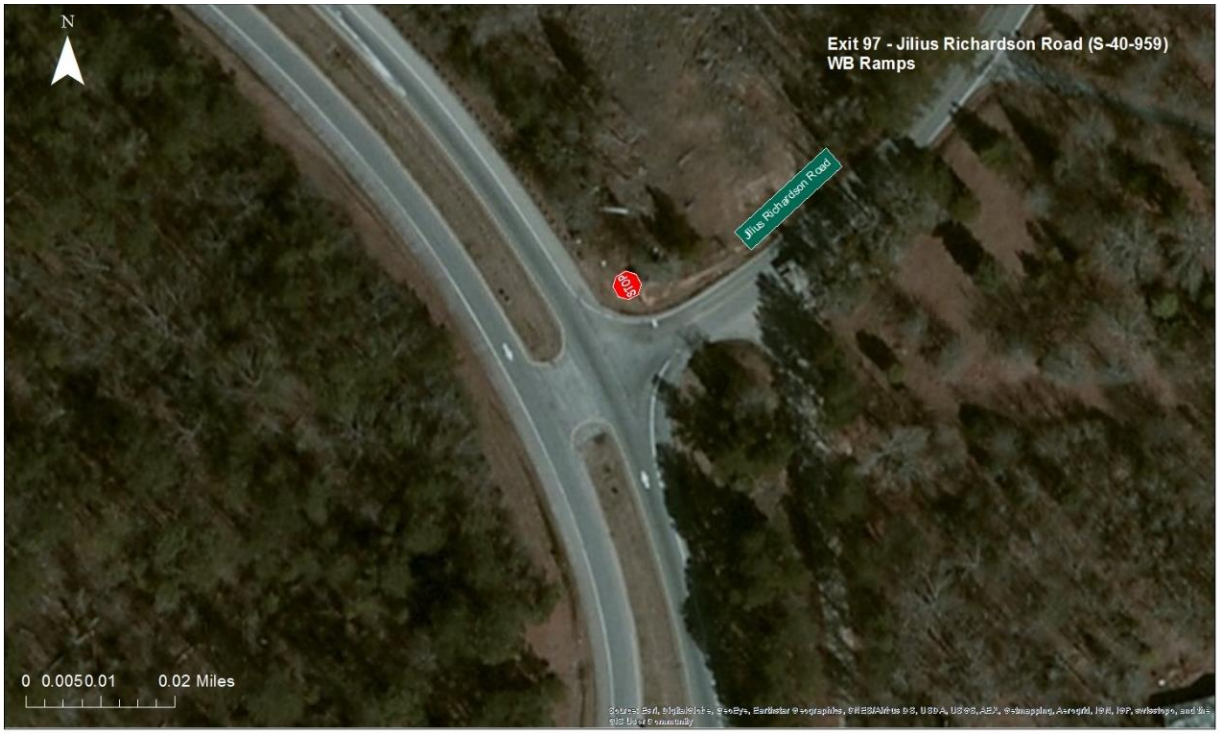
Figure 7. Exit 97: Broad Stone Road at Rauch-Metz Road



Source: Figure 26, Interstate 26 Widening Traffic Analysis Report

Figure 8. Exit 97: Broad Stone Road at Broad River Road

The intersection of the westbound ramps with Julius Richardson Road (S-40-959) is located in the northeastern quadrant of the interchange approximately 835 feet northwest from gore point of westbound off-ramp. The intersection of westbound ramps with Julius Richardson Road (S-40-959) is an unsignalized intersection with the approach of Julius Richardson Road controlled by the STOP sign. Julius Richardson Road is an undivided two lane road with 45 mph posted speed limit. The existing configuration of westbound ramps with Julius Richardson Road intersection is shown in **Figure 9**.



Source: Figure 27, Interstate 26 Widening Traffic Analysis Report

Figure 9. Exit 97: Westbound Ramps at Julius Richardson Road

The intersection of Broad River Road with westbound ramps and with south driveway to the Broad River Village shopping center is located in the northern end of the interchange approximately 790 feet from the middle of the I-26 and Broad River Road interchange. The intersection of Broad River Road with the westbound ramps and the south driveway to the shopping center is a signalized intersection. The south shopping center driveway has two inbound lanes and two outbound lanes consisting of a separate left turn lane and a shared through-right turn lane. These lanes are separated by a concrete median. The westbound off-ramp approach has a left turn lane with 185 feet of storage and a through lane with 185 feet long storage with a painted median between them. The existing configuration of Broad River Road at the westbound ramps and with south driveway to the mall with Food Lion intersection is shown in **Figure 5.**

The intersection of Broad River Road with the center driveway to the Broad River Village shopping center is located in the northern end of the interchange approximately 1,150 feet from the

middle of I-26 and Broad River Road interchange, and approximately 360 feet from the signalized intersection of Broad River Road with the westbound ramps and the southern shopping center driveway. The right turn movement from the westbound off-ramp merges into northbound Broad River Road approximately 60 feet north of the central driveway intersection. The central shopping center driveway is an unsignalized right turn in/right turn out intersection with a concrete channelizing island. The southbound right turn movement into driveway is made from a separate right turn lane with approximately 310 feet of storage, and a taper that ends just south of the northern shopping center driveway. The STOP sign controlled right turn movement from the driveway is made into the southbound right turn lane at the signalized intersection with the westbound ramps and the southern shopping center driveway. Traffic wishing to travel through on southbound Broad River Road or turn left onto the westbound on-ramp has to weave into those lanes within the approximately 245 feet available between the outbound driveway stop line and the stop line at the signalized intersection. The existing configuration of Broad River Road with westbound ramps and with central driveway to the mall with Food Lion intersection is shown in **Figure 4**.

The intersection of Broad River Road with the north driveway to the Broad River Village shopping center is located approximately 1,740 feet north of the middle of the I-26 and Broad River Road interchange and approximately 600 feet north of the center shopping center driveway. The intersection of Broad River Road with the north shopping center driveway is an unsignalized intersection with the approach of north driveway controlled by a STOP sign. The approach of north driveway has a single entrance lanes and separate left and right turn exit lanes. On southbound Broad River Road, there is a separate right turn lane for traffic entering the shopping center. This right turn lane has approximately 270 feet of vehicle storage. Northbound Broad River Road has a separate left turn lane for traffic turning left into this driveway. This left turn lane has approximately 215 feet of vehicle storage. The existing configuration of Broad River Road with westbound ramps and with north driveway to the mall with Food Lion intersection is shown in **Figure 10.**

The intersection of Broad River Road with West Shady Grove Road is located approximately 3,400 feet north of the middle of the I-26 and Broad River Road interchange and approximately 1,680 feet north of the north shopping center driveway. West Shady Grove Road intersects Julius Richardson Road approximately 4,170 east of its intersection with Broad River Road. The intersection of Broad River Road with West Shady Grove Road is an unsignalized intersection with the westbound approach of West Shady Grove controlled by a STOP sign. There are no separate turn lanes provided on any of the approaches to the intersection. The configuration of the intersection of Broad River Road and West Shady Grove Road is shown in **Figure 11**.

Source: Figure 28, Interstate 26 Widening Traffic Analysis Report

Figure 10. Exit 97: Broad River Road at Westbound Ramps and North Driveway

Source: Figure 29, Interstate 26 Widening Traffic Analysis Report

Figure 11. Exit 97: Broad River Road at West Shady Grove Road

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-26 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.

Conceptual Design

The US 176/Broad River Road interchange is expected to be modified as part of the I-26 widening project. Analyses evaluating 2040 Build conditions for the intersections within the Exit 97 interchange area were performed for three alternatives.

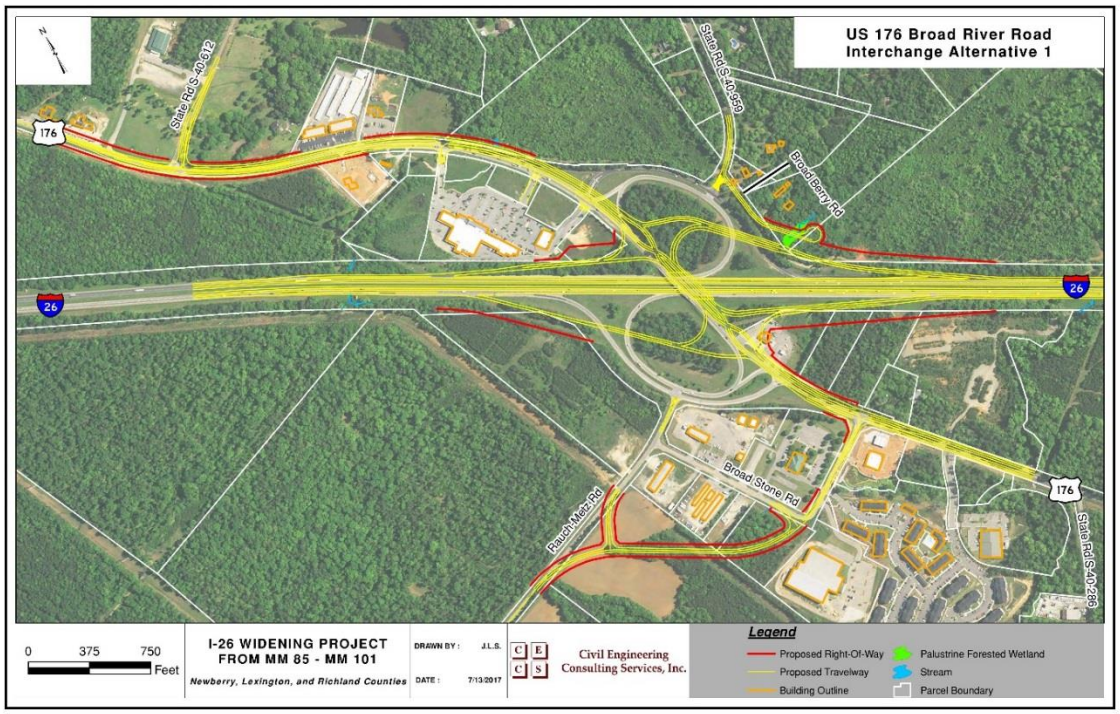
Three alternatives were developed for Exit 97 (**Figure 12** through **Figure 14**).

- Alternative 1 replaces the existing Exit 97 with a diverging diamond interchange (DDI). The conceptual design of Alternative 2 is shown in **Figure 12**.
- Alternative 2 replaces the existing Exit 97 with a new partial cloverleaf interchange. The conceptual design of Alternative 2 is shown in **Figure 13.**
- Alternative 3 replaces the existing Exit 97 with a single point urban interchange (SPUI). The conceptual design of Alternative 3 is shown in **Figure 14**.

In each of the Exit 97 alternatives, traffic from the existing ramp intersections of Julius Richardson Road and Rauch Metz Road would be redirected to West Shady Grove Road and Broad Stone Road respectively. The existing intersection ramp intersections with Broad River Road would be eliminated, and Broad River Road would be widened through the interchange area between Broad Stone Road and the main Shopping Center Driveway. The eastbound off-ramp intersection would operate under traffic signal control. The existing traffic signal at the shopping center driveway would be removed and a new signal would be installed at the southern access to the shopping center, and traffic signals would be installed at the Broad River Road intersections with Broad Stone Road and West Shady Grove Road.

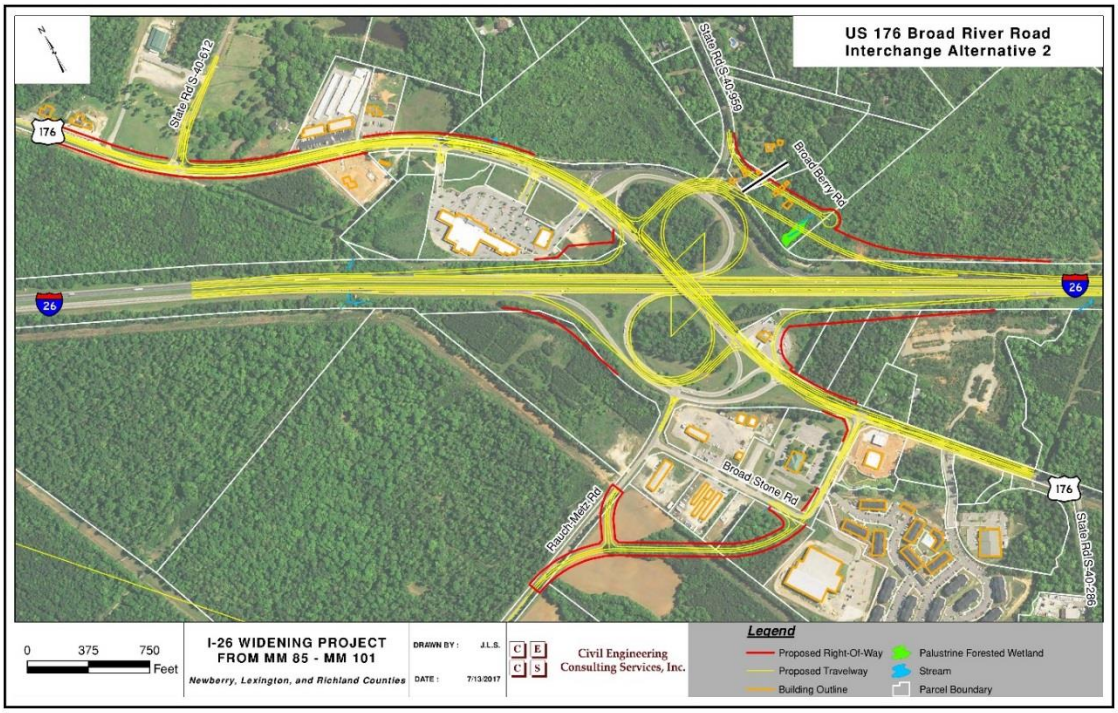
Alternative 1, the DDI, was selected as the Preferred Alternative for Exit 97. Alternative 1 would impact the least amount of streams and wetlands, when compared to the other Build alternatives, making this the least environmentally damaging practicable alternative. It also requires the least amount of new right-of-way and has the lowest overall estimated construction

cost. The DDI would also reduce congestion and provide a safer interchange, satisfying the project purpose and need. The intersections of Broad River Road and the I-26 ramps would be improved from LOS E or F to LOS C or better. Because of these reasons, Alternative 1 was selected as the Preferred Alternative.



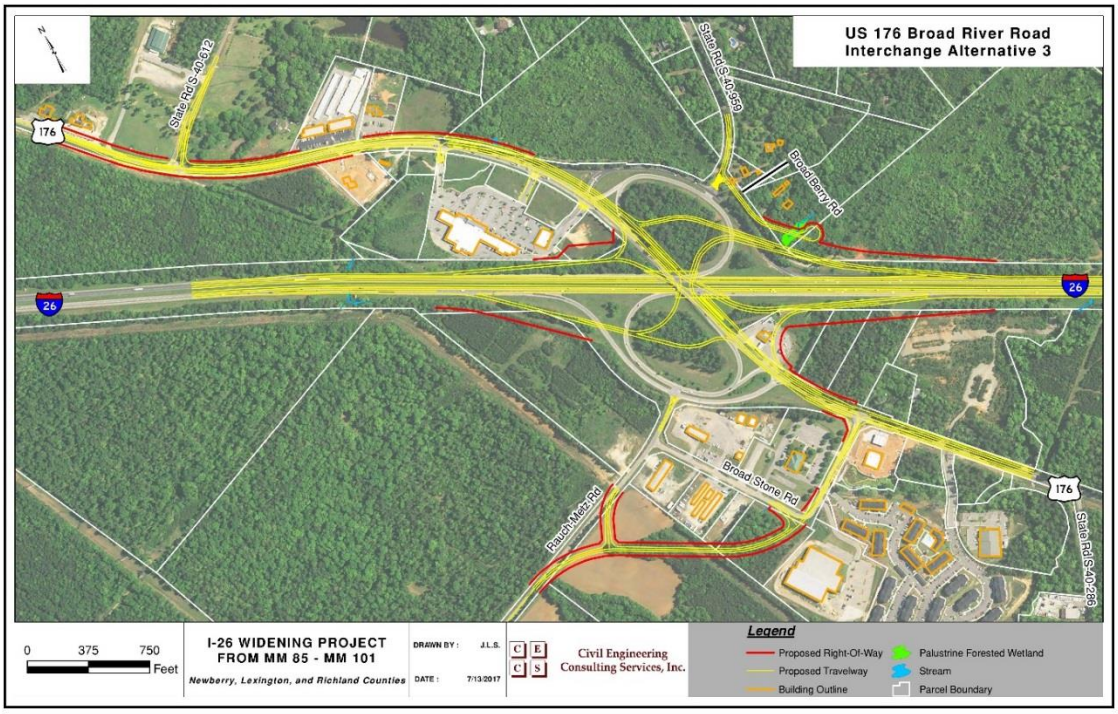
Source: Figure 84, *Interstate 26 Widening Traffic Analysis Report*

Figure 12. Improvement Alternative 1 Diverging Diamond Interchange



Source: Figure 83, *Interstate 26 Widening Traffic Analysis Report*

Figure 13. Improvement Alternative 2 Partial Cloverleaf



Source: Figure 85, *Interstate 26 Widening Traffic Analysis Report*

Figure 14. Improvement Alternative 3 SPUI

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-26 Widening project. The contact information for the I-26 Exit 97 IMR study is provided below:

Michael L. Hood, P.E., DBIA
Assistant Program Manager, Design-Build Group
SC Department of Transportation
955 Park St., Columbia, SC 29201

III. Study Area

In South Carolina, I-26 covers about 221 miles, and provides connections to I-95 south of Providence, to I-77 south of Cayce, to I-20 west of Columbia, and to I-85 north-west of Spartanburg. Within the study area shown on **Figure 1**, I-26 crosses portions of Newberry, Lexington and Richland Counties.

Demographics

According to the 2010 Census, Newberry County has approximately 37,500 residents, Lexington County has approximately 262,500 residents and Richland County has approximately 384,500. The counties have seen a steady increase in population since the 1950's. Between 2000 and 2010, Newberry county saw a 3.7% increase in population, Lexington County saw a 17.7% increase in population and Richland County saw a 16.6% increase in population.

According to the South Carolina Revenue and Fiscal Affairs Office, Newberry County is expected to continue to see gradual population growth between 2010 and 2030,[1] while Lexington County is expected to see more significant population growth by 2030. The same source estimates Richland County's population will continue to grow but possibly at a slower rate than from 2000 to 2010. Table 1, presents population growth and projections for the three counties.

[1] S.C. Revenue and Fiscal Affairs Office, *County Population Projections 2000-2030*, http://www.sccommunityprofiles.org/census/proj_c2010.html

Table 1: Population Growth in the I-26 PSA

County	2000 Population	2010 Population	2030 Population	2000 – 2010 % Growth	2010 – 2030 % Growth
Newberry	36,108	37,508	39,800	3.7%	5.6%
Lexington	216,014	262,391	333,200	17.7%	21.3%
Richland	320,677	384,504	456,000	16.6%	15.7%

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

Land Use

The I-26 Widening project corridor is located primarily within unincorporated areas of Newberry, Lexington, and Richland counties, but includes small portions of the towns of Irmo and Chapin. Existing land uses are primarily forested land and commercial businesses with areas of rural residential and light industrial operations. The closest incorporated municipalities are the City of Columbia to the southeast; the town of Irmo to the southwest; the Town of Chapin to the southwest; the Town of Little Mountain to the south and the Town of Newberry to the northwest.

Along the mainline of I-26, land uses consist mainly of forested land but become increasingly mixed with commercial and residential properties moving from west to east towards Columbia. An industrial park (Chapin Business and Technology Park) and a planned residential/ commercial neighborhood is located southwest of Exit 91. The industrial park has infrastructure and zoning in place but no buildings as of yet. The adjacent residential/ commercial area is in the planning stages.

Exit 97 – Broad River Road

Land uses surrounding Exit 97 – Broad River Road consist of light industrial, commercial, low-density residential, and open/forested land. Low-density residential land, off of Julius Richardson Road, and forested land is located to the north and northeast of the interchange. To the east of the interchange is the Evergreen 123 BP gas station and forested land. An SCDOT section shed and the SC Department of Motor Vehicles office are located to the south of the interchange. Small commercial businesses occupy this area as well. To the southwest of the interchange are two utility rights-of-way and forested land. To the northwest of the interchange is a commercial shopping center with several small businesses, anchored by the Food Lion grocery store.

With anticipated population growth and the corridor's proximity to Columbia, residential, commercial and industrial development are expected to continue within the project study area, for the No-Build and the Preferred Alternative.

Along the mainline of I-26 in the project study area, the land use consists of mainly of forested land, with areas of commercial, residential, and light industrial uses. The proposed widening of the mainline is not expected to change land uses along the mainline of the interstate.

Transportation System

The Project study area roadway transportation system is part of the I-26 Widening study depicted in **Figure 1**. This region of Lexington, Newberry and Richland counties is accessed via I-26, which is an east-west freeway connecting Columbia with its suburbs in northwest direction.

For this IMR, a focused roadway system was evaluated. It consisted of I-26 mainline with its merges and diverges areas and the Exit 97 – Broad River Road (US 176) interchange. Specifically, I-26 westbound and eastbound mainline segments at Exit 97 – Broad River Road (US 176) were evaluated for traffic conditions during different hours of the day. This study area is a subset of the broader study area that was analyzed during the Interstate 26 Widening Traffic Analysis Report.

IV. Methodology

Scenarios Analyzed

In March 2017, STV Incorporated prepared the I-26 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 conditions (2040 traffic and modified intersection traffic control and geometry reflecting the reasonable interchange improvement alternative). The Exit 97 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 97 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 three Reasonable Alternatives developed for Exit 97. 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 1 was recommended as the Preferred Alternative for Exit 97. Therefore, the other alternatives were not carried forward in this document and Alternative 1 was analyzed for the 2040 Build Conditions for Exit 97.

The interchanges adjacent to Exit 97 are Exit 91 and Exit 101. Exit 91 – Columbia Avenue (S-32-48) is located approximately 5.30 miles northwest of Exit 97. Exit 101 – Broad River Road (S-40-76, US 176) is the next adjacent interchange to the southeast of Exit 97 and is located approximately 4.95 miles away. The interaction of the modifications proposed at Exit 97 with the adjacent interchanges at Exits 91 and 101 were initially analyzed and are included in the I-26 Widening Traffic Analysis Report.

By replacing the substandard ramps and modifying the existing interchange to meet current design standards, the proposed modified interchange with US 176/Broad River Road is anticipated to contribute to an improvement in traffic safety and provide space for the construction of an additional travel lane in each direction along I-26. 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 US 176/Broad River Road.

The Preferred Alternative of the interchange design also provides space for the construction of an additional travel lane in each direction along I-26 to the west of the interchange and 2 additional lanes in each direction to the east of the interchange. 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.

Traffic Forecasts

A proposed average annual growth rate was estimated based on a comparison of the AADT average annual growth rates (for 1996 and 2015) and the SCSWM average annual growth rates for each of the segments. This proposed growth rates were 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 1.00 percent per year based on the statewide model. Historic data of all segments exceeded 2.00 percent per year. Given the long term historic growth in the corridor, the growth rate falls in a range from 1.5 percent (based on the model assignments) and 2.5 percent per year (based on the long term growth rate from 1996 – 2015). Based on discussions with SCDOT it was determined that a growth rate of 1.5 percent would be used to the east of US 176 (Broad River Road), a growth rate of 2 percent would be used from US 176 (Broad River Road) to east of SC 202, and a growth rate of 2.5 percent would be used from SC 202 to the west.

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 analysis and simulation software 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 9.1.910.24)
   - Unsignalized Intersections
   - Signalized Intersections

c. Caliper's *TransModeler* (Version 4.0 Build 6020)
   - Network Simulation
   - Freeway Segments
   - Ramp Merge/Diverge Areas

Level of Service Criteria

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 operations 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 freeway segments, ramp merge/diverge segments, weaving segments, unsignalized intersections and signalization intersections.

Freeway Segments

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 2** 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).

Table 2. Freeway Segment LOS Criteria

Basic Freeway Segments	
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 12 – *Interstate 26 Widening Traffic Analysis Report*

Weaving Segments

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 a relative short distance (usually 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 3** shows the HCM LOS criteria for Freeway Weaving Segments.

Table 3. Weaving Segment LOS Criteria

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 13 – *Interstate 26 Widening Traffic Analysis Report*

Ramp Merge and Diverge Areas

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 upstream of a diverge point and downstream from 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 upstream freeway segment (at diverge areas) or the downstream freeway segment (at merge areas), as well as when the ramp demand exceeds the ramp capacity. **Table 4** shows the HCM LOS criteria for Ramp Merge and Diverge areas.

Table 4. Merge/Diverge LOS Criteria

Ramp Merge and Diverge Areas	
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 14 – *Interstate 26 Widening Traffic Analysis Report*

Unsignalized Intersections

The LOS for unsignalized intersections is based on the average control delay per vehicle. Since major street traffic is seldom controlled by STOP 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 5** shows the HCM LOS criteria for unsignalized intersections.

Table 5. Unsignalized Intersection LOS Criteria

Unsignalized Intersections	
LOS	Control Delay (sec/vehicle)
A	< 10
B	> 10-15
C	> 15-25
D	> 25-35
E	> 35-50
F	> 50

Source: Table 15 – *Interstate 26 Widening Traffic Analysis Report*

Signalized Intersections

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 6** shows the HCM LOS criteria for signalized intersections.

Table 6. Signalized Intersection LOS Criteria

Signalized Intersections	
LOS	Control Delay (sec/vehicle)
A	< 10
B	> 10-20
C	> 20-35
D	> 35-55
E	> 55-80
F	> 80

Source: Table 16 – *Interstate 26 Widening Traffic Analysis Report*

V. Traffic Volumes

The traffic volumes used in the analysis for Exit 97 consisted of Existing (2016) conditions, and Future (2040) No-Build and Build conditions.

Existing 2016 Traffic Volumes

Turning movement traffic count data was obtained for a number of ramp termini and other adjacent intersections within the Exit 97 interchange area from 7:00 to 9:00 AM and from 4:00 to 6:00 PM on Tuesday, August 23 2016. The turning movement count data, which are provided in **Appendix A**, included:

- US 176 & Center Food Lion Drive (right in/out)
- US 176 & North Food Lion Drive (full access/STOP controlled)
- US 176 & S-40-612 (W Shady Grove Road)
- S-40-385 Rauch-Metz Road & S-40-2805 (Broad Stone Road)

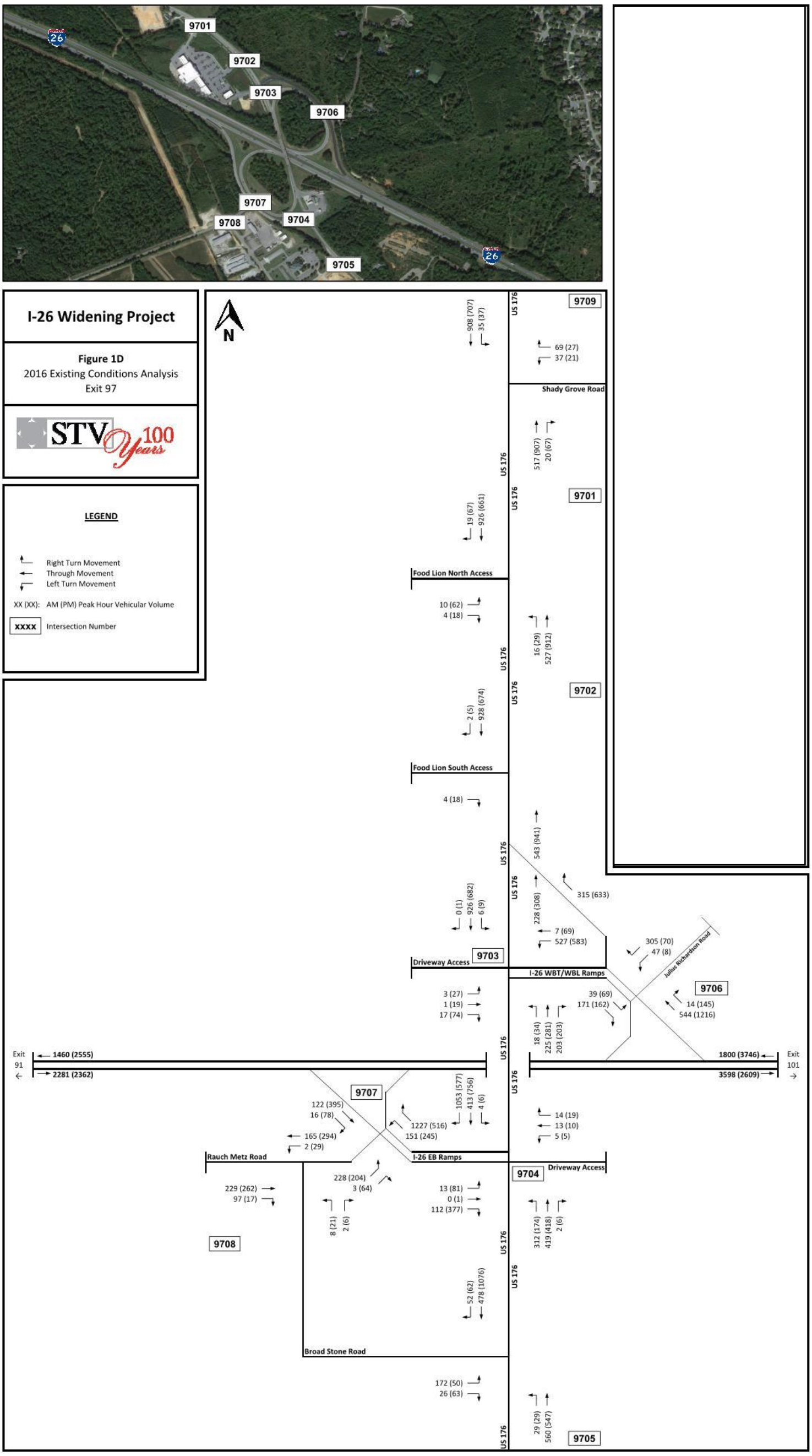
Turning movement counts were conducted for 12 hours between 7:00 AM and 7:00 PM on Tuesday, August 23, 2016 at the following locations:

- US 176 & I-26 westbound ramps/Exxon Drive
- US 176 & I-26 eastbound ramps/South Food Lion Drive
- I-26 eastbound ramp & S-40-385 (Rauch-Metz Road)
- I-26 westbound ramp & S-40-2894 (Julius Richardson Road)
- US 176 & S-40-2805 (Broad Stone Road)
- S-40-385 Rauch-Metz Road & S-40-2805 (Broad Stone Road)

The turning movement traffic count data 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 were balanced between intersections. The balanced morning and afternoon peak hour volumes for the interchanges are shown in **Figure 15**.

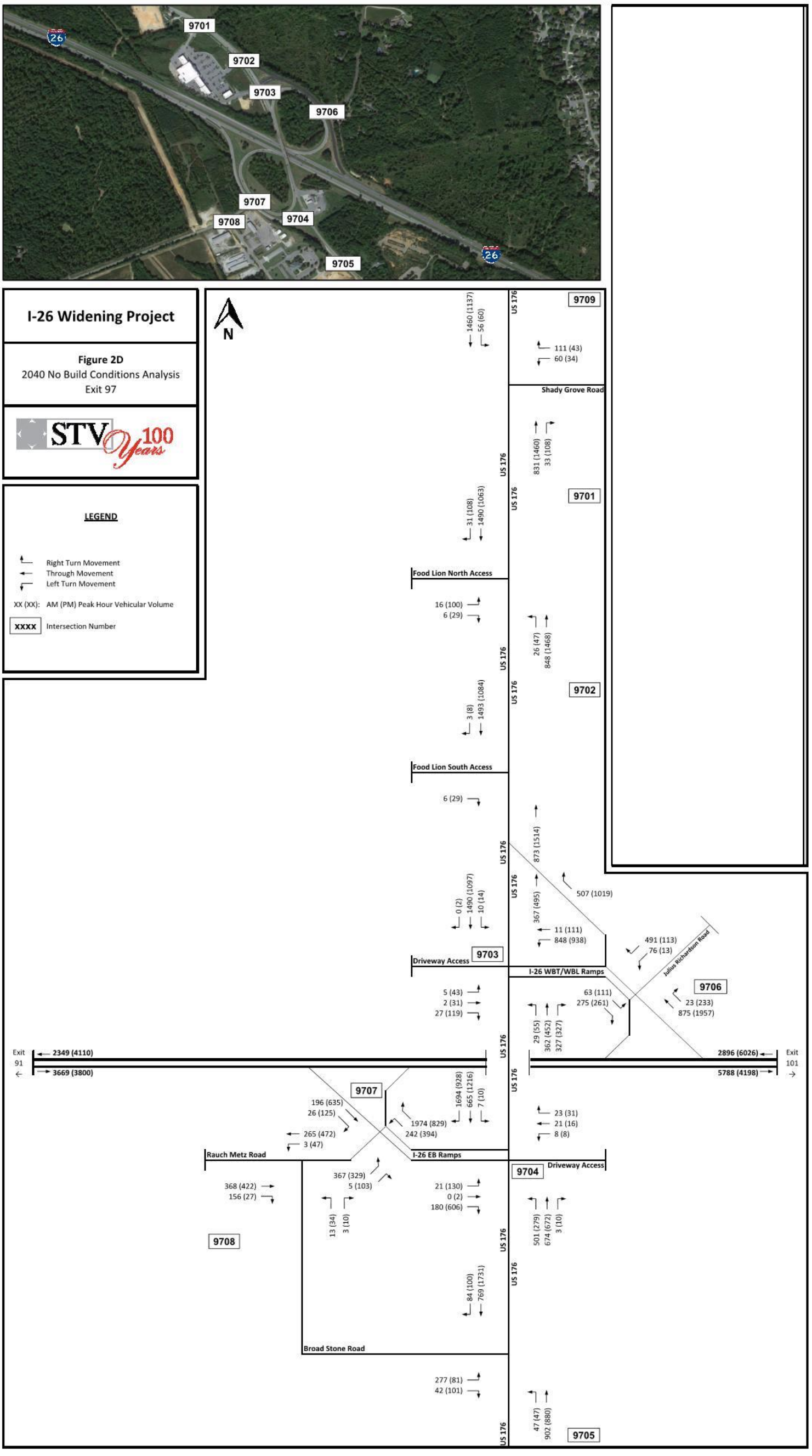
2040 Traffic Volumes

An annual growth rate of the study area of about 2.0 percent per year was applied to the freeway between Exits 91 and 101 to achieve balanced volumes through the corridor to achieve balanced volumes throughout the corridor. A similar rate was applied to the 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 97 interchange are shown in **Figure 16** and on the Preferred Alternative 1A in **Figure 17**.



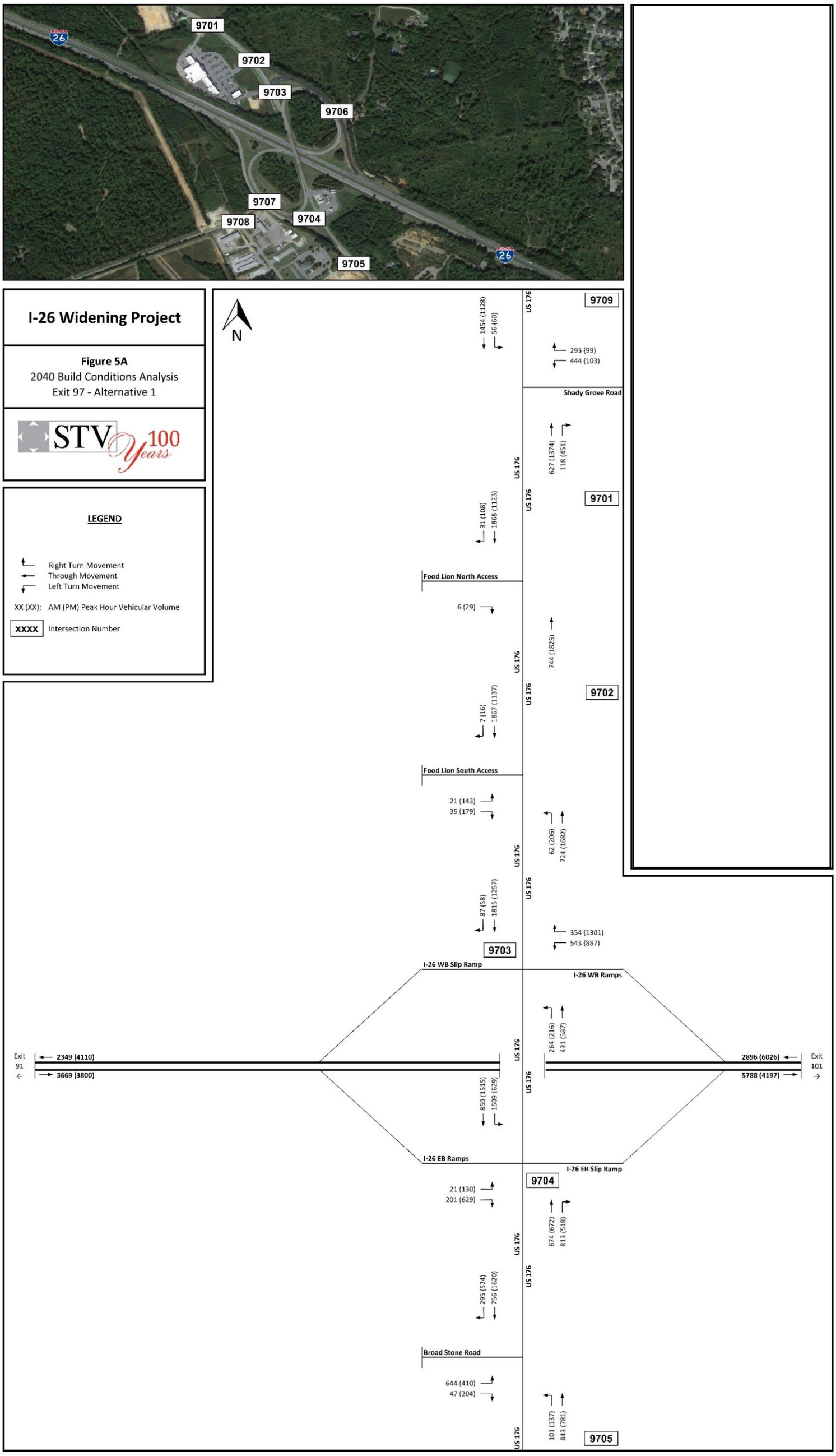
Source: Figure 60, *Interstate 26 Widening Traffic Analysis Report*

Figure 15. Existing Peak Hour Turning Movement Volumes



Source: Figure 66, *Interstate 26 Widening Traffic Analysis Report*

Figure 16. 2040 Estimated No-Build Peak Hour Turning Movement Volumes



Source: Figure 93, *Interstate 26 Widening Traffic Analysis Report*

Figure 17. 2040 Estimated Peak Hour Turning Movement Volumes Alternative 1

VI. Traffic Operations

Freeway and Ramp Merge/Diverge Segment Analysis

The analysis of basic freeway segments within the study area were performed for existing conditions (2016), future (2040) No-Build conditions and future (2040) Build conditions. The following criteria were identified through discussions with SCDOT and used for various inputs within the freeway segment analysis:

- The 10th highest hour volumes based on the P-0112 ATR count station data for the eastbound AM design hour, and the P-0015 ATR count station data for the eastbound PM and westbound AM and PM design hours, balanced through the system, were used for the freeway segment mainline volumes.
- To develop future (2040) traffic volumes, a growth rate of 2.0 percent was applied to existing volumes from US 176 (Broad River Road) to east of SC 202.
- A peak hour factor of 0.90 was used for freeway segments and ramp areas.
- Mainline vehicle classification counts were completed in both directions east of Exit 101 and west of Exit 85. The highest observed peak hour truck percentages at the vehicle classification counts for all of the segments in each direction/peak hour were used. The highest observed truck percentages all ended up being the truck percentages observed west of Exit 85. The proportion of trucks and buses traveling on the freeway segments and ramp movements, based on SCDOT data, is:
    - Eastbound AM – 16%
    - Eastbound PM – 14%
    - Westbound AM – 23%
    - Westbound PM – 13%
- Based on the grades through the study area, the terrain was selected as “Rolling”, instead of “Level” or “Mountainous”.
- Free-flow speed was set at the posted speed limit along the segment.

The existing conditions and 2040 No-Build conditions analyses were performed using the existing number of freeway lanes present on the segments within the study area. The 2040 Build conditions analyses were performed assuming I-26 would provide three lanes in each direction from Exit 85 to Exit 101 and four lanes in each direction from Exit 101 to Exit 102. In addition, analysis results indicated that four lanes were needed between exits 97 and 101 and five lanes between exits 101 and 102 due to inadequate LOS. The Basic Freeway Segment Analysis outputs are provided in **Appendix B** and are shown in **Table 7.** The results of the ramp merge and diverge analysis for Exit 97 are shown in **Table 8** and **Table 9** respectively.

Table 7 - Freeway Segment Capacity Analysis Results

Basic Freeway Segment Analysis Results																	
Direction	Segment	Existing # of lanes	Future # of lanes	AM Peak Hour						PM Peak Hour					
				2016 Existing		2040 No-Build		2040 Build		2016 Existing		2040 No-Build		2040 Build	
				LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density
WB	Exit 101-97	2	4	C	19.3	E	36.5	B[2]	15.5	F	46.5	F	n/a	D[2]	30.9
WB	Exit 97-91	2	3	B	15.6	D	26.4	B	16.7	C	24.6	F	59.4	D	26.9
EB	Exit 91-97	2	3	C	23.6	F	54.1	C	25.8	C	22.9	F	50.9	C	25.0
EB	Exit 97-101	2	4	F	51.4	F	n/a	D[2]	33.0	D	26.0	F	68.7	C[2]	20.1

[1] - Weaving section treated as freeway segment

[2] - Widened to four lanes

Table 8 - Ramp Merge Capacity Analysis Results

Freeway Merge Analysis Results													
Direction	Merge Location	AM Peak Hour						PM Peak Hour					
		2016 Existing		2040 No-Build		2040 Build		2016 Existing		2040 No-Build		2040 Build	
		LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density
WB	Exit 97 Loop	B	13.1	C	23.2	B	14.3	C	22.0	F	40.3	C	24.4
EB	Exit 97 Loop	D	32.5	F	54.6	D[1]	31.9	C	21.7	F	37.3	C	25.3

[1] - Analysis reflects 4 lanes, with 4th lane being an add-lane for acceptable operations

Table 9 - Ramp Diverge Capacity Analysis Results

Freeway Diverge Analysis Results													
Direction	Diverge Location	AM Peak Hour						PM Peak Hour					
		2016 Existing		2040 No-Build		2040 Build		2016 Existing		2040 No-Build		2040 Build	
		LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density
WB	Exit 97	B	16.5	D	30.6	B	13.2	F	35.2	F	60.7	A[1]	7.4
EB	Exit 97	C	23.2	F	40.0	C	21.8	C	22.5	F	39.0	C	24.0

[1] - Analysis reflects 4 lanes and 2 Ramp Lanes

The analysis results for the freeway segments in the westbound and in the eastbound direction between Exit 91 and Exit 101 for the 2016 Existing Conditions, summarized in **Table 7**, indicate the following:

- During the morning peak hour, the freeway segments operate at LOS C or better except the eastbound segment between Exit 97-101 that operates at LOS F;
- During the afternoon peak hour, the freeway segments operate at LOS D or better except the westbound Exit 101-97 that operates at LOS F.

With traffic volumes projected to increase within the vicinity of Exit 97 at an annual rate of about 2.0 percent per year, and if I-26 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 westbound freeway segment between Exit 97 and Exit 91 operates at LOS D. The remaining segments operate at LOS E or LOS F;
- During the 2040 No-Build afternoon peak hour all freeway segments will operate at LOS F.

The additional capacity provided by the construction of one more lane in each direction between Exits 91 and 97, and two more lanes in each direction between Exit 97 and Exit 101, will result in an improved LOS compared to the 2040 No-Build conditions and to the Existing Conditions. The 2040 Build analysis results indicate that:

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

The Ramp Merge Analyses outputs are provided in **Appendix C** and the summary analysis results for the ramp merge areas are shown in **Table 8.** The analysis results for the ramp merge areas indicate the following:

Using the design hour volumes for the morning and afternoon peak hours, the analysis results for the 2016 Existing Conditions indicate that:

- During the morning peak hour, all merge areas at Exit 97 operate at LOS D or better;
- During the afternoon peak hour, all merge areas at Exit 97 operate at LOS C.

With traffic volumes projected to increase on the merge ramps within the corridor at an annual rate of about 2.0 percent per year, and if I-26 is not widened, the increased traffic volumes traveling on the existing merge ramps capacity will result in increased density and will reduce the LOS of merge areas.

- During the 2040 No-Build morning peak hour, the westbound loop on ramp merge at Exit 97 would operate at LOS C, while the eastbound Exit 97 loop on-ramp is expected to operate at LOS F;
- During the 2040 No-Build afternoon peak hour, both merge areas at Exit 97 operate at LOS F.

The additional capacity provided by the construction of one in each direction along I-26 from Exit between Exit 91 and Exit 97, and two lanes in each direction between Exit 97 to Exit 101 will lower densities in the ramp merge areas, and result in comparable LOS compared to the Existing Conditions, and improved LOS over the 2040 No-Build condition in the afternoon peak hour.

- During the 2040 Build morning peak hour, the Exit 97 merge areas would operate at LOS D or better if the fourth lane is constructed between Exit 97 and Exit 91. Note, the 4th lane would be an add lane and the simulation analysis may be more representative of the Exit 97 eastbound on-ramp area.
- During the 2040 Build afternoon peak hour, all merge areas at Exit 97 or adjacent to it are expected to operate at LOS C.

The Ramp Diverge Analyses are also provided in **Appendix C** and summaries of the results are shown in **Table 9**. The analysis results indicate the following:

Using the design hour volumes for the morning and afternoon peak hours, the analysis results for 2016 Existing Conditions indicate that:

- During the morning peak hour, the Exit 97 diverge areas operate at LOS C or better;
- During the afternoon peak hour, the Exit 97 eastbound diverge area operates at LOS C and the westbound diverge area operates at LOS F.

With traffic volumes projected to increase within the corridor at an annual rate of 2.0 percent per year, and if I-26 is not widened, the increased traffic volumes traveling on the existing exit ramps will experience increased density and will reduce the diverge area LOS at the off-ramps.

- During the 2040 No-Build morning peak hour, the westbound off-ramp at Exit 97 will operate at LOS D and the eastbound off ramp at Exit 97 will operate at LOS F;
- During the 2040 No-Build afternoon peak hour the eastbound and westbound diverge areas at Exit 97 will operate at LOS F.

The additional capacity provided by the construction of a third lane in each direction along I-26 between Exit 91 and 97, and up to four lanes between Exits 97 and 101 will lower densities in the ramp diverge areas, resulting in an improvement in LOS compared to the 2040 No-Build condition and comparable to 2016 Existing conditions. The 2040 Build analysis results indicate that:

- During the morning peak hour, the Exit 97 diverge areas are projected to operate at LOS C or better;
- During the afternoon peak hour, the Exit 97 westbound diverge area is projected to operate at LOS A with the fourth lane is constructed between Exit 97 and Exit 91 and a two-lane off-ramp. This 4th lane would be a lane drop at Exit 97 and therefore, due to the limitations of HCS in analyzing lane drops the simulation analysis may be more representative of the off-ramp analysis. Additional Freeway segment analysis immediately upstream and downstream of the ramp diverge area show the area operates at LOS D. The eastbound diverge area is expected to operate at LOS C.

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), 2040 No-Build conditions (2040 traffic, and existing intersection traffic control and geometry), and 2040 Build conditions (2040 traffic and modified 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 and signalized intersection capacity analyses for existing conditions and the 2040 No-Build conditions are shown in **Table 10** and **Figure 18.** The HCM intersection capacity outputs for each intersection are provided in **Appendix D**.

Under the existing conditions at Exit 97, atypical intersection configurations at several locations and heavy volumes lead to several intersections operating at LOS E or F in both peak hours. These intersections include:

- Broad River Road at Food Lion North Access,
- Broad River Road at Broad Stone Road,
- I-26 WB Ramps at Julius Richardson Road, and
- I-26 EB Ramps at Rauch-Metz Road.

For the intersections identified above, several improvements may be necessary to provide acceptable LOS under existing conditions, such as installing a new traffic signals on Broad River Road at Food Lion North Access and at Broad Stone Road

In general, with the forecasted increases in traffic and without improvements to the intersections, delay in the 2040 No-Build analyses can be expected to be 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 separating left and/or right turn lanes) and/or changes in the traffic control (such as installing traffic signals) to reduce delay and improve the LOS.

Under the 2040 No-Build conditions with the forecasted increases in traffic, delay can be expected to increase on the intersection approaches. Additional intersections are expected to operate at LOS E or F in the morning and afternoon peak hours, in addition to those described in existing conditions, including Broad River Road at I-26 westbound right turn Slip Ramp, and Broad River Road at I-26 westbound ramp. However, due to unprocessed volume from upstream queuing, the No-Build conditions may appear better than the Existing conditions in some locations.

The operation of the intersections on Broad River Road at the I-26 WB Ramps may require capacity or traffic control improvements, such as an additional through lane on Broad River Road in both directions, to provide acceptable LOS during the 2040 No-Build operating conditions.

The analysis results for the existing and 2040 No-Build conditions at Exit 97 for the Broad River Road (US 176) interchange intersections are illustrated in **Figure 18**.

2040 Build Intersection Analysis – Preferred Alternative (Alternative 1)

The Broad River Road (US 176) interchange is expected to be modified as part of the I-26 widening project. The 2040 Build analyses for the intersections within the Exit 97 interchange area were performed for three alternatives in the I-26 Mainline Study.

Alternative 1, which replaces the existing Exit 97 interchange with a diverging diamond interchange, was selected as the Preferred Alternative. Other elements of the alternative concept include:

- Shifting Julius Richardson Road traffic to West Shady Grove Road
- Shifting Rauch-Metz Road traffic to Broad Stone Road
- Eliminate the existing intersection of Broad River Road and the I-26 westbound ramps/shopping center access
- Widen Broad River Road between Broad Stone Road and the Food Lion North Access
- Upgraded acceleration/deceleration lanes on I-26
    - Eastbound on-ramp: 1325’ (1625’ including taper)
    - Eastbound off-ramp: 990’ (1290’ including taper)
    - Westbound on-ramp: 770’ (1070’ including taper)

Capacity analyses for the signalized and unsignalized intersections of the Preferred Alternative were performed for the 2040 Build conditions which included the 2040 traffic volumes and modified intersection traffic control and geometry to the interchange at Exit 97. The traffic operations analysis of the Preferred Alternative 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 (with and without additional improvements) are shown in **Table 11**. **Table 12** also summarizes the storage length and queuing for 2040 Build Conditions. The conceptual design of Alternative 1 for the Broad River Road (US 176) interchange intersections and the results of the capacity analyses (with additional improvements) are illustrated in **Figure 19**.

Table 10 - Intersection Capacity Analysis Results

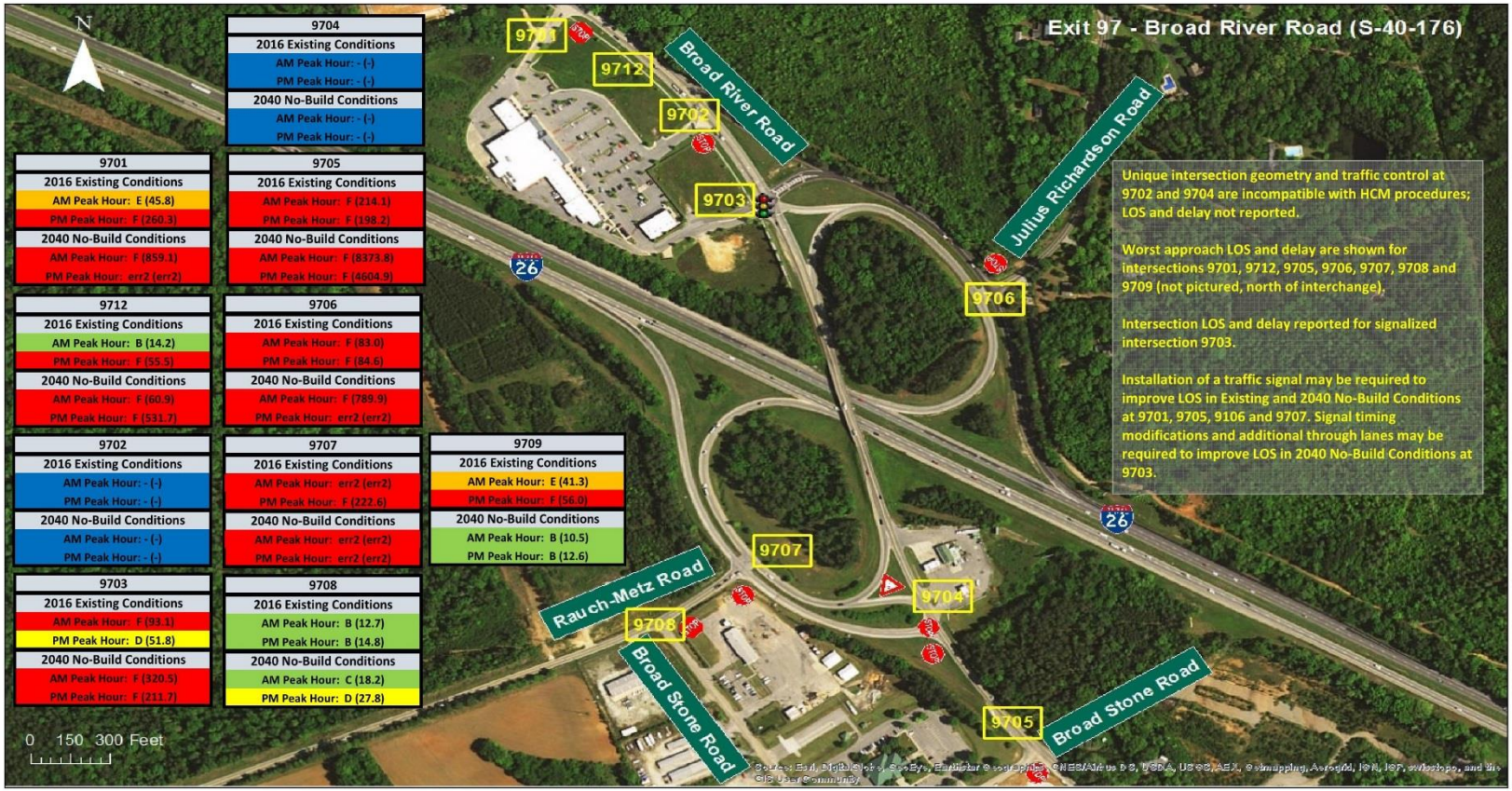
Intersection #	Intersection Name	2016 Existing Conditions				2040 No Build Conditions			
		AM Peak		PM Peak		AM Peak		PM Peak	
		LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
Exit 97									
9701	Broad River Road (US 176) at Food Lion North Access[1]	E	45.8	F	260.3	F	859.1	err[2]	err[2]
9702	Broad River Road (US 176) at Food Lion South Access	incompatible with HCM 2000 due to free movements							
9712	Broad River Road (US 176) at I-26 WBR Slip Ramp[1]	B	14.2	F	55.5	F	60.9	F	531.7
9703	Broad River Road (US 176) at I-26 WBT / WBL Ramps	F	93.1	D	51.8	F	320.5	F	211.7
9704	Broad River Road (US 176) at I-26 EB Ramps	incompatible with HCM 2000 due to five-legged intersection							
9705	Broad River Road (US 176) at Broad Stone Road	F	214.1	F	198.2	F	8,373.8	F	4,604.9
9706	I-26 WB Ramps at Julius Richardson Road[1]	F	83.0	F	84.6	F	789.9	err[2]	err[2]
9707	I-26 EB Ramps at Rauch-Metz Road[1]	err[2]	err[2]	F	222.6	err[2]	err[2]	err[2]	err[2]
9708	Rauch-Metz Road at Broad Stone Road[1]	B	12.7	B	14.8	C	18.2	D	27.8
9709	Broad River Road (US 176) at Shady Grove Road[1]	E	41.3	F	56.0	B	10.5	B	12.6

[1] Intersection unsignalized under all scenarios; worst approach LOS and delay reported.

[2] Queue unable to be processed per HCM 2000 methodology; error reported.

[3] Values from *Interchange Modification Report: I-26 at S-48 (Columbia Avenue) Interchange Improvements.*

Source: Table 21 – *Interstate 26 Widening Traffic Analysis Report*



Source: Figure 76, *Interstate 26 Widening Traffic Analysis Report*

Figure 18. Exit 97 – Broad River Road (US 176) Interchange Intersection LOS Summary

Table 11- Intersection Capacity Analysis Results - 2040 Base vs 2040 Build Exit 97

Intersection #	Intersection Name	2040 No Build Conditions				2040 Build Conditions				2040 Build Conditions with Improvements			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
Alternative 1: DDI													
9701	Broad River Road (US 176) at Food Lion North Access [1]	F	859.1	err[2]	err[2]	C	21.5	B	14.9	C	21.5	B	14.9
9702	Broad River Road (US 176) at Food Lion South Access [3]	incompatible with HCM 2000 due to free movements				F	611.4	err[5]	err[5]	A	7.4	B	14.2
9712	Broad River Road (US 176) at I-26 WBR Slip Ramp [1]	F	60.9	F	531.7	intersection removed; shifted to 9713							
9703	Broad River Road (US 176) at I-26 WBT/WBL Ramps	F	320.5	F	211.7	B	16.6	C	21.1	B	10.3	B	10.8
9704	Broad River Road (US 176) at I-26 EB Ramps [2]	incompatible with HCM 2000 due to five-legged intersection				C	21.8	C	22.5	B	17.3	C	24.1
9705	Broad River Road (US 176) at Broad Stone Road [3]	F	8,373.8	F	4,604.9	F	9,323.3	err[5]	err[5]	B	15.3	B	19.3
9706	I-26 WB Ramps at Julius Richardson Road [1]	F	789.9	err[2]	err[2]	intersection removed; shifted to 9709							
9707	I-26 EB Ramps at Rauch-Metz Road [1]	err2	err2	err2	err2	intersection removed; shifted to 9705							
9708	Rauch-Metz Road at Broad Stone Road [1]	C	18.2	D	27.8	free-flow under Build Conditions							
9709	Broad River Road (US 176) at Shady Grove Road [3]	B	10.5	B	12.6	F	6,032.1	F	5,129.5	C	26.7	C	29.9
9713	Broad River Road (US 176) at I-26 WBR Slip Ramp	added under Build Conditions				B	14.7	F	541.8	A	1.8	B	10.8
9714	Broad River Road (US 176) at I-26 EBR Slip Ramp [4]					C	16.2	F	601.8	A	0.0	A	0.0
9723	Broad River Road (US 176) at I-26 WBL Slip Ramp					B	14.7	B	14.0	B	14.6	B	18.5
9724	Broad River Road (US 176) at I-26 EBL Slip Ramp [1]					B	11.2	B	12.8	B	11.2	B	12.8

[1] Intersection unsignalized under all scenarios; worst approach LOS and delay reported.

[2] Intersection signalized under 2040 Build Conditions; otherwise, worst approach LOS and delay reported.

[3] Intersection signalized under 2040 Build Conditions with Improvements; otherwise, worst approach LOS and delay reported.

[4] Lane added and YIELD control removed under 2040 Build Conditions with Improvements; zero delay reported per HCM 2000 methodology.

[5] Delay unable to be processed per HCM 2000 methodology; error reported.

Source: Table 23 – *Interstate 26 Widening Traffic Analysis Report*

Table 12 - 2040 Build Intersection Queue Lengths Exit 97

Intersection #	Intersection Name	Movement			95th Percentile Queue Length (ft)						Available Storage Length (ft)			
		2040 No Build Conditions	2040 Build Conditions	2040 Build Conditions w/ Improvements	2040 No Build Conditions		2040 Build Conditions		2040 Build Conditions w/ Improvements		2040 No Build	2040 Build	2040 Build Conditions w/ Improvements	2040 Build Final Plans
					AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak				
Alternative 1: DDI														
9701	Broad River Road (US 176) at Food Lion North Access (South Access in Final Plans)	NBL	-	-	25	0	-	-	-	-	250	-	-	-
		NBT[1]	NBT	NBT	0	0	0	0	0	0	525	525	525	675
		SBT[1]	SBTR	SBTR	0	0	0	0	0	0	1,700	1,700	1,700	525
		SBR			0	0					250			
		EBLR	-	-	100	err[3]	-	-	-	-	-	-	-	-
			EBR	EBR			0	0	0	0		-	-	-
9702	Broad River Road (US 176) at Food Lion South Access (North Access in Final Plans)	-	NBL	NBL	incompatible with HCM 2000 due to free movements		25	50	25[m]	75[m]	-	325	325	200
		NBT	NBT	NBT			0	0	25	300[m]	350	675	675	525
		SBT[1]	SBTR	SBTR			0	0	775[#]	250	525	525	525	1,700
		SBR[1]									525			
		-	EBLR	EBL			175	err[3]	25	150[#]	-	-	-	200
		EBR		EBR					25	50	-		-	85
9703	Broad River Road (US 176) at I-26 WBT/WBL Ramps	NBL	-	-	25	75	-	-	-	-	400	-	-	-
		NBT	NBT	NBT	300	400	75[#]	100	150[#]	125	400	550	550	550
		SBL	-	-	25	25	-	-	-	-	350	-	-	-
		SBTR	SBT	SBT	2,875[#]	2,100[#]	525	400	50	25	350	650	650	650
9704	Broad River Road (US 176) at I-26 EB Ramps	NBLTR	NBT	NBT	incompatible with HCM 2000 due to five-legged intersection		250	275	200	200[m]	525	875	875	875
		SBLT	SBT	SBT			200[m]	400	300[m]	550[m]	1,425	550	550	550
9705	Broad River Road (US 176) at Broad Stone Road	NBLT	NBL	NBL	0	25	25	150	50	100[#]	500	150	150	170
			NBT	NBT			0	0	225	100		500	500	500
		SBT	SBT	SBT	0	0	0	0	100	650[#]	525	725	875	875
		SBR[4]	SBR	SBR	0	0	0	0	0	0	100	725	725	290
		EBL	EBL	EBL	err[3]	err[3]	err[3]	err[3]	225	225[m]	-	-	-	-
		EBR	EBR	EBR	25	325	25	err[3]	25	100	250	250	250	250
9709	Broad River Road (US 176) at Shady Grove Road	NBTR	NBT	NBT	0	0	0	0	525	1,225[#]	1,700	2,225	2,225	2,225
			NBR	NBR			0	0	75	50		2,225	2,225	2,225
		SBLT	SBL	SBL	0	25	0	25	50	75[#]	2,150	100	100	200
			SBT	SBT			0	0	550[#]	125		2,150	2,150	2,150
		WBLR	WBL	WBL	err[3]	err[3]	err[3]	err[3]	425[#]	150[#]	-	100	100	265
			WBR	WBR			150	125	125	75		-	-	280
9713	Broad River Road (US 176) at I-26 WBR Slip Ramp	added under Build Conditions	WBR[1]	WBR[1]	added under Build Conditions		75	2,550	50	525[#]	added under Build Conditions	1,300	1,300	2,200
9714	Broad River Road (US 176) at I-26 EBR Slip Ramp		EBR[1]	EBR[1,2]			50	1,350	0	0		1,400	1,400	1,900
9723	Broad River Road (US 176) at I-26 WBL Slip Ramp		WBL[1]	WBL[1]			275[#]	325	275[#]	375[#]		1,200	1,200	2,275
9724	Broad River Road (US 176) at I-26 EBL Slip Ramp		EBR[1]	EBR[1]			0	25	0	25		1,500	1,500	1,800

Source: Table 25, *Interstate 26 Widening Traffic Analysis Report*

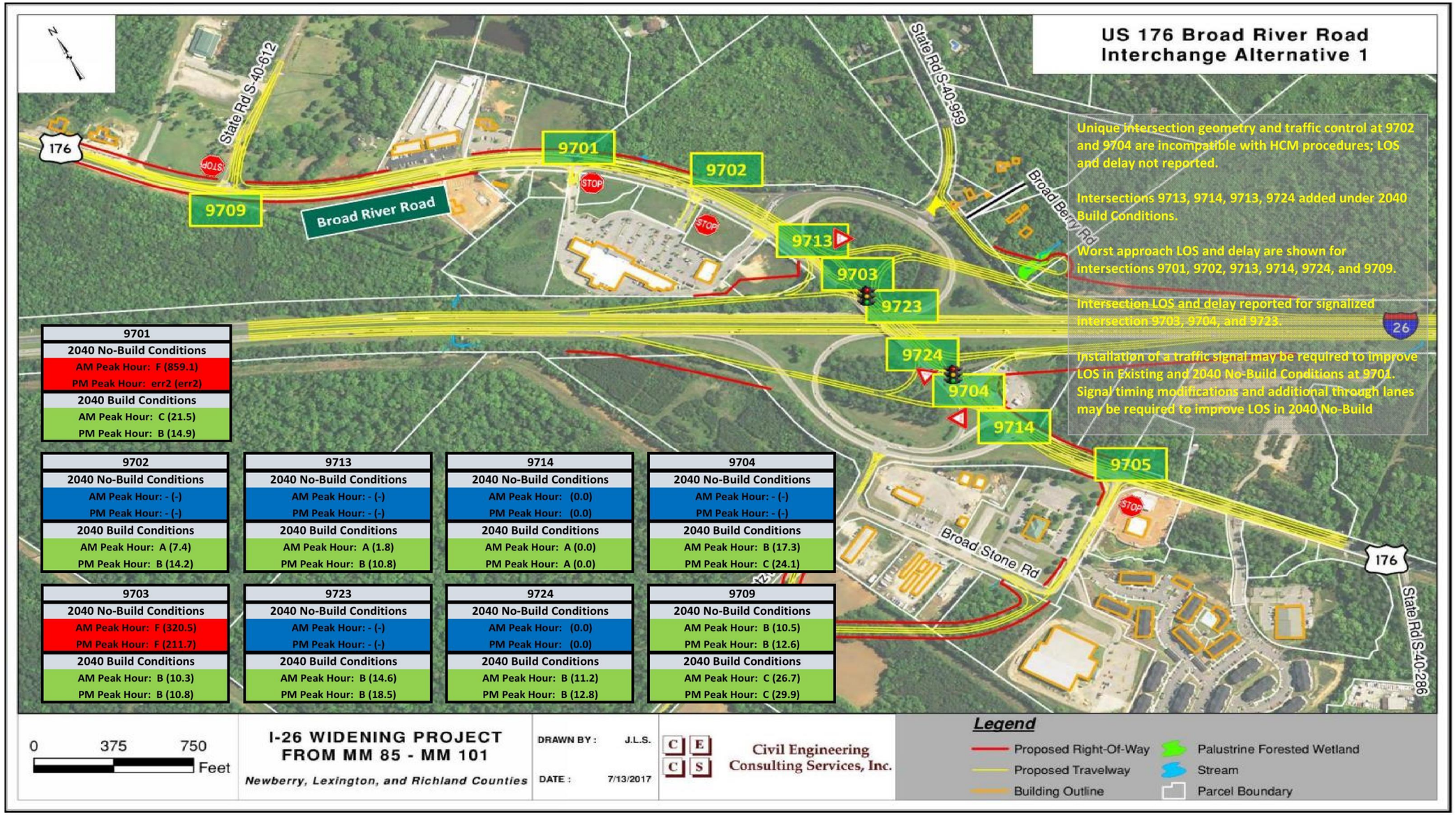


Figure 19. Exit 97 – Broad River Road (US 176) Preferred Alternative

TransModeler Network Analysis

TransModeler, a microsimulation software, was used to analyze the Existing, No-Build, and Build alternative freeway networks. A TransModeler microsimulation model consists of a large amount of component database and executable files that are run through the TransModeler software. The model then is initiated within TransModeler through a single project file. The main components of the model are network files, traffic control and signal timing plans, vehicle detector layout and configuration, trip tables for both autos and trucks, traffic counts, and parameter files. This section illustrates how to develop these main components for creating a base year model of existing conditions. The microsimulation model was developed for the 20-mile interstate section of the project and was based on a calibrated base model for the area.

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. TransModeler evaluates each segment and lane by taking into consideration vehicle interaction and driver behaviors, as well as the operational impacts for both the upstream and downstream traffic conditions.

The existing conditions and 2040 No-Build conditions TransModeler analysis was performed using the existing number of freeway lanes present on the segments within the study area, similar to the HCS analysis. Therefore, the same TransModeler simulation network was used for existing and No-Build conditions. The only difference between the existing and No-Build condition is the input trip table volumes and a proposed widening project along Broad River Road. The 2040 No-Build conditions volumes were developed using the growth rates determined based on discussions with SCDOT. It was determined that a growth rate of 1.5 percent would be used from the east end of the study area to east of US 176 (Broad River Road), 2.0 percent would be used from US 176 (Broad River Road) to the east of SC 202, and a growth rate of 2.5 percent would be used from SC 202 to the west. The existing truck percentages for the model were developed utilizing classification counts along the mainline along with intersection counts along the arterials. These inputs were combined to develop an Origin-Destination (OD) matrix for both medium and heavy trucks. These truck volumes were then scaled up to 2040 volumes by the same proportions as the overall volume growth.

The 2040 Build AM and PM TransModeler models for the 20-mile study area of I-26 were developed by modifying the 2040 No-Build models to incorporate the widening of I-26 in each direction as well as the Preferred Alternatives for each interchange. Synchro was used to input the recommended traffic signal timing information into the network for the arterial intersections.

Each simulation was run for one hour with 30 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 conditions are in **Appendix E** and a summary of results are shown in **Table 13**.

The widening of I-26 through Exit 97 is necessary to accommodate the projected increase in traffic volume within the corridor. This widening will result in segment densities adjacent to Exit 97 in the 2040 Build condition being comparable to those in existing conditions.

The analysis results for the freeway segment analysis for the Existing Conditions, summarized in **Table 13**, indicate the following:

- During the morning peak hour, the eastbound segment from Exit 97 to Exit 101 operates at an LOS E, the other freeway segments operate at LOS C;
- During the afternoon peak hour, the westbound segment from Exit 101 to Exit 97 operates at LOS F and the other freeway segments operate at LOS D or better.

With traffic volumes projected to increase within the corridor at an annual rate of approximately 2.0 percent per year, and if I-26 is not widened, the increased volumes traveling on the existing interstate during the 2040 No-Build conditions will result in increased density and reductions of freeway segment LOS. However, due to unprocessed volume from upstream queuing, the No-Build conditions may appear better than the Existing conditions in some locations.

- During the 2040 No-Build morning peak hour, the westbound segment from Exit 97 to 91 is expected to operate at an LOS E. All other segments are expected to operate at LOS D or better.
- During the 2040 No-Build afternoon peak hour, the eastbound segment from Exit 91 to 97 and the westbound segment from Exit 101 to Exit 97 are expected to operate at an LOS F. All other segments are expected to operate at LOS C.

The additional capacity provided by the construction of a third in each direction along I-26 between Exit 85 and Exit 97 and a third and fourth lane in each direction along I-26 between Exit 97 and Exit 101 (the fourth lane was determined to be necessary based on the HCS analysis) will result in substantial improvement in LOS compared to the 2040 No-Build condition, with LOS comparable to those experienced under existing conditions. The 2040 Build analysis results indicate that:

- During the morning peak hour, all freeway segments operate at LOS C;
- During the afternoon peak hour, the westbound segment from Exit 101 to Exit 97 is expected to operate at LOS D and other all freeway segments operate at LOS C.

The summary of the Ramp Merge Analyses results for the Build condition, compared to the Existing and No-Build conditions are shown in **Table 14**. The outputs for the Build condition analyses are provided in **Appendix F**.

The widening of I-26 through Exit 97 to accommodate the projected increase in traffic volume within the corridor. This widening will result in the Exit 97 merge areas in the 2040 Build condition having densities comparable to those in existing conditions.

The analysis results for the ramp merge areas, summarized in **Table 14**, indicate the following:

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

- During the morning peak hour, the Exit 97 eastbound loop on-ramp merge area operates at LOS E, and westbound loop on-ramp merge area operate at LOS B;
- During the afternoon peak hour, the Exit 97 eastbound and westbound ramp merge areas operate at LOS C.

With traffic volumes projected to increase within the corridor for 2040 No-Build conditions, and if I-26 is not widened, the increased traffic volumes will result in increased density and may reduce the merge area LOS. However, due to unprocessed volume from upstream queuing, the No-Build conditions may appear better than the Existing conditions in some locations.

- During the morning peak hour, the Exit 97 eastbound loop on-ramp merge area operates at LOS D and the westbound loop on-ramp merge area operates at LOS B;
- During the afternoon peak hour, the Exit 97 eastbound and westbound loop on-ramp merge areas operate at LOS B.

The additional capacity provided by the construction of a third lane in each direction west of Exit 97 and a fourth lane in each direction east of Exit 97 will reduce density and provide an improvement in LOS compared to the 2040 No-Build condition, with LOS comparable to that experienced under existing conditions. The 2040 Build analysis results indicate that:

- During the morning peak hour, the Exit 97 eastbound merge ramp operates at LOS C and westbound ramp merge area operate at LOS B;
- During the afternoon peak hour, the Exit 97 eastbound and westbound ramp merge areas operate at LOS B and LOS C, respectively.

The summary of the Ramp Diverge Analyses results for the Build condition, compared to the Existing and No-Build conditions are shown in **Table 15**. The outputs for the Build condition analyses are also provided in **Appendix F**.

The widening of I-26 to three lanes to the west of Exit 97 and four lanes to the east of Exit 97 will result in the Exit 97 diverge areas in the 2040 Build condition having densities comparable to those in existing conditions.

The analysis results for the ramp diverge areas, summarized in **Table 15** indicate the following:

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

- During the morning peak hour, the Exit 97 eastbound and westbound ramp diverge areas operate at LOS B;
- During the afternoon peak hour, the Exit 97 eastbound ramp diverge operates at LOS B and the westbound ramp diverge areas operate at LOS E.

With traffic volumes projected to increase within the corridor for 2040 No-Build conditions, and if I-26 is not widened, the increased traffic volumes will result in higher density and lower LOS at the diverge areas.

- During the morning peak hour, the Exit 97 eastbound diverge area is expected to operate at an LOS E and the westbound ramp diverge area is expected to operate at LOS C;
- During the afternoon peak hour, the Exit 97 eastbound and westbound ramp diverge areas operate at LOS F.

The additional capacity provided by the construction of a third lane in each direction west of Exit 97 and a fourth lane in each direction east of Exit 97 will result in a reduction of density and an improvement in LOS compared to the 2040 No-Build condition, with LOS comparable to those experienced under existing conditions. The 2040 Build analysis results indicate that:

- During the morning peak hour, the Exit 97 eastbound and westbound ramp diverge areas operate at LOS B;
- During the afternoon peak hour, the Exit 97 eastbound diverge area is expected to operate at an LOS B and the westbound ramp diverge area is expected to operate at LOS C.

Table 13: Basic Freeway Segment Analysis TransModeler Results

Segment	Existing Conditions				2040 No Build Conditions				2040 Build Conditions			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]
I-26 Eastbound												
Exit 91 to Exit 97	C	23.2	C	23.7	C	21.7	F	78.2	C	20.4	C	20.8
Exit 97 to Exit 101	E	35.9	C	25.5	D	32.2	C	20.1	C	25.7	B	17.5
I-26 Westbound												
Exit 101 to Exit 97	C	22.2	F	54.7	D	31.5	F	115.3	B	15.1	D	26.3
Exit 97 to Exit 91	C	19.0	D	27.8	E	36.6	C	24.5	B	16.2	C	23.4

[1] Per Highway Capacity Manual 2010 criteria.
[2] Density expressed as passanger cars/per mile/per lane.

Source: Table 32 – *Interstate 26 Widening Traffic Analysis Report*

Table 14: Freeway Merge Analysis TransModeler Results

Segment	Existing Conditions				2040 No Build Conditions				2040 Build Conditions			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]
I-26 Eastbound												
Exit 97 Loop	E	40.6	C	20.2	D	31.9	B	16.1	C	23.5	B	14.3
I-26 Westbound												
Exit 97 Loop	B	13.4	C	20.3	B	17.5	B	16.2	B	12.8	C	19.5

[1] Per Highway Capacity Manual 2010 criteria.
[2] Density expressed as passanger cars/per mile/per lane.

Source: Table 33 – *Interstate 26 Widening Traffic Analysis Report*

Table 15: Freeway Diverge Analysis TransModeler Results

Segment	Existing Conditions				2040 No Build Conditions				2040 Build Conditions			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]	LOS[1]	Density[2]
I-26 Eastbound												
Exit 97	B	17.2	B	16.9	E	38.3	F	133.5	B	17.2	B	17.6
I-26 Westbound												
Exit 97	B	16.1	E	40.9	C	24.7	F	86.7	B	12.9	C	23.1

[1] Per Highway Capacity Manual 2010 criteria.
[2] Density expressed as passanger cars/per mile/per lane.

Source: Table 34 – *Interstate 16 Widening Traffic Analysis Report*

VII. 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, on August 27, 2009 and on May 22, 2017. 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, U. S. Department of Transportation Federal Highway Administration published a Memorandum on May 22, 2017. This FHWA Guide was followed in preparing the current Interchange Modification Report (IMR) for the I-26/Exit 97 Interchange in Richland County, South Carolina.

Policy Point 1

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 should, 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, should 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 should 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 should 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 1 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 97 is an extension of the previous project-wide traffic operations and safety analysis as summarized in the *I-26 Widening Traffic Analysis Report* and the *I-26 Widening Project MM 85 – MM 101 Traffic Safety Analysis Report*.

The analysis of the interstate facility includes the portion of I-26 between Columbia Avenue (S-32-48) interchange (Exit 91) and the Broad River Road (S-40-76, US 176) interchange (Exit 101), including the proposed modification of Broad River Road (US 176) interchange (Exit 97). 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 TransModeler simulation model software.

The analysis of the 2040 Build condition of the Preferred Alternative (Alternative 1) illustrates that the project would not have any significant negative impact on the safety and the operation of the facilities within the project area. The analysis shows Interstate 26 mainline operations and ramp merge/diverge areas are estimated to operate at LOS D 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 C to LOS E during the 2040 No-Build morning peak hour, and between LOS B to LOS F during the 2040 No-Build afternoon peak hour.

Exit 91 (Columbia Avenue), the interchange adjacent to the west of Exit 97, is expected to be modified to provide a Diverging Diamond Interchange. The DDI concept was evaluated and selected as the Preferred Alternative in the *Interchange Modification Report, I-26 at S-48 (Columbia Avenue) Interchange Improvements*. Exit 101 (Broad River Road), the interchange adjacent to the east of Exit 97, is not expected to be modified as a part of this project.

Exit 91 - Columbia Avenue (S-32-48) - is located approximately 5.30 miles northwest of the Exit 97 interchange. Exit 101 - Broad River Road (S-40-76, US 176) – is located approximately 4.95 miles southeast of the Exit 97 interchange. With interchange spacing exceeding 3 miles to the next adjacent interchange from Exit 97, 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 identifies rear end collisions and no collision with motor vehicle as the most frequent types of crashes within the study area. The report also identifies driving too fast for conditions as the main cause of rear end crashes. The presence of median barriers and guardrail fences are noted as the first harmful event for no collision with motor vehicle crashes. The Accident Analysis Report points out that the geometric conditions resulting from merge/diverge areas of loop ramps seem to play a role in the frequency of the crashes and that merging distance at on-ramps and diverging distances at off-ramps should be improved to SCDOT standards where these standards are not already met. Study area hot spots along the interchange

arterials include frequent crashes at Exit 91 along Columbia Avenue at business driveways to the west of the eastbound off-ramp intersection. It is anticipated that access controls implements as part of the proposed Exit 91 DDI improvement will address these concerns.

Modifying the Exit 97 interchange to eliminate the loop ramps may also reduce crashes on the free segments and the merge areas adjacent to the loop ramps. Replacing the current ParClo interchange at Exit 97 with the proposed DDI, is anticipated to contribute to an improvement in traffic safety.

The preferred alternative of the Exit 97 interchange design also provides space for the construction of additional travel lanes in each direction along I-26. 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.

A conceptual signing plan is included in **Appendix G**.

Policy Point 2

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, such as 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)). In rare instances where all basic movements are not provided by the proposed design, the report should include a full-interchange option with a comparison of the operational and safety analyses to the partial-interchange option. The report should also include the mitigation proposed to compensate for the missing movements, including wayfinding signage, impacts on local intersections, mitigation of driver expectation leading to wrong-way movements on ramps, etc. The report should describe whether future provision of a full interchange is precluded by the proposed design.

The intent of the Policy Point 2 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 Broad River Road (US 176) interchange is a partial cloverleaf interchange that provides for all traffic movements. All of the ramps are located on the northeast and southwest sides of the interchange. Spacing between the existing ramps are short. In addition, Julius Richardson Road intersects the westbound ramps and Rauch-Metz Road intersects the eastbound ramp, creating mid-ramp intersections that violate driver's expectations.

As illustrated in the design concept for the Preferred Alternative, the proposed modification of Exit 97 to a DDI 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 Broad River Road, and provide ramps that meet or exceed current design standards, improving access to Broad River Road and the surrounding roadway network.

