STATE ROUTE 316
IMPLEMENTATION PLAN

Prepared for
Georgia Department of Transportation

Prepared by
HNTB Corporation

FINAL REPORT

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SECTION I EXECUTIVE SUMMARY

The SR 316 Implementation Plan is a study conducted by the Georgia Department of Transportation (GDOT) of planned and programmed transportation improvements along the SR 316/University Parkway Corridor in Gwinnett, Barrow and Oconee Counties, Georgia. This corridor has experienced substantial growth in traffic volumes over the last several decades and is in need of significant traffic capacity improvements.

BACKGROUND

Several studies, design and construction projects have been performed by GDOT that included the SR 316 corridor. Four of these GDOT sponsored projects are as follows:

- State Route 316 Corridor Analysis
- HOV Strategic Implementation Plan for the Atlanta Region
- SR 316/I-85 Interchange Reconstruction
- SR 316 Grade Separation Projects

PURPOSE OF THE STUDY

The purpose of this study is to develop tools for GDOT to evaluate the currently planned and other potential highway improvement projects within the SR 316 corridor to determine an implementation plan for these projects. Projects in the construction work program (CWP) and in Long Range (LR) will be evaluated to determine if they will address the needs of the corridor in the most efficient way.

STAKEHOLDER IDENTIFICATION

The stakeholders coordinated with during this study included the following local governments:

- Gwinnett County Department of Transportation
- Barrow County Public Works Department
- Oconee County Public Works Department

PROGRAMMED AND FUTURE PROJECTS

For the purposes of this study, programmed and future highway improvement projects used in the implementation analysis fell into the three following categories:

1. Programmed projects scheduled to be completed before 2015
2. Programmed General Purpose (GP) projects scheduled to be completed between 2015 and 2032
3. Eastern expansion of SR 316 HOV system to SR 10 (Athens Loop)

TRAFFIC FORECASTS

Traffic forecasts for this study were estimated using a combination of current traffic counts and traffic projections taken from a corridor travel demand model that was prepared specifically for this study.

The following models served as a base for the SR 316 Corridor Model:

- ARC's 20-County Model
- MACORTS Model

The entire portion of Gwinnett and Barrow County were extracted from the ARC model and a portion of Oconee and Clarke County were extracted from the MACORTS model. The extracted portions of these two models were then merged to form a single corridor-based model.

In addition to the existing (2007) model, models were developed for the analysis years of 2015 and 2032. The 2015 and 2032 model networks were modified to include the committed projects. These networks serve as the 2015 Existing and Committed (E+C), and 2032 E+C models. The 2015 E+C model included all GP and HOV projects that were currently programmed to be completed before 2015. The 2032 E+C model included the improvements from the 2015 E+C model plus any other GP improvements that were currently programmed to be completed before 2032.

CORSIM MODELING AND TRAFFIC ANALYSIS

Traffic conditions within the SR 316 corridor were analyzed for the future years of 2015 and 2032 under various conditions. The traffic operations analyses followed the procedures defined by the 2000 Highway Capacity Manual and were performed using Synchro, a traffic signal timing optimization computer software. The capacity analyses were supplemented by operational analyses using the CORSIM traffic micro-simulation computer software.

All the traffic bottleneck locations were evaluated to determine if minor transportation improvements could significantly reduce the simulated congestion problem. If these improvements did not reduce congestion at the bottleneck, such that it did not impact adjacent intersections or other roads, then more substantial improvements were implemented. The changes for the 2015 E+C network are listed in **Table I-1** (See **Figures IV-1** through **IV-3** for locations of improvements).

The programmed projects were added to the 2032 E+C models, and then based on preliminary CORSIM runs, supplemental improvements were made to these models. The supplemental improvements made to the 2032 E+C models are listed in **Table I-2** (See **Figures IV-1** through **IV-3** for locations of improvements). The proposed future HOV improvements were added to create the 2032 Build CORSIM models. Then supplemental improvements were made to these models, see **Table I-3** (See **Figures IV-1** through **IV-3** for locations of improvements).

Table I-1 Supplemental 2015 E+C Highway Improvements along SR 316

Loc #	Project	County	Description	Comment
4	Lawrenceville-Suwanee/SR 316 HOV Interchange Traffic Signal	Gwinnett	New traffic signal at SR 316 HOV ramp terminal intersection	
9	SR 20/SR 316 Interchange Right Turn Lane	Gwinnett	Convert outside SR 20 SB through lane to shared right and through lane	SR 20 SB dual right turns
7	Hi Hope Rd Widening	Gwinnett	Widen Hi Hope Rd to four lanes south of Hurricane Shoals Rd	
7	Hurricane Shoals Rd/Hi Hope Rd Traffic Signal & Left Turn Lane	Gwinnett	New traffic signal and WB left turn lane at existing intersection	Hurricane Shoals Rd WB dual left turns
37	Fence Rd/SR 316 Right Turn Lane	Gwinnett	New Fence Rd SB right turn lane	
16	Kilcrease Rd/SR 316 Right Turn Lane	Barrow	New Kilcrease Rd SB right turn lane	
16	Kilcrease Rd/Fred Kilcrease Rd Left Turn Lane	Barrow	New Kilcrease Rd SB left turn lane	
35	Dials Mill Road Traffic Signal	Oconee	New traffic signal at existing SR 316 intersection	
38	SR 10/Monroe Hwy/SR 316 Interchange Traffic Signal	Oconee	New traffic signal at SR 316 WB ramp terminal intersection	
30	Jimmy Daniel Rd/SR 316 Left Turn Lane	Oconee	New Jimmy Daniel Rd SB left turn lane	