Appendix A

Turning Movement Count Data

Exit 97

Type of peak hour being reported: Intersection Peak

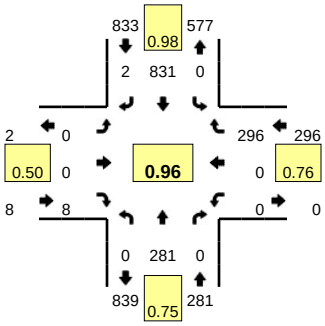
Method for determining peak hour: Total Entering Volume

LOCATION: US 176 (Broad River Rd) -- Shopping Center Dr 2

CITY/STATE: Richland, SC

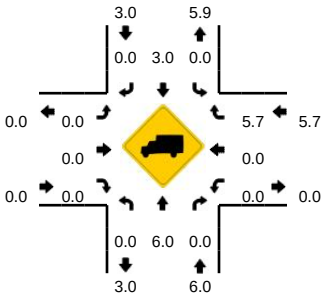
QC JOB #: 138535180

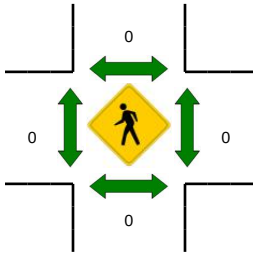
DATE: Tue, Aug 23 2016

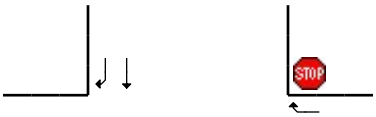


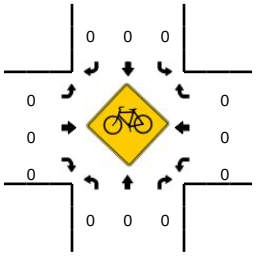
Peak-Hour: 7:30 AM -- 8:30 AM

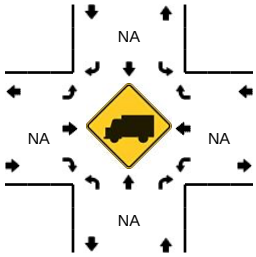
Peak 15-Min: 8:15 AM -- 8:30 AM

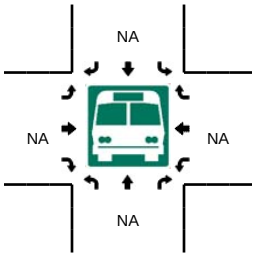












15-Min Count Period Beginning At	US 176 (Broad River Rd) (Northbound)				US 176 (Broad River Rd) (Southbound)				Shopping Center Dr 2 (Eastbound)				Shopping Center Dr 2 (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	34	0	0	0	230	0	0	0	0	1	0	0	0	35	0	300	
7:15 AM	0	41	0	0	0	222	0	0	0	0	0	0	0	0	41	0	304	
7:30 AM	0	59	0	0	0	224	0	0	0	0	2	0	0	0	59	0	344	
7:45 AM	0	62	0	0	0	231	1	0	0	0	2	0	0	0	65	0	361	1309
8:00 AM	0	66	0	0	0	201	1	0	0	0	0	0	0	0	74	0	342	1351
8:15 AM	0	94	0	0	0	175	0	0	0	0	4	0	0	0	98	0	371	1418
8:30 AM	0	29	0	0	0	182	2	0	0	0	2	0	0	0	33	0	248	1322
8:45 AM	0	40	0	0	0	112	1	0	0	0	2	0	0	0	41	0	196	1157

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	0	700	0	0	0	0	16	0	0	0	392	0	1484
Heavy Trucks	0	32	0		0	20	0		0	0	0		0	0	36		88
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:51 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

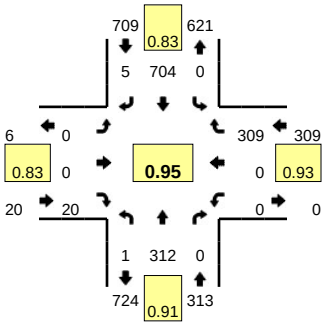
Method for determining peak hour: Total Entering Volume

LOCATION: US 176 (Broad River Rd) -- Shopping Center Dr 2

QC JOB #: 138535181

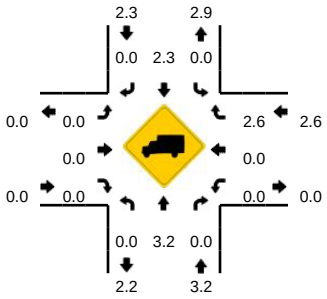
CITY/STATE: Richland, SC

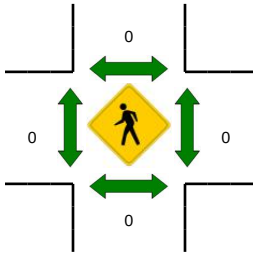
DATE: Tue, Aug 23 2016

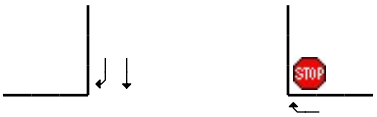


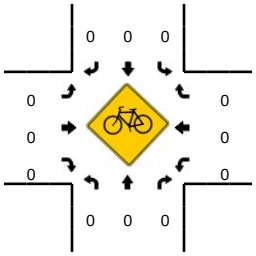
Peak-Hour: 4:30 PM -- 5:30 PM

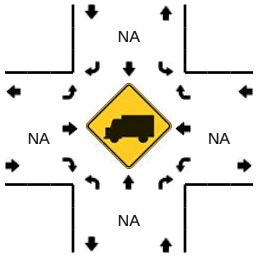
Peak 15-Min: 5:15 PM -- 5:30 PM

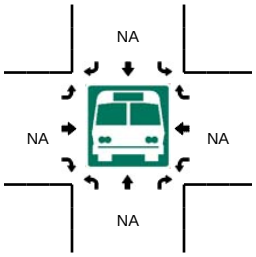












15-Min Count Period Beginning At	US 176 (Broad River Rd) (Northbound)				US 176 (Broad River Rd) (Southbound)				Shopping Center Dr 2 (Eastbound)				Shopping Center Dr 2 (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	70	0	0	0	226	3	0	0	0	6	0	0	0	69	0	374	
4:15 PM	0	72	0	0	0	181	1	0	0	0	4	0	0	0	73	0	331	
4:30 PM	0	68	0	0	0	181	2	0	0	0	5	0	0	0	68	0	324	
4:45 PM	0	74	0	0	0	164	1	0	0	0	5	0	0	0	75	0	319	1348
5:00 PM	1	83	0	0	0	180	0	0	0	0	6	0	0	0	81	0	351	1325
5:15 PM	0	87	0	0	0	179	2	0	0	0	4	0	0	0	85	0	357	1351
5:30 PM	0	70	0	0	0	152	2	0	0	0	5	0	0	0	74	0	303	1330
5:45 PM	0	68	0	0	0	156	1	0	0	0	3	0	0	0	66	0	294	1305

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	348	0	0	0	716	8	0	0	0	16	0	0	0	340	0	1428
Heavy Trucks	0	16	0		0	16	0		0	0	0		0	0	16		48
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:51 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

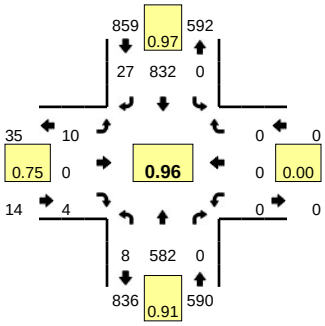
Method for determining peak hour: Total Entering Volume

LOCATION: US 176 (Broad River Rd) -- Shopping Center Dr 3

QC JOB #: 138535182

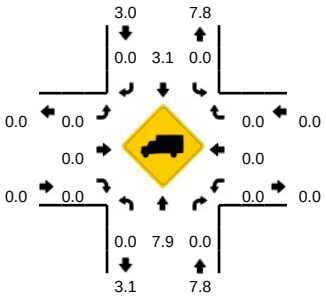
CITY/STATE: Richland, SC

DATE: Tue, Aug 23 2016



Peak-Hour: 7:30 AM -- 8:30 AM

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



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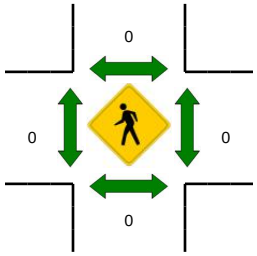
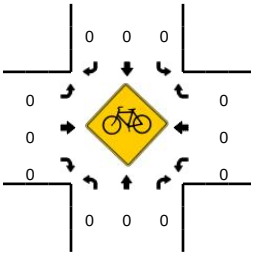
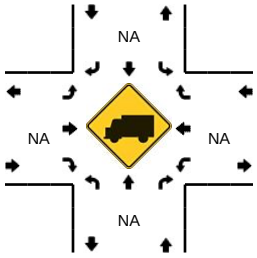
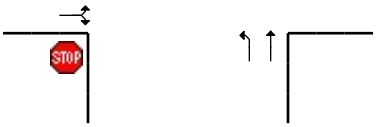
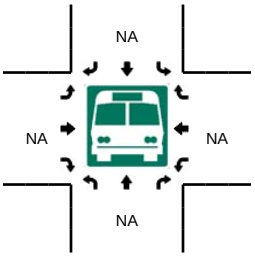










15-Min Count Period Beginning At	US 176 (Broad River Rd) (Northbound)				US 176 (Broad River Rd) (Southbound)				Shopping Center Dr 3 (Eastbound)				Shopping Center Dr 3 (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	93	0	0	0	228	3	0	1	0	0	0	0	0	0	0	327	
7:15 AM	9	106	0	0	0	222	1	0	2	0	1	0	0	0	0	0	341	
7:30 AM	5	134	0	0	0	225	7	0	4	0	1	0	0	0	0	0	376	
7:45 AM	2	136	0	0	0	234	5	0	2	0	1	0	0	0	0	0	380	1424
8:00 AM	0	151	0	0	0	193	6	0	2	0	1	0	0	0	0	0	353	1450
8:15 AM	1	161	0	0	0	180	9	0	2	0	1	0	0	0	0	0	354	1463
8:30 AM	1	77	0	0	0	176	3	0	5	0	1	0	0	0	0	0	263	1350
8:45 AM	2	89	0	0	0	114	5	0	6	0	0	0	0	0	0	0	216	1186

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	544	0	0	0	936	20	0	8	0	4	0	0	0	0	0	1520
Heavy Trucks	0	32	0		0	32	0		0	0	0		0	0	0		64
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:51 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

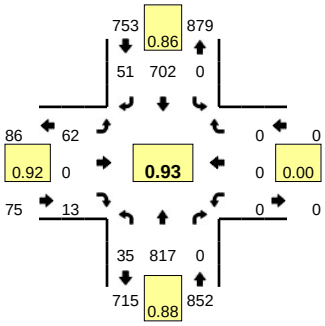
LOCATION: US 176 (Broad River Rd) -- Shopping Center Dr 3

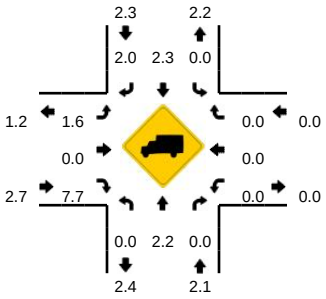
QC JOB #: 138535183

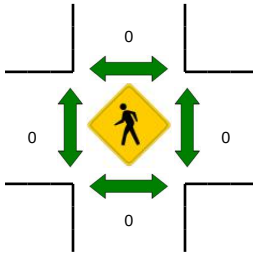
CITY/STATE: Richland, SC

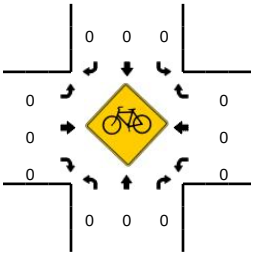
DATE: Tue, Aug 23 2016

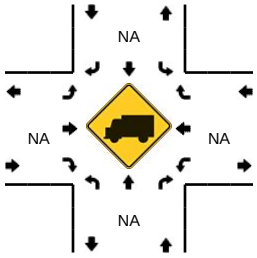
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

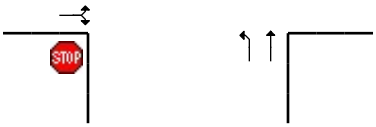


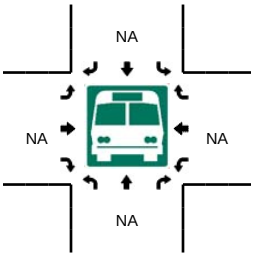












15-Min Count Period Beginning At	US 176 (Broad River Rd) (Northbound)				US 176 (Broad River Rd) (Southbound)				Shopping Center Dr 3 (Eastbound)				Shopping Center Dr 3 (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	7	163	0	0	0	222	11	0	8	0	2	0	0	0	0	0	413	
4:15 PM	9	155	0	0	0	176	14	0	16	0	2	0	0	0	0	0	372	
4:30 PM	7	180	0	0	0	190	17	0	11	0	3	0	0	0	0	0	408	
4:45 PM	10	196	0	0	0	159	13	0	15	0	5	0	0	0	0	0	398	1591
5:00 PM	9	236	0	0	0	174	13	0	20	0	2	0	0	0	0	0	454	1632
5:15 PM	9	205	0	0	0	179	8	0	16	0	3	0	0	0	0	0	420	1680
5:30 PM	5	197	0	0	0	155	17	0	14	0	6	0	0	0	0	0	394	1666
5:45 PM	6	173	0	0	0	153	29	0	12	0	7	0	0	0	0	0	380	1648

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	36	944	0	0	0	696	52	0	80	0	8	0	0	0	0	0	1816
Heavy Trucks	0	20	0		0	16	0		0	0	0		0	0	0		36
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:51 PM

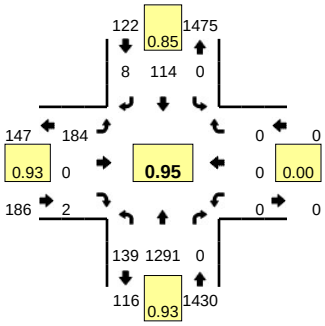
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

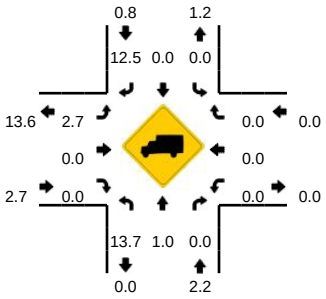
Method for determining peak hour: Total Entering Volume

LOCATION: I-26 EB Ramp -- S-40-385 (Rauch-Metz Rd)
CITY/STATE: Irmo, SC

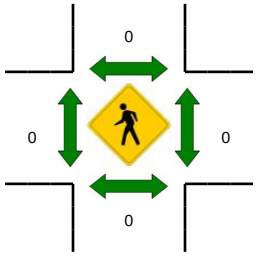
QC JOB #: 138535284
DATE: Tue, Aug 23 2016

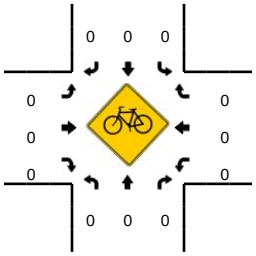


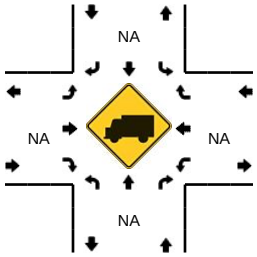
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:15 AM -- 7:30 AM

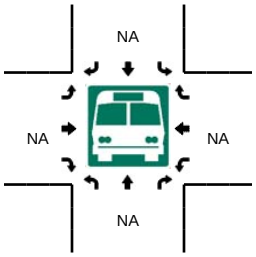


Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES









15-Min Count Period Beginning At	I-26 EB Ramp (Northbound)				I-26 EB Ramp (Southbound)				S-40-385 (Rauch-Metz Rd) (Eastbound)				S-40-385 (Rauch-Metz Rd) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	34	352	0	0	0	21	1	0	39	0	0	0	0	0	0	0	447	
7:15 AM	28	357	0	0	0	24	2	0	45	0	2	0	0	0	0	0	458	
7:30 AM	31	301	0	0	0	29	3	0	55	0	0	0	0	0	0	0	419	
7:45 AM	46	281	0	0	0	40	2	0	45	0	0	0	0	0	0	0	414	1738
8:00 AM	32	229	0	0	0	29	9	0	72	0	0	0	0	0	0	0	371	1662
8:15 AM	39	182	0	0	0	26	5	0	69	0	2	0	0	0	0	0	323	1527
8:30 AM	27	177	0	0	0	17	4	0	72	0	5	0	0	0	0	0	302	1410
8:45 AM	28	158	0	0	0	16	2	0	79	0	2	0	0	0	0	0	285	1281
9:00 AM	31	124	0	1	0	30	2	0	65	0	2	0	0	0	0	0	255	1165
9:15 AM	24	118	0	0	0	17	3	0	67	0	2	0	0	0	0	0	231	1073
9:30 AM	29	104	0	0	0	20	1	0	59	0	4	0	0	0	0	0	217	988
9:45 AM	34	88	0	0	0	26	2	0	56	0	2	0	0	0	0	0	208	911
10:00 AM	27	80	0	0	0	19	4	1	47	0	4	0	0	0	0	0	182	838
10:15 AM	21	90	0	0	0	20	1	0	57	0	4	0	0	0	0	0	193	800
10:30 AM	25	89	0	0	0	12	0	0	50	0	8	0	0	0	0	0	184	767
10:45 AM	20	85	0	0	0	21	2	1	37	0	9	0	0	0	0	0	175	734
11:00 AM	28	72	0	0	0	12	1	0	54	0	6	0	0	0	0	0	173	725
11:15 AM	30	79	0	0	0	12	4	0	44	0	4	0	0	0	0	0	173	705
11:30 AM	36	76	0	1	0	18	1	0	38	0	9	0	0	0	0	0	179	700
11:45 AM	18	90	0	0	0	21	2	0	50	0	8	0	0	0	0	0	189	714
12:00 PM	26	58	0	0	0	21	1	0	34	0	3	0	0	0	0	0	143	684
12:15 PM	37	65	0	0	0	21	2	0	43	0	9	0	0	0	0	0	177	688
12:30 PM	38	71	0	0	0	27	3	0	32	0	5	0	0	0	0	0	176	685
12:45 PM	30	61	0	0	0	16	4	0	38	0	9	0	0	0	0	0	158	654

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	112	1428	0	0	0	96	8	0	180	0	8	0	0	0	0	0	1832
Heavy Trucks	28	4	0		0	0	0		0	0	0		0	0	0		32
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:52 PM

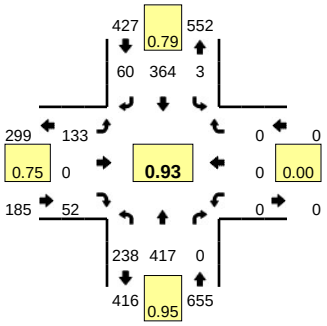
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

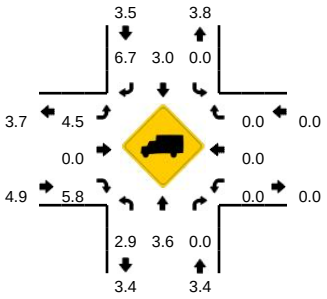
LOCATION: I-26 EB Ramp -- S-40-385 (Rauch-Metz Rd)
CITY/STATE: Irmo, SC

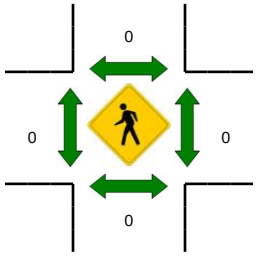
QC JOB #: 138535285
DATE: Tue, Aug 23 2016

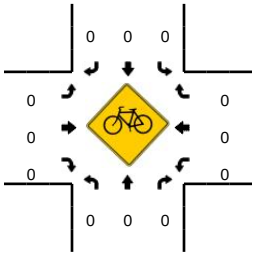


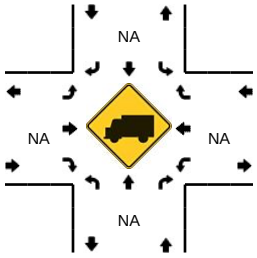
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

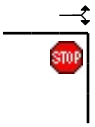
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

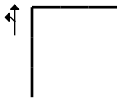


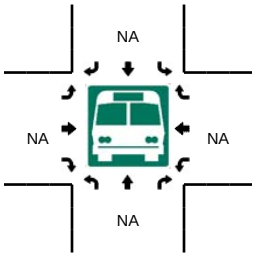












15-Min Count Period Beginning At	I-26 EB Ramp (Northbound)				I-26 EB Ramp (Southbound)				S-40-385 (Rauch-Metz Rd) (Eastbound)				S-40-385 (Rauch-Metz Rd) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
1:00 PM	28	84	0	0	0	26	1	0	34	0	3	0	0	0	0	0	176	
1:15 PM	44	58	0	1	0	14	2	0	39	0	7	0	0	0	0	0	165	
1:30 PM	21	66	0	0	0	27	2	0	55	0	5	0	0	0	0	0	176	
1:45 PM	46	76	0	0	0	25	3	0	50	0	8	0	0	0	0	0	208	725
2:00 PM	43	88	0	0	0	18	5	0	35	0	11	0	0	0	0	0	200	749
2:15 PM	49	67	0	0	0	45	6	0	40	0	2	0	0	0	0	0	209	793
2:30 PM	42	76	0	0	0	31	1	0	34	0	7	0	0	0	0	0	191	808
2:45 PM	42	82	0	0	0	21	3	0	40	0	6	0	0	0	0	0	194	794
3:00 PM	39	86	0	0	0	33	5	0	44	0	10	0	0	0	0	0	217	811
3:15 PM	54	92	0	0	0	25	1	0	49	0	10	0	0	0	0	0	231	833
3:30 PM	46	97	0	0	0	29	2	0	40	0	11	0	0	0	0	0	225	867
3:45 PM	55	146	0	0	0	49	6	0	40	0	3	0	0	0	0	0	299	972
4:00 PM	54	164	0	0	0	54	6	0	36	0	4	0	0	0	0	0	318	1073
4:15 PM	63	130	0	0	0	37	5	0	61	0	11	0	0	0	0	0	307	1149
4:30 PM	52	156	0	0	0	33	5	0	35	0	4	0	0	0	0	0	285	1209
4:45 PM	65	147	0	0	0	57	2	0	37	0	5	0	0	0	0	0	313	1223
5:00 PM	59	95	0	0	0	88	12	0	45	0	19	0	0	0	0	0	318	1223
5:15 PM	60	90	0	0	0	119	33	0	25	0	13	0	0	0	0	0	340	1256
5:30 PM	54	85	0	0	0	100	13	3	25	0	15	1	0	0	0	0	296	1267
5:45 PM	63	78	0	0	0	88	20	4	43	0	17	0	0	0	0	0	313	1267
6:00 PM	69	108	0	0	0	33	5	0	39	0	9	0	0	0	0	0	263	1212
6:15 PM	57	121	0	0	0	36	3	0	32	0	9	0	0	0	0	0	258	1130
6:30 PM	58	72	0	0	0	31	2	0	32	0	6	0	0	0	0	0	201	1035
6:45 PM	44	79	0	0	0	31	1	0	37	0	7	0	0	0	0	0	199	921

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	240	360	0	0	0	476	132	0	100	0	52	0	0	0	0	0	1360
Heavy Trucks	4	4	0		0	8	12		0	0	4		0	0	0		32
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:52 PM

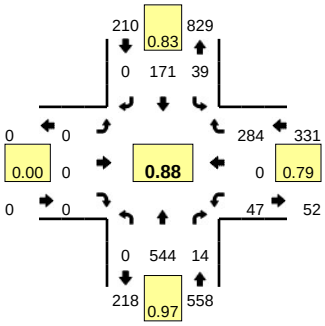
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

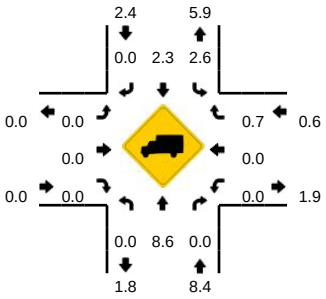
Method for determining peak hour: Total Entering Volume

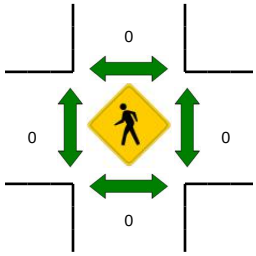
LOCATION: I-26 WB Ramp -- S-40-2894 (Julius Richardson Rd)
CITY/STATE: Irmo, SC

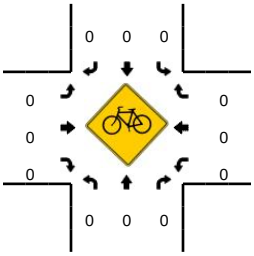
QC JOB #: 138535286
DATE: Tue, Aug 23 2016

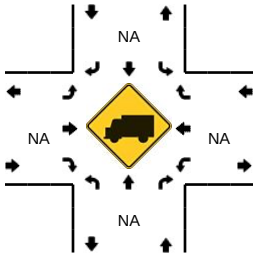


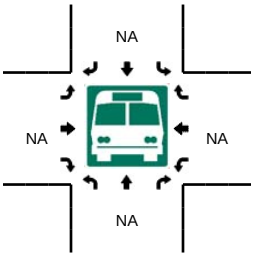
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:15 AM -- 7:30 AM











15-Min Count Period Beginning At	I-26 WB Ramp (Northbound)				I-26 WB Ramp (Southbound)				S-40-2894 (Julius Richardson Rd) (Eastbound)				S-40-2894 (Julius Richardson 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	101	4	0	2	30	0	0	0	0	0	0	6	0	88	0	231	
7:15 AM	0	127	5	0	8	55	0	0	0	0	0	0	5	0	111	0	311	
7:30 AM	0	138	3	0	12	34	0	0	0	0	0	0	14	0	77	0	278	
7:45 AM	0	140	4	0	15	36	0	1	0	0	0	0	13	0	52	0	261	1081
8:00 AM	0	139	2	0	3	46	0	0	0	0	0	0	15	0	44	0	249	1099
8:15 AM	0	119	15	0	4	46	0	0	0	0	0	0	2	0	38	0	224	1012
8:30 AM	0	93	5	0	2	27	0	0	0	0	0	0	2	0	30	0	159	893
8:45 AM	0	95	8	0	5	23	0	0	0	0	0	0	2	0	37	0	170	802
9:00 AM	0	93	7	0	3	22	0	0	0	0	0	0	3	0	14	0	142	695
9:15 AM	0	84	8	0	7	19	0	0	0	0	0	0	2	0	24	0	144	615
9:30 AM	0	97	2	0	3	20	0	0	0	0	0	0	6	0	21	0	149	605
9:45 AM	0	94	8	0	3	26	0	0	0	0	0	0	2	0	25	0	158	593
10:00 AM	0	85	4	0	3	18	0	0	0	0	0	0	2	0	14	0	126	577
10:15 AM	0	85	7	0	4	29	0	0	0	0	0	0	0	0	21	0	146	579
10:30 AM	0	76	6	0	3	17	0	0	0	0	0	0	2	0	13	0	117	547
10:45 AM	0	101	5	0	6	19	0	0	0	0	0	0	1	0	21	0	153	542
11:00 AM	0	84	4	0	7	22	0	0	0	0	0	0	3	0	9	0	129	545
11:15 AM	0	112	10	0	8	19	0	0	0	0	0	0	1	0	17	0	167	566
11:30 AM	0	94	6	0	5	19	0	0	0	0	0	0	0	0	15	0	139	588
11:45 AM	0	80	11	0	6	22	0	0	0	0	0	0	0	0	10	0	129	564
12:00 PM	0	107	10	0	6	25	0	0	0	0	0	0	2	0	10	0	160	595
12:15 PM	0	121	13	0	6	23	0	0	0	0	0	0	2	0	8	0	173	601
12:30 PM	0	126	7	0	5	34	0	0	0	0	0	0	0	0	9	0	181	643
12:45 PM	0	118	18	0	4	24	0	0	0	0	0	0	0	0	23	0	187	701

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	508	20	0	32	220	0	0	0	0	0	0	20	0	444	0	1244
Heavy Trucks	0	44	0		4	4	0		0	0	0		0	0	0		52
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:52 PM

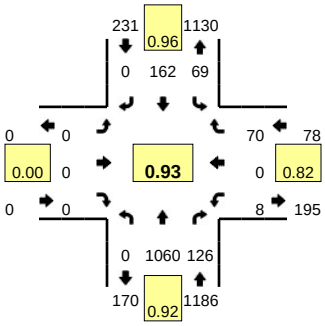
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

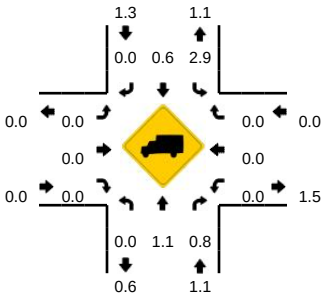
Method for determining peak hour: Total Entering Volume

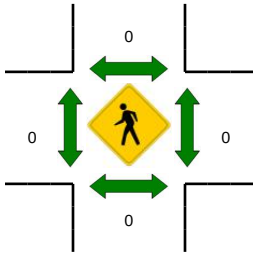
LOCATION: I-26 WB Ramp -- S-40-2894 (Julius Richardson Rd)
CITY/STATE: Irmo, SC

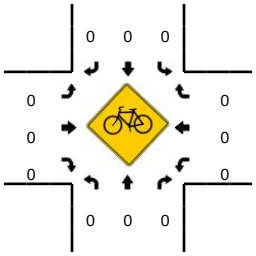
QC JOB #: 138535287
DATE: Tue, Aug 23 2016

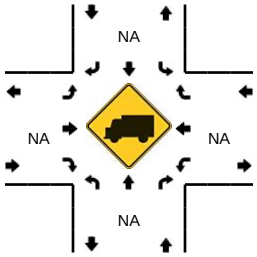


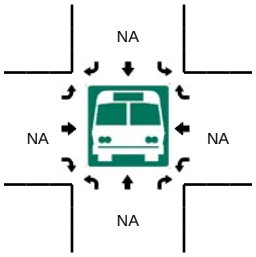
Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:00 PM -- 5:15 PM











15-Min Count Period Beginning At	I-26 WB Ramp (Northbound)				I-26 WB Ramp (Southbound)				S-40-2894 (Julius Richardson Rd) (Eastbound)				S-40-2894 (Julius Richardson Rd) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
1:00 PM	0	129	13	0	12	29	0	1	0	0	0	0	1	0	13	0	198	
1:15 PM	0	128	10	0	6	18	0	0	0	0	0	0	0	0	9	0	171	
1:30 PM	0	108	13	0	3	25	0	0	0	0	0	0	0	0	17	0	166	
1:45 PM	0	148	11	0	6	22	0	0	0	0	0	0	0	0	12	0	199	734
2:00 PM	0	132	15	0	6	17	0	0	0	0	0	0	1	0	16	0	187	723
2:15 PM	0	163	13	0	5	17	0	0	0	0	0	0	3	0	17	0	218	770
2:30 PM	0	158	25	0	7	26	0	0	0	0	0	0	2	0	19	0	237	841
2:45 PM	0	154	22	0	11	30	0	0	0	0	0	0	0	0	16	0	233	875
3:00 PM	0	175	10	0	27	20	0	0	0	0	0	0	1	0	10	0	243	931
3:15 PM	0	193	16	0	3	17	0	0	0	0	0	0	1	0	10	0	240	953
3:30 PM	0	201	16	0	14	33	0	0	0	0	0	0	1	0	12	0	277	993
3:45 PM	0	194	14	0	5	18	0	0	0	0	0	0	3	0	16	0	250	1010
4:00 PM	0	206	29	0	11	26	0	0	0	0	0	0	2	0	10	0	284	1051
4:15 PM	0	203	23	0	12	25	0	0	0	0	0	0	1	0	23	0	287	1098
4:30 PM	0	254	49	0	17	38	0	0	0	0	0	0	1	0	25	0	384	1205
4:45 PM	0	268	28	0	19	20	0	0	0	0	0	0	3	0	14	0	352	1307
5:00 PM	0	296	31	0	20	36	0	0	0	0	0	0	2	0	16	0	401	1424
5:15 PM	0	244	29	0	11	45	0	0	0	0	0	0	2	0	16	0	347	1484
5:30 PM	0	261	32	0	21	39	0	0	0	0	0	0	3	0	21	0	377	1477
5:45 PM	0	259	34	0	17	42	0	0	0	0	0	0	1	0	17	0	370	1495
6:00 PM	0	235	28	0	14	37	0	0	0	0	0	0	4	0	18	0	336	1430
6:15 PM	0	222	29	0	18	26	0	0	0	0	0	0	2	0	17	0	314	1397
6:30 PM	0	261	38	0	15	31	0	0	0	0	0	0	2	0	11	0	358	1378
6:45 PM	0	156	21	0	10	20	0	1	0	0	0	0	1	0	17	0	226	1234

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	1184	124	0	80	144	0	0	0	0	0	0	8	0	64	0	1604
Heavy Trucks	0	32	0		0	4	0		0	0	0		0	0	0		36
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:52 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

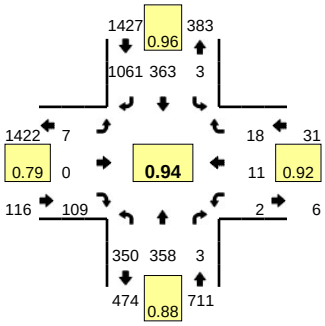
Type of peak hour being reported: Intersection Peak

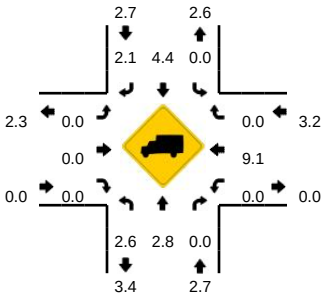
Method for determining peak hour: Total Entering Volume

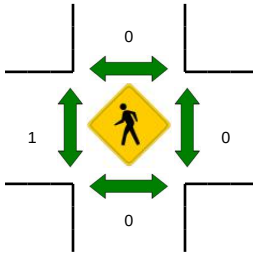
LOCATION: US 176 -- I-26 EB Ramps (Exit 97)
CITY/STATE: Richland, SC

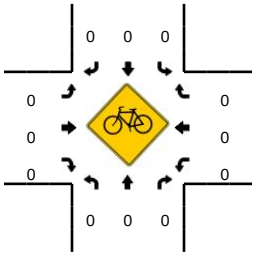
QC JOB #: 138535300
DATE: Tue, Aug 23 2016

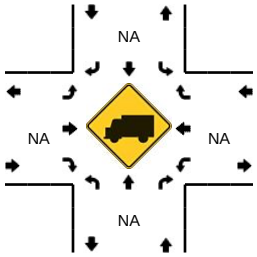
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:15 AM -- 7:30 AM

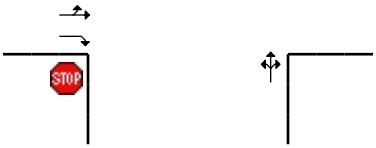


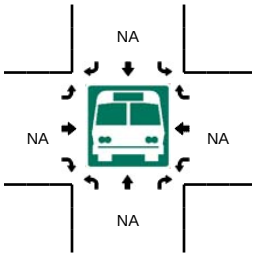












15-Min Count Period Beginning At	US 176 (Northbound)				US 176 (Southbound)				I-26 EB Ramps (Exit 97) (Eastbound)				I-26 EB Ramps (Exit 97) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	105	60	2	0	0	60	270	0	0	0	21	0	0	3	5	0	526	
7:15 AM	114	88	0	0	0	103	268	0	2	0	24	0	1	3	6	0	609	
7:30 AM	73	101	1	0	2	107	255	0	1	0	28	0	1	4	5	0	578	
7:45 AM	58	109	0	0	1	93	268	0	4	0	36	0	0	1	2	0	572	2285
8:00 AM	53	110	1	0	1	105	204	0	6	0	24	0	3	5	1	0	513	2272
8:15 AM	44	129	0	0	0	69	175	0	7	0	20	0	0	2	4	0	450	2113
8:30 AM	36	49	0	0	2	87	164	0	5	0	18	0	0	4	3	0	368	1903
8:45 AM	31	60	0	0	2	53	152	0	4	0	14	0	1	3	3	0	323	1654
9:00 AM	32	45	2	0	1	48	121	0	9	0	20	1	1	2	1	0	283	1424
9:15 AM	49	46	0	0	1	67	90	0	2	0	16	0	4	3	1	0	279	1253
9:30 AM	24	48	0	0	0	75	103	0	6	0	18	0	0	6	3	0	283	1168
9:45 AM	24	53	1	0	0	64	95	0	8	0	19	0	2	3	4	0	273	1118
10:00 AM	18	40	3	0	0	52	86	0	3	0	17	0	2	3	2	0	226	1061
10:15 AM	29	49	0	0	8	54	80	0	5	0	17	0	1	2	1	0	246	1028
10:30 AM	26	45	0	0	3	64	86	0	6	1	11	1	1	2	2	0	248	993
10:45 AM	18	51	1	0	1	78	85	0	9	0	17	1	3	2	2	0	268	988
11:00 AM	17	49	0	0	2	53	80	0	4	0	12	0	2	3	1	0	223	985
11:15 AM	17	65	1	0	0	65	90	0	5	0	9	1	0	2	5	0	260	999
11:30 AM	19	43	0	0	1	69	92	0	8	0	20	0	0	1	2	0	255	1006
11:45 AM	24	59	3	0	0	90	83	0	8	0	16	1	2	1	1	0	288	1026
12:00 PM	27	88	1	0	1	65	56	0	2	0	17	1	2	1	4	0	265	1068
12:15 PM	19	64	2	0	2	64	82	0	7	0	20	0	2	1	6	0	269	1077
12:30 PM	25	66	1	0	1	63	82	0	8	0	21	2	3	2	1	0	275	1097
12:45 PM	18	58	0	0	3	63	72	0	9	0	15	0	1	1	2	0	242	1051

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	456	352	0	0	0	412	1072	0	8	0	96	0	4	12	24	0	2436
Heavy Trucks	4	8	0		0	8	24		0	0	0		0	4	0		48
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:52 PM

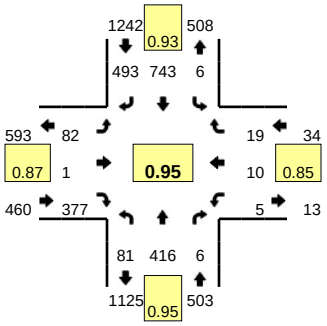
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

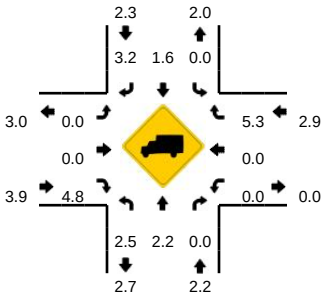
Method for determining peak hour: Total Entering Volume

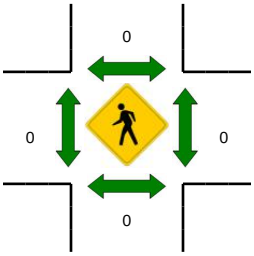
LOCATION: US 176 -- I-26 EB Ramps (Exit 97)
CITY/STATE: Richland, SC

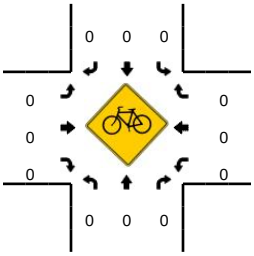
QC JOB #: 138535301
DATE: Tue, Aug 23 2016

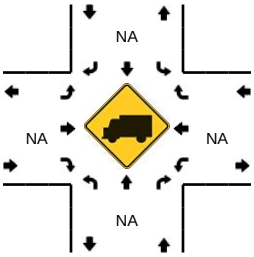


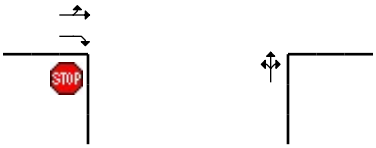
Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

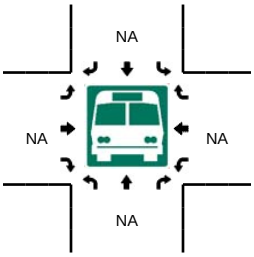












15-Min Count Period Beginning At	US 176 (Northbound)				US 176 (Southbound)				I-26 EB Ramps (Exit 97) (Eastbound)				I-26 EB Ramps (Exit 97) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
1:00 PM	25	67	0	0	0	76	86	0	2	0	23	0	2	1	0	0	282	
1:15 PM	18	64	0	0	1	51	84	0	8	0	13	0	0	0	0	0	239	
1:30 PM	21	56	2	0	0	59	63	0	7	0	19	0	2	3	3	0	235	
1:45 PM	33	69	1	0	2	86	89	0	7	0	23	0	2	0	3	0	315	1071
2:00 PM	17	52	0	0	0	93	111	0	10	0	19	0	1	3	4	0	310	1099
2:15 PM	22	61	1	0	1	72	93	0	12	0	29	1	1	1	1	0	295	1155
2:30 PM	20	78	1	0	1	82	93	0	13	0	25	0	2	5	3	0	323	1243
2:45 PM	36	79	0	0	0	87	86	0	12	0	14	1	0	2	5	0	322	1250
3:00 PM	23	86	1	0	1	70	101	0	15	0	24	0	0	1	2	0	324	1264
3:15 PM	18	72	1	0	0	83	126	0	11	0	22	2	0	2	4	0	341	1310
3:30 PM	18	80	0	0	3	132	123	0	12	0	25	0	1	2	6	0	402	1389
3:45 PM	17	63	3	0	1	164	179	0	15	0	34	0	2	5	2	0	485	1552
4:00 PM	23	71	0	0	0	121	188	0	12	0	46	0	1	7	2	0	471	1699
4:15 PM	20	88	2	0	0	144	163	0	11	0	33	0	0	10	3	0	474	1832
4:30 PM	26	109	0	0	1	149	176	0	10	0	29	0	1	6	5	0	512	1942
4:45 PM	30	80	3	0	2	137	180	0	6	0	53	1	1	2	5	0	500	1957
5:00 PM	14	101	3	0	2	169	137	0	17	1	70	3	1	3	6	0	527	2013
5:15 PM	23	106	0	0	3	188	123	0	20	0	111	1	1	4	8	0	588	2127
5:30 PM	20	104	1	0	0	195	118	0	21	0	102	4	1	1	3	0	570	2185
5:45 PM	24	105	2	0	1	191	115	0	15	0	94	1	2	2	2	0	554	2239
6:00 PM	27	109	1	0	1	181	144	0	7	0	33	0	1	6	5	0	515	2227
6:15 PM	23	101	1	0	3	134	151	0	10	0	34	0	0	4	2	0	463	2102
6:30 PM	14	69	0	0	1	156	114	0	9	0	28	0	0	2	4	0	397	1929
6:45 PM	14	73	1	0	3	113	107	0	14	0	23	0	0	2	0	0	350	1725

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	92	424	0	0	12	752	492	0	80	0	444	4	4	16	32	0	2352
Heavy Trucks	0	16	0		0	16	8		0	0	12		0	0	4		56
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:52 PM

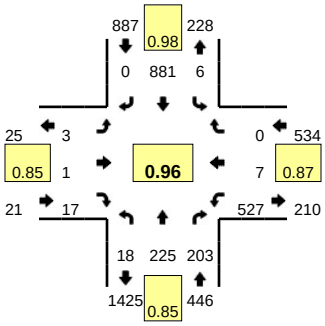
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

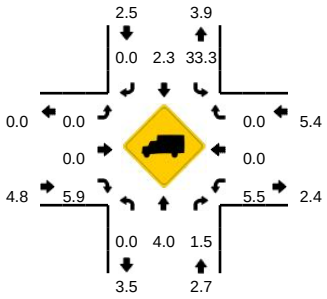
Method for determining peak hour: Total Entering Volume

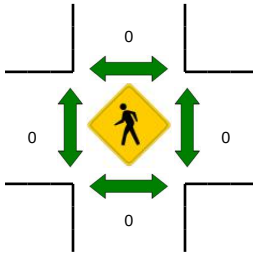
LOCATION: US 176 -- I-26 WB Ramps (Exit 97)
CITY/STATE: Richland, SC

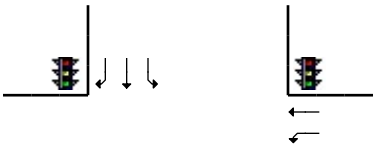
QC JOB #: 138535302
DATE: Tue, Aug 23 2016

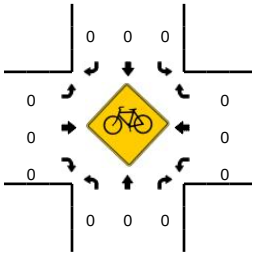


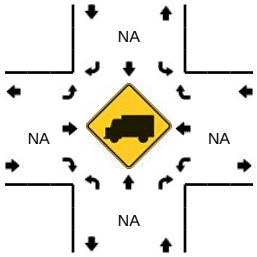
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

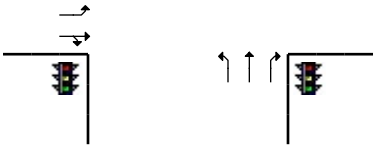


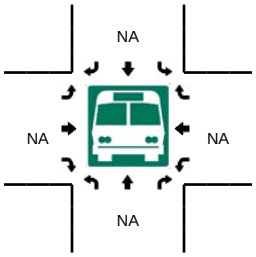












15-Min Count Period Beginning At	US 176 (Northbound)				US 176 (Southbound)				I-26 WB Ramps (Exit 97) (Eastbound)				I-26 WB Ramps (Exit 97) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	33	30	0	2	231	0	0	1	0	3	0	116	3	0	0	422	
7:15 AM	3	41	59	0	4	221	0	0	0	0	1	0	158	0	0	0	487	
7:30 AM	4	58	46	0	0	225	0	0	1	0	3	0	145	2	0	0	484	
7:45 AM	9	60	51	0	1	233	0	0	2	0	7	0	125	3	0	0	491	1884
8:00 AM	2	66	47	0	1	202	0	0	0	1	6	0	99	2	0	0	426	1888
8:15 AM	2	94	47	0	3	175	0	0	0	0	0	0	82	7	0	0	410	1811
8:30 AM	6	28	27	0	0	180	0	0	1	2	3	0	80	0	0	0	327	1654
8:45 AM	1	40	26	0	2	113	1	0	0	0	5	0	80	1	0	0	269	1432
9:00 AM	2	31	21	0	4	108	1	0	1	0	0	0	58	4	0	0	230	1236
9:15 AM	5	21	24	0	1	93	0	0	0	1	6	0	60	3	0	1	215	1041
9:30 AM	7	31	20	0	2	119	0	0	1	1	5	0	68	3	0	0	257	971
9:45 AM	5	38	27	0	1	88	0	0	1	1	2	0	83	4	0	0	250	952
10:00 AM	3	21	19	0	2	84	0	0	0	0	3	0	47	1	0	0	180	902
10:15 AM	4	32	26	0	6	74	0	0	0	1	8	0	66	3	0	1	221	908
10:30 AM	6	39	18	0	1	94	0	0	0	1	3	0	58	1	0	1	222	873
10:45 AM	7	35	22	0	2	89	1	0	1	1	3	0	78	3	0	0	242	865
11:00 AM	6	25	26	0	2	73	0	0	1	1	2	0	60	3	0	0	199	884
11:15 AM	11	47	24	0	2	77	1	0	0	1	7	0	75	4	0	0	249	912
11:30 AM	6	27	20	0	3	92	0	0	1	1	5	0	70	3	0	0	228	918
11:45 AM	6	38	28	0	0	120	0	0	3	0	9	0	48	5	0	0	257	933
12:00 PM	5	66	30	0	0	55	1	0	1	1	9	0	55	3	0	0	226	960
12:15 PM	14	38	27	0	1	78	1	0	0	1	6	0	65	5	0	0	236	947
12:30 PM	6	43	30	0	5	71	0	0	2	4	5	0	72	7	0	1	246	965
12:45 PM	11	37	26	0	2	55	0	0	0	0	9	0	85	11	0	1	237	945

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	36	240	204	0	4	932	0	0	8	0	28	0	500	12	0	0	1964
Heavy Trucks	0	16	4		4	28	0		0	0	0		36	0	0		88
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:52 PM

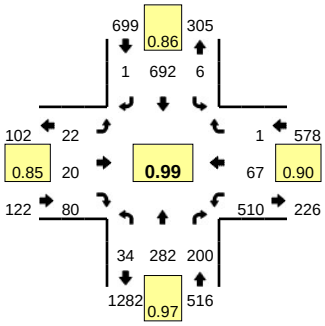
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

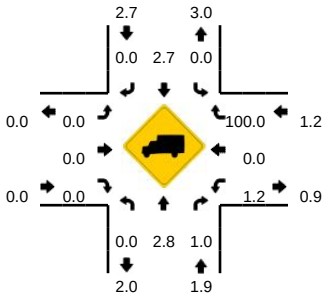
Method for determining peak hour: Total Entering Volume

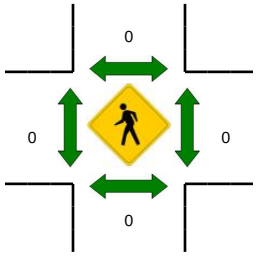
LOCATION: US 176 -- I-26 WB Ramps (Exit 97)
CITY/STATE: Richland, SC

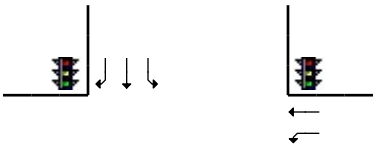
QC JOB #: 138535303
DATE: Tue, Aug 23 2016

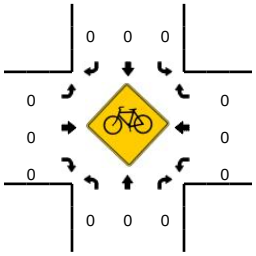


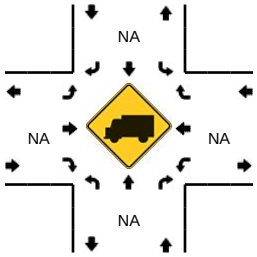
Peak-Hour: 5:15 PM -- 6:15 PM
Peak 15-Min: 6:00 PM -- 6:15 PM

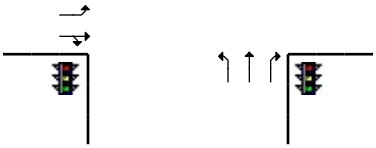


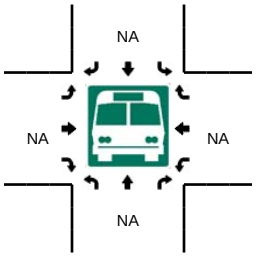












15-Min Count Period Beginning At	US 176 (Northbound)				US 176 (Southbound)				I-26 WB Ramps (Exit 97) (Eastbound)				I-26 WB Ramps (Exit 97) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
1:00 PM	4	34	35	0	7	78	0	0	2	0	9	0	75	8	0	0	252	
1:15 PM	8	47	23	0	1	46	1	0	0	0	5	0	78	6	0	0	215	
1:30 PM	14	34	24	1	3	57	0	0	0	1	6	0	67	7	0	1	215	
1:45 PM	9	48	24	1	3	68	1	0	1	1	12	0	95	10	0	0	273	955
2:00 PM	7	36	21	0	2	122	0	0	0	0	5	0	84	9	2	0	288	991
2:15 PM	6	54	17	0	3	69	1	0	2	2	7	0	90	8	0	0	259	1035
2:30 PM	9	53	31	0	1	73	0	0	3	1	9	0	98	8	0	0	286	1106
2:45 PM	7	50	38	0	2	86	0	0	3	1	5	0	88	9	0	1	290	1123
3:00 PM	7	60	44	0	0	91	1	0	1	3	5	0	84	4	0	0	300	1135
3:15 PM	12	63	17	0	2	115	0	0	2	1	7	0	94	12	0	1	326	1202
3:30 PM	7	63	38	0	2	157	0	0	4	7	14	0	90	5	0	1	388	1304
3:45 PM	6	55	21	0	1	244	0	0	3	1	10	0	95	17	0	0	453	1467
4:00 PM	1	63	26	0	5	230	0	0	7	6	7	0	95	9	1	0	450	1617
4:15 PM	6	66	31	0	3	180	0	0	6	3	14	0	123	20	0	0	452	1743
4:30 PM	11	63	48	0	2	178	0	0	5	5	11	0	151	14	0	0	488	1843
4:45 PM	9	66	31	0	3	167	0	0	8	5	9	0	129	22	1	0	450	1840
5:00 PM	6	74	49	0	4	186	0	0	9	3	12	0	115	16	0	0	474	1864
5:15 PM	8	80	46	0	2	181	1	0	7	8	16	0	120	12	0	0	481	1893
5:30 PM	12	65	56	0	2	155	0	0	5	2	22	0	137	17	0	0	473	1878
5:45 PM	8	62	52	0	1	156	0	0	6	6	24	0	136	24	1	0	476	1904
6:00 PM	6	75	46	0	1	200	0	0	4	4	18	0	117	14	0	0	485	1915
6:15 PM	11	73	33	0	2	157	0	0	3	9	19	0	108	16	0	0	431	1865
6:30 PM	10	39	38	1	2	122	1	0	3	6	8	0	142	15	0	0	387	1779
6:45 PM	11	57	29	0	2	115	0	0	2	0	8	0	100	6	0	0	330	1633

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	24	300	184	0	4	800	0	0	16	16	72	0	468	56	0	0	1940
Heavy Trucks	0	8	0		0	24	0		0	0	0		4	0	0		36
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:52 PM

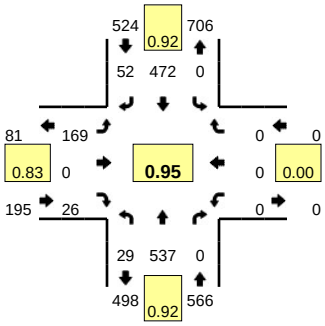
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

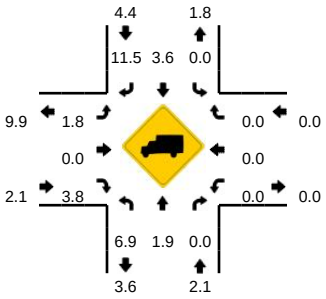
Method for determining peak hour: Total Entering Volume

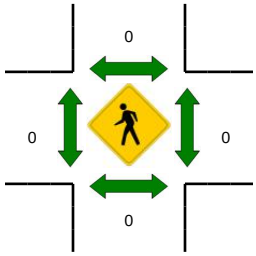
LOCATION: US 176 -- S-40-2805 (Broad Stone Rd)
CITY/STATE: Richland, SC

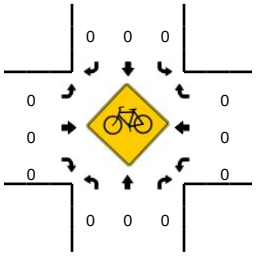
QC JOB #: 138535304
DATE: Tue, Aug 23 2016

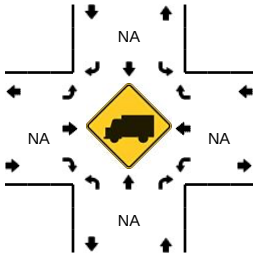


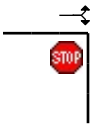
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

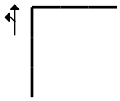


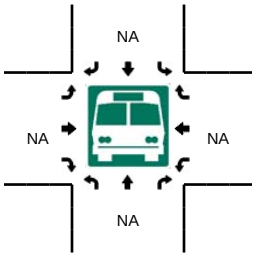












15-Min Count Period Beginning At	US 176 (Northbound)				US 176 (Southbound)				S-40-2805 (Broad Stone Rd) (Eastbound)				S-40-2805 (Broad Stone Rd) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	6	130	0	0	0	78	10	0	52	0	4	0	0	0	0	0	280	
7:15 AM	3	137	0	0	0	115	6	0	61	0	5	0	0	0	0	0	327	
7:30 AM	6	137	0	0	0	137	6	0	41	0	12	0	0	0	0	0	339	
7:45 AM	10	124	0	0	0	114	21	0	36	0	7	0	0	0	0	0	312	1258
8:00 AM	10	139	0	0	0	106	19	0	31	0	2	0	0	0	0	0	307	1285
8:15 AM	9	151	0	0	0	85	13	0	19	0	4	0	0	0	0	0	281	1239
8:30 AM	10	67	0	0	0	91	11	0	19	0	7	0	0	0	0	0	205	1105
8:45 AM	11	83	0	0	0	53	15	0	17	0	7	0	0	0	0	0	186	979
9:00 AM	6	66	0	0	0	57	11	0	14	0	5	0	0	0	0	0	159	831
9:15 AM	9	76	0	0	0	74	12	0	15	0	7	0	0	0	0	0	193	743
9:30 AM	8	53	0	0	0	89	9	0	12	0	7	0	0	0	0	0	178	716
9:45 AM	11	67	0	0	0	68	18	0	12	0	5	0	0	0	0	0	181	711
10:00 AM	10	45	0	0	0	55	14	0	17	0	15	0	0	0	0	0	156	708
10:15 AM	12	61	0	0	0	69	7	0	16	0	9	0	0	0	0	0	174	689
10:30 AM	5	57	0	0	0	64	7	1	10	0	7	1	0	0	0	0	152	663
10:45 AM	7	63	0	0	0	82	19	0	7	0	11	0	0	0	0	0	189	671
11:00 AM	11	67	0	0	0	51	14	0	10	0	3	0	0	0	0	0	156	671
11:15 AM	8	68	0	0	0	63	11	0	14	0	8	0	0	0	0	0	172	669
11:30 AM	4	52	0	0	0	73	12	0	11	0	5	0	0	0	0	0	157	674
11:45 AM	12	76	0	0	0	100	18	0	9	0	4	0	0	0	0	0	219	704
12:00 PM	8	93	0	0	0	57	13	1	27	0	14	0	0	0	0	0	213	761
12:15 PM	9	67	0	0	0	78	15	0	14	0	8	0	0	0	0	0	191	780
12:30 PM	10	79	0	0	0	70	13	0	14	0	7	0	0	0	0	0	193	816
12:45 PM	8	64	0	0	0	57	19	0	18	0	10	0	0	0	0	0	176	773

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	24	548	0	0	0	548	24	0	164	0	48	0	0	0	0	0	1356
Heavy Trucks	0	4	0		0	12	0		0	0	4		0	0	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:52 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

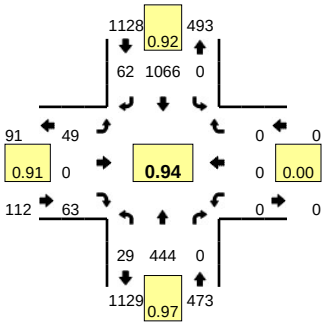
Type of peak hour being reported: Intersection Peak

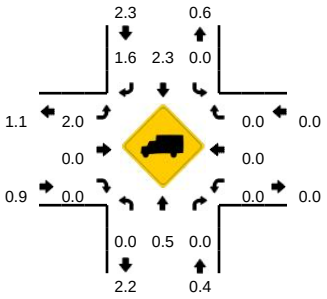
Method for determining peak hour: Total Entering Volume

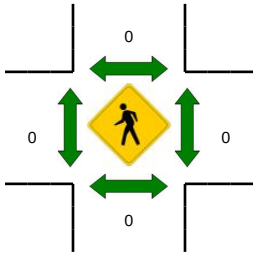
LOCATION: US 176 -- S-40-2805 (Broad Stone Rd)
CITY/STATE: Richland, SC

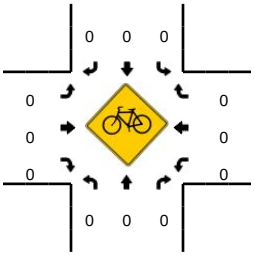
QC JOB #: 138535305
DATE: Tue, Aug 23 2016

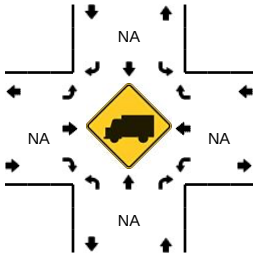
Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

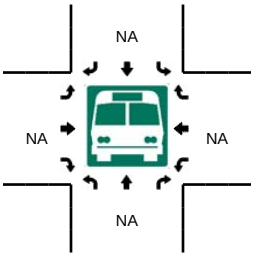












15-Min Count Period Beginning At	US 176 (Northbound)				US 176 (Southbound)				S-40-2805 (Broad Stone Rd) (Eastbound)				S-40-2805 (Broad Stone Rd) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
1:00 PM	5	78	0	0	0	79	21	0	16	0	9	0	0	0	0	0	208	
1:15 PM	11	68	0	0	0	55	15	0	17	0	2	0	0	0	0	0	168	
1:30 PM	13	65	0	0	0	60	15	0	12	0	10	0	0	0	0	0	175	
1:45 PM	8	76	0	0	0	89	18	0	23	0	11	0	0	0	0	0	225	776
2:00 PM	7	53	0	1	0	105	10	0	18	0	7	0	0	0	0	0	201	769
2:15 PM	5	61	0	0	0	86	17	0	13	0	6	0	0	0	0	0	188	789
2:30 PM	10	90	0	0	0	97	13	0	15	0	3	0	0	0	0	0	228	842
2:45 PM	8	97	0	0	0	91	12	0	21	0	4	0	0	0	0	0	233	850
3:00 PM	4	91	0	0	0	74	12	0	16	0	7	0	0	0	0	0	204	853
3:15 PM	13	87	0	0	0	97	10	0	13	0	9	0	0	0	0	0	229	894
3:30 PM	8	98	0	0	0	147	12	0	8	0	6	0	0	0	0	0	279	945
3:45 PM	12	72	0	0	0	174	23	0	8	0	10	1	0	0	0	0	300	1012
4:00 PM	16	87	0	0	0	152	31	0	11	0	13	0	0	0	0	0	310	1118
4:15 PM	10	99	0	0	0	144	23	0	18	0	9	0	0	0	0	0	303	1192
4:30 PM	4	123	0	0	0	156	21	0	23	0	12	0	0	0	0	0	339	1252
4:45 PM	10	89	0	0	0	164	25	0	21	0	7	0	0	0	0	0	316	1268
5:00 PM	4	97	0	0	0	233	12	0	18	0	12	0	0	0	0	0	376	1334
5:15 PM	4	120	0	0	0	283	15	0	10	0	24	0	0	0	0	0	456	1487
5:30 PM	10	112	0	0	0	292	15	0	11	0	10	0	0	0	0	0	450	1598
5:45 PM	11	115	0	0	0	258	20	0	10	0	17	0	0	0	0	0	431	1713
6:00 PM	11	119	0	0	0	208	14	0	15	0	4	0	0	0	0	0	371	1708
6:15 PM	11	116	0	0	0	154	10	0	7	0	2	0	0	0	0	0	300	1552
6:30 PM	5	73	0	0	0	164	14	0	12	0	7	0	0	0	0	0	275	1377
6:45 PM	9	79	0	0	0	124	10	0	10	0	3	0	0	0	0	0	235	1181

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	16	480	0	0	0	1132	60	0	40	0	96	0	0	0	0	0	1824
Heavy Trucks	0	8	0		0	20	0		0	0	0		0	0	0		28
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/23/2016 2:52 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix B

HCS Freeway Segment Analysis Outputs

Appendix B

HCS Freeway Segment Analysis Outputs EX AM

HCS 2010: Basic Freeway Segments Release 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/08/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 SB
From/To:	EB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	2281	veh/h
Peak-hour factor, PHF	0.88	
Peak 15-min volume, v15	648	v
Trucks and buses	16	%
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	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	1607	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1607	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	68.1	mi/h
Number of lanes, N	2	
Density, D	23.6	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

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/08/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 SB
From/To:	EB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	3598	veh/h
Peak-hour factor, PHF	0.88	
Peak 15-min volume, v15	1022	v
Trucks and buses	16	%
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	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	2535	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	2535	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	49.3	mi/h
Number of lanes, N	2	
Density, D	51.4	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 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/08/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 NB
From/To:	WB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	1800	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	500	v
Trucks and buses	23	%
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	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	1345	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1345	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.8	mi/h
Number of lanes, N	2	
Density, D	19.3	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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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/08/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 NB
From/To:	WB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	1460	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	406	v
Trucks and buses	23	%
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	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	1091	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1091	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	15.6	pc/mi/ln
Level of service, LOS	B	

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

Appendix B

HCS Freeway Segment Analysis Outputs EX PM

HCS 2010: Basic Freeway Segments Release 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/08/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 SB
From/To:	EB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	2362	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	649	v
Trucks and buses	14	%
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	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	1570	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1570	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	68.4	mi/h
Number of lanes, N	2	
Density, D	22.9	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 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/08/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 SB
From/To:	EB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	2609	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	717	v
Trucks and buses	14	%
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	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	1735	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1735	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	66.7	mi/h
Number of lanes, N	2	
Density, D	26.0+	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:	03/08/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 NB
From/To:	WB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	3746	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1018	v
Trucks and buses	13	%
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	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	2433	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	2433	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	52.4	mi/h
Number of lanes, N	2	
Density, D	46.5	pc/mi/ln
Level of service, LOS	F	

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:	03/08/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 NB
From/To:	WB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	2555	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	694	v
Trucks and buses	13	%
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	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	1659	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1659	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	67.6	mi/h
Number of lanes, N	2	
Density, D	24.6	pc/mi/ln
Level of service, LOS	C	

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

Appendix B

HCS Freeway Segment Analysis Outputs NO_BUILD AM

HCS 2010: Basic Freeway Segments Release 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 SB
From/To:	EB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	3669	veh/h
Peak-hour factor, PHF	0.88	
Peak 15-min volume, v15	1042	v
Trucks and buses	16	%
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	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	2585	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	2585	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	47.7	mi/h
Number of lanes, N	2	
Density, D	54.1	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 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 SB
From/To:	EB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	5788	veh/h
Peak-hour factor, PHF	0.88	
Peak 15-min volume, v15	1644	v
Trucks and buses	16	%
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	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	4078	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	4078	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		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 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 NB
From/To:	WB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	2896	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	804	v
Trucks and buses	23	%
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	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	2164	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	2164	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	59.2	mi/h
Number of lanes, N	2	
Density, D	36.5	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 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 NB
From/To:	WB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	2349	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	653	v
Trucks and buses	23	%
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	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	1755	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1755	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	66.4	mi/h
Number of lanes, N	2	
Density, D	26.4	pc/mi/ln
Level of service, LOS	D	

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

Appendix B

HCS Freeway Segment Analysis Outputs NO_BUILD PM

HCS 2010: Basic Freeway Segments Release 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 SB
From/To:	EB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	3800	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1044	v
Trucks and buses	14	%
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	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	2526	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	2526	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	49.6	mi/h
Number of lanes, N	2	
Density, D	50.9	pc/mi/ln
Level of service, LOS	F	

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:	03/09/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 SB
From/To:	EB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	4198	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1153	v
Trucks and buses	14	%
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	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	2791	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	2791	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	40.6	mi/h
Number of lanes, N	2	
Density, D	68.7	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 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 NB
From/To:	WB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	6026	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1637	v
Trucks and buses	13	%
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	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	3914	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	3914	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

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:	03/09/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 NB
From/To:	WB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	4110	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1117	v
Trucks and buses	13	%
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	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	2669	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	2669	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	45.0	mi/h
Number of lanes, N	2	
Density, D	59.4	pc/mi/ln
Level of service, LOS	F	

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

Appendix B

HCS Freeway Segment Analysis Outputs 2040_BUILD AM

HCS 2010: Basic Freeway Segments Release 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 SB
From/To:	EB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	3669	veh/h
Peak-hour factor, PHF	0.88	
Peak 15-min volume, v15	1042	v
Trucks and buses	16	%
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	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	1723	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1723	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	66.8	mi/h
Number of lanes, N	3	
Density, D	25.8	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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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 SB
From/To:	EB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	5788	veh/h
Peak-hour factor, PHF	0.88	
Peak 15-min volume, v15	1644	v
Trucks and buses	16	%
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	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	2039	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	2039	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	61.8	mi/h
Number of lanes, N	4	
Density, D	33.0	pc/mi/ln
Level of service, LOS	D	

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

HCS 2010: Basic Freeway Segments Release 6.90

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 NB
From/To:	WB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	2896	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	804	v
Trucks and buses	23	%
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	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	1082	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1082	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	4	
Density, D	15.5	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 6.3

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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 NB
From/To:	WB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	2349	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	653	v
Trucks and buses	23	%
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	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	1170	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1170	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	16.7	pc/mi/ln
Level of service, 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:	03/09/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 SB
From/To:	EB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	3800	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1044	v
Trucks and buses	14	%
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	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	1684	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1684	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	67.3	mi/h
Number of lanes, N	3	
Density, D	25.0	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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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 SB
From/To:	EB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	4198	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1153	v
Trucks and buses	14	%
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	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	1395	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1395	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.6	mi/h
Number of lanes, N	4	
Density, D	20.1	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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Operational Analysis

Analyst:	RJD
Agency or Company:	STV Incorporated
Date Performed:	03/09/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 NB
From/To:	WB05 Segment Exit 97-101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	6026	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1637	v
Trucks and buses	13	%
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	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	1957	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1957	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	63.4	mi/h
Number of lanes, N	4	
Density, D	30.9	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:	03/09/2017
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 NB
From/To:	WB04 Segment Exit 91-97
Jurisdiction:	Lexington/Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Flow Inputs and Adjustments

Volume, V	4110	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1117	v
Trucks and buses	13	%
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	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	1780	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	70.0	mi/h
Lane width adjustment, fLW	-	mi/h
Lateral clearance adjustment, fLC	-	mi/h
TRD adjustment	-	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and Performance Measures

Flow rate, vp	1780	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	66.1	mi/h
Number of lanes, N	3	
Density, D	26.9	pc/mi/ln
Level of service, LOS	D	

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

Appendix C

HCS Ramp Merge/Diverge Analysis Outputs

Appendix C

HCS Ramp Diverge Analysis Outputs
Existing I-26 Eastbound Off-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2158	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	99	vph
Length of first accel/decel lane	210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	283	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2158		99		283		vph
Peak-hour factor, PHF	0.88		0.83		0.96		
Peak 15-min volume, v15	613		30		74		v
Trucks and buses	16		22		8		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.752		0.893		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3041 159 330 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 2560.94 (Equation 13-12 or 13-13)

P_{FD} = 0.677 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2109 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3041	7200	No
$v_{FO} = v_F - v_R$	2882	7200	No
v_R	159	2100	No
v_3 or v_{av34}	932 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} = 2109 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2109	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 20.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.377

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 63.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2158	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	99	vph
Length of first accel/decel lane	210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	416	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3275	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2158		99		416		vph
Peak-hour factor, PHF	0.88		0.83		0.86		
Peak 15-min volume, v15	613		30		121		v
Trucks and buses	16		22		7		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.752		0.905		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3041 159 535 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.677 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2109 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3041	7200	No
$v_{FO} = v_F - v_R$	2882	7200	No
v_R	159	2100	No
v_3 or v_{av34}	932 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} = 2109 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2109	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 20.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.377

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 63.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2345	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	223	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	416	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2345		223		416		vph
Peak-hour factor, PHF	0.88		0.87		0.86		
Peak 15-min volume, v15	666		64		121		v
Trucks and buses	16		15		7		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.816		0.905		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3304 314 535 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 4345.07 (Equation 13-12 or 13-13)

P_{FD} = 0.663 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2296 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3304	7200	No
$v_{FO} = v_F - v_R$	2990	7200	No
v_R	314	2100	No
v_3 or v_{av34}	1008 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} = 2296 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2296	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 22.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.391

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 63.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2345	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	223	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	416	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2345		223		416		vph
Peak-hour factor, PHF	0.88		0.87		0.86		
Peak 15-min volume, v15	666		64		121		v
Trucks and buses	16		15		7		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.816		0.905		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3304 314 535 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 4345.07 (Equation 13-12 or 13-13)

P_{FD} = 0.663 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2296 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3304	7200	No
$v_{FO} = v_F - v_R$	2990	7200	No
v_R	314	2100	No
v_3 or v_{av34}	1008 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} = 2296 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2296	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 22.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.391

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 63.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3669	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	222	vph
Length of first accel/decel lane	1265	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1417	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3669		222		1417		vph
Peak-hour factor, PHF	0.88		0.72		0.82		
Peak 15-min volume, v15	1042		77		432		v
Trucks and buses	16		5		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.930		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5170 331 1832 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 11119.61 Equation 13-12 or 13-13)

P_{FD} = 0.626 Using Equation 6

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3360 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5170	7200	No
$v_{FO} = v_F - v_R$	4839	7200	No
v_R	331	2000	No
v_3 or v_{av34}	1810 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} = 3360 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3360	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 21.8 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 = 57.2 mph

Space mean speed in outer lanes, S_O = 73.6 mph

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3669	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	222	vph
Length of first accel/decel lane	1265	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	2340	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3150	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3669		222		2340		vph
Peak-hour factor, PHF	0.88		0.72		0.88		
Peak 15-min volume, v15	1042		77		665		v
Trucks and buses	16		5		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.930		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5170 331 2819 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.616 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3310 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5170	7200	No
$v_{FO} = v_F - v_R$	4839	7200	No
v_R	331	2000	No
v_3 or v_{av34}	1860 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} = 3310 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3310	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 21.3 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 = 57.2 mph

Space mean speed in outer lanes, S_O = 73.4 mph

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3598	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	127	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1455	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3598	127	1455	vph
Peak-hour factor, PHF	0.88	0.46	0.88	
Peak 15-min volume, v15	1022	69	413	v
Trucks and buses	16	3	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.957	0.943	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5070	289	1753	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 10582.81 Equation 13-12 or 13-13)

P_{FD} = 0.625 Using Equation 6

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3278 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5070	6900	No
$v_{FO} = v_F - v_R$	4781	6900	No
v_R	289	1900	No

v_{R3} or v_{av34} 1792 pc/h (Equation 13-14 or 13-17)

Is v_{R3} or v_{av34} > 2700 pc/h? No

Is v_{R3} or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3278 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3278	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 30.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.584

Space mean speed in ramp influence area, S_R = 49.5 mph

Space mean speed in outer lanes, S_0 = 62.7 mph

Space mean speed for all vehicles, S = 53.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3598	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	127	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	203	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3598	127	203	vph
Peak-hour factor, PHF	0.88	0.46	0.60	
Peak 15-min volume, v15	1022	69	85	v
Trucks and buses	16	3	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.957	0.930	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5070	289	364	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 413.37 (Equation 13-12 or 13-13)

P_{FD} = 0.620 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3253 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5070	6900	No
$v_{FO} = v_F - v_R$	4781	6900	No
v_R	289	1900	No

v_R or v_{av34} 1817 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} = 3253 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3253	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 30.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.584

Space mean speed in ramp influence area, S_R = 49.5 mph

Space mean speed in outer lanes, S_0 = 62.6 mph

Space mean speed for all vehicles, S = 53.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3471	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	203	vph
Length of first accel/decel lane	915	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	127	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3471	203	127	vph
Peak-hour factor, PHF	0.88	0.60	0.46	
Peak 15-min volume, v15	986	85	69	v
Trucks and buses	16	5	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.930	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4891	364	289	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.621 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3175 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4891	6900	No
$v_{FO} = v_F - v_R$	4527	6900	No
v_R	364	1900	No

v_{R3} or v_{av34} 1716 pc/h (Equation 13-14 or 13-17)

Is v_{R3} or v_{av34} > 2700 pc/h? No

Is v_{R3} or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3175 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3175	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 23.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.591

Space mean speed in ramp influence area, S_R = 49.4 mph

Space mean speed in outer lanes, S_0 = 63.0 mph

Space mean speed for all vehicles, S = 53.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3471	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	203	vph
Length of first accel/decel lane	915	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1361	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	930	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3471	203	1361	vph
Peak-hour factor, PHF	0.88	0.60	0.83	
Peak 15-min volume, v15	986	85	410	v
Trucks and buses	16	5	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.930	0.917	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4891	364	1787	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.621 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3175 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4891	6900	No
$v_{FO} = v_F - v_R$	4527	6900	No
v_R	364	1900	No

v_{R} or v_{av34} = 1716 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} = 3175 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3175	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 23.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.591

Space mean speed in ramp influence area, S_R = 49.4 mph

Space mean speed in outer lanes, S_0 = 63.0 mph

Space mean speed for all vehicles, S = 53.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2721	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	134	vph
Length of first accel/decel lane	210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	221	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2721		134		221		vph
Peak-hour factor, PHF	0.91		0.79		0.85		
Peak 15-min volume, v15	748		42		65		v
Trucks and buses	14		8		18		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.893		0.787		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3618 190 330 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 2360.95 (Equation 13-12 or 13-13)

P_{FD} = 0.661 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2455 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3618	7200	No
$v_{FO} = v_F - v_R$	3428	7200	No
v_R	190	2100	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} = 2455 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2455	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 23.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.380

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = 76.2 mph

Space mean speed for all vehicles, S = 63.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2721	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	134	vph
Length of first accel/decel lane	210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	81	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3275	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2721		134		81		vph
Peak-hour factor, PHF	0.91		0.79		0.66		
Peak 15-min volume, v15	748		42		31		v
Trucks and buses	14		8		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.893		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3618 190 141 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.661 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2455 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3618	7200	No
$v_{FO} = v_F - v_R$	3428	7200	No
v_R	190	2100	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} = 2455 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2455	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 23.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.380

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = 76.2 mph

Space mean speed for all vehicles, S = 63.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3200	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	81	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3200		230		81		vph
Peak-hour factor, PHF	0.91		0.85		0.66		
Peak 15-min volume, v15	879		68		31		v
Trucks and buses	14		16		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.806		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4255 336 141 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 983.75 (Equation 13-12 or 13-13)

P_{FD} = 0.638 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2837 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4255	7200	No
$v_{FO} = v_F - v_R$	3919	7200	No
v_R	336	2100	No
v_3 or v_{av34}	1418 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} = 2837 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2837	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 26.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.393

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = 75.2 mph

Space mean speed for all vehicles, S = 63.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3200	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1362	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2830	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3200		230		1362		vph
Peak-hour factor, PHF	0.91		0.85		0.77		
Peak 15-min volume, v15	879		68		442		v
Trucks and buses	14		16		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.806		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4255 336 1901 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.638 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2837 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4255	7200	No
$v_{FO} = v_F - v_R$	3919	7200	No
v_R	336	2100	No
v_3 or v_{av34}	1418 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} = 2837 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2837	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 26.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.393

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = 75.2 mph

Space mean speed for all vehicles, S = 63.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3800	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	761	vph
Length of first accel/decel lane	1265	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1362	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3800		761		1362		vph
Peak-hour factor, PHF	0.91		0.83		0.77		
Peak 15-min volume, v15	1044		229		442		v
Trucks and buses	14		15		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.816		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5053 1123 1901 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 18660.85 Equation 13-12 or 13-13)

P_{FD} = 0.635 Using Equation 6

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3618 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5053	7200	No
$v_{FO} = v_F - v_R$	3930	7200	No
v_R	1123	2000	No
v_3 or v_{av34}	1435 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} = 3618 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3618	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 24.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.529

Space mean speed in ramp influence area, S_R = 55.2 mph

Space mean speed in outer lanes, S_O = 75.1 mph

Space mean speed for all vehicles, S = 59.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3800	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	761	vph
Length of first accel/decel lane	1265	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1158	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3150	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3800		761		1158		vph
Peak-hour factor, PHF	0.91		0.83		0.94		
Peak 15-min volume, v15	1044		229		308		v
Trucks and buses	14		15		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.816		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5053 1123 1324 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.582 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3410 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5053	7200	No
$v_{FO} = v_F - v_R$	3930	7200	No
v_R	1123	2000	No
v_3 or v_{av34}	1643 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} = 3410 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3410	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 22.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.529

Space mean speed in ramp influence area, S_R = 55.2 mph

Space mean speed in outer lanes, S_O = 74.3 mph

Space mean speed for all vehicles, S = 60.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2609	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	105	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	720	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2609	105	720	vph
Peak-hour factor, PHF	0.91	0.94	0.94	
Peak 15-min volume, v15	717	28	191	v
Trucks and buses	14	3	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.957	0.930	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3469	117	823	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 5800.06 (Equation 13-12 or 13-13)

P_{FD} = 0.668 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2356 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3469	6900	No
$v_{FO} = v_F - v_R$	3352	6900	No
v_R	117	1900	No

v_R or v_{av34} 1113 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} = 2356 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2356	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 22.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.569

Space mean speed in ramp influence area, S_R = 49.8 mph

Space mean speed in outer lanes, S_0 = 65.4 mph

Space mean speed for all vehicles, S = 53.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2609	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	105	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	55	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2609	105	55	vph
Peak-hour factor, PHF	0.91	0.94	0.86	
Peak 15-min volume, v15	717	28	16	v
Trucks and buses	14	3	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.957	0.943	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3469	117	68	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 68.31 (Equation 13-12 or 13-13)

P_{FD} = 0.668 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2356 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3469	6900	No
$v_{FO} = v_F - v_R$	3352	6900	No
v_R	117	1900	No

v_R or v_{av34} 1113 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} = 2356 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2356	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 22.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.569

Space mean speed in ramp influence area, S_R = 49.8 mph

Space mean speed in outer lanes, S_0 = 65.4 mph

Space mean speed for all vehicles, S = 53.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2504	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	55	vph
Length of first accel/decel lane	915	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	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2504	55	105	vph
Peak-hour factor, PHF	0.91	0.86	0.94	
Peak 15-min volume, v15	688	16	28	v
Trucks and buses	14	4	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.943	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3329	68	117	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.674 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2265 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3329	6900	No
$v_{FO} = v_F - v_R$	3261	6900	No
v_R	68	1900	No

v_R or v_{av34} 1064 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} = 2265 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2265	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 15.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.564

Space mean speed in ramp influence area, S_R = 49.8 mph

Space mean speed in outer lanes, S_0 = 65.6 mph

Space mean speed for all vehicles, S = 54.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2504	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	55	vph
Length of first accel/decel lane	915	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	856	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	930	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2504	55	856	vph
Peak-hour factor, PHF	0.91	0.86	0.95	
Peak 15-min volume, v15	688	16	225	v
Trucks and buses	14	4	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.943	0.917	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3329	68	982	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.674 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2265 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3329	6900	No
$v_{FO} = v_F - v_R$	3261	6900	No
v_R	68	1900	No

v_R or v_{av34} 1064 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} = 2265 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2265	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 15.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.564

Space mean speed in ramp influence area, S_R = 49.8 mph

Space mean speed in outer lanes, S_0 = 65.6 mph

Space mean speed for all vehicles, S = 54.0 mph

Appendix C

HCS Ramp Merge Analysis Outputs
Existing I-26 Eastbound On-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1127	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	156	vph
Length of first accel/decel lane	1375	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	64	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2265	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1127	156	64	vph
Peak-hour factor, PHF	0.88	0.96	0.80	
Peak 15-min volume, v15	320	41	20	v
Trucks and buses	16	8	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.893	0.837	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1588	182	96	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1588 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1770	4800	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_{3av34} or v_{3av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1588 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1770	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 10.6 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 = 63.1 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 63.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1127	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	156	vph
Length of first accel/decel lane	1375	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	55	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1127	156	55	vph
Peak-hour factor, PHF	0.88	0.96	0.83	
Peak 15-min volume, v15	320	41	17	v
Trucks and buses	16	8	22	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.893	0.752	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1588	182	88	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_{12}(P_{FM})$ = 1588 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1770	4800	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	

```
      3     av34
Is   v  or v      > 1.5 v  /2            No
      3     av34         12
If yes, v    = 1588                   (Equation 13-15, 13-16, 13-18, or 13-19)
         12A

_______________________Flow Entering Merge Influence Area_____________________
                     Actual        Max Desirable         Violation?
     v               1770          4600                  No
      R12
_________________Level of Service Determination (if not F)____________________

Density, D = 5.475 + 0.00734 v  + 0.0078 v   - 0.00627 L   =   10.6    pc/mi/ln
          R                   R           12            A
Level of service for ramp-freeway junction areas of influence  B

_____________________________Speed Estimation_____________________________________

Intermediate speed variable,                 M  = 0.248
                                              S
Space mean speed in ramp influence area,     S  = 63.1    mph
                                              R
Space mean speed in outer lanes,             S  =  N/A    mph
                                              0
Space mean speed for all vehicles,           S  = 63.1    mph
_____________________________________________________________________________
```

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1228	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	230	vph
Length of first accel/decel lane	520	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	55	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1228	230	55	vph
Peak-hour factor, PHF	0.88	0.86	0.83	
Peak 15-min volume, v15	349	67	17	v
Trucks and buses	16	7	22	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.905	0.752	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1730	296	88	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1730 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2026	4800	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_{3av34} or v_{3av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1730 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2026	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.314	
Space mean speed in ramp influence area,	S_R = 61.2	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 61.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1228	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	230	vph
Length of first accel/decel lane	520	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	78	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1228	230	78	vph
Peak-hour factor, PHF	0.88	0.86	0.87	
Peak 15-min volume, v15	349	67	22	v
Trucks and buses	16	7	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.905	0.816	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1730	296	110	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1730 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2026	4800	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_{3av34} or v_{3av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1730 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2026	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.314	
Space mean speed in ramp influence area,	S_R = 61.2	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 61.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1380	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	901	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	78	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1380	901	78	vph
Peak-hour factor, PHF	0.88	0.82	0.87	
Peak 15-min volume, v15	392	275	22	v
Trucks and buses	16	4	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.816	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1945	1165	110	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1945 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3110	4800	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 $v_{3,av34}$ or $v_{3,av34}$ > 1.5 v_{12} /2 — No

If yes, v_{12A} = 1945 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3110	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.303

Space mean speed in ramp influence area, S_R = 61.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 61.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1380	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	901	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	138	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1380	901	138	vph
Peak-hour factor, PHF	0.88	0.82	0.72	
Peak 15-min volume, v15	392	275	48	v
Trucks and buses	16	4	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.930	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1945	1165	206	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1945 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3110	4800	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	

```
      3     av34
Is   v  or v      > 1.5 v  /2            No
      3     av34         12
If yes, v    = 1945                   (Equation 13-15, 13-16, 13-18, or 13-19)
         12A

_______________________Flow Entering Merge Influence Area_____________________
                     Actual        Max Desirable         Violation?
     v               3110          4600                  No
      R12
_________________Level of Service Determination (if not F)____________________

Density, D = 5.475 + 0.00734 v  + 0.0078 v   - 0.00627 L   =   19.8    pc/mi/ln
          R                   R           12            A
Level of service for ramp-freeway junction areas of influence  B

_____________________________Speed Estimation_____________________________________

Intermediate speed variable,                 M  = 0.303
                                              S
Space mean speed in ramp influence area,     S  = 61.5    mph
                                              R
Space mean speed in outer lanes,             S  =  N/A    mph
                                              0
Space mean speed for all vehicles,           S  = 61.5    mph
_____________________________________________________________________________
```

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2143	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	1455	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	138	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	905	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2143	1455	138	vph
Peak-hour factor, PHF	0.88	0.88	0.72	
Peak 15-min volume, v15	609	413	48	v
Trucks and buses	16	4	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.930	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3020	1753	206	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_{12}(P_{FM})$ = 3020 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4773	4800	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_{av34} /2 — No

If yes, v_{12A} = 3020 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4773	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 32.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.677

Space mean speed in ramp influence area, S_R = 51.0 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 51.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2143	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	1455	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	127	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2143	1455	127	vph
Peak-hour factor, PHF	0.88	0.88	0.46	
Peak 15-min volume, v15	609	413	69	v
Trucks and buses	16	4	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3020	1753	289	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_{12} (P_{FM})$ = 3020 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4773	4800	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_{av34} /2 No

If yes, v_{12A} = 3020 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4773	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 32.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.677

Space mean speed in ramp influence area, S_R = 51.0 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 51.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1896	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	122	vph
Length of first accel/decel lane	1375	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	88	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2265	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1896	122	88	vph
Peak-hour factor, PHF	0.91	0.85	0.74	
Peak 15-min volume, v15	521	36	30	v
Trucks and buses	14	18	18	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.787	0.787	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2521	182	151	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2521 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2703	4800	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_{av34} or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2521 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2703	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.283	
Space mean speed in ramp influence area,	S_R = 62.1	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 62.1	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1896	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	122	vph
Length of first accel/decel lane	1375	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	74	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1896	122	74	vph
Peak-hour factor, PHF	0.91	0.85	0.79	
Peak 15-min volume, v15	521	36	23	v
Trucks and buses	14	18	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.787	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2521	182	105	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2521 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2703	4800	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_{3av34} or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2521 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2703	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.283

Space mean speed in ramp influence area, S_R = 62.1 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1944	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	45	vph
Length of first accel/decel lane	520	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	74	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1944	45	74	vph
Peak-hour factor, PHF	0.91	0.66	0.79	
Peak 15-min volume, v15	534	17	23	v
Trucks and buses	14	10	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.870	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2585	78	105	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_{12}(P_{FM})$ = 2585 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		2663	4800	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_{av34} /2 — No

If yes, v_{12A} = 2585 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2663	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.0 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 = 60.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 60.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1944	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	45	vph
Length of first accel/decel lane	520	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	136	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1944	45	136	vph
Peak-hour factor, PHF	0.91	0.66	0.85	
Peak 15-min volume, v15	534	17	40	v
Trucks and buses	14	10	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.870	0.806	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2585	78	198	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2585 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2663	4800	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_{3av34} or v_{12A} > 1.5 v_{3av34} /2 No

If yes, v_{12A} = 2585 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2663	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.0 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 = 60.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 60.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1853	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	509	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	136	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1853	509	136	vph
Peak-hour factor, PHF	0.91	0.77	0.85	
Peak 15-min volume, v15	509	165	40	v
Trucks and buses	14	5	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.806	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2464	711	198	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2464 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3175	4800	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	

v_{av34}

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2464 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3175	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 = 20.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.309

Space mean speed in ramp influence area, S_R = 61.3 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 61.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1853	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	509	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	473	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1853	509	473	vph
Peak-hour factor, PHF	0.91	0.77	0.83	
Peak 15-min volume, v15	509	165	142	v
Trucks and buses	14	5	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.816	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2464	711	698	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2464 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3175	4800	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	

v_{3av34}

Is v_{3av34} or v_{12} > 1.5 v_{12A} /2 No

If yes, v_{12A} = 2464 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3175	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R12} + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.309	
Space mean speed in ramp influence area,	S_R = 61.3	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 61.3	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1889	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	720	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	473	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	905	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1889	720	473	vph
Peak-hour factor, PHF	0.91	0.94	0.83	
Peak 15-min volume, v15	519	191	142	v
Trucks and buses	14	5	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.816	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2512	823	698	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2512 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3335	4800	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_{av34} /2 — No

If yes, v_{12A} = 2512 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3335	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 21.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.326	
Space mean speed in ramp influence area,	S_R = 60.9	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 60.9	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1889	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	720	vph
Length of first accel/decel lane	1500	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	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1889	720	105	vph
Peak-hour factor, PHF	0.91	0.94	0.94	
Peak 15-min volume, v15	519	191	28	v
Trucks and buses	14	5	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2512	823	117	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2512 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3335	4800	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	

v_{av34}
Is v_3 or v_{av34} > 1.5 v_{12} /2 No

v_{av34}
If yes, v_{12A} = 2512 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3335	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 = 21.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.326

Space mean speed in ramp influence area, S_R = 60.9 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 60.9 mph

Appendix C

HCS Ramp Diverge Analysis Outputs
Existing I-26 Westbound Off-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2006	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	343	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	238	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1922	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2006	343	238	vph
Peak-hour factor, PHF	0.90	0.87	0.78	
Peak 15-min volume, v15	557	99	76	v
Trucks and buses	23	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2998	436	337	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.665 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2140 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2998	6900	No
$v_{FO} = v_F - v_R$	2562	6900	No
v_R	436	1900	No

v_R or v_{av34} = 858 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} = 2140 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2140	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 13.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.597

Space mean speed in ramp influence area, S_R = 49.2 mph

Space mean speed in outer lanes, S_0 = 65.8 mph

Space mean speed for all vehicles, S = 53.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2006	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	343	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	137	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2006	343	137	vph
Peak-hour factor, PHF	0.90	0.87	0.93	
Peak 15-min volume, v15	557	99	37	v
Trucks and buses	23	7	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.905	0.943	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2998	436	156	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.665 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2140 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2998	6900	No
$v_{FO} = v_F - v_R$	2562	6900	No
v_R	436	1900	No

v_R or v_{av34} = 858 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} = 2140 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2140	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 13.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.597

Space mean speed in ramp influence area, S_R = 49.2 mph

Space mean speed in outer lanes, S_0 = 65.8 mph

Space mean speed for all vehicles, S = 53.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2896	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	898	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	196	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2896		898		196		vph
Peak-hour factor, PHF	0.90		0.83		0.93		
Peak 15-min volume, v15	804		270		53		v
Trucks and buses	23		13		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.837		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4328 1293 223 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2616 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4328	9600	No
$v_{FO} = v_F - v_R$	3035	9600	No
v_R	1293	2000	No
v_3 or v_{av34}	856 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} = 2616 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2616	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 13.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.544

Space mean speed in ramp influence area, S_R = 54.8 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2896	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	898	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	351	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3290	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2896		898		351		vph
Peak-hour factor, PHF	0.90		0.83		0.79		
Peak 15-min volume, v15	804		270		111		v
Trucks and buses	23		13		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.837		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4328 1293 478 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2616 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4328	9600	No
$v_{FO} = v_F - v_R$	3035	9600	No
v_R	1293	2000	No
v_3 or v_{av34}	856 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} = 2616 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2616	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 13.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.544

Space mean speed in ramp influence area, S_R = 54.8 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2349	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1188	vph
Length of first accel/decel lane	1065	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	351	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2349		1188		351		vph
Peak-hour factor, PHF	0.90		0.82		0.79		
Peak 15-min volume, v15	653		362		111		v
Trucks and buses	23		16		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.806		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3510 1796 478 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 31377.16 Equation 13-12 or 13-13)

P_{FD} = 0.609 Using Equation 6

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2840 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3510	7200	No
$v_{FO} = v_F - v_R$	1714	7200	No
v_R	1796	2100	No
v_3 or v_{av34}	670 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} = 2840 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2840	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 19.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.525

Space mean speed in ramp influence area, S_R = 55.3 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 58.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2349	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1188	vph
Length of first accel/decel lane	1065	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	184	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2350	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2349		1188		184		vph
Peak-hour factor, PHF	0.90		0.82		0.94		
Peak 15-min volume, v15	653		362		49		v
Trucks and buses	23		16		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.806		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3510 1796 225 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.590 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2807 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3510	7200	No
$v_{FO} = v_F - v_R$	1714	7200	No
v_R	1796	2100	No
v_3 or v_{av34}	703 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} = 2807 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2807	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 18.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.525

Space mean speed in ramp influence area, S_R = 55.3 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 58.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1123	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	29	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	108	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1123	29	108	vph
Peak-hour factor, PHF	0.90	0.61	0.94	
Peak 15-min volume, v15	312	12	29	v
Trucks and buses	23	11	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.858	0.870	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1678	55	132	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1678 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1678	4800	No
$v_{FO} = v_F - v_R$	1623	4800	No
v_R	55	2000	No

v_R 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} = 1678 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1678	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 14.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.498

Space mean speed in ramp influence area, S_R = 56.1 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 56.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1123	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	29	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	76	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1123	29	76	vph
Peak-hour factor, PHF	0.90	0.61	0.75	
Peak 15-min volume, v15	312	12	25	v
Trucks and buses	23	11	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.858	0.837	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1678	55	121	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1678 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1678	4800	No
$v_{FO} = v_F - v_R$	1623	4800	No
v_R	55	2000	No

v_R 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} = 1678 (Equation 13-15, 13-16, 18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1678	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 14.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.498

Space mean speed in ramp influence area, S_R = 56.1 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 56.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1170	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	154	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	76	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1170	154	76	vph
Peak-hour factor, PHF	0.90	0.93	0.75	
Peak 15-min volume, v15	325	41	25	v
Trucks and buses	23	25	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.727	0.837	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1748	228	121	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1748 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1748	4800	No
$v_{FO} = v_F - v_R$	1520	4800	No
v_R	228	2100	No

v_R
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} = 1748 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1748	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 11.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.384

Space mean speed in ramp influence area, S_R = 59.3 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 59.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1170	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	154	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	113	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1170	154	113	vph
Peak-hour factor, PHF	0.90	0.93	0.83	
Peak 15-min volume, v15	325	41	34	v
Trucks and buses	23	25	37	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.727	0.643	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1748	228	212	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1748 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1748	4800	No
$v_{FO} = v_F - v_R$	1520	4800	No
v_R	228	2100	No

v_R 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} = 1748 (Equation 13-15, 13-16, 18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1748	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 11.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.384

Space mean speed in ramp influence area, S_R = 59.3 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 59.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4460	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	970	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	556	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1922	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4460	970	556	vph
Peak-hour factor, PHF	0.92	0.92	0.86	
Peak 15-min volume, v15	1212	264	162	v
Trucks and buses	13	6	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.917	0.930	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5793	1149	695	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.562 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3760 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5793	6900	No
$v_{FO} = v_F - v_R$	4644	6900	No
v_R	1149	1900	No

v_R or v_{av34} = 2033 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} = 3760 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3760	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 27.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.661

Space mean speed in ramp influence area, S_R = 48.1 mph

Space mean speed in outer lanes, S_0 = 61.8 mph

Space mean speed for all vehicles, S = 52.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4460	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	970	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	256	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4460	970	256	vph
Peak-hour factor, PHF	0.92	0.92	0.89	
Peak 15-min volume, v15	1212	264	72	v
Trucks and buses	13	6	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.917	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5793	1149	301	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.562 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3760 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5793	6900	No
$v_{FO} = v_F - v_R$	4644	6900	No
v_R	1149	1900	No

v_R
v_3 or v_{av34} 2033 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} = 3760 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3760	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 27.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.661

Space mean speed in ramp influence area, S_R = 48.1 mph

Space mean speed in outer lanes, S_0 = 61.8 mph

Space mean speed for all vehicles, S = 52.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	2189	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	366	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	6026		2189		366		vph
Peak-hour factor, PHF	0.92		0.86		0.89		
Peak 15-min volume, v15	1637		636		103		v
Trucks and buses	13		4		3		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.943		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7827 2698 430 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4032 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	9600	No
$v_{FO} = v_F - v_R$	5129	9600	No
v_R	2698	4000	No
v_3 or v_{av34}	1897 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} = 4032 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4032	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 7.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = 73.3 mph

Space mean speed for all vehicles, S = 60.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	2189	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	273	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3290	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	6026		2189		273		vph
Peak-hour factor, PHF	0.92		0.86		0.93		
Peak 15-min volume, v15	1637		636		73		v
Trucks and buses	13		4		2		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.943		0.971		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7827 2698 302 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4032 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	9600	No
$v_{FO} = v_F - v_R$	5129	9600	No
v_R	2698	4000	No
v_3 or v_{av34}	1897 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} = 4032 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4032	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 7.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = 73.3 mph

Space mean speed for all vehicles, S = 60.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4110	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1576	vph
Length of first accel/decel lane	1065	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	273	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4110		1576		273		vph
Peak-hour factor, PHF	0.92		0.93		0.93		
Peak 15-min volume, v15	1117		424		73		v
Trucks and buses	13		13		2		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.837		0.971		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5339 2025 302 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 7569.49 (Equation 13-12 or 13-13)

P_{FD} = 0.533 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3793 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5339	7200	No
$v_{FO} = v_F - v_R$	3314	7200	No
v_R	2025	2100	No
v_3 or v_{av34}	1546 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} = 3793 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3793	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 27.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.545

Space mean speed in ramp influence area, S_R = 54.7 mph

Space mean speed in outer lanes, S_O = 74.7 mph

Space mean speed for all vehicles, S = 59.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/21/2018
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4110	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1576	vph
Length of first accel/decel lane	1065	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	267	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2350	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4110		1576		267		vph
Peak-hour factor, PHF	0.92		0.93		0.69		
Peak 15-min volume, v15	1117		424		97		v
Trucks and buses	13		13		8		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.837		0.893		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5339 2025 433 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.533 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3793 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5339	7200	No
$v_{FO} = v_F - v_R$	3314	7200	No
v_R	2025	2100	No
v_3 or v_{av34}	1546 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} = 3793 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3793	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 27.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.545

Space mean speed in ramp influence area, S_R = 54.7 mph

Space mean speed in outer lanes, S_O = 74.7 mph

Space mean speed for all vehicles, S = 59.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2053	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	104	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	88	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2053	104	88	vph
Peak-hour factor, PHF	0.92	0.90	0.69	
Peak 15-min volume, v15	558	29	32	v
Trucks and buses	13	10	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.870	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2667	133	143	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2667 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2667	4800	No
$v_{FO} = v_F - v_R$	2534	4800	No
v_R	133	2000	No

v_R
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} = 2667 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2667	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 23.5 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.505
Space mean speed in ramp influence area, S_R = 55.9 mph
Space mean speed in outer lanes, S_0 = N/A mph
Space mean speed for all vehicles, S = 55.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2053	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	104	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	70	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2053	104	70	vph
Peak-hour factor, PHF	0.92	0.90	0.79	
Peak 15-min volume, v15	558	29	22	v
Trucks and buses	13	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.870	0.870	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2667	133	102	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2667 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2667	4800	No
$v_{FO} = v_F - v_R$	2534	4800	No
v_R	133	2000	No

v_R
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} = 2667 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2667	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 23.5 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.505
Space mean speed in ramp influence area, S_R = 55.9 mph
Space mean speed in outer lanes, S_0 = N/A mph
Space mean speed for all vehicles, S = 55.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2019	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	175	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	70	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2019	175	70	vph
Peak-hour factor, PHF	0.92	0.86	0.79	
Peak 15-min volume, v15	549	51	22	v
Trucks and buses	13	14	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.826	0.870	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2623	246	102	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2623 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2623	4800	No
$v_{FO} = v_F - v_R$	2377	4800	No
v_R	246	2100	No

v_R 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} = 2623 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2623	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 19.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.385

Space mean speed in ramp influence area, S_R = 59.2 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 59.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2019	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	175	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	70	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2019	175	70	vph
Peak-hour factor, PHF	0.92	0.86	0.80	
Peak 15-min volume, v15	549	51	22	v
Trucks and buses	13	14	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.826	0.743	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2623	246	118	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2623 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2623	4800	No
$v_{FO} = v_F - v_R$	2377	4800	No
v	246	2100	No

v_R
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} = 2623 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2623	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 19.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.385

Space mean speed in ramp influence area, S_R = 59.2 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 59.2 mph

Appendix C

HCS Ramp Merge Analysis Outputs
Existing I-26 Westbound On-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	1663	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	137	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	343	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1663	137	343	vph
Peak-hour factor, PHF	0.90	0.93	0.87	
Peak 15-min volume, v15	462	37	99	v
Trucks and buses	23	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.943	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2485	156	436	pcph

Estimation of V12 Merge Areas

L_{EQ} = 497.31 (Equation 13-6 or 13-7)

P_{FM} = 0.609 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1514 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2641	6900	No
v_3 or v_{av34}	971 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	

v_{av34}
Is v_3 or v_{av34} > 1.5 v_{12} /2 No
v_{av34}
If yes, v_{12A} = 1514 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2641	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R12} + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.262
Space mean speed in ramp influence area, S_R = 55.3 mph
Space mean speed in outer lanes, S_0 = 58.3 mph
Space mean speed for all vehicles, S = 56.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	1663	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	137	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	558	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1663	137	558	vph
Peak-hour factor, PHF	0.90	0.93	0.83	
Peak 15-min volume, v15	462	37	168	v
Trucks and buses	23	4	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.943	0.837	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2485	156	803	pcph

Estimation of V12 Merge Areas

L_{EQ} = 3475.51 (Equation 13-6 or 13-7)

P_{FM} = 0.609 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1514 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2641	6900	No
v_3 or v_{av34}	971 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	

v_{3av34} Is v_{3av34} or v_{12} > 1.5 v_{12A} /2 No

If yes, v_{3av34} = 1514 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2641	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.262

Space mean speed in ramp influence area, S_R = 55.3 mph

Space mean speed in outer lanes, S_0 = 58.3 mph

Space mean speed for all vehicles, S = 56.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB Loop
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1242	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	218	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	558	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1242	218	558	vph
Peak-hour factor, PHF	0.90	0.79	0.83	
Peak 15-min volume, v15	345	69	168	v
Trucks and buses	23	5	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.930	0.837	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1856	297	803	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1856 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2153	4800	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 $v_{3,av34}$ or $v_{3,av34}$ > 1.5 v_{12} /2 — No

If yes, v_{12A} = 1856 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2153	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 13.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.254

Space mean speed in ramp influence area, S_R = 62.9 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 62.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1242	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	218	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	445	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1242	218	445	vph
Peak-hour factor, PHF	0.90	0.79	0.82	
Peak 15-min volume, v15	345	69	136	v
Trucks and buses	23	5	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.930	0.806	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1856	297	673	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1856 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2153	4800	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 $v_{3,av34}$ or $v_{3,av34}$ > 1.5 v_{12} /2 — No

If yes, v_{12A} = 1856 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2153	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 13.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.254	
Space mean speed in ramp influence area,	S_R = 62.9	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 62.9	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1015	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	108	vph
Length of first accel/decel lane	1195	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	445	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1465	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1015	108	445	vph
Peak-hour factor, PHF	0.90	0.94	0.82	
Peak 15-min volume, v15	282	29	136	v
Trucks and buses	23	10	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.870	0.806	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1517	132	673	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1517 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1649	4800	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	

v_{av34}
Is v_3 or v_{av34} > 1.5 v_{12} /2 No
v_{av34}
If yes, v_{12A} = 1517 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1649	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R12} + 0.0078\ v_{12} - 0.00627\ L_A$ = 10.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.258
Space mean speed in ramp influence area, S_R = 62.8 mph
Space mean speed in outer lanes, S_0 = N/A mph
Space mean speed for all vehicles, S = 62.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1015	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	108	vph
Length of first accel/decel lane	1195	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	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1015	108	29	vph
Peak-hour factor, PHF	0.90	0.94	0.61	
Peak 15-min volume, v15	282	29	12	v
Trucks and buses	23	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.870	0.858	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1517	132	55	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1517 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1649	4800	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_{3av34} or v_{3av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1517 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1649	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 10.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.258	
Space mean speed in ramp influence area,	S_R = 62.8	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 62.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1094	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	76	vph
Length of first accel/decel lane	555	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	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1094	76	29	vph
Peak-hour factor, PHF	0.90	0.75	0.61	
Peak 15-min volume, v15	304	25	12	v
Trucks and buses	23	13	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.837	0.858	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1635	121	55	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1635 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1756	4800	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_{3av34} or v_{3av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1635 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1756	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 15.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.305

Space mean speed in ramp influence area, S_R = 61.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 61.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1094	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	76	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	154	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1094	76	154	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	291	20	41	v
Trucks and buses	23	13	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.837	0.727	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1565	97	225	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_{12}(P_{FM})$ = 1565 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1662	4800	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_{3av34} or v_{3av34} > 1.5 v_{12} /2 — No

If yes, v_{12A} = 1565 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1662	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 14.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.303

Space mean speed in ramp influence area, S_R = 61.5 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 61.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3490	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	256	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	970	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3490	256	970	vph
Peak-hour factor, PHF	0.92	0.89	0.92	
Peak 15-min volume, v15	948	72	264	v
Trucks and buses	13	3	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.957	0.917	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4533	301	1149	pcph

Estimation of V12 Merge Areas

L_{EQ} = 966.62 (Equation 13-6 or 13-7)

P_{FM} = 0.609 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2762 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4834	6900	No
v_3 or v_{av34}	1771 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	

v_{av34}

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2762 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4834	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.325

Space mean speed in ramp influence area, S_R = 54.2 mph

Space mean speed in outer lanes, S_0 = 55.4 mph

Space mean speed for all vehicles, S = 54.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3490	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	256	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1361	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3490	256	1361	vph
Peak-hour factor, PHF	0.92	0.89	0.86	
Peak 15-min volume, v15	948	72	396	v
Trucks and buses	13	3	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.957	0.943	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4533	301	1678	pcph

Estimation of V12 Merge Areas

L_{EQ} = 7262.65 (Equation 13-6 or 13-7)

P_{FM} = 0.609 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2762 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4834	6900	No
v_3 or v_{av34}	1771 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	

v_{3av34}

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2762 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4834	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.325

Space mean speed in ramp influence area, S_R = 54.2 mph

Space mean speed in outer lanes, S_0 = 55.4 mph

Space mean speed for all vehicles, S = 54.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2385	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	170	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1361	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2385	170	1361	vph
Peak-hour factor, PHF	0.92	0.93	0.86	
Peak 15-min volume, v15	648	46	396	v
Trucks and buses	13	2	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.971	0.943	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3098	188	1678	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3098 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3286	4800	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} = 3098 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3286	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_{A} =$ 22.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.324	
Space mean speed in ramp influence area,	S_R = 60.9	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 60.9	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2385	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	170	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	590	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2385	170	590	vph
Peak-hour factor, PHF	0.92	0.93	0.93	
Peak 15-min volume, v15	648	46	159	v
Trucks and buses	13	2	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.971	0.837	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3098	188	758	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3098 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3286	4800	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 $v_{3,av34}$ or $v_{3,av34}$ > 1.5 v_{12} /2 — No

If yes, v_{12A} = 3098 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3286	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.324	
Space mean speed in ramp influence area,	S_R = 60.9	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 60.9	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1965	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	88	vph
Length of first accel/decel lane	1195	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	590	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1465	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1965	88	590	vph
Peak-hour factor, PHF	0.92	0.69	0.93	
Peak 15-min volume, v15	534	32	159	v
Trucks and buses	13	8	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.893	0.837	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2552	143	758	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2552 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2695	4800	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_{av34} /2 No

If yes, v_{12A} = 2552 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2695	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.295

Space mean speed in ramp influence area, S_R = 61.7 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 61.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1965	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	88	vph
Length of first accel/decel lane	1195	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	104	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1965	88	104	vph
Peak-hour factor, PHF	0.92	0.69	0.90	
Peak 15-min volume, v15	534	32	29	v
Trucks and buses	13	8	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.893	0.870	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2552	143	133	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2552 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2695	4800	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_{av34} /2 No

If yes, v_{12A} = 2552 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2695	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.295	
Space mean speed in ramp influence area,	S_R = 61.7	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 61.7	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1949	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	70	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	104	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1949	70	104	vph
Peak-hour factor, PHF	0.92	0.79	0.90	
Peak 15-min volume, v15	530	22	29	v
Trucks and buses	13	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.870	0.870	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2532	102	133	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2532 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2634	4800	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_{av34} /2 No

If yes, v_{12A} = 2532 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2634	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.336

Space mean speed in ramp influence area, S_R = 60.6 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 60.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/08/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2016
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1949	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	70	vph
Length of first accel/decel lane	555	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	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1949	70	175	vph
Peak-hour factor, PHF	0.92	0.79	0.86	
Peak 15-min volume, v15	530	22	51	v
Trucks and buses	13	10	14	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.870	0.826	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2532	102	246	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2532 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2634	4800	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_{av34} /2 No

If yes, v_{12A} = 2532 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2634	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.336	
Space mean speed in ramp influence area,	S_R = 60.6	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 60.6	mph

Appendix C

HCS Ramp Diverge Analysis Outputs
2040 No-Build I-26 Eastbound Off-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1861	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	116	vph
Length of first accel/decel lane	875	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	283	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2265	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1861		116		283		vph
Peak-hour factor, PHF	0.88		0.80		0.96		
Peak 15-min volume, v15	529		36		74		v
Trucks and buses	16		13		8		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.837		0.893		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2622 173 330 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2622 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2622	4800	No
$v_{FO} = v_F - v_R$	2449	4800	No
v_R	173	2100	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} = 2622 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2622	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 18.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.379	
Space mean speed in ramp influence area,	S_R = 59.4	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 59.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1861	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	116	vph
Length of first accel/decel lane	875	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)	1861		116			vph
Peak-hour factor, PHF	0.88		0.80			
Peak 15-min volume, v15	529		36			v
Trucks and buses	16		13			%
Recreational vehicles	0		0			%
Terrain type:	Rolling		Rolling			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	2.5		2.5			
Recreational vehicle PCE, ER	2.0		2.0			
Heavy vehicle adjustment, fHV	0.806		0.837			
Driver population factor, fP	1.00		1.00			

Flow rate, vp 2622 173 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2622 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2622	4800	No
$v_{FO} = v_F - v_R$	2449	4800	No
v_R	173	2100	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} = 2622 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2622	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 18.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.379	
Space mean speed in ramp influence area,	S_R = 59.4	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 59.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2158	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	99	vph
Length of first accel/decel lane	405	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	416	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2158		99		416		vph
Peak-hour factor, PHF	0.88		0.83		0.86		
Peak 15-min volume, v15	613		30		121		v
Trucks and buses	16		22		7		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.752		0.905		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3041 159 535 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3041 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3041	4800	No
$v_{FO} = v_F - v_R$	2882	4800	No
v_R	159	2100	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} = 3041 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3041	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 26.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.377

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 59.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2158	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	99	vph
Length of first accel/decel lane	405	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	283	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2158		99		283		vph
Peak-hour factor, PHF	0.88		0.83		0.96		
Peak 15-min volume, v15	613		30		74		v
Trucks and buses	16		22		8		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.752		0.893		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3041 159 330 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3041 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3041	4800	No
$v_{FO} = v_F - v_R$	2882	4800	No
v_R	159	2100	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} = 3041 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3041	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 26.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.377

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 59.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2345	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	223	vph
Length of first accel/decel lane	995	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1417	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2345		223		1417		vph
Peak-hour factor, PHF	0.88		0.87		0.82		
Peak 15-min volume, v15	666		64		432		v
Trucks and buses	16		15		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.816		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3304 314 1832 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3304 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3304	4800	No
$v_{FO} = v_F - v_R$	2990	4800	No
v_R	314	2100	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} = 3304 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3304	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 23.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.391

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 59.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2345	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	223	vph
Length of first accel/decel lane	995	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	416	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2345		223		416		vph
Peak-hour factor, PHF	0.88		0.87		0.86		
Peak 15-min volume, v15	666		64		121		v
Trucks and buses	16		15		7		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.816		0.905		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3304 314 535 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3304 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3304	4800	No
$v_{FO} = v_F - v_R$	2990	4800	No
v_R	314	2100	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} = 3304 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3304	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 23.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.391

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 59.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3669	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	222	vph
Length of first accel/decel lane	970	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	2340	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	905	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3669		222		2340		vph
Peak-hour factor, PHF	0.88		0.72		0.88		
Peak 15-min volume, v15	1042		77		665		v
Trucks and buses	16		5		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.930		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5170 331 2819 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5170 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5170	4800	Yes
$v_{FO} = v_F - v_R$	4839	4800	Yes
v_R	331	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} = 5170 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	5170	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 40.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.458

Space mean speed in ramp influence area, S_R = 57.2 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 57.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3669	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	222	vph
Length of first accel/decel lane	970	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1417	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3669		222		1417		vph
Peak-hour factor, PHF	0.88		0.72		0.82		
Peak 15-min volume, v15	1042		77		432		v
Trucks and buses	16		5		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.930		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5170 331 1832 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5170 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5170	4800	Yes
$v_{FO} = v_F - v_R$	4839	4800	Yes
v_R	331	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} = 5170 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	5170	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 40.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.458

Space mean speed in ramp influence area, S_R = 57.2 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 57.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5788	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	182	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	291	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	5788		182		291		vph
Peak-hour factor, PHF	0.88		0.46		0.60		
Peak 15-min volume, v15	1644		99		121		v
Trucks and buses	16		3		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.957		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 8156 413 521 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 708.16 (Equation 13-12 or 13-13)

P_{FD} = 0.537 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4572 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	8156	6900	Yes
$v_{FO} = v_F - v_R$	7743	6900	Yes
v_R	413	1900	No
v_3 or v_{av34}	3584 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} = 5456 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	5456	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 49.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.595

Space mean speed in ramp influence area, S_R = 49.3 mph

Space mean speed in outer lanes, S_O = 59.2 mph

Space mean speed for all vehicles, S = 52.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5606	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	291	vph
Length of first accel/decel lane	915	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1946	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	930	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	5606		291		1946		vph
Peak-hour factor, PHF	0.88		0.60		0.83		
Peak 15-min volume, v15	1593		121		586		v
Trucks and buses	16		5		6		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.930		0.917		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7899 521 2556 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.539 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4494 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7899	6900	Yes
$v_{FO} = v_F - v_R$	7378	6900	Yes
v_R	521	1900	No
v_3 or v_{av34}	3405 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} = 5199 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	5199	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 40.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.605

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = 59.2 mph

Space mean speed for all vehicles, S = 52.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5606	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	291	vph
Length of first accel/decel lane	915	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	182	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	5606		291		182		vph
Peak-hour factor, PHF	0.88		0.60		0.46		
Peak 15-min volume, v15	1593		121		99		v
Trucks and buses	16		5		3		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.930		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7899 521 413 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.539 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4494 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7899	6900	Yes
$v_{FO} = v_F - v_R$	7378	6900	Yes
v_R	521	1900	No
v_3 or v_{av34}	3405 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} = 5199 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	5199	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 40.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.605

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = 59.2 mph

Space mean speed for all vehicles, S = 52.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5788	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	182	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	2340	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	5788		182		2340		vph
Peak-hour factor, PHF	0.88		0.46		0.88		
Peak 15-min volume, v15	1644		99		665		v
Trucks and buses	16		3		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.957		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 8156 413 2819 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 12407.57 Equation 13-12 or 13-13)

P_{FD} = 0.537 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4572 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	8156	6900	Yes
$v_{FO} = v_F - v_R$	7743	6900	Yes
v_R	413	1900	No
v_3 or v_{av34}	3584 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 Yes

If yes, v_{12A} = 5456 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	5456	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 49.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.595

Space mean speed in ramp influence area, S_R = 49.3 mph

Space mean speed in outer lanes, S_O = 59.2 mph

Space mean speed for all vehicles, S = 52.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3191	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	160	vph
Length of first accel/decel lane	875	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	221	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2265	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3191		160		221		vph
Peak-hour factor, PHF	0.91		0.74		0.85		
Peak 15-min volume, v15	877		54		65		v
Trucks and buses	14		18		18		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.787		0.787		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4243 275 330 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4243 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4243	4800	No
$v_{FO} = v_F - v_R$	3968	4800	No
v_R	275	2100	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} = 4243 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4243	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 32.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.388

Space mean speed in ramp influence area, S_R = 59.1 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 59.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3191	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	160	vph
Length of first accel/decel lane	875	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)	3191		160			vph
Peak-hour factor, PHF	0.91		0.74			
Peak 15-min volume, v15	877		54			v
Trucks and buses	14		18			%
Recreational vehicles	0		0			%
Terrain type:	Rolling		Rolling			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	2.5		2.5			
Recreational vehicle PCE, ER	2.0		2.0			
Heavy vehicle adjustment, fHV	0.826		0.787			
Driver population factor, fP	1.00		1.00			

Flow rate, vp 4243 275 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4243 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4243	4800	No
$v_{FO} = v_F - v_R$	3968	4800	No
v_R	275	2100	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} = 4243 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4243	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 32.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.388

Space mean speed in ramp influence area, S_R = 59.1 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 59.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2721	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	134	vph
Length of first accel/decel lane	405	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	81	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2721		134		81		vph
Peak-hour factor, PHF	0.91		0.79		0.66		
Peak 15-min volume, v15	748		42		31		v
Trucks and buses	14		8		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.893		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3618 190 141 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3618 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3618	4800	No
$v_{FO} = v_F - v_R$	3428	4800	No
v_R	190	2100	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} = 3618 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3618	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 31.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.380

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 59.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2721	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	134	vph
Length of first accel/decel lane	405	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	221	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2721		134		221		vph
Peak-hour factor, PHF	0.91		0.79		0.85		
Peak 15-min volume, v15	748		42		65		v
Trucks and buses	14		8		18		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.893		0.787		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3618 190 330 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3618 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3618	4800	No
$v_{FO} = v_F - v_R$	3428	4800	No
v_R	190	2100	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} = 3618 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3618	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 31.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.380

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 59.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3200	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	995	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1362	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3200		230		1362		vph
Peak-hour factor, PHF	0.91		0.85		0.77		
Peak 15-min volume, v15	879		68		442		v
Trucks and buses	14		16		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.806		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4255 336 1901 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4255 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4255	4800	No
$v_{FO} = v_F - v_R$	3919	4800	No
v_R	336	2100	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} = 4255 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4255	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 31.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.393

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 59.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3200	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	995	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	81	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3200		230		81		vph
Peak-hour factor, PHF	0.91		0.85		0.66		
Peak 15-min volume, v15	879		68		31		v
Trucks and buses	14		16		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.806		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4255 336 141 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4255 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4255	4800	No
$v_{FO} = v_F - v_R$	3919	4800	No
v_R	336	2100	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} = 4255 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4255	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 31.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.393

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 59.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3800	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	761	vph
Length of first accel/decel lane	970	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1158	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	905	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3800		761		1158		vph
Peak-hour factor, PHF	0.91		0.83		0.94		
Peak 15-min volume, v15	1044		229		308		v
Trucks and buses	14		15		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.816		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5053 1123 1324 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5053 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5053	4800	Yes
$v_{FO} = v_F - v_R$	3930	4800	No
v_R	1123	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} = 5053 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	5053	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 39.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.529

Space mean speed in ramp influence area, S_R = 55.2 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 55.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3800	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	761	vph
Length of first accel/decel lane	970	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1362	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3800		761		1362		vph
Peak-hour factor, PHF	0.91		0.83		0.77		
Peak 15-min volume, v15	1044		229		442		v
Trucks and buses	14		15		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.816		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5053 1123 1901 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5053 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5053	4800	Yes
$v_{FO} = v_F - v_R$	3930	4800	No
v_R	1123	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} = 5053 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	5053	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 39.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.529	
Space mean speed in ramp influence area,	S_R = 55.2	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 55.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4198	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	151	vph
Length of first accel/decel lane	225	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	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4198		151		79		vph
Peak-hour factor, PHF	0.91		0.94		0.86		
Peak 15-min volume, v15	1153		40		23		v
Trucks and buses	14		3		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.957		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5582 168 97 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 106.74 (Equation 13-12 or 13-13)

P_{FD} = 0.613 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3485 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5582	6900	No
$v_{FO} = v_F - v_R$	5414	6900	No
v_R	168	1900	No
v_3 or v_{av34}	2097 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} = 3485 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3485	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 32.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.573

Space mean speed in ramp influence area, S_R = 49.7 mph

Space mean speed in outer lanes, S_O = 61.5 mph

Space mean speed for all vehicles, S = 53.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4047	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	79	vph
Length of first accel/decel lane	915	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1224	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	930	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4047		79		1224		vph
Peak-hour factor, PHF	0.91		0.86		0.95		
Peak 15-min volume, v15	1112		23		322		v
Trucks and buses	14		4		6		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.943		0.917		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5381 97 1404 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.621 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3378 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5381	6900	No
$v_{FO} = v_F - v_R$	5284	6900	No
v_R	97	1900	No
v_3 or v_{av34}	2003 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} = 3378 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3378	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 25.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.567

Space mean speed in ramp influence area, S_R = 49.8 mph

Space mean speed in outer lanes, S_O = 61.9 mph

Space mean speed for all vehicles, S = 53.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4047	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	79	vph
Length of first accel/decel lane	915	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	151	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4047		79		151		vph
Peak-hour factor, PHF	0.91		0.86		0.94		
Peak 15-min volume, v15	1112		23		40		v
Trucks and buses	14		4		3		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.943		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5381 97 168 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.621 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3378 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5381	6900	No
$v_{FO} = v_F - v_R$	5284	6900	No
v_R	97	1900	No
v_3 or v_{av34}	2003 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} = 3378 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3378	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 25.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.567

Space mean speed in ramp influence area, S_R = 49.8 mph

Space mean speed in outer lanes, S_O = 61.9 mph

Space mean speed for all vehicles, S = 53.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4198	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	151	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1158	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4198		151		1158		vph
Peak-hour factor, PHF	0.91		0.94		0.94		
Peak 15-min volume, v15	1153		40		308		v
Trucks and buses	14		3		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.957		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5582 168 1324 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 7094.71 (Equation 13-12 or 13-13)

P_{FD} = 0.613 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3485 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5582	6900	No
$v_{FO} = v_F - v_R$	5414	6900	No
v_R	168	1900	No
v_3 or v_{av34}	2097 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} = 3485 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3485	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 32.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.573

Space mean speed in ramp influence area, S_R = 49.7 mph

Space mean speed in outer lanes, S_O = 61.5 mph

Space mean speed for all vehicles, S = 53.6 mph

Appendix C

HCS Ramp Diverge Analysis Outputs
2040 No-Build I-26 Westbound Off-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1430	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	279	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	205	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1430		279		205		vph
Peak-hour factor, PHF	0.90		0.93		0.83		
Peak 15-min volume, v15	397		75		62		v
Trucks and buses	23		25		37		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.727		0.643		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2137 412 384 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2137 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2137	4800	No
$v_{FO} = v_F - v_R$	1725	4800	No
v_R	412	2100	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} = 2137 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2137	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 15.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.400

Space mean speed in ramp influence area, S_R = 58.8 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 58.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1430	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	279	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	137	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1430		279		137		vph
Peak-hour factor, PHF	0.90		0.93		0.75		
Peak 15-min volume, v15	397		75		46		v
Trucks and buses	23		25		13		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.727		0.837		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2137 412 218 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2137 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2137	4800	No
$v_{FO} = v_F - v_R$	1725	4800	No
v_R	412	2100	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} = 2137 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2137	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 15.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.400

Space mean speed in ramp influence area, S_R = 58.8 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 58.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1345	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	52	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	137	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1345		52		137		vph
Peak-hour factor, PHF	0.90		0.61		0.75		
Peak 15-min volume, v15	374		21		46		v
Trucks and buses	23		11		13		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.858		0.837		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2010 99 218 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2010 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2010	4800	No
$v_{FO} = v_F - v_R$	1911	4800	No
v_R	99	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} = 2010 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2010	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 17.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.502

Space mean speed in ramp influence area, S_R = 55.9 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 55.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1345	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	52	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	184	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1345		52		184		vph
Peak-hour factor, PHF	0.90		0.61		0.94		
Peak 15-min volume, v15	374		21		49		v
Trucks and buses	23		11		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.858		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2010 99 225 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2010 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2010	4800	No
$v_{FO} = v_F - v_R$	1911	4800	No
v_R	99	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} = 2010 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2010	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 17.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.502

Space mean speed in ramp influence area, S_R = 55.9 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 55.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2349	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1188	vph
Length of first accel/decel lane	1150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	184	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1465	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2349		1188		184		vph
Peak-hour factor, PHF	0.90		0.82		0.94		
Peak 15-min volume, v15	653		362		49		v
Trucks and buses	23		16		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.806		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3510 1796 225 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3510 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3510	4800	No
$v_{FO} = v_F - v_R$	1714	4800	No
v_R	1796	2100	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} = 3510 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3510	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 24.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.525

Space mean speed in ramp influence area, S_R = 55.3 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 55.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2349	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1188	vph
Length of first accel/decel lane	1150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	351	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2349		1188		351		vph
Peak-hour factor, PHF	0.90		0.82		0.79		
Peak 15-min volume, v15	653		362		111		v
Trucks and buses	23		16		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.806		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3510 1796 478 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3510 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3510	4800	No
$v_{FO} = v_F - v_R$	1714	4800	No
v_R	1796	2100	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} = 3510 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3510	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 24.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.525

Space mean speed in ramp influence area, S_R = 55.3 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 55.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2896	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	898	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	351	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2896		898		351		vph
Peak-hour factor, PHF	0.90		0.83		0.79		
Peak 15-min volume, v15	804		270		111		v
Trucks and buses	23		13		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.837		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4328 1293 478 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4328 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4328	4800	No
$v_{FO} = v_F - v_R$	3035	4800	No
v_R	1293	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} = 4328 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4328	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 30.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.544

Space mean speed in ramp influence area, S_R = 54.8 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 54.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2896	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	898	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	196	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2896		898		196		vph
Peak-hour factor, PHF	0.90		0.83		0.93		
Peak 15-min volume, v15	804		270		53		v
Trucks and buses	23		13		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.837		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4328 1293 223 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4328 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4328	4800	No
$v_{FO} = v_F - v_R$	3035	4800	No
v_R	1293	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} = 4328 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4328	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 30.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.544

Space mean speed in ramp influence area, S_R = 54.8 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 54.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3191	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	491	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	196	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3191		491		196		vph
Peak-hour factor, PHF	0.90		0.87		0.93		
Peak 15-min volume, v15	886		141		53		v
Trucks and buses	23		7		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.905		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4769 624 223 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.612 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3161 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4769	6900	No
$v_{FO} = v_F - v_R$	4145	6900	No
v_R	624	1900	No
v_3 or v_{av34}	1608 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} = 3161 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3161	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 22.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.614

Space mean speed in ramp influence area, S_R = 48.9 mph

Space mean speed in outer lanes, S_O = 63.4 mph

Space mean speed for all vehicles, S = 53.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3191	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	491	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	341	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1922	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3191		491		341		vph
Peak-hour factor, PHF	0.90		0.87		0.78		
Peak 15-min volume, v15	886		141		109		v
Trucks and buses	23		7		7		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.905		0.905		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4769 624 483 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.612 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3161 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4769	6900	No
$v_{FO} = v_F - v_R$	4145	6900	No
v_R	624	1900	No
v_3 or v_{av34}	1608 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} = 3161 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3161	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 22.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.614

Space mean speed in ramp influence area, S_R = 48.9 mph

Space mean speed in outer lanes, S_O = 63.4 mph

Space mean speed for all vehicles, S = 53.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2740	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	317	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	127	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2740		317		127		vph
Peak-hour factor, PHF	0.92		0.86		0.80		
Peak 15-min volume, v15	745		92		40		v
Trucks and buses	13		14		23		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.826		0.743		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3559 446 214 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3559 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3559	4800	No
$v_{FO} = v_F - v_R$	3113	4800	No
v_R	446	2100	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} = 3559 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3559	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 27.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.403

Space mean speed in ramp influence area, S_R = 58.7 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 58.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2740	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	317	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	127	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2740		317		127		vph
Peak-hour factor, PHF	0.92		0.86		0.79		
Peak 15-min volume, v15	745		92		40		v
Trucks and buses	13		14		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.826		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3559 446 185 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3559 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3559	4800	No
$v_{FO} = v_F - v_R$	3113	4800	No
v_R	446	2100	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} = 3559 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3559	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 27.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.403

Space mean speed in ramp influence area, S_R = 58.7 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 58.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2801	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	188	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	127	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2801		188		127		vph
Peak-hour factor, PHF	0.92		0.90		0.79		
Peak 15-min volume, v15	761		52		40		v
Trucks and buses	13		10		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.870		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3638 240 185 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3638 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3638	4800	No
$v_{FO} = v_F - v_R$	3398	4800	No
v_R	240	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} = 3638 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3638	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, v_{12} - L_D$ = 31.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.515

Space mean speed in ramp influence area, S_R = 55.6 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 55.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2801	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	188	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	267	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2801		188		267		vph
Peak-hour factor, PHF	0.92		0.90		0.69		
Peak 15-min volume, v15	761		52		97		v
Trucks and buses	13		10		8		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.870		0.893		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3638 240 433 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3638 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3638	4800	No
$v_{FO} = v_F - v_R$	3398	4800	No
v_R	240	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} = 3638 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3638	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 31.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.515

Space mean speed in ramp influence area, S_R = 55.6 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 55.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4110	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1576	vph
Length of first accel/decel lane	1150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	267	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1465	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4110		1576		267		vph
Peak-hour factor, PHF	0.92		0.93		0.69		
Peak 15-min volume, v15	1117		424		97		v
Trucks and buses	13		13		8		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.837		0.893		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5339 2025 433 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5339 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5339	4800	Yes
$v_{FO} = v_F - v_R$	3314	4800	No
v_R	2025	2100	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} = 5339 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	5339	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 39.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.545

Space mean speed in ramp influence area, S_R = 54.7 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 54.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4110	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1576	vph
Length of first accel/decel lane	1150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	273	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4110		1576		273		vph
Peak-hour factor, PHF	0.92		0.93		0.93		
Peak 15-min volume, v15	1117		424		73		v
Trucks and buses	13		13		2		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.837		0.971		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5339 2025 302 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5339 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5339	4800	Yes
$v_{FO} = v_F - v_R$	3314	4800	No
v_R	2025	2100	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} = 5339 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	5339	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 39.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.545

Space mean speed in ramp influence area, S_R = 54.7 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 54.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	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	2189	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	273	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	6026		2189		273		vph
Peak-hour factor, PHF	0.92		0.86		0.93		
Peak 15-min volume, v15	1637		636		73		v
Trucks and buses	13		4		2		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.943		0.971		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7827 2698 302 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 7827 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	4800	Yes
$v_{FO} = v_F - v_R$	5129	4800	Yes
v_R	2698	2000	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} = 7827 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	7827	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 60.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 51.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	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	2189	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	366	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	6026		2189		366		vph
Peak-hour factor, PHF	0.92		0.86		0.89		
Peak 15-min volume, v15	1637		636		103		v
Trucks and buses	13		4		3		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.943		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7827 2698 430 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 7827 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	4800	Yes
$v_{FO} = v_F - v_R$	5129	4800	Yes
v_R	2698	2000	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} = 7827 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	7827	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 60.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 51.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	7047	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	1387	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	366	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	7047		1387		366		vph
Peak-hour factor, PHF	0.92		0.92		0.89		
Peak 15-min volume, v15	1915		377		103		v
Trucks and buses	13		6		3		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.917		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 9153 1643 430 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.456 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5065 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	9153	6900	Yes
$v_{FO} = v_F - v_R$	7510	6900	Yes
v_R	1643	1900	No
v_3 or v_{av34}	4088 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} = 6453 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	6453	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 50.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.706

Space mean speed in ramp influence area, S_R = 47.3 mph

Space mean speed in outer lanes, S_O = 59.2 mph

Space mean speed for all vehicles, S = 50.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	7047	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	1387	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	795	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1922	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	7047		1387		795		vph
Peak-hour factor, PHF	0.92		0.92		0.86		
Peak 15-min volume, v15	1915		377		231		v
Trucks and buses	13		6		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.917		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 9153 1643 994 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.456 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5065 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	9153	6900	Yes
$v_{FO} = v_F - v_R$	7510	6900	Yes
v_R	1643	1900	No
v_3 or v_{av34}	4088 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} = 6453 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	6453	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 50.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.706

Space mean speed in ramp influence area, S_R = 47.3 mph

Space mean speed in outer lanes, S_O = 59.2 mph

Space mean speed for all vehicles, S = 50.3 mph

Appendix C

HCS Ramp Merge Analysis Outputs
2040 No-Build I-26 Eastbound On-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1745	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	283	vph
Length of first accel/decel lane	1375	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	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1745	283	99	vph
Peak-hour factor, PHF	0.88	0.96	0.83	
Peak 15-min volume, v15	496	74	30	v
Trucks and buses	16	8	22	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.893	0.752	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2459 330 159 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2459 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2789	4800	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} = 2459 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2789	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 18.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.288

Space mean speed in ramp influence area, S_R = 61.9 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1745	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	283	vph
Length of first accel/decel lane	1375	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	116	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2265	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1745	283	116	vph
Peak-hour factor, PHF	0.88	0.96	0.80	
Peak 15-min volume, v15	496	74	36	v
Trucks and buses	16	8	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.893	0.837	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2459 330 173 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2459 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2789	4800	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} = 2459 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2789	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.288

Space mean speed in ramp influence area, S_R = 61.9 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2059	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	416	vph
Length of first accel/decel lane	520	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	223	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2059	416	223	vph
Peak-hour factor, PHF	0.88	0.86	0.87	
Peak 15-min volume, v15	585	121	64	v
Trucks and buses	16	7	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.905	0.816	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2901 535 314 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2901 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3436	4800	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} = 2901 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3436	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 28.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.406	
Space mean speed in ramp influence area,	S_R = 58.6	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 58.6	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2059	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	416	vph
Length of first accel/decel lane	520	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	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2059	416	99	vph
Peak-hour factor, PHF	0.88	0.86	0.83	
Peak 15-min volume, v15	585	121	30	v
Trucks and buses	16	7	22	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.905	0.752	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2901 535 159 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2901 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3436	4800	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} = 2901 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3436	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 28.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.406	
Space mean speed in ramp influence area,	S_R = 58.6	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 58.6	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2252	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	1417	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	222	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2252	1417	222	vph
Peak-hour factor, PHF	0.88	0.82	0.72	
Peak 15-min volume, v15	640	432	77	v
Trucks and buses	16	4	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.930	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3173 1832 331 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3173 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5005	4800	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} = 3173 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	5005	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 34.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.798

Space mean speed in ramp influence area, S_R = 47.7 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 47.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2252	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	1417	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	223	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2252	1417	223	vph
Peak-hour factor, PHF	0.88	0.82	0.87	
Peak 15-min volume, v15	640	432	64	v
Trucks and buses	16	4	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.816	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3173 1832 314 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3173 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5005	4800	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} = 3173 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	5005	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 34.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.798

Space mean speed in ramp influence area, S_R = 47.7 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 47.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3447	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	2340	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	182	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3447	2340	182	vph
Peak-hour factor, PHF	0.88	0.88	0.46	
Peak 15-min volume, v15	979	665	99	v
Trucks and buses	16	4	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4857 2819 413 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4857 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7676	4800	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} = 4857 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	7676	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 54.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 8.624

Space mean speed in ramp influence area, S_R = -171.5 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3447	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	2340	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	222	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	905	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3447	2340	222	vph
Peak-hour factor, PHF	0.88	0.88	0.72	
Peak 15-min volume, v15	979	665	77	v
Trucks and buses	16	4	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.930	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4857 2819 331 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4857 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7676	4800	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} = 4857 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	7676	4600	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 54.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 8.624

Space mean speed in ramp influence area, S_R = -171.5 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3031	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	221	vph
Length of first accel/decel lane	1375	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	134	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3031	221	134	vph
Peak-hour factor, PHF	0.91	0.85	0.79	
Peak 15-min volume, v15	833	65	42	v
Trucks and buses	14	18	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.787	0.893	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4030 330 190 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4030 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4360	4800	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} = 4030 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4360	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 30.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.530

Space mean speed in ramp influence area, S_R = 55.2 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 55.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3031	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	221	vph
Length of first accel/decel lane	1375	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	160	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2265	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3031	221	160	vph
Peak-hour factor, PHF	0.91	0.85	0.74	
Peak 15-min volume, v15	833	65	54	v
Trucks and buses	14	18	18	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.787	0.787	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4030 330 275 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4030 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4360	4800	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} = 4030 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4360	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 30.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.530	
Space mean speed in ramp influence area,	S_R = 55.2	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 55.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2587	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	81	vph
Length of first accel/decel lane	520	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2587	81	230	vph
Peak-hour factor, PHF	0.91	0.66	0.85	
Peak 15-min volume, v15	711	31	68	v
Trucks and buses	14	10	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.870	0.806	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3440 141 336 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3440 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3581	4800	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} = 3440 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3581	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 30.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.425

Space mean speed in ramp influence area, S_R = 58.1 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 58.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2587	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	81	vph
Length of first accel/decel lane	520	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	134	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2587	81	134	vph
Peak-hour factor, PHF	0.91	0.66	0.79	
Peak 15-min volume, v15	711	31	42	v
Trucks and buses	14	10	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.870	0.893	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3440 141 190 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM}) =$ 3440 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3581	4800	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} = 3440 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3581	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 30.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.425	
Space mean speed in ramp influence area,	S_R = 58.1	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 58.1	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2438	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	1362	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	761	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2438	1362	761	vph
Peak-hour factor, PHF	0.91	0.77	0.83	
Peak 15-min volume, v15	670	442	229	v
Trucks and buses	14	5	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.816	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3242 1901 1123 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3242 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5143	4800	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} = 3242 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	5143	4600	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 35.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.884

Space mean speed in ramp influence area, S_R = 45.3 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 45.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2438	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	1362	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2438	1362	230	vph
Peak-hour factor, PHF	0.91	0.77	0.85	
Peak 15-min volume, v15	670	442	68	v
Trucks and buses	14	5	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.806	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3242 1901 336 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3242 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5143	4800	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} = 3242 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	5143	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 35.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.884	
Space mean speed in ramp influence area,	S_R = 45.3	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 45.3	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3039	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	1158	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	151	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3039	1158	151	vph
Peak-hour factor, PHF	0.91	0.94	0.94	
Peak 15-min volume, v15	835	308	40	v
Trucks and buses	14	5	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4041 1324 168 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4041 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5365	4800	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} = 4041 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	5365	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 37.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 1.050

Space mean speed in ramp influence area, S_R = 40.6 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 40.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3039	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	1158	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	761	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	905	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3039	1158	761	vph
Peak-hour factor, PHF	0.91	0.94	0.83	
Peak 15-min volume, v15	835	308	229	v
Trucks and buses	14	5	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.816	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4041 1324 1123 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4041 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5365	4800	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} = 4041 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	5365	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 37.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 1.050

Space mean speed in ramp influence area, S_R = 40.6 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 40.6 mph

Appendix C

HCS Ramp Merge Analysis Outputs
2040 No-Build I-26 Westbound On-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1613	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	205	vph
Length of first accel/decel lane	1300	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)	1613	205		vph
Peak-hour factor, PHF	0.90	0.83		
Peak 15-min volume, v15	448	62		v
Trucks and buses	23	37		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Rolling		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5		
Recreational vehicle PCE, ER	2.0	2.0		
Heavy vehicle adjustment, fHV	0.743	0.643		
Driver population factor, fP	1.00	1.00		

Flow rate, vp 2411 384 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2411 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2795	4800	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} = 2411 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2795	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 18.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.294	
Space mean speed in ramp influence area,	S_R = 61.8	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1613	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	205	vph
Length of first accel/decel lane	1300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	279	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1613	205	279	vph
Peak-hour factor, PHF	0.90	0.83	0.93	
Peak 15-min volume, v15	448	62	75	v
Trucks and buses	23	37	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.643	0.727	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2411 384 412 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2411 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2795	4800	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} = 2411 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2795	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.294	
Space mean speed in ramp influence area,	S_R = 61.8	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1293	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	137	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	279	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1293	137	279	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	344	36	74	v
Trucks and buses	23	13	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.837	0.727	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1850 174 408 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1850 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2024	4800	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} = 1850 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2024	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.312	
Space mean speed in ramp influence area,	S_R = 61.3	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.3	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1293	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	137	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	52	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1293	137	52	vph
Peak-hour factor, PHF	0.90	0.75	0.61	
Peak 15-min volume, v15	359	46	21	v
Trucks and buses	23	13	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.837	0.858	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1932 218 99 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1932 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2150	4800	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} = 1932 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2150	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.316	
Space mean speed in ramp influence area,	S_R = 61.2	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1161	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	184	vph
Length of first accel/decel lane	1195	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	52	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1161	184	52	vph
Peak-hour factor, PHF	0.90	0.94	0.61	
Peak 15-min volume, v15	323	49	21	v
Trucks and buses	23	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.870	0.858	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1735 225 99 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1735 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1960	4800	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} = 1735 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1960	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 13.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.265	
Space mean speed in ramp influence area,	S_R = 62.6	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 62.6	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1161	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	184	vph
Length of first accel/decel lane	1195	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1188	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1465	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1161	184	1188	vph
Peak-hour factor, PHF	0.90	0.94	0.82	
Peak 15-min volume, v15	323	49	362	v
Trucks and buses	23	10	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.870	0.806	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1735 225 1796 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1735 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1960	4800	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} = 1735 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1960	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 13.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.265

Space mean speed in ramp influence area, S_R = 62.6 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 62.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
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Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1998	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	351	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1188	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1998	351	1188	vph
Peak-hour factor, PHF	0.90	0.79	0.82	
Peak 15-min volume, v15	555	111	362	v
Trucks and buses	23	5	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.930	0.806	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2986 478 1796 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2986 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3464	4800	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} = 2986 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3464	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.345	
Space mean speed in ramp influence area,	S_R = 60.3	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 60.3	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1998	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	351	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	898	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1998	351	898	vph
Peak-hour factor, PHF	0.90	0.79	0.83	
Peak 15-min volume, v15	555	111	270	v
Trucks and buses	23	5	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.930	0.837	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2986 478 1293 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2986 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3464	4800	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} = 2986 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3464	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.345	
Space mean speed in ramp influence area,	S_R = 60.3	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 60.3	mph

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Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2700	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	196	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	898	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2700	196	898	vph
Peak-hour factor, PHF	0.90	0.93	0.83	
Peak 15-min volume, v15	750	53	270	v
Trucks and buses	23	4	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.943	0.837	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4035 223 1293 pcph

Estimation of V12 Merge Areas

L_{EQ} = 5596.31 (Equation 13-6 or 13-7)

P_{FM} = 0.609 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2458 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4258	6900	No
v_3 or v_{av34}	1577 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} = 2458 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4258	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.298

Space mean speed in ramp influence area, S_R = 54.6 mph

Space mean speed in outer lanes, S_O = 56.1 mph

Space mean speed for all vehicles, S = 55.2 mph

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Phone: Fax:
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Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2700	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	196	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	491	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2700	196	491	vph
Peak-hour factor, PHF	0.90	0.93	0.87	
Peak 15-min volume, v15	750	53	141	v
Trucks and buses	23	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.943	0.905	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4035 223 624 pcph

Estimation of V12 Merge Areas

L_{EQ} = 843.35 (Equation 13-6 or 13-7)

P_{FM} = 0.609 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2458 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4258	6900	No
v_3 or v_{av34}	1577 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} = 2458 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4258	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.298

Space mean speed in ramp influence area, S_R = 54.6 mph

Space mean speed in outer lanes, S_O = 56.1 mph

Space mean speed for all vehicles, S = 55.2 mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2924	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	127	vph
Length of first accel/decel lane	1300	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)	2924	127		vph
Peak-hour factor, PHF	0.92	0.80		
Peak 15-min volume, v15	795	40		v
Trucks and buses	13	23		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Rolling		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5		
Recreational vehicle PCE, ER	2.0	2.0		
Heavy vehicle adjustment, fHV	0.837	0.743		
Driver population factor, fP	1.00	1.00		

Flow rate, vp 3798 214 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3798 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4012	4800	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} = 3798 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4012	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	M_S = 0.446	
Space mean speed in ramp influence area,	S_R = 57.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 57.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
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Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2924	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	127	vph
Length of first accel/decel lane	1300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	317	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2924	127	317	vph
Peak-hour factor, PHF	0.92	0.80	0.86	
Peak 15-min volume, v15	795	40	92	v
Trucks and buses	13	23	14	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.743	0.826	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3798 214 446 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3798 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4012	4800	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} = 3798 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4012	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	M_S = 0.446	
Space mean speed in ramp influence area,	S_R = 57.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 57.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2613	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	127	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	317	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2613	127	317	vph
Peak-hour factor, PHF	0.92	0.79	0.86	
Peak 15-min volume, v15	710	40	92	v
Trucks and buses	13	10	14	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.870	0.826	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3394 185 446 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3394 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3579	4800	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} = 3394 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3579	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 29.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.422	
Space mean speed in ramp influence area,	S_R = 58.2	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 58.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2613	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	127	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	188	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2613	127	188	vph
Peak-hour factor, PHF	0.92	0.79	0.90	
Peak 15-min volume, v15	710	40	52	v
Trucks and buses	13	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.870	0.870	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3394 185 240 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3394 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3579	4800	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} = 3394 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3579	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 29.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.422	
Space mean speed in ramp influence area,	S_R = 58.2	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 58.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	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	267	vph
Length of first accel/decel lane	1195	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	188	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2534	267	188	vph
Peak-hour factor, PHF	0.92	0.69	0.90	
Peak 15-min volume, v15	689	97	52	v
Trucks and buses	13	8	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.893	0.870	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3291 433 240 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3291 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3724	4800	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} = 3291 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3724	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 26.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.399

Space mean speed in ramp influence area, S_R = 58.8 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 58.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	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	267	vph
Length of first accel/decel lane	1195	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1576	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1465	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2534	267	1576	vph
Peak-hour factor, PHF	0.92	0.69	0.93	
Peak 15-min volume, v15	689	97	424	v
Trucks and buses	13	8	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.893	0.837	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3291 433 2025 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM}) = 3291$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3724	4800	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} = 3291 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3724	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 26.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.399	
Space mean speed in ramp influence area,	S_R = 58.8	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 58.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4110	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	273	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1576	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4110	273	1576	vph
Peak-hour factor, PHF	0.92	0.93	0.93	
Peak 15-min volume, v15	1117	73	424	v
Trucks and buses	13	2	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.971	0.837	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 5339 302 2025 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 5339 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5641	4800	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} = 5339 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	5641	4600	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 40.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 1.319

Space mean speed in ramp influence area, S_R = 33.1 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 33.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4110	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	273	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	2189	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4110	273	2189	vph
Peak-hour factor, PHF	0.92	0.93	0.86	
Peak 15-min volume, v15	1117	73	636	v
Trucks and buses	13	2	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.971	0.943	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 5339 302 2698 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 5339 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5641	4800	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} = 5339 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	5641	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 40.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 1.319	
Space mean speed in ramp influence area,	S_R = 33.1	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 33.1	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5660	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	366	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	2189	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5660	366	2189	vph
Peak-hour factor, PHF	0.92	0.89	0.86	
Peak 15-min volume, v15	1538	103	636	v
Trucks and buses	13	3	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.957	0.943	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 7352 430 2698 pcph

Estimation of V12 Merge Areas

L_{EQ} = 11677.38 Equation 13-6 or 13-7)

P_{FM} = 0.620 Using Equation 5

$v_{12} = v_F (P_{FM})$ = 4555 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7782	6900	Yes
v_3 or v_{av34}	2797 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	Yes	

If yes, v_{12A} = 4652 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	5082	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 37.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.870

Space mean speed in ramp influence area, S_R = 44.3 mph

Space mean speed in outer lanes, S_O = 51.1 mph

Space mean speed for all vehicles, S = 46.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 No-Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5660	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	366	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1387	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5660	366	1387	vph
Peak-hour factor, PHF	0.92	0.89	0.92	
Peak 15-min volume, v15	1538	103	377	v
Trucks and buses	13	3	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.957	0.917	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 7352 430 1643 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1597.49 (Equation 13-6 or 13-7)

P_{FM} = 0.577 Using Equation 2

$v_{12} = v_F (P_{FM})$ = 4239 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7782	6900	Yes
v_3 or v_{av34}	3113 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} = 4652 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	7782	4600	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 37.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.870

Space mean speed in ramp influence area, S_R = 44.3 mph

Space mean speed in outer lanes, S_O = 51.1 mph

Space mean speed for all vehicles, S = 46.5 mph

Appendix C

HCS Ramp Diverge Analysis Outputs
2040 Build I-26 Eastbound Off-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2158	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	99	vph
Length of first accel/decel lane	405	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	416	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2158		99		416		vph
Peak-hour factor, PHF	0.88		0.83		0.86		
Peak 15-min volume, v15	613		30		121		v
Trucks and buses	16		22		7		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.752		0.905		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3041 159 535 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.677 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2109 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3041	7200	No
$v_{FO} = v_F - v_R$	2882	7200	No
v_R	159	2100	No
v_3 or v_{av34}	932 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} = 2109 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2109	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 18.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.377

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 63.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2158	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	99	vph
Length of first accel/decel lane	405	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	283	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2158		99		283		vph
Peak-hour factor, PHF	0.88		0.83		0.96		
Peak 15-min volume, v15	613		30		74		v
Trucks and buses	16		22		8		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.752		0.893		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3041 159 330 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 2560.94 (Equation 13-12 or 13-13)

P_{FD} = 0.677 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2109 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3041	7200	No
$v_{FO} = v_F - v_R$	2882	7200	No
v_R	159	2100	No
v_3 or v_{av34}	932 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} = 2109 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2109	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 18.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.377

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 63.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2345	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	223	vph
Length of first accel/decel lane	995	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1417	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2345		223		1417		vph
Peak-hour factor, PHF	0.88		0.87		0.82		
Peak 15-min volume, v15	666		64		432		v
Trucks and buses	16		15		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.816		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3304 314 1832 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.663 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2296 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3304	7200	No
$v_{FO} = v_F - v_R$	2990	7200	No
v_R	314	2100	No
v_3 or v_{av34}	1008 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} = 2296 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2296	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 15.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.391

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 63.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2345	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	223	vph
Length of first accel/decel lane	995	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	416	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2345		223		416		vph
Peak-hour factor, PHF	0.88		0.87		0.86		
Peak 15-min volume, v15	666		64		121		v
Trucks and buses	16		15		7		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.816		0.905		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3304 314 535 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 4345.07 (Equation 13-12 or 13-13)

P_{FD} = 0.663 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2296 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3304	7200	No
$v_{FO} = v_F - v_R$	2990	7200	No
v_R	314	2100	No
v_3 or v_{av34}	1008 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} = 2296 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2296	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 15.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.391

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 63.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3669	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	222	vph
Length of first accel/decel lane	970	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	2340	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	905	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3669		222		2340		vph
Peak-hour factor, PHF	0.88		0.72		0.88		
Peak 15-min volume, v15	1042		77		665		v
Trucks and buses	16		5		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.930		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5170 331 2819 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.616 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3310 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5170	7200	No
$v_{FO} = v_F - v_R$	4839	7200	No
v_R	331	2000	No
v_3 or v_{av34}	1860 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} = 3310 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3310	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 24.0 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 = 57.2 mph

Space mean speed in outer lanes, S_O = 73.4 mph

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3669	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	222	vph
Length of first accel/decel lane	970	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1417	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3669		222		1417		vph
Peak-hour factor, PHF	0.88		0.72		0.82		
Peak 15-min volume, v15	1042		77		432		v
Trucks and buses	16		5		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.930		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5170 331 1832 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 11119.61 Equation 13-12 or 13-13)

P_{FD} = 0.626 Using Equation 10

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3360 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5170	7200	No
$v_{FO} = v_F - v_R$	4839	7200	No
v_R	331	2000	No
v_3 or v_{av34}	1810 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} = 3360 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3360	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 24.4 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 = 57.2 mph

Space mean speed in outer lanes, S_O = 73.6 mph

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5788	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	182	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	291	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	5788		182		291		vph
Peak-hour factor, PHF	0.88		0.46		0.60		
Peak 15-min volume, v15	1644		99		121		v
Trucks and buses	16		3		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.957		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 8156 413 521 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 708.16 (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3789 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	8156	9200	No
$v_{FO} = v_F - v_R$	7743	9200	No
v_R	413	1900	No
v_3 or v_{av34}	2183 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} = 3789 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3789	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 34.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.595

Space mean speed in ramp influence area, S_R = 49.3 mph

Space mean speed in outer lanes, S_O = 61.2 mph

Space mean speed for all vehicles, S = 55.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5606	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	291	vph
Length of first accel/decel lane	915	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1946	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	930	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	5606		291		1946		vph
Peak-hour factor, PHF	0.88		0.60		0.83		
Peak 15-min volume, v15	1593		121		586		v
Trucks and buses	16		5		6		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.930		0.917		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7899 521 2556 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3738 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7899	9200	No
$v_{FO} = v_F - v_R$	7378	9200	No
v_R	521	1900	No
v_3 or v_{av34}	2080 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} = 3738 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3738	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 28.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.605

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = 61.6 mph

Space mean speed for all vehicles, S = 55.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5606	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	291	vph
Length of first accel/decel lane	915	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	182	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	5606		291		182		vph
Peak-hour factor, PHF	0.88		0.60		0.46		
Peak 15-min volume, v15	1593		121		99		v
Trucks and buses	16		5		3		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.930		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7899 521 413 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3738 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7899	9200	No
$v_{FO} = v_F - v_R$	7378	9200	No
v_R	521	1900	No
v_3 or v_{av34}	2080 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} = 3738 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3738	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 28.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.605

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = 61.6 mph

Space mean speed for all vehicles, S = 55.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5788	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	182	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	2340	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	5788		182		2340		vph
Peak-hour factor, PHF	0.88		0.46		0.88		
Peak 15-min volume, v15	1644		99		665		v
Trucks and buses	16		3		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.806		0.957		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 8156 413 2819 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3789 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	8156	9200	No
$v_{FO} = v_F - v_R$	7743	9200	No
v_R	413	1900	No
v_3 or v_{av34}	2183 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} = 3789 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3789	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 34.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.595

Space mean speed in ramp influence area, S_R = 49.3 mph

Space mean speed in outer lanes, S_O = 61.2 mph

Space mean speed for all vehicles, S = 55.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2721	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	134	vph
Length of first accel/decel lane	405	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	81	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2721		134		81	vph
Peak-hour factor, PHF	0.91		0.79		0.66	
Peak 15-min volume, v15	748		42		31	v
Trucks and buses	14		8		10	%
Recreational vehicles	0		0		0	%
Terrain type:	Rolling		Rolling		Rolling	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	2.5		2.5		2.5	
Recreational vehicle PCE, ER	2.0		2.0		2.0	
Heavy vehicle adjustment, fHV	0.826		0.893		0.870	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp 3618 190 141 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.661 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2455 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3618	7200	No
$v_{FO} = v_F - v_R$	3428	7200	No
v_R	190	2100	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} = 2455 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2455	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 21.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.380

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = 76.2 mph

Space mean speed for all vehicles, S = 63.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2721	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	134	vph
Length of first accel/decel lane	405	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	221	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2721		134		221		vph
Peak-hour factor, PHF	0.91		0.79		0.85		
Peak 15-min volume, v15	748		42		65		v
Trucks and buses	14		8		18		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.893		0.787		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3618 190 330 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 2360.95 (Equation 13-12 or 13-13)

P_{FD} = 0.661 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2455 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3618	7200	No
$v_{FO} = v_F - v_R$	3428	7200	No
v_R	190	2100	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} = 2455 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2455	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 21.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.380

Space mean speed in ramp influence area, S_R = 59.4 mph

Space mean speed in outer lanes, S_O = 76.2 mph

Space mean speed for all vehicles, S = 63.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3200	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	995	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1362	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3200		230		1362		vph
Peak-hour factor, PHF	0.91		0.85		0.77		
Peak 15-min volume, v15	879		68		442		v
Trucks and buses	14		16		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.806		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4255 336 1901 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.638 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2837 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4255	7200	No
$v_{FO} = v_F - v_R$	3919	7200	No
v_R	336	2100	No
v_3 or v_{av34}	1418 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} = 2837 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2837	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 19.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.393

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = 75.2 mph

Space mean speed for all vehicles, S = 63.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3200	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	995	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	81	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3200		230		81		vph
Peak-hour factor, PHF	0.91		0.85		0.66		
Peak 15-min volume, v15	879		68		31		v
Trucks and buses	14		16		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.806		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4255 336 141 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 983.75 (Equation 13-12 or 13-13)

P_{FD} = 0.638 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2837 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4255	7200	No
$v_{FO} = v_F - v_R$	3919	7200	No
v_R	336	2100	No
v_3 or v_{av34}	1418 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} = 2837 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2837	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 19.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.393

Space mean speed in ramp influence area, S_R = 59.0 mph

Space mean speed in outer lanes, S_O = 75.2 mph

Space mean speed for all vehicles, S = 63.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3800	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	761	vph
Length of first accel/decel lane	970	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1158	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	905	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3800		761		1158		vph
Peak-hour factor, PHF	0.91		0.83		0.94		
Peak 15-min volume, v15	1044		229		308		v
Trucks and buses	14		15		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.816		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5053 1123 1324 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.582 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3410 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5053	7200	No
$v_{FO} = v_F - v_R$	3930	7200	No
v_R	1123	2000	No
v_3 or v_{av34}	1643 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} = 3410 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3410	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 24.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.529

Space mean speed in ramp influence area, S_R = 55.2 mph

Space mean speed in outer lanes, S_O = 74.3 mph

Space mean speed for all vehicles, S = 60.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3800	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	761	vph
Length of first accel/decel lane	970	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1362	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3800		761		1362		vph
Peak-hour factor, PHF	0.91		0.83		0.77		
Peak 15-min volume, v15	1044		229		442		v
Trucks and buses	14		15		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.816		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5053 1123 1901 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 18660.85 Equation 13-12 or 13-13)

P_{FD} = 0.635 Using Equation 10

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3618 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5053	7200	No
$v_{FO} = v_F - v_R$	3930	7200	No
v_R	1123	2000	No
v_3 or v_{av34}	1435 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} = 3618 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3618	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 26.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.529

Space mean speed in ramp influence area, S_R = 55.2 mph

Space mean speed in outer lanes, S_O = 75.1 mph

Space mean speed for all vehicles, S = 59.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4198	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	151	vph
Length of first accel/decel lane	225	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	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	4198		151		79	vph
Peak-hour factor, PHF	0.91		0.94		0.86	
Peak 15-min volume, v15	1153		40		23	v
Trucks and buses	14		3		4	%
Recreational vehicles	0		0		0	%
Terrain type:	Rolling		Rolling		Rolling	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	2.5		2.5		2.5	
Recreational vehicle PCE, ER	2.0		2.0		2.0	
Heavy vehicle adjustment, fHV	0.826		0.957		0.943	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp 5582 168 97 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 106.74 (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2529 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5582	9200	No
$v_{FO} = v_F - v_R$	5414	9200	No
v_R	168	1900	No
v_3 or v_{av34}	1526 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} = 2529 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2529	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 24.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.573

Space mean speed in ramp influence area, S_R = 49.7 mph

Space mean speed in outer lanes, S_O = 63.8 mph

Space mean speed for all vehicles, S = 56.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4047	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	79	vph
Length of first accel/decel lane	915	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1224	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	930	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4047		79		1224		vph
Peak-hour factor, PHF	0.91		0.86		0.95		
Peak 15-min volume, v15	1112		23		322		v
Trucks and buses	14		4		6		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.943		0.917		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5381 97 1404 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2401 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5381	9200	No
$v_{FO} = v_F - v_R$	5284	9200	No
v_R	97	1900	No
v_3 or v_{av34}	1490 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} = 2401 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2401	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 16.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.567