Table I-2 Supplemental 2032 E+C Highway Improvements along SR 316

Loc #	Project	County	Description	Comment
5	Lawrenceville-Suwanee/ SR 120 Left Turn Lane	Gwinnett	New Lawrenceville-Suwanee SB left turn lane	Lawrenceville-Suwanee SB dual left turns
9	SR 120/SR 316 Interchange Right Turn Lane	Gwinnett	New SR 316 WB ramp terminal intersection right lane	
6	Walther Boulevard/SR 316 HOV Interchange Traffic Signal	Gwinnett	New traffic signal at SR 316 HOV ramp terminal intersection	
32	SR 10/Athens Loop Interchange	Oconee	Widen SR 316 to six lanes through the interchange	Widen bridge to seven lanes

Table I-3 Supplemental 2032 Build Highway Improvements along SR 316

Loc #	Project	County	Description	Comment
3	Herrington Rd/SR 316 HOV Interchange Traffic Signal	Gwinnett	New traffic signal at SR 316 HOV ramp terminal intersection	
7	Hi Hope Rd/SR 316 HOV Interchange Traffic Signal	Gwinnett	New traffic signal at SR 316 HOV ramp terminal intersection	
14	US 29/SR 8 Interchange Bridge Widening	Gwinnett	Widen US 29/SR 8 bridge over SR 316 to six lanes	
33	Harbins Rd/SR 316 HOV Interchange Traffic Signal	Gwinnett	New traffic signal at SR 316 HOV ramp terminal intersection	
16	Kilcrease Rd/SR 316 HOV Interchange Widening	Barrow	Widen Kilcrease Rd to four lanes in the vicinity of SR 316	
16	Kilcrease Rd/SR 316 HOV Interchange Traffic Signal	Barrow	New traffic signal at SR 316 HOV ramp terminal intersection	
16	Barrow Industrial Rd/Kilcrease Rd Traffic Signal	Barrow	New traffic signal at existing intersection	
17	Kennedy Rd/Patrick Mill Rd Intersection Traffic Signal and Left Turn Lane	Barrow	New traffic signal and Patrick Mill Rd SB left turn lane at existing intersection	
18	Carl Bethlehem Rd/SR 316 HOV Interchange Traffic Signal	Barrow	New traffic signal at SR 316 HOV ramp terminal intersection	
35	Dials Mill Rd/SR 316 HOV Interchange Traffic Signal	Oconee	New traffic signal at SR 316 HOV ramp terminal intersection	
38	Mars Hill Rd/SR 10/Monroe Hwy Widening	Oconee	Widened Mars Hill Rd to four lanes east of SR 10	Mars Hill Rd WB dual left turns
36	Virgil Langford Rd/SR 316 HOV Interchange Widening	Oconee	Widen Virgil Langford Rd to four lanes in the vicinity of SR 316	
36	Virgil Langford Rd/SR 316 HOV Interchange Traffic Signal	Oconee	New traffic signal at SR 316 HOV ramp terminal intersection	
32	SR 10/Athens Loop Interchange Widening	Oconee	Add one SR 10 WB through lane east of interchange	
32	SR 10/Athens Loop Interchange Left Turn Lane	Oconee	New SR 10 NB ramp terminal intersection left turn lane	SR 10 Loop NB ramp triple left turns

STUDY RECOMMENDATIONS

The evaluation of future traffic demand along the SR 316 corridor clearly justified implementation of all the currently programmed highway improvements. The 2015 E+C model clearly demonstrated the need for the eastern expansion of SR 316 freeway facilities to Drowning Creek Road in Gwinnett County and three grade separations currently under concept design in Barrow County (SR 81, SR 11 and SR 53). These existing at-grade intersections fail by 2015 without any further improvements.

Since the projected HOV volumes are much lower than the GP volumes, the proposed HOV improvements will have a lower benefit to cost ratio than the GP projects.

However, the HOV projects could promote the increase in HOV usage within the study area.

Since the modeling strategy employed by this study incorporated all of the programmed and future projects within the SR 316 corridor in the various CORSIM models, interpretations of the results of these simulation model runs are limited to the ability of these improvements to meet future traffic demands and identifying the specific shortfalls associated with these improvements. Many of these shortfalls, but not all, were addressed by the supplemental highway improvements identified above.

This study only considered lower costs solutions to this problem (widening the SR 316 bridge and additional turn lanes); however, these proposed improvements would not address the disparity between the future interchange type and the approach facilities. The nature of this intersection will change when SR 316 also becomes a limited access highway, and three out of the four legs of this interchange are limited access, free flow facilities. Consideration should be given to creating free flow connections for all the movements between the limited access approaches. This may require eliminating arterial access to this interchange from the east and converting it to a full system to system trumpet interchange by 2032. Access to the east of the SR 10 Loop could be provided by the new Jennings Mill Parkway.

The preliminary recommendations for future GP and HOV interchange configurations are listed in **Tables I-4** and **I-5**, respectively (See **Figures IV-1** through **IV-3** for locations of improvements