Space mean speed in ramp influence area, S_R = 49.8 mph

Space mean speed in outer lanes, S_O = 63.9 mph

Space mean speed for all vehicles, S = 56.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4047	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	79	vph
Length of first accel/decel lane	915	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	151	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	2240	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4047		79		151		vph
Peak-hour factor, PHF	0.91		0.86		0.94		
Peak 15-min volume, v15	1112		23		40		v
Trucks and buses	14		4		3		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.943		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5381 97 168 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2401 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5381	9200	No
$v_{FO} = v_F - v_R$	5284	9200	No
v_R	97	1900	No
v_3 or v_{av34}	1490 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} = 2401 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2401	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 16.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.567

Space mean speed in ramp influence area, S_R = 49.8 mph

Space mean speed in outer lanes, S_O = 63.9 mph

Space mean speed for all vehicles, S = 56.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4198	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	151	vph
Length of first accel/decel lane	225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1158	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4198		151		1158		vph
Peak-hour factor, PHF	0.91		0.94		0.94		
Peak 15-min volume, v15	1153		40		308		v
Trucks and buses	14		3		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.826		0.957		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5582 168 1324 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2529 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5582	9200	No
$v_{FO} = v_F - v_R$	5414	9200	No
v_R	168	1900	No
v_3 or v_{av34}	1526 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} = 2529 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2529	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 24.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.573

Space mean speed in ramp influence area, S_R = 49.7 mph

Space mean speed in outer lanes, S_O = 63.8 mph

Space mean speed for all vehicles, S = 56.5 mph

Appendix C

HCS Ramp Diverge Analysis Outputs
2040 Build I-26 Westbound Off-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1430	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	279	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	205	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1430		279		205		vph
Peak-hour factor, PHF	0.90		0.93		0.83		
Peak 15-min volume, v15	397		75		62		v
Trucks and buses	23		25		37		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.727		0.643		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2137 412 384 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.688 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1598 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2137	7200	No
$v_{FO} = v_F - v_R$	1725	7200	No
v_R	412	2100	No
v_3 or v_{av34}	539 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} = 1598 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1598	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 10.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.400

Space mean speed in ramp influence area, S_R = 58.8 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 62.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1430	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	279	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	137	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1430		279		137		vph
Peak-hour factor, PHF	0.90		0.93		0.75		
Peak 15-min volume, v15	397		75		46		v
Trucks and buses	23		25		13		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.727		0.837		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2137 412 218 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 2453.88 (Equation 13-12 or 13-13)

P_{FD} = 0.688 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1598 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2137	7200	No
$v_{FO} = v_F - v_R$	1725	7200	No
v_R	412	2100	No
v_3 or v_{av34}	539 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} = 1598 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1598	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 10.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.400

Space mean speed in ramp influence area, S_R = 58.8 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 62.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1345	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	52	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	137	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1345		52		137		vph
Peak-hour factor, PHF	0.90		0.61		0.75		
Peak 15-min volume, v15	374		21		46		v
Trucks and buses	23		11		13		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.858		0.837		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2010 99 218 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.705 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1447 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2010	7200	No
$v_{FO} = v_F - v_R$	1911	7200	No
v_R	99	2000	No
v_3 or v_{av34}	563 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} = 1447 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1447	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 13.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.502

Space mean speed in ramp influence area, S_R = 55.9 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 60.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1345	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	52	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	184	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1345		52		184		vph
Peak-hour factor, PHF	0.90		0.61		0.94		
Peak 15-min volume, v15	374		21		49		v
Trucks and buses	23		11		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.858		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2010 99 225 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 2050.94 (Equation 13-12 or 13-13)

P_{FD} = 0.705 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1447 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2010	7200	No
$v_{FO} = v_F - v_R$	1911	7200	No
v_R	99	2000	No
v_3 or v_{av34}	563 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} = 1447 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1447	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 13.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.502

Space mean speed in ramp influence area, S_R = 55.9 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 60.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2349	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1188	vph
Length of first accel/decel lane	1150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	184	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1465	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2349		1188		184		vph
Peak-hour factor, PHF	0.90		0.82		0.94		
Peak 15-min volume, v15	653		362		49		v
Trucks and buses	23		16		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.806		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3510 1796 225 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.590 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2807 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3510	7200	No
$v_{FO} = v_F - v_R$	1714	7200	No
v_R	1796	2100	No
v_3 or v_{av34}	703 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} = 2807 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2807	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 18.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.525	
Space mean speed in ramp influence area,	S_R = 55.3	mph
Space mean speed in outer lanes,	S_O = 76.8	mph
Space mean speed for all vehicles,	S = 58.6	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2349	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1188	vph
Length of first accel/decel lane	1150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	351	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2349		1188		351		vph
Peak-hour factor, PHF	0.90		0.82		0.79		
Peak 15-min volume, v15	653		362		111		v
Trucks and buses	23		16		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.806		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3510 1796 478 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 31377.16 Equation 13-12 or 13-13)

P_{FD} = 0.609 Using Equation 10

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2840 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3510	7200	No
$v_{FO} = v_F - v_R$	1714	7200	No
v_R	1796	2100	No
v_3 or v_{av34}	670 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} = 2840 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2840	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 18.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.525

Space mean speed in ramp influence area, S_R = 55.3 mph

Space mean speed in outer lanes, S_O = 76.8 mph

Space mean speed for all vehicles, S = 58.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2896	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	898	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	351	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2896		898		351		vph
Peak-hour factor, PHF	0.90		0.83		0.79		
Peak 15-min volume, v15	804		270		111		v
Trucks and buses	23		13		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.837		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4328 1293 478 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.592 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3091 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4328	7200	No
$v_{FO} = v_F - v_R$	3035	7200	No
v_R	1293	2000	No
v_3 or v_{av34}	1237 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} = 3091 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3091	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 19.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.544

Space mean speed in ramp influence area, S_R = 54.8 mph

Space mean speed in outer lanes, S_O = 75.9 mph

Space mean speed for all vehicles, S = 59.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2896	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	898	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	196	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2896		898		196		vph
Peak-hour factor, PHF	0.90		0.83		0.93		
Peak 15-min volume, v15	804		270		53		v
Trucks and buses	23		13		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.837		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4328 1293 223 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 3085.39 (Equation 13-12 or 13-13)

P_{FD} = 0.592 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3091 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4328	7200	No
$v_{FO} = v_F - v_R$	3035	7200	No
v_R	1293	2000	No
v_3 or v_{av34}	1237 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} = 3091 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3091	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 19.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.544

Space mean speed in ramp influence area, S_R = 54.8 mph

Space mean speed in outer lanes, S_O = 75.9 mph

Space mean speed for all vehicles, S = 59.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3191	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	491	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	196	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3191		491		196		vph
Peak-hour factor, PHF	0.90		0.87		0.93		
Peak 15-min volume, v15	886		141		53		v
Trucks and buses	23		7		4		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.905		0.943		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4769 624 223 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2431 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4769	9200	No
$v_{FO} = v_F - v_R$	4145	9200	No
v_R	624	1900	No
v_3 or v_{av34}	1169 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} = 2431 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2431	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 15.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.614

Space mean speed in ramp influence area, S_R = 48.9 mph

Space mean speed in outer lanes, S_O = 65.2 mph

Space mean speed for all vehicles, S = 55.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3191	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	491	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	341	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1922	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3191		491		341		vph
Peak-hour factor, PHF	0.90		0.87		0.78		
Peak 15-min volume, v15	886		141		109		v
Trucks and buses	23		7		7		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.743		0.905		0.905		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 4769 624 483 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2431 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4769	9200	No
$v_{FO} = v_F - v_R$	4145	9200	No
v_R	624	1900	No
v_3 or v_{av34}	1169 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} = 2431 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2431	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 15.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.614

Space mean speed in ramp influence area, S_R = 48.9 mph

Space mean speed in outer lanes, S_O = 65.2 mph

Space mean speed for all vehicles, S = 55.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2740	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	317	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	127	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2740		317		127		vph
Peak-hour factor, PHF	0.92		0.86		0.80		
Peak 15-min volume, v15	745		92		40		v
Trucks and buses	13		14		23		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.826		0.743		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3559 446 214 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.651 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2471 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3559	7200	No
$v_{FO} = v_F - v_R$	3113	7200	No
v_R	446	2100	No
v_3 or v_{av34}	1088 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} = 2471 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2471	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.403

Space mean speed in ramp influence area, S_R = 58.7 mph

Space mean speed in outer lanes, S_O = 76.4 mph

Space mean speed for all vehicles, S = 63.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2740	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	317	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	127	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2740		317		127		vph
Peak-hour factor, PHF	0.92		0.86		0.79		
Peak 15-min volume, v15	745		92		40		v
Trucks and buses	13		14		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.826		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3559 446 185 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 1555.13 (Equation 13-12 or 13-13)

P_{FD} = 0.651 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2471 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3559	7200	No
$v_{FO} = v_F - v_R$	3113	7200	No
v_R	446	2100	No
v_3 or v_{av34}	1088 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} = 2471 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2471	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.403

Space mean speed in ramp influence area, S_R = 58.7 mph

Space mean speed in outer lanes, S_O = 76.4 mph

Space mean speed for all vehicles, S = 63.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2801	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	188	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	127	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2801		188		127		vph
Peak-hour factor, PHF	0.92		0.90		0.79		
Peak 15-min volume, v15	761		52		40		v
Trucks and buses	13		10		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.870		0.870		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3638 240 185 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.658 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2476 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3638	7200	No
$v_{FO} = v_F - v_R$	3398	7200	No
v_R	240	2000	No
v_3 or v_{av34}	1162 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} = 2476 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2476	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 21.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.515

Space mean speed in ramp influence area, S_R = 55.6 mph

Space mean speed in outer lanes, S_O = 76.2 mph

Space mean speed for all vehicles, S = 60.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2801	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	30.0	mph
Volume on ramp	188	vph
Length of first accel/decel lane	415	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	267	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2801		188		267		vph
Peak-hour factor, PHF	0.92		0.90		0.69		
Peak 15-min volume, v15	761		52		97		v
Trucks and buses	13		10		8		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.870		0.893		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3638 240 433 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 3173.70 (Equation 13-12 or 13-13)

P_{FD} = 0.658 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2476 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3638	7200	No
$v_{FO} = v_F - v_R$	3398	7200	No
v_R	240	2000	No
v_3 or v_{av34}	1162 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} = 2476 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2476	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 21.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.515

Space mean speed in ramp influence area, S_R = 55.6 mph

Space mean speed in outer lanes, S_O = 76.2 mph

Space mean speed for all vehicles, S = 60.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4110	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1576	vph
Length of first accel/decel lane	1150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	267	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1465	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4110		1576		267		vph
Peak-hour factor, PHF	0.92		0.93		0.69		
Peak 15-min volume, v15	1117		424		97		v
Trucks and buses	13		13		8		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.837		0.893		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5339 2025 433 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.533 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3793 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5339	7200	No
$v_{FO} = v_F - v_R$	3314	7200	No
v_R	2025	2100	No
v_3 or v_{av34}	1546 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} = 3793 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3793	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 26.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.545

Space mean speed in ramp influence area, S_R = 54.7 mph

Space mean speed in outer lanes, S_O = 74.7 mph

Space mean speed for all vehicles, S = 59.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4110	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1576	vph
Length of first accel/decel lane	1150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	273	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4110		1576		273		vph
Peak-hour factor, PHF	0.92		0.93		0.93		
Peak 15-min volume, v15	1117		424		73		v
Trucks and buses	13		13		2		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.837		0.971		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 5339 2025 302 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 7569.49 (Equation 13-12 or 13-13)

P_{FD} = 0.533 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3793 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5339	7200	No
$v_{FO} = v_F - v_R$	3314	7200	No
v_R	2025	2100	No
v_3 or v_{av34}	1546 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} = 3793 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3793	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 26.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.545

Space mean speed in ramp influence area, S_R = 54.7 mph

Space mean speed in outer lanes, S_O = 74.7 mph

Space mean speed for all vehicles, S = 59.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	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	2189	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	273	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	6026		2189		273		vph
Peak-hour factor, PHF	0.92		0.86		0.93		
Peak 15-min volume, v15	1637		636		73		v
Trucks and buses	13		4		2		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.943		0.971		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7827 2698 302 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.440 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4956 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	7200	Yes
$v_{FO} = v_F - v_R$	5129	7200	No
v_R	2698	2000	Yes
v_3 or v_{av34}	2871 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} = 5127 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	5127	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 37.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = 70.2 mph

Space mean speed for all vehicles, S = 56.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	2189	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	273	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	6026		2189		273		vph
Peak-hour factor, PHF	0.92		0.86		0.93		
Peak 15-min volume, v15	1637		636		73		v
Trucks and buses	13		4		2		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.943		0.971		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7827 2698 302 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5006 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	7200	Yes
$v_{FO} = v_F - v_R$	5129	7200	No
v_R	2698	4000	No
v_3 or v_{av34}	2821 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} = 5127 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	5127	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 22.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = 70.2 mph

Space mean speed for all vehicles, S = 56.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	2189	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	273	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	6026		2189		273	vph
Peak-hour factor, PHF	0.92		0.86		0.93	
Peak 15-min volume, v15	1637		636		73	v
Trucks and buses	13		4		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Rolling		Rolling		Rolling	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	2.5		2.5		2.5	
Recreational vehicle PCE, ER	2.0		2.0		2.0	
Heavy vehicle adjustment, fHV	0.837		0.943		0.971	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp 7827 2698 302 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4032 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	9600	No
$v_{FO} = v_F - v_R$	5129	9600	No
v_R	2698	4000	No
v_3 or v_{av34}	1897 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} = 4032 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4032	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 12.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = 73.3 mph

Space mean speed for all vehicles, S = 60.0 mph

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Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	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	2189	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	273	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	6026		2189		273		vph
Peak-hour factor, PHF	0.92		0.86		0.93		
Peak 15-min volume, v15	1637		636		73		v
Trucks and buses	13		4		2		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.943		0.971		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7827 2698 302 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4934 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	9600	No
$v_{FO} = v_F - v_R$	5129	9600	No
v_R	2698	2000	Yes
v_3 or v_{av34}	1446 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} = 4934 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4934	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 35.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = 75.1 mph

Space mean speed for all vehicles, S = 58.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	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	2189	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	366	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	6026		2189		366		vph
Peak-hour factor, PHF	0.92		0.86		0.89		
Peak 15-min volume, v15	1637		636		103		v
Trucks and buses	13		4		3		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.943		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7827 2698 430 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 9353.31 (Equation 13-12 or 13-13)

P_{FD} = 0.440 Using Equation 9

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4956 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	7200	Yes
$v_{FO} = v_F - v_R$	5129	7200	No
v_R	2698	2000	Yes
v_3 or v_{av34}	2871 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} = 5127 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	5127	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 37.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = 70.2 mph

Space mean speed for all vehicles, S = 56.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	2189	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	366	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	6026		2189		366		vph
Peak-hour factor, PHF	0.92		0.86		0.89		
Peak 15-min volume, v15	1637		636		103		v
Trucks and buses	13		4		3		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.943		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 7827 2698 430 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5006 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	7200	Yes
$v_{FO} = v_F - v_R$	5129	7200	No
v_R	2698	4000	No
v_3 or v_{av34}	2821 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} = 5127 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	5127	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 22.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = 70.2 mph

Space mean speed for all vehicles, S = 56.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	2189	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	366	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	6026		2189		366	vph
Peak-hour factor, PHF	0.92		0.86		0.89	
Peak 15-min volume, v15	1637		636		103	v
Trucks and buses	13		4		3	%
Recreational vehicles	0		0		0	%
Terrain type:	Rolling		Rolling		Rolling	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	2.5		2.5		2.5	
Recreational vehicle PCE, ER	2.0		2.0		2.0	
Heavy vehicle adjustment, fHV	0.837		0.943		0.957	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp 7827 2698 430 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4032 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	9600	No
$v_{FO} = v_F - v_R$	5129	9600	No
v_R	2698	4000	No
v_3 or v_{av34}	1897 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} = 4032 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4032	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 12.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = 73.3 mph

Space mean speed for all vehicles, S = 60.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6026	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	2189	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	366	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	6026		2189		366	vph
Peak-hour factor, PHF	0.92		0.86		0.89	
Peak 15-min volume, v15	1637		636		103	v
Trucks and buses	13		4		3	%
Recreational vehicles	0		0		0	%
Terrain type:	Rolling		Rolling		Rolling	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	2.5		2.5		2.5	
Recreational vehicle PCE, ER	2.0		2.0		2.0	
Heavy vehicle adjustment, fHV	0.837		0.943		0.957	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp 7827 2698 430 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4934 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7827	9600	No
$v_{FO} = v_F - v_R$	5129	9600	No
v_R	2698	2000	Yes
v_3 or v_{av34}	1446 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} = 4934 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4934	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 35.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.671

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = 75.1 mph

Space mean speed for all vehicles, S = 58.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	7047	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	1387	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	366	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	7047		1387		366		vph
Peak-hour factor, PHF	0.92		0.92		0.89		
Peak 15-min volume, v15	1915		377		103		v
Trucks and buses	13		6		3		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.917		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 9153 1643 430 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4917 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	9153	9200	No
$v_{FO} = v_F - v_R$	7510	9200	No
v_R	1643	1900	No
v_3 or v_{av34}	2118 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} = 4917 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4917	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, v_{12} - L_D$ = 37.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.706

Space mean speed in ramp influence area, S_R = 47.3 mph

Space mean speed in outer lanes, S_O = 61.5 mph

Space mean speed for all vehicles, S = 52.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	7047	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	1387	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	366	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	7047		1387		366		vph
Peak-hour factor, PHF	0.92		0.92		0.89		
Peak 15-min volume, v15	1915		377		103		v
Trucks and buses	13		6		3		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.917		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 9153 1643 430 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3596 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	9153	9200	No
$v_{FO} = v_F - v_R$	7510	9200	No
v_R	1643	3800	No
v_3 or v_{av34}	2778 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} = 3753 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3753	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 13.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.706

Space mean speed in ramp influence area, S_R = 47.3 mph

Space mean speed in outer lanes, S_O = 59.2 mph

Space mean speed for all vehicles, S = 53.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	7047	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	1387	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	795	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1922	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	7047		1387		795		vph
Peak-hour factor, PHF	0.92		0.92		0.86		
Peak 15-min volume, v15	1915		377		231		v
Trucks and buses	13		6		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.917		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 9153 1643 994 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4917 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	9153	9200	No
$v_{FO} = v_F - v_R$	7510	9200	No
v_R	1643	1900	No
v_3 or v_{av34}	2118 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} = 4917 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4917	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 37.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.706

Space mean speed in ramp influence area, S_R = 47.3 mph

Space mean speed in outer lanes, S_O = 61.5 mph

Space mean speed for all vehicles, S = 52.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	7047	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	1387	vph
Length of first accel/decel lane	1035	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	795	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1922	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	7047		1387		795		vph
Peak-hour factor, PHF	0.92		0.92		0.86		
Peak 15-min volume, v15	1915		377		231		v
Trucks and buses	13		6		5		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		
Heavy vehicle adjustment, fHV	0.837		0.917		0.930		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 9153 1643 994 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3596 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	9153	9200	No
$v_{FO} = v_F - v_R$	7510	9200	No
v_R	1643	3800	No
v_3 or v_{av34}	2778 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} = 3753 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3753	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 13.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.706

Space mean speed in ramp influence area, S_R = 47.3 mph

Space mean speed in outer lanes, S_O = 59.2 mph

Space mean speed for all vehicles, S = 53.7 mph

Appendix C

HCS Ramp Merge Analysis Outputs
2040 Build I-26 Eastbound On-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1745	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	283	vph
Length of first accel/decel lane	1375	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	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1745	283	99	vph
Peak-hour factor, PHF	0.88	0.96	0.83	
Peak 15-min volume, v15	496	74	30	v
Trucks and buses	16	8	22	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.893	0.752	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2459 330 159 pcph

Estimation of V12 Merge Areas

L_{EQ} = 619.34 (Equation 13-6 or 13-7)

P_{FM} = 0.616 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1515 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2789	7200	No
v_3 or v_{av34}	944 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} = 1515 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1845	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.249	
Space mean speed in ramp influence area,	S_R = 63.0	mph
Space mean speed in outer lanes,	S_O = 68.4	mph
Space mean speed for all vehicles,	S = 64.7	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1745	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	283	vph
Length of first accel/decel lane	1375	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	116	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2265	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1745	283	116	vph
Peak-hour factor, PHF	0.88	0.96	0.80	
Peak 15-min volume, v15	496	74	36	v
Trucks and buses	16	8	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.893	0.837	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2459 330 173 pcph

Estimation of V12 Merge Areas

L_{EQ} = 635.55 (Equation 13-6 or 13-7)

P_{FM} = 0.616 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1515 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2789	7200	No
v_3 or v_{av34}	944 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} = 1515 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2789	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.249

Space mean speed in ramp influence area, S_R = 63.0 mph

Space mean speed in outer lanes, S_O = 68.4 mph

Space mean speed for all vehicles, S = 64.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2059	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	416	vph
Length of first accel/decel lane	520	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	223	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2059	416	223	vph
Peak-hour factor, PHF	0.88	0.86	0.87	
Peak 15-min volume, v15	585	121	64	v
Trucks and buses	16	7	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.905	0.816	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2901 535 314 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1900.27 (Equation 13-6 or 13-7)

P_{FM} = 0.592 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1718 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3436	7200	No
v_3 or v_{av34}	1183 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} = 1718 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2253	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.322

Space mean speed in ramp influence area, S_R = 61.0 mph

Space mean speed in outer lanes, S_O = 67.5 mph

Space mean speed for all vehicles, S = 63.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2059	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	416	vph
Length of first accel/decel lane	520	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	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2059	416	99	vph
Peak-hour factor, PHF	0.88	0.86	0.83	
Peak 15-min volume, v15	585	121	30	v
Trucks and buses	16	7	22	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.905	0.752	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2901 535 159 pcph

Estimation of V12 Merge Areas

L_{EQ} = 394.38 (Equation 13-6 or 13-7)

P_{FM} = 0.592 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1718 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3436	7200	No
v_3 or v_{av34}	1183 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} = 1718 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2253	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.322

Space mean speed in ramp influence area, S_R = 61.0 mph

Space mean speed in outer lanes, S_O = 67.5 mph

Space mean speed for all vehicles, S = 63.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2252	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	1417	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	222	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2252	1417	222	vph
Peak-hour factor, PHF	0.88	0.82	0.72	
Peak 15-min volume, v15	640	432	77	v
Trucks and buses	16	4	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.930	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3173 1832 331 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1225.47 (Equation 13-6 or 13-7)

P_{FM} = 0.619 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1966 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5005	7200	No
v_3 or v_{av34}	1207 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} = 1966 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3798	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 24.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.390

Space mean speed in ramp influence area, S_R = 59.1 mph

Space mean speed in outer lanes, S_O = 67.5 mph

Space mean speed for all vehicles, S = 60.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2252	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	1417	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	223	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2252	1417	223	vph
Peak-hour factor, PHF	0.88	0.82	0.87	
Peak 15-min volume, v15	640	432	64	v
Trucks and buses	16	4	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.816	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3173 1832 314 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1165.27 (Equation 13-6 or 13-7)

P_{FM} = 0.619 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1966 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5005	7200	No
v_3 or v_{av34}	1207 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} = 1966 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3798	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 24.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.390

Space mean speed in ramp influence area, S_R = 59.1 mph

Space mean speed in outer lanes, S_O = 67.5 mph

Space mean speed for all vehicles, S = 60.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3447	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	2340	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	182	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3447	2340	182	vph
Peak-hour factor, PHF	0.88	0.88	0.46	
Peak 15-min volume, v15	979	665	99	v
Trucks and buses	16	4	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4857 2819 413 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1529.06 (Equation 13-6 or 13-7)

P_{FM} = 0.619 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 3009 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7676	7200	Yes
v_3 or v_{av34}	1848 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} = 3009 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	5828	4600	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 40.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 1.541

Space mean speed in ramp influence area, S_R = 26.9 mph

Space mean speed in outer lanes, S_O = 65.1 mph

Space mean speed for all vehicles, S = 31.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3447	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	2340	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	182	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3447	2340	182	vph
Peak-hour factor, PHF	0.88	0.88	0.46	
Peak 15-min volume, v15	979	665	99	v
Trucks and buses	16	4	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4857 2819 413 pcph

Estimation of V12 Merge Areas

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

P_{FM} = -0.135 Using Equation 0

$v_{12} = v_F (P_{FM})$ = -653 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7676	9600	No
v_3 or v_{av34}	2755 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 $v_{12}/2$	Yes	

If yes, v_{12A} = 1942 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	4761	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 31.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.672	
Space mean speed in ramp influence area,	S_R = 51.2	mph
Space mean speed in outer lanes,	S_O = 66.6	mph
Space mean speed for all vehicles,	S = 56.1	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3447	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	2340	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	222	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	905	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3447	2340	222	vph
Peak-hour factor, PHF	0.88	0.88	0.72	
Peak 15-min volume, v15	979	665	77	v
Trucks and buses	16	4	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.930	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4857 2819 331 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1736.86 (Equation 13-6 or 13-7)

P_{FM} = 0.567 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 2754 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7676	7200	Yes
v_3 or v_{av34}	2103 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} = 2775 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	5594	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 38.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 1.264	
Space mean speed in ramp influence area,	S_R = 34.6	mph
Space mean speed in outer lanes,	S_O = 64.3	mph
Space mean speed for all vehicles,	S = 39.6	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3447	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	2340	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	222	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	905	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3447	2340	222	vph
Peak-hour factor, PHF	0.88	0.88	0.72	
Peak 15-min volume, v15	979	665	77	v
Trucks and buses	16	4	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.943	0.930	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4857 2819 331 pcph

Estimation of V12 Merge Areas

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

P_{FM} = -0.135 Using Equation 0

$v_{12} = v_F (P_{FM})$ = -653 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7676	9600	No
v_3 or v_{av34}	2755 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 $v_{12}/2$	Yes	

If yes, v_{12A} = 1942 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	4761	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 31.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.672	
Space mean speed in ramp influence area,	S_R = 51.2	mph
Space mean speed in outer lanes,	S_O = 66.6	mph
Space mean speed for all vehicles,	S = 56.1	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3031	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	221	vph
Length of first accel/decel lane	1375	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	134	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3031	221	134	vph
Peak-hour factor, PHF	0.91	0.85	0.79	
Peak 15-min volume, v15	833	65	42	v
Trucks and buses	14	18	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.787	0.893	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4030 330 190 pcph

Estimation of V12 Merge Areas

L_{EQ} = 740.09 (Equation 13-6 or 13-7)

P_{FM} = 0.616 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2482 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4360	7200	No
v_3 or v_{av34}	1548 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} = 2482 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4360	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.290	
Space mean speed in ramp influence area,	S_R = 61.9	mph
Space mean speed in outer lanes,	S_O = 66.2	mph
Space mean speed for all vehicles,	S = 63.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 82
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3031	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	221	vph
Length of first accel/decel lane	1375	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	160	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2265	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3031	221	160	vph
Peak-hour factor, PHF	0.91	0.85	0.74	
Peak 15-min volume, v15	833	65	54	v
Trucks and buses	14	18	18	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.787	0.787	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4030 330 275 pcph

Estimation of V12 Merge Areas

L_{EQ} = 971.74 (Equation 13-6 or 13-7)

P_{FM} = 0.616 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2482 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4360	7200	No
v_3 or v_{av34}	1548 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} = 2482 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2812	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.290

Space mean speed in ramp influence area, S_R = 61.9 mph

Space mean speed in outer lanes, S_O = 66.2 mph

Space mean speed for all vehicles, S = 63.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2587	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	81	vph
Length of first accel/decel lane	520	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2587	81	230	vph
Peak-hour factor, PHF	0.91	0.66	0.85	
Peak 15-min volume, v15	711	31	68	v
Trucks and buses	14	10	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.870	0.806	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3440 141 336 pcph

Estimation of V12 Merge Areas

L_{EQ} = 2033.41 (Equation 13-6 or 13-7)

P_{FM} = 0.592 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2037 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3581	7200	No
v_3 or v_{av34}	1403 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} = 2037 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2178	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.319	
Space mean speed in ramp influence area,	S_R = 61.1	mph
Space mean speed in outer lanes,	S_O = 66.7	mph
Space mean speed for all vehicles,	S = 63.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 85 Loop
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2587	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	81	vph
Length of first accel/decel lane	520	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	134	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2587	81	134	vph
Peak-hour factor, PHF	0.91	0.66	0.79	
Peak 15-min volume, v15	711	31	42	v
Trucks and buses	14	10	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.870	0.893	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3440 141 190 pcph

Estimation of V12 Merge Areas

L_{EQ} = 425.41 (Equation 13-6 or 13-7)

P_{FM} = 0.592 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2037 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3581	7200	No
v_3 or v_{av34}	1403 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} = 2037 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2178	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.319

Space mean speed in ramp influence area, S_R = 61.1 mph

Space mean speed in outer lanes, S_O = 66.7 mph

Space mean speed for all vehicles, S = 63.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2438	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	1362	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	761	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2438	1362	761	vph
Peak-hour factor, PHF	0.91	0.77	0.83	
Peak 15-min volume, v15	670	442	229	v
Trucks and buses	14	5	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.816	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3242 1901 1123 pcph

Estimation of V12 Merge Areas

L_{EQ} = 4157.72 (Equation 13-6 or 13-7)

P_{FM} = 0.619 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2008 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5143	7200	No
v_3 or v_{av34}	1234 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} = 2008 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3909	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 25.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.410

Space mean speed in ramp influence area, S_R = 58.5 mph

Space mean speed in outer lanes, S_O = 67.4 mph

Space mean speed for all vehicles, S = 60.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2438	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	1362	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2438	1362	230	vph
Peak-hour factor, PHF	0.91	0.77	0.85	
Peak 15-min volume, v15	670	442	68	v
Trucks and buses	14	5	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.806	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3242 1901 336 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1194.80 (Equation 13-6 or 13-7)

P_{FM} = 0.619 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2008 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5143	7200	No
v_3 or v_{av34}	1234 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} = 2008 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3909	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 25.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.410

Space mean speed in ramp influence area, S_R = 58.5 mph

Space mean speed in outer lanes, S_O = 67.4 mph

Space mean speed for all vehicles, S = 60.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3039	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	1158	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	151	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3039	1158	151	vph
Peak-hour factor, PHF	0.91	0.94	0.94	
Peak 15-min volume, v15	835	308	40	v
Trucks and buses	14	5	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4041 1324 168 pcph

Estimation of V12 Merge Areas

L_{EQ} = 621.99 (Equation 13-6 or 13-7)

P_{FM} = 0.619 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2503 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5365	7200	No
v_3 or v_{av34}	1538 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} = 2503 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3827	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 25.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.395	
Space mean speed in ramp influence area,	S_R = 58.9	mph
Space mean speed in outer lanes,	S_O = 66.3	mph
Space mean speed for all vehicles,	S = 60.9	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 SB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3039	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	1158	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	761	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	905	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3039	1158	761	vph
Peak-hour factor, PHF	0.91	0.94	0.83	
Peak 15-min volume, v15	835	308	229	v
Trucks and buses	14	5	15	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.826	0.930	0.816	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4041 1324 1123 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1242.31 (Equation 13-6 or 13-7)

P_{FM} = 0.598 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 2417 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5365	7200	No
v_3 or v_{av34}	1624 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} = 2417 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3741	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 24.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.380	
Space mean speed in ramp influence area,	S_R = 59.4	mph
Space mean speed in outer lanes,	S_O = 66.0	mph
Space mean speed for all vehicles,	S = 61.2	mph

Appendix C

HCS Ramp Merge Analysis Outputs
2040 Build I-26 Westbound On-Ramps

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1293	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	137	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	279	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1293	137	279	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	344	36	74	v
Trucks and buses	23	13	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.837	0.727	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1850 174 408 pcph

Estimation of V12 Merge Areas

L_{EQ} = 2414.42 (Equation 13-6 or 13-7)

P_{FM} = 0.593 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1097 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2024	7200	No
v_3 or v_{av34}	753 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} = 1097 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1271	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.296

Space mean speed in ramp influence area, S_R = 61.7 mph

Space mean speed in outer lanes, S_O = 69.1 mph

Space mean speed for all vehicles, S = 64.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1293	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	137	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	52	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1293	137	52	vph
Peak-hour factor, PHF	0.90	0.75	0.61	
Peak 15-min volume, v15	359	46	21	v
Trucks and buses	23	13	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.837	0.858	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1932 218 99 pcph

Estimation of V12 Merge Areas

L_{EQ} = 134.72 (Equation 13-6 or 13-7)

P_{FM} = 0.593 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1146 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2150	7200	No
v_3 or v_{av34}	786 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} = 1146 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1364	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 12.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.297

Space mean speed in ramp influence area, S_R = 61.7 mph

Space mean speed in outer lanes, S_O = 69.0 mph

Space mean speed for all vehicles, S = 64.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1161	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	184	vph
Length of first accel/decel lane	1195	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	52	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1161	184	52	vph
Peak-hour factor, PHF	0.90	0.94	0.61	
Peak 15-min volume, v15	323	49	21	v
Trucks and buses	23	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.870	0.858	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1735 225 99 pcph

Estimation of V12 Merge Areas

L_{EQ} = 416.90 (Equation 13-6 or 13-7)

P_{FM} = 0.611 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1060 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1960	7200	No
v_3 or v_{av34}	675 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} = 1060 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1285	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 7.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.251

Space mean speed in ramp influence area, S_R = 63.0 mph

Space mean speed in outer lanes, S_O = 69.4 mph

Space mean speed for all vehicles, S = 65.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1161	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	184	vph
Length of first accel/decel lane	1195	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1188	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1465	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1161	184	1188	vph
Peak-hour factor, PHF	0.90	0.94	0.82	
Peak 15-min volume, v15	323	49	362	v
Trucks and buses	23	10	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.870	0.806	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1735 225 1796 pcph

Estimation of V12 Merge Areas

L_{EQ} = 378.22 (Equation 13-6 or 13-7)

P_{FM} = 0.611 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1060 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1960	7200	No
v_3 or v_{av34}	675 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} = 1060 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1285	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 7.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.251

Space mean speed in ramp influence area, S_R = 63.0 mph

Space mean speed in outer lanes, S_O = 69.4 mph

Space mean speed for all vehicles, S = 65.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1998	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	351	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1188	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1998	351	1188	vph
Peak-hour factor, PHF	0.90	0.79	0.82	
Peak 15-min volume, v15	555	111	362	v
Trucks and buses	23	5	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.930	0.806	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2986 478 1796 pcph

Estimation of V12 Merge Areas

L_{EQ} = 6811.29 (Equation 13-6 or 13-7)

P_{FM} = 0.618 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1845 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3464	7200	No
v_3 or v_{av34}	1141 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} = 1845 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2323	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 14.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.260	
Space mean speed in ramp influence area,	S_R = 62.7	mph
Space mean speed in outer lanes,	S_O = 67.7	mph
Space mean speed for all vehicles,	S = 64.3	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1998	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	351	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	898	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1998	351	898	vph
Peak-hour factor, PHF	0.90	0.79	0.83	
Peak 15-min volume, v15	555	111	270	v
Trucks and buses	23	5	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.930	0.837	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2986 478 1293 pcph

Estimation of V12 Merge Areas

L_{EQ} = 808.86 (Equation 13-6 or 13-7)

P_{FM} = 0.612 Using Equation 2

$v_{12} = v_F (P_{FM})$ = 1826 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3464	7200	No
v_3 or v_{av34}	1160 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} = 1826 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3464	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 14.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.259

Space mean speed in ramp influence area, S_R = 62.7 mph

Space mean speed in outer lanes, S_O = 67.6 mph

Space mean speed for all vehicles, S = 64.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2700	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	196	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	898	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2700	196	898	vph
Peak-hour factor, PHF	0.90	0.93	0.83	
Peak 15-min volume, v15	750	53	270	v
Trucks and buses	23	4	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.943	0.837	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4035 223 1293 pcph

Estimation of V12 Merge Areas

L_{EQ} = 5596.31 (Equation 13-6 or 13-7)

P_{FM} = 0.190 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 766 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4258	9200	No
v_3 or v_{av34}	1634 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} = 1614 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	4258	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 12.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.266	
Space mean speed in ramp influence area,	S_R = 55.2	mph
Space mean speed in outer lanes,	S_O = 57.4	mph
Space mean speed for all vehicles,	S = 56.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2700	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	196	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	491	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2700	196	491	vph
Peak-hour factor, PHF	0.90	0.93	0.87	
Peak 15-min volume, v15	750	53	141	v
Trucks and buses	23	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.743	0.943	0.905	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 4035 223 624 pcph

Estimation of V12 Merge Areas

L_{EQ} = 843.35 (Equation 13-6 or 13-7)

P_{FM} = 0.190 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 766 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4258	9200	No
v_3 or v_{av34}	1634 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} = 1614 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	4258	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 12.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.266	
Space mean speed in ramp influence area,	S_R = 55.2	mph
Space mean speed in outer lanes,	S_O = 57.4	mph
Space mean speed for all vehicles,	S = 56.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2613	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	127	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	317	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2613	127	317	vph
Peak-hour factor, PHF	0.92	0.79	0.86	
Peak 15-min volume, v15	710	40	92	v
Trucks and buses	13	10	14	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.870	0.826	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3394 185 446 pcph

Estimation of V12 Merge Areas

L_{EQ} = 2639.29 (Equation 13-6 or 13-7)

P_{FM} = 0.593 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2013 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3579	7200	No
v_3 or v_{av34}	1381 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} = 2013 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2198	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.317

Space mean speed in ramp influence area, S_R = 61.1 mph

Space mean speed in outer lanes, S_O = 66.8 mph

Space mean speed for all vehicles, S = 63.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 85
Jurisdiction:	Newberry County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2613	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	127	vph
Length of first accel/decel lane	555	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	188	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	980	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2613	127	188	vph
Peak-hour factor, PHF	0.92	0.79	0.90	
Peak 15-min volume, v15	710	40	52	v
Trucks and buses	13	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.870	0.870	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3394 185 240 pcph

Estimation of V12 Merge Areas

L_{EQ} = 440.53 (Equation 13-6 or 13-7)

P_{FM} = 0.593 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2013 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3579	7200	No
v_3 or v_{av34}	1381 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} = 2013 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2198	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.317

Space mean speed in ramp influence area, S_R = 61.1 mph

Space mean speed in outer lanes, S_O = 66.8 mph

Space mean speed for all vehicles, S = 63.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	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	267	vph
Length of first accel/decel lane	1195	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	188	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2534	267	188	vph
Peak-hour factor, PHF	0.92	0.69	0.90	
Peak 15-min volume, v15	689	97	52	v
Trucks and buses	13	8	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.893	0.870	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3291 433 240 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1010.68 (Equation 13-6 or 13-7)

P_{FM} = 0.611 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2011 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3724	7200	No
v_3 or v_{av34}	1280 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} = 2011 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2444	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 16.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.282

Space mean speed in ramp influence area, S_R = 62.1 mph

Space mean speed in outer lanes, S_O = 67.2 mph

Space mean speed for all vehicles, S = 63.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 91
Jurisdiction:	Lexington County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	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	267	vph
Length of first accel/decel lane	1195	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1576	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1465	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2534	267	1576	vph
Peak-hour factor, PHF	0.92	0.69	0.93	
Peak 15-min volume, v15	689	97	424	v
Trucks and buses	13	8	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.893	0.837	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3291 433 2025 pcph

Estimation of V12 Merge Areas

L_{EQ} = 755.72 (Equation 13-6 or 13-7)

P_{FM} = 0.611 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 2011 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3724	7200	No
v_3 or v_{av34}	1280 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} = 2011 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2444	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 16.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.282

Space mean speed in ramp influence area, S_R = 62.1 mph

Space mean speed in outer lanes, S_O = 67.2 mph

Space mean speed for all vehicles, S = 63.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4110	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	273	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1576	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4110	273	1576	vph
Peak-hour factor, PHF	0.92	0.93	0.93	
Peak 15-min volume, v15	1117	73	424	v
Trucks and buses	13	2	13	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.971	0.837	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 5339 302 2025 pcph

Estimation of V12 Merge Areas

L_{EQ} = 7679.76 (Equation 13-6 or 13-7)

P_{FM} = 0.618 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 3299 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5641	7200	No
v_3 or v_{av34}	2040 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} = 3299 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3601	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 24.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.363

Space mean speed in ramp influence area, S_R = 59.8 mph

Space mean speed in outer lanes, S_O = 64.5 mph

Space mean speed for all vehicles, S = 61.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 97 Loop
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4110	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	273	vph
Length of first accel/decel lane	1440	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	2189	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	710	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4110	273	2189	vph
Peak-hour factor, PHF	0.92	0.93	0.86	
Peak 15-min volume, v15	1117	73	636	v
Trucks and buses	13	2	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.971	0.943	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 5339 302 2698 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1274.73 (Equation 13-6 or 13-7)

P_{FM} = 0.582 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 3108 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5641	7200	No
v_3 or v_{av34}	2231 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} = 3108 (Equation 13-15, 13-16, 18, or 19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3410	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.338	
Space mean speed in ramp influence area,	S_R = 60.5	mph
Space mean speed in outer lanes,	S_O = 63.8	mph
Space mean speed for all vehicles,	S = 61.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.90

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5660	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	366	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	2189	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	9999	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5660	366	2189	vph
Peak-hour factor, PHF	0.92	0.89	0.86	
Peak 15-min volume, v15	1538	103	636	v
Trucks and buses	13	3	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.957	0.943	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 7352 430 2698 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.164 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1206 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7782	9200	No
v_3 or v_{av34}	3073 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	Yes	

If yes, v_{12A} = 2940 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3370	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 24.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.355	
Space mean speed in ramp influence area,	S_R = 53.6	mph
Space mean speed in outer lanes,	S_O = 53.9	mph
Space mean speed for all vehicles,	S = 53.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.3

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RJD
Agency/Co.:	STV Incorporated
Date performed:	03/09/2017
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 NB
Junction:	Exit 101
Jurisdiction:	Richland County
Analysis Year:	2040 Build
Description:	I-26 mm 85-101

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	5660	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	366	vph
Length of first accel/decel lane	1135	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1387	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1080	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5660	366	1387	vph
Peak-hour factor, PHF	0.92	0.89	0.92	
Peak 15-min volume, v15	1538	103	377	v
Trucks and buses	13	3	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	
Heavy vehicle adjustment, fHV	0.837	0.957	0.917	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 7352 430 1643 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1597.49 (Equation 13-6 or 13-7)

P_{FM} = 0.164 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 1206 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7782	9200	No
v_3 or v_{av34}	3073 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	Yes	

If yes, v_{12A} = 2940 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	7782	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 24.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.355	
Space mean speed in ramp influence area,	S_R = 53.6	mph
Space mean speed in outer lanes,	S_O = 53.9	mph
Space mean speed for all vehicles,	S = 53.8	mph

Appendix D

Synchro Intersection Analysis Outputs

Appendix D

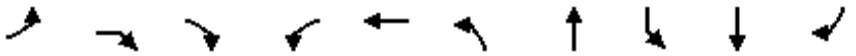
Synchro Intersection Analysis Outputs
Exit 97 - Existing AM

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	4	16	527	926	19
Future Volume (Veh/h)	10	4	16	527	926	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.63	1.00	0.44	0.87	0.93	0.68
Hourly flow rate (vph)	16	4	36	606	996	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				953		
pX, platoon unblocked	0.95					
vC, conflicting volume	1674	996	1024			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1684	996	1024			
tC, single (s)	6.4	6.5	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.5	2.2			
p0 queue free %	83	99	95			
cM capacity (veh/h)	94	268	670			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	36	606	996	28
Volume Left	16	36	0	0	0
Volume Right	4	0	0	0	28
cSH	108	670	1700	1700	1700
Volume to Capacity	0.19	0.05	0.36	0.59	0.02
Queue Length 95th (ft)	16	4	0	0	0
Control Delay (s)	45.8	10.7	0.0	0.0	0.0
Lane LOS	E	B			
Approach Delay (s)	45.8	0.6		0.0	
Approach LOS	E				

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

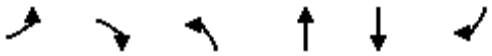


Movement	EBL	EBR	EBR2	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	3	1	17	527	7	18	225	6	926	0
Future Volume (vph)	3	1	17	527	7	18	225	6	926	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.0	6.5	6.0	6.9	6.9	6.9	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85		1.00	1.00	1.00	1.00	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1560		1703	1900	1745	1766	1229	1801	
Flt Permitted	0.75	1.00		0.95	1.00	0.04	1.00	0.60	1.00	
Satd. Flow (perm)	1434	1560		1703	1900	74	1766	771	1801	
Peak-hour factor, PHF	0.38	0.25	0.61	0.83	0.58	0.50	0.85	0.38	0.95	0.90
Adj. Flow (vph)	8	4	28	635	12	36	265	16	975	0
RTOR Reduction (vph)	0	31	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	8	1	0	635	12	36	265	16	975	0
Heavy Vehicles (%)	0%	0%	4%	6%	0%	0%	4%	42%	2%	2%
Turn Type	Perm	Prot		pm+pt	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases		8		7	4	1	6		2	
Permitted Phases	8			4		6		2		2
Actuated Green, G (s)	5.3	5.3		50.5	50.5	104.6	104.6	93.5	93.5	
Effective Green, g (s)	5.3	5.3		50.5	50.5	104.6	104.6	93.5	93.5	
Actuated g/C Ratio	0.03	0.03		0.30	0.30	0.62	0.62	0.55	0.55	
Clearance Time (s)	6.5	6.5		6.0	6.5	6.0	6.9	6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	45	49		510	569	96	1096	427	999	
v/s Ratio Prot		0.00		c0.29	0.01	0.01	c0.15		c0.54	
v/s Ratio Perm	0.01			0.08		0.22		0.02		
v/c Ratio	0.18	0.02		1.25	0.02	0.38	0.24	0.04	0.98	
Uniform Delay, d1	79.5	79.1		59.0	41.6	36.6	14.3	17.0	36.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.9	0.2		126.0	0.0	2.5	0.2	0.0	22.7	
Delay (s)	81.4	79.3		185.0	41.6	39.1	14.4	17.1	59.1	
Level of Service	F	E		F	D	D	B	B	E	
Approach Delay (s)					182.3		17.4		58.4	
Approach LOS					F		B		E	

Intersection Summary			
HCM 2000 Control Delay	93.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	168.5	Sum of lost time (s)	25.4
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

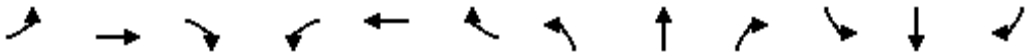
Intersection has too many legs for HCM analysis.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	172	26	29	560	478	52
Future Volume (Veh/h)	172	26	29	560	478	52
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.54	0.73	0.97	0.86	0.62
Hourly flow rate (vph)	249	48	40	577	556	84
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	1213	556	640			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1213	556	640			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	91	96			
cM capacity (veh/h)	192	531	930			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	249	48	617	556	84
Volume Left	249	0	40	0	0
Volume Right	0	48	0	0	84
cSH	192	531	930	1700	1700
Volume to Capacity	1.30	0.09	0.04	0.33	0.05
Queue Length 95th (ft)	346	7	3	0	0
Control Delay (s)	214.1	12.5	1.1	0.0	0.0
Lane LOS	F	B	A		
Approach Delay (s)	181.5		1.1	0.0	
Approach LOS	F				

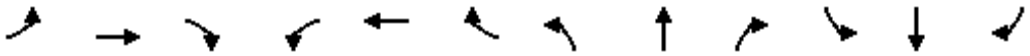
Intersection Summary			
Average Delay	35.1		
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	39	0	0	47	305	0	544	14	0	0	0
Future Volume (Veh/h)	0	39	0	0	47	305	0	544	14	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.63	0.90	0.90	0.78	0.64	0.90	0.97	0.70	0.90	0.90	0.90
Hourly flow rate (vph)	0	62	0	0	60	477	0	561	20	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)											863	
pX, platoon unblocked												
vC, conflicting volume	1078	581	0	602	571	571	0			581		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1078	581	0	602	571	571	0			581		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	85	100	100	86	9	100			100		
cM capacity (veh/h)	15	425	1091	368	431	522	1636			1003		

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	62	537	581
Volume Left	0	0	0
Volume Right	0	477	20
cSH	425	510	1700
Volume to Capacity	0.15	1.05	0.34
Queue Length 95th (ft)	13	399	0
Control Delay (s)	14.9	83.0	0.0
Lane LOS	B	F	
Approach Delay (s)	14.9	83.0	0.0
Approach LOS	B	F	

Intersection Summary				
Average Delay	38.5			
Intersection Capacity Utilization	70.3%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	228	3	0	151	0	0	0	0	0	122	16
Future Volume (Veh/h)	0	228	3	0	151	0	0	0	0	0	122	16
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.75	0.25	0.90	0.74	0.90	0.90	0.90	0.90	0.90	0.76	0.44
Hourly flow rate (vph)	0	304	12	0	204	0	0	0	0	0	161	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	281	179	179	343	197	0	197			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	281	179	179	343	197	0	197			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	57	99	100	71	100	100			100		
cM capacity (veh/h)	523	715	869	405	699	1091	1388			1636		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	316	204	197
Volume Left	0	0	0
Volume Right	12	0	36
cSH	720	699	1700
Volume to Capacity	0.44	0.29	0.12
Queue Length 95th (ft)	56	30	0
Control Delay (s)	13.9	12.3	0.0
Lane LOS	B	B	
Approach Delay (s)	13.9	12.3	0.0
Approach LOS	B	B	

Intersection Summary				
Average Delay	9.6			
Intersection Capacity Utilization	101.7%	ICU Level of Service	G	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	229	97	2	165	8	2
Future Volume (Veh/h)	229	97	2	165	8	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.67	0.50	0.78	0.50	0.50
Hourly flow rate (vph)	301	145	4	212	16	4
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			446		594	374
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			446		594	374
tC, single (s)			4.6		6.4	6.7
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.8
p0 queue free %			100		97	99
cM capacity (veh/h)			901		469	578

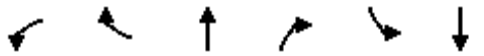
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	446	216	20
Volume Left	0	4	16
Volume Right	145	0	4
cSH	1700	901	488
Volume to Capacity	0.26	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.2	12.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	12.7
Approach LOS			B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	69	517	20	35	908
Future Volume (Veh/h)	37	69	517	20	35	908
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)	41	77	574	22	39	1009
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	1672	585			596	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1672	585			596	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	59	85			96	
cM capacity (veh/h)	101	511			980	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	118	596	1048
Volume Left	41	0	39
Volume Right	77	22	0
cSH	212	1700	980
Volume to Capacity	0.56	0.35	0.04
Queue Length 95th (ft)	75	0	3
Control Delay (s)	41.3	0.0	1.2
Lane LOS	E		A
Approach Delay (s)	41.3	0.0	1.2
Approach LOS	E		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	315	228	0	0	930
Future Volume (Veh/h)	0	315	228	0	0	930
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.81	0.86	0.90	0.90	0.95
Hourly flow rate (vph)	0	389	265	0	0	979
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			568			
pX, platoon unblocked	0.94	0.94			0.94	
vC, conflicting volume	754	265			265	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	704	181			181	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	50			100	
cM capacity (veh/h)	352	775			1317	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	389	265	490	490
Volume Left	0	0	0	0
Volume Right	389	0	0	0
cSH	775	1700	1700	1700
Volume to Capacity	0.50	0.16	0.29	0.29
Queue Length 95th (ft)	71	0	0	0
Control Delay (s)	14.2	0.0	0.0	0.0
Lane LOS	B			
Approach Delay (s)	14.2	0.0	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

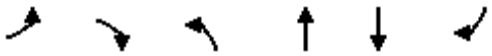
Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	47	0	0	0	39	171
Future Volume (Veh/h)	47	0	0	0	39	171
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.78	0.90	0.90	0.90	0.63	0.78
Hourly flow rate (vph)	60	0	0	0	62	219
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	343	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	343	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	100			96	
cM capacity (veh/h)	632	1091			1617	

Direction, Lane #	WB 1	SB 1
Volume Total	60	281
Volume Left	60	62
Volume Right	0	0
cSH	632	1617
Volume to Capacity	0.09	0.04
Queue Length 95th (ft)	8	3
Control Delay (s)	11.3	1.9
Lane LOS	B	A
Approach Delay (s)	11.3	1.9
Approach LOS	B	

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		



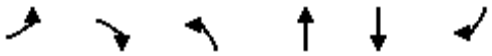
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	228	0	151	1227	0	0
Future Volume (Veh/h)	228	0	151	1227	0	0
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.90	0.74	0.82	0.90	0.90
Hourly flow rate (vph)	304	0	204	1496	0	0
Pedestrians						
Lane 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	1904	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1904	0	0			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	0	100	87			
cM capacity (veh/h)	65	1091	1530			

Direction, Lane #	EB 1	NB 1
Volume Total	304	1700
Volume Left	304	204
Volume Right	0	0
cSH	65	1530
Volume to Capacity	4.67	0.13
Queue Length 95th (ft)	Err	12
Control Delay (s)	Err	7.7
Lane LOS	F	A
Approach Delay (s)	Err	7.7
Approach LOS	F	

Intersection Summary			
Average Delay	1523.4		
Intersection Capacity Utilization	102.5%	ICU Level of Service	G
Analysis Period (min)	15		

Appendix D

Synchro Intersection Analysis Outputs
Exit 97 - Existing PM

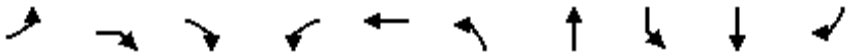


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	62	18	29	912	661	67
Future Volume (Veh/h)	62	18	29	912	661	67
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.64	0.81	0.86	0.92	0.58
Hourly flow rate (vph)	79	28	36	1060	718	116
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				953		
pX, platoon unblocked	0.91					
vC, conflicting volume	1850	718	834			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1885	718	834			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	94	96			
cM capacity (veh/h)	68	432	808			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	107	36	1060	718	116
Volume Left	79	36	0	0	0
Volume Right	28	0	0	0	116
cSH	87	808	1700	1700	1700
Volume to Capacity	1.23	0.04	0.62	0.42	0.07
Queue Length 95th (ft)	193	3	0	0	0
Control Delay (s)	260.3	9.7	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	260.3	0.3		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	13.8		
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

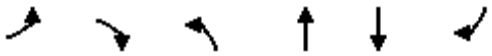


Movement	EBL	EBR	EBR2	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	27	19	74	583	69	34	281	9	682	1
Future Volume (vph)	27	19	74	583	69	34	281	9	682	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.0	6.5	6.0	6.9	6.9	6.9	6.9
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1615		1787	1900	1745	1818	1745	1766	1561
Flt Permitted	0.69	1.00		0.95	1.00	0.10	1.00	0.57	1.00	1.00
Satd. Flow (perm)	1320	1615		1787	1900	186	1818	1042	1766	1561
Peak-hour factor, PHF	0.75	0.59	0.77	0.93	0.72	0.71	0.88	0.56	0.91	0.25
Adj. Flow (vph)	36	32	96	627	96	48	319	16	749	4
RTOR Reduction (vph)	0	90	0	0	0	0	0	0	0	2
Lane Group Flow (vph)	36	38	0	627	96	48	319	16	749	2
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	1%	0%	4%	0%
Turn Type	Perm	Prot		pm+pt	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases		8		7	4	1	6		2	
Permitted Phases	8			4		6		2		2
Actuated Green, G (s)	9.8	9.8		56.1	56.1	82.5	82.5	71.2	71.2	71.2
Effective Green, g (s)	9.8	9.8		56.1	56.1	82.5	82.5	71.2	71.2	71.2
Actuated g/C Ratio	0.06	0.06		0.37	0.37	0.54	0.54	0.47	0.47	0.47
Clearance Time (s)	6.5	6.5		6.0	6.5	6.0	6.9	6.9	6.9	6.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	85	104		659	701	155	986	488	827	731
v/s Ratio Prot		0.02		c0.25	0.05	0.01	c0.18		c0.42	
v/s Ratio Perm	0.03			0.10		0.16		0.02		0.00
v/c Ratio	0.42	0.37		0.95	0.14	0.31	0.32	0.03	0.91	0.00
Uniform Delay, d1	68.4	68.1		46.6	31.9	27.7	19.3	21.8	37.3	21.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	2.2		23.6	0.1	1.1	0.3	0.0	13.6	0.0
Delay (s)	71.8	70.3		70.2	32.0	28.8	19.5	21.8	50.9	21.5
Level of Service	E	E		E	C	C	B	C	D	C
Approach Delay (s)					65.2		20.8		50.2	
Approach LOS					E		C		D	

Intersection Summary			
HCM 2000 Control Delay	51.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	152.0	Sum of lost time (s)	25.4
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

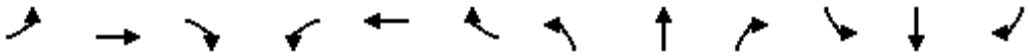
Intersection has too many legs for HCM analysis.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	63	29	547	1076	62
Future Volume (Veh/h)	50	63	29	547	1076	62
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.68	0.66	0.66	0.93	0.91	0.78
Hourly flow rate (vph)	74	95	44	588	1182	79
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	1858	1182	1261			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1858	1182	1261			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	1	59	92			
cM capacity (veh/h)	75	233	538			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	74	95	632	1182	79
Volume Left	74	0	44	0	0
Volume Right	0	95	0	0	79
cSH	75	233	538	1700	1700
Volume to Capacity	0.99	0.41	0.08	0.70	0.05
Queue Length 95th (ft)	131	47	7	0	0
Control Delay (s)	198.2	30.6	2.3	0.0	0.0
Lane LOS	F	D	A		
Approach Delay (s)	104.0		2.3	0.0	
Approach LOS	F				

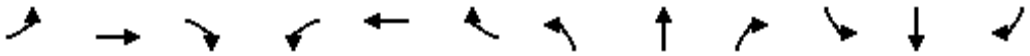
Intersection Summary			
Average Delay	9.2		
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	69	0	0	8	70	0	1216	145	0	0	0
Future Volume (Veh/h)	0	69	0	0	8	70	0	1216	145	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.82	0.90	0.90	0.67	0.83	0.90	0.90	0.93	0.90	0.90	0.90
Hourly flow rate (vph)	0	84	0	0	12	84	0	1351	156	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)											863	
pX, platoon unblocked												
vC, conflicting volume	1519	1507	0	1471	1429	1429	0			1507		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1519	1507	0	1471	1429	1429	0			1507		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	30	100	100	91	50	100			100		
cM capacity (veh/h)	46	121	1091	46	135	167	1636			450		

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	84	96	1507
Volume Left	0	0	0
Volume Right	0	84	156
cSH	121	162	1700
Volume to Capacity	0.70	0.59	0.89
Queue Length 95th (ft)	94	79	0
Control Delay (s)	84.6	55.1	0.0
Lane LOS	F	F	
Approach Delay (s)	84.6	55.1	0.0
Approach LOS	F	F	

Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	98.2%	ICU Level of Service	F	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	204	64	0	245	0	0	0	0	0	395	78
Future Volume (Veh/h)	0	204	64	0	245	0	0	0	0	0	395	78
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.77	0.84	0.90	0.94	0.90	0.90	0.90	0.90	0.90	0.83	0.59
Hourly flow rate (vph)	0	265	76	0	261	0	0	0	0	0	476	132
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	672	542	542	750	608	0	608			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	672	542	542	750	608	0	608			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	41	86	100	36	100	100			100		
cM capacity (veh/h)	182	447	544	150	410	1091	980			1636		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	341	261	608
Volume Left	0	0	0
Volume Right	76	0	132
cSH	466	410	1700
Volume to Capacity	0.73	0.64	0.36
Queue Length 95th (ft)	148	107	0
Control Delay (s)	31.0	27.9	0.0
Lane LOS	D	D	
Approach Delay (s)	31.0	27.9	0.0
Approach LOS	D	D	

Intersection Summary				
Average Delay	14.8			
Intersection Capacity Utilization	90.0%	ICU Level of Service	E	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	262	17	29	294	21	6
Future Volume (Veh/h)	262	17	29	294	21	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.61	0.73	0.84	0.75	0.75
Hourly flow rate (vph)	323	28	40	350	28	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			351		767	337
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			351		767	337
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			97		92	99
cM capacity (veh/h)			1219		361	681

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	351	390	36
Volume Left	0	40	28
Volume Right	28	0	8
cSH	1700	1219	403
Volume to Capacity	0.21	0.03	0.09
Queue Length 95th (ft)	0	3	7
Control Delay (s)	0.0	1.1	14.8
Lane LOS		A	B
Approach Delay (s)	0.0	1.1	14.8
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	21	27	907	67	37	707
Future Volume (Veh/h)	21	27	907	67	37	707
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)	23	30	1008	74	41	786
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	1913	1045			1082	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1913	1045			1082	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	67	89			94	
cM capacity (veh/h)	70	278			645	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	53	1082	827
Volume Left	23	0	41
Volume Right	30	74	0
cSH	121	1700	645
Volume to Capacity	0.44	0.64	0.06
Queue Length 95th (ft)	48	0	5
Control Delay (s)	56.0	0.0	1.8
Lane LOS	F		A
Approach Delay (s)	56.0	0.0	1.8
Approach LOS	F		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	633	308	0	0	679
Future Volume (Veh/h)	0	633	308	0	0	679
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.89	0.90	0.90	0.93
Hourly flow rate (vph)	0	703	346	0	0	730
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			568			
pX, platoon unblocked	0.90	0.90			0.90	
vC, conflicting volume	711	346			346	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	621	214			214	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	1			100	
cM capacity (veh/h)	381	710			1228	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	703	346	365	365
Volume Left	0	0	0	0
Volume Right	703	0	0	0
cSH	710	1700	1700	1700
Volume to Capacity	0.99	0.20	0.21	0.21
Queue Length 95th (ft)	396	0	0	0
Control Delay (s)	55.5	0.0	0.0	0.0
Lane LOS	F			
Approach Delay (s)	55.5	0.0	0.0	
Approach LOS	F			

Intersection Summary			
Average Delay	21.9		
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

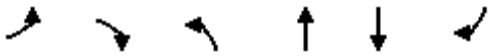
Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	0	0	0	69	162
Future Volume (Veh/h)	8	0	0	0	69	162
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.67	0.90	0.90	0.90	0.82	0.90
Hourly flow rate (vph)	12	0	0	0	84	180
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	348	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	348	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			95	
cM capacity (veh/h)	620	1091			1636	

Direction, Lane #	WB 1	SB 1
Volume Total	12	264
Volume Left	12	84
Volume Right	0	0
cSH	620	1636
Volume to Capacity	0.02	0.05
Queue Length 95th (ft)	1	4
Control Delay (s)	10.9	2.6
Lane LOS	B	A
Approach Delay (s)	10.9	2.6
Approach LOS	B	

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	99.9%	ICU Level of Service	F	
Analysis Period (min)	15			



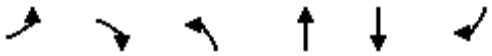
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	204	0	245	516	0	0
Future Volume (Veh/h)	204	0	245	516	0	0
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.90	0.94	0.92	0.90	0.90
Hourly flow rate (vph)	265	0	261	561	0	0
Pedestrians						
Lane 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	1083	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1083	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	84			
cM capacity (veh/h)	200	1091	1630			

Direction, Lane #	EB 1	NB 1
Volume Total	265	822
Volume Left	265	261
Volume Right	0	0
cSH	200	1630
Volume to Capacity	1.32	0.16
Queue Length 95th (ft)	370	14
Control Delay (s)	222.6	3.7
Lane LOS	F	A
Approach Delay (s)	222.6	3.7
Approach LOS	F	

Intersection Summary			
Average Delay	57.0		
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

Appendix D

Synchro Intersection Analysis Outputs
Exit 97 - No Build AM

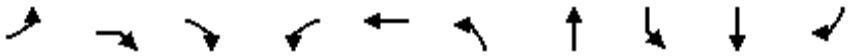


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	4	16	527	926	19
Future Volume (Veh/h)	10	4	16	527	926	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.63	1.00	0.44	0.87	0.93	0.68
Hourly flow rate (vph)	26	6	59	975	1603	45
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				953		
pX, platoon unblocked	0.89					
vC, conflicting volume	2696	1603	1648			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2846	1603	1648			
tC, single (s)	6.4	6.5	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.5	2.2			
p0 queue free %	0	95	85			
cM capacity (veh/h)	15	115	387			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	59	975	1603	45
Volume Left	26	59	0	0	0
Volume Right	6	0	0	0	45
cSH	17	387	1700	1700	1700
Volume to Capacity	1.84	0.15	0.57	0.94	0.03
Queue Length 95th (ft)	112	13	0	0	0
Control Delay (s)	859.1	16.0	0.0	0.0	0.0
Lane LOS	F	C			
Approach Delay (s)	859.1	0.9		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	10.5		
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		

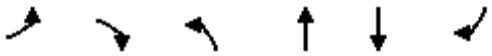
Intersection Sign configuration not allowed in HCM analysis.



Movement	EBL	EBR	EBR2	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	3	1	17	527	7	18	225	6	926	0
Future Volume (vph)	3	1	17	527	7	18	225	6	926	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.0	6.5	6.0	6.9	6.9	6.9	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85		1.00	1.00	1.00	1.00	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1805	1560		1703	1900	1745	1766	1229	1801	
Flt Permitted	0.75	1.00		0.95	1.00	0.04	1.00	0.51	1.00	
Satd. Flow (perm)	1416	1560		1703	1900	74	1766	656	1801	
Peak-hour factor, PHF	0.38	0.25	0.61	0.83	0.58	0.50	0.85	0.38	0.95	0.90
Growth Factor (vph)	161%	161%	161%	161%	161%	161%	161%	161%	161%	161%
Adj. Flow (vph)	13	6	45	1022	19	58	426	25	1569	0
RTOR Reduction (vph)	0	49	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	13	2	0	1022	19	58	426	25	1569	0
Heavy Vehicles (%)	0%	0%	4%	6%	0%	0%	4%	42%	2%	2%
Turn Type	Perm	Prot		pm+pt	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases		8		7	4	1	6		2	
Permitted Phases	8			4		6		2		2
Actuated Green, G (s)	5.9	5.9		51.1	51.1	105.4	105.4	93.6	93.6	
Effective Green, g (s)	5.9	5.9		51.1	51.1	105.4	105.4	93.6	93.6	
Actuated g/C Ratio	0.03	0.03		0.30	0.30	0.62	0.62	0.55	0.55	
Clearance Time (s)	6.5	6.5		6.0	6.5	6.0	6.9	6.9	6.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	49	54		512	571	102	1095	361	992	
v/s Ratio Prot		0.00		c0.46	0.01	0.02	c0.24		c0.87	
v/s Ratio Perm	0.01			0.14		0.33		0.04		
v/c Ratio	0.27	0.03		2.00	0.03	0.57	0.39	0.07	1.58	
Uniform Delay, d1	79.9	79.2		59.4	42.0	40.4	16.1	17.8	38.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.9	0.2		455.2	0.0	7.1	0.3	0.1	266.6	
Delay (s)	82.8	79.5		514.6	42.0	47.5	16.5	17.9	304.7	
Level of Service	F	E		F	D	D	B	B	F	
Approach Delay (s)					505.9		20.2		300.2	
Approach LOS					F		C		F	

Intersection Summary			
HCM 2000 Control Delay	320.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.75		
Actuated Cycle Length (s)	169.9	Sum of lost time (s)	25.4
Intersection Capacity Utilization	145.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

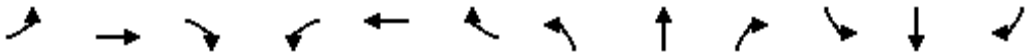
Intersection has too many legs for HCM analysis.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	172	26	29	560	478	52
Future Volume (Veh/h)	172	26	29	560	478	52
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.54	0.73	0.97	0.86	0.62
Hourly flow rate (vph)	401	78	64	929	895	135
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	1952	895	1030			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1952	895	1030			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	77	90			
cM capacity (veh/h)	64	339	663			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	401	78	993	895	135
Volume Left	401	0	64	0	0
Volume Right	0	78	0	0	135
cSH	64	339	663	1700	1700
Volume to Capacity	6.29	0.23	0.10	0.53	0.08
Queue Length 95th (ft)	Err	22	8	0	0
Control Delay (s)	Err	18.7	2.9	0.0	0.0
Lane LOS	F	C	A		
Approach Delay (s)	8373.8		2.9	0.0	
Approach LOS	F				

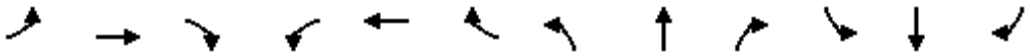
Intersection Summary			
Average Delay	1604.3		
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	39	0	0	47	305	0	544	14	0	0	0
Future Volume (Veh/h)	0	39	0	0	47	305	0	544	14	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.63	0.90	0.90	0.78	0.64	0.90	0.97	0.70	0.90	0.90	0.90
Hourly flow rate (vph)	0	100	0	0	97	767	0	903	32	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)											863	
pX, platoon unblocked												
vC, conflicting volume	1734	935	0	969	919	919	0			935		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1734	935	0	969	919	919	0			935		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	62	100	100	64	0	100			100		
cM capacity (veh/h)	0	265	1091	166	271	330	1636			741		

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	100	864	935
Volume Left	0	0	0
Volume Right	0	767	32
cSH	265	322	1700
Volume to Capacity	0.38	2.68	0.55
Queue Length 95th (ft)	42	1805	0
Control Delay (s)	26.5	789.9	0.0
Lane LOS	D	F	
Approach Delay (s)	26.5	789.9	0.0
Approach LOS	D	F	

Intersection Summary				
Average Delay	360.8			
Intersection Capacity Utilization	108.0%	ICU Level of Service	G	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	228	3	0	151	0	0	0	0	0	122	16
Future Volume (Veh/h)	0	228	3	0	151	0	0	0	0	0	122	16
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.75	0.25	0.90	0.74	0.90	0.90	0.90	0.90	0.90	0.76	0.44
Hourly flow rate (vph)	0	489	19	0	329	0	0	0	0	0	258	59
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	452	288	288	551	317	0	317			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	452	288	288	551	317	0	317			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	21	97	100	45	100	100			100		
cM capacity (veh/h)	295	622	756	153	599	1091	1255			1636		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	508	329	317
Volume Left	0	0	0
Volume Right	19	0	59
cSH	626	599	1700
Volume to Capacity	0.81	0.55	0.19
Queue Length 95th (ft)	207	83	0
Control Delay (s)	30.7	18.1	0.0
Lane LOS	D	C	
Approach Delay (s)	30.7	18.1	0.0
Approach LOS	D	C	

Intersection Summary				
Average Delay	18.7			
Intersection Capacity Utilization	158.1%	ICU Level of Service	H	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	229	97	2	165	8	2
Future Volume (Veh/h)	229	97	2	165	8	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.67	0.50	0.78	0.50	0.50
Hourly flow rate (vph)	485	233	6	341	26	6
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			718		954	602
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			718		954	602
tC, single (s)			4.6		6.4	6.7
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.8
p0 queue free %			99		91	99
cM capacity (veh/h)			699		287	422

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	718	347	32
Volume Left	0	6	26
Volume Right	233	0	6
cSH	1700	699	305
Volume to Capacity	0.42	0.01	0.10
Queue Length 95th (ft)	0	1	9
Control Delay (s)	0.0	0.3	18.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.3	18.2
Approach LOS			C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	69	517	20	35	908
Future Volume (Veh/h)	37	69	517	20	35	908
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)	66	123	925	36	63	1624
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	2693	943			961	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2693	943			961	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	61			91	
cM capacity (veh/h)	22	318			716	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	189	961	1687
Volume Left	66	0	63
Volume Right	123	36	0
cSH	55	1700	716
Volume to Capacity	3.42	0.57	0.09
Queue Length 95th (ft)	Err	0	7
Control Delay (s)	Err	0.0	10.5
Lane LOS	F		B
Approach Delay (s)	Err	0.0	10.5
Approach LOS	F		

Intersection Summary			
Average Delay	672.4		
Intersection Capacity Utilization	139.4%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	315	228	0	0	930
Future Volume (Veh/h)	0	315	228	0	0	930
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.81	0.86	0.90	0.90	0.95
Hourly flow rate (vph)	0	626	427	0	0	1576
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			568			
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	1215	427			427	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1176	281			281	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	0			100	
cM capacity (veh/h)	165	628			1138	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	626	427	788	788
Volume Left	0	0	0	0
Volume Right	626	0	0	0
cSH	628	1700	1700	1700
Volume to Capacity	1.00	0.25	0.46	0.46
Queue Length 95th (ft)	381	0	0	0
Control Delay (s)	60.9	0.0	0.0	0.0
Lane LOS	F			
Approach Delay (s)	60.9	0.0	0.0	
Approach LOS	F			

Intersection Summary			
Average Delay	14.5		
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

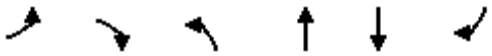
Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	47	0	0	0	39	171
Future Volume (Veh/h)	47	0	0	0	39	171
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.78	0.90	0.90	0.90	0.63	0.78
Hourly flow rate (vph)	97	0	0	0	100	353
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	553	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	553	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	100			94	
cM capacity (veh/h)	467	1091			1617	

Direction, Lane #	WB 1	SB 1
Volume Total	97	453
Volume Left	97	100
Volume Right	0	0
cSH	467	1617
Volume to Capacity	0.21	0.06
Queue Length 95th (ft)	19	5
Control Delay (s)	14.7	2.1
Lane LOS	B	A
Approach Delay (s)	14.7	2.1
Approach LOS	B	

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	109.7%	ICU Level of Service	H
Analysis Period (min)	15		



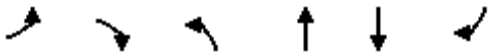
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	228	0	151	1227	0	0
Future Volume (Veh/h)	228	0	151	1227	0	0
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.90	0.74	0.82	0.90	0.90
Hourly flow rate (vph)	489	0	329	2409	0	0
Pedestrians						
Lane 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	3067	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3067	0	0			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	0	100	78			
cM capacity (veh/h)	11	1091	1530			

Direction, Lane #	EB 1	NB 1
Volume Total	489	2738
Volume Left	489	329
Volume Right	0	0
cSH	11	1530
Volume to Capacity	46.21	0.22
Queue Length 95th (ft)	Err	20
Control Delay (s)	Err	1.0
Lane LOS	F	A
Approach Delay (s)	Err	1.0
Approach LOS	F	

Intersection Summary			
Average Delay	1516.0		
Intersection Capacity Utilization	158.9%	ICU Level of Service	H
Analysis Period (min)	15		

Appendix D

Synchro Intersection Analysis Outputs
Exit 97 - No Build PM

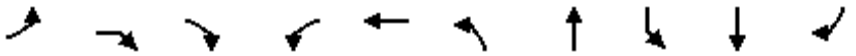


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	62	18	29	912	661	67
Future Volume (Veh/h)	62	18	29	912	661	67
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.64	0.81	0.86	0.92	0.58
Hourly flow rate (vph)	128	45	58	1707	1157	186
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				953		
pX, platoon unblocked	0.83					
vC, conflicting volume	2980	1157	1343			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3284	1157	1343			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	81	89			
cM capacity (veh/h)	7	241	520			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	173	58	1707	1157	186
Volume Left	128	58	0	0	0
Volume Right	45	0	0	0	186
cSH	10	520	1700	1700	1700
Volume to Capacity	17.94	0.11	1.00	0.68	0.11
Queue Length 95th (ft)	Err	9	0	0	0
Control Delay (s)	Err	12.8	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	Err	0.4		0.0	
Approach LOS	F				

Intersection Summary				
Average Delay	527.5			
Intersection Capacity Utilization	91.2%	ICU Level of Service		F
Analysis Period (min)	15			

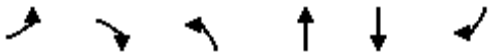
Intersection Sign configuration not allowed in HCM analysis.



Movement	EBL	EBR	EBR2	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	27	19	74	583	69	34	281	9	682	1
Future Volume (vph)	27	19	74	583	69	34	281	9	682	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.0	6.5	6.0	6.9	6.9	6.9	6.9
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1615		1787	1900	1745	1818	1745	1766	1561
Flt Permitted	0.66	1.00		0.95	1.00	0.04	1.00	0.43	1.00	1.00
Satd. Flow (perm)	1252	1615		1787	1900	74	1818	796	1766	1561
Peak-hour factor, PHF	0.75	0.59	0.77	0.93	0.72	0.71	0.88	0.56	0.91	0.25
Growth Factor (vph)	161%	161%	161%	161%	161%	161%	161%	161%	161%	161%
Adj. Flow (vph)	58	52	155	1009	154	77	514	26	1207	6
RTOR Reduction (vph)	0	89	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	58	118	0	1009	154	77	514	26	1207	3
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	1%	0%	4%	0%
Turn Type	Perm	Prot		pm+pt	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases		8		7	4	1	6		2	
Permitted Phases	8			4		6		2		2
Actuated Green, G (s)	13.5	13.5		58.5	58.5	107.0	107.0	93.1	93.1	93.1
Effective Green, g (s)	13.5	13.5		58.5	58.5	107.0	107.0	93.1	93.1	93.1
Actuated g/C Ratio	0.08	0.08		0.33	0.33	0.60	0.60	0.52	0.52	0.52
Clearance Time (s)	6.5	6.5		6.0	6.5	6.0	6.9	6.9	6.9	6.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	94	121		584	621	118	1087	414	919	812
v/s Ratio Prot		0.07		c0.38	0.08	0.03	c0.28		c0.68	
v/s Ratio Perm	0.05			0.19		0.36		0.03		0.00
v/c Ratio	0.62	0.98		1.73	0.25	0.65	0.47	0.06	1.31	0.00
Uniform Delay, d1	80.2	82.5		60.2	44.1	43.0	20.1	21.3	42.9	20.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.5	74.0		334.6	0.2	12.2	0.4	0.1	148.8	0.0
Delay (s)	91.6	156.5		394.8	44.3	55.3	20.6	21.4	191.7	20.6
Level of Service	F	F		F	D	E	C	C	F	C
Approach Delay (s)					348.4		25.1		187.3	
Approach LOS					F		C		F	

Intersection Summary			
HCM 2000 Control Delay	211.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.49		
Actuated Cycle Length (s)	178.9	Sum of lost time (s)	25.4
Intersection Capacity Utilization	135.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

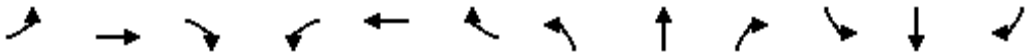
Intersection has too many legs for HCM analysis.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	50	63	29	547	1076	62
Future Volume (Veh/h)	50	63	29	547	1076	62
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.68	0.66	0.66	0.93	0.91	0.78
Hourly flow rate (vph)	118	154	71	947	1904	128
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	2993	1904	2032			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2993	1904	2032			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	0	0	74			
cM capacity (veh/h)	11	87	270			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	118	154	1018	1904	128
Volume Left	118	0	71	0	0
Volume Right	0	154	0	0	128
cSH	11	87	270	1700	1700
Volume to Capacity	10.44	1.77	0.26	1.12	0.08
Queue Length 95th (ft)	Err	322	26	0	0
Control Delay (s)	Err	471.8	14.3	0.0	0.0
Lane LOS	F	F	B		
Approach Delay (s)	4604.9		14.3	0.0	
Approach LOS	F				

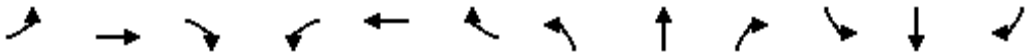
Intersection Summary			
Average Delay	381.4		
Intersection Capacity Utilization	104.1%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	69	0	0	8	70	0	1216	145	0	0	0
Future Volume (Veh/h)	0	69	0	0	8	70	0	1216	145	0	0	0
Sign Control		Yield			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.82	0.90	0.90	0.67	0.83	0.90	0.90	0.93	0.90	0.90	0.90
Hourly flow rate (vph)	0	135	0	0	19	136	0	2175	251	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)											863	
pX, platoon unblocked												
vC, conflicting volume	2446	2426	0	2368	2300	2300	0			2426		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2446	2426	0	2368	2300	2300	0			2426		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	100	0	51	0	100			100		
cM capacity (veh/h)	0	32	1091	0	39	50	1636			198		

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	135	155	2426
Volume Left	0	0	0
Volume Right	0	136	251
cSH	32	48	1700
Volume to Capacity	4.20	3.22	1.43
Queue Length 95th (ft)	Err	Err	0
Control Delay (s)	Err	Err	0.0
Lane LOS	F	F	
Approach Delay (s)	Err	Err	0.0
Approach LOS	F	F	

Intersection Summary			
Average Delay	1067.6		
Intersection Capacity Utilization	153.0%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	204	64	0	245	0	0	0	0	0	395	78
Future Volume (Veh/h)	0	204	64	0	245	0	0	0	0	0	395	78
Sign Control		Stop			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.77	0.84	0.90	0.94	0.90	0.90	0.90	0.90	0.90	0.83	0.59
Hourly flow rate (vph)	0	427	123	0	420	0	0	0	0	0	766	213
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	1082	872	872	1209	979	0	979			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1082	872	872	1209	979	0	979			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	65	0	0	100	100			100		
cM capacity (veh/h)	0	289	353	0	250	1091	713			1636		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	550	420	979
Volume Left	0	0	0
Volume Right	123	0	213
cSH	301	250	1700
Volume to Capacity	1.83	1.68	0.58
Queue Length 95th (ft)	919	676	0
Control Delay (s)	414.2	357.3	0.0
Lane LOS	F	F	
Approach Delay (s)	414.2	357.3	0.0
Approach LOS	F	F	

Intersection Summary				
Average Delay	193.9			
Intersection Capacity Utilization	139.4%	ICU Level of Service	H	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	262	17	29	294	21	6
Future Volume (Veh/h)	262	17	29	294	21	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.61	0.73	0.84	0.75	0.75
Hourly flow rate (vph)	521	45	64	564	45	13
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			566		1236	544
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			566		1236	544
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			94		76	97
cM capacity (veh/h)			1016		184	519

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	566	628	58
Volume Left	0	64	45
Volume Right	45	0	13
cSH	1700	1016	215
Volume to Capacity	0.33	0.06	0.27
Queue Length 95th (ft)	0	5	26
Control Delay (s)	0.0	1.6	27.8
Lane LOS		A	D
Approach Delay (s)	0.0	1.6	27.8
Approach LOS			D

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		64.7%	ICU Level of Service C
Analysis Period (min)		15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	21	27	907	67	37	707
Future Volume (Veh/h)	21	27	907	67	37	707
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)	38	48	1623	120	66	1265
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	3080	1683			1743	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3080	1683			1743	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	59			82	
cM capacity (veh/h)	11	117			360	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	86	1743	1331
Volume Left	38	0	66
Volume Right	48	120	0
cSH	22	1700	360
Volume to Capacity	3.90	1.03	0.18
Queue Length 95th (ft)	Err	0	17
Control Delay (s)	Err	0.0	12.6
Lane LOS	F		B
Approach Delay (s)	Err	0.0	12.6
Approach LOS	F		

Intersection Summary			
Average Delay	277.4		
Intersection Capacity Utilization	119.7%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	633	308	0	0	679
Future Volume (Veh/h)	0	633	308	0	0	679
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.89	0.90	0.90	0.93
Hourly flow rate (vph)	0	1132	557	0	0	1175
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			568			
pX, platoon unblocked	0.82	0.82			0.82	
vC, conflicting volume	1144	557			557	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1064	343			343	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	0			100	
cM capacity (veh/h)	180	532			1000	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	1132	557	588	588
Volume Left	0	0	0	0
Volume Right	1132	0	0	0
cSH	532	1700	1700	1700
Volume to Capacity	2.13	0.33	0.35	0.35
Queue Length 95th (ft)	2007	0	0	0
Control Delay (s)	531.7	0.0	0.0	0.0
Lane LOS	F			
Approach Delay (s)	531.7	0.0	0.0	
Approach LOS	F			

Intersection Summary			
Average Delay	210.2		
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		

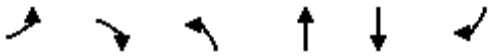
Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	0	0	0	69	162
Future Volume (Veh/h)	8	0	0	0	69	162
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.67	0.90	0.90	0.90	0.82	0.90
Hourly flow rate (vph)	19	0	0	0	135	290
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	560	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	560	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	100			92	
cM capacity (veh/h)	452	1091			1636	

Direction, Lane #	WB 1	SB 1
Volume Total	19	425
Volume Left	19	135
Volume Right	0	0
cSH	452	1636
Volume to Capacity	0.04	0.08
Queue Length 95th (ft)	3	7
Control Delay (s)	13.3	2.9
Lane LOS	B	A
Approach Delay (s)	13.3	2.9
Approach LOS	B	

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	154.7%	ICU Level of Service	H
Analysis Period (min)	15		



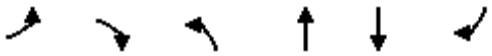
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	204	0	245	516	0	0
Future Volume (Veh/h)	204	0	245	516	0	0
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.90	0.94	0.92	0.90	0.90
Hourly flow rate (vph)	427	0	420	903	0	0
Pedestrians						
Lane 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	1743	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1743	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	100	74			
cM capacity (veh/h)	70	1091	1630			

Direction, Lane #	EB 1	NB 1
Volume Total	427	1323
Volume Left	427	420
Volume Right	0	0
cSH	70	1630
Volume to Capacity	6.11	0.26
Queue Length 95th (ft)	Err	26
Control Delay (s)	Err	5.5
Lane LOS	F	A
Approach Delay (s)	Err	5.5
Approach LOS	F	

Intersection Summary			
Average Delay	2443.9		
Intersection Capacity Utilization	140.2%	ICU Level of Service	H
Analysis Period (min)	15		

Appendix D

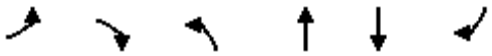
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 1 AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	6	0	744	1868	31
Future Volume (Veh/h)	0	6	0	744	1868	31
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	7	0	827	2076	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1316		
pX, platoon unblocked						
vC, conflicting volume	2506	1055	2110			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2506	1055	2110			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	24	225	263			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	7	414	414	1384	726
Volume Left	0	0	0	0	0
Volume Right	7	0	0	0	34
cSH	225	1700	1700	1700	1700
Volume to Capacity	0.03	0.24	0.24	0.81	0.43
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	21.5	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	21.5	0.0		0.0	
Approach LOS	C				

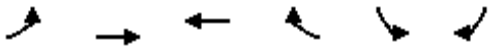
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	35	62	724	1867	7
Future Volume (Veh/h)	21	35	62	724	1867	7
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)	23	39	69	804	2074	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)				722		
pX, platoon unblocked						
vC, conflicting volume	2618	1041	2082			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2618	1041	2082			
tC, single (s)	6.8	7.4	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.5	2.2			
p0 queue free %	0	80	73			
cM capacity (veh/h)	15	191	256			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	62	69	402	402	1383	699
Volume Left	23	69	0	0	0	0
Volume Right	39	0	0	0	0	8
cSH	35	256	1700	1700	1700	1700
Volume to Capacity	1.76	0.27	0.24	0.24	0.81	0.41
Queue Length 95th (ft)	170	27	0	0	0	0
Control Delay (s)	611.4	24.2	0.0	0.0	0.0	0.0
Lane LOS	F	C				
Approach Delay (s)	611.4	1.9			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	13.1		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

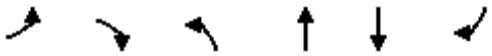


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	431	0	0	0	1815	0
Future Volume (vph)	431	0	0	0	1815	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0				6.0	
Lane Util. Factor	0.97				0.97	
Frt	1.00				1.00	
Flt Protected	0.95				0.95	
Satd. Flow (prot)	3367				3433	
Flt Permitted	0.95				0.95	
Satd. Flow (perm)	3367				3433	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	479	0	0	0	2017	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	479	0	0	0	2017	0
Heavy Vehicles (%)	4%	0%	0%	0%	2%	0%
Turn Type	Prot				Prot	
Protected Phases	6				2	
Permitted Phases						
Actuated Green, G (s)	17.4				60.6	
Effective Green, g (s)	17.4				60.6	
Actuated g/C Ratio	0.19				0.67	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	4.0				4.0	
Lane Grp Cap (vph)	650				2311	
v/s Ratio Prot	c0.14				c0.59	
v/s Ratio Perm						
v/c Ratio	0.74				0.87	
Uniform Delay, d1	34.1				11.6	
Progression Factor	0.37				1.00	
Incremental Delay, d2	3.9				4.9	
Delay (s)	16.7				16.6	
Level of Service	B				B	
Approach Delay (s)		16.7	0.0		16.6	
Approach LOS		B	A		B	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	850	0	674	0
Future Volume (vph)	0	0	850	0	674	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0		6.0	
Lane Util. Factor			0.97		0.97	
Frt			1.00		1.00	
Flt Protected			0.95		0.95	
Satd. Flow (prot)			3303		3400	
Flt Permitted			0.95		0.95	
Satd. Flow (perm)			3303		3400	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	944	0	749	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	944	0	749	0
Heavy Vehicles (%)	0%	0%	6%	0%	3%	0%
Turn Type			Prot		Prot	
Protected Phases			2		6	
Permitted Phases						
Actuated Green, G (s)			51.9		26.1	
Effective Green, g (s)			51.9		26.1	
Actuated g/C Ratio			0.58		0.29	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			4.0		4.0	
Lane Grp Cap (vph)			1904		986	
v/s Ratio Prot			c0.29		c0.22	
v/s Ratio Perm						
v/c Ratio			0.50		0.76	
Uniform Delay, d1			11.3		29.1	
Progression Factor			1.12		1.00	
Incremental Delay, d2			0.5		3.6	
Delay (s)			13.1		32.7	
Level of Service			B		C	
Approach Delay (s)	0.0			13.1	32.7	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	644	47	101	843	756	295
Future Volume (Veh/h)	644	47	101	843	756	295
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)	716	52	112	937	840	328
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					932	
pX, platoon unblocked						
vC, conflicting volume	1532	840	1168			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1532	840	1168			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	83	81			
cM capacity (veh/h)	86	309	577			

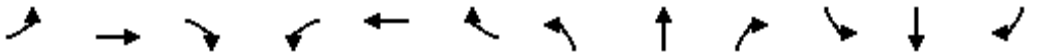
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	716	52	112	468	468	840	328
Volume Left	716	0	112	0	0	0	0
Volume Right	0	52	0	0	0	0	328
cSH	86	309	577	1700	1700	1700	1700
Volume to Capacity	8.28	0.17	0.19	0.28	0.28	0.49	0.19
Queue Length 95th (ft)	Err	15	18	0	0	0	0
Control Delay (s)	Err	19.0	12.7	0.0	0.0	0.0	0.0
Lane LOS	F	C	B				
Approach Delay (s)	9323.3		1.4			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	2399.2		
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	444	293	627	118	56	1454
Future Volume (Veh/h)	444	293	627	118	56	1454
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)	493	326	697	131	62	1616
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	2437	697			828	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2437	697			828	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	26			92	
cM capacity (veh/h)	32	441			803	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	493	326	697	131	62	1616
Volume Left	493	0	0	0	62	0
Volume Right	0	326	0	131	0	0
cSH	32	441	1700	1700	803	1700
Volume to Capacity	15.35	0.74	0.41	0.08	0.08	0.95
Queue Length 95th (ft)	Err	150	0	0	6	0
Control Delay (s)	Err	33.0	0.0	0.0	9.9	0.0
Lane LOS	F	D			A	
Approach Delay (s)	6032.1		0.0		0.4	
Approach LOS	F					

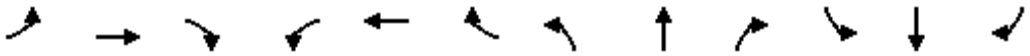
Intersection Summary			
Average Delay	1486.0		
Intersection Capacity Utilization	107.8%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	354	0	431	0	0	1815	87
Future Volume (Veh/h)	0	0	0	0	0	354	0	431	0	0	1815	87
Sign Control		Yield			Yield			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	0	0	393	0	479	0	0	2017	97
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								145				
pX, platoon unblocked												
vC, conflicting volume	2650	2496	1008	1488	2593	240	2114			479		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2650	2496	1008	1488	2593	240	2114			479		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	7.0	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	48	100			100		
cM capacity (veh/h)	6	29	242	88	25	759	262			1094		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	393	240	240	1008	1008	97
Volume Left	0	0	0	0	0	0
Volume Right	393	0	0	0	0	97
cSH	759	1700	1700	1700	1700	1700
Volume to Capacity	0.52	0.14	0.14	0.59	0.59	0.06
Queue Length 95th (ft)	76	0	0	0	0	0
Control Delay (s)	14.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	14.7	0.0		0.0		
Approach LOS	B					

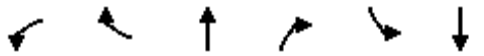
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	92.6%	ICU Level of Service	F	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	201	0	0	0	0	674	813	0	850	0
Future Volume (Veh/h)	0	0	201	0	0	0	0	674	813	0	850	0
Sign Control		Yield			Yield			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	223	0	0	0	0	749	903	0	944	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)											213	
pX, platoon unblocked												
vC, conflicting volume	1318	2596	472	1444	1693	374	944			1652		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1318	2596	472	1444	1693	374	944			1652		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	59	100	100	100	100			100		
cM capacity (veh/h)	117	25	541	56	94	629	735			396		

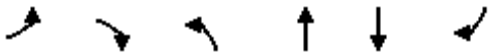
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	223	374	374	903	472	472
Volume Left	0	0	0	0	0	0
Volume Right	223	0	0	903	0	0
cSH	541	1700	1700	1700	1700	1700
Volume to Capacity	0.41	0.22	0.22	0.53	0.28	0.28
Queue Length 95th (ft)	50	0	0	0	0	0
Control Delay (s)	16.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	16.2	0.0			0.0	
Approach LOS	C					

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	93.4%	ICU Level of Service	F	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	543	0	0	0	0	1815
Future Volume (vph)	543	0	0	0	0	1815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0					6.0
Lane Util. Factor	0.97					0.95
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	3303					3539
Flt Permitted	0.95					1.00
Satd. Flow (perm)	3303					3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	603	0	0	0	0	2017
RTOR Reduction (vph)	30	0	0	0	0	0
Lane Group Flow (vph)	573	0	0	0	0	2017
Heavy Vehicles (%)	6%	0%	0%	0%	0%	2%
Turn Type	Prot					NA
Protected Phases	8					12
Permitted Phases						
Actuated Green, G (s)	17.4					60.6
Effective Green, g (s)	17.4					60.6
Actuated g/C Ratio	0.19					0.67
Clearance Time (s)	6.0					6.0
Vehicle Extension (s)	3.0					4.0
Lane Grp Cap (vph)	638					2382
v/s Ratio Prot	c0.17					c0.57
v/s Ratio Perm						
v/c Ratio	0.90					0.85
Uniform Delay, d1	35.4					11.2
Progression Factor	1.00					0.11
Incremental Delay, d2	17.9					1.9
Delay (s)	53.4					3.2
Level of Service	D					A
Approach Delay (s)	53.4		0.0			3.2
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	0	0	674	0	0
Future Volume (Veh/h)	21	0	0	674	0	0
Sign Control	Yield			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)	23	0	0	749	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)				250	634	
pX, platoon unblocked						
vC, conflicting volume	374	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	100	100			
cM capacity (veh/h)	605	1091	1636			

Direction, Lane #	EB 1	NB 1	NB 2
Volume Total	23	374	374
Volume Left	23	0	0
Volume Right	0	0	0
cSH	605	1700	1700
Volume to Capacity	0.04	0.22	0.22
Queue Length 95th (ft)	3	0	0
Control Delay (s)	11.2	0.0	0.0
Lane LOS	B		
Approach Delay (s)	11.2	0.0	
Approach LOS	B		

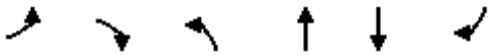
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Appendix D

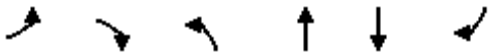
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 1 PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	29	0	1825	1123	108
Future Volume (Veh/h)	0	29	0	1825	1123	108
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	32	0	2028	1248	120
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1316		
pX, platoon unblocked						
vC, conflicting volume	2322	684	1368			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2322	684	1368			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	92	100			
cM capacity (veh/h)	32	396	508			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	1014	1014	832	536
Volume Left	0	0	0	0	0
Volume Right	32	0	0	0	120
cSH	396	1700	1700	1700	1700
Volume to Capacity	0.08	0.60	0.60	0.49	0.32
Queue Length 95th (ft)	7	0	0	0	0
Control Delay (s)	14.9	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	14.9	0.0		0.0	
Approach LOS	B				

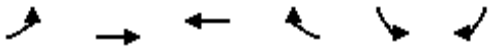
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	143	179	206	1682	1137	16
Future Volume (Veh/h)	143	179	206	1682	1137	16
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)	159	199	229	1869	1263	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)				722		
pX, platoon unblocked						
vC, conflicting volume	2664	640	1281			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2664	640	1281			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	53	58			
cM capacity (veh/h)	11	423	549			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	358	229	934	934	842	439
Volume Left	159	229	0	0	0	0
Volume Right	199	0	0	0	0	18
cSH	23	549	1700	1700	1700	1700
Volume to Capacity	15.46	0.42	0.55	0.55	0.50	0.26
Queue Length 95th (ft)	Err	51	0	0	0	0
Control Delay (s)	Err	16.2	0.0	0.0	0.0	0.0
Lane LOS	F	C				
Approach Delay (s)	Err	1.8			0.0	
Approach LOS	F					

Intersection Summary				
Average Delay	958.9			
Intersection Capacity Utilization	72.3%	ICU Level of Service		C
Analysis Period (min)	15			

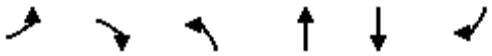


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	587	0	0	0	1257	0
Future Volume (vph)	587	0	0	0	1257	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0				6.0	
Lane Util. Factor	0.97				0.97	
Frt	1.00				1.00	
Flt Protected	0.95				0.95	
Satd. Flow (prot)	3467				3367	
Flt Permitted	0.95				0.95	
Satd. Flow (perm)	3467				3367	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	652	0	0	0	1397	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	652	0	0	0	1397	0
Heavy Vehicles (%)	1%	0%	0%	0%	4%	0%
Turn Type	Prot				Prot	
Protected Phases	6				2	
Permitted Phases						
Actuated Green, G (s)	34.5				43.5	
Effective Green, g (s)	34.5				43.5	
Actuated g/C Ratio	0.38				0.48	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	4.0				4.0	
Lane Grp Cap (vph)	1329				1627	
v/s Ratio Prot	c0.19				c0.41	
v/s Ratio Perm						
v/c Ratio	0.49				0.86	
Uniform Delay, d1	21.1				20.5	
Progression Factor	0.42				1.00	
Incremental Delay, d2	0.3				6.1	
Delay (s)	9.1				26.7	
Level of Service	A				C	
Approach Delay (s)		9.1	0.0		26.7	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	1515	0	672	0
Future Volume (vph)	0	0	1515	0	672	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0		6.0	
Lane Util. Factor			0.97		0.97	
Frt			1.00		1.00	
Flt Protected			0.95		0.95	
Satd. Flow (prot)			3467		3467	
Flt Permitted			0.95		0.95	
Satd. Flow (perm)			3467		3467	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	1683	0	747	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	1683	0	747	0
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%
Turn Type			Prot		Prot	
Protected Phases			2		6	
Permitted Phases						
Actuated Green, G (s)			54.5		23.5	
Effective Green, g (s)			54.5		23.5	
Actuated g/C Ratio			0.61		0.26	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			4.0		4.0	
Lane Grp Cap (vph)			2099		905	
v/s Ratio Prot			c0.49		c0.22	
v/s Ratio Perm						
v/c Ratio			0.80		0.83	
Uniform Delay, d1			13.6		31.3	
Progression Factor			1.00		1.00	
Incremental Delay, d2			2.2		6.5	
Delay (s)			15.7		37.8	
Level of Service			B		D	
Approach Delay (s)	0.0			15.7	37.8	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	125.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	410	204	137	781	1620	524
Future Volume (Veh/h)	410	204	137	781	1620	524
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)	456	227	152	868	1800	582
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					932	
pX, platoon unblocked						
vC, conflicting volume	2538	1800	2382			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2538	1800	2382			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	0	0	19			
cM capacity (veh/h)	4	71	188			

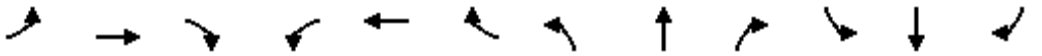
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	456	227	152	434	434	1800	582
Volume Left	456	0	152	0	0	0	0
Volume Right	0	227	0	0	0	0	582
cSH	4	71	188	1700	1700	1700	1700
Volume to Capacity	104.89	3.21	0.81	0.26	0.26	1.06	0.34
Queue Length 95th (ft)	Err	Err	141	0	0	0	0
Control Delay (s)	Err	Err	74.8	0.0	0.0	0.0	0.0
Lane LOS	F	F	F				
Approach Delay (s)	Err		11.2			0.0	
Approach LOS	F						

Intersection Summary			
Average Delay	1674.6		
Intersection Capacity Utilization	125.6%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	103	99	1374	51	60	1128
Future Volume (Veh/h)	103	99	1374	51	60	1128
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)	114	110	1527	57	67	1253
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	2914	1527			1584	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2914	1527			1584	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	24			84	
cM capacity (veh/h)	14	145			415	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	114	110	1527	57	67	1253
Volume Left	114	0	0	0	67	0
Volume Right	0	110	0	57	0	0
cSH	14	145	1700	1700	415	1700
Volume to Capacity	7.94	0.76	0.90	0.03	0.16	0.74
Queue Length 95th (ft)	Err	115	0	0	14	0
Control Delay (s)	Err	83.0	0.0	0.0	15.3	0.0
Lane LOS	F	F			C	
Approach Delay (s)	5129.5		0.0		0.8	
Approach LOS	F					

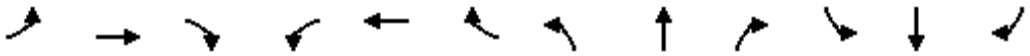
Intersection Summary			
Average Delay	367.7		
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	1301	0	587	0	0	1257	58
Future Volume (Veh/h)	0	0	0	0	0	1301	0	587	0	0	1257	58
Sign Control		Yield			Yield			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	0	0	1446	0	652	0	0	1397	64
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								145				
pX, platoon unblocked												
vC, conflicting volume	3169	2049	698	1350	2113	326	1461			652		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3169	2049	698	1350	2113	326	1461			652		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	100	100	100	0	100			100		
cM capacity (veh/h)	0	56	387	111	51	670	469			944		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	1446	326	326	698	698	64
Volume Left	0	0	0	0	0	0
Volume Right	1446	0	0	0	0	64
cSH	670	1700	1700	1700	1700	1700
Volume to Capacity	2.16	0.19	0.19	0.41	0.41	0.04
Queue Length 95th (ft)	2558	0	0	0	0	0
Control Delay (s)	541.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	F					
Approach Delay (s)	541.8	0.0		0.0		
Approach LOS	F					

Intersection Summary				
Average Delay	220.1			
Intersection Capacity Utilization	140.1%	ICU Level of Service		H
Analysis Period (min)	15			



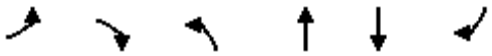
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	629	0	0	0	0	672	518	0	1515	0
Future Volume (Veh/h)	0	0	629	0	0	0	0	672	518	0	1515	0
Sign Control		Yield			Yield			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	699	0	0	0	0	747	576	0	1683	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)											213	
pX, platoon unblocked												
vC, conflicting volume	2056	3006	842	2288	2430	374	1683			1323		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2056	3006	842	2288	2430	374	1683			1323		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	0	0	100	100	100			100		
cM capacity (veh/h)	33	14	310	0	32	630	385			529		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	699	374	374	576	842	842
Volume Left	0	0	0	0	0	0
Volume Right	699	0	0	576	0	0
cSH	310	1700	1700	1700	1700	1700
Volume to Capacity	2.26	0.22	0.22	0.34	0.49	0.49
Queue Length 95th (ft)	1338	0	0	0	0	0
Control Delay (s)	601.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	F					
Approach Delay (s)	601.8	0.0			0.0	
Approach LOS	F					

Intersection Summary				
Average Delay	113.5			
Intersection Capacity Utilization	120.6%	ICU Level of Service	H	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	887	0	0	0	0	1257
Future Volume (vph)	887	0	0	0	0	1257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0					6.0
Lane Util. Factor	0.97					0.95
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	3467					3471
Flt Permitted	0.95					1.00
Satd. Flow (perm)	3467					3471
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	986	0	0	0	0	1397
RTOR Reduction (vph)	35	0	0	0	0	0
Lane Group Flow (vph)	951	0	0	0	0	1397
Heavy Vehicles (%)	1%	0%	0%	0%	0%	4%
Turn Type	Prot					NA
Protected Phases	8					12
Permitted Phases						
Actuated Green, G (s)	34.5					43.5
Effective Green, g (s)	34.5					43.5
Actuated g/C Ratio	0.38					0.48
Clearance Time (s)	6.0					6.0
Vehicle Extension (s)	3.0					4.0
Lane Grp Cap (vph)	1329					1677
v/s Ratio Prot	c0.27					c0.40
v/s Ratio Perm						
v/c Ratio	0.72					0.83
Uniform Delay, d1	23.6					20.1
Progression Factor	1.00					0.10
Incremental Delay, d2	3.3					3.0
Delay (s)	26.9					4.9
Level of Service	C					A
Approach Delay (s)	26.9		0.0			4.9
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	130	0	0	672	0	0
Future Volume (Veh/h)	130	0	0	672	0	0
Sign Control	Yield			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)	144	0	0	747	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)				250	634	
pX, platoon unblocked						
vC, conflicting volume	374	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	100	100			
cM capacity (veh/h)	606	1091	1636			

Direction, Lane #	EB 1	NB 1	NB 2
Volume Total	144	374	374
Volume Left	144	0	0
Volume Right	0	0	0
cSH	606	1700	1700
Volume to Capacity	0.24	0.22	0.22
Queue Length 95th (ft)	23	0	0
Control Delay (s)	12.8	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.8	0.0	
Approach LOS	B		

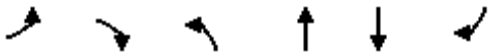
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Appendix D

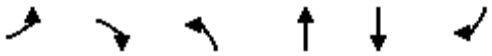
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 1 with Improvements AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	6	0	744	1868	31
Future Volume (Veh/h)	0	6	0	744	1868	31
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	7	0	827	2076	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				594		
pX, platoon unblocked	0.95					
vC, conflicting volume	2506	1055	2110			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2482	1055	2110			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	24	225	263			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	7	414	414	1384	726
Volume Left	0	0	0	0	0
Volume Right	7	0	0	0	34
cSH	225	1700	1700	1700	1700
Volume to Capacity	0.03	0.24	0.24	0.81	0.43
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	21.5	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	21.5	0.0		0.0	
Approach LOS	C				

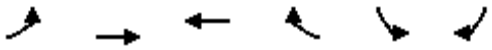
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	21	35	62	724	1867	7
Future Volume (vph)	21	35	62	724	1867	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1292	1678	3292	3386	
Flt Permitted	0.95	1.00	0.06	1.00	1.00	
Satd. Flow (perm)	1805	1292	104	3292	3386	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	39	69	804	2074	8
RTOR Reduction (vph)	0	37	0	0	0	0
Lane Group Flow (vph)	23	2	69	804	2082	0
Heavy Vehicles (%)	0%	25%	4%	6%	3%	0%
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	4.6	4.6	73.4	73.4	62.0	
Effective Green, g (s)	4.6	4.6	73.4	73.4	62.0	
Actuated g/C Ratio	0.05	0.05	0.82	0.82	0.69	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	4.0	4.0	
Lane Grp Cap (vph)	92	66	179	2684	2332	
v/s Ratio Prot	c0.01		0.02	c0.24	c0.61	
v/s Ratio Perm		0.00	0.29			
v/c Ratio	0.25	0.03	0.39	0.30	0.89	
Uniform Delay, d1	41.0	40.6	15.4	2.0	11.3	
Progression Factor	1.00	1.00	3.77	0.39	0.36	
Incremental Delay, d2	1.4	0.2	1.2	0.3	3.0	
Delay (s)	42.5	40.8	59.4	1.0	7.1	
Level of Service	D	D	E	A	A	
Approach Delay (s)	41.4			5.7	7.1	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

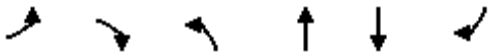


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	431	0	0	0	1815	0
Future Volume (vph)	431	0	0	0	1815	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0				6.0	
Lane Util. Factor	0.97				0.97	
Frt	1.00				1.00	
Flt Protected	0.95				0.95	
Satd. Flow (prot)	3367				3433	
Flt Permitted	0.95				0.95	
Satd. Flow (perm)	3367				3433	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	479	0	0	0	2017	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	479	0	0	0	2017	0
Heavy Vehicles (%)	4%	0%	0%	0%	2%	0%
Turn Type	Prot				Prot	
Protected Phases	6				2	
Permitted Phases						
Actuated Green, G (s)	17.2				60.8	
Effective Green, g (s)	17.2				60.8	
Actuated g/C Ratio	0.19				0.68	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	4.0				4.0	
Lane Grp Cap (vph)	643				2319	
v/s Ratio Prot	c0.14				c0.59	
v/s Ratio Perm						
v/c Ratio	0.74				0.87	
Uniform Delay, d1	34.3				11.5	
Progression Factor	0.46				0.35	
Incremental Delay, d2	4.3				3.9	
Delay (s)	19.9				8.0	
Level of Service	B				A	
Approach Delay (s)		19.9	0.0		8.0	
Approach LOS		B	A		A	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	850	0	674	0
Future Volume (vph)	0	0	850	0	674	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0		6.0	
Lane Util. Factor			0.97		0.97	
Frt			1.00		1.00	
Flt Protected			0.95		0.95	
Satd. Flow (prot)			3303		3400	
Flt Permitted			0.95		0.95	
Satd. Flow (perm)			3303		3400	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	944	0	749	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	944	0	749	0
Heavy Vehicles (%)	0%	0%	6%	0%	3%	0%
Turn Type			Prot		Prot	
Protected Phases			2		6	
Permitted Phases						
Actuated Green, G (s)			51.9		26.1	
Effective Green, g (s)			51.9		26.1	
Actuated g/C Ratio			0.58		0.29	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			4.0		4.0	
Lane Grp Cap (vph)			1904		986	
v/s Ratio Prot			c0.29		c0.22	
v/s Ratio Perm						
v/c Ratio			0.50		0.76	
Uniform Delay, d1			11.3		29.1	
Progression Factor			0.73		0.86	
Incremental Delay, d2			0.4		3.1	
Delay (s)			8.6		28.1	
Level of Service			A		C	
Approach Delay (s)	0.0			8.6	28.1	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



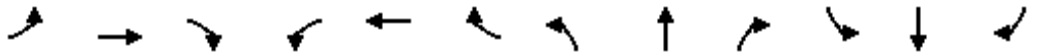
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	644	47	101	843	756	295
Future Volume (vph)	644	47	101	843	756	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	11	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3204	1478	1662	3421	3355	1446
Flt Permitted	0.95	1.00	0.22	1.00	1.00	1.00
Satd. Flow (perm)	3204	1478	379	3421	3355	1446
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	716	52	112	937	840	328
RTOR Reduction (vph)	0	37	0	0	0	90
Lane Group Flow (vph)	716	15	112	937	840	238
Heavy Vehicles (%)	2%	2%	5%	2%	4%	8%
Turn Type	Prot	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4	2			6
Actuated Green, G (s)	25.4	25.4	52.6	52.6	39.9	65.3
Effective Green, g (s)	25.4	25.4	52.6	52.6	39.9	65.3
Actuated g/C Ratio	0.28	0.28	0.58	0.58	0.44	0.73
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	4.0	4.0	3.0
Lane Grp Cap (vph)	904	417	317	1999	1487	1145
v/s Ratio Prot	c0.22		0.03	c0.27	c0.25	0.06
v/s Ratio Perm		0.01	0.18			0.11
v/c Ratio	0.79	0.04	0.35	0.47	0.56	0.21
Uniform Delay, d1	29.9	23.4	10.2	10.7	18.6	4.0
Progression Factor	1.00	1.00	1.00	1.00	0.42	0.00
Incremental Delay, d2	4.8	0.0	0.7	0.8	1.5	0.1
Delay (s)	34.7	23.5	10.8	11.5	9.2	0.1
Level of Service	C	C	B	B	A	A
Approach Delay (s)	33.9			11.4	6.6	
Approach LOS	C			B	A	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	444	293	627	118	56	1454
Future Volume (vph)	444	293	627	118	56	1454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1652	1478	1863	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.23	1.00
Satd. Flow (perm)	1652	1478	1863	1583	431	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	493	326	697	131	62	1616
RTOR Reduction (vph)	0	122	0	61	0	0
Lane Group Flow (vph)	493	204	697	70	62	1616
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	29.7	29.7	48.3	48.3	48.3	48.3
Effective Green, g (s)	29.7	29.7	48.3	48.3	48.3	48.3
Actuated g/C Ratio	0.33	0.33	0.54	0.54	0.54	0.54
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	545	487	999	849	231	1899
v/s Ratio Prot	c0.30		0.37			c0.46
v/s Ratio Perm		0.14		0.04	0.14	
v/c Ratio	0.90	0.42	0.70	0.08	0.27	0.85
Uniform Delay, d1	28.8	23.4	15.4	10.1	11.3	17.8
Progression Factor	1.00	1.00	1.24	2.80	1.00	1.00
Incremental Delay, d2	18.4	0.6	3.9	0.2	2.8	5.0
Delay (s)	47.2	24.0	23.0	28.4	14.1	22.8
Level of Service	D	C	C	C	B	C
Approach Delay (s)	38.0		23.9			22.5
Approach LOS	D		C			C

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	354	0	431	0	0	1815	87
Future Volume (vph)	0	0	0	0	0	354	0	431	0	0	1815	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	12	11	11
Total Lost time (s)						6.0		6.0			6.0	6.0
Lane Util. Factor						0.88		0.95			0.95	1.00
Frt						0.85		1.00			1.00	0.85
Flt Protected						1.00		1.00			1.00	1.00
Satd. Flow (prot)						2760		3355			3421	1487
Flt Permitted						1.00		1.00			1.00	1.00
Satd. Flow (perm)						2760		3355			3421	1487
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	0	0	393	0	479	0	0	2017	97
RTOR Reduction (vph)	0	0	0	0	0	20	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	373	0	479	0	0	2017	97
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	4%	0%	0%	2%	5%
Turn Type						Perm		NA			NA	Perm
Protected Phases								6			2 6	
Permitted Phases						2						2 6
Actuated Green, G (s)						60.8		17.2			90.0	90.0
Effective Green, g (s)						60.8		17.2			90.0	90.0
Actuated g/C Ratio						0.68		0.19			1.00	1.00
Clearance Time (s)						6.0		6.0				
Vehicle Extension (s)						4.0		4.0				
Lane Grp Cap (vph)						1864		641			3421	1487
v/s Ratio Prot								0.14			c0.59	
v/s Ratio Perm						0.14						0.07
v/c Ratio						0.20		0.75			0.59	0.07
Uniform Delay, d1						5.5		34.3			0.0	0.0
Progression Factor						1.00		0.08			1.00	1.00
Incremental Delay, d2						0.2		3.3			0.2	0.0
Delay (s)						5.7		5.9			0.2	0.0
Level of Service						A		A			A	A
Approach Delay (s)		0.0			5.7			5.9			0.2	
Approach LOS		A			A			A			A	

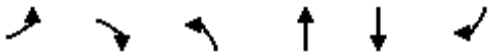
Intersection Summary			
HCM 2000 Control Delay	1.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	543	0	0	0	0	1815
Future Volume (vph)	543	0	0	0	0	1815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0					6.0
Lane Util. Factor	0.97					0.95
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	3303					3539
Flt Permitted	0.95					1.00
Satd. Flow (perm)	3303					3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	603	0	0	0	0	2017
RTOR Reduction (vph)	30	0	0	0	0	0
Lane Group Flow (vph)	573	0	0	0	0	2017
Heavy Vehicles (%)	6%	0%	0%	0%	0%	2%
Turn Type	Prot					NA
Protected Phases	8					12
Permitted Phases						
Actuated Green, G (s)	17.2					60.8
Effective Green, g (s)	17.2					60.8
Actuated g/C Ratio	0.19					0.68
Clearance Time (s)	6.0					6.0
Vehicle Extension (s)	3.0					4.0
Lane Grp Cap (vph)	631					2390
v/s Ratio Prot	c0.17					c0.57
v/s Ratio Perm						
v/c Ratio	0.91					0.84
Uniform Delay, d1	35.6					11.0
Progression Factor	1.00					0.06
Incremental Delay, d2	19.3					1.9
Delay (s)	54.9					2.5
Level of Service	D					A
Approach Delay (s)	54.9		0.0			2.5
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	0	0	674	0	0
Future Volume (Veh/h)	21	0	0	674	0	0
Sign Control	Yield			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)	23	0	0	749	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)				250	634	
pX, platoon unblocked						
vC, conflicting volume	374	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	100	100			
cM capacity (veh/h)	605	1091	1636			

Direction, Lane #	EB 1	NB 1	NB 2
Volume Total	23	374	374
Volume Left	23	0	0
Volume Right	0	0	0
cSH	605	1700	1700
Volume to Capacity	0.04	0.22	0.22
Queue Length 95th (ft)	3	0	0
Control Delay (s)	11.2	0.0	0.0
Lane LOS	B		
Approach Delay (s)	11.2	0.0	
Approach LOS	B		

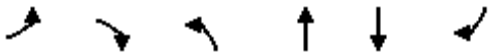
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Appendix D

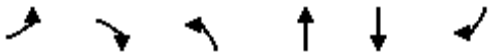
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 1 with Improvements PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	29	0	1825	1123	108
Future Volume (Veh/h)	0	29	0	1825	1123	108
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	32	0	2028	1248	120
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				594		
pX, platoon unblocked	0.63					
vC, conflicting volume	2322	684	1368			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1926	684	1368			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	92	100			
cM capacity (veh/h)	38	396	508			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	1014	1014	832	536
Volume Left	0	0	0	0	0
Volume Right	32	0	0	0	120
cSH	396	1700	1700	1700	1700
Volume to Capacity	0.08	0.60	0.60	0.49	0.32
Queue Length 95th (ft)	7	0	0	0	0
Control Delay (s)	14.9	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	14.9	0.0		0.0	
Approach LOS	B				

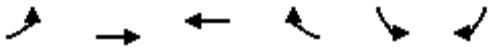
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	143	179	206	1682	1137	16
Future Volume (vph)	143	179	206	1682	1137	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1615	1745	3455	3382	
Flt Permitted	0.95	1.00	0.12	1.00	1.00	
Satd. Flow (perm)	1770	1615	219	3455	3382	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	159	199	229	1869	1263	18
RTOR Reduction (vph)	0	172	0	0	1	0
Lane Group Flow (vph)	159	27	229	1869	1280	0
Heavy Vehicles (%)	2%	0%	0%	1%	3%	0%
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	12.3	12.3	65.7	65.7	48.9	
Effective Green, g (s)	12.3	12.3	65.7	65.7	48.9	
Actuated g/C Ratio	0.14	0.14	0.73	0.73	0.54	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	4.0	4.0	
Lane Grp Cap (vph)	241	220	342	2522	1837	
v/s Ratio Prot	c0.09		0.08	c0.54	0.38	
v/s Ratio Perm		0.02	0.41			
v/c Ratio	0.66	0.12	0.67	0.74	0.70	
Uniform Delay, d1	36.9	34.1	12.4	7.1	15.1	
Progression Factor	1.00	1.00	1.29	0.89	0.95	
Incremental Delay, d2	6.4	0.3	2.8	1.1	2.0	
Delay (s)	43.3	34.4	18.8	7.5	16.3	
Level of Service	D	C	B	A	B	
Approach Delay (s)	38.3			8.8	16.3	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

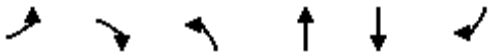


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	587	0	0	0	1257	0
Future Volume (vph)	587	0	0	0	1257	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0				6.0	
Lane Util. Factor	0.97				0.97	
Frt	1.00				1.00	
Flt Protected	0.95				0.95	
Satd. Flow (prot)	3467				3367	
Flt Permitted	0.95				0.95	
Satd. Flow (perm)	3467				3367	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	652	0	0	0	1397	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	652	0	0	0	1397	0
Heavy Vehicles (%)	1%	0%	0%	0%	4%	0%
Turn Type	Prot				Prot	
Protected Phases	6				2	
Permitted Phases						
Actuated Green, G (s)	27.4				50.6	
Effective Green, g (s)	27.4				50.6	
Actuated g/C Ratio	0.30				0.56	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	4.0				4.0	
Lane Grp Cap (vph)	1055				1893	
v/s Ratio Prot	c0.19				c0.41	
v/s Ratio Perm						
v/c Ratio	0.62				0.74	
Uniform Delay, d1	26.8				14.7	
Progression Factor	0.39				0.56	
Incremental Delay, d2	1.0				2.4	
Delay (s)	11.3				10.6	
Level of Service	B				B	
Approach Delay (s)		11.3	0.0		10.6	
Approach LOS		B	A		B	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	112.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	1515	0	672	0
Future Volume (vph)	0	0	1515	0	672	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0		6.0	
Lane Util. Factor			0.97		0.97	
Frt			1.00		1.00	
Flt Protected			0.95		0.95	
Satd. Flow (prot)			3467		3467	
Flt Permitted			0.95		0.95	
Satd. Flow (perm)			3467		3467	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	1683	0	747	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	1683	0	747	0
Heavy Vehicles (%)	0%	0%	1%	0%	1%	0%
Turn Type			Prot		Prot	
Protected Phases			2		6	
Permitted Phases						
Actuated Green, G (s)			54.5		23.5	
Effective Green, g (s)			54.5		23.5	
Actuated g/C Ratio			0.61		0.26	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			4.0		4.0	
Lane Grp Cap (vph)			2099		905	
v/s Ratio Prot			c0.49		c0.22	
v/s Ratio Perm						
v/c Ratio			0.80		0.83	
Uniform Delay, d1			13.6		31.3	
Progression Factor			1.07		1.14	
Incremental Delay, d2			1.9		5.6	
Delay (s)			16.5		41.3	
Level of Service			B		D	
Approach Delay (s)	0.0			16.5	41.3	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	125.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



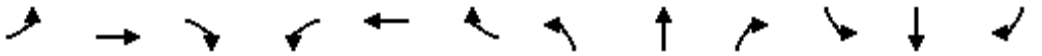
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	410	204	137	781	1620	524
Future Volume (vph)	410	204	137	781	1620	524
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	11	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3236	1507	1646	3455	3490	1531
Flt Permitted	0.95	1.00	0.07	1.00	1.00	1.00
Satd. Flow (perm)	3236	1507	125	3455	3490	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	456	227	152	868	1800	582
RTOR Reduction (vph)	0	150	0	0	0	82
Lane Group Flow (vph)	456	77	152	868	1800	500
Heavy Vehicles (%)	1%	0%	6%	1%	0%	2%
Turn Type	Prot	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4	2			6
Actuated Green, G (s)	14.4	14.4	63.6	63.6	49.4	63.8
Effective Green, g (s)	14.4	14.4	63.6	63.6	49.4	63.8
Actuated g/C Ratio	0.16	0.16	0.71	0.71	0.55	0.71
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	4.0	4.0	3.0
Lane Grp Cap (vph)	517	241	226	2441	1915	1187
v/s Ratio Prot	c0.14		c0.06	0.25	c0.52	0.07
v/s Ratio Perm		0.05	0.41			0.26
v/c Ratio	0.88	0.32	0.67	0.36	0.94	0.42
Uniform Delay, d1	37.0	33.5	21.9	5.2	18.9	5.4
Progression Factor	1.00	1.00	1.00	1.00	0.61	0.00
Incremental Delay, d2	16.1	0.8	7.7	0.4	9.1	0.2
Delay (s)	53.1	34.2	29.6	5.6	20.7	0.2
Level of Service	D	C	C	A	C	A
Approach Delay (s)	46.8			9.2	15.7	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	103	99	1374	451	60	1128
Future Volume (vph)	103	99	1374	451	60	1128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1652	1478	1863	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.06	1.00
Satd. Flow (perm)	1652	1478	1863	1583	108	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	114	110	1527	501	67	1253
RTOR Reduction (vph)	0	70	0	115	0	0
Lane Group Flow (vph)	114	40	1527	386	67	1253
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	8.7	8.7	69.3	69.3	69.3	69.3
Effective Green, g (s)	8.7	8.7	69.3	69.3	69.3	69.3
Actuated g/C Ratio	0.10	0.10	0.77	0.77	0.77	0.77
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	159	142	1434	1218	83	2725
v/s Ratio Prot	c0.07		c0.82			0.35
v/s Ratio Perm		0.03		0.24	0.62	
v/c Ratio	0.72	0.28	1.06	0.32	0.81	0.46
Uniform Delay, d1	39.5	37.8	10.4	3.1	6.3	3.7
Progression Factor	1.00	1.00	1.33	3.38	1.00	1.00
Incremental Delay, d2	14.3	1.1	39.5	0.5	55.4	0.6
Delay (s)	53.7	38.9	53.2	11.1	61.7	4.2
Level of Service	D	D	D	B	E	A
Approach Delay (s)	46.4		42.8			7.2
Approach LOS	D		D			A

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	1301	0	587	0	0	1257	58
Future Volume (vph)	0	0	0	0	0	1301	0	587	0	0	1257	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	12	11	11
Total Lost time (s)						6.0		6.0			6.0	6.0
Lane Util. Factor						0.88		0.95			0.95	1.00
Frt						0.85		1.00			1.00	0.85
Flt Protected						1.00		1.00			1.00	1.00
Satd. Flow (prot)						2787		3455			3355	1561
Flt Permitted						1.00		1.00			1.00	1.00
Satd. Flow (perm)						2787		3455			3355	1561
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	0	0	1446	0	652	0	0	1397	64
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	1400	0	652	0	0	1397	64
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	4%	0%
Turn Type						Perm		NA			NA	Perm
Protected Phases								6			2 6	
Permitted Phases						2						2 6
Actuated Green, G (s)						50.6		27.4			90.0	90.0
Effective Green, g (s)						50.6		27.4			90.0	90.0
Actuated g/C Ratio						0.56		0.30			1.00	1.00
Clearance Time (s)						6.0		6.0				
Vehicle Extension (s)						4.0		4.0				
Lane Grp Cap (vph)						1566		1051			3355	1561
v/s Ratio Prot								c0.19			0.42	
v/s Ratio Perm						c0.50						0.04
v/c Ratio						0.89		0.62			0.42	0.04
Uniform Delay, d1						17.3		26.8			0.0	0.0
Progression Factor						1.00		0.04			1.00	1.00
Incremental Delay, d2						8.3		1.0			0.1	0.0
Delay (s)						25.6		2.1			0.1	0.0
Level of Service						C		A			A	A
Approach Delay (s)		0.0			25.6			2.1			0.1	
Approach LOS		A			C			A			A	

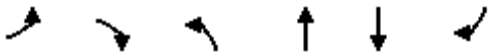
Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	887	0	0	0	0	1257
Future Volume (vph)	887	0	0	0	0	1257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0					6.0
Lane Util. Factor	0.97					0.95
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	3467					3471
Flt Permitted	0.95					1.00
Satd. Flow (perm)	3467					3471
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	986	0	0	0	0	1397
RTOR Reduction (vph)	53	0	0	0	0	0
Lane Group Flow (vph)	933	0	0	0	0	1397
Heavy Vehicles (%)	1%	0%	0%	0%	0%	4%
Turn Type	Prot					NA
Protected Phases	8					12
Permitted Phases						
Actuated Green, G (s)	27.4					50.6
Effective Green, g (s)	27.4					50.6
Actuated g/C Ratio	0.30					0.56
Clearance Time (s)	6.0					6.0
Vehicle Extension (s)	3.0					4.0
Lane Grp Cap (vph)	1055					1951
v/s Ratio Prot	c0.27					c0.40
v/s Ratio Perm						
v/c Ratio	0.88					0.72
Uniform Delay, d1	29.8					14.4
Progression Factor	1.00					0.10
Incremental Delay, d2	10.8					1.5
Delay (s)	40.6					2.9
Level of Service	D					A
Approach Delay (s)	40.6		0.0			2.9
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	130	0	0	672	0	0
Future Volume (Veh/h)	130	0	0	672	0	0
Sign Control	Yield			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)	144	0	0	747	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)				250	634	
pX, platoon unblocked						
vC, conflicting volume	374	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	100	100			
cM capacity (veh/h)	606	1091	1636			

Direction, Lane #	EB 1	NB 1	NB 2
Volume Total	144	374	374
Volume Left	144	0	0
Volume Right	0	0	0
cSH	606	1700	1700
Volume to Capacity	0.24	0.22	0.22
Queue Length 95th (ft)	23	0	0
Control Delay (s)	12.8	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.8	0.0	
Approach LOS	B		

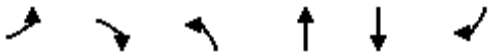
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Appendix D

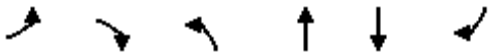
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 2 AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	6	0	744	1868	31
Future Volume (Veh/h)	0	6	0	744	1868	31
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	7	0	827	2076	34
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	2920	2093	2110			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2920	2093	2110			
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	90	100			
cM capacity (veh/h)	17	67	263			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	7	827	2110
Volume Left	0	0	0
Volume Right	7	0	34
cSH	67	1700	1700
Volume to Capacity	0.10	0.49	1.24
Queue Length 95th (ft)	8	0	0
Control Delay (s)	65.2	0.0	0.0
Lane LOS	F		
Approach Delay (s)	65.2	0.0	0.0
Approach LOS	F		

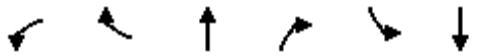
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	110.2%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	35	62	724	1867	7
Future Volume (Veh/h)	21	35	62	724	1867	7
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)	23	39	69	804	2074	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)				734		
pX, platoon unblocked	0.89					
vC, conflicting volume	3020	2078	2082			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3214	2078	2082			
tC, single (s)	6.4	6.5	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.5	2.2			
p0 queue free %	0	32	74			
cM capacity (veh/h)	7	58	262			

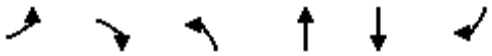
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	23	39	69	804	2082
Volume Left	23	0	69	0	0
Volume Right	0	39	0	0	8
cSH	7	58	262	1700	1700
Volume to Capacity	3.18	0.68	0.26	0.47	1.22
Queue Length 95th (ft)	Err	71	26	0	0
Control Delay (s)	Err	150.1	23.6	0.0	0.0
Lane LOS	F	F	C		
Approach Delay (s)	3803.7		1.9		0.0
Approach LOS	F				

Intersection Summary			
Average Delay	78.7		
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	543	354	431	0	0	1815
Future Volume (vph)	543	354	431	0	0	1815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0			6.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1703	1568	1827			1863
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1703	1568	1827			1863
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	603	393	479	0	0	2017
RTOR Reduction (vph)	0	172	0	0	0	0
Lane Group Flow (vph)	603	221	479	0	0	2017
Heavy Vehicles (%)	6%	3%	4%	0%	0%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		6			2
Permitted Phases		8				
Actuated Green, G (s)	37.0	37.0	101.0			101.0
Effective Green, g (s)	37.0	37.0	101.0			101.0
Actuated g/C Ratio	0.25	0.25	0.67			0.67
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	3.0	3.0	4.0			4.0
Lane Grp Cap (vph)	420	386	1230			1254
v/s Ratio Prot	c0.35		0.26			c1.08
v/s Ratio Perm		0.14				
v/c Ratio	1.44	0.57	0.39			1.61
Uniform Delay, d1	56.5	49.6	10.8			24.5
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	209.3	6.1	0.3			277.5
Delay (s)	265.8	55.6	11.1			302.0
Level of Service	F	E	B			F
Approach Delay (s)	182.9		11.1			302.0
Approach LOS	F		B			F

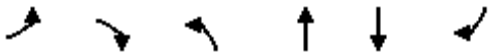
Intersection Summary			
HCM 2000 Control Delay	228.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.56		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	161.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	201	0	674	850	0
Future Volume (Veh/h)	21	201	0	674	850	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)	23	223	0	749	944	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)					852	
pX, platoon unblocked	0.40	0.40	0.40			
vC, conflicting volume	1693	944	944			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1986	100	100			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	15	41	100			
cM capacity (veh/h)	27	381	598			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	23	223	749	944
Volume Left	23	0	0	0
Volume Right	0	223	0	0
cSH	27	381	1700	1700
Volume to Capacity	0.85	0.59	0.44	0.56
Queue Length 95th (ft)	67	90	0	0
Control Delay (s)	333.0	27.0	0.0	0.0
Lane LOS	F	D		
Approach Delay (s)	55.6		0.0	0.0
Approach LOS	F			

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	644	47	101	843	756	295
Future Volume (Veh/h)	644	47	101	843	756	295
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)	716	52	112	937	840	328
Pedestrians	109					
Lane Width (ft)	10.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	9					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2110	949	1277			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2110	949	1277			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	82	77			
cM capacity (veh/h)	39	289	488			

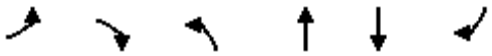
Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	716	52	1049	840	328
Volume Left	716	0	112	0	0
Volume Right	0	52	0	0	328
cSH	39	289	488	1700	1700
Volume to Capacity	18.13	0.18	0.23	0.49	0.19
Queue Length 95th (ft)	Err	16	22	0	0
Control Delay (s)	Err	20.2	8.2	0.0	0.0
Lane LOS	F	C	A		
Approach Delay (s)	9323.4		8.2	0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	2401.7		
Intersection Capacity Utilization	135.4%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	444	293	627	118	56	1454
Future Volume (Veh/h)	444	293	627	118	56	1454
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)	493	326	697	131	62	1616
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	2502	762			828	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2502	762			828	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	19			92	
cM capacity (veh/h)	29	405			803	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	493	326	828	62	1616
Volume Left	493	0	0	62	0
Volume Right	0	326	131	0	0
cSH	29	405	1700	803	1700
Volume to Capacity	16.91	0.81	0.49	0.08	0.95
Queue Length 95th (ft)	Err	180	0	6	0
Control Delay (s)	Err	41.9	0.0	9.9	0.0
Lane LOS	F	E		A	
Approach Delay (s)	6035.6		0.0	0.4	
Approach LOS	F				

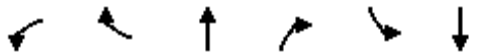
Intersection Summary			
Average Delay	1486.8		
Intersection Capacity Utilization	107.8%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	785	1815	87
Future Volume (Veh/h)	0	0	0	785	1815	87
Sign Control	Yield			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	872	2017	97
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				156		
pX, platoon unblocked	0.88					
vC, conflicting volume	2889	2017	2114			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3073	2017	2114			
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)	12	74	262			

Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	872	2017	97
Volume Left	0	0	0
Volume Right	0	0	97
cSH	1700	1700	1700
Volume to Capacity	0.51	1.19	0.06
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			
Approach Delay (s)	0.0	0.0	
Approach LOS			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	98.9%	ICU Level of Service	F
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	674	813	0	1051
Future Volume (Veh/h)	0	0	674	813	0	1051
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	749	903	0	1168
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						1161
pX, platoon unblocked	0.42					
vC, conflicting volume	1917	749			1652	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2493	749			1652	
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)	14	415			396	

Direction, Lane #	NB 1	NB 2	SB 1
Volume Total	749	903	1168
Volume Left	0	0	0
Volume Right	0	903	0
cSH	1700	1700	1700
Volume to Capacity	0.44	0.53	0.69
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			
Approach Delay (s)	0.0		0.0
Approach LOS			

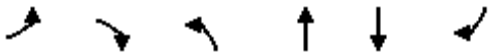
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Appendix D

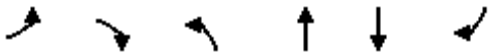
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 2 PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	29	0	1825	1123	108
Future Volume (Veh/h)	0	29	0	1825	1123	108
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	32	0	2028	1248	120
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	3336	1308	1368			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3336	1308	1368			
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	84	100			
cM capacity (veh/h)	9	197	508			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	32	2028	1368
Volume Left	0	0	0
Volume Right	32	0	120
cSH	197	1700	1700
Volume to Capacity	0.16	1.19	0.80
Queue Length 95th (ft)	14	0	0
Control Delay (s)	26.8	0.0	0.0
Lane LOS	D		
Approach Delay (s)	26.8	0.0	0.0
Approach LOS	D		

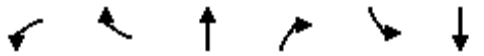
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	143	179	206	1682	1137	16
Future Volume (Veh/h)	143	179	206	1682	1137	16
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)	159	199	229	1869	1263	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)				734		
pX, platoon unblocked	0.71					
vC, conflicting volume	3599	1272	1281			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4462	1272	1281			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	4	58			
cM capacity (veh/h)	1	207	549			

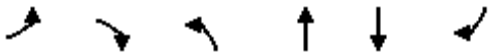
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	159	199	229	1869	1281
Volume Left	159	0	229	0	0
Volume Right	0	199	0	0	18
cSH	1	207	549	1700	1700
Volume to Capacity	243.27	0.96	0.42	1.10	0.75
Queue Length 95th (ft)	Err	204	51	0	0
Control Delay (s)	Err	101.4	16.2	0.0	0.0
Lane LOS	F	F	C		
Approach Delay (s)	4497.2		1.8		0.0
Approach LOS	F				

Intersection Summary				
Average Delay	431.8			
Intersection Capacity Utilization	103.1%	ICU Level of Service	G	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	887	1301	587	0	0	1257
Future Volume (vph)	887	1301	587	0	0	1257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0			6.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1787	1583	1881			1827
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1787	1583	1881			1827
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	986	1446	652	0	0	1397
RTOR Reduction (vph)	0	88	0	0	0	0
Lane Group Flow (vph)	986	1358	652	0	0	1397
Heavy Vehicles (%)	1%	2%	1%	0%	0%	4%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		6			2
Permitted Phases		8				
Actuated Green, G (s)	70.0	70.0	68.0			68.0
Effective Green, g (s)	70.0	70.0	68.0			68.0
Actuated g/C Ratio	0.47	0.47	0.45			0.45
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	3.0	3.0	4.0			4.0
Lane Grp Cap (vph)	833	738	852			828
v/s Ratio Prot	0.55		0.35			c0.76
v/s Ratio Perm		c0.86				
v/c Ratio	1.18	1.84	0.77			1.69
Uniform Delay, d1	40.0	40.0	34.3			41.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	94.8	383.3	4.4			314.5
Delay (s)	134.8	423.3	38.7			355.5
Level of Service	F	F	D			F
Approach Delay (s)	306.3		38.7			355.5
Approach LOS	F		D			F

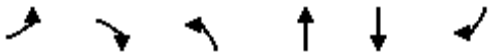
Intersection Summary			
HCM 2000 Control Delay	282.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	190.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	130	629	0	672	1515	0
Future Volume (Veh/h)	130	629	0	672	1515	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)	144	699	0	747	1683	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)					852	
pX, platoon unblocked	0.55	0.55	0.55			
vC, conflicting volume	2430	1683	1683			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3185	1832	1832			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	100			
cM capacity (veh/h)	6	53	186			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	144	699	747	1683
Volume Left	144	0	0	0
Volume Right	0	699	0	0
cSH	6	53	1700	1700
Volume to Capacity	22.51	13.26	0.44	0.99
Queue Length 95th (ft)	Err	Err	0	0
Control Delay (s)	Err	Err	0.0	0.0
Lane LOS	F	F		
Approach Delay (s)	Err		0.0	0.0
Approach LOS	F			

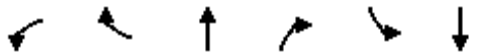
Intersection Summary			
Average Delay	2575.4		
Intersection Capacity Utilization	164.1%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	410	204	137	781	1620	524
Future Volume (Veh/h)	410	204	137	781	1620	524
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)	456	227	152	868	1800	582
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	2972	1800	2382			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2972	1800	2382			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	0	0	22			
cM capacity (veh/h)	4	100	196			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total	456	227	1020	1800	582
Volume Left	456	0	152	0	0
Volume Right	0	227	0	0	582
cSH	4	100	196	1700	1700
Volume to Capacity	128.30	2.26	0.78	1.06	0.34
Queue Length 95th (ft)	Err	502	132	0	0
Control Delay (s)	Err	667.0	67.5	0.0	0.0
Lane LOS	F	F	F		
Approach Delay (s)	6897.4		67.5	0.0	
Approach LOS	F				

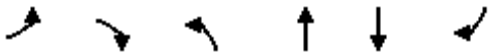
Intersection Summary			
Average Delay	1170.1		
Intersection Capacity Utilization	166.7%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	103	99	1374	451	60	1128
Future Volume (Veh/h)	103	99	1374	451	60	1128
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)	114	110	1527	501	67	1253
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	3164	1778			2028	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3164	1778			2028	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	0			76	
cM capacity (veh/h)	9	102			279	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	114	110	2028	67	1253
Volume Left	114	0	0	67	0
Volume Right	0	110	501	0	0
cSH	9	102	1700	279	1700
Volume to Capacity	12.78	1.08	1.19	0.24	0.74
Queue Length 95th (ft)	Err	173	0	23	0
Control Delay (s)	Err	188.7	0.0	21.9	0.0
Lane LOS	F	F		C	
Approach Delay (s)	5181.4		0.0	1.1	
Approach LOS	F				

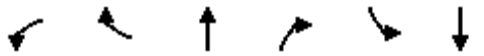
Intersection Summary			
Average Delay	325.3		
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1888	1257	58
Future Volume (Veh/h)	0	0	0	1888	1257	58
Sign Control	Yield			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	2098	1397	64
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				156		
pX, platoon unblocked	0.71					
vC, conflicting volume	3495	1397	1461			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4325	1397	1461			
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)	1	174	469			

Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	2098	1397	64
Volume Left	0	0	0
Volume Right	0	0	64
cSH	1700	1700	1700
Volume to Capacity	1.23	0.82	0.04
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			
Approach Delay (s)	0.0	0.0	
Approach LOS			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑	↱		↑
Traffic Volume (veh/h)	0	0	672	518	0	2144
Future Volume (Veh/h)	0	0	672	518	0	2144
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	747	576	0	2382
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						1161
pX, platoon unblocked	0.55					
vC, conflicting volume	3129	747			1323	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	4442	747			1323	
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)	1	416			529	

Direction, Lane #	NB 1	NB 2	SB 1
Volume Total	747	576	2382
Volume Left	0	0	0
Volume Right	0	576	0
cSH	1700	1700	1700
Volume to Capacity	0.44	0.34	1.40
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			
Approach Delay (s)	0.0		0.0
Approach LOS			

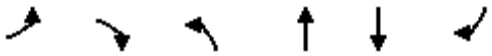
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	116.2%	ICU Level of Service	H
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Appendix D

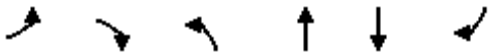
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 2 with Improvements AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	6	0	744	1868	31
Future Volume (Veh/h)	0	6	0	744	1868	31
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	7	0	827	2076	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				594		
pX, platoon unblocked	0.95					
vC, conflicting volume	2506	1055	2110			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2483	1055	2110			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	24	225	263			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	7	414	414	1384	726
Volume Left	0	0	0	0	0
Volume Right	7	0	0	0	34
cSH	225	1700	1700	1700	1700
Volume to Capacity	0.03	0.24	0.24	0.81	0.43
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	21.5	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	21.5	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

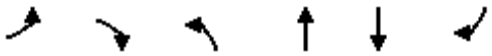


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	21	35	62	724	1867	7
Future Volume (vph)	21	35	62	724	1867	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1292	1736	3406	3503	
Flt Permitted	0.95	1.00	0.06	1.00	1.00	
Satd. Flow (perm)	1805	1292	107	3406	3503	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	39	69	804	2074	8
RTOR Reduction (vph)	0	37	0	0	0	0
Lane Group Flow (vph)	23	2	69	804	2082	0
Heavy Vehicles (%)	0%	25%	4%	6%	3%	0%
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	4.6	4.6	73.4	73.4	62.1	
Effective Green, g (s)	4.6	4.6	73.4	73.4	62.1	
Actuated g/C Ratio	0.05	0.05	0.82	0.82	0.69	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	4.0	4.0	
Lane Grp Cap (vph)	92	66	183	2777	2417	
v/s Ratio Prot	c0.01		0.02	c0.24	c0.59	
v/s Ratio Perm		0.00	0.28			
v/c Ratio	0.25	0.03	0.38	0.29	0.86	
Uniform Delay, d1	41.0	40.6	15.2	2.0	10.7	
Progression Factor	1.00	1.00	1.72	0.80	0.34	
Incremental Delay, d2	1.4	0.2	1.2	0.2	2.3	
Delay (s)	42.5	40.8	27.5	1.9	5.9	
Level of Service	D	D	C	A	A	
Approach Delay (s)	41.4			3.9	5.9	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

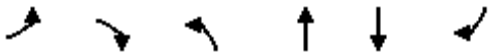
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	543	354	431	0	0	1815
Future Volume (vph)	543	354	431	0	0	1815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0			6.0
Lane Util. Factor	0.97	0.91	0.95			0.91
Frt	0.98	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3282	1427	3471			5085
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3282	1427	3471			5085
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	603	393	479	0	0	2017
RTOR Reduction (vph)	13	217	0	0	0	0
Lane Group Flow (vph)	673	93	479	0	0	2017
Heavy Vehicles (%)	6%	3%	4%	0%	0%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		6			2
Permitted Phases		8				
Actuated Green, G (s)	27.0	27.0	51.0			51.0
Effective Green, g (s)	27.0	27.0	51.0			51.0
Actuated g/C Ratio	0.30	0.30	0.57			0.57
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	3.0	3.0	4.0			4.0
Lane Grp Cap (vph)	984	428	1966			2881
v/s Ratio Prot	c0.21		0.14			c0.40
v/s Ratio Perm		0.07				
v/c Ratio	0.68	0.22	0.24			0.70
Uniform Delay, d1	27.7	23.6	9.8			14.0
Progression Factor	1.00	1.00	0.81			0.41
Incremental Delay, d2	3.9	1.2	0.3			0.9
Delay (s)	31.6	24.8	8.2			6.7
Level of Service	C	C	A			A
Approach Delay (s)	29.5		8.2			6.7
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	21	201	0	674	850	0
Future Volume (vph)	21	201	0	674	850	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		0.95	0.91	
Frt	0.88	0.85		1.00	1.00	
Flt Protected	0.99	1.00		1.00	1.00	
Satd. Flow (prot)	1640	1519		3505	4893	
Flt Permitted	0.99	1.00		1.00	1.00	
Satd. Flow (perm)	1640	1519		3505	4893	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	223	0	749	944	0
RTOR Reduction (vph)	91	112	0	0	0	0
Lane Group Flow (vph)	32	11	0	749	944	0
Heavy Vehicles (%)	0%	1%	0%	3%	6%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	7.7	7.7		70.3	70.3	
Effective Green, g (s)	7.7	7.7		70.3	70.3	
Actuated g/C Ratio	0.09	0.09		0.78	0.78	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	140	129		2737	3821	
v/s Ratio Prot	c0.02			c0.21	0.19	
v/s Ratio Perm		0.01				
v/c Ratio	0.23	0.08		0.27	0.25	
Uniform Delay, d1	38.4	37.9		2.7	2.7	
Progression Factor	1.00	1.00		0.46	0.66	
Incremental Delay, d2	0.8	0.3		0.2	0.1	
Delay (s)	39.2	38.2		1.5	1.9	
Level of Service	D	D		A	A	
Approach Delay (s)	38.7			1.5	1.9	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



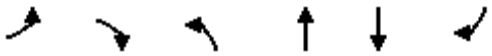
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	644	47	101	843	756	295
Future Volume (vph)	644	47	101	843	756	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	11	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3204	1478	1662	3421	3355	1446
Flt Permitted	0.95	1.00	0.22	1.00	1.00	1.00
Satd. Flow (perm)	3204	1478	379	3421	3355	1446
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	716	52	112	937	840	328
RTOR Reduction (vph)	0	37	0	0	0	90
Lane Group Flow (vph)	716	15	112	937	840	238
Heavy Vehicles (%)	2%	2%	5%	2%	4%	8%
Turn Type	Prot	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4	2			6
Actuated Green, G (s)	25.4	25.4	52.6	52.6	39.9	65.3
Effective Green, g (s)	25.4	25.4	52.6	52.6	39.9	65.3
Actuated g/C Ratio	0.28	0.28	0.58	0.58	0.44	0.73
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	4.0	4.0	3.0
Lane Grp Cap (vph)	904	417	317	1999	1487	1145
v/s Ratio Prot	c0.22		0.03	c0.27	c0.25	0.06
v/s Ratio Perm		0.01	0.18			0.11
v/c Ratio	0.79	0.04	0.35	0.47	0.56	0.21
Uniform Delay, d1	29.9	23.4	10.2	10.7	18.6	4.0
Progression Factor	1.00	1.00	1.00	1.00	0.70	3.29
Incremental Delay, d2	4.8	0.0	0.7	0.8	1.5	0.1
Delay (s)	34.7	23.5	10.8	11.5	14.6	13.2
Level of Service	C	C	B	B	B	B
Approach Delay (s)	33.9			11.4	14.2	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	444	293	627	118	56	1454
Future Volume (vph)	444	293	627	118	56	1454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1652	1478	1863	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.23	1.00
Satd. Flow (perm)	1652	1478	1863	1583	431	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	493	326	697	131	62	1616
RTOR Reduction (vph)	0	122	0	61	0	0
Lane Group Flow (vph)	493	204	697	70	62	1616
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	29.7	29.7	48.3	48.3	48.3	48.3
Effective Green, g (s)	29.7	29.7	48.3	48.3	48.3	48.3
Actuated g/C Ratio	0.33	0.33	0.54	0.54	0.54	0.54
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	545	487	999	849	231	1899
v/s Ratio Prot	c0.30		0.37			c0.46
v/s Ratio Perm		0.14		0.04	0.14	
v/c Ratio	0.90	0.42	0.70	0.08	0.27	0.85
Uniform Delay, d1	28.8	23.4	15.4	10.1	11.3	17.8
Progression Factor	1.00	1.00	0.95	1.91	1.00	1.00
Incremental Delay, d2	18.4	0.6	3.9	0.2	2.8	5.0
Delay (s)	47.2	24.0	18.6	19.5	14.1	22.8
Level of Service	D	C	B	B	B	C
Approach Delay (s)	38.0		18.8			22.5
Approach LOS	D		B			C

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	785	1815	87
Future Volume (Veh/h)	0	0	0	785	1815	87
Sign Control	Yield			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	872	2017	97
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				184	549	
pX, platoon unblocked	0.62	0.59	0.59			
vC, conflicting volume	2502	721	2114			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	736	0	462			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	224	645	656			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	436	436	807	807	500
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	97
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.26	0.26	0.47	0.47	0.29
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	674	813	0	1051
Future Volume (Veh/h)	0	0	674	813	0	1051
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	749	903	0	1168
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			635			309
pX, platoon unblocked	0.95					
vC, conflicting volume	1138	374			1652	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	978	374			1652	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	240	629			396	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	374	374	903	389	389	389
Volume Left	0	0	0	0	0	0
Volume Right	0	0	903	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.22	0.53	0.23	0.23	0.23
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

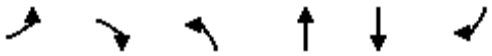
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Appendix D

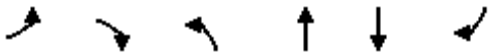
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 2 with Improvements PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	29	0	1825	1123	108
Future Volume (Veh/h)	0	29	0	1825	1123	108
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	32	0	2028	1248	120
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				594		
pX, platoon unblocked	0.65					
vC, conflicting volume	2322	684	1368			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1954	684	1368			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	92	100			
cM capacity (veh/h)	37	396	508			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	1014	1014	832	536
Volume Left	0	0	0	0	0
Volume Right	32	0	0	0	120
cSH	396	1700	1700	1700	1700
Volume to Capacity	0.08	0.60	0.60	0.49	0.32
Queue Length 95th (ft)	7	0	0	0	0
Control Delay (s)	14.9	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	14.9	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

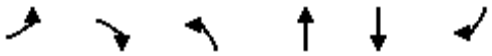


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	143	179	206	1682	1137	16
Future Volume (vph)	143	179	206	1682	1137	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1615	1805	3574	3499	
Flt Permitted	0.95	1.00	0.12	1.00	1.00	
Satd. Flow (perm)	1770	1615	224	3574	3499	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	159	199	229	1869	1263	18
RTOR Reduction (vph)	0	172	0	0	1	0
Lane Group Flow (vph)	159	27	229	1869	1280	0
Heavy Vehicles (%)	2%	0%	0%	1%	3%	0%
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	12.4	12.4	65.6	65.6	48.6	
Effective Green, g (s)	12.4	12.4	65.6	65.6	48.6	
Actuated g/C Ratio	0.14	0.14	0.73	0.73	0.54	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	4.0	4.0	
Lane Grp Cap (vph)	243	222	356	2605	1889	
v/s Ratio Prot	c0.09		0.08	c0.52	0.37	
v/s Ratio Perm		0.02	0.39			
v/c Ratio	0.65	0.12	0.64	0.72	0.68	
Uniform Delay, d1	36.8	34.0	11.8	6.9	15.0	
Progression Factor	1.00	1.00	1.08	0.92	1.03	
Incremental Delay, d2	6.2	0.3	2.2	1.0	1.8	
Delay (s)	43.0	34.3	15.0	7.3	17.3	
Level of Service	D	C	B	A	B	
Approach Delay (s)	38.1			8.2	17.3	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

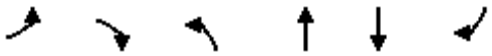
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	887	1301	587	0	0	1257
Future Volume (vph)	887	1301	587	0	0	1257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0			6.0
Lane Util. Factor	0.97	0.91	0.95			0.91
Frt	0.94	0.85	1.00			1.00
Flt Protected	0.97	1.00	1.00			1.00
Satd. Flow (prot)	3316	1441	3574			4988
Flt Permitted	0.97	1.00	1.00			1.00
Satd. Flow (perm)	3316	1441	3574			4988
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	986	1446	652	0	0	1397
RTOR Reduction (vph)	29	29	0	0	0	0
Lane Group Flow (vph)	1622	752	652	0	0	1397
Heavy Vehicles (%)	1%	2%	1%	0%	0%	4%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		6			2
Permitted Phases		8				
Actuated Green, G (s)	50.0	50.0	28.0			28.0
Effective Green, g (s)	50.0	50.0	28.0			28.0
Actuated g/C Ratio	0.56	0.56	0.31			0.31
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	3.0	3.0	4.0			4.0
Lane Grp Cap (vph)	1842	800	1111			1551
v/s Ratio Prot	0.49		0.18			c0.28
v/s Ratio Perm		c0.52				
v/c Ratio	0.88	0.94	0.59			0.90
Uniform Delay, d1	17.4	18.6	26.1			29.7
Progression Factor	1.00	1.00	0.83			0.73
Incremental Delay, d2	6.4	20.1	2.1			6.9
Delay (s)	23.8	38.7	23.8			28.5
Level of Service	C	D	C			C
Approach Delay (s)	28.6		23.8			28.5
Approach LOS	C		C			C

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	114.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	130	629	0	672	1515	0
Future Volume (vph)	130	629	0	672	1515	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		0.95	0.91	
Frt	0.90	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	1671	1519		3574	5136	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	1671	1519		3574	5136	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	144	699	0	747	1683	0
RTOR Reduction (vph)	5	5	0	0	0	0
Lane Group Flow (vph)	426	407	0	747	1683	0
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	29.7	29.7		48.3	48.3	
Effective Green, g (s)	29.7	29.7		48.3	48.3	
Actuated g/C Ratio	0.33	0.33		0.54	0.54	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	551	501		1918	2756	
v/s Ratio Prot	0.26			0.21	c0.33	
v/s Ratio Perm		c0.27				
v/c Ratio	0.77	0.81		0.39	0.61	
Uniform Delay, d1	27.1	27.6		12.2	14.4	
Progression Factor	1.00	1.00		1.39	0.72	
Incremental Delay, d2	6.7	9.7		0.5	0.4	
Delay (s)	33.8	37.4		17.5	10.7	
Level of Service	C	D		B	B	
Approach Delay (s)	35.5			17.5	10.7	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



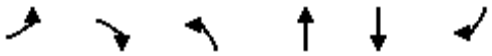
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	410	204	137	781	1620	524
Future Volume (vph)	410	204	137	781	1620	524
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	11	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3236	1507	1646	3455	3490	1531
Flt Permitted	0.95	1.00	0.07	1.00	1.00	1.00
Satd. Flow (perm)	3236	1507	125	3455	3490	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	456	227	152	868	1800	582
RTOR Reduction (vph)	0	150	0	0	0	82
Lane Group Flow (vph)	456	77	152	868	1800	500
Heavy Vehicles (%)	1%	0%	6%	1%	0%	2%
Turn Type	Prot	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4	2			6
Actuated Green, G (s)	14.4	14.4	63.6	63.6	49.4	63.8
Effective Green, g (s)	14.4	14.4	63.6	63.6	49.4	63.8
Actuated g/C Ratio	0.16	0.16	0.71	0.71	0.55	0.71
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	4.0	4.0	3.0
Lane Grp Cap (vph)	517	241	226	2441	1915	1187
v/s Ratio Prot	c0.14		c0.06	0.25	c0.52	0.07
v/s Ratio Perm		0.05	0.41			0.26
v/c Ratio	0.88	0.32	0.67	0.36	0.94	0.42
Uniform Delay, d1	37.0	33.5	21.9	5.2	18.9	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.23	0.93
Incremental Delay, d2	16.1	0.8	7.7	0.4	8.7	0.2
Delay (s)	53.1	34.2	29.6	5.6	32.1	5.2
Level of Service	D	C	C	A	C	A
Approach Delay (s)	46.8			9.2	25.5	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	103	99	1374	451	60	1128
Future Volume (vph)	103	99	1374	451	60	1128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1652	1478	1863	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.06	1.00
Satd. Flow (perm)	1652	1478	1863	1583	108	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	114	110	1527	501	67	1253
RTOR Reduction (vph)	0	70	0	115	0	0
Lane Group Flow (vph)	114	40	1527	386	67	1253
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	8.7	8.7	69.3	69.3	69.3	69.3
Effective Green, g (s)	8.7	8.7	69.3	69.3	69.3	69.3
Actuated g/C Ratio	0.10	0.10	0.77	0.77	0.77	0.77
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	159	142	1434	1218	83	2725
v/s Ratio Prot	c0.07		c0.82			0.35
v/s Ratio Perm		0.03		0.24	0.62	
v/c Ratio	0.72	0.28	1.06	0.32	0.81	0.46
Uniform Delay, d1	39.5	37.8	10.4	3.1	6.3	3.7
Progression Factor	1.00	1.00	1.31	1.51	1.00	1.00
Incremental Delay, d2	14.3	1.1	39.7	0.5	55.4	0.6
Delay (s)	53.7	38.9	53.3	5.2	61.7	4.2
Level of Service	D	D	D	A	E	A
Approach Delay (s)	46.4		41.4			7.2
Approach LOS	D		D			A

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1888	1257	58
Future Volume (Veh/h)	0	0	0	1888	1257	58
Sign Control	Yield			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	2098	1397	64
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				184	549	
pX, platoon unblocked	0.86	0.79	0.79			
vC, conflicting volume	2478	498	1461			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1230	0	642			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	149	859	750			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	1049	1049	559	559	343
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	64
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.62	0.62	0.33	0.33	0.20
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	672	518	0	2144
Future Volume (Veh/h)	0	0	672	518	0	2144
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	747	576	0	2382
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			635			309
pX, platoon unblocked	0.77					
vC, conflicting volume	1541	374			1323	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	670	374			1323	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	305	630			529	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	374	374	576	794	794	794
Volume Left	0	0	0	0	0	0
Volume Right	0	0	576	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.22	0.34	0.47	0.47	0.47
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						

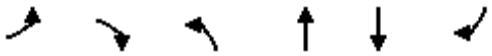
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Appendix D

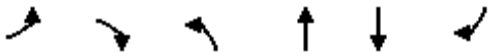
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 3 AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	6	62	724	1868	31
Future Volume (Veh/h)	21	6	62	724	1868	31
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)	23	7	69	804	2076	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1316		
pX, platoon unblocked	0.93					
vC, conflicting volume	2633	1055	2110			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2604	1055	2110			
tC, single (s)	6.8	7.4	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.5	2.2			
p0 queue free %	0	96	72			
cM capacity (veh/h)	14	187	249			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	23	7	337	536	1384	726
Volume Left	23	0	69	0	0	0
Volume Right	0	7	0	0	0	34
cSH	14	187	249	1700	1700	1700
Volume to Capacity	1.66	0.04	0.28	0.32	0.81	0.43
Queue Length 95th (ft)	89	3	27	0	0	0
Control Delay (s)	878.7	25.1	11.6	0.0	0.0	0.0
Lane LOS	F	D	B			
Approach Delay (s)	679.5		4.5		0.0	
Approach LOS	F					

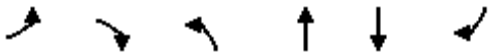
Intersection Summary				
Average Delay	8.1			
Intersection Capacity Utilization	77.6%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	35	0	785	1867	7
Future Volume (Veh/h)	0	35	0	785	1867	7
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	39	0	872	2074	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)				722		
pX, platoon unblocked	0.91					
vC, conflicting volume	2514	1041	2074			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2466	1041	2074			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	83	100			
cM capacity (veh/h)	23	230	272			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	39	436	436	1383	699
Volume Left	0	0	0	0	0
Volume Right	39	0	0	0	8
cSH	230	1700	1700	1700	1700
Volume to Capacity	0.17	0.26	0.26	0.81	0.41
Queue Length 95th (ft)	15	0	0	0	0
Control Delay (s)	23.8	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	23.8	0.0		0.0	
Approach LOS	C				

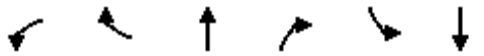
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	785	1815	87
Future Volume (Veh/h)	0	0	0	785	1815	87
Sign Control	Yield			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	872	2017	97
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				143		
pX, platoon unblocked	0.90					
vC, conflicting volume	2453	1008	2114			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2395	1008	2114			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	26	242	262			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	436	436	1008	1008	97
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	97
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.26	0.26	0.59	0.59	0.06
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

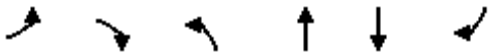
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑	↱		↑↑
Traffic Volume (veh/h)	0	0	674	813	0	1051
Future Volume (Veh/h)	0	0	674	813	0	1051
Sign Control	Yield		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	749	903	0	1168
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						681
pX, platoon unblocked	0.95					
vC, conflicting volume	1333	374			1652	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1244	374			1652	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	161	629			396	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	374	374	903	584	584
Volume Left	0	0	0	0	0
Volume Right	0	0	903	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.22	0.53	0.34	0.34
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	644	47	101	843	756	295
Future Volume (Veh/h)	644	47	101	843	756	295
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)	716	52	112	937	840	328
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	1532	420	1168			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1532	420	1168			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	91	81			
cM capacity (veh/h)	86	582	577			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	716	52	112	468	468	420	420	328
Volume Left	716	0	112	0	0	0	0	0
Volume Right	0	52	0	0	0	0	0	328
cSH	86	582	577	1700	1700	1700	1700	1700
Volume to Capacity	8.28	0.09	0.19	0.28	0.28	0.25	0.25	0.19
Queue Length 95th (ft)	Err	7	18	0	0	0	0	0
Control Delay (s)	Err	11.8	12.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	B	B					
Approach Delay (s)	9322.8		1.4			0.0		
Approach LOS	F							

Intersection Summary			
Average Delay	2399.1		
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

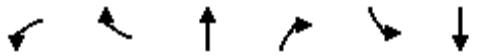
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	444	293	627	118	56	1454
Future Volume (Veh/h)	444	293	627	118	56	1454
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	493	326	697	131	62	1616
Pedestrians						
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	1629	697			828	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1629	697			828	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	15			92	
cM capacity (veh/h)	85	383			799	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	329	490	697	131	62	808	808
Volume Left	329	164	0	0	62	0	0
Volume Right	0	326	0	131	0	0	0
cSH	85	195	1700	1700	799	1700	1700
Volume to Capacity	3.85	2.52	0.41	0.08	0.08	0.48	0.48
Queue Length 95th (ft)	Err	1035	0	0	6	0	0
Control Delay (s)	Err	736.0	0.0	0.0	9.9	0.0	0.0
Lane LOS	F	F			A		
Approach Delay (s)	4453.3		0.0		0.4		
Approach LOS	F						

Intersection Summary			
Average Delay	1097.1		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

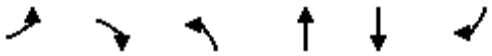
Movement	EBL	WBL	NBL	NBT	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	543	264	410	1509	307
Future Volume (vph)	21	543	264	410	1509	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.97	1.00	0.95	0.97	0.95
Frt	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	0.95	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3303	1787	3505	3400	3539
Flt Permitted	0.95	0.95	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1805	3303	1787	3505	3400	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	603	293	456	1677	341
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	23	603	293	456	1677	341
Heavy Vehicles (%)	0%	6%	1%	3%	3%	2%
Turn Type	Prot	Prot	Prot	NA	Prot	NA
Protected Phases	4	8	5	2	1	6
Permitted Phases						
Actuated Green, G (s)	18.0	18.0	21.6	15.0	49.0	42.4
Effective Green, g (s)	18.0	18.0	21.6	15.0	49.0	42.4
Actuated g/C Ratio	0.18	0.18	0.22	0.15	0.49	0.42
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	324	594	385	525	1666	1500
v/s Ratio Prot	0.01	c0.18	0.16	c0.13	c0.49	0.10
v/s Ratio Perm						
v/c Ratio	0.07	1.02	0.76	0.87	1.01	0.23
Uniform Delay, d1	34.1	41.0	36.8	41.5	25.5	18.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	40.8	9.1	14.6	21.7	0.1
Delay (s)	34.1	81.8	45.9	56.1	47.2	18.4
Level of Service	C	F	D	E	D	B
Approach Delay (s)				52.1		42.3
Approach LOS				D		D

Intersection Summary			
HCM 2000 Control Delay	51.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	354	431	0	0	1815
Future Volume (vph)	0	354	431	0	0	1815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			6.0
Lane Util. Factor		0.88	0.95			0.95
Frt		0.85	1.00			1.00
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		2760	3471			3539
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		2760	3471			3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	393	479	0	0	2017
RTOR Reduction (vph)	0	196	0	0	0	0
Lane Group Flow (vph)	0	197	479	0	0	2017
Heavy Vehicles (%)	0%	3%	4%	0%	0%	2%
Turn Type		Prot	NA			NA
Protected Phases		1	2 4			1 2 4
Permitted Phases						
Actuated Green, G (s)		49.0	39.0			100.0
Effective Green, g (s)		49.0	39.0			100.0
Actuated g/C Ratio		0.49	0.39			1.00
Clearance Time (s)		6.0				
Vehicle Extension (s)		4.0				
Lane Grp Cap (vph)		1352	1353			3539
v/s Ratio Prot		0.07	0.14			c0.57
v/s Ratio Perm						
v/c Ratio		0.15	0.35			0.57
Uniform Delay, d1		14.0	21.6			0.0
Progression Factor		1.00	0.03			1.00
Incremental Delay, d2		0.1	0.1			0.3
Delay (s)		14.1	0.8			0.3
Level of Service		B	A			A
Approach Delay (s)	14.1		0.8			0.3
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	2.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



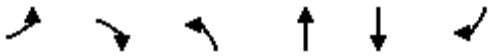
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	201	0	674	850	0
Future Volume (Veh/h)	0	201	0	674	850	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	223	0	749	944	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					435	
pX, platoon unblocked	0.94	0.94	0.94			
vC, conflicting volume	1318	472	944			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1219	322	822			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	65	100			
cM capacity (veh/h)	166	639	771			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	223	374	374	472	472
Volume Left	0	0	0	0	0
Volume Right	223	0	0	0	0
cSH	639	1700	1700	1700	1700
Volume to Capacity	0.35	0.22	0.22	0.28	0.28
Queue Length 95th (ft)	39	0	0	0	0
Control Delay (s)	13.6	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	13.6	0.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	42.6%	ICU Level of Service		A
Analysis Period (min)	15			

Appendix D

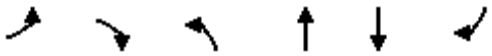
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 3 PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	143	29	206	1682	1123	108
Future Volume (Veh/h)	143	29	206	1682	1123	108
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)	159	32	229	1869	1248	120
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1316		
pX, platoon unblocked	0.90					
vC, conflicting volume	2700	684	1368			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2667	684	1368			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	92	55			
cM capacity (veh/h)	9	396	508			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	159	32	852	1246	832	536
Volume Left	159	0	229	0	0	0
Volume Right	0	32	0	0	0	120
cSH	9	396	508	1700	1700	1700
Volume to Capacity	17.74	0.08	0.45	0.73	0.49	0.32
Queue Length 95th (ft)	Err	7	58	0	0	0
Control Delay (s)	Err	14.9	14.0	0.0	0.0	0.0
Lane LOS	F	B	B			
Approach Delay (s)	8326.3		5.7		0.0	
Approach LOS	F					

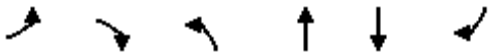
Intersection Summary			
Average Delay	438.1		
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	179	0	1888	1137	16
Future Volume (Veh/h)	0	179	0	1888	1137	16
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	199	0	2098	1263	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)				722		
pX, platoon unblocked	0.89					
vC, conflicting volume	2321	640	1263			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2236	640	1263			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	53	100			
cM capacity (veh/h)	33	423	557			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	199	1049	1049	842	439
Volume Left	0	0	0	0	0
Volume Right	199	0	0	0	18
cSH	423	1700	1700	1700	1700
Volume to Capacity	0.47	0.62	0.62	0.50	0.26
Queue Length 95th (ft)	61	0	0	0	0
Control Delay (s)	20.9	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	20.9	0.0		0.0	
Approach LOS	C				

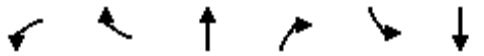
Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	55.5%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1888	1257	58
Future Volume (Veh/h)	0	0	0	1888	1257	58
Sign Control	Yield			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	2098	1397	64
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				143		
pX, platoon unblocked	0.89					
vC, conflicting volume	2446	698	1461			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2375	698	1461			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	26	387	469			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	1049	1049	698	698	64
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	64
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.62	0.62	0.41	0.41	0.04
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

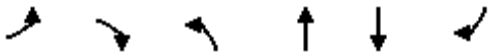
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑	↱		↑↑
Traffic Volume (veh/h)	0	0	672	518	0	2144
Future Volume (Veh/h)	0	0	672	518	0	2144
Sign Control	Yield		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	747	576	0	2382
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						681
pX, platoon unblocked	0.84					
vC, conflicting volume	1938	374			1323	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1739	374			1323	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	67	630			529	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	374	374	576	1191	1191
Volume Left	0	0	0	0	0
Volume Right	0	0	576	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.22	0.34	0.70	0.70
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

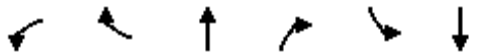
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	410	204	137	781	1620	524
Future Volume (Veh/h)	410	204	137	781	1620	524
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)	456	227	152	868	1800	582
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	2538	900	2382			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2538	900	2382			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	0	20	19			
cM capacity (veh/h)	4	285	188			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	456	227	152	434	434	900	900	582
Volume Left	456	0	152	0	0	0	0	0
Volume Right	0	227	0	0	0	0	0	582
cSH	4	285	188	1700	1700	1700	1700	1700
Volume to Capacity	104.89	0.80	0.81	0.26	0.26	0.53	0.53	0.34
Queue Length 95th (ft)	Err	157	141	0	0	0	0	0
Control Delay (s)	Err	53.0	74.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	F	F					
Approach Delay (s)	6693.4		11.2			0.0		
Approach LOS	F							

Intersection Summary			
Average Delay	1121.9		
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		



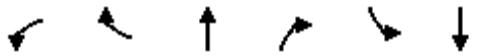
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	103	99	1374	451	60	1128
Future Volume (Veh/h)	103	99	1374	451	60	1128
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	114	110	1527	501	67	1253
Pedestrians						
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	2288	1527			2028	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2288	1527			2028	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	0			76	
cM capacity (veh/h)	25	106			276	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	76	148	1527	501	67	626	626
Volume Left	76	38	0	0	67	0	0
Volume Right	0	110	0	501	0	0	0
cSH	25	92	1700	1700	276	1700	1700
Volume to Capacity	3.03	1.61	0.90	0.29	0.24	0.37	0.37
Queue Length 95th (ft)	Err	293	0	0	23	0	0
Control Delay (s)	Err	396.7	0.0	0.0	22.2	0.0	0.0
Lane LOS	F	F			C		
Approach Delay (s)	3654.6		0.0		1.1		
Approach LOS	F						

Intersection Summary			
Average Delay	229.6		
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

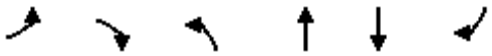
Movement	EBL	WBL	NBL	NBT	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	130	887	216	457	629	628
Future Volume (vph)	130	887	216	457	629	628
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.97	1.00	0.95	0.97	0.95
Frt	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	0.95	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3467	1805	3574	3367	3471
Flt Permitted	0.95	0.95	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1805	3467	1805	3574	3367	3471
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	144	986	240	508	699	698
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	144	986	240	508	699	698
Heavy Vehicles (%)	0%	1%	0%	1%	4%	4%
Turn Type	Prot	Prot	Prot	NA	Prot	NA
Protected Phases	4	8	5	2	1	6
Permitted Phases						
Actuated Green, G (s)	27.0	27.0	19.0	16.0	39.0	36.0
Effective Green, g (s)	27.0	27.0	19.0	16.0	39.0	36.0
Actuated g/C Ratio	0.27	0.27	0.19	0.16	0.39	0.36
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	487	936	342	571	1313	1249
v/s Ratio Prot	0.08	c0.28	c0.13	c0.14	0.21	c0.20
v/s Ratio Perm						
v/c Ratio	0.30	1.05	0.70	0.89	0.53	0.56
Uniform Delay, d1	29.0	36.5	37.9	41.1	23.5	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	44.5	6.8	16.0	0.5	0.6
Delay (s)	29.3	81.0	44.7	57.1	24.0	26.3
Level of Service	C	F	D	E	C	C
Approach Delay (s)				53.1		25.1
Approach LOS				D		C

Intersection Summary			
HCM 2000 Control Delay	48.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	1301	587	0	0	1257
Future Volume (vph)	0	1301	587	0	0	1257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			6.0
Lane Util. Factor		0.88	0.95			0.95
Frt		0.85	1.00			1.00
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		2787	3574			3471
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		2787	3574			3471
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1446	652	0	0	1397
RTOR Reduction (vph)	0	205	0	0	0	0
Lane Group Flow (vph)	0	1241	652	0	0	1397
Heavy Vehicles (%)	0%	2%	1%	0%	0%	4%
Turn Type		Prot	NA			NA
Protected Phases		1	2 4			1 2 4
Permitted Phases						
Actuated Green, G (s)		39.0	49.0			100.0
Effective Green, g (s)		39.0	49.0			100.0
Actuated g/C Ratio		0.39	0.49			1.00
Clearance Time (s)		6.0				
Vehicle Extension (s)		4.0				
Lane Grp Cap (vph)		1086	1751			3471
v/s Ratio Prot		c0.45	0.18			c0.40
v/s Ratio Perm						
v/c Ratio		1.14	0.37			0.40
Uniform Delay, d1		30.5	15.9			0.0
Progression Factor		1.00	0.06			1.00
Incremental Delay, d2		75.5	0.1			0.1
Delay (s)		106.0	1.1			0.1
Level of Service		F	A			A
Approach Delay (s)	106.0		1.1			0.1
Approach LOS	F		A			A

Intersection Summary			
HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



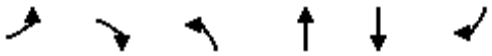
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	629	0	672	1515	0
Future Volume (Veh/h)	0	629	0	672	1515	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	699	0	747	1683	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					435	
pX, platoon unblocked	0.84	0.84	0.84			
vC, conflicting volume	2056	842	1683			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1878	434	1434			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	0	100			
cM capacity (veh/h)	54	482	404			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	699	374	374	842	842
Volume Left	0	0	0	0	0
Volume Right	699	0	0	0	0
cSH	482	1700	1700	1700	1700
Volume to Capacity	1.45	0.22	0.22	0.49	0.49
Queue Length 95th (ft)	868	0	0	0	0
Control Delay (s)	237.1	0.0	0.0	0.0	0.0
Lane LOS	F				
Approach Delay (s)	237.1	0.0		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	53.0		
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

Appendix D

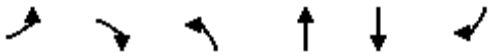
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 3 with Improvements AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	21	6	62	724	1868	31
Future Volume (vph)	21	6	62	724	1868	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	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	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1745	1249	1678	3292	3498	
Flt Permitted	0.95	1.00	0.07	1.00	1.00	
Satd. Flow (perm)	1745	1249	130	3292	3498	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	7	69	804	2076	34
RTOR Reduction (vph)	0	7	0	0	1	0
Lane Group Flow (vph)	23	0	69	804	2109	0
Heavy Vehicles (%)	0%	25%	4%	6%	3%	0%
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	4.8	4.8	103.2	103.2	103.2	
Effective Green, g (s)	4.8	4.8	103.2	103.2	103.2	
Actuated g/C Ratio	0.04	0.04	0.86	0.86	0.86	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	69	49	111	2831	3008	
v/s Ratio Prot	c0.01			0.24	c0.60	
v/s Ratio Perm		0.00	0.53			
v/c Ratio	0.33	0.01	0.62	0.28	0.70	
Uniform Delay, d1	56.0	55.3	2.5	1.6	3.0	
Progression Factor	1.00	1.00	2.65	0.64	1.00	
Incremental Delay, d2	2.8	0.0	20.2	0.2	1.4	
Delay (s)	58.9	55.4	26.9	1.2	4.4	
Level of Service	E	E	C	A	A	
Approach Delay (s)	58.1			3.2	4.4	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

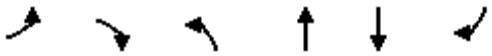
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	35	0	785	1867	7
Future Volume (Veh/h)	0	35	0	785	1867	7
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	39	0	872	2074	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)				722	594	
pX, platoon unblocked	0.22	0.16	0.16			
vC, conflicting volume	2514	1041	2074			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	78	100			
cM capacity (veh/h)	230	174	261			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	39	436	436	1383	699
Volume Left	0	0	0	0	0
Volume Right	39	0	0	0	8
cSH	174	1700	1700	1700	1700
Volume to Capacity	0.22	0.26	0.26	0.81	0.41
Queue Length 95th (ft)	21	0	0	0	0
Control Delay (s)	31.6	0.0	0.0	0.0	0.0
Lane LOS	D				
Approach Delay (s)	31.6	0.0		0.0	
Approach LOS	D				

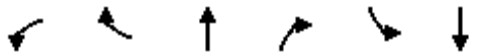
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	785	1815	87
Future Volume (Veh/h)	0	0	0	785	1815	87
Sign Control	Yield			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	872	2017	97
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				143	1173	
pX, platoon unblocked	0.73	0.66	0.66			
vC, conflicting volume	2453	1008	2114			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1439	5	1667			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	92	720	260			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	436	436	1008	1008	97
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	97
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.26	0.26	0.59	0.59	0.06
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

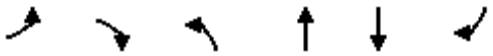
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑	↱		↑↑
Traffic Volume (veh/h)	0	0	674	813	0	1051
Future Volume (Veh/h)	0	0	674	813	0	1051
Sign Control	Yield		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	749	903	0	1168
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			719			246
pX, platoon unblocked	0.88					
vC, conflicting volume	1333	374			1652	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1110	374			1652	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	182	629			396	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	374	374	903	584	584
Volume Left	0	0	0	0	0
Volume Right	0	0	903	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.22	0.53	0.34	0.34
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	644	47	101	843	756	295
Future Volume (vph)	644	47	101	843	756	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	11	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3204	1478	1662	3421	3355	1446
Flt Permitted	0.95	1.00	0.24	1.00	1.00	1.00
Satd. Flow (perm)	3204	1478	416	3421	3355	1446
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	716	52	112	937	840	328
RTOR Reduction (vph)	0	38	0	0	0	74
Lane Group Flow (vph)	716	14	112	937	840	254
Heavy Vehicles (%)	2%	2%	5%	2%	4%	8%
Turn Type	Prot	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4	2			6
Actuated Green, G (s)	32.6	32.6	75.4	75.4	60.5	93.1
Effective Green, g (s)	32.6	32.6	75.4	75.4	60.5	93.1
Actuated g/C Ratio	0.27	0.27	0.63	0.63	0.50	0.78
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	4.0	4.0	3.0
Lane Grp Cap (vph)	870	401	353	2149	1691	1194
v/s Ratio Prot	c0.22		0.02	c0.27	c0.25	0.06
v/s Ratio Perm		0.01	0.18			0.12
v/c Ratio	0.82	0.04	0.32	0.44	0.50	0.21
Uniform Delay, d1	41.0	32.1	10.8	11.4	19.7	3.6
Progression Factor	1.00	1.00	1.00	1.00	0.78	8.71
Incremental Delay, d2	6.3	0.0	0.5	0.6	1.0	0.1
Delay (s)	47.3	32.2	11.3	12.1	16.3	31.6
Level of Service	D	C	B	B	B	C
Approach Delay (s)	46.3			12.0	20.6	
Approach LOS	D			B	C	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

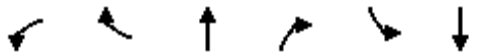
c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	444	293	627	118	56	1454
Future Volume (vph)	444	293	627	118	56	1454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3204	1478	1863	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.28	1.00
Satd. Flow (perm)	3204	1478	1863	1583	524	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	493	326	697	131	62	1616
RTOR Reduction (vph)	0	194	0	55	0	0
Lane Group Flow (vph)	493	132	697	76	62	1616
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	15.8	15.8	39.0	39.0	39.0	39.0
Effective Green, g (s)	15.8	15.8	39.0	39.0	39.0	39.0
Actuated g/C Ratio	0.24	0.24	0.58	0.58	0.58	0.58
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	757	349	1087	924	305	2066
v/s Ratio Prot	c0.15		0.37			c0.46
v/s Ratio Perm		0.09		0.05	0.12	
v/c Ratio	0.65	0.38	0.64	0.08	0.20	0.78
Uniform Delay, d1	23.0	21.4	9.2	6.1	6.6	10.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.7	1.5	0.1	0.5	2.1
Delay (s)	25.0	22.1	10.7	6.1	7.0	12.8
Level of Service	C	C	B	A	A	B
Approach Delay (s)	23.9		10.0			12.6
Approach LOS	C		A			B

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

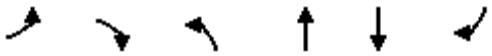
Movement	EBL	WBL	NBL	NBT	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	543	264	410	1509	307
Future Volume (vph)	21	543	264	410	1509	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.97	1.00	0.95	0.97	0.95
Frt	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	0.95	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3303	1787	3505	3400	3539
Flt Permitted	0.95	0.95	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1805	3303	1787	3505	3400	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	603	293	456	1677	341
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	23	603	293	456	1677	341
Heavy Vehicles (%)	0%	6%	1%	3%	3%	2%
Turn Type	Prot	Prot	Prot	NA	Prot	NA
Protected Phases	4	8	5	2	1	6
Permitted Phases						
Actuated Green, G (s)	22.0	22.0	25.1	20.0	60.0	54.9
Effective Green, g (s)	22.0	22.0	25.1	20.0	60.0	54.9
Actuated g/C Ratio	0.18	0.18	0.21	0.17	0.50	0.46
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	4.0	3.0	4.0
Lane Grp Cap (vph)	330	605	373	584	1700	1619
v/s Ratio Prot	0.01	c0.18	0.16	c0.13	c0.49	0.10
v/s Ratio Perm						
v/c Ratio	0.07	1.00	0.79	0.78	0.99	0.21
Uniform Delay, d1	40.5	49.0	44.9	47.9	29.6	19.5
Progression Factor	1.00	1.00	1.16	0.89	0.93	1.21
Incremental Delay, d2	0.1	35.5	10.3	9.9	16.6	0.2
Delay (s)	40.6	84.5	62.3	52.3	44.1	23.9
Level of Service	D	F	E	D	D	C
Approach Delay (s)				56.2		40.7
Approach LOS				E		D

Intersection Summary			
HCM 2000 Control Delay	51.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	354	431	0	0	1815
Future Volume (vph)	0	354	431	0	0	1815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			6.0
Lane Util. Factor		0.88	0.95			0.95
Frt		0.85	1.00			1.00
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		2760	3471			3539
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		2760	3471			3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	393	479	0	0	2017
RTOR Reduction (vph)	0	10	0	0	0	0
Lane Group Flow (vph)	0	383	479	0	0	2017
Heavy Vehicles (%)	0%	3%	4%	0%	0%	2%
Turn Type		custom	NA			NA
Protected Phases		1 4	2			1 2 4
Permitted Phases						
Actuated Green, G (s)		88.0	20.0			120.0
Effective Green, g (s)		88.0	20.0			120.0
Actuated g/C Ratio		0.73	0.17			1.00
Clearance Time (s)			6.0			
Vehicle Extension (s)			4.0			
Lane Grp Cap (vph)		2024	578			3539
v/s Ratio Prot		0.14	c0.14			c0.57
v/s Ratio Perm						
v/c Ratio		0.19	0.83			0.57
Uniform Delay, d1		5.0	48.3			0.0
Progression Factor		1.00	0.41			1.00
Incremental Delay, d2		0.0	8.7			0.2
Delay (s)		5.0	28.6			0.2
Level of Service		A	C			A
Approach Delay (s)	5.0		28.6			0.2
Approach LOS	A		C			A

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

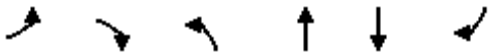


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	201	0	674	850	0
Future Volume (vph)	0	201	0	674	850	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	
Lane Util. Factor		0.88		0.95	0.95	
Frt		0.85		1.00	1.00	
Flt Protected		1.00		1.00	1.00	
Satd. Flow (prot)		2814		3505	3406	
Flt Permitted		1.00		1.00	1.00	
Satd. Flow (perm)		2814		3505	3406	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	223	0	749	944	0
RTOR Reduction (vph)	0	176	0	0	0	0
Lane Group Flow (vph)	0	47	0	749	944	0
Heavy Vehicles (%)	0%	1%	0%	3%	6%	0%
Turn Type		Prot		NA	NA	
Protected Phases		5		5 6 8	6 8	
Permitted Phases						
Actuated Green, G (s)		25.1		120.0	82.9	
Effective Green, g (s)		25.1		120.0	82.9	
Actuated g/C Ratio		0.21		1.00	0.69	
Clearance Time (s)		6.0				
Vehicle Extension (s)		3.0				
Lane Grp Cap (vph)		588		3505	2352	
v/s Ratio Prot		0.02		c0.21	c0.28	
v/s Ratio Perm						
v/c Ratio		0.08		0.21	0.40	
Uniform Delay, d1		38.2		0.0	7.9	
Progression Factor		1.00		1.00	0.92	
Incremental Delay, d2		0.1		0.0	0.1	
Delay (s)		38.2		0.0	7.4	
Level of Service		D		A	A	
Approach Delay (s)	38.2			0.0	7.4	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix D

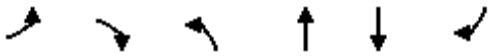
Synchro Intersection Analysis Outputs
Exit 97 - Alternative 3 with Improvements PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	143	29	206	1682	1123	108
Future Volume (vph)	143	29	206	1682	1123	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	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	0.95	0.95	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1711	1561	1745	3455	3468	
Flt Permitted	0.95	1.00	0.17	1.00	1.00	
Satd. Flow (perm)	1711	1561	320	3455	3468	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	159	32	229	1869	1248	120
RTOR Reduction (vph)	0	29	0	0	8	0
Lane Group Flow (vph)	159	3	229	1869	1360	0
Heavy Vehicles (%)	2%	0%	0%	1%	3%	0%
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	9.4	9.4	68.6	68.6	68.6	
Effective Green, g (s)	9.4	9.4	68.6	68.6	68.6	
Actuated g/C Ratio	0.10	0.10	0.76	0.76	0.76	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	178	163	243	2633	2643	
v/s Ratio Prot	c0.09			0.54	0.39	
v/s Ratio Perm		0.00	c0.72			
v/c Ratio	0.89	0.02	0.94	0.71	0.51	
Uniform Delay, d1	39.8	36.2	9.0	5.5	4.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	38.6	0.1	44.6	1.7	0.7	
Delay (s)	78.4	36.2	53.6	7.2	4.9	
Level of Service	E	D	D	A	A	
Approach Delay (s)	71.4			12.3	4.9	
Approach LOS	E			B	A	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

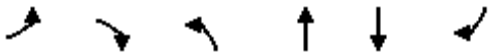
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	179	0	1888	1137	16
Future Volume (Veh/h)	0	179	0	1888	1137	16
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	199	0	2098	1263	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)				722	594	
pX, platoon unblocked	0.92	0.85	0.85			
vC, conflicting volume	2321	640	1263			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1512	216	950			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	70	100			
cM capacity (veh/h)	104	674	619			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	199	1049	1049	842	439
Volume Left	0	0	0	0	0
Volume Right	199	0	0	0	18
cSH	674	1700	1700	1700	1700
Volume to Capacity	0.30	0.62	0.62	0.50	0.26
Queue Length 95th (ft)	31	0	0	0	0
Control Delay (s)	12.6	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.6	0.0		0.0	
Approach LOS	B				

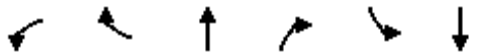
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	55.5%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1888	1257	58
Future Volume (Veh/h)	0	0	0	1888	1257	58
Sign Control	Yield			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	2098	1397	64
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				143	1173	
pX, platoon unblocked	0.91	0.87	0.87			
vC, conflicting volume	2446	698	1461			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1743	355	1231			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	72	563	498			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	1049	1049	698	698	64
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	64
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.62	0.62	0.41	0.41	0.04
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

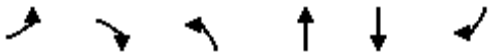
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑	↱		↑↑
Traffic Volume (veh/h)	0	0	672	518	0	2144
Future Volume (Veh/h)	0	0	672	518	0	2144
Sign Control	Yield		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	747	576	0	2382
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			719			246
pX, platoon unblocked	0.68					
vC, conflicting volume	1938	374			1323	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1427	374			1323	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	87	630			529	

Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	374	374	576	1191	1191
Volume Left	0	0	0	0	0
Volume Right	0	0	576	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.22	0.22	0.34	0.70	0.70
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0			0.0	
Approach LOS					

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	410	204	137	781	1620	524
Future Volume (vph)	410	204	137	781	1620	524
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	11	11	11	11
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3236	1507	1646	3455	3490	1531
Flt Permitted	0.95	1.00	0.07	1.00	1.00	1.00
Satd. Flow (perm)	3236	1507	124	3455	3490	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	456	227	152	868	1800	582
RTOR Reduction (vph)	0	151	0	0	0	82
Lane Group Flow (vph)	456	76	152	868	1800	500
Heavy Vehicles (%)	1%	0%	6%	1%	0%	2%
Turn Type	Prot	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		5	2	6	4
Permitted Phases		4	2			6
Actuated Green, G (s)	14.1	14.1	63.9	63.9	49.7	63.8
Effective Green, g (s)	14.1	14.1	63.9	63.9	49.7	63.8
Actuated g/C Ratio	0.16	0.16	0.71	0.71	0.55	0.71
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	4.0	4.0	3.0
Lane Grp Cap (vph)	506	236	226	2453	1927	1187
v/s Ratio Prot	c0.14		c0.06	0.25	c0.52	0.07
v/s Ratio Perm		0.05	0.41			0.26
v/c Ratio	0.90	0.32	0.67	0.35	0.93	0.42
Uniform Delay, d1	37.3	33.7	21.9	5.1	18.6	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.1	0.8	7.7	0.4	9.9	0.2
Delay (s)	56.3	34.5	29.6	5.5	28.6	5.7
Level of Service	E	C	C	A	C	A
Approach Delay (s)	49.1			9.1	23.0	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

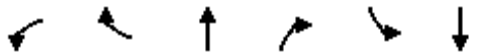
c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	103	99	1374	451	60	1128
Future Volume (vph)	103	99	1374	451	60	1128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	12	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3204	1478	1863	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.06	1.00
Satd. Flow (perm)	3204	1478	1863	1583	104	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	114	110	1527	501	67	1253
RTOR Reduction (vph)	0	70	0	109	0	0
Lane Group Flow (vph)	114	40	1527	392	67	1253
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	8.1	8.1	71.9	71.9	71.9	71.9
Effective Green, g (s)	8.1	8.1	71.9	71.9	71.9	71.9
Actuated g/C Ratio	0.09	0.09	0.78	0.78	0.78	0.78
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	282	130	1455	1237	81	2765
v/s Ratio Prot	c0.04		c0.82			0.35
v/s Ratio Perm		0.03		0.25	0.65	
v/c Ratio	0.40	0.31	1.05	0.32	0.83	0.45
Uniform Delay, d1	39.7	39.3	10.0	2.9	6.2	3.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	1.3	37.7	0.2	48.9	0.2
Delay (s)	40.6	40.7	47.8	3.1	55.1	3.6
Level of Service	D	D	D	A	E	A
Approach Delay (s)	40.6		36.8			6.2
Approach LOS	D		D			A

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

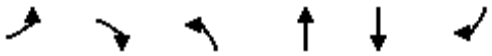
Movement	EBL	WBL	NBL	NBT	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	130	887	216	457	629	628
Future Volume (vph)	130	887	216	457	629	628
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.97	1.00	0.95	0.97	0.95
Frt	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	0.95	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3467	1805	3574	3367	3471
Flt Permitted	0.95	0.95	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1805	3467	1805	3574	3367	3471
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	144	986	240	508	699	698
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	144	986	240	508	699	698
Heavy Vehicles (%)	0%	1%	0%	1%	4%	4%
Turn Type	Prot	Prot	Prot	NA	Prot	NA
Protected Phases	4	8	5	2	1	6
Permitted Phases						
Actuated Green, G (s)	39.0	39.0	30.3	34.0	29.0	32.7
Effective Green, g (s)	39.0	39.0	30.3	34.0	29.0	32.7
Actuated g/C Ratio	0.32	0.32	0.25	0.28	0.24	0.27
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	4.0	3.0	4.0
Lane Grp Cap (vph)	586	1126	455	1012	813	945
v/s Ratio Prot	0.08	c0.28	0.13	0.14	c0.21	c0.20
v/s Ratio Perm						
v/c Ratio	0.25	0.88	0.53	0.50	0.86	0.74
Uniform Delay, d1	29.7	38.2	38.7	35.9	43.6	39.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	7.8	1.1	1.8	8.5	4.8
Delay (s)	29.9	46.0	39.8	37.7	52.0	44.6
Level of Service	C	D	D	D	D	D
Approach Delay (s)				38.4		48.3
Approach LOS				D		D

Intersection Summary			
HCM 2000 Control Delay	44.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	1301	587	0	0	1257
Future Volume (vph)	0	1301	587	0	0	1257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			6.0
Lane Util. Factor		0.88	0.95			0.95
Frt		0.85	1.00			1.00
Flt Protected		1.00	1.00			1.00
Satd. Flow (prot)		2787	3574			3471
Flt Permitted		1.00	1.00			1.00
Satd. Flow (perm)		2787	3574			3471
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1446	652	0	0	1397
RTOR Reduction (vph)	0	33	0	0	0	0
Lane Group Flow (vph)	0	1413	652	0	0	1397
Heavy Vehicles (%)	0%	2%	1%	0%	0%	4%
Turn Type		custom	NA			NA
Protected Phases		1 4	2			1 2 4
Permitted Phases						
Actuated Green, G (s)		74.0	34.0			120.0
Effective Green, g (s)		74.0	34.0			120.0
Actuated g/C Ratio		0.62	0.28			1.00
Clearance Time (s)			6.0			
Vehicle Extension (s)			4.0			
Lane Grp Cap (vph)		1718	1012			3471
v/s Ratio Prot		c0.51	c0.18			c0.40
v/s Ratio Perm						
v/c Ratio		0.82	0.64			0.40
Uniform Delay, d1		17.9	37.7			0.0
Progression Factor		1.00	0.49			1.00
Incremental Delay, d2		3.3	2.9			0.1
Delay (s)		21.2	21.4			0.1
Level of Service		C	C			A
Approach Delay (s)	21.2		21.4			0.1
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	629	0	672	1515	0
Future Volume (vph)	0	629	0	672	1515	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0	
Lane Util. Factor		0.88		0.95	0.95	
Frt		0.85		1.00	1.00	
Flt Protected		1.00		1.00	1.00	
Satd. Flow (prot)		2814		3574	3574	
Flt Permitted		1.00		1.00	1.00	
Satd. Flow (perm)		2814		3574	3574	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	699	0	747	1683	0
RTOR Reduction (vph)	0	41	0	0	0	0
Lane Group Flow (vph)	0	658	0	747	1683	0
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%
Turn Type		Prot		NA	NA	
Protected Phases		5		5 6 8	6 8	
Permitted Phases						
Actuated Green, G (s)		30.3		120.0	77.7	
Effective Green, g (s)		30.3		120.0	77.7	
Actuated g/C Ratio		0.25		1.00	0.65	
Clearance Time (s)		6.0				
Vehicle Extension (s)		3.0				
Lane Grp Cap (vph)		710		3574	2314	
v/s Ratio Prot		c0.23		c0.21	c0.47	
v/s Ratio Perm						
v/c Ratio		0.93		0.21	0.73	
Uniform Delay, d1		43.8		0.0	14.1	
Progression Factor		1.00		1.00	0.17	
Incremental Delay, d2		18.0		0.0	0.6	
Delay (s)		61.8		0.0	3.0	
Level of Service		E		A	A	
Approach Delay (s)	61.8			0.0	3.0	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Appendix E

TransModeler Freeway Segment Outputs

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on EXIT 101A RAMP TO US 176	4755	23.0	0.5	22.3	24.0	10
SEB on EXIT 101A RAMP TO US 176	4756	18.1	0.9	16.3	19.2	10
NWB on EXIT 101B RAMP TO US 176	4741	17.7	0.6	17.0	18.7	10
NWB on EXIT 101B RAMP TO US 176	4742	14.1	0.9	11.9	15.1	10
NWB on I 26 E	4781	19.0	0.9	17.8	21.2	10
NWB on I 26 E	4782	20.5	2.2	17.6	23.7	10
NWB on I 26 E	4783	14.0	1.5	11.4	16.6	10
SEB on I 26 E	4785	16.9	1.4	14.4	19.7	10
SEB on I 26 E	4786	27.3	2.1	23.3	31.3	10
SEB on I 26 E	4787	23.2	0.3	22.7	23.6	10
SEB on I 26 E	4788	27.8	1.7	25.8	30.7	10
SEB on I 26 E	4789	17.2	1.5	15.2	19.3	10
SEB on I 26 E	4793	16.8	1.5	14.7	19.8	10
EB on I 26 E	4799	12.4	0.4	11.4	12.8	10
SEB on I 26 E	4800	20.4	1.8	17.6	22.9	10
SEB on I 26 E	4801	16.7	0.3	16.1	17.1	10
SEB on I 26 E	4802	12.3	1.5	8.9	14.1	10
EB on I 26 E	8740	14.0	1.4	12.5	16.4	10
EB on I 26 E	8741	11.8	1.9	9.6	15.3	10
SEB on I 26 E	8744	17.0	1.6	14.5	19.7	10
EB on I 26 E	8764	12.0	0.7	10.7	12.9	10
EB on I 26 E	8766	10.6	1.3	7.8	12.7	10
EB on I 26 E	8769	9.1	0.5	8.1	10.0	10
EB on I 26 E	8770	14.3	0.9	12.8	16.1	10
EB on I 26 E	8778	13.9	0.3	13.4	14.4	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)
Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
NWB on I 26 W	4791	16.1	1.5	14.0	18.1	10
NWB on I 26 W	4795	10.5	1.3	7.8	12.6	10
NWB on I 26 W	4796	15.3	0.7	14.2	16.9	10
NWB on I 26 W	4797	16.7	1.6	14.2	20.1	10
NWB on I 26 W	4805	15.8	1.6	13.6	17.8	10
WB on I 26 W	4807	15.4	0.7	14.3	17.1	10
WB on I 26 W	4808	19.0	3.0	13.3	24.1	10
WB on I 26 W	4809	13.8	2.1	11.5	17.9	10
WB on I 26 W	8748	16.7	1.0	15.2	18.4	10
WB on I 26 W	8756	11.5	1.7	9.2	14.5	10
WB on I 26 W	8757	15.2	0.8	14.0	16.6	10
NWB on I 26 W	8773	9.6	1.3	8.1	12.5	10
WB on I 26 W	8775	12.8	1.1	10.7	15.3	10
WB on I 26 W	8776	11.5	1.6	8.9	14.1	10
WB on I 26 W	8777	16.5	1.5	13.6	19.0	10
NWB on I 26 W	8779	14.2	0.9	13.1	16.3	10
SEB on JAMES F BYRNES EXPY	4718	36.1	2.3	31.7	38.7	10
SEB on JAMES F BYRNES EXPY	4719	39.8	1.2	37.5	41.6	10
SEB on JAMES F BYRNES EXPY	4720	33.1	0.9	31.2	34.4	10
NWB on JAMES F BYRNES EXPY	4725	19.3	1.7	16.9	22.6	10
NWB on JAMES F BYRNES EXPY	4726	23.4	0.7	22.6	24.8	10
NWB on JAMES F BYRNES EXPY	4727	28.5	2.1	23.5	31.5	10
NWB on JAMES F BYRNES EXPY	4728	24.1	1.3	21.6	26.6	10
NWB on JAMES F BYRNES EXPY	4729	27.5	4.3	22.0	36.4	10
NWB on JAMES F BYRNES EXPY	4730	18.3	0.6	16.8	19.3	10
NWB on JAMES F BYRNES EXPY	4732	18.5	0.5	17.5	19.3	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on JAMES F BYRNES EXPY	4733	27.0	0.7	25.8	27.9	10
SEB on JAMES F BYRNES EXPY	4736	29.5	1.0	28.4	31.2	10
SEB on JAMES F BYRNES EXPY	4737	24.2	0.8	22.1	24.9	10
NWB on JAMES F BYRNES EXPY	4739	14.5	0.7	13.3	16.1	10
SEB on JAMES F BYRNES EXPY	4745	21.8	1.3	19.7	24.0	10
SEB on JAMES F BYRNES EXPY	4748	26.6	0.8	25.5	27.8	10
NWB on JAMES F BYRNES EXPY	4753	14.8	1.5	12.5	17.5	10
NWB on JAMES F BYRNES EXPY	4760	12.1	1.4	9.1	14.3	10
NWB on JAMES F BYRNES EXPY	4761	19.2	1.9	15.7	22.2	10
NWB on JAMES F BYRNES EXPY	4762	22.2	0.9	21.1	24.5	10
NWB on JAMES F BYRNES EXPY	4763	24.3	3.4	20.6	32.9	10
NWB on JAMES F BYRNES EXPY	4764	16.1	1.3	14.0	18.2	10
SEB on JAMES F BYRNES EXPY	4766	40.6	3.7	35.1	45.7	10
SEB on JAMES F BYRNES EXPY	4767	53.6	3.3	47.8	59.9	10
SEB on JAMES F BYRNES EXPY	4768	35.9	0.6	35.1	37.0	10
SEB on JAMES F BYRNES EXPY	4769	28.9	1.7	26.6	31.9	10
NWB on JAMES F BYRNES EXPY	4771	18.6	1.7	16.3	22.1	10
NWB on JAMES F BYRNES EXPY	4773	13.4	1.4	10.4	15.7	10
NWB on JAMES F BYRNES EXPY	4774	19.0	0.9	17.7	21.5	10
SEB on JAMES F BYRNES EXPY	4776	24.7	1.5	22.0	26.5	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on EXIT 101A RAMP TO US 176	4755	16.8	1.4	14.5	19.2	10
SEB on EXIT 101A RAMP TO US 176	4756	13.8	0.8	12.7	15.3	10
NWB on EXIT 101B RAMP TO US 176	4741	54.8	17.7	34.7	81.8	10
NWB on EXIT 101B RAMP TO US 176	4742	56.8	21.8	27.7	87.6	10
NWB on I 26 E	4781	28.7	1.5	24.6	30.1	10
NWB on I 26 E	4782	29.6	2.8	23.9	34.0	10
NWB on I 26 E	4783	19.9	1.1	17.1	21.8	10
SEB on I 26 E	4785	16.6	0.8	15.5	18.0	10
SEB on I 26 E	4786	26.8	2.1	23.8	30.9	10
SEB on I 26 E	4787	23.7	0.6	22.9	24.8	10
SEB on I 26 E	4788	28.0	4.1	22.8	36.4	10
SEB on I 26 E	4789	16.9	1.1	14.8	18.7	10
SEB on I 26 E	4793	19.3	1.2	17.1	21.1	10
EB on I 26 E	4799	18.7	0.5	17.6	19.4	10
SEB on I 26 E	4800	22.5	1.3	20.6	24.7	10
SEB on I 26 E	4801	20.5	0.4	19.7	21.2	10
SEB on I 26 E	4802	15.5	0.8	14.2	16.6	10
EB on I 26 E	8740	21.0	1.7	18.1	24.8	10
EB on I 26 E	8741	16.1	2.6	14.4	23.5	10
SEB on I 26 E	8744	17.5	1.9	14.9	21.3	10
EB on I 26 E	8764	18.7	0.7	17.4	19.5	10
EB on I 26 E	8766	15.6	1.6	12.5	17.5	10
EB on I 26 E	8769	14.2	1.1	12.8	15.7	10
EB on I 26 E	8770	20.1	1.5	17.3	22.6	10
EB on I 26 E	8778	20.0	0.3	19.4	20.7	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
NWB on I 26 W	4791	23.7	1.7	19.2	25.3	10
NWB on I 26 W	4795	17.7	1.7	13.5	19.6	10
NWB on I 26 W	4796	24.5	1.3	21.0	25.5	10
NWB on I 26 W	4797	25.9	2.2	23.9	30.7	10
NWB on I 26 W	4805	25.0	1.3	23.2	27.0	10
WB on I 26 W	4807	24.9	1.3	21.4	26.1	10
WB on I 26 W	4808	29.4	2.2	26.3	33.5	10
WB on I 26 W	4809	21.8	2.4	17.2	24.8	10
WB on I 26 W	8748	25.0	1.3	22.5	27.2	10
WB on I 26 W	8756	18.7	2.0	15.6	23.0	10
WB on I 26 W	8757	23.4	1.2	20.2	24.6	10
NWB on I 26 W	8773	14.6	1.2	12.3	16.1	10
WB on I 26 W	8775	21.6	1.5	19.1	23.6	10
WB on I 26 W	8776	17.6	2.2	14.7	21.9	10
WB on I 26 W	8777	25.3	2.1	19.8	27.6	10
NWB on I 26 W	8779	21.4	1.3	17.9	23.1	10
SEB on JAMES F BYRNES EXPY	4718	25.9	2.7	22.3	31.5	10
SEB on JAMES F BYRNES EXPY	4719	28.9	2.1	25.7	32.2	10
SEB on JAMES F BYRNES EXPY	4720	25.9	0.7	24.8	27.1	10
NWB on JAMES F BYRNES EXPY	4725	135.6	2.2	131.6	140.2	10
NWB on JAMES F BYRNES EXPY	4726	75.6	2.0	72.9	78.8	10
NWB on JAMES F BYRNES EXPY	4727	71.0	3.3	65.7	75.3	10
NWB on JAMES F BYRNES EXPY	4728	48.9	3.4	46.7	58.9	10
NWB on JAMES F BYRNES EXPY	4729	58.2	5.2	48.5	66.8	10
NWB on JAMES F BYRNES EXPY	4730	35.1	4.1	32.4	46.7	10
NWB on JAMES F BYRNES EXPY	4732	40.4	7.1	34.9	58.8	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various

Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on JAMES F BYRNES EXPY	4733	20.8	0.7	19.5	22.1	10
SEB on JAMES F BYRNES EXPY	4736	21.9	0.7	20.7	23.1	10
SEB on JAMES F BYRNES EXPY	4737	17.0	1.4	14.5	19.1	10
NWB on JAMES F BYRNES EXPY	4739	35.2	8.2	27.9	52.7	10
SEB on JAMES F BYRNES EXPY	4745	16.6	1.1	14.7	18.2	10
SEB on JAMES F BYRNES EXPY	4748	17.9	1.1	16.6	19.8	10
NWB on JAMES F BYRNES EXPY	4753	112.6	22.5	75.6	144.8	10
NWB on JAMES F BYRNES EXPY	4760	119.2	5.4	112.0	127.9	10
NWB on JAMES F BYRNES EXPY	4761	168.1	4.7	160.6	178.0	10
NWB on JAMES F BYRNES EXPY	4762	54.7	15.6	45.7	100.7	10
NWB on JAMES F BYRNES EXPY	4763	68.3	12.9	57.9	104.6	10
NWB on JAMES F BYRNES EXPY	4764	40.9	10.3	31.1	68.6	10
SEB on JAMES F BYRNES EXPY	4766	20.2	1.4	17.6	22.3	10
SEB on JAMES F BYRNES EXPY	4767	29.2	2.8	24.9	33.9	10
SEB on JAMES F BYRNES EXPY	4768	25.5	0.6	24.2	26.2	10
SEB on JAMES F BYRNES EXPY	4769	20.9	1.6	18.7	23.3	10
NWB on JAMES F BYRNES EXPY	4771	30.7	1.4	28.2	33.1	10
NWB on JAMES F BYRNES EXPY	4773	20.3	1.5	17.3	22.3	10
NWB on JAMES F BYRNES EXPY	4774	27.8	1.5	23.8	29.1	10
SEB on JAMES F BYRNES EXPY	4776	19.4	1.5	15.9	20.7	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on EXIT 101A RAMP TO US 176	4755	21.1	1.3	19.0	23.6	10
SEB on EXIT 101A RAMP TO US 176	4756	17.1	1.4	14.3	19.2	10
NWB on EXIT 101B RAMP TO US 176	4741	24.3	1.2	22.4	26.3	10
NWB on EXIT 101B RAMP TO US 176	4742	20.0	1.1	18.5	22.3	10
NWB on I 26 E	4781	148.9	22.9	109.6	179.4	10
NWB on I 26 E	4782	191.9	10.7	170.3	209.3	10
NWB on I 26 E	4783	130.2	10.4	110.5	149.6	10
SEB on I 26 E	4785	14.4	1.2	12.1	16.3	10
SEB on I 26 E	4786	22.3	2.1	19.1	25.9	10
SEB on I 26 E	4787	21.7	1.7	18.7	24.4	10
SEB on I 26 E	4788	53.8	14.3	27.0	70.8	10
SEB on I 26 E	4789	38.3	9.7	21.9	55.3	10
SEB on I 26 E	4793	18.4	0.5	17.8	19.6	10
EB on I 26 E	4799	17.6	0.3	17.2	18.1	10
SEB on I 26 E	4800	39.5	3.4	35.6	45.7	10
SEB on I 26 E	4801	104.9	7.6	88.0	112.5	10
SEB on I 26 E	4802	137.5	4.9	130.0	145.6	10
EB on I 26 E	8740	21.6	1.4	19.5	23.9	10
EB on I 26 E	8741	17.9	1.3	15.9	20.0	10
SEB on I 26 E	8744	30.9	2.5	28.5	36.9	10
EB on I 26 E	8764	17.9	0.7	16.8	19.0	10
EB on I 26 E	8766	15.3	1.5	13.2	17.5	10
EB on I 26 E	8769	14.0	0.6	12.7	15.2	10
EB on I 26 E	8770	21.0	1.6	17.9	23.5	10
EB on I 26 E	8778	20.4	0.3	20.0	20.9	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)
Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
NWB on I 26 W	4791	17.9	2.0	14.8	21.4	10
NWB on I 26 W	4795	10.0	0.9	9.0	12.5	10
NWB on I 26 W	4796	13.2	1.2	11.7	15.0	10
NWB on I 26 W	4797	14.5	2.3	9.5	19.0	10
NWB on I 26 W	4805	13.6	2.3	10.5	18.5	10
WB on I 26 W	4807	13.6	1.3	11.7	15.6	10
WB on I 26 W	4808	16.2	2.3	13.6	19.7	10
WB on I 26 W	4809	13.0	2.1	9.0	16.8	10
WB on I 26 W	8748	11.6	1.4	8.4	13.5	10
WB on I 26 W	8756	9.3	1.3	6.6	11.5	10
WB on I 26 W	8757	10.9	0.9	9.3	12.1	10
NWB on I 26 W	8773	7.5	1.0	5.7	9.6	10
WB on I 26 W	8775	8.5	0.9	7.0	9.8	10
WB on I 26 W	8776	8.8	1.5	6.5	11.4	10
WB on I 26 W	8777	11.9	1.6	9.7	15.5	10
NWB on I 26 W	8779	10.5	0.7	9.7	11.8	10
SEB on JAMES F BYRNES EXPY	4718	46.1	5.9	36.4	55.5	10
SEB on JAMES F BYRNES EXPY	4719	45.9	2.7	41.1	50.1	10
SEB on JAMES F BYRNES EXPY	4720	35.5	1.1	33.8	37.4	10
NWB on JAMES F BYRNES EXPY	4725	27.9	2.5	23.8	31.4	10
NWB on JAMES F BYRNES EXPY	4726	42.6	4.5	37.8	52.3	10
NWB on JAMES F BYRNES EXPY	4727	54.8	8.4	48.1	70.3	10
NWB on JAMES F BYRNES EXPY	4728	43.8	9.6	34.5	63.9	10
NWB on JAMES F BYRNES EXPY	4729	58.2	17.2	35.3	92.8	10
NWB on JAMES F BYRNES EXPY	4730	40.2	11.3	26.8	65.0	10
NWB on JAMES F BYRNES EXPY	4732	27.0	1.3	24.2	28.9	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on JAMES F BYRNES EXPY	4733	27.5	0.9	26.0	29.0	10
SEB on JAMES F BYRNES EXPY	4736	29.9	1.3	27.6	32.0	10
SEB on JAMES F BYRNES EXPY	4737	24.0	1.3	22.2	26.3	10
NWB on JAMES F BYRNES EXPY	4739	21.5	0.9	20.0	22.7	10
SEB on JAMES F BYRNES EXPY	4745	20.9	1.6	18.3	23.1	10
SEB on JAMES F BYRNES EXPY	4748	27.9	1.3	26.0	30.3	10
NWB on JAMES F BYRNES EXPY	4753	19.9	1.0	18.3	21.7	10
NWB on JAMES F BYRNES EXPY	4760	17.0	0.8	15.1	17.8	10
NWB on JAMES F BYRNES EXPY	4761	33.2	3.0	28.3	38.6	10
NWB on JAMES F BYRNES EXPY	4762	31.5	0.6	30.5	32.7	10
NWB on JAMES F BYRNES EXPY	4763	37.5	2.8	31.2	40.9	10
NWB on JAMES F BYRNES EXPY	4764	24.7	3.4	20.7	32.3	10
SEB on JAMES F BYRNES EXPY	4766	31.9	7.7	25.1	52.1	10
SEB on JAMES F BYRNES EXPY	4767	41.7	5.5	35.0	50.3	10
SEB on JAMES F BYRNES EXPY	4768	32.2	1.9	29.3	35.5	10
SEB on JAMES F BYRNES EXPY	4769	27.2	2.3	21.9	30.4	10
NWB on JAMES F BYRNES EXPY	4771	25.3	1.5	23.1	27.6	10
NWB on JAMES F BYRNES EXPY	4773	17.5	0.8	16.0	18.7	10
NWB on JAMES F BYRNES EXPY	4774	36.6	17.1	24.0	80.8	10
SEB on JAMES F BYRNES EXPY	4776	23.7	6.9	16.7	43.8	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on EXIT 101A RAMP TO US 176	4755	14.2	0.8	12.9	15.3	10
SEB on EXIT 101A RAMP TO US 176	4756	11.9	1.2	10.0	13.8	10
NWB on EXIT 101B RAMP TO US 176	4741	146.0	20.0	106.6	181.0	10
NWB on EXIT 101B RAMP TO US 176	4742	138.7	16.3	102.9	161.8	10
NWB on I 26 E	4781	115.2	44.6	27.1	182.2	10
NWB on I 26 E	4782	163.2	9.6	138.4	177.3	10
NWB on I 26 E	4783	106.2	9.0	89.6	123.1	10
SEB on I 26 E	4785	13.0	0.7	12.0	14.3	10
SEB on I 26 E	4786	20.8	1.4	18.7	23.7	10
SEB on I 26 E	4787	78.2	15.4	51.8	108.8	10
SEB on I 26 E	4788	217.9	10.8	199.8	235.5	10
SEB on I 26 E	4789	133.5	7.9	120.9	146.1	10
SEB on I 26 E	4793	17.8	0.8	16.6	19.1	10
EB on I 26 E	4799	23.2	0.6	21.8	24.0	10
SEB on I 26 E	4800	34.8	3.5	28.0	41.0	10
SEB on I 26 E	4801	99.6	8.1	86.7	111.6	10
SEB on I 26 E	4802	123.3	7.8	112.1	135.7	10
EB on I 26 E	8740	27.1	1.5	24.4	29.6	10
EB on I 26 E	8741	22.1	2.4	19.2	26.4	10
SEB on I 26 E	8744	26.5	3.1	21.8	30.9	10
EB on I 26 E	8764	23.2	0.9	21.5	24.7	10
EB on I 26 E	8766	19.8	1.7	17.2	22.9	10
EB on I 26 E	8769	17.8	1.0	15.9	19.6	10
EB on I 26 E	8770	26.3	1.6	23.7	28.5	10
EB on I 26 E	8778	25.6	0.6	24.3	26.7	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various

Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
NWB on I 26 W	4791	19.9	1.4	17.5	21.5	10
NWB on I 26 W	4795	11.3	1.1	10.1	13.3	10
NWB on I 26 W	4796	15.1	0.7	13.9	16.2	10
NWB on I 26 W	4797	16.6	1.5	14.6	18.7	10
NWB on I 26 W	4805	16.0	1.2	14.6	18.1	10
WB on I 26 W	4807	15.6	0.7	14.4	16.5	10
WB on I 26 W	4808	17.2	2.0	14.5	20.6	10
WB on I 26 W	4809	15.2	2.1	11.4	17.7	10
WB on I 26 W	8748	13.3	1.4	10.7	14.9	10
WB on I 26 W	8756	11.1	1.5	8.8	14.0	10
WB on I 26 W	8757	13.6	0.6	12.4	14.4	10
NWB on I 26 W	8773	8.6	0.9	7.1	10.2	10
WB on I 26 W	8775	11.8	0.9	10.3	13.0	10
WB on I 26 W	8776	11.0	0.9	9.9	12.4	10
WB on I 26 W	8777	13.9	1.3	12.0	15.5	10
NWB on I 26 W	8779	12.5	0.6	11.2	13.3	10
SEB on JAMES F BYRNES EXPY	4718	26.9	2.6	22.8	30.5	10
SEB on JAMES F BYRNES EXPY	4719	29.1	1.7	26.7	32.4	10
SEB on JAMES F BYRNES EXPY	4720	24.6	1.1	22.7	26.2	10
NWB on JAMES F BYRNES EXPY	4725	152.1	4.6	145.2	160.1	10
NWB on JAMES F BYRNES EXPY	4726	117.9	13.4	99.8	146.9	10
NWB on JAMES F BYRNES EXPY	4727	125.2	17.0	101.3	160.6	10
NWB on JAMES F BYRNES EXPY	4728	111.9	18.9	83.8	150.8	10
NWB on JAMES F BYRNES EXPY	4729	143.3	23.4	102.4	188.4	10
NWB on JAMES F BYRNES EXPY	4730	97.2	13.6	73.5	123.5	10
NWB on JAMES F BYRNES EXPY	4732	129.7	19.4	95.5	167.0	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various

Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on JAMES F BYRNES EXPY	4733	19.0	0.9	17.8	20.3	10
SEB on JAMES F BYRNES EXPY	4736	19.0	1.1	16.8	21.1	10
SEB on JAMES F BYRNES EXPY	4737	16.1	1.1	14.0	17.5	10
NWB on JAMES F BYRNES EXPY	4739	113.9	14.5	86.0	139.3	10
SEB on JAMES F BYRNES EXPY	4745	12.9	0.7	11.6	14.3	10
SEB on JAMES F BYRNES EXPY	4748	17.0	1.0	15.5	19.1	10
NWB on JAMES F BYRNES EXPY	4753	198.9	9.6	173.5	210.5	10
NWB on JAMES F BYRNES EXPY	4760	155.7	3.8	151.1	162.8	10
NWB on JAMES F BYRNES EXPY	4761	196.3	5.9	185.8	208.7	10
NWB on JAMES F BYRNES EXPY	4762	115.3	8.2	106.1	135.2	10
NWB on JAMES F BYRNES EXPY	4763	124.5	10.0	111.2	146.9	10
NWB on JAMES F BYRNES EXPY	4764	86.7	4.1	78.7	92.2	10
SEB on JAMES F BYRNES EXPY	4766	16.1	0.9	14.5	17.8	10
SEB on JAMES F BYRNES EXPY	4767	22.2	1.3	19.7	24.2	10
SEB on JAMES F BYRNES EXPY	4768	20.1	0.8	19.1	21.5	10
SEB on JAMES F BYRNES EXPY	4769	16.7	1.6	15.1	20.7	10
NWB on JAMES F BYRNES EXPY	4771	28.6	2.3	25.1	33.7	10
NWB on JAMES F BYRNES EXPY	4773	16.2	0.7	14.6	17.1	10
NWB on JAMES F BYRNES EXPY	4774	24.5	10.0	18.7	54.3	10
SEB on JAMES F BYRNES EXPY	4776	18.3	0.9	16.7	19.8	10

Summary Aggregate Report for Segment Statistics

Density (PCE/mi/lane)

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on EXIT 101A RAMP TO US 176	4755	26.9	0.7	25.8	27.8	10
SEB on EXIT 101A RAMP TO US 176	4756	23.9	1.1	21.8	25.8	10
NWB on EXIT 101B RAMP TO US 176	4741	18.3	0.8	17.0	19.6	10
NWB on EXIT 101B RAMP TO US 176	4742	17.7	1.7	14.9	21.2	10
WB on I 26 E	4780	19.0	2.2	14.5	22.7	10
WB on I 26 E	4781	16.1	0.4	15.6	16.7	10
WB on I 26 E	4782	21.9	5.1	15.8	33.5	10
WB on I 26 E	4783	18.0	3.0	15.2	26.4	10
SEB on I 26 E	4785	16.5	0.9	14.8	18.1	10
SEB on I 26 E	4786	26.0	1.7	23.0	28.2	10
SEB on I 26 E	4787	20.4	0.3	20.0	21.0	10
SEB on I 26 E	4789	17.2	0.9	16.1	18.5	10
SEB on I 26 E	4793	15.2	0.7	14.2	16.1	10
EB on I 26 E	4799	17.7	0.3	17.3	18.2	10
SEB on I 26 E	4800	13.2	1.1	11.6	14.8	10
SEB on I 26 E	4801	13.0	0.8	11.9	14.3	10
SEB on I 26 E	4802	20.8	1.9	18.4	24.3	10
SEB on I 26 E	8740	12.9	0.9	11.5	14.1	10
EB on I 26 E	8741	23.1	2.5	18.1	26.4	10
EB on I 26 E	8764	17.5	0.6	16.8	18.6	10
EB on I 26 E	8766	14.8	2.0	12.6	19.7	10
EB on I 26 E	8769	14.4	1.5	12.4	16.6	10
EB on I 26 E	8770	21.0	1.4	20.0	25.0	10
EB on I 26 E	8778	20.1	0.4	19.3	20.7	10
SEB on I 26 E	8887	24.4	1.9	21.5	28.4	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)
Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on I 26 E	8888	23.4	3.7	17.0	28.3	10
SEB on I 26 E	8890	15.5	1.7	12.8	18.2	10
EB on I 26 E	8891	14.2	1.1	12.4	16.7	10
SEB on I 26 E	8893	15.9	0.3	15.3	16.5	10
NWB on I 26 W	4791	9.4	0.6	8.4	10.3	10
NWB on I 26 W	4795	8.0	0.9	6.4	9.5	10
NWB on I 26 W	4796	7.7	0.9	6.6	9.1	10
NWB on I 26 W	4797	10.4	1.5	8.5	14.1	10
NWB on I 26 W	4805	10.5	0.6	9.8	11.3	10
WB on I 26 W	4806	15.1	4.0	10.7	22.4	10
WB on I 26 W	4807	9.9	0.4	9.2	10.4	10
WB on I 26 W	4808	7.9	1.2	5.4	9.9	10
WB on I 26 W	4809	8.9	1.2	6.9	10.8	10
WB on I 26 W	8748	10.3	1.0	9.1	12.6	10
WB on I 26 W	8756	9.8	1.7	7.7	12.8	10
WB on I 26 W	8757	7.7	1.4	5.4	9.9	10
NWB on I 26 W	8773	10.0	0.7	8.7	11.0	10
WB on I 26 W	8775	11.5	0.8	9.9	12.9	10
WB on I 26 W	8776	11.4	2.2	8.8	16.4	10
WB on I 26 W	8777	15.4	1.1	13.8	16.9	10
NWB on I 26 W	8779	13.0	0.5	12.2	14.0	10
NWB on I 26 W	8889	10.0	0.3	9.2	10.4	10
WB on I 26 W	8895	14.7	0.5	14.1	15.5	10
WB on I 26 W	8896	10.6	1.8	6.9	12.7	10
SEB on JAMES F BYRNES EXPY	4718	50.7	3.9	45.3	58.0	10
SEB on JAMES F BYRNES EXPY	4719	40.5	1.1	39.2	42.3	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)
Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on JAMES F BYRNES EXPY	4720	34.2	0.6	33.3	35.1	10
NWB on JAMES F BYRNES EXPY	4725	25.0	3.0	18.9	30.3	10
NWB on JAMES F BYRNES EXPY	4726	24.8	0.5	23.8	25.4	10
NWB on JAMES F BYRNES EXPY	4727	30.3	1.1	28.6	32.7	10
NWB on JAMES F BYRNES EXPY	4728	26.1	1.5	24.6	29.1	10
NWB on JAMES F BYRNES EXPY	4729	25.4	1.7	22.2	28.6	10
NWB on JAMES F BYRNES EXPY	4730	24.3	1.0	22.3	25.6	10
NWB on JAMES F BYRNES EXPY	4732	19.8	0.7	19.0	21.6	10
SEB on JAMES F BYRNES EXPY	4733	34.2	1.6	31.9	36.5	10
SEB on JAMES F BYRNES EXPY	4736	33.2	0.5	32.1	33.8	10
SEB on JAMES F BYRNES EXPY	4737	29.3	1.3	28.1	32.1	10
NWB on JAMES F BYRNES EXPY	4739	16.6	0.9	15.3	18.1	10
SEB on JAMES F BYRNES EXPY	4745	25.8	0.5	25.1	26.5	10
SEB on JAMES F BYRNES EXPY	4748	33.4	0.9	32.3	34.8	10
NWB on JAMES F BYRNES EXPY	4753	14.8	0.9	13.3	16.6	10
NWB on JAMES F BYRNES EXPY	4760	14.4	0.6	13.2	15.2	10
NWB on JAMES F BYRNES EXPY	4761	15.8	1.4	13.0	17.7	10
NWB on JAMES F BYRNES EXPY	4763	15.1	0.4	14.6	15.8	10
NWB on JAMES F BYRNES EXPY	4764	12.9	0.2	12.5	13.4	10
SEB on JAMES F BYRNES EXPY	4768	23.5	0.6	22.3	24.2	10
SEB on JAMES F BYRNES EXPY	4769	31.8	1.0	30.2	33.1	10
NWB on JAMES F BYRNES EXPY	4771	15.2	0.6	14.4	16.1	10
NWB on JAMES F BYRNES EXPY	4773	12.8	1.2	11.1	14.6	10
NWB on JAMES F BYRNES EXPY	4774	16.2	0.4	15.7	16.8	10
NWB on JAMES F BYRNES EXPY	4775	19.1	2.0	17.1	23.4	10
SEB on JAMES F BYRNES EXPY	4776	19.7	0.5	19.1	20.6	10

Summary Aggregate Report for Segment Statistics

Density (PCE/mi/lane)

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
NWB on JAMES F BYRNES EXPY	4779	16.5	1.1	15.0	18.1	10
SEB on JAMES F BYRNES EXPY	8856	25.7	0.2	25.2	25.9	10

Summary Aggregate Report for Segment Statistics

Density (PCE/mi/lane)

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on EXIT 101A RAMP TO US 176	4755	18.7	1.0	17.2	20.9	10
SEB on EXIT 101A RAMP TO US 176	4756	16.2	1.5	13.6	18.2	10
NWB on EXIT 101B RAMP TO US 176	4741	33.3	0.5	32.4	34.0	10
NWB on EXIT 101B RAMP TO US 176	4742	32.8	1.0	31.0	34.3	10
WB on I 26 E	4780	27.4	2.5	24.0	31.7	10
WB on I 26 E	4781	23.8	0.4	23.3	24.5	10
WB on I 26 E	4782	31.8	4.6	25.2	40.3	10
WB on I 26 E	4783	24.0	3.4	21.3	33.5	10
SEB on I 26 E	4785	16.8	0.9	15.5	18.5	10
SEB on I 26 E	4786	26.0	2.5	21.5	29.7	10
SEB on I 26 E	4787	20.8	0.3	20.1	21.4	10
SEB on I 26 E	4789	17.6	0.8	16.6	19.2	10
SEB on I 26 E	4793	16.3	0.6	15.2	17.2	10
EB on I 26 E	4799	23.5	0.6	22.1	24.5	10
SEB on I 26 E	4800	17.4	0.8	16.0	18.7	10
SEB on I 26 E	4801	13.0	0.6	11.9	14.1	10
SEB on I 26 E	4802	21.3	1.7	19.7	25.1	10
SEB on I 26 E	8740	16.4	0.8	14.9	17.8	10
EB on I 26 E	8741	28.2	2.0	24.4	30.8	10
EB on I 26 E	8764	23.0	0.8	22.0	24.5	10
EB on I 26 E	8766	19.7	1.1	17.6	21.1	10
EB on I 26 E	8769	18.1	0.7	16.6	19.1	10
EB on I 26 E	8770	26.8	1.3	24.3	28.5	10
EB on I 26 E	8778	25.9	0.7	24.9	27.1	10
SEB on I 26 E	8887	25.9	2.5	22.3	31.2	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)
Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on I 26 E	8888	23.8	4.1	18.8	31.5	10
SEB on I 26 E	8890	16.5	1.3	14.7	19.3	10
EB on I 26 E	8891	18.2	1.0	16.3	19.9	10
SEB on I 26 E	8893	16.9	0.3	16.3	17.5	10
NWB on I 26 W	4791	15.9	0.7	14.5	17.2	10
NWB on I 26 W	4795	13.4	1.1	11.3	14.8	10
NWB on I 26 W	4796	13.5	0.6	12.1	14.3	10
NWB on I 26 W	4797	18.8	1.2	16.3	20.7	10
NWB on I 26 W	4805	17.5	1.2	16.0	19.6	10
WB on I 26 W	4806	25.3	3.4	20.1	31.0	10
WB on I 26 W	4807	16.7	0.4	16.0	17.1	10
WB on I 26 W	4808	14.3	0.9	12.5	15.6	10
WB on I 26 W	4809	16.2	1.5	12.9	18.0	10
WB on I 26 W	8748	16.0	1.1	14.0	18.1	10
WB on I 26 W	8756	14.3	1.4	11.7	15.9	10
WB on I 26 W	8757	13.6	1.4	10.5	15.3	10
NWB on I 26 W	8773	15.2	1.0	13.9	16.7	10
WB on I 26 W	8775	21.4	1.2	20.1	24.0	10
WB on I 26 W	8776	19.3	1.7	17.1	21.9	10
WB on I 26 W	8777	25.4	1.7	22.8	29.0	10
NWB on I 26 W	8779	21.5	0.5	20.8	22.1	10
NWB on I 26 W	8889	16.6	0.3	16.1	16.9	10
WB on I 26 W	8895	24.6	0.6	23.6	25.3	10
WB on I 26 W	8896	20.3	2.4	17.2	25.8	10
SEB on JAMES F BYRNES EXPY	4718	28.9	2.6	24.8	31.9	10
SEB on JAMES F BYRNES EXPY	4719	27.3	0.9	25.6	28.8	10

Summary Aggregate Report for Segment Statistics
Density (PCE/mi/lane)
Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
SEB on JAMES F BYRNES EXPY	4720	27.0	1.0	25.0	28.3	10
NWB on JAMES F BYRNES EXPY	4725	126.0	2.4	123.0	131.3	10
NWB on JAMES F BYRNES EXPY	4726	77.2	0.5	76.5	78.4	10
NWB on JAMES F BYRNES EXPY	4727	62.4	1.5	58.5	64.7	10
NWB on JAMES F BYRNES EXPY	4728	47.3	1.2	45.7	48.6	10
NWB on JAMES F BYRNES EXPY	4729	43.1	0.8	41.3	44.0	10
NWB on JAMES F BYRNES EXPY	4730	38.7	0.9	37.5	39.9	10
NWB on JAMES F BYRNES EXPY	4732	35.7	0.5	35.0	36.7	10
SEB on JAMES F BYRNES EXPY	4733	24.7	1.1	22.6	26.6	10
SEB on JAMES F BYRNES EXPY	4736	23.3	0.8	21.9	24.8	10
SEB on JAMES F BYRNES EXPY	4737	21.3	1.0	19.7	23.2	10
NWB on JAMES F BYRNES EXPY	4739	30.7	0.8	29.7	32.3	10
SEB on JAMES F BYRNES EXPY	4745	18.5	1.5	15.1	20.9	10
SEB on JAMES F BYRNES EXPY	4748	20.5	0.8	19.1	21.3	10
NWB on JAMES F BYRNES EXPY	4753	25.4	1.0	24.0	27.5	10
NWB on JAMES F BYRNES EXPY	4760	24.9	1.0	23.5	26.3	10
NWB on JAMES F BYRNES EXPY	4761	27.4	1.0	25.6	29.0	10
NWB on JAMES F BYRNES EXPY	4763	26.3	0.2	26.0	26.6	10
NWB on JAMES F BYRNES EXPY	4764	23.1	0.5	22.4	23.9	10
SEB on JAMES F BYRNES EXPY	4768	14.3	0.8	13.3	15.2	10
SEB on JAMES F BYRNES EXPY	4769	21.7	1.3	19.4	23.8	10
NWB on JAMES F BYRNES EXPY	4771	22.1	0.2	21.7	22.5	10
NWB on JAMES F BYRNES EXPY	4773	19.5	1.0	17.7	20.6	10
NWB on JAMES F BYRNES EXPY	4774	23.4	0.3	22.8	23.7	10
NWB on JAMES F BYRNES EXPY	4775	26.8	2.3	22.8	30.1	10
SEB on JAMES F BYRNES EXPY	4776	16.4	0.5	15.8	17.1	10

Summary Aggregate Report for Segment Statistics

Density (PCE/mi/lane)

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

Segment Name/Description	Segment ID	Average	Standard Deviation	Min	Max	Number Of Samples
NWB on JAMES F BYRNES EXPY	4779	25.0	1.2	23.2	26.8	10
SEB on JAMES F BYRNES EXPY	8856	17.5	0.2	17.1	17.9	10

Appendix F

TransModeler Ramp Merge/Diverge Outputs

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4718

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	35.0	D
	2	34.0	D
	3	35.0	E
	4	35.0	D
	5	34.0	D
	6	34.0	D
	7	34.0	D
	8	36.0	E
	9	33.0	D
	10	35.0	E

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4719

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	35.0	D
	2	34.0	D
	3	35.0	E
	4	35.0	D
	5	34.0	D
	6	34.0	D
	7	34.0	D
	8	36.0	E
	9	33.0	D
	10	35.0	E

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4720

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	33.0	D
	2	33.0	D
	3	32.0	D
	4	33.0	D
	5	32.0	D
	6	32.0	D
	7	33.0	D
	8	34.0	D
	9	31.0	D
	10	32.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4725

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	22.0	C
	2	24.0	C
	3	22.0	C
	4	24.0	C
	5	23.0	C
	6	22.0	C
	7	21.0	C
	8	22.0	C
	9	22.0	C
	10	23.0	C

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4726

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	22.0	C
	2	24.0	C
	3	22.0	C
	4	24.0	C
	5	23.0	C
	6	22.0	C
	7	21.0	C
	8	22.0	C
	9	22.0	C
	10	23.0	C

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4727

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	26.0	C
	2	28.0	D
	3	27.0	C
	4	29.0	D
	5	27.0	C
	6	27.0	C
	7	28.0	C
	8	27.0	C
	9	27.0	C
	10	27.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4728

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	24.0	C
	2	34.0	D
	3	24.0	C
	4	25.0	C
	5	26.0	C
	6	27.0	D
	7	27.0	D
	8	29.0	D
	9	28.0	D
	10	27.0	D

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4729

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	21.0	C
	2	21.0	C
	3	19.0	B
	4	20.0	B
	5	20.0	C
	6	20.0	B
	7	20.0	B
	8	20.0	C
	9	20.0	B
	10	20.0	C

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4730

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	21.0	C
	2	21.0	C
	3	19.0	B
	4	20.0	B
	5	20.0	C
	6	20.0	B
	7	20.0	B
	8	20.0	C
	9	20.0	B
	10	20.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4732

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	19.0	C
	2	19.0	C
	3	18.0	C
	4	18.0	C
	5	18.0	B
	6	19.0	C
	7	19.0	C
	8	19.0	C
	9	18.0	C
	10	18.0	C

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4733

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	28.0	D
	2	28.0	D
	3	27.0	D
	4	27.0	D
	5	27.0	D
	6	28.0	D
	7	26.0	D
	8	27.0	D
	9	26.0	C
	10	28.0	D

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4736

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	34.0	D
	2	31.0	D
	3	31.0	D
	4	32.0	D
	5	31.0	D
	6	32.0	D
	7	31.0	D
	8	33.0	D
	9	28.0	D
	10	30.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4737

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	27.0	C
	2	27.0	C
	3	26.0	C
	4	27.0	C
	5	26.0	C
	6	26.0	C
	7	26.0	C
	8	28.0	C
	9	25.0	C
	10	25.0	C

NWB on JAMES F BYRNES EXPY (Merge/Diverge Analysis)
Segment ID 4739

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	14.0	B
	2	16.0	B
	3	14.0	B
	4	15.0	B
	5	14.0	B
	6	15.0	B
	7	13.0	B
	8	14.0	B
	9	15.0	B
	10	14.0	B

NWB on EXIT 101B RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	19.0	C
	2	20.0	C
	3	21.0	C
	4	18.0	C
	5	18.0	B
	6	22.0	C
	7	18.0	C
	8	16.0	B
	9	17.0	B
	10	19.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on EXIT 101B RAMP TO US 176 (Diverge Analysis)
Segment ID 4742

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	16.0	B
	3	14.0	B
	4	16.0	B
	5	16.0	B
	6	14.0	B
	7	15.0	B
	8	16.0	B
	9	16.0	B
	10	16.0	B

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4745

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	23.0	C
	2	23.0	C
	3	20.0	C
	4	21.0	C
	5	22.0	C
	6	22.0	C
	7	20.0	C
	8	22.0	C
	9	21.0	C
	10	24.0	C

SEB on JAMES F BYRNES EXPY (Merge/Diverge Analysis)
Segment ID 4748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	25.0	C
	2	27.0	C
	3	28.0	C
	4	27.0	C
	5	27.0	C
	6	26.0	C
	7	27.0	C
	8	27.0	C
	9	25.0	C
	10	26.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4753

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	18.0	B
	3	13.0	B
	4	15.0	B
	5	16.0	B
	6	16.0	B
	7	14.0	B
	8	15.0	B
	9	14.0	B
	10	13.0	B

SEB on EXIT 101A RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4755

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	26.0	C
	2	25.0	C
	3	22.0	C
	4	24.0	C
	5	22.0	C
	6	24.0	C
	7	24.0	C
	8	22.0	C
	9	25.0	C
	10	23.0	C

SEB on EXIT 101A RAMP TO US 176 (Diverge Analysis)
Segment ID 4756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	21.0	C
	3	19.0	B
	4	20.0	C
	5	21.0	C
	6	20.0	B
	7	20.0	B
	8	20.0	C
	9	19.0	B
	10	20.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4760

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	18.0	B
	3	17.0	B
	4	16.0	B
	5	16.0	B
	6	18.0	B
	7	16.0	B
	8	16.0	B
	9	16.0	B
	10	16.0	B

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4761

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	18.0	B
	3	17.0	B
	4	16.0	B
	5	16.0	B
	6	18.0	B
	7	16.0	B
	8	16.0	B
	9	16.0	B
	10	16.0	B

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4762

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	22.0	C
	2	24.0	C
	3	21.0	C
	4	23.0	C
	5	22.0	C
	6	22.0	C
	7	22.0	C
	8	23.0	C
	9	22.0	C
	10	22.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4763

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	19.0	B
	3	17.0	B
	4	17.0	B
	5	16.0	B
	6	19.0	B
	7	16.0	B
	8	17.0	B
	9	16.0	B
	10	17.0	B

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	19.0	B
	3	17.0	B
	4	17.0	B
	5	16.0	B
	6	19.0	B
	7	16.0	B
	8	17.0	B
	9	16.0	B
	10	17.0	B

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4766

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	43.0	E
	2	39.0	E
	3	35.0	E
	4	42.0	E
	5	39.0	E
	6	35.0	E
	7	37.0	E
	8	42.0	E
	9	45.0	E
	10	44.0	E

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4767

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	37.0	E
	2	37.0	E
	3	35.0	E
	4	36.0	E
	5	36.0	E
	6	36.0	E
	7	35.0	E
	8	36.0	E
	9	35.0	E
	10	36.0	E

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4768

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	37.0	E
	2	37.0	E
	3	35.0	E
	4	36.0	E
	5	36.0	E
	6	36.0	E
	7	35.0	E
	8	36.0	E
	9	35.0	E
	10	36.0	E

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	42.0	E
	2	40.0	E
	3	37.0	E
	4	42.0	E
	5	40.0	E
	6	37.0	E
	7	39.0	E
	8	42.0	E
	9	43.0	E
	10	42.0	E

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4771

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	17.0	B
	2	20.0	C
	3	16.0	B
	4	19.0	C
	5	21.0	C
	6	22.0	C
	7	18.0	B
	8	18.0	C
	9	17.0	B
	10	18.0	C

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	13.0	B
	4	16.0	B
	5	17.0	B
	6	13.0	B
	7	17.0	B
	8	15.0	B
	9	16.0	B
	10	15.0	B

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4774

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	19.0	C
	2	22.0	C
	3	18.0	B
	4	20.0	C
	5	19.0	C
	6	20.0	C
	7	19.0	C
	8	19.0	C
	9	19.0	C
	10	19.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	26.0	D
	2	25.0	C
	3	25.0	C
	4	27.0	D
	5	22.0	C
	6	23.0	C
	7	25.0	C
	8	25.0	C
	9	26.0	D
	10	23.0	C

NWB on I 26 E (Basic Analysis)
Segment ID 4781

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	19.0	C
	2	21.0	C
	3	18.0	C
	4	20.0	C
	5	19.0	C
	6	19.0	C
	7	19.0	C
	8	19.0	C
	9	19.0	C
	10	19.0	C

NWB on I 26 E (Partial Basic Analysis)
Segment ID 4782

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	19.0	C
	2	21.0	C
	3	18.0	C
	4	20.0	C
	5	19.0	C
	6	19.0	C
	7	19.0	C
	8	19.0	C
	9	19.0	C
	10	19.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 E (Diverge Analysis)
Segment ID 4783

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	18.0	B
	3	16.0	B
	4	15.0	B
	5	17.0	B
	6	17.0	B
	7	17.0	B
	8	17.0	B
	9	18.0	B
	10	17.0	B

SEB on I 26 E (Merge Analysis)
Segment ID 4785

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	18.0	B
	2	20.0	C
	3	19.0	B
	4	19.0	B
	5	19.0	B
	6	19.0	B
	7	17.0	B
	8	19.0	B
	9	18.0	B
	10	17.0	B

SEB on I 26 E (Merge Analysis)
Segment ID 4786

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	18.0	B
	2	20.0	C
	3	19.0	B
	4	19.0	B
	5	19.0	B
	6	19.0	B
	7	17.0	B
	8	19.0	B
	9	18.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4787

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	23.0	C
	2	23.0	C
	3	23.0	C
	4	23.0	C
	5	23.0	C
	6	23.0	C
	7	23.0	C
	8	23.0	C
	9	23.0	C
	10	24.0	C

SEB on I 26 E (Diverge Analysis)
Segment ID 4788

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	B
	2	22.0	C
	3	20.0	C
	4	20.0	C
	5	21.0	C
	6	21.0	C
	7	19.0	B
	8	20.0	B
	9	19.0	B
	10	18.0	B

SEB on I 26 E (Diverge Analysis)
Segment ID 4789

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	B
	2	22.0	C
	3	20.0	C
	4	20.0	C
	5	21.0	C
	6	21.0	C
	7	19.0	B
	8	20.0	B
	9	19.0	B
	10	18.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4791

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	18.0	B
	3	14.0	B
	4	18.0	C
	5	15.0	B
	6	18.0	B
	7	15.0	B
	8	18.0	B
	9	15.0	B
	10	15.0	B

SEB on I 26 E (Basic Analysis)
Segment ID 4793

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	15.0	B
	3	17.0	B
	4	16.0	B
	5	18.0	B
	6	18.0	B
	7	15.0	B
	8	20.0	C
	9	17.0	B
	10	17.0	B

NWB on I 26 W (Merge Analysis)
Segment ID 4795

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	14.0	B
	2	16.0	B
	3	14.0	B
	4	14.0	B
	5	13.0	B
	6	13.0	B
	7	13.0	B
	8	12.0	B
	9	11.0	B
	10	12.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Partial Basic Analysis)
Segment ID 4796

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	14.0	B
	4	16.0	B
	5	16.0	B
	6	15.0	B
	7	15.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

NWB on I 26 W (Basic Analysis)
Segment ID 4797

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	14.0	B
	4	16.0	B
	5	16.0	B
	6	15.0	B
	7	15.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

EB on I 26 E (Partial Basic Analysis)
Segment ID 4799

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	12.0	B
	2	13.0	B
	3	12.0	B
	4	12.0	B
	5	13.0	B
	6	13.0	B
	7	12.0	B
	8	12.0	B
	9	12.0	B
	10	13.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Merge Analysis)
Segment ID 4800

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	15.0	B
	3	14.0	B
	4	15.0	B
	5	14.0	B
	6	15.0	B
	7	16.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4801

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	17.0	B
	4	17.0	B
	5	17.0	B
	6	17.0	B
	7	16.0	B
	8	17.0	B
	9	17.0	B
	10	17.0	B

SEB on I 26 E (Diverge Analysis)
Segment ID 4802

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	16.0	B
	3	15.0	B
	4	16.0	B
	5	14.0	B
	6	16.0	B
	7	16.0	B
	8	14.0	B
	9	16.0	B
	10	16.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4805

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	14.0	B
	4	17.0	B
	5	17.0	B
	6	17.0	B
	7	14.0	B
	8	14.0	B
	9	18.0	B
	10	16.0	B

WB on I 26 W (Partial Basic Analysis)
Segment ID 4807

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	14.0	B
	4	16.0	B
	5	15.0	B
	6	16.0	B
	7	15.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

WB on I 26 W (Diverge Analysis)
Segment ID 4808

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	14.0	B
	4	15.0	B
	5	16.0	B
	6	16.0	B
	7	13.0	B
	8	15.0	B
	9	16.0	B
	10	15.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Diverge Analysis)
Segment ID 4809

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	14.0	B
	4	15.0	B
	5	16.0	B
	6	16.0	B
	7	13.0	B
	8	15.0	B
	9	16.0	B
	10	15.0	B

EB on I 26 E (Basic Analysis)
Segment ID 8740

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	13.0	B
	2	16.0	B
	3	13.0	B
	4	16.0	B
	5	15.0	B
	6	14.0	B
	7	13.0	B
	8	15.0	B
	9	13.0	B
	10	14.0	B

EB on I 26 E (Diverge Analysis)
Segment ID 8741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	12.0	B
	2	12.0	B
	3	13.0	B
	4	11.0	B
	5	12.0	B
	6	13.0	B
	7	12.0	B
	8	12.0	B
	9	11.0	B
	10	12.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Merge Analysis)
Segment ID 8744

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	15.0	B
	3	14.0	B
	4	15.0	B
	5	14.0	B
	6	15.0	B
	7	16.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

WB on I 26 W (Basic Analysis)
Segment ID 8748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	18.0	C
	2	18.0	B
	3	16.0	B
	4	15.0	B
	5	15.0	B
	6	17.0	B
	7	17.0	B
	8	16.0	B
	9	17.0	B
	10	17.0	B

WB on I 26 W (Merge Analysis)
Segment ID 8756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	14.0	B
	2	16.0	B
	3	13.0	B
	4	14.0	B
	5	13.0	B
	6	14.0	B
	7	14.0	B
	8	12.0	B
	9	13.0	B
	10	13.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Partial Basic Analysis)
Segment ID 8757

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	17.0	B
	3	14.0	B
	4	16.0	B
	5	15.0	B
	6	16.0	B
	7	15.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

EB on I 26 E (Basic Analysis)
Segment ID 8764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	12.0	B
	2	12.0	B
	3	11.0	A
	4	13.0	B
	5	13.0	B
	6	12.0	B
	7	11.0	B
	8	13.0	B
	9	11.0	B
	10	12.0	B

EB on I 26 E (Diverge Analysis)
Segment ID 8766

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	B
	2	12.0	B
	3	12.0	B
	4	12.0	B
	5	11.0	B
	6	13.0	B
	7	13.0	B
	8	12.0	B
	9	12.0	B
	10	12.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Merge Analysis)
Segment ID 8769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	B
	2	12.0	B
	3	10.0	B
	4	10.0	B
	5	11.0	B
	6	11.0	B
	7	11.0	B
	8	11.0	B
	9	11.0	B
	10	10.0	B

EB on I 26 E (Partial Basic Analysis)
Segment ID 8770

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	13.0	B
	2	14.0	B
	3	14.0	B
	4	14.0	B
	5	14.0	B
	6	14.0	B
	7	14.0	B
	8	14.0	B
	9	13.0	B
	10	14.0	B

NWB on I 26 W (Merge Analysis)
Segment ID 8773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	11.0	B
	2	10.0	B
	3	9.0	A
	4	11.0	B
	5	9.0	A
	6	12.0	B
	7	10.0	A
	8	12.0	B
	9	11.0	B
	10	9.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Basic Analysis)
Segment ID 8775

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	11.0	A
	2	15.0	B
	3	12.0	B
	4	14.0	B
	5	13.0	B
	6	13.0	B
	7	13.0	B
	8	12.0	B
	9	12.0	B
	10	13.0	B

WB on I 26 W (Diverge Analysis)
Segment ID 8776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	16.0	B
	3	15.0	B
	4	15.0	B
	5	14.0	B
	6	13.0	B
	7	14.0	B
	8	12.0	B
	9	13.0	B
	10	13.0	B

WB on I 26 W (Partial Basic Analysis)
Segment ID 8777

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	17.0	B
	3	14.0	B
	4	16.0	B
	5	15.0	B
	6	16.0	B
	7	15.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Partial Basic Analysis)
Segment ID 8778

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	13.0	B
	2	14.0	B
	3	14.0	B
	4	14.0	B
	5	14.0	B
	6	14.0	B
	7	14.0	B
	8	14.0	B
	9	13.0	B
	10	14.0	B

NWB on I 26 W (Partial Basic Analysis)
Segment ID 8779

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	14.0	B
	2	16.0	B
	3	13.0	B
	4	14.0	B
	5	14.0	B
	6	15.0	B
	7	14.0	B
	8	13.0	B
	9	14.0	B
	10	14.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4718

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	26.0	C
	2	27.0	C
	3	27.0	C
	4	25.0	C
	5	28.0	C
	6	25.0	C
	7	28.0	C
	8	28.0	D
	9	28.0	C
	10	28.0	D

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4719

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	26.0	C
	2	27.0	C
	3	27.0	C
	4	25.0	C
	5	28.0	C
	6	25.0	C
	7	28.0	C
	8	28.0	D
	9	28.0	C
	10	28.0	D

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4720

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	25.0	C
	2	26.0	C
	3	26.0	C
	4	26.0	D
	5	24.0	C
	6	26.0	C
	7	26.0	D
	8	26.0	C
	9	25.0	C
	10	25.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4725

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	95.0	F
	2	96.0	F
	3	93.0	F
	4	99.0	F
	5	94.0	F
	6	97.0	F
	7	94.0	F
	8	97.0	F
	9	94.0	F
	10	96.0	F

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4726

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	95.0	F
	2	96.0	F
	3	93.0	F
	4	99.0	F
	5	94.0	F
	6	97.0	F
	7	94.0	F
	8	97.0	F
	9	94.0	F
	10	96.0	F

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4727

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	74.0	F
	2	73.0	F
	3	74.0	F
	4	77.0	F
	5	75.0	F
	6	78.0	F
	7	74.0	F
	8	80.0	F
	9	76.0	F
	10	76.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4728

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	52.0	F
	2	53.0	F
	3	51.0	F
	4	53.0	F
	5	51.0	F
	6	56.0	F
	7	58.0	F
	8	65.0	F
	9	51.0	F
	10	57.0	F

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4729

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	41.0	E
	2	39.0	E
	3	38.0	E
	4	37.0	E
	5	38.0	E
	6	38.0	E
	7	38.0	E
	8	51.0	E
	9	39.0	E
	10	40.0	E

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4730

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	41.0	E
	2	39.0	E
	3	38.0	E
	4	37.0	E
	5	38.0	E
	6	38.0	E
	7	38.0	E
	8	51.0	E
	9	39.0	E
	10	40.0	E

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4732

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	49.0	F
	2	37.0	E
	3	39.0	E
	4	37.0	E
	5	38.0	E
	6	35.0	D
	7	36.0	E
	8	59.0	F
	9	38.0	E
	10	38.0	E

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4733

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	21.0	C
	3	21.0	C
	4	22.0	C
	5	21.0	C
	6	20.0	C
	7	21.0	C
	8	21.0	C
	9	20.0	C
	10	21.0	C

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4736

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	22.0	C
	3	25.0	C
	4	20.0	C
	5	23.0	C
	6	22.0	C
	7	23.0	C
	8	23.0	C
	9	25.0	C
	10	22.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4737

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	B
	2	19.0	B
	3	17.0	B
	4	21.0	C
	5	20.0	B
	6	19.0	B
	7	21.0	C
	8	20.0	B
	9	18.0	B
	10	19.0	B

NWB on JAMES F BYRNES EXPY (Merge/Diverge Analysis)
Segment ID 4739

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	48.0	E
	2	29.0	D
	3	37.0	E
	4	28.0	D
	5	38.0	E
	6	31.0	D
	7	28.0	C
	8	53.0	E
	9	30.0	D
	10	29.0	D

NWB on EXIT 101B RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	76.0	F
	2	36.0	E
	3	64.0	F
	4	36.0	E
	5	72.0	F
	6	39.0	E
	7	40.0	E
	8	70.0	F
	9	47.0	F
	10	49.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on EXIT 101B RAMP TO US 176 (Diverge Analysis)
Segment ID 4742

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	80.0	E
	2	32.0	D
	3	72.0	E
	4	34.0	D
	5	86.0	E
	6	30.0	D
	7	35.0	D
	8	62.0	E
	9	62.0	E
	10	65.0	E

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4745

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	16.0	B
	2	18.0	B
	3	18.0	C
	4	18.0	B
	5	15.0	B
	6	16.0	B
	7	17.0	B
	8	17.0	B
	9	17.0	B
	10	16.0	B

SEB on JAMES F BYRNES EXPY (Merge/Diverge Analysis)
Segment ID 4748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	18.0	B
	2	19.0	B
	3	19.0	B
	4	17.0	B
	5	17.0	B
	6	17.0	B
	7	17.0	B
	8	20.0	B
	9	18.0	B
	10	19.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4753

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	145.0	F
	2	76.0	F
	3	132.0	F
	4	97.0	F
	5	141.0	F
	6	80.0	F
	7	116.0	F
	8	103.0	F
	9	118.0	F
	10	120.0	F

SEB on EXIT 101A RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4755

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	16.0	B
	2	16.0	B
	3	16.0	B
	4	19.0	C
	5	19.0	C
	6	16.0	B
	7	21.0	C
	8	18.0	C
	9	15.0	B
	10	17.0	B

SEB on EXIT 101A RAMP TO US 176 (Diverge Analysis)
Segment ID 4756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	15.0	B
	2	14.0	B
	3	13.0	B
	4	16.0	B
	5	16.0	B
	6	14.0	B
	7	17.0	B
	8	15.0	B
	9	14.0	B
	10	16.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4760

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	83.0	F
	2	81.0	F
	3	79.0	F
	4	76.0	F
	5	79.0	F
	6	87.0	F
	7	84.0	F
	8	102.0	F
	9	81.0	F
	10	80.0	F

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4761

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	83.0	F
	2	81.0	F
	3	79.0	F
	4	76.0	F
	5	79.0	F
	6	87.0	F
	7	84.0	F
	8	102.0	F
	9	81.0	F
	10	80.0	F

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4762

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	48.0	F
	2	47.0	F
	3	52.0	F
	4	45.0	E
	5	48.0	F
	6	55.0	F
	7	49.0	F
	8	100.0	F
	9	47.0	F
	10	45.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4763

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	73.0	E
	2	70.0	E
	3	70.0	E
	4	65.0	E
	5	68.0	E
	6	80.0	E
	7	75.0	E
	8	95.0	E
	9	72.0	E
	10	71.0	E

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	73.0	E
	2	70.0	E
	3	70.0	E
	4	65.0	E
	5	68.0	E
	6	80.0	E
	7	75.0	E
	8	95.0	E
	9	72.0	E
	10	71.0	E

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4766

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	18.0	B
	2	22.0	C
	3	20.0	B
	4	23.0	C
	5	21.0	C
	6	20.0	B
	7	23.0	C
	8	22.0	C
	9	20.0	B
	10	21.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4767

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	26.0	C
	3	26.0	C
	4	26.0	D
	5	25.0	C
	6	25.0	C
	7	26.0	D
	8	26.0	D
	9	25.0	C
	10	25.0	C

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4768

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	26.0	C
	3	26.0	C
	4	26.0	D
	5	25.0	C
	6	25.0	C
	7	26.0	D
	8	26.0	D
	9	25.0	C
	10	25.0	C

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	24.0	C
	3	22.0	C
	4	24.0	C
	5	23.0	C
	6	22.0	C
	7	24.0	C
	8	24.0	C
	9	23.0	C
	10	23.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4771

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	31.0	D
	2	33.0	D
	3	28.0	D
	4	31.0	D
	5	29.0	D
	6	32.0	D
	7	30.0	D
	8	30.0	D
	9	32.0	D
	10	31.0	D

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	24.0	C
	3	22.0	C
	4	24.0	C
	5	22.0	C
	6	22.0	C
	7	25.0	C
	8	19.0	B
	9	22.0	C
	10	23.0	C

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4774

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	29.0	D
	2	29.0	D
	3	27.0	D
	4	29.0	D
	5	28.0	D
	6	27.0	D
	7	29.0	D
	8	24.0	C
	9	29.0	D
	10	28.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	16.0	B
	2	20.0	C
	3	21.0	C
	4	20.0	C
	5	21.0	C
	6	20.0	C
	7	19.0	C
	8	20.0	C
	9	17.0	B
	10	20.0	C

NWB on I 26 E (Basic Analysis)
Segment ID 4781

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	30.0	D
	2	30.0	D
	3	28.0	D
	4	30.0	D
	5	29.0	D
	6	29.0	D
	7	30.0	D
	8	25.0	C
	9	29.0	D
	10	29.0	D

NWB on I 26 E (Partial Basic Analysis)
Segment ID 4782

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	30.0	D
	2	30.0	D
	3	28.0	D
	4	30.0	D
	5	29.0	D
	6	29.0	D
	7	30.0	D
	8	25.0	C
	9	29.0	D
	10	29.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 E (Diverge Analysis)
Segment ID 4783

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	26.0	C
	2	25.0	C
	3	23.0	C
	4	24.0	C
	5	23.0	C
	6	24.0	C
	7	24.0	C
	8	20.0	C
	9	25.0	C
	10	25.0	C

SEB on I 26 E (Merge Analysis)
Segment ID 4785

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	18.0	B
	2	19.0	B
	3	18.0	B
	4	17.0	B
	5	17.0	B
	6	18.0	B
	7	18.0	B
	8	18.0	B
	9	20.0	B
	10	18.0	B

SEB on I 26 E (Merge Analysis)
Segment ID 4786

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	18.0	B
	2	19.0	B
	3	18.0	B
	4	17.0	B
	5	17.0	B
	6	18.0	B
	7	18.0	B
	8	18.0	B
	9	20.0	B
	10	18.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4787

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	23.0	C
	2	25.0	C
	3	24.0	C
	4	24.0	C
	5	24.0	C
	6	23.0	C
	7	24.0	C
	8	24.0	C
	9	24.0	C
	10	23.0	C

SEB on I 26 E (Diverge Analysis)
Segment ID 4788

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	21.0	C
	3	20.0	C
	4	19.0	B
	5	19.0	B
	6	20.0	B
	7	20.0	C
	8	20.0	C
	9	21.0	C
	10	20.0	B

SEB on I 26 E (Diverge Analysis)
Segment ID 4789

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	21.0	C
	3	20.0	C
	4	19.0	B
	5	19.0	B
	6	20.0	B
	7	20.0	C
	8	20.0	C
	9	21.0	C
	10	20.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4791

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	25.0	C
	3	24.0	C
	4	25.0	C
	5	25.0	C
	6	22.0	C
	7	24.0	C
	8	19.0	C
	9	24.0	C
	10	23.0	C

SEB on I 26 E (Basic Analysis)
Segment ID 4793

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	C
	2	19.0	C
	3	19.0	C
	4	21.0	C
	5	21.0	C
	6	18.0	C
	7	20.0	C
	8	20.0	C
	9	17.0	B
	10	18.0	C

NWB on I 26 W (Merge Analysis)
Segment ID 4795

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	23.0	C
	3	20.0	B
	4	24.0	C
	5	22.0	C
	6	22.0	C
	7	22.0	C
	8	18.0	B
	9	22.0	C
	10	22.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Partial Basic Analysis)
Segment ID 4796

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	25.0	C
	2	26.0	C
	3	24.0	C
	4	25.0	C
	5	24.0	C
	6	24.0	C
	7	25.0	C
	8	21.0	C
	9	25.0	C
	10	25.0	C

NWB on I 26 W (Basic Analysis)
Segment ID 4797

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	25.0	C
	2	26.0	C
	3	24.0	C
	4	25.0	C
	5	24.0	C
	6	24.0	C
	7	25.0	C
	8	21.0	C
	9	25.0	C
	10	25.0	C

EB on I 26 E (Partial Basic Analysis)
Segment ID 4799

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	18.0	B
	2	19.0	C
	3	19.0	C
	4	18.0	B
	5	19.0	C
	6	19.0	C
	7	19.0	C
	8	19.0	C
	9	19.0	C
	10	19.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Merge Analysis)
Segment ID 4800

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	19.0	B
	3	17.0	B
	4	17.0	B
	5	18.0	B
	6	16.0	B
	7	17.0	B
	8	16.0	B
	9	17.0	B
	10	17.0	B

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4801

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	20.0	C
	2	21.0	C
	3	20.0	C
	4	21.0	C
	5	20.0	C
	6	20.0	C
	7	21.0	C
	8	20.0	C
	9	21.0	C
	10	20.0	C

SEB on I 26 E (Diverge Analysis)
Segment ID 4802

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	19.0	B
	3	20.0	B
	4	20.0	B
	5	19.0	B
	6	18.0	B
	7	18.0	B
	8	18.0	B
	9	18.0	B
	10	19.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4805

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	27.0	D
	2	27.0	D
	3	26.0	C
	4	25.0	C
	5	24.0	C
	6	25.0	C
	7	24.0	C
	8	23.0	C
	9	24.0	C
	10	26.0	C

WB on I 26 W (Partial Basic Analysis)
Segment ID 4807

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	26.0	D
	2	26.0	D
	3	24.0	C
	4	26.0	C
	5	25.0	C
	6	25.0	C
	7	25.0	C
	8	21.0	C
	9	25.0	C
	10	25.0	C

WB on I 26 W (Diverge Analysis)
Segment ID 4808

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	26.0	C
	2	26.0	C
	3	23.0	C
	4	27.0	C
	5	25.0	C
	6	25.0	C
	7	26.0	C
	8	22.0	C
	9	25.0	C
	10	26.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Diverge Analysis)
Segment ID 4809

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	26.0	C
	2	26.0	C
	3	23.0	C
	4	27.0	C
	5	25.0	C
	6	25.0	C
	7	26.0	C
	8	22.0	C
	9	25.0	C
	10	26.0	C

EB on I 26 E (Basic Analysis)
Segment ID 8740

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	20.0	C
	3	20.0	C
	4	22.0	C
	5	21.0	C
	6	18.0	C
	7	25.0	C
	8	21.0	C
	9	22.0	C
	10	20.0	C

EB on I 26 E (Diverge Analysis)
Segment ID 8741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	16.0	B
	2	17.0	B
	3	17.0	B
	4	17.0	B
	5	17.0	B
	6	18.0	B
	7	17.0	B
	8	18.0	B
	9	17.0	B
	10	19.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Merge Analysis)
Segment ID 8744

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	19.0	B
	3	17.0	B
	4	17.0	B
	5	18.0	B
	6	16.0	B
	7	17.0	B
	8	16.0	B
	9	17.0	B
	10	17.0	B

WB on I 26 W (Basic Analysis)
Segment ID 8748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	26.0	D
	2	25.0	C
	3	27.0	D
	4	26.0	D
	5	26.0	C
	6	24.0	C
	7	25.0	C
	8	23.0	C
	9	24.0	C
	10	24.0	C

WB on I 26 W (Merge Analysis)
Segment ID 8756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	23.0	C
	2	23.0	C
	3	20.0	B
	4	21.0	C
	5	21.0	C
	6	21.0	C
	7	22.0	C
	8	18.0	B
	9	22.0	C
	10	21.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Partial Basic Analysis)
Segment ID 8757

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	24.0	C
	3	23.0	C
	4	25.0	C
	5	24.0	C
	6	23.0	C
	7	24.0	C
	8	20.0	C
	9	24.0	C
	10	24.0	C

EB on I 26 E (Basic Analysis)
Segment ID 8764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	18.0	C
	2	19.0	C
	3	19.0	C
	4	18.0	C
	5	19.0	C
	6	20.0	C
	7	19.0	C
	8	18.0	C
	9	18.0	B
	10	17.0	B

EB on I 26 E (Diverge Analysis)
Segment ID 8766

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	18.0	B
	3	17.0	B
	4	17.0	B
	5	17.0	B
	6	16.0	B
	7	19.0	B
	8	17.0	B
	9	20.0	B
	10	19.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Merge Analysis)
Segment ID 8769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	14.0	B
	2	15.0	B
	3	15.0	B
	4	16.0	B
	5	15.0	B
	6	16.0	B
	7	15.0	B
	8	17.0	B
	9	15.0	B
	10	16.0	B

EB on I 26 E (Partial Basic Analysis)
Segment ID 8770

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	C
	2	20.0	C
	3	19.0	C
	4	20.0	C
	5	20.0	C
	6	20.0	C
	7	21.0	C
	8	20.0	C
	9	20.0	C
	10	20.0	C

NWB on I 26 W (Merge Analysis)
Segment ID 8773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	15.0	B
	3	16.0	B
	4	15.0	B
	5	15.0	B
	6	14.0	B
	7	16.0	B
	8	13.0	B
	9	17.0	B
	10	16.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Basic Analysis)
Segment ID 8775

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	19.0	C
	3	22.0	C
	4	23.0	C
	5	23.0	C
	6	22.0	C
	7	22.0	C
	8	19.0	C
	9	21.0	C
	10	22.0	C

WB on I 26 W (Diverge Analysis)
Segment ID 8776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	22.0	C
	2	23.0	C
	3	20.0	C
	4	21.0	C
	5	20.0	B
	6	21.0	C
	7	22.0	C
	8	18.0	B
	9	22.0	C
	10	21.0	C

WB on I 26 W (Partial Basic Analysis)
Segment ID 8777

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	24.0	C
	3	23.0	C
	4	25.0	C
	5	24.0	C
	6	23.0	C
	7	24.0	C
	8	20.0	C
	9	24.0	C
	10	24.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Partial Basic Analysis)
Segment ID 8778

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	C
	2	20.0	C
	3	19.0	C
	4	20.0	C
	5	20.0	C
	6	20.0	C
	7	21.0	C
	8	20.0	C
	9	20.0	C
	10	20.0	C

NWB on I 26 W (Partial Basic Analysis)
Segment ID 8779

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	23.0	C
	2	22.0	C
	3	21.0	C
	4	22.0	C
	5	22.0	C
	6	22.0	C
	7	22.0	C
	8	18.0	B
	9	21.0	C
	10	22.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4718

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	41.0	E
	2	38.0	E
	3	39.0	E
	4	43.0	E
	5	36.0	E
	6	40.0	E
	7	42.0	E
	8	40.0	E
	9	36.0	E
	10	40.0	E

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4719

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	41.0	E
	2	38.0	E
	3	39.0	E
	4	43.0	E
	5	36.0	E
	6	40.0	E
	7	42.0	E
	8	40.0	E
	9	36.0	E
	10	40.0	E

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4720

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	36.0	E
	2	34.0	D
	3	34.0	D
	4	35.0	E
	5	34.0	D
	6	34.0	D
	7	35.0	D
	8	36.0	E
	9	33.0	D
	10	34.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4725

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	39.0	E
	2	44.0	E
	3	36.0	E
	4	36.0	E
	5	40.0	E
	6	39.0	E
	7	36.0	E
	8	35.0	E
	9	39.0	E
	10	38.0	E

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4726

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	39.0	E
	2	44.0	E
	3	36.0	E
	4	36.0	E
	5	40.0	E
	6	39.0	E
	7	36.0	E
	8	35.0	E
	9	39.0	E
	10	38.0	E

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4727

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	47.0	E
	2	62.0	E
	3	46.0	E
	4	41.0	E
	5	61.0	E
	6	45.0	E
	7	47.0	E
	8	45.0	E
	9	52.0	E
	10	47.0	E

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4728

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	41.0	E
	2	65.0	F
	3	40.0	E
	4	42.0	E
	5	58.0	F
	6	40.0	E
	7	45.0	F
	8	42.0	E
	9	57.0	F
	10	41.0	E

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4729

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	39.0	E
	2	64.0	E
	3	32.0	D
	4	28.0	D
	5	48.0	E
	6	33.0	D
	7	42.0	E
	8	32.0	D
	9	54.0	E
	10	37.0	E

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4730

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	39.0	E
	2	64.0	E
	3	32.0	D
	4	28.0	D
	5	48.0	E
	6	33.0	D
	7	42.0	E
	8	32.0	D
	9	54.0	E
	10	37.0	E

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4732

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	27.0	D
	2	29.0	D
	3	28.0	D
	4	24.0	C
	5	28.0	D
	6	27.0	D
	7	27.0	D
	8	25.0	C
	9	28.0	D
	10	27.0	D

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4733

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	28.0	D
	2	29.0	D
	3	26.0	D
	4	28.0	D
	5	27.0	D
	6	26.0	D
	7	28.0	D
	8	27.0	D
	9	28.0	D
	10	28.0	D

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4736

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	32.0	D
	2	34.0	D
	3	30.0	D
	4	32.0	D
	5	28.0	D
	6	31.0	D
	7	31.0	D
	8	32.0	D
	9	32.0	D
	10	31.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4737

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	28.0	D
	2	27.0	C
	3	25.0	C
	4	26.0	C
	5	26.0	C
	6	25.0	C
	7	27.0	C
	8	28.0	D
	9	26.0	C
	10	26.0	C

NWB on JAMES F BYRNES EXPY (Merge/Diverge Analysis)
Segment ID 4739

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	22.0	C
	2	22.0	C
	3	22.0	C
	4	20.0	C
	5	21.0	C
	6	20.0	C
	7	21.0	C
	8	21.0	C
	9	22.0	C
	10	23.0	C

NWB on EXIT 101B RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	25.0	C
	2	25.0	C
	3	24.0	C
	4	28.0	D
	5	23.0	C
	6	29.0	D
	7	24.0	C
	8	28.0	D
	9	25.0	C
	10	27.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on EXIT 101B RAMP TO US 176 (Diverge Analysis)
Segment ID 4742

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	22.0	C
	2	20.0	B
	3	21.0	C
	4	21.0	C
	5	21.0	C
	6	21.0	C
	7	22.0	C
	8	22.0	C
	9	21.0	C
	10	22.0	C

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4745

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	23.0	C
	3	19.0	C
	4	21.0	C
	5	22.0	C
	6	18.0	C
	7	21.0	C
	8	22.0	C
	9	23.0	C
	10	22.0	C

SEB on JAMES F BYRNES EXPY (Merge/Diverge Analysis)
Segment ID 4748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	28.0	D
	2	28.0	C
	3	27.0	C
	4	30.0	D
	5	26.0	C
	6	26.0	C
	7	29.0	D
	8	27.0	C
	9	29.0	D
	10	28.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4753

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	18.0	C
	2	21.0	C
	3	19.0	C
	4	19.0	C
	5	20.0	C
	6	20.0	C
	7	20.0	C
	8	22.0	C
	9	20.0	C
	10	21.0	C

SEB on EXIT 101A RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4755

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	24.0	C
	2	22.0	C
	3	20.0	C
	4	23.0	C
	5	22.0	C
	6	21.0	C
	7	23.0	C
	8	22.0	C
	9	21.0	C
	10	20.0	C

SEB on EXIT 101A RAMP TO US 176 (Diverge Analysis)
Segment ID 4756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	20.0	B
	3	17.0	B
	4	17.0	B
	5	20.0	B
	6	18.0	B
	7	19.0	B
	8	19.0	B
	9	19.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4760

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	25.0	C
	2	23.0	C
	3	26.0	C
	4	25.0	C
	5	26.0	C
	6	25.0	C
	7	27.0	C
	8	27.0	C
	9	27.0	C
	10	25.0	C

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4761

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	25.0	C
	2	23.0	C
	3	26.0	C
	4	25.0	C
	5	26.0	C
	6	25.0	C
	7	27.0	C
	8	27.0	C
	9	27.0	C
	10	25.0	C

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4762

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	31.0	D
	2	30.0	D
	3	31.0	D
	4	31.0	D
	5	32.0	D
	6	32.0	D
	7	31.0	D
	8	32.0	D
	9	31.0	D
	10	32.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4763

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	24.0	C
	2	24.0	C
	3	27.0	C
	4	24.0	C
	5	26.0	C
	6	25.0	C
	7	27.0	C
	8	27.0	C
	9	28.0	C
	10	26.0	C

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	24.0	C
	2	24.0	C
	3	27.0	C
	4	24.0	C
	5	26.0	C
	6	25.0	C
	7	27.0	C
	8	27.0	C
	9	28.0	C
	10	26.0	C

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4766

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	33.0	D
	2	35.0	E
	3	29.0	D
	4	27.0	C
	5	26.0	C
	6	26.0	C
	7	29.0	D
	8	48.0	E
	9	37.0	E
	10	29.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4767

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	33.0	D
	2	34.0	D
	3	29.0	D
	4	32.0	D
	5	31.0	D
	6	29.0	D
	7	33.0	D
	8	33.0	D
	9	35.0	E
	10	32.0	D

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4768

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	33.0	D
	2	34.0	D
	3	29.0	D
	4	32.0	D
	5	31.0	D
	6	29.0	D
	7	33.0	D
	8	33.0	D
	9	35.0	E
	10	32.0	D

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	35.0	D
	2	37.0	E
	3	31.0	D
	4	31.0	D
	5	27.0	C
	6	28.0	D
	7	31.0	D
	8	43.0	E
	9	38.0	E
	10	32.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4771

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	25.0	C
	2	25.0	C
	3	23.0	C
	4	23.0	C
	5	27.0	D
	6	23.0	C
	7	27.0	D
	8	26.0	C
	9	28.0	D
	10	27.0	D

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	37.0	E
	2	30.0	D
	3	20.0	C
	4	29.0	D
	5	21.0	C
	6	20.0	C
	7	18.0	B
	8	31.0	D
	9	25.0	C
	10	25.0	C

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4774

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	85.0	F
	2	49.0	F
	3	25.0	C
	4	31.0	D
	5	25.0	C
	6	25.0	C
	7	24.0	C
	8	51.0	F
	9	31.0	D
	10	33.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	23.0	C
	3	21.0	C
	4	22.0	C
	5	17.0	B
	6	21.0	C
	7	24.0	C
	8	44.0	E
	9	24.0	C
	10	22.0	C

NWB on I 26 E (Basic Analysis)
Segment ID 4781

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	180.0	F
	2	177.0	F
	3	125.0	F
	4	156.0	F
	5	151.0	F
	6	149.0	F
	7	109.0	F
	8	177.0	F
	9	134.0	F
	10	130.0	F

NWB on I 26 E (Partial Basic Analysis)
Segment ID 4782

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	180.0	F
	2	177.0	F
	3	125.0	F
	4	156.0	F
	5	151.0	F
	6	149.0	F
	7	109.0	F
	8	177.0	F
	9	134.0	F
	10	130.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 E (Diverge Analysis)
Segment ID 4783

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	159.0	F
	2	167.0	F
	3	137.0	F
	4	155.0	F
	5	132.0	F
	6	140.0	F
	7	142.0	F
	8	155.0	F
	9	148.0	F
	10	149.0	F

SEB on I 26 E (Merge Analysis)
Segment ID 4785

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	22.0	C
	2	23.0	C
	3	19.0	B
	4	21.0	C
	5	17.0	B
	6	19.0	B
	7	17.0	B
	8	22.0	C
	9	17.0	B
	10	20.0	B

SEB on I 26 E (Merge Analysis)
Segment ID 4786

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	22.0	C
	2	23.0	C
	3	19.0	B
	4	21.0	C
	5	17.0	B
	6	19.0	B
	7	17.0	B
	8	22.0	C
	9	17.0	B
	10	20.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4787

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	21.0	C
	2	24.0	C
	3	19.0	C
	4	22.0	C
	5	18.0	C
	6	21.0	C
	7	21.0	C
	8	23.0	C
	9	23.0	C
	10	21.0	C

SEB on I 26 E (Diverge Analysis)
Segment ID 4788

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	35.0	E
	2	36.0	E
	3	30.0	D
	4	30.0	D
	5	24.0	C
	6	31.0	D
	7	21.0	C
	8	39.0	E
	9	20.0	C
	10	33.0	D

SEB on I 26 E (Diverge Analysis)
Segment ID 4789

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	35.0	E
	2	36.0	E
	3	30.0	D
	4	30.0	D
	5	24.0	C
	6	31.0	D
	7	21.0	C
	8	39.0	E
	9	20.0	C
	10	33.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4791

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	17.0	B
	2	15.0	B
	3	21.0	C
	4	16.0	B
	5	20.0	C
	6	20.0	C
	7	18.0	B
	8	16.0	B
	9	17.0	B
	10	18.0	C

SEB on I 26 E (Basic Analysis)
Segment ID 4793

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	18.0	B
	2	18.0	C
	3	19.0	C
	4	19.0	C
	5	19.0	C
	6	18.0	C
	7	18.0	C
	8	18.0	B
	9	20.0	C
	10	18.0	C

NWB on I 26 W (Merge Analysis)
Segment ID 4795

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	12.0	B
	3	12.0	B
	4	13.0	B
	5	13.0	B
	6	13.0	B
	7	12.0	B
	8	13.0	B
	9	11.0	B
	10	13.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Partial Basic Analysis)
Segment ID 4796

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	12.0	B
	2	12.0	B
	3	15.0	B
	4	13.0	B
	5	14.0	B
	6	15.0	B
	7	14.0	B
	8	13.0	B
	9	12.0	B
	10	13.0	B

NWB on I 26 W (Basic Analysis)
Segment ID 4797

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	12.0	B
	2	12.0	B
	3	15.0	B
	4	13.0	B
	5	14.0	B
	6	15.0	B
	7	14.0	B
	8	13.0	B
	9	12.0	B
	10	13.0	B

EB on I 26 E (Partial Basic Analysis)
Segment ID 4799

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	17.0	B
	2	18.0	C
	3	18.0	B
	4	17.0	B
	5	17.0	B
	6	18.0	C
	7	18.0	B
	8	18.0	B
	9	17.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Merge Analysis)
Segment ID 4800

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	58.0	E
	2	61.0	E
	3	60.0	E
	4	60.0	E
	5	62.0	E
	6	64.0	E
	7	64.0	E
	8	59.0	E
	9	61.0	E
	10	60.0	E

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4801

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	113.0	F
	2	97.0	F
	3	97.0	F
	4	108.0	F
	5	110.0	F
	6	110.0	F
	7	109.0	F
	8	111.0	F
	9	87.0	F
	10	104.0	F

SEB on I 26 E (Diverge Analysis)
Segment ID 4802

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	116.0	F
	2	119.0	F
	3	113.0	F
	4	122.0	F
	5	122.0	F
	6	122.0	F
	7	124.0	F
	8	118.0	F
	9	113.0	F
	10	119.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4805

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	11.0	A
	2	13.0	B
	3	19.0	C
	4	11.0	B
	5	16.0	B
	6	15.0	B
	7	12.0	B
	8	13.0	B
	9	13.0	B
	10	14.0	B

WB on I 26 W (Partial Basic Analysis)
Segment ID 4807

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	12.0	B
	2	12.0	B
	3	15.0	B
	4	13.0	B
	5	15.0	B
	6	16.0	B
	7	15.0	B
	8	13.0	B
	9	12.0	B
	10	14.0	B

WB on I 26 W (Diverge Analysis)
Segment ID 4808

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	12.0	B
	2	13.0	B
	3	16.0	B
	4	14.0	B
	5	14.0	B
	6	16.0	B
	7	14.0	B
	8	12.0	B
	9	13.0	B
	10	12.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Diverge Analysis)
Segment ID 4809

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	12.0	B
	2	13.0	B
	3	16.0	B
	4	14.0	B
	5	14.0	B
	6	16.0	B
	7	14.0	B
	8	12.0	B
	9	13.0	B
	10	12.0	B

EB on I 26 E (Basic Analysis)
Segment ID 8740

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	20.0	C
	3	21.0	C
	4	24.0	C
	5	21.0	C
	6	22.0	C
	7	21.0	C
	8	23.0	C
	9	20.0	C
	10	23.0	C

EB on I 26 E (Diverge Analysis)
Segment ID 8741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	19.0	B
	2	19.0	B
	3	19.0	B
	4	17.0	B
	5	17.0	B
	6	18.0	B
	7	17.0	B
	8	18.0	B
	9	18.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Merge Analysis)
Segment ID 8744

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	58.0	E
	2	61.0	E
	3	60.0	E
	4	60.0	E
	5	62.0	E
	6	64.0	E
	7	64.0	E
	8	59.0	E
	9	61.0	E
	10	60.0	E

WB on I 26 W (Basic Analysis)
Segment ID 8748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	13.0	B
	2	8.0	A
	3	13.0	B
	4	11.0	A
	5	12.0	B
	6	11.0	B
	7	13.0	B
	8	11.0	A
	9	11.0	B
	10	12.0	B

WB on I 26 W (Merge Analysis)
Segment ID 8756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	9.0	A
	2	9.0	A
	3	10.0	B
	4	11.0	B
	5	12.0	B
	6	10.0	A
	7	11.0	B
	8	9.0	A
	9	9.0	A
	10	9.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Partial Basic Analysis)
Segment ID 8757

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	10.0	A
	3	12.0	B
	4	11.0	B
	5	12.0	B
	6	12.0	B
	7	11.0	A
	8	10.0	A
	9	10.0	A
	10	11.0	B

EB on I 26 E (Basic Analysis)
Segment ID 8764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	17.0	B
	2	18.0	C
	3	18.0	B
	4	17.0	B
	5	18.0	C
	6	19.0	C
	7	18.0	B
	8	19.0	C
	9	17.0	B
	10	17.0	B

EB on I 26 E (Diverge Analysis)
Segment ID 8766

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	17.0	B
	2	16.0	B
	3	17.0	B
	4	17.0	B
	5	16.0	B
	6	16.0	B
	7	17.0	B
	8	15.0	B
	9	17.0	B
	10	18.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Merge Analysis)
Segment ID 8769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	16.0	B
	3	16.0	B
	4	15.0	B
	5	16.0	B
	6	15.0	B
	7	16.0	B
	8	16.0	B
	9	16.0	B
	10	16.0	B

EB on I 26 E (Partial Basic Analysis)
Segment ID 8770

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	20.0	C
	3	21.0	C
	4	20.0	C
	5	20.0	C
	6	21.0	C
	7	21.0	C
	8	20.0	C
	9	20.0	C
	10	21.0	C

NWB on I 26 W (Merge Analysis)
Segment ID 8773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	7.0	A
	2	7.0	A
	3	7.0	A
	4	8.0	A
	5	8.0	A
	6	10.0	A
	7	8.0	A
	8	7.0	A
	9	8.0	A
	10	8.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Basic Analysis)
Segment ID 8775

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	7.0	A
	2	9.0	A
	3	9.0	A
	4	9.0	A
	5	9.0	A
	6	10.0	A
	7	8.0	A
	8	7.0	A
	9	9.0	A
	10	8.0	A

WB on I 26 W (Diverge Analysis)
Segment ID 8776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	9.0	A
	3	10.0	A
	4	11.0	B
	5	12.0	B
	6	11.0	B
	7	11.0	B
	8	9.0	A
	9	9.0	A
	10	10.0	B

WB on I 26 W (Partial Basic Analysis)
Segment ID 8777

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	10.0	A
	3	12.0	B
	4	11.0	B
	5	12.0	B
	6	12.0	B
	7	11.0	A
	8	10.0	A
	9	10.0	A
	10	11.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Partial Basic Analysis)
Segment ID 8778

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	20.0	C
	3	21.0	C
	4	20.0	C
	5	20.0	C
	6	21.0	C
	7	21.0	C
	8	20.0	C
	9	20.0	C
	10	21.0	C

NWB on I 26 W (Partial Basic Analysis)
Segment ID 8779

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	10.0	A
	3	11.0	A
	4	10.0	A
	5	12.0	B
	6	11.0	B
	7	11.0	B
	8	10.0	A
	9	10.0	A
	10	11.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4718

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	29.0	D
	2	26.0	C
	3	29.0	D
	4	28.0	C
	5	26.0	C
	6	28.0	C
	7	27.0	C
	8	27.0	C
	9	26.0	C
	10	27.0	C

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4719

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	29.0	D
	2	26.0	C
	3	29.0	D
	4	28.0	C
	5	26.0	C
	6	28.0	C
	7	27.0	C
	8	27.0	C
	9	26.0	C
	10	27.0	C

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4720

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	25.0	C
	2	24.0	C
	3	26.0	C
	4	24.0	C
	5	24.0	C
	6	24.0	C
	7	26.0	C
	8	23.0	C
	9	22.0	C
	10	24.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4725

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	141.0	F
	2	132.0	F
	3	123.0	F
	4	131.0	F
	5	126.0	F
	6	115.0	F
	7	152.0	F
	8	116.0	F
	9	130.0	F
	10	128.0	F

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4726

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	141.0	F
	2	132.0	F
	3	123.0	F
	4	131.0	F
	5	126.0	F
	6	115.0	F
	7	152.0	F
	8	116.0	F
	9	130.0	F
	10	128.0	F

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4727

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	135.0	E
	2	119.0	F
	3	108.0	F
	4	122.0	E
	5	117.0	E
	6	99.0	F
	7	144.0	E
	8	103.0	F
	9	114.0	F
	10	117.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4728

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	135.0	F
	2	117.0	F
	3	100.0	F
	4	119.0	F
	5	116.0	F
	6	89.0	F
	7	158.0	F
	8	92.0	F
	9	114.0	F
	10	119.0	F

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4729

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	120.0	E
	2	101.0	E
	3	87.0	E
	4	98.0	E
	5	107.0	E
	6	76.0	E
	7	133.0	E
	8	89.0	E
	9	105.0	E
	10	101.0	E

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4730

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	120.0	E
	2	101.0	E
	3	87.0	E
	4	98.0	E
	5	107.0	E
	6	76.0	E
	7	133.0	E
	8	89.0	E
	9	105.0	E
	10	101.0	E

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4732

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	153.0	F
	2	128.0	F
	3	110.0	F
	4	122.0	F
	5	141.0	F
	6	96.0	F
	7	167.0	F
	8	122.0	F
	9	135.0	F
	10	127.0	F

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4733

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	20.0	C
	2	19.0	C
	3	19.0	C
	4	18.0	B
	5	18.0	C
	6	19.0	C
	7	19.0	C
	8	20.0	C
	9	18.0	C
	10	20.0	C

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4736

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	23.0	C
	2	18.0	B
	3	21.0	C
	4	21.0	C
	5	19.0	C
	6	19.0	C
	7	19.0	C
	8	19.0	C
	9	17.0	B
	10	20.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4737

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	B
	2	17.0	B
	3	18.0	B
	4	17.0	B
	5	17.0	B
	6	18.0	B
	7	18.0	B
	8	17.0	B
	9	16.0	B
	10	18.0	B

NWB on JAMES F BYRNES EXPY (Merge/Diverge Analysis)
Segment ID 4739

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	130.0	E
	2	112.0	E
	3	101.0	E
	4	104.0	E
	5	122.0	E
	6	86.0	E
	7	139.0	E
	8	108.0	E
	9	121.0	E
	10	116.0	E

NWB on EXIT 101B RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	165.0	F
	2	151.0	F
	3	131.0	F
	4	130.0	F
	5	161.0	F
	6	113.0	F
	7	184.0	F
	8	139.0	F
	9	158.0	F
	10	144.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on EXIT 101B RAMP TO US 176 (Diverge Analysis)
Segment ID 4742

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	157.0	E
	2	148.0	E
	3	129.0	E
	4	129.0	E
	5	149.0	E
	6	102.0	E
	7	167.0	F
	8	134.0	E
	9	152.0	E
	10	132.0	E

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4745

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	13.0	B
	2	13.0	B
	3	13.0	B
	4	12.0	B
	5	12.0	B
	6	12.0	B
	7	14.0	B
	8	14.0	B
	9	13.0	B
	10	13.0	B

SEB on JAMES F BYRNES EXPY (Merge/Diverge Analysis)
Segment ID 4748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	B
	2	17.0	B
	3	17.0	B
	4	16.0	B
	5	16.0	B
	6	18.0	B
	7	18.0	B
	8	17.0	B
	9	17.0	B
	10	16.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4753

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	206.0	F
	2	202.0	F
	3	174.0	F
	4	204.0	F
	5	203.0	F
	6	193.0	F
	7	211.0	F
	8	199.0	F
	9	203.0	F
	10	199.0	F

SEB on EXIT 101A RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4755

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	16.0	B
	2	14.0	B
	3	15.0	B
	4	14.0	B
	5	13.0	B
	6	14.0	B
	7	15.0	B
	8	14.0	B
	9	13.0	B
	10	13.0	B

SEB on EXIT 101A RAMP TO US 176 (Diverge Analysis)
Segment ID 4756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	13.0	B
	2	12.0	B
	3	14.0	B
	4	12.0	B
	5	12.0	B
	6	13.0	B
	7	13.0	B
	8	13.0	B
	9	12.0	B
	10	14.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4760

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	128.0	F
	2	120.0	F
	3	124.0	F
	4	128.0	F
	5	121.0	F
	6	126.0	F
	7	139.0	E
	8	118.0	F
	9	127.0	F
	10	130.0	F

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4761

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	128.0	F
	2	120.0	F
	3	124.0	F
	4	128.0	F
	5	121.0	F
	6	126.0	F
	7	139.0	E
	8	118.0	F
	9	127.0	F
	10	130.0	F

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4762

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	114.0	F
	2	108.0	F
	3	120.0	F
	4	114.0	F
	5	108.0	F
	6	112.0	F
	7	135.0	F
	8	106.0	F
	9	111.0	F
	10	121.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4763

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	117.0	F
	2	109.0	F
	3	114.0	F
	4	119.0	F
	5	108.0	F
	6	119.0	F
	7	127.0	F
	8	112.0	F
	9	117.0	F
	10	119.0	F

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	117.0	F
	2	109.0	F
	3	114.0	F
	4	119.0	F
	5	108.0	F
	6	119.0	F
	7	127.0	F
	8	112.0	F
	9	117.0	F
	10	119.0	F

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4766

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	18.0	B
	2	15.0	B
	3	17.0	B
	4	16.0	B
	5	16.0	B
	6	17.0	B
	7	17.0	B
	8	16.0	B
	9	16.0	B
	10	16.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4767

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	19.0	C
	3	21.0	C
	4	19.0	C
	5	19.0	C
	6	21.0	C
	7	22.0	C
	8	20.0	C
	9	19.0	C
	10	20.0	C

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4768

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	19.0	C
	3	21.0	C
	4	19.0	C
	5	19.0	C
	6	21.0	C
	7	22.0	C
	8	20.0	C
	9	19.0	C
	10	20.0	C

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	B
	2	17.0	B
	3	18.0	B
	4	18.0	B
	5	18.0	B
	6	19.0	B
	7	18.0	B
	8	18.0	B
	9	17.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4771

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	30.0	D
	2	29.0	D
	3	25.0	C
	4	28.0	D
	5	28.0	D
	6	30.0	D
	7	26.0	C
	8	34.0	D
	9	28.0	D
	10	28.0	D

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	37.0	E
	2	19.0	B
	3	19.0	B
	4	18.0	B
	5	18.0	B
	6	18.0	B
	7	16.0	B
	8	17.0	B
	9	21.0	C
	10	17.0	B

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4774

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	59.0	F
	2	22.0	C
	3	21.0	C
	4	21.0	C
	5	22.0	C
	6	21.0	C
	7	19.0	C
	8	23.0	C
	9	22.0	C
	10	21.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	C
	2	17.0	B
	3	18.0	C
	4	17.0	B
	5	19.0	C
	6	18.0	C
	7	19.0	C
	8	18.0	B
	9	18.0	B
	10	20.0	C

NWB on I 26 E (Basic Analysis)
Segment ID 4781

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	176.0	F
	2	73.0	F
	3	84.0	F
	4	105.0	F
	5	114.0	F
	6	112.0	F
	7	28.0	D
	8	146.0	F
	9	183.0	F
	10	126.0	F

NWB on I 26 E (Partial Basic Analysis)
Segment ID 4782

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	176.0	F
	2	73.0	F
	3	84.0	F
	4	105.0	F
	5	114.0	F
	6	112.0	F
	7	28.0	D
	8	146.0	F
	9	183.0	F
	10	126.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 E (Diverge Analysis)
Segment ID 4783

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	136.0	F
	2	121.0	F
	3	116.0	F
	4	122.0	F
	5	129.0	F
	6	117.0	F
	7	96.0	F
	8	118.0	F
	9	134.0	F
	10	133.0	F

SEB on I 26 E (Merge Analysis)
Segment ID 4785

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	41.0	E
	2	44.0	E
	3	42.0	E
	4	44.0	E
	5	44.0	E
	6	42.0	E
	7	40.0	E
	8	38.0	E
	9	46.0	E
	10	43.0	E

SEB on I 26 E (Merge Analysis)
Segment ID 4786

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	41.0	E
	2	44.0	E
	3	42.0	E
	4	44.0	E
	5	44.0	E
	6	42.0	E
	7	40.0	E
	8	38.0	E
	9	46.0	E
	10	43.0	E

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4787

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	63.0	F
	2	75.0	F
	3	49.0	F
	4	98.0	F
	5	72.0	F
	6	73.0	F
	7	67.0	F
	8	78.0	F
	9	107.0	F
	10	75.0	F

SEB on I 26 E (Diverge Analysis)
Segment ID 4788

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	95.0	F
	2	102.0	F
	3	94.0	F
	4	102.0	F
	5	99.0	F
	6	95.0	F
	7	94.0	F
	8	91.0	F
	9	105.0	F
	10	97.0	F

SEB on I 26 E (Diverge Analysis)
Segment ID 4789

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	95.0	F
	2	102.0	F
	3	94.0	F
	4	102.0	F
	5	99.0	F
	6	95.0	F
	7	94.0	F
	8	91.0	F
	9	105.0	F
	10	97.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4791

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	18.0	C
	3	20.0	C
	4	20.0	C
	5	21.0	C
	6	21.0	C
	7	18.0	C
	8	22.0	C
	9	20.0	C
	10	18.0	B

SEB on I 26 E (Basic Analysis)
Segment ID 4793

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	18.0	C
	2	17.0	B
	3	18.0	C
	4	17.0	B
	5	17.0	B
	6	19.0	C
	7	17.0	B
	8	17.0	B
	9	19.0	C
	10	18.0	C

NWB on I 26 W (Merge Analysis)
Segment ID 4795

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	13.0	B
	2	15.0	B
	3	15.0	B
	4	12.0	B
	5	14.0	B
	6	13.0	B
	7	13.0	B
	8	16.0	B
	9	13.0	B
	10	13.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Partial Basic Analysis)
Segment ID 4796

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	15.0	B
	2	15.0	B
	3	15.0	B
	4	15.0	B
	5	16.0	B
	6	16.0	B
	7	14.0	B
	8	16.0	B
	9	15.0	B
	10	14.0	B

NWB on I 26 W (Basic Analysis)
Segment ID 4797

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	15.0	B
	2	15.0	B
	3	15.0	B
	4	15.0	B
	5	16.0	B
	6	16.0	B
	7	14.0	B
	8	16.0	B
	9	15.0	B
	10	14.0	B

EB on I 26 E (Partial Basic Analysis)
Segment ID 4799

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	23.0	C
	3	24.0	C
	4	23.0	C
	5	23.0	C
	6	23.0	C
	7	22.0	C
	8	23.0	C
	9	23.0	C
	10	23.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Merge Analysis)
Segment ID 4800

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	60.0	E
	2	54.0	E
	3	52.0	E
	4	54.0	E
	5	56.0	E
	6	54.0	E
	7	50.0	E
	8	52.0	E
	9	58.0	E
	10	56.0	E

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4801

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	109.0	F
	2	104.0	F
	3	95.0	F
	4	111.0	F
	5	100.0	F
	6	86.0	F
	7	98.0	F
	8	96.0	F
	9	106.0	F
	10	86.0	F

SEB on I 26 E (Diverge Analysis)
Segment ID 4802

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	113.0	F
	2	114.0	F
	3	104.0	F
	4	109.0	F
	5	114.0	F
	6	103.0	F
	7	108.0	F
	8	107.0	F
	9	114.0	F
	10	107.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4805

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	15.0	B
	2	16.0	B
	3	15.0	B
	4	18.0	B
	5	16.0	B
	6	15.0	B
	7	16.0	B
	8	18.0	C
	9	16.0	B
	10	15.0	B

WB on I 26 W (Partial Basic Analysis)
Segment ID 4807

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	15.0	B
	2	16.0	B
	3	16.0	B
	4	15.0	B
	5	16.0	B
	6	16.0	B
	7	15.0	B
	8	17.0	B
	9	15.0	B
	10	14.0	B

WB on I 26 W (Diverge Analysis)
Segment ID 4808

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	14.0	B
	2	16.0	B
	3	16.0	B
	4	14.0	B
	5	17.0	B
	6	15.0	B
	7	13.0	B
	8	16.0	B
	9	15.0	B
	10	15.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Diverge Analysis)
Segment ID 4809

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	14.0	B
	2	16.0	B
	3	16.0	B
	4	14.0	B
	5	17.0	B
	6	15.0	B
	7	13.0	B
	8	16.0	B
	9	15.0	B
	10	15.0	B

EB on I 26 E (Basic Analysis)
Segment ID 8740

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	27.0	D
	2	30.0	D
	3	28.0	D
	4	29.0	D
	5	26.0	C
	6	28.0	D
	7	24.0	C
	8	27.0	D
	9	25.0	C
	10	28.0	D

EB on I 26 E (Diverge Analysis)
Segment ID 8741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	21.0	C
	3	23.0	C
	4	22.0	C
	5	22.0	C
	6	23.0	C
	7	21.0	C
	8	23.0	C
	9	23.0	C
	10	22.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Merge Analysis)
Segment ID 8744

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	60.0	E
	2	54.0	E
	3	52.0	E
	4	54.0	E
	5	56.0	E
	6	54.0	E
	7	50.0	E
	8	52.0	E
	9	58.0	E
	10	56.0	E

WB on I 26 W (Basic Analysis)
Segment ID 8748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	14.0	B
	2	15.0	B
	3	14.0	B
	4	12.0	B
	5	13.0	B
	6	14.0	B
	7	13.0	B
	8	15.0	B
	9	15.0	B
	10	11.0	A

WB on I 26 W (Merge Analysis)
Segment ID 8756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	10.0	B
	2	14.0	B
	3	11.0	B
	4	12.0	B
	5	13.0	B
	6	12.0	B
	7	13.0	B
	8	13.0	B
	9	11.0	B
	10	11.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Partial Basic Analysis)
Segment ID 8757

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	12.0	B
	2	14.0	B
	3	14.0	B
	4	14.0	B
	5	14.0	B
	6	14.0	B
	7	14.0	B
	8	14.0	B
	9	13.0	B
	10	13.0	B

EB on I 26 E (Basic Analysis)
Segment ID 8764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	23.0	C
	2	24.0	C
	3	25.0	C
	4	24.0	C
	5	23.0	C
	6	24.0	C
	7	23.0	C
	8	22.0	C
	9	24.0	C
	10	22.0	C

EB on I 26 E (Diverge Analysis)
Segment ID 8766

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	23.0	C
	3	23.0	C
	4	22.0	C
	5	22.0	C
	6	23.0	C
	7	20.0	C
	8	24.0	C
	9	22.0	C
	10	22.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Merge Analysis)
Segment ID 8769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	18.0	B
	3	20.0	B
	4	20.0	C
	5	19.0	B
	6	20.0	B
	7	19.0	B
	8	20.0	B
	9	20.0	C
	10	21.0	C

EB on I 26 E (Partial Basic Analysis)
Segment ID 8770

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	26.0	D
	2	25.0	C
	3	27.0	D
	4	26.0	D
	5	25.0	C
	6	26.0	C
	7	24.0	C
	8	26.0	C
	9	26.0	C
	10	26.0	C

NWB on I 26 W (Merge Analysis)
Segment ID 8773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	8.0	A
	2	10.0	A
	3	11.0	B
	4	9.0	A
	5	9.0	A
	6	9.0	A
	7	8.0	A
	8	10.0	A
	9	10.0	A
	10	9.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Basic Analysis)
Segment ID 8775

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	11.0	B
	2	13.0	B
	3	13.0	B
	4	11.0	B
	5	12.0	B
	6	13.0	B
	7	12.0	B
	8	12.0	B
	9	11.0	A
	10	10.0	A

WB on I 26 W (Diverge Analysis)
Segment ID 8776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	12.0	B
	2	13.0	B
	3	12.0	B
	4	12.0	B
	5	13.0	B
	6	12.0	B
	7	13.0	B
	8	14.0	B
	9	12.0	B
	10	13.0	B

WB on I 26 W (Partial Basic Analysis)
Segment ID 8777

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	12.0	B
	2	14.0	B
	3	14.0	B
	4	14.0	B
	5	14.0	B
	6	14.0	B
	7	14.0	B
	8	14.0	B
	9	13.0	B
	10	13.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Partial Basic Analysis)
Segment ID 8778

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	26.0	D
	2	25.0	C
	3	27.0	D
	4	26.0	D
	5	25.0	C
	6	26.0	C
	7	24.0	C
	8	26.0	C
	9	26.0	C
	10	26.0	C

NWB on I 26 W (Partial Basic Analysis)
Segment ID 8779

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	11.0	B
	2	13.0	B
	3	12.0	B
	4	12.0	B
	5	13.0	B
	6	13.0	B
	7	13.0	B
	8	13.0	B
	9	12.0	B
	10	12.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4718

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	39.0	E
	2	41.0	E
	3	38.0	E
	4	38.0	E
	5	40.0	E
	6	39.0	E
	7	40.0	E
	8	41.0	E
	9	38.0	E
	10	39.0	E

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4719

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	36.0	E
	2	35.0	E
	3	35.0	D
	4	35.0	D
	5	35.0	D
	6	35.0	D
	7	35.0	D
	8	35.0	D
	9	36.0	E
	10	36.0	E

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4720

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	36.0	E
	2	35.0	E
	3	35.0	D
	4	35.0	D
	5	35.0	D
	6	35.0	D
	7	35.0	D
	8	35.0	D
	9	36.0	E
	10	36.0	E

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4725

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	25.0	C
	2	25.0	C
	3	25.0	C
	4	24.0	C
	5	25.0	C
	6	23.0	C
	7	24.0	C
	8	24.0	C
	9	25.0	C
	10	24.0	C

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4726

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	25.0	C
	2	25.0	C
	3	25.0	C
	4	24.0	C
	5	25.0	C
	6	23.0	C
	7	24.0	C
	8	24.0	C
	9	25.0	C
	10	24.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4727

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	32.0	D
	2	32.0	D
	3	34.0	D
	4	32.0	D
	5	32.0	D
	6	31.0	D
	7	32.0	D
	8	32.0	D
	9	33.0	D
	10	32.0	D

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4728

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	25.0	C
	2	27.0	C
	3	27.0	C
	4	26.0	C
	5	26.0	C
	6	25.0	C
	7	27.0	C
	8	27.0	C
	9	26.0	C
	10	27.0	C

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4729

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	25.0	C
	2	27.0	C
	3	27.0	C
	4	26.0	C
	5	26.0	C
	6	25.0	C
	7	27.0	C
	8	27.0	C
	9	26.0	C
	10	27.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4730

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	25.0	C
	2	27.0	C
	3	27.0	C
	4	26.0	C
	5	26.0	C
	6	25.0	C
	7	27.0	C
	8	27.0	C
	9	26.0	C
	10	27.0	C

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4732

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	20.0	C
	3	22.0	C
	4	19.0	C
	5	20.0	C
	6	19.0	C
	7	21.0	C
	8	20.0	C
	9	19.0	C
	10	19.0	C

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4733

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	35.0	D
	2	34.0	D
	3	32.0	D
	4	32.0	D
	5	35.0	E
	6	35.0	D
	7	36.0	E
	8	37.0	E
	9	32.0	D
	10	34.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4736

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	40.0	E
	2	35.0	D
	3	38.0	E
	4	37.0	E
	5	36.0	E
	6	40.0	E
	7	39.0	E
	8	41.0	E
	9	38.0	E
	10	40.0	E

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4737

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	28.0	C
	2	28.0	D
	3	28.0	C
	4	27.0	C
	5	27.0	C
	6	27.0	C
	7	27.0	C
	8	27.0	C
	9	27.0	C
	10	27.0	C

NWB on JAMES F BYRNES EXPY (Weaving Analysis)
Segment ID 4739

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	17.0	B
	2	18.0	B
	3	15.0	B
	4	18.0	B
	5	17.0	B
	6	16.0	B
	7	17.0	B
	8	16.0	B
	9	16.0	B
	10	16.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on EXIT 101B RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	24.0	C
	2	22.0	C
	3	27.0	D
	4	23.0	C
	5	21.0	C
	6	21.0	C
	7	24.0	C
	8	23.0	C
	9	26.0	D
	10	24.0	C

NWB on EXIT 101B RAMP TO US 176 (Diverge Analysis)
Segment ID 4742

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	14.0	B
	3	17.0	B
	4	16.0	B
	5	14.0	B
	6	14.0	B
	7	14.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4745

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	27.0	D
	2	27.0	D
	3	25.0	C
	4	26.0	D
	5	26.0	C
	6	25.0	C
	7	27.0	D
	8	26.0	C
	9	26.0	C
	10	25.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Weaving Analysis)
Segment ID 4748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	33.0	D
	2	33.0	D
	3	34.0	D
	4	32.0	D
	5	33.0	D
	6	35.0	D
	7	34.0	D
	8	33.0	D
	9	33.0	D
	10	35.0	D

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4753

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	15.0	B
	3	15.0	B
	4	14.0	B
	5	15.0	B
	6	15.0	B
	7	17.0	B
	8	16.0	B
	9	13.0	B
	10	14.0	B

SEB on EXIT 101A RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4755

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	26.0	D
	2	28.0	D
	3	31.0	D
	4	28.0	D
	5	28.0	D
	6	29.0	D
	7	24.0	C
	8	28.0	D
	9	28.0	D
	10	27.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on EXIT 101A RAMP TO US 176 (Diverge Analysis)
Segment ID 4756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	21.0	C
	2	21.0	C
	3	20.0	C
	4	20.0	C
	5	20.0	B
	6	21.0	C
	7	21.0	C
	8	21.0	C
	9	21.0	C
	10	21.0	C

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4760

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	9.0	A
	2	9.0	A
	3	9.0	A
	4	9.0	A
	5	9.0	A
	6	9.0	A
	7	10.0	B
	8	10.0	A
	9	9.0	A
	10	10.0	A

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4761

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	9.0	A
	2	9.0	A
	3	9.0	A
	4	9.0	A
	5	9.0	A
	6	9.0	A
	7	10.0	B
	8	10.0	A
	9	9.0	A
	10	10.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4763

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	16.0	B
	3	15.0	B
	4	15.0	B
	5	15.0	B
	6	15.0	B
	7	16.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	9.0	A
	2	9.0	A
	3	9.0	A
	4	11.0	B
	5	9.0	A
	6	8.0	A
	7	8.0	A
	8	10.0	A
	9	9.0	A
	10	9.0	A

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4768

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	22.0	C
	2	21.0	C
	3	20.0	C
	4	21.0	C
	5	19.0	B
	6	21.0	C
	7	20.0	B
	8	21.0	C
	9	19.0	B
	10	20.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	24.0	C
	2	24.0	C
	3	23.0	C
	4	23.0	C
	5	22.0	C
	6	24.0	C
	7	23.0	C
	8	24.0	C
	9	22.0	C
	10	23.0	C

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4771

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	14.0	B
	2	16.0	B
	3	15.0	B
	4	16.0	B
	5	15.0	B
	6	14.0	B
	7	16.0	B
	8	16.0	B
	9	15.0	B
	10	15.0	B

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	13.0	B
	2	13.0	B
	3	12.0	B
	4	12.0	B
	5	13.0	B
	6	12.0	B
	7	13.0	B
	8	13.0	B
	9	12.0	B
	10	13.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4774

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	16.0	B
	4	16.0	B
	5	16.0	B
	6	16.0	B
	7	16.0	B
	8	17.0	B
	9	16.0	B
	10	16.0	B

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4775

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	16.0	B
	4	16.0	B
	5	16.0	B
	6	16.0	B
	7	16.0	B
	8	17.0	B
	9	16.0	B
	10	16.0	B

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	20.0	C
	3	19.0	C
	4	19.0	C
	5	20.0	C
	6	20.0	C
	7	21.0	C
	8	20.0	C
	9	20.0	C
	10	19.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4779

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	17.0	B
	2	17.0	B
	3	18.0	B
	4	18.0	B
	5	15.0	B
	6	17.0	B
	7	16.0	B
	8	18.0	C
	9	15.0	B
	10	15.0	B

WB on I 26 E (Basic Analysis)
Segment ID 4780

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	16.0	B
	3	16.0	B
	4	16.0	B
	5	15.0	B
	6	16.0	B
	7	17.0	B
	8	16.0	B
	9	16.0	B
	10	16.0	B

WB on I 26 E (Partial Basic Analysis)
Segment ID 4781

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	16.0	B
	3	16.0	B
	4	16.0	B
	5	15.0	B
	6	16.0	B
	7	17.0	B
	8	16.0	B
	9	16.0	B
	10	16.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 E (Diverge Analysis)
Segment ID 4782

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	18.0	B
	2	16.0	B
	3	17.0	B
	4	18.0	B
	5	24.0	C
	6	16.0	B
	7	16.0	B
	8	17.0	B
	9	18.0	B
	10	17.0	B

WB on I 26 E (Diverge Analysis)
Segment ID 4783

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	18.0	B
	2	16.0	B
	3	17.0	B
	4	18.0	B
	5	24.0	C
	6	16.0	B
	7	16.0	B
	8	17.0	B
	9	18.0	B
	10	17.0	B

SEB on I 26 E (Merge Analysis)
Segment ID 4785

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	13.0	B
	2	14.0	B
	3	15.0	B
	4	14.0	B
	5	14.0	B
	6	13.0	B
	7	14.0	B
	8	14.0	B
	9	14.0	B
	10	15.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4786

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	21.0	C
	3	20.0	C
	4	20.0	C
	5	20.0	C
	6	20.0	C
	7	21.0	C
	8	21.0	C
	9	21.0	C
	10	20.0	C

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4787

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	21.0	C
	3	20.0	C
	4	20.0	C
	5	20.0	C
	6	20.0	C
	7	21.0	C
	8	21.0	C
	9	21.0	C
	10	20.0	C

SEB on I 26 E (Diverge Analysis)
Segment ID 4789

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	16.0	B
	3	15.0	B
	4	15.0	B
	5	14.0	B
	6	15.0	B
	7	15.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4791

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	9.0	A
	3	10.0	A
	4	9.0	A
	5	9.0	A
	6	9.0	A
	7	10.0	A
	8	10.0	A
	9	9.0	A
	10	8.0	A

SEB on I 26 E (Basic Analysis)
Segment ID 4793

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	16.0	B
	3	14.0	B
	4	15.0	B
	5	16.0	B
	6	15.0	B
	7	15.0	B
	8	16.0	B
	9	15.0	B
	10	14.0	B

NWB on I 26 W (Merge Analysis)
Segment ID 4795

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	7.0	A
	2	7.0	A
	3	7.0	A
	4	7.0	A
	5	6.0	A
	6	7.0	A
	7	7.0	A
	8	6.0	A
	9	6.0	A
	10	6.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Merge Analysis)
Segment ID 4796

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	7.0	A
	2	7.0	A
	3	7.0	A
	4	7.0	A
	5	6.0	A
	6	7.0	A
	7	7.0	A
	8	6.0	A
	9	6.0	A
	10	6.0	A

NWB on I 26 W (Basic Analysis)
Segment ID 4797

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	10.0	A
	3	10.0	A
	4	10.0	A
	5	9.0	A
	6	10.0	A
	7	10.0	A
	8	10.0	A
	9	10.0	A
	10	10.0	A

EB on I 26 E (Partial Basic Analysis)
Segment ID 4799

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	18.0	B
	2	18.0	B
	3	18.0	C
	4	18.0	B
	5	18.0	B
	6	18.0	B
	7	18.0	B
	8	18.0	B
	9	17.0	B
	10	18.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Basic Analysis)
Segment ID 4800

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	13.0	B
	2	13.0	B
	3	12.0	B
	4	13.0	B
	5	13.0	B
	6	14.0	B
	7	13.0	B
	8	13.0	B
	9	13.0	B
	10	13.0	B

SEB on I 26 E (Merge Analysis)
Segment ID 4801

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	13.0	B
	2	13.0	B
	3	12.0	B
	4	12.0	B
	5	12.0	B
	6	11.0	B
	7	12.0	B
	8	12.0	B
	9	12.0	B
	10	12.0	B

SEB on I 26 E (Diverge Analysis)
Segment ID 4802

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	14.0	B
	2	14.0	B
	3	15.0	B
	4	14.0	B
	5	13.0	B
	6	13.0	B
	7	13.0	B
	8	14.0	B
	9	14.0	B
	10	14.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4805

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	11.0	A
	3	11.0	A
	4	11.0	B
	5	10.0	A
	6	10.0	A
	7	11.0	B
	8	11.0	B
	9	10.0	A
	10	10.0	A

WB on I 26 W (Basic Analysis)
Segment ID 4806

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	11.0	A
	3	10.0	A
	4	10.0	A
	5	9.0	A
	6	10.0	A
	7	10.0	A
	8	10.0	A
	9	10.0	A
	10	9.0	A

WB on I 26 W (Partial Basic Analysis)
Segment ID 4807

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	11.0	A
	3	10.0	A
	4	10.0	A
	5	9.0	A
	6	10.0	A
	7	10.0	A
	8	10.0	A
	9	10.0	A
	10	9.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Diverge Analysis)
Segment ID 4808

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	6.0	A
	2	6.0	A
	3	6.0	A
	4	6.0	A
	5	6.0	A
	6	5.0	A
	7	6.0	A
	8	6.0	A
	9	5.0	A
	10	6.0	A

WB on I 26 W (Diverge Analysis)
Segment ID 4809

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	6.0	A
	2	6.0	A
	3	6.0	A
	4	6.0	A
	5	6.0	A
	6	5.0	A
	7	6.0	A
	8	6.0	A
	9	5.0	A
	10	6.0	A

SEB on I 26 E (Basic Analysis)
Segment ID 8740

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	13.0	B
	2	13.0	B
	3	12.0	B
	4	13.0	B
	5	13.0	B
	6	14.0	B
	7	13.0	B
	8	13.0	B
	9	13.0	B
	10	13.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Diverge Analysis)
Segment ID 8741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	19.0	B
	2	19.0	B
	3	18.0	B
	4	18.0	B
	5	16.0	B
	6	17.0	B
	7	18.0	B
	8	18.0	B
	9	17.0	B
	10	17.0	B

WB on I 26 W (Basic Analysis)
Segment ID 8748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	9.0	A
	2	9.0	A
	3	11.0	B
	4	10.0	A
	5	10.0	A
	6	9.0	A
	7	13.0	B
	8	11.0	A
	9	10.0	A
	10	11.0	A

WB on I 26 W (Merge Analysis)
Segment ID 8756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	12.0	B
	2	11.0	B
	3	11.0	B
	4	11.0	B
	5	9.0	A
	6	11.0	B
	7	12.0	B
	8	11.0	B
	9	11.0	B
	10	9.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Merge Analysis)
Segment ID 8757

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	12.0	B
	2	11.0	B
	3	11.0	B
	4	11.0	B
	5	9.0	A
	6	11.0	B
	7	12.0	B
	8	11.0	B
	9	11.0	B
	10	9.0	A

EB on I 26 E (Basic Analysis)
Segment ID 8764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	17.0	B
	2	17.0	B
	3	17.0	B
	4	17.0	B
	5	19.0	C
	6	18.0	B
	7	18.0	C
	8	18.0	B
	9	17.0	B
	10	17.0	B

EB on I 26 E (Diverge Analysis)
Segment ID 8766

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	18.0	B
	3	15.0	B
	4	15.0	B
	5	17.0	B
	6	17.0	B
	7	16.0	B
	8	17.0	B
	9	17.0	B
	10	16.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Merge Analysis)
Segment ID 8769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	17.0	B
	2	17.0	B
	3	17.0	B
	4	16.0	B
	5	15.0	B
	6	15.0	B
	7	15.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

EB on I 26 E (Partial Basic Analysis)
Segment ID 8770

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	21.0	C
	3	20.0	C
	4	20.0	C
	5	20.0	C
	6	20.0	C
	7	21.0	C
	8	20.0	C
	9	20.0	C
	10	19.0	C

NWB on I 26 W (Merge Analysis)
Segment ID 8773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	10.0	B
	3	11.0	B
	4	12.0	B
	5	11.0	B
	6	10.0	A
	7	9.0	A
	8	11.0	B
	9	11.0	B
	10	10.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Basic Analysis)
Segment ID 8775

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	11.0	B
	2	12.0	B
	3	11.0	A
	4	11.0	B
	5	11.0	A
	6	11.0	B
	7	13.0	B
	8	13.0	B
	9	10.0	A
	10	12.0	B

WB on I 26 W (Diverge Analysis)
Segment ID 8776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	11.0	B
	2	12.0	B
	3	11.0	B
	4	11.0	B
	5	10.0	A
	6	11.0	B
	7	13.0	B
	8	11.0	B
	9	11.0	B
	10	10.0	B

WB on I 26 W (Partial Basic Analysis)
Segment ID 8777

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	15.0	B
	3	15.0	B
	4	15.0	B
	5	14.0	B
	6	15.0	B
	7	15.0	B
	8	15.0	B
	9	14.0	B
	10	14.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Partial Basic Analysis)
Segment ID 8778

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	20.0	C
	2	21.0	C
	3	20.0	C
	4	20.0	C
	5	20.0	C
	6	20.0	C
	7	21.0	C
	8	20.0	C
	9	20.0	C
	10	19.0	C

NWB on I 26 W (Partial Basic Analysis)
Segment ID 8779

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	13.0	B
	2	14.0	B
	3	13.0	B
	4	13.0	B
	5	13.0	B
	6	13.0	B
	7	14.0	B
	8	13.0	B
	9	13.0	B
	10	12.0	B

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 8856

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	26.0	C
	2	26.0	C
	3	26.0	C
	4	25.0	C
	5	25.0	C
	6	26.0	C
	7	26.0	C
	8	26.0	C
	9	26.0	C
	10	26.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Diverge Analysis)
Segment ID 8887

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	16.0	B
	3	15.0	B
	4	15.0	B
	5	14.0	B
	6	15.0	B
	7	15.0	B
	8	15.0	B
	9	15.0	B
	10	15.0	B

SEB on I 26 E (Diverge Analysis)
Segment ID 8888

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	14.0	B
	2	14.0	B
	3	15.0	B
	4	14.0	B
	5	13.0	B
	6	13.0	B
	7	13.0	B
	8	14.0	B
	9	14.0	B
	10	14.0	B

NWB on I 26 W (Partial Basic Analysis)
Segment ID 8889

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	10.0	A
	2	10.0	A
	3	10.0	A
	4	10.0	A
	5	9.0	A
	6	10.0	A
	7	10.0	A
	8	10.0	A
	9	10.0	A
	10	10.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Partial Basic Analysis)
Segment ID 8890

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	16.0	B
	4	16.0	B
	5	16.0	B
	6	16.0	B
	7	16.0	B
	8	16.0	B
	9	16.0	B
	10	15.0	B

EB on I 26 E (Diverge Analysis)
Segment ID 8891

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	19.0	B
	2	19.0	B
	3	18.0	B
	4	18.0	B
	5	16.0	B
	6	17.0	B
	7	18.0	B
	8	18.0	B
	9	17.0	B
	10	17.0	B

SEB on I 26 E (Partial Basic Analysis)
Segment ID 8893

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	16.0	B
	2	17.0	B
	3	16.0	B
	4	16.0	B
	5	16.0	B
	6	16.0	B
	7	16.0	B
	8	16.0	B
	9	16.0	B
	10	15.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (7:15:00AM - 8:15:00AM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Partial Basic Analysis)
Segment ID 8895

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	15.0	B
	2	15.0	B
	3	15.0	B
	4	15.0	B
	5	14.0	B
	6	15.0	B
	7	15.0	B
	8	15.0	B
	9	14.0	B
	10	14.0	B

WB on I 26 W (Merge Analysis)
Segment ID 8896

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
8:15:00AM	1	12.0	B
	2	11.0	B
	3	11.0	B
	4	11.0	B
	5	9.0	A
	6	11.0	B
	7	12.0	B
	8	11.0	B
	9	11.0	B
	10	9.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4718

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	27.0	C
	2	27.0	C
	3	27.0	C
	4	28.0	C
	5	26.0	C
	6	27.0	C
	7	27.0	C
	8	28.0	D
	9	27.0	C
	10	27.0	C

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4719

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	27.0	D
	2	25.0	C
	3	25.0	C
	4	27.0	D
	5	27.0	D
	6	28.0	D
	7	27.0	D
	8	28.0	D
	9	28.0	D
	10	27.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4720

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	27.0	D
	2	25.0	C
	3	25.0	C
	4	27.0	D
	5	27.0	D
	6	28.0	D
	7	27.0	D
	8	28.0	D
	9	28.0	D
	10	27.0	D

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4725

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	87.0	F
	2	87.0	F
	3	89.0	F
	4	88.0	F
	5	87.0	F
	6	89.0	F
	7	87.0	F
	8	88.0	F
	9	87.0	F
	10	87.0	F

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4726

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	87.0	F
	2	87.0	F
	3	89.0	F
	4	88.0	F
	5	87.0	F
	6	89.0	F
	7	87.0	F
	8	88.0	F
	9	87.0	F
	10	87.0	F

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4727

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	81.0	F
	2	82.0	F
	3	82.0	F
	4	80.0	F
	5	81.0	F
	6	82.0	F
	7	79.0	F
	8	81.0	F
	9	82.0	F
	10	80.0	F

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4728

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	37.0	E
	2	37.0	E
	3	38.0	F
	4	39.0	F
	5	38.0	E
	6	39.0	E
	7	39.0	E
	8	38.0	E
	9	38.0	F
	10	37.0	E

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4729

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	37.0	E
	2	37.0	E
	3	38.0	F
	4	39.0	F
	5	38.0	E
	6	39.0	E
	7	39.0	E
	8	38.0	E
	9	38.0	F
	10	37.0	E

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4730

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	37.0	E
	2	37.0	E
	3	38.0	F
	4	39.0	F
	5	38.0	E
	6	39.0	E
	7	39.0	E
	8	38.0	E
	9	38.0	F
	10	37.0	E

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4732

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	36.0	E
	2	35.0	E
	3	37.0	E
	4	36.0	E
	5	35.0	E
	6	36.0	E
	7	36.0	E
	8	36.0	E
	9	35.0	E
	10	35.0	E

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4733

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	23.0	C
	2	25.0	C
	3	25.0	C
	4	27.0	D
	5	24.0	C
	6	25.0	C
	7	25.0	C
	8	25.0	C
	9	24.0	C
	10	25.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4736

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	30.0	D
	2	22.0	C
	3	26.0	C
	4	28.0	D
	5	26.0	C
	6	24.0	C
	7	30.0	D
	8	23.0	C
	9	24.0	C
	10	20.0	C

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4737

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	17.0	B
	3	17.0	B
	4	18.0	B
	5	17.0	B
	6	18.0	B
	7	18.0	B
	8	18.0	B
	9	18.0	B
	10	17.0	B

NWB on JAMES F BYRNES EXPY (Weaving Analysis)
Segment ID 4739

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	32.0	D
	2	31.0	D
	3	30.0	D
	4	31.0	D
	5	30.0	D
	6	31.0	D
	7	30.0	D
	8	31.0	D
	9	32.0	D
	10	31.0	D

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on EXIT 101B RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	45.0	F
	2	35.0	D
	3	44.0	E
	4	45.0	F
	5	44.0	E
	6	45.0	E
	7	44.0	E
	8	43.0	E
	9	44.0	E
	10	50.0	F

NWB on EXIT 101B RAMP TO US 176 (Diverge Analysis)
Segment ID 4742

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	26.0	C
	2	27.0	C
	3	27.0	C
	4	26.0	C
	5	26.0	C
	6	27.0	C
	7	26.0	C
	8	26.0	C
	9	26.0	C
	10	26.0	C

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4745

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	C
	2	18.0	C
	3	20.0	C
	4	20.0	C
	5	19.0	C
	6	17.0	B
	7	18.0	B
	8	21.0	C
	9	15.0	B
	10	19.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Weaving Analysis)
Segment ID 4748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	19.0	B
	3	19.0	B
	4	20.0	B
	5	21.0	C
	6	21.0	C
	7	20.0	C
	8	21.0	C
	9	21.0	C
	10	21.0	C

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4753

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	25.0	C
	3	28.0	D
	4	24.0	C
	5	25.0	C
	6	25.0	C
	7	26.0	C
	8	26.0	C
	9	26.0	D
	10	26.0	C

SEB on EXIT 101A RAMP TO US 176 (Partial Basic Analysis)
Segment ID 4755

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	C
	2	19.0	C
	3	22.0	C
	4	20.0	C
	5	21.0	C
	6	20.0	C
	7	18.0	B
	8	18.0	B
	9	26.0	C
	10	20.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on EXIT 101A RAMP TO US 176 (Diverge Analysis)
Segment ID 4756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	11.0	B
	2	11.0	B
	3	9.0	A
	4	11.0	B
	5	12.0	B
	6	12.0	B
	7	12.0	B
	8	12.0	B
	9	11.0	B
	10	11.0	B

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4760

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	16.0	B
	2	15.0	B
	3	16.0	B
	4	15.0	B
	5	16.0	B
	6	16.0	B
	7	15.0	B
	8	16.0	B
	9	16.0	B
	10	16.0	B

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4761

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	16.0	B
	2	15.0	B
	3	16.0	B
	4	15.0	B
	5	16.0	B
	6	16.0	B
	7	15.0	B
	8	16.0	B
	9	16.0	B
	10	16.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4763

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	26.0	D
	2	26.0	C
	3	26.0	D
	4	27.0	D
	5	26.0	D
	6	26.0	D
	7	26.0	C
	8	26.0	D
	9	26.0	D
	10	26.0	D

NWB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	23.0	C
	2	22.0	C
	3	23.0	C
	4	23.0	C
	5	23.0	C
	6	22.0	C
	7	23.0	C
	8	24.0	C
	9	25.0	C
	10	21.0	C

SEB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4768

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	10.0	B
	2	10.0	B
	3	9.0	A
	4	10.0	B
	5	12.0	B
	6	10.0	B
	7	10.0	A
	8	11.0	B
	9	11.0	B
	10	10.0	A

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on JAMES F BYRNES EXPY (Diverge Analysis)
Segment ID 4769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	13.0	B
	2	12.0	B
	3	13.0	B
	4	12.0	B
	5	13.0	B
	6	12.0	B
	7	13.0	B
	8	13.0	B
	9	13.0	B
	10	13.0	B

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4771

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	22.0	C
	2	22.0	C
	3	22.0	C
	4	22.0	C
	5	22.0	C
	6	22.0	C
	7	22.0	C
	8	22.0	C
	9	22.0	C
	10	23.0	C

NWB on JAMES F BYRNES EXPY (Merge Analysis)
Segment ID 4773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	18.0	B
	2	16.0	B
	3	17.0	B
	4	17.0	B
	5	18.0	B
	6	15.0	B
	7	16.0	B
	8	18.0	B
	9	17.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 4774

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	24.0	C
	3	23.0	C
	4	24.0	C
	5	23.0	C
	6	23.0	C
	7	23.0	C
	8	24.0	C
	9	24.0	C
	10	24.0	C

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4775

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	24.0	C
	3	23.0	C
	4	24.0	C
	5	23.0	C
	6	23.0	C
	7	23.0	C
	8	24.0	C
	9	24.0	C
	10	24.0	C

SEB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	16.0	B
	2	16.0	B
	3	16.0	B
	4	17.0	B
	5	16.0	B
	6	17.0	B
	7	17.0	B
	8	16.0	B
	9	16.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on JAMES F BYRNES EXPY (Basic Analysis)
Segment ID 4779

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	25.0	C
	2	25.0	C
	3	23.0	C
	4	24.0	C
	5	26.0	D
	6	24.0	C
	7	24.0	C
	8	27.0	D
	9	26.0	D
	10	27.0	D

WB on I 26 E (Basic Analysis)
Segment ID 4780

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	23.0	C
	3	24.0	C
	4	24.0	C
	5	23.0	C
	6	23.0	C
	7	23.0	C
	8	24.0	C
	9	24.0	C
	10	24.0	C

WB on I 26 E (Partial Basic Analysis)
Segment ID 4781

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	23.0	C
	3	24.0	C
	4	24.0	C
	5	23.0	C
	6	23.0	C
	7	23.0	C
	8	24.0	C
	9	24.0	C
	10	24.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 E (Diverge Analysis)
Segment ID 4782

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	22.0	C
	2	22.0	C
	3	22.0	C
	4	22.0	C
	5	28.0	D
	6	22.0	C
	7	22.0	C
	8	21.0	C
	9	23.0	C
	10	24.0	C

WB on I 26 E (Diverge Analysis)
Segment ID 4783

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	22.0	C
	2	22.0	C
	3	22.0	C
	4	22.0	C
	5	28.0	D
	6	22.0	C
	7	22.0	C
	8	21.0	C
	9	23.0	C
	10	24.0	C

SEB on I 26 E (Merge Analysis)
Segment ID 4785

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	14.0	B
	2	14.0	B
	3	14.0	B
	4	15.0	B
	5	14.0	B
	6	13.0	B
	7	14.0	B
	8	13.0	B
	9	15.0	B
	10	13.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4786

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	21.0	C
	3	21.0	C
	4	21.0	C
	5	21.0	C
	6	21.0	C
	7	20.0	C
	8	21.0	C
	9	21.0	C
	10	21.0	C

SEB on I 26 E (Partial Basic Analysis)
Segment ID 4787

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	21.0	C
	2	21.0	C
	3	21.0	C
	4	21.0	C
	5	21.0	C
	6	21.0	C
	7	20.0	C
	8	21.0	C
	9	21.0	C
	10	21.0	C

SEB on I 26 E (Diverge Analysis)
Segment ID 4789

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	16.0	B
	2	16.0	B
	3	16.0	B
	4	18.0	B
	5	16.0	B
	6	16.0	B
	7	16.0	B
	8	16.0	B
	9	17.0	B
	10	15.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4791

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	15.0	B
	2	16.0	B
	3	16.0	B
	4	17.0	B
	5	15.0	B
	6	16.0	B
	7	17.0	B
	8	16.0	B
	9	16.0	B
	10	16.0	B

SEB on I 26 E (Basic Analysis)
Segment ID 4793

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	16.0	B
	3	16.0	B
	4	17.0	B
	5	16.0	B
	6	16.0	B
	7	15.0	B
	8	17.0	B
	9	16.0	B
	10	17.0	B

NWB on I 26 W (Merge Analysis)
Segment ID 4795

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	10.0	A
	2	10.0	B
	3	10.0	B
	4	10.0	A
	5	10.0	B
	6	10.0	A
	7	10.0	A
	8	10.0	A
	9	10.0	B
	10	11.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Merge Analysis)
Segment ID 4796

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	10.0	A
	2	10.0	B
	3	10.0	B
	4	10.0	A
	5	10.0	B
	6	10.0	A
	7	10.0	A
	8	10.0	A
	9	10.0	B
	10	11.0	B

NWB on I 26 W (Basic Analysis)
Segment ID 4797

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	16.0	B
	3	17.0	B
	4	17.0	B
	5	17.0	B
	6	17.0	B
	7	16.0	B
	8	17.0	B
	9	17.0	B
	10	17.0	B

EB on I 26 E (Partial Basic Analysis)
Segment ID 4799

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	24.0	C
	2	24.0	C
	3	24.0	C
	4	24.0	C
	5	23.0	C
	6	23.0	C
	7	22.0	C
	8	24.0	C
	9	23.0	C
	10	23.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Basic Analysis)
Segment ID 4800

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	16.0	B
	3	17.0	B
	4	18.0	B
	5	18.0	C
	6	16.0	B
	7	16.0	B
	8	17.0	B
	9	17.0	B
	10	16.0	B

SEB on I 26 E (Merge Analysis)
Segment ID 4801

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	11.0	B
	2	11.0	B
	3	11.0	B
	4	12.0	B
	5	10.0	B
	6	10.0	B
	7	10.0	B
	8	10.0	A
	9	10.0	B
	10	12.0	B

SEB on I 26 E (Diverge Analysis)
Segment ID 4802

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	12.0	B
	2	13.0	B
	3	13.0	B
	4	14.0	B
	5	12.0	B
	6	11.0	B
	7	13.0	B
	8	13.0	B
	9	13.0	B
	10	13.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

NWB on I 26 W (Basic Analysis)
Segment ID 4805

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	16.0	B
	3	18.0	C
	4	20.0	C
	5	17.0	B
	6	17.0	B
	7	17.0	B
	8	16.0	B
	9	17.0	B
	10	19.0	C

WB on I 26 W (Basic Analysis)
Segment ID 4806

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	16.0	B
	3	17.0	B
	4	17.0	B
	5	17.0	B
	6	17.0	B
	7	16.0	B
	8	17.0	B
	9	17.0	B
	10	17.0	B

WB on I 26 W (Partial Basic Analysis)
Segment ID 4807

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	16.0	B
	3	17.0	B
	4	17.0	B
	5	17.0	B
	6	17.0	B
	7	16.0	B
	8	17.0	B
	9	17.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Diverge Analysis)
Segment ID 4808

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	10.0	B
	2	9.0	A
	3	12.0	B
	4	9.0	A
	5	10.0	B
	6	11.0	B
	7	11.0	B
	8	10.0	A
	9	10.0	A
	10	12.0	B

WB on I 26 W (Diverge Analysis)
Segment ID 4809

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	10.0	B
	2	9.0	A
	3	12.0	B
	4	9.0	A
	5	10.0	B
	6	11.0	B
	7	11.0	B
	8	10.0	A
	9	10.0	A
	10	12.0	B

SEB on I 26 E (Basic Analysis)
Segment ID 8740

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	16.0	B
	3	17.0	B
	4	18.0	B
	5	18.0	C
	6	16.0	B
	7	16.0	B
	8	17.0	B
	9	17.0	B
	10	16.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Diverge Analysis)
Segment ID 8741

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	22.0	C
	2	23.0	C
	3	22.0	C
	4	22.0	C
	5	21.0	C
	6	21.0	C
	7	22.0	C
	8	23.0	C
	9	22.0	C
	10	22.0	C

WB on I 26 W (Basic Analysis)
Segment ID 8748

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	16.0	B
	2	14.0	B
	3	16.0	B
	4	15.0	B
	5	18.0	C
	6	17.0	B
	7	16.0	B
	8	16.0	B
	9	16.0	B
	10	15.0	B

WB on I 26 W (Merge Analysis)
Segment ID 8756

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	B
	2	17.0	B
	3	18.0	B
	4	18.0	B
	5	19.0	B
	6	17.0	B
	7	16.0	B
	8	18.0	B
	9	18.0	B
	10	19.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Merge Analysis)
Segment ID 8757

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	B
	2	17.0	B
	3	18.0	B
	4	18.0	B
	5	19.0	B
	6	17.0	B
	7	16.0	B
	8	18.0	B
	9	18.0	B
	10	19.0	B

EB on I 26 E (Basic Analysis)
Segment ID 8764

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	23.0	C
	2	22.0	C
	3	24.0	C
	4	25.0	C
	5	24.0	C
	6	23.0	C
	7	22.0	C
	8	23.0	C
	9	22.0	C
	10	22.0	C

EB on I 26 E (Diverge Analysis)
Segment ID 8766

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	22.0	C
	2	23.0	C
	3	22.0	C
	4	24.0	C
	5	23.0	C
	6	21.0	C
	7	21.0	C
	8	24.0	C
	9	23.0	C
	10	23.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Merge Analysis)
Segment ID 8769

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	20.0	B
	2	21.0	C
	3	20.0	B
	4	19.0	B
	5	18.0	B
	6	19.0	B
	7	19.0	B
	8	20.0	C
	9	20.0	B
	10	21.0	C

EB on I 26 E (Partial Basic Analysis)
Segment ID 8770

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	25.0	C
	2	26.0	C
	3	26.0	D
	4	27.0	D
	5	26.0	D
	6	25.0	C
	7	25.0	C
	8	26.0	D
	9	27.0	D
	10	25.0	C

NWB on I 26 W (Merge Analysis)
Segment ID 8773

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	15.0	B
	2	15.0	B
	3	15.0	B
	4	15.0	B
	5	17.0	B
	6	15.0	B
	7	16.0	B
	8	15.0	B
	9	17.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Basic Analysis)
Segment ID 8775

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	20.0	C
	2	21.0	C
	3	23.0	C
	4	24.0	C
	5	20.0	C
	6	21.0	C
	7	22.0	C
	8	21.0	C
	9	23.0	C
	10	20.0	C

WB on I 26 W (Diverge Analysis)
Segment ID 8776

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	B
	2	18.0	B
	3	17.0	B
	4	18.0	B
	5	18.0	B
	6	18.0	B
	7	17.0	B
	8	18.0	B
	9	17.0	B
	10	19.0	B

WB on I 26 W (Partial Basic Analysis)
Segment ID 8777

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	25.0	C
	2	24.0	C
	3	25.0	C
	4	25.0	C
	5	25.0	C
	6	25.0	C
	7	24.0	C
	8	25.0	C
	9	25.0	C
	10	25.0	C

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

EB on I 26 E (Partial Basic Analysis)
Segment ID 8778

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	25.0	C
	2	26.0	C
	3	26.0	D
	4	27.0	D
	5	26.0	D
	6	25.0	C
	7	25.0	C
	8	26.0	D
	9	27.0	D
	10	25.0	C

NWB on I 26 W (Partial Basic Analysis)
Segment ID 8779

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	22.0	C
	2	21.0	C
	3	21.0	C
	4	22.0	C
	5	22.0	C
	6	21.0	C
	7	21.0	C
	8	21.0	C
	9	22.0	C
	10	22.0	C

SEB on JAMES F BYRNES EXPY (Partial Basic Analysis)
Segment ID 8856

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	18.0	B
	2	17.0	B
	3	17.0	B
	4	17.0	B
	5	17.0	B
	6	17.0	B
	7	17.0	B
	8	18.0	B
	9	18.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Diverge Analysis)
Segment ID 8887

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	16.0	B
	2	16.0	B
	3	16.0	B
	4	18.0	B
	5	16.0	B
	6	16.0	B
	7	16.0	B
	8	16.0	B
	9	17.0	B
	10	15.0	B

SEB on I 26 E (Diverge Analysis)
Segment ID 8888

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	12.0	B
	2	13.0	B
	3	13.0	B
	4	14.0	B
	5	12.0	B
	6	11.0	B
	7	13.0	B
	8	13.0	B
	9	13.0	B
	10	13.0	B

NWB on I 26 W (Partial Basic Analysis)
Segment ID 8889

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	16.0	B
	3	17.0	B
	4	17.0	B
	5	17.0	B
	6	17.0	B
	7	16.0	B
	8	17.0	B
	9	17.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

SEB on I 26 E (Partial Basic Analysis)
Segment ID 8890

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	17.0	B
	3	17.0	B
	4	17.0	B
	5	17.0	B
	6	17.0	B
	7	16.0	B
	8	17.0	B
	9	17.0	B
	10	17.0	B

EB on I 26 E (Diverge Analysis)
Segment ID 8891

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	22.0	C
	2	23.0	C
	3	22.0	C
	4	22.0	C
	5	21.0	C
	6	21.0	C
	7	22.0	C
	8	23.0	C
	9	22.0	C
	10	22.0	C

SEB on I 26 E (Partial Basic Analysis)
Segment ID 8893

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	17.0	B
	2	17.0	B
	3	17.0	B
	4	17.0	B
	5	17.0	B
	6	17.0	B
	7	16.0	B
	8	17.0	B
	9	17.0	B
	10	17.0	B

Overview Aggregate Report for Freeway Segment Level of Service

Across 10 simulations (4:45:00PM - 5:45:00PM)

Date & Time of Run: Various Selection: I-26 Mainline

WB on I 26 W (Partial Basic Analysis)
Segment ID 8895

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	25.0	C
	2	24.0	C
	3	25.0	C
	4	25.0	C
	5	25.0	C
	6	25.0	C
	7	24.0	C
	8	25.0	C
	9	25.0	C
	10	25.0	C

WB on I 26 W (Merge Analysis)
Segment ID 8896

Interval Ending	Run	Density (pce/mi/ln)	Level of Service
5:45:00PM	1	19.0	B
	2	17.0	B
	3	18.0	B
	4	18.0	B
	5	19.0	B
	6	17.0	B
	7	16.0	B
	8	18.0	B
	9	18.0	B
	10	19.0	B

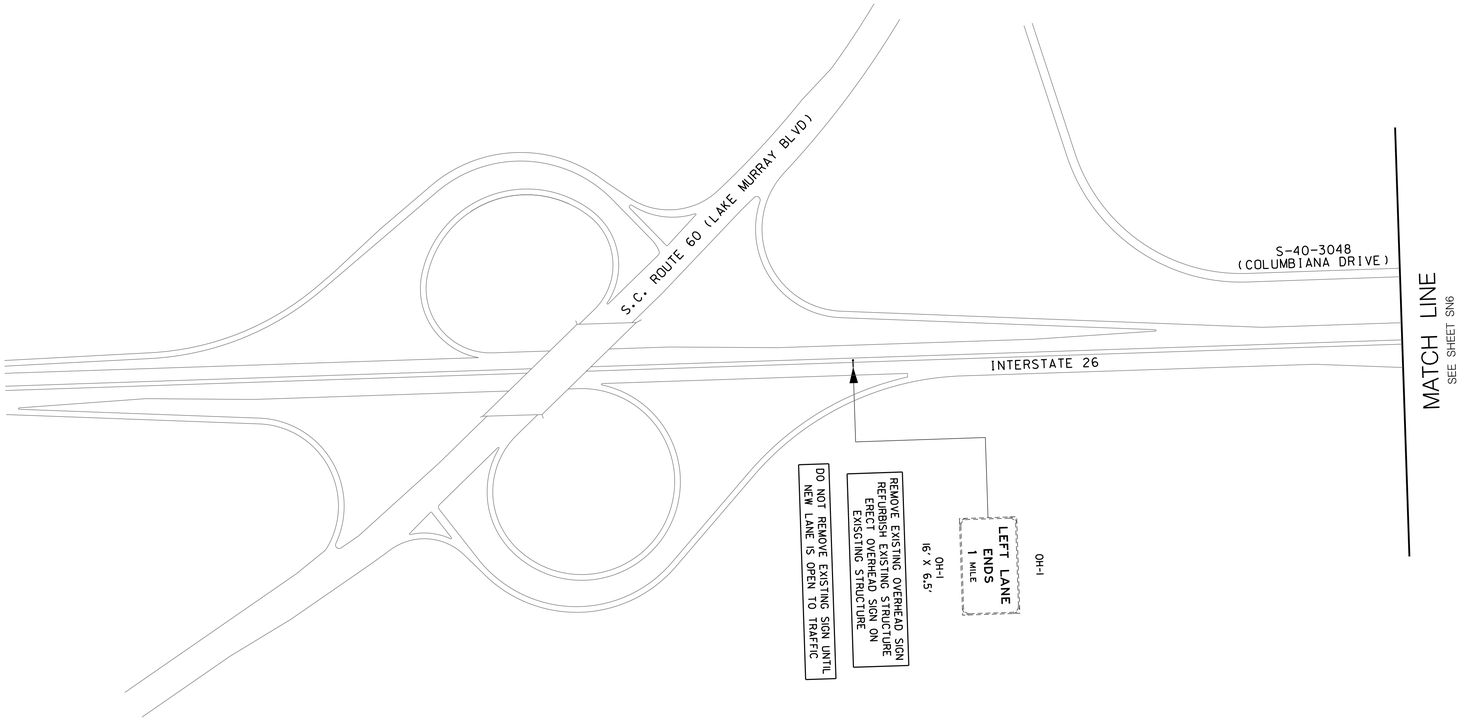
Appendix G

Conceptual Signing Plan

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND LEXINGTON	P029208	I-26	SN5

GENERAL NOTES:
1) ALL I-BEAM POSTS FOR LOGO SIGNS WILL BE DESIGNED TO SUPPORT FULL SIZE LOGO PANELS, MAINLINE PANELS ARE 15' X 10' AND RAMP PANELS ARE 8.5' X 6.5'



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DATE : 01/08/18

APPROVED BY : B.G.N.
DATE : 01/09/18

CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND AND LEXINGTON	P029208	I-26	SN6

MATCH LINE
SEE SHEET SN5

S-40-3048
(COLUMBIANA DRIVE)

EXITS 102 A-B
60
Lake Murray Blvd
Irmo
½ MILE

OH-2

OH-2A-102A-B

EXIT 101 B
176
EAST
Broad River Road - EAST
EXIT ONLY

OH-2B-101B
15.5' X 12.5'
EP-10' X 2.5'

RETAIN EXISTING OVERHEAD SIGN
OH2A-102A-B
REMOVE EXISTING OVERHEAD SIGN OH-2B-101B
REFURBISH AND MODIFY EXISTING STRUCTURE
AND ADJUST SIGN HANGERS
ERECT NEW OVERHEAD SIGN OH-2B-101B ON
EXISTING STRUCTURE

M1025-101

EXIT 101

M1025-101
6.5' X 5'

ERECT NEW I-BEAM POSTS
INSTALL NEW SIGN

OH-3

EXIT 101 A
WEST
176
Broad River Road - WEST
EXIT ONLY

EXIT 101 B
EAST
176
Broad River Road - EAST
EXIT ONLY

OH-3B-101A
15.5' X 12.5'
EP-10.5' X 2.5'

OH-3B-101B
15.5' X 12.5'
EP-10' X 2.5'

ERECT NEW CANTILEVER STRUCTURE
INSTALL NEW SIGN

Entering SCDOT Assistance Zone
DIAL *HP

REMOVE EXISTING SIGN
REMOVE EXISTING I-BEAM POSTS

INTERSTATE 26

S-40-2894 (WESTERN LN)

600 605 610 615

R2-4a-48-60/45
SPEED LIMIT 60 MINIMUM 45

ERECT NEW I-BEAM POSTS
INSTALL NEW SIGN

R2-4a-48-60/45
SPEED LIMIT 60 MINIMUM 45

INSTALL BARRIER-MOUNT I-BEAM POST
INSTALL NEW SIGN

MATCH LINE STA. 615+00
SEE SHEET SN7

R2-4a-48-65/45
SPEED LIMIT 65 MINIMUM 45

ERECT NEW I-BEAM POSTS
INSTALL NEW SIGN

Leaving SCDOT Assistance Zone

REMOVE EXISTING SIGN
REMOVE EXISTING I-BEAM POSTS

U.S. ROUTE 176 (BROAD RIVER RD)

NOTE:
REMOVE LANE DROP WARNING
SIGNS AND POSTS
ON BARRIER WALL WHEN NEW
LANE IS OPEN TO TRAFFIC

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DATE : 01/09/18

CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

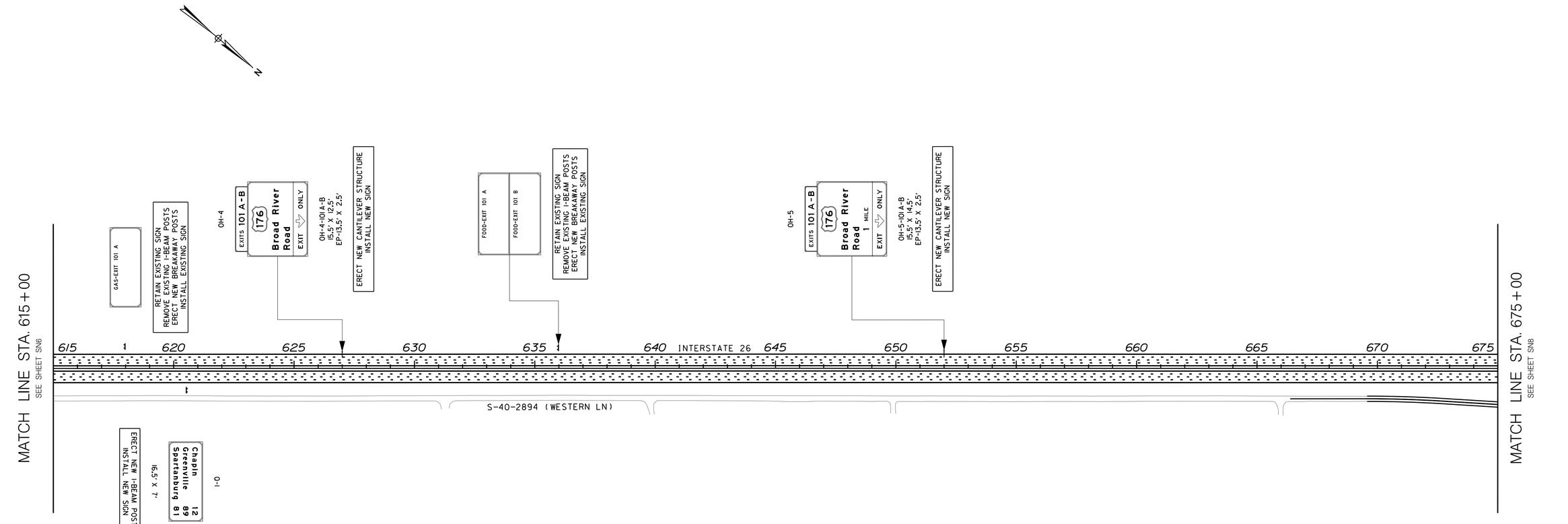
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
BEGIN TO STA. 615+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND AND LEXINGTON	P029208	I-26	SN7



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CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

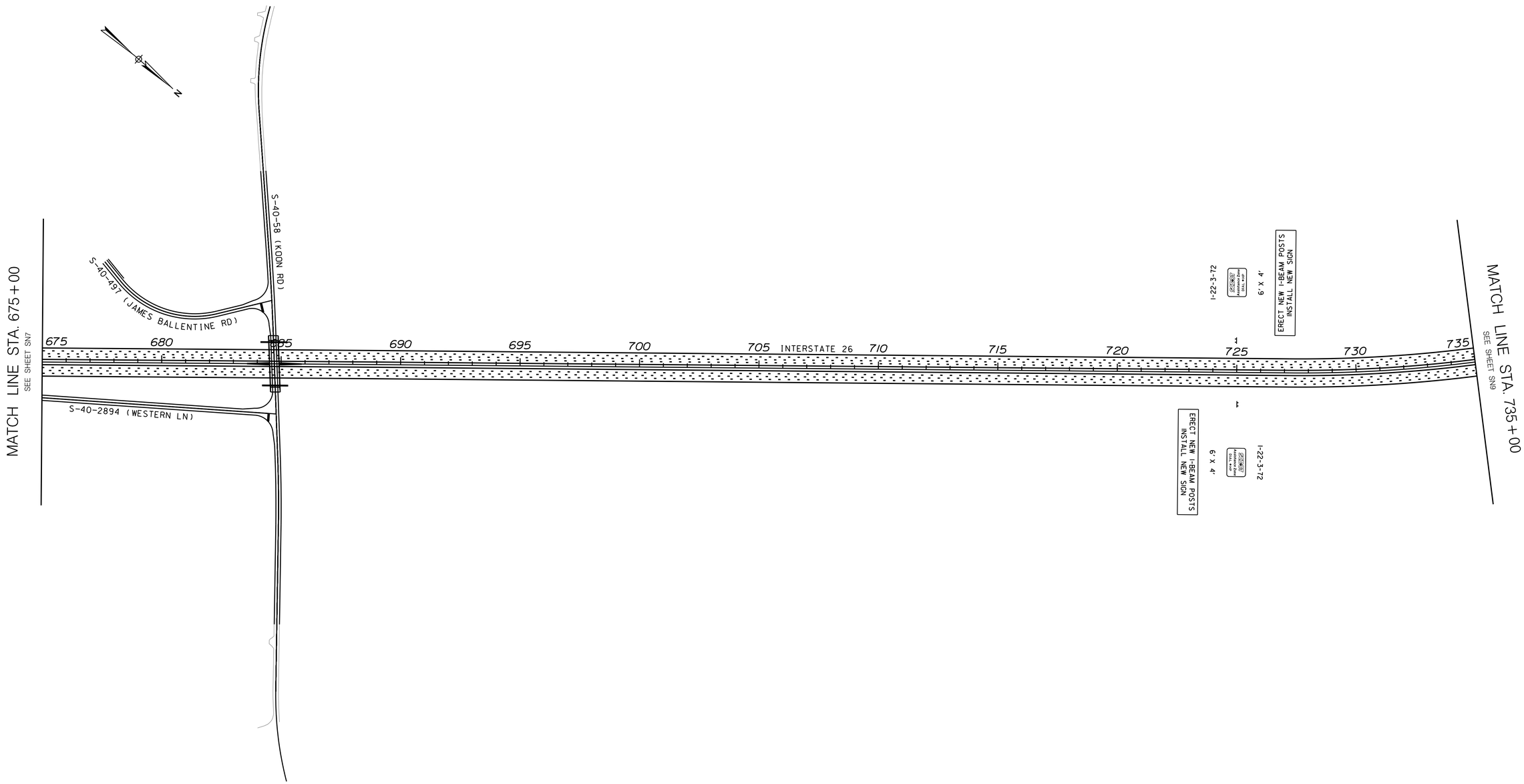
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 615+00.00 TO STA. 675+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND LEXINGTON	P029208	I-26	SN8



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DATE : 01/09/18

C E
C S
CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800
SCALE: 1" = 200' HORIZ

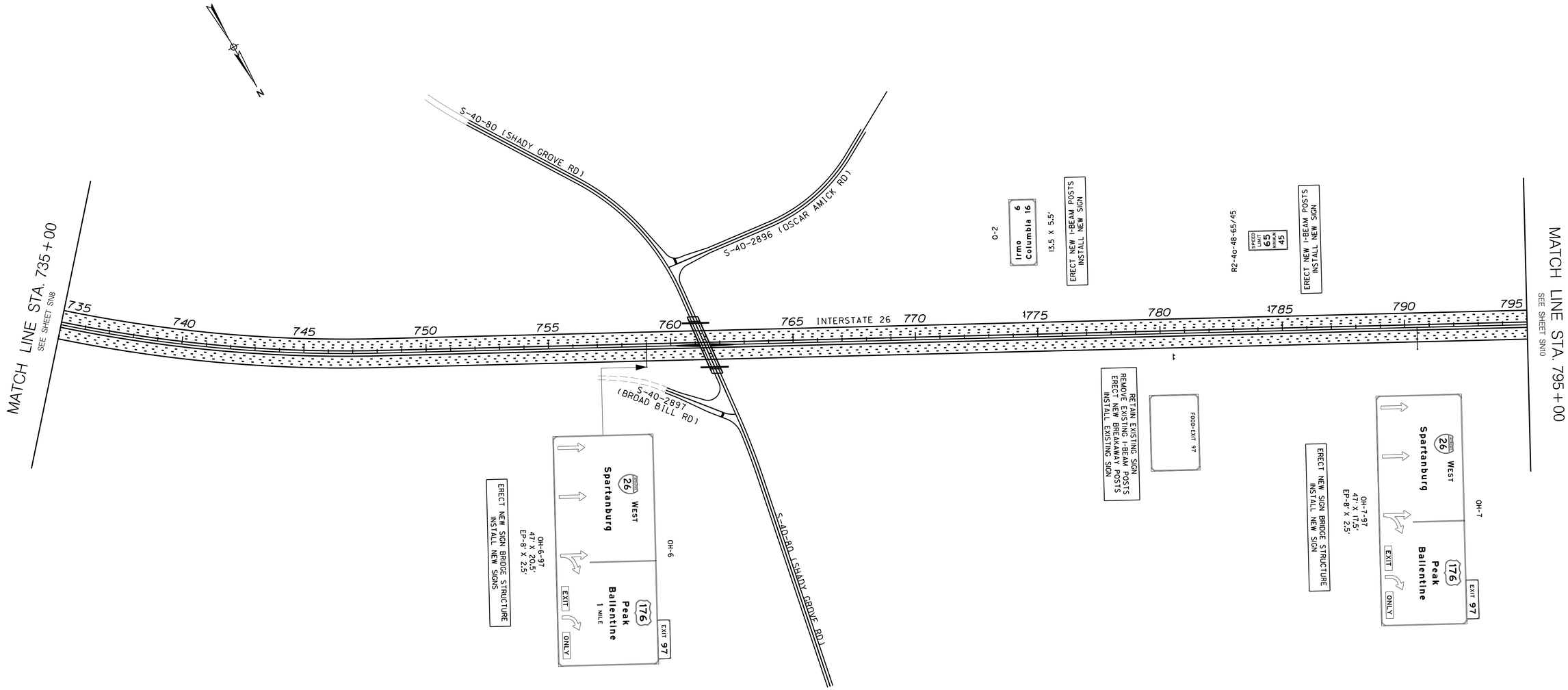
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
SCDOT

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 675+00.00 TO STA. 735+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND LEXINGTON	P029208	I-26	SN9



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DATE : 01/09/18

CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 735+00.00 TO STA. 795+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND/ KOLAND LEXINGTON	P029208	I-26	SN10

MATCH LINE STA. 795+00
SEE SHEET SN9

MATCH LINE STA. 855+00
SEE SHEET SN11

INTERSTATE 26

795 800 805 810 815 820 825 830 835 840 845 850 855

U.S. ROUTE 176 (BROAD RIVER RD)

S-40-385 (RAUCH-METZ RD)

S-40-2805 (BROAD STONE RD CONN.)

S-40-2805 (BROAD STONE RD)

S-40-2898 (BROAD BERRY RD)

N

OH-14
Columbia
EAST
26
RIGHT LANE
ERECT NEW CANTILEVER STRUCTURE INSTALL NEW SIGN
21.5' X 10'

OH-15A
Spartanburg
WEST
26
LEFT LANE
ERECT NEW CANTILEVER STRUCTURE INSTALL NEW SIGN
15.5' X 10'

OH-15
Columbia
EAST
26
15.5' X 8.5'

OH-13
Ballentine
White Rock
EAST
176

OH-13B
15' X 12.5'
ERECT NEW SIGN BRIDGE STRUCTURE INSTALL NEW SIGNS

OH-13A
14.5' X 11'

Columbia
EAST
26
ONLY

OH-12
Peak
Pomaria
WEST
176

OH-12A
13.5' X 12.5'
ERECT NEW SIGN BRIDGE STRUCTURE INSTALL NEW SIGNS

OH-12B
15' X 12.5'

GAS
RETAIN EXISTING SIGN
REMOVE EXISTING I-BEAM POSTS
ERECT NEW BREAKAWAY POSTS
INSTALL EXISTING SIGN

FOOD
RETAIN EXISTING SIGN
REMOVE EXISTING I-BEAM POSTS
ERECT NEW BREAKAWAY POSTS
INSTALL EXISTING SIGN

MI025-97
EXIT 97
6' X 5'
ERECT NEW I-BEAM POSTS INSTALL NEW SIGN

OH-17
EXIT 97
Ballentine
White Rock
EAST
176

OH-17-97
18.5' X 10'
EP-8' X 2.5'
ERECT NEW CANTILEVER STRUCTURE INSTALL NEW SIGN

OH-10
West
Spartanburg
RIGHT LANE
26

OH-10
15.5' X 12'
ERECT NEW CANTILEVER STRUCTURE INSTALL NEW SIGN

OH-8
Spartanburg
WEST
26
Peak
Ballentine
176
EXIT
ONLY
EXIT 97

OH-8-97
47' X 17.5'
EP-8' X 2.5'
ERECT NEW SIGN BRIDGE STRUCTURE INSTALL NEW SIGNS

GAS-EXIT 97
RETAIN EXISTING SIGN
REMOVE EXISTING I-BEAM POSTS
ERECT NEW BREAKAWAY POSTS
INSTALL EXISTING SIGN

OH-9
Ballentine
White Rock
EAST
176

OH-9A
15' X 12.5'
ERECT NEW SIGN BRIDGE STRUCTURE INSTALL NEW SIGNS

OH-9B
16' X 12.5'
Peak
Pomaria
WEST
176

RETAIN EXISTING SIGN
REMOVE EXISTING I-BEAM POSTS
ERECT NEW BREAKAWAY POSTS
INSTALL EXISTING SIGN

FOOD

GAS

OH-16
Spartanburg
WEST
26

OH-16A
19' X 8.5'
ERECT NEW SIGN BRIDGE STRUCTURE INSTALL NEW SIGNS

OH-16B
12.5' X 14.5'

OH-16
Peak
Pomaria
WEST
176

OH-16
Columbia
EAST
26
LEFT LANE

OH-16A
12.5' X 10'

OH-16B
19' X 8.5'
ERECT NEW CANTILEVER STRUCTURE INSTALL NEW SIGN

OH-16
Spartanburg
WEST
26

4' X 7'

Ⓐ ERECT NEW I-BEAM POSTS INSTALL NEW SIGN

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CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800
SCALE: 1" = 200' HORIZ

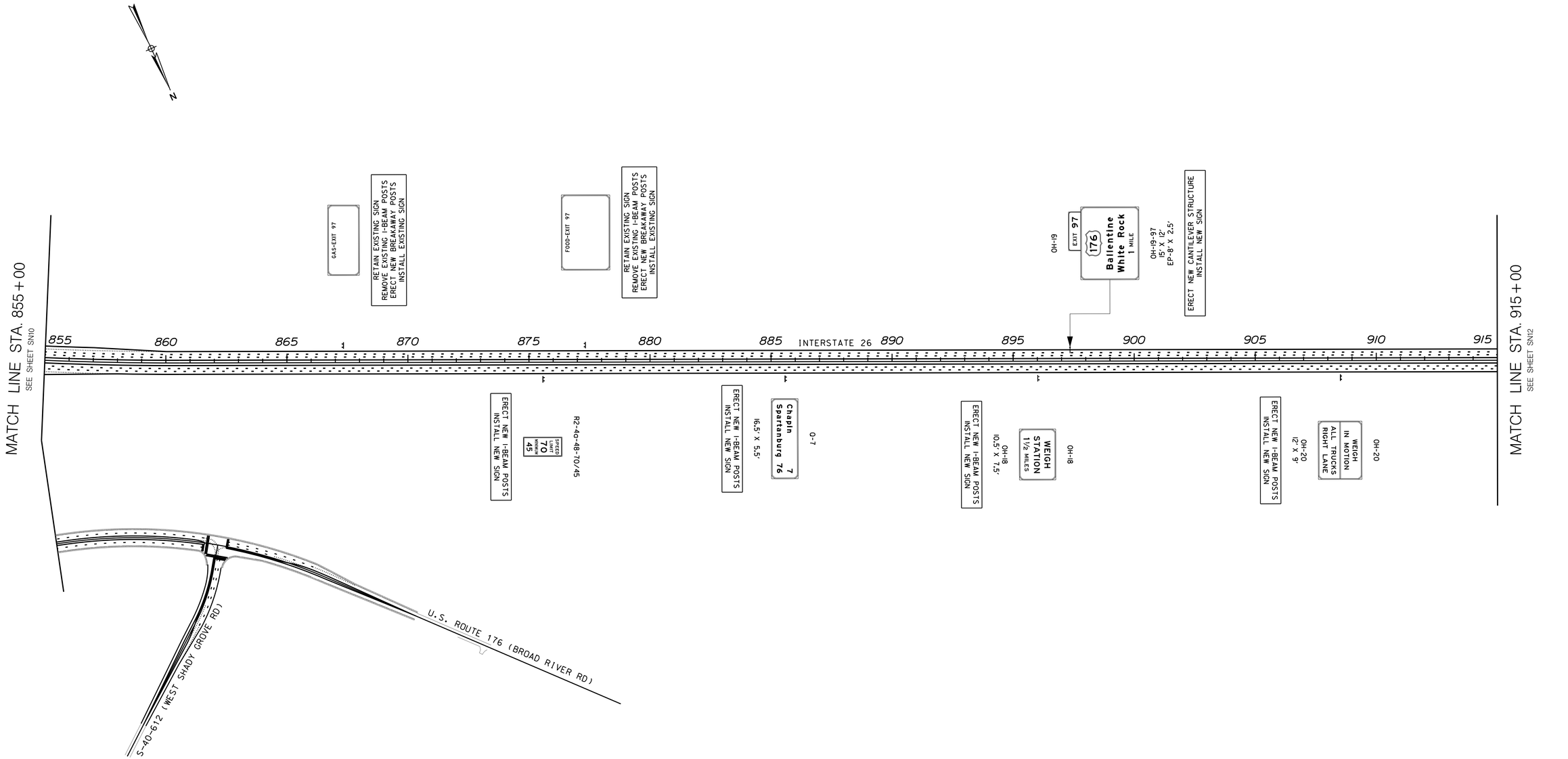
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 795+00.00 TO STA. 855+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND LEXINGTON	P029208	I-26	SN11



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CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

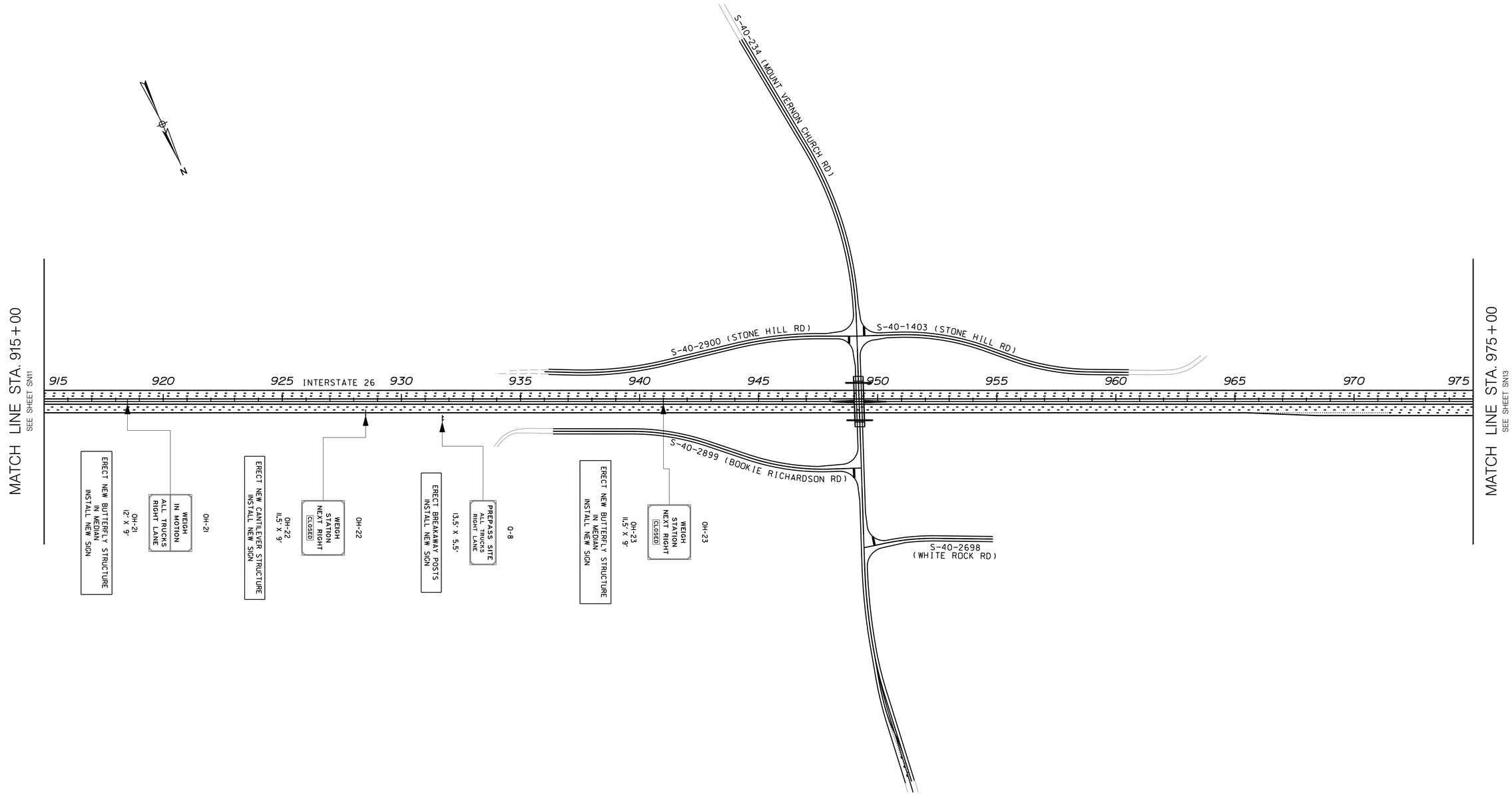
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 855+00.00 TO STA. 915+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND AND LEXINGTON	P029208	I-26	SN12



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CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

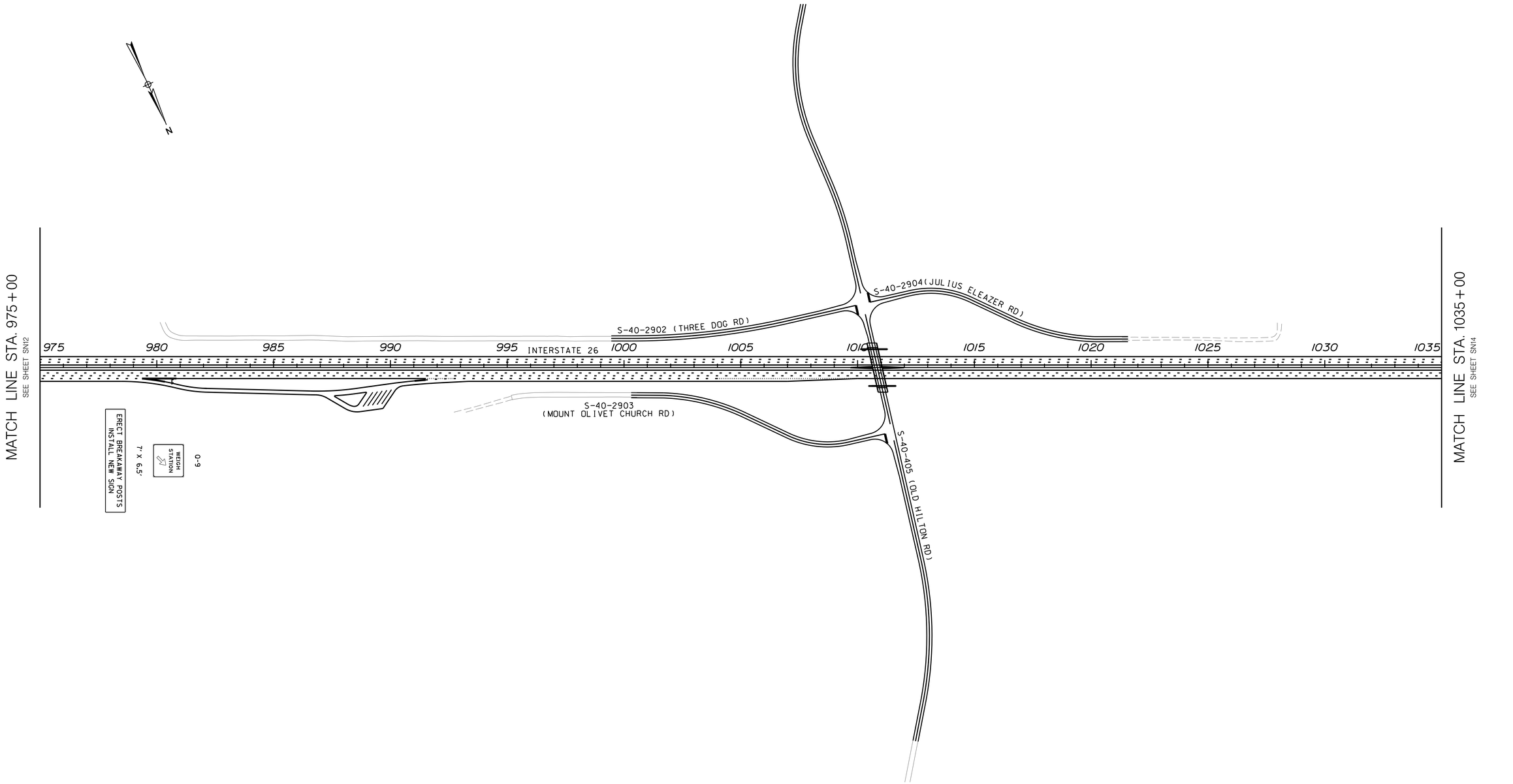
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 915+00.00 TO STA. 975+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND, RICHLAND AND LEXINGTON	P029208	I-26	SNI3



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CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

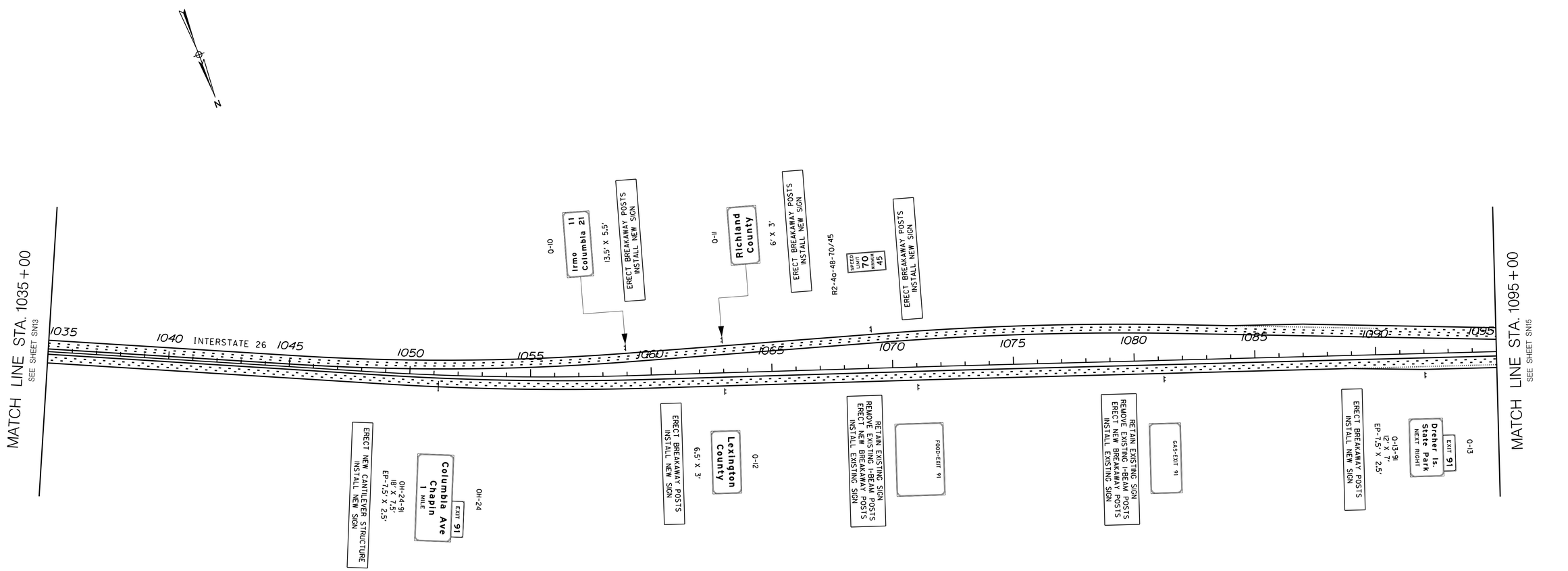
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 975+00.00 TO STA. 1035+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND LEXINGTON	P029208	I-26	SN14



REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED	REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED

DRAWN BY : R.L.D.
DATE : 01/05/18

REVIEWED BY : T.L.R.
DATE : 01/08/18

APPROVED BY : B.G.N.
DATE : 01/09/18

CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

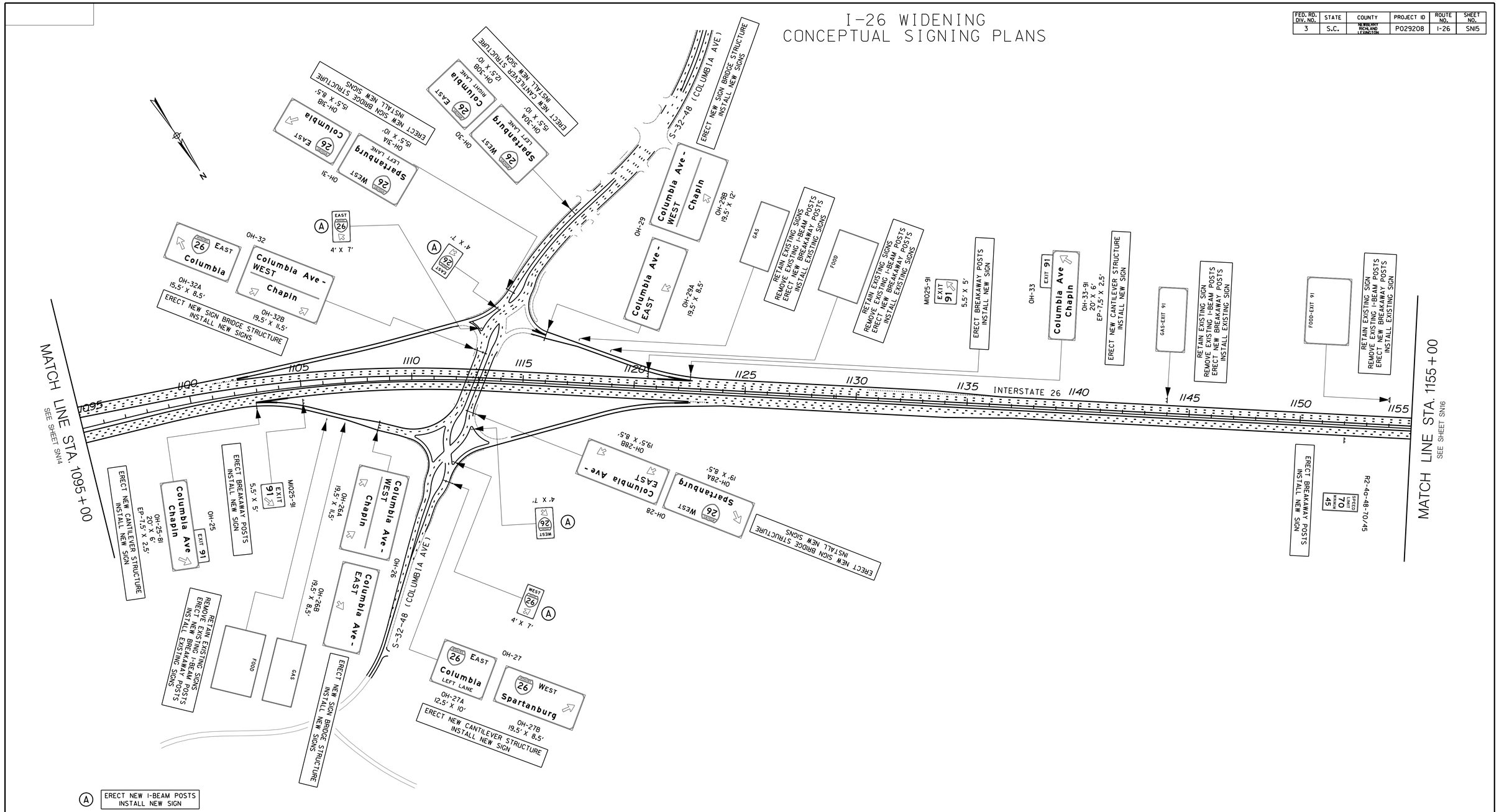
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 1035+00.00 TO STA. 1095+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND LEXINGTON	P029208	I-26	SN15



REVISIONS NO.	DATE	DESCRIPTION	BY	CHECKED	REVISIONS NO.	DATE	DESCRIPTION	BY	CHECKED

DRAWN BY : R.L.D. DATE : 01/05/18

REVIEWED BY : T.L.R. DATE : 01/08/18

APPROVED BY : B.G.N. DATE : 01/09/18

CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

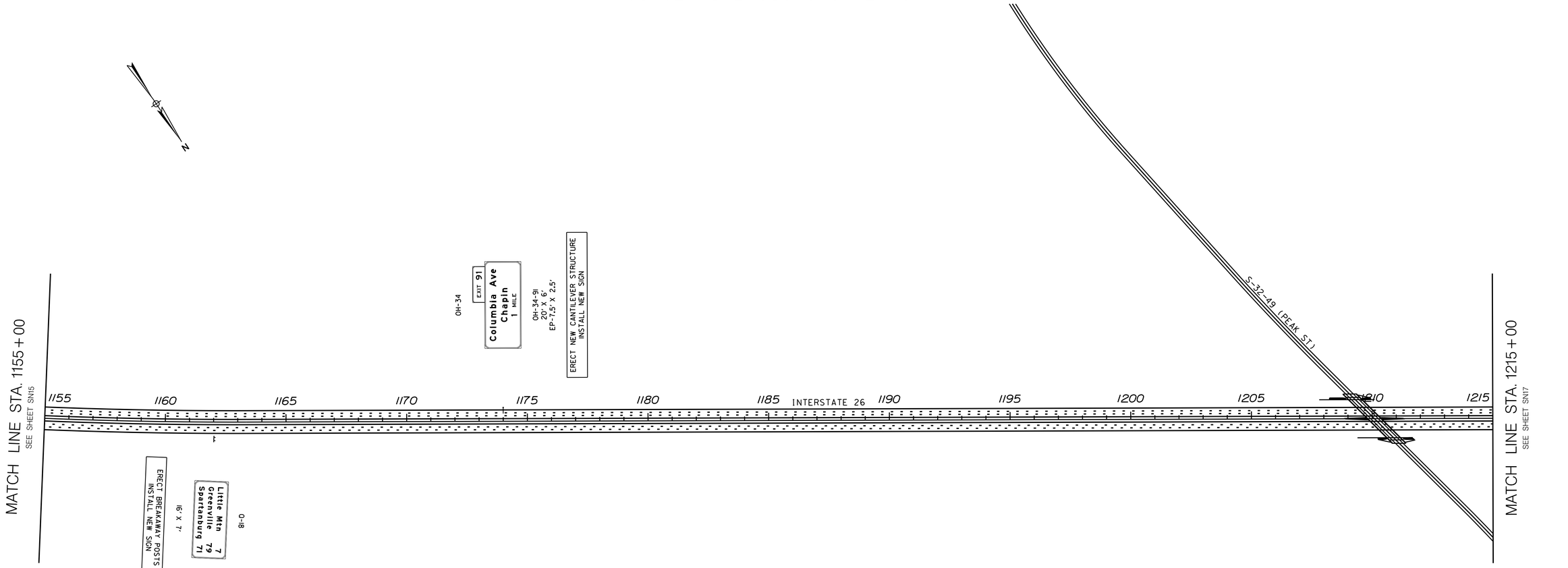
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 1095+00.00 TO STA. 1155+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND/ FAIRFIELD/ LEXINGTON	P029208	I-26	SN16



REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED	REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED

DRAWN BY : R.L.D.
DATE : 01/05/18

REVIEWED BY : T.L.R.
DATE : 01/08/18

APPROVED BY : B.G.N.
DATE : 01/09/18

C E
C S
CIVIL ENGINEERING
CONSULTING SERVICES, INC.

0 200 400 600 800
SCALE: 1" = 200' HORIZ

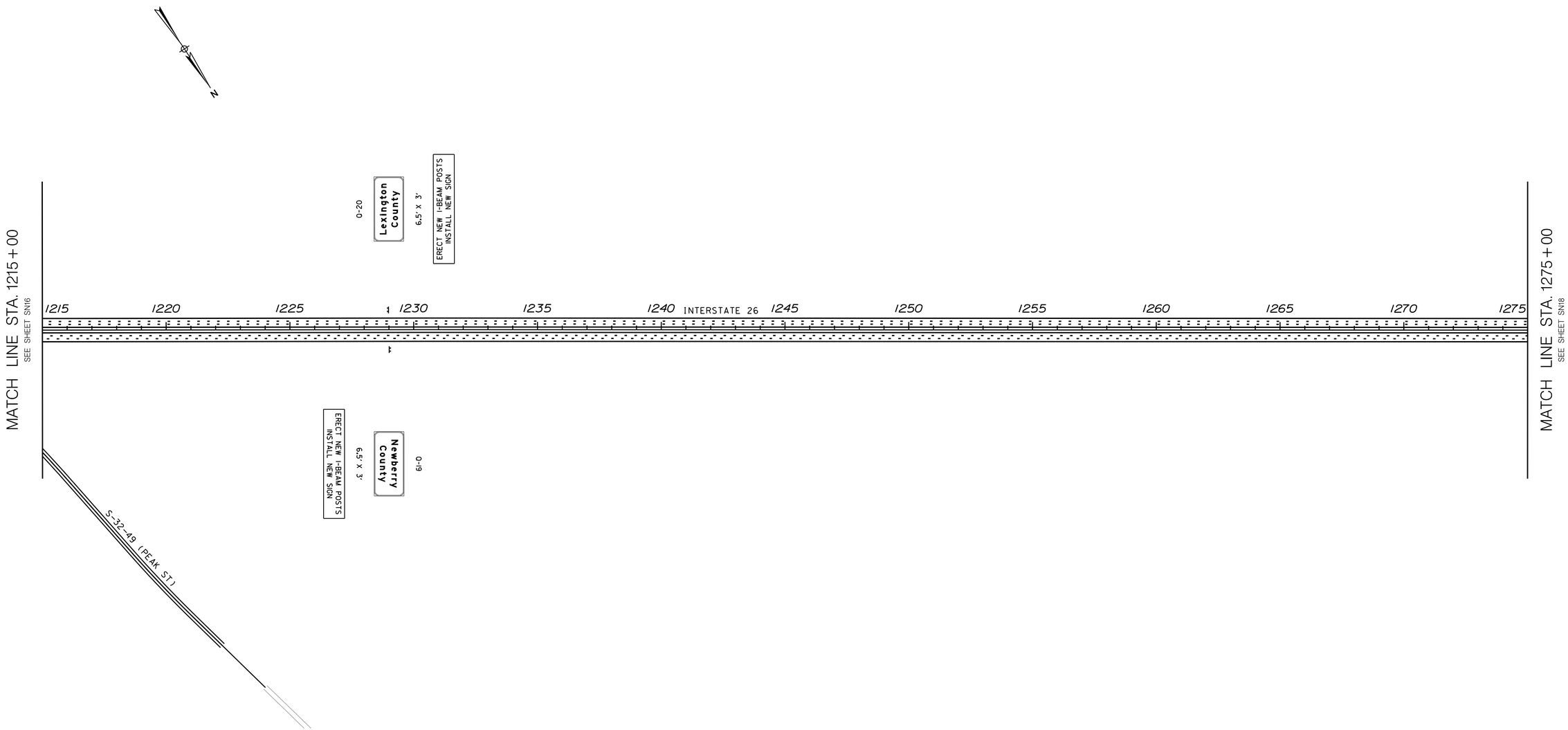
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 1155+00.00 TO STA. 1215+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND LEXINGTON	P029208	I-26	SN17



REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED	REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED

DRAWN BY : R.L.D.
DATE : 01/05/18

REVIEWED BY : T.L.R.
DATE : 01/08/18

APPROVED BY : B.G.N.
DATE : 01/09/18

CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

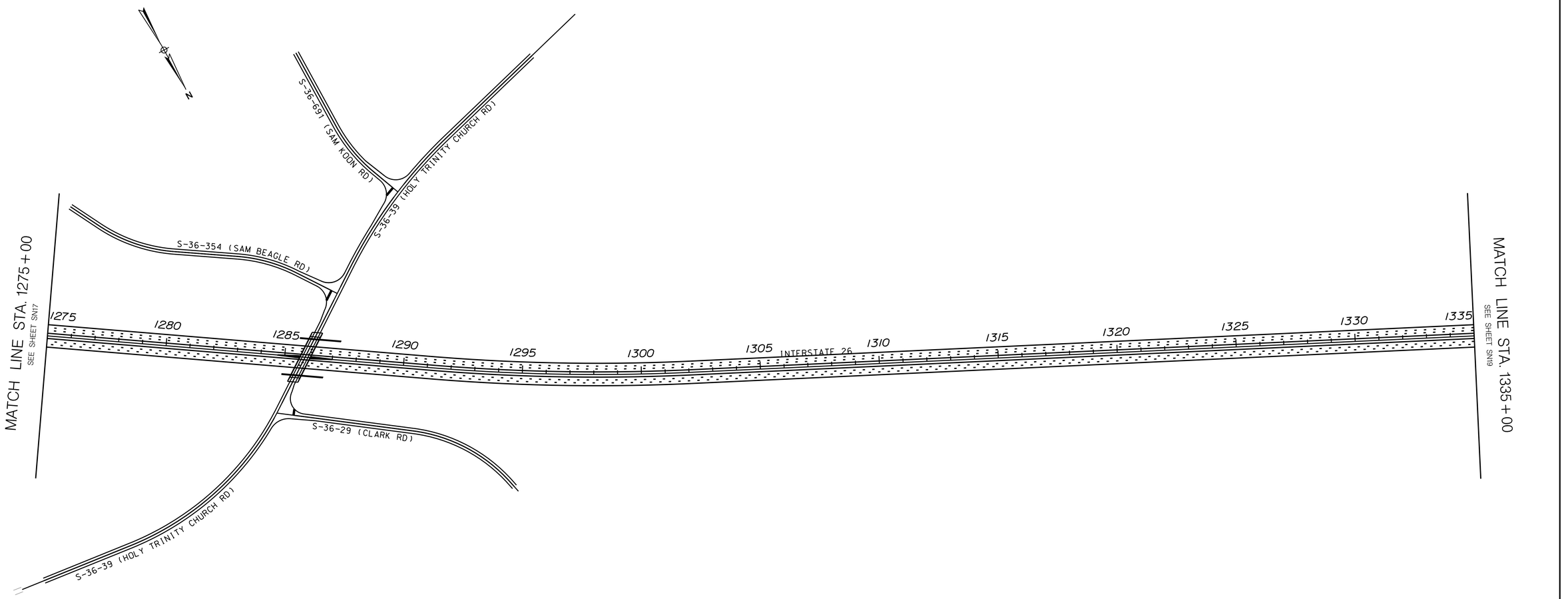
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 1215+00.00 TO STA. 1275+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND LEXINGTON	P029208	I-26	SN18



REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED	REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED

DRAWN BY : R.L.D.
DATE : 01/05/18

REVIEWED BY : T.L.R.
DATE : 01/08/18

APPROVED BY : B.G.N.
DATE : 01/09/18

CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

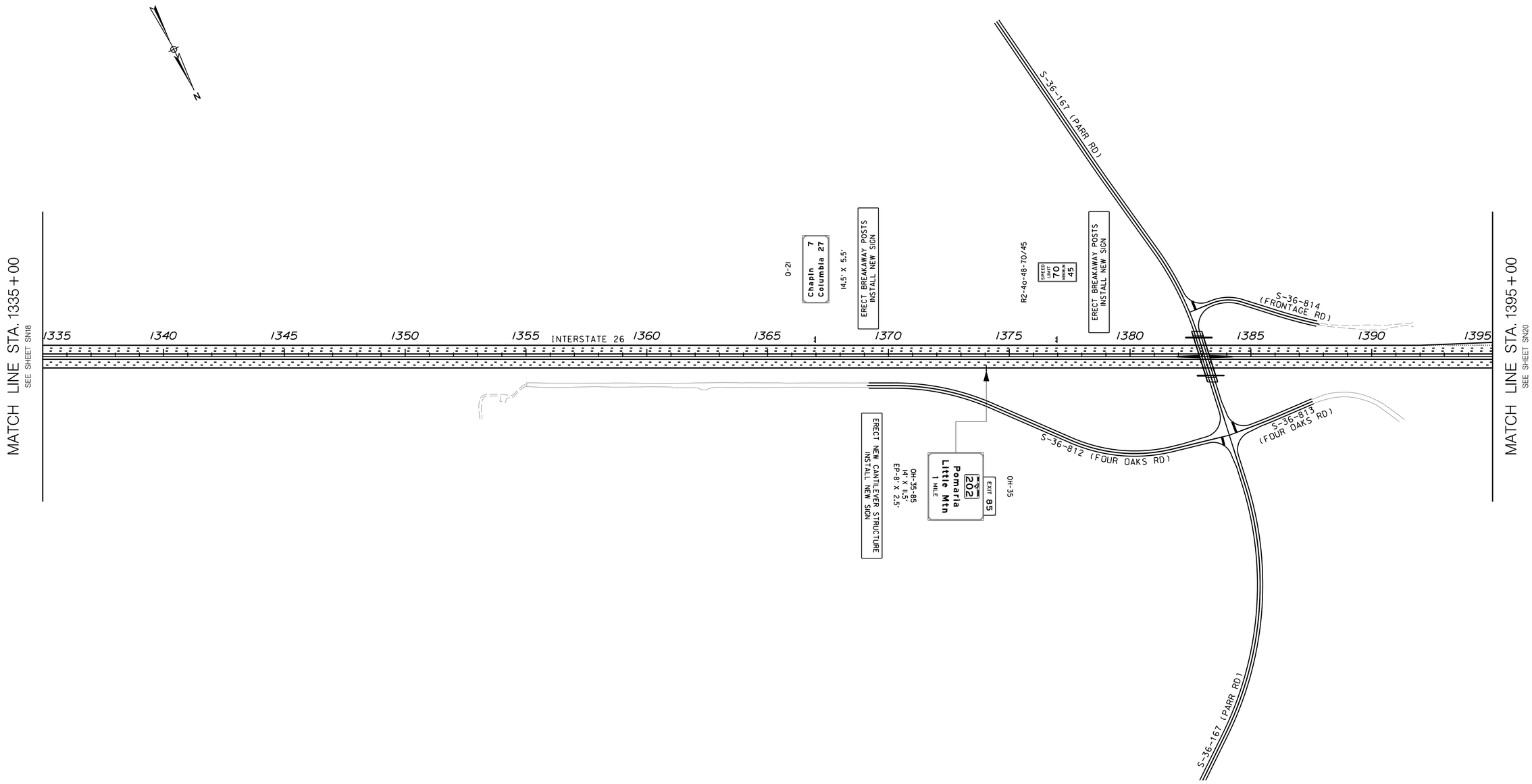
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 1275+00.00 TO STA. 1335+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND LEXINGTON	P029208	I-26	SN19



REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED	REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED

DRAWN BY : R.L.D.
DATE : 01/05/18

REVIEWED BY : T.L.R.
DATE : 01/08/18

APPROVED BY : B.G.N.
DATE : 01/09/18

CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

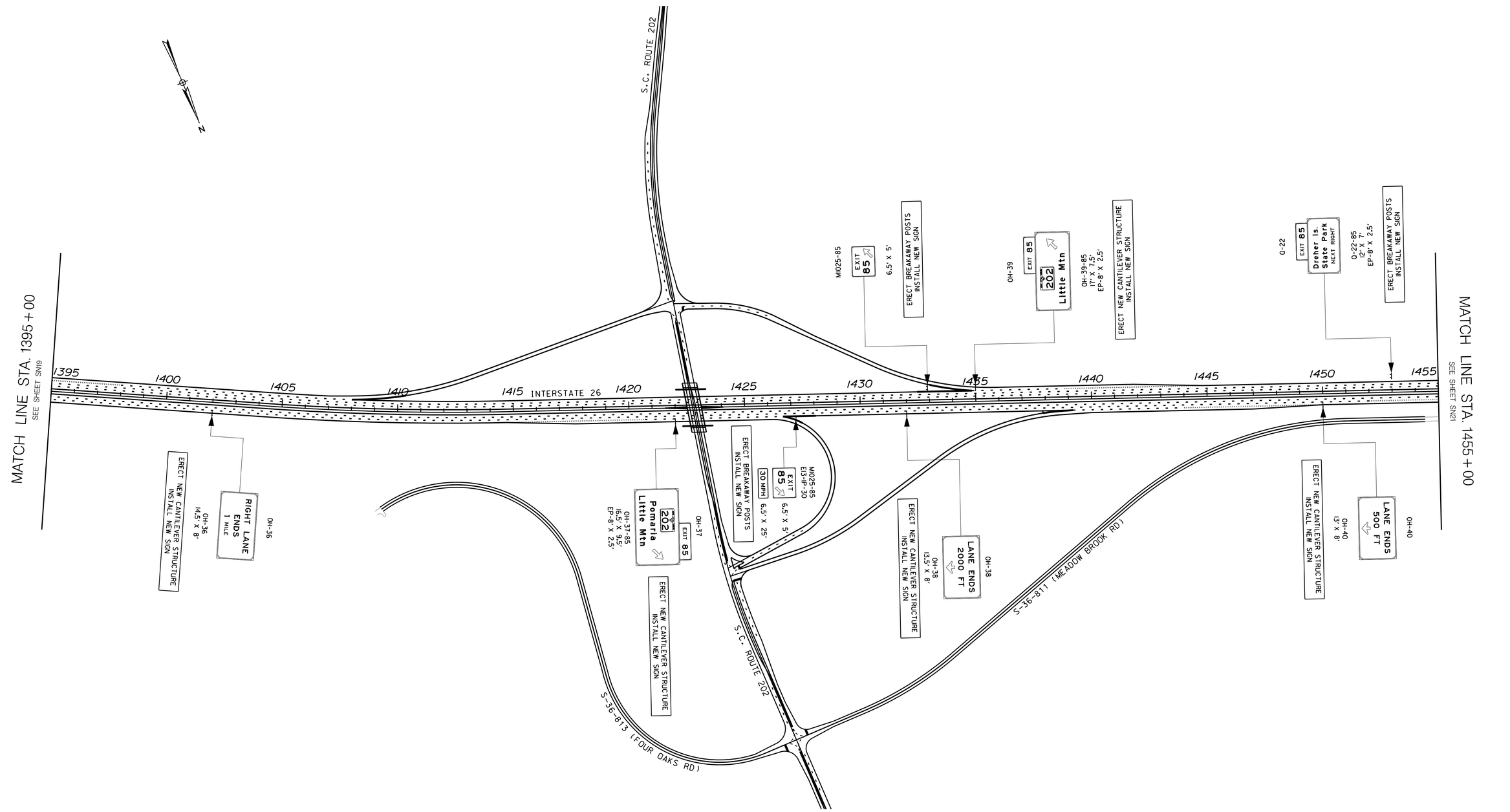
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 1335+00.00 TO STA. 1395+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND LEXINGTON	P029208	I-26	SN20



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DRAWN BY : R.L.D.
DATE : 01/05/18

REVIEWED BY : T.L.R.
DATE : 01/08/18

APPROVED BY : B.G.N.
DATE : 01/09/18

CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

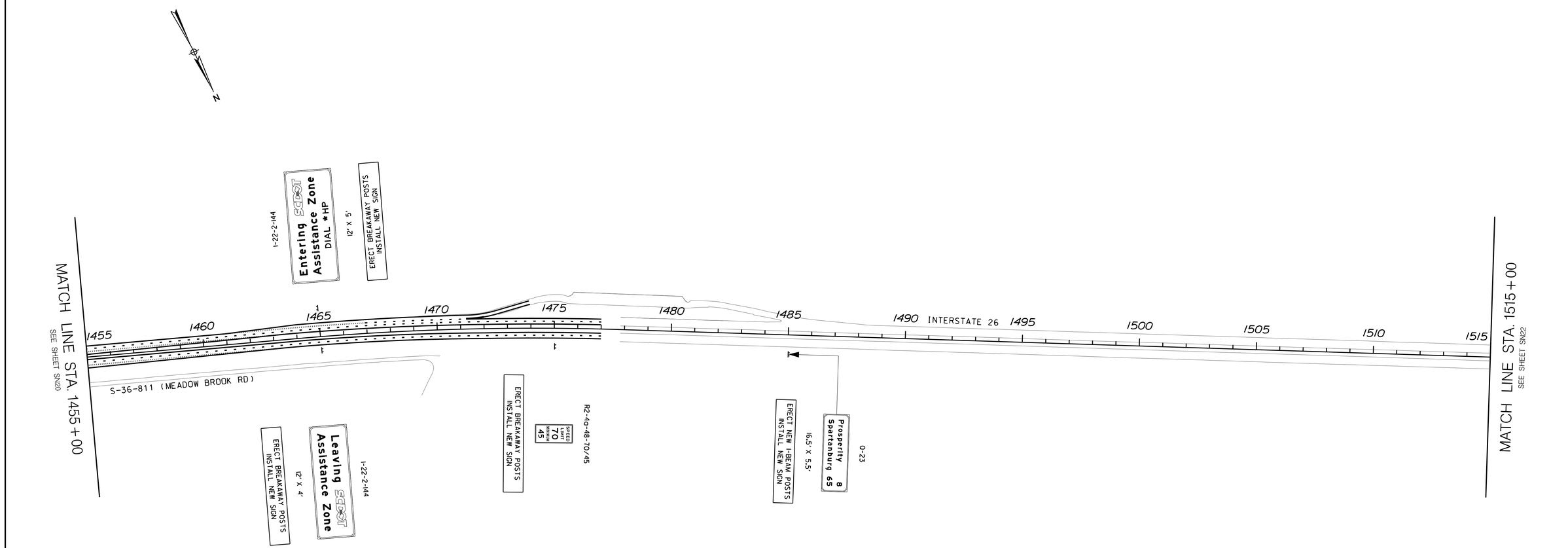
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 1395+00.00 TO STA. 1455+00.00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	SPARTANBURG/ RICHLAND/ LEXINGTON	P029208	I-26	SN21



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DRAWN BY : R.L.D.
DATE : 01/05/18

REVIEWED BY : T.L.R.
DATE : 01/08/18

APPROVED BY : B.G.N.
DATE : 01/09/18

CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 1455+00.00 TO STA. 1515+00

I-26 WIDENING
CONCEPTUAL SIGNING PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROUTE NO.	SHEET NO.
3	S.C.	RICHLAND & LEXINGTON	P029208	I-26	SN22

REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED	REVISIONS NO.	REVISIONS DATE	DESCRIPTION	BY	CHECKED

DRAWN BY : R.L.D. DATE : 01/05/18

REVIEWED BY : T.L.R. DATE : 01/08/18

APPROVED BY : B.G.N. DATE : 01/09/18

CIVIL ENGINEERING CONSULTING SERVICES, INC.

0 200 400 600 800

SCALE: 1" = 200' HORIZ

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

INTERSTATE 26 WIDENING

SIGNING PLAN SHEET
STA. 1515+00.00 TO STA. XX+XX

$$$$$$paths$$$$$$$$filename$$$$$$$$
$$$$date$$$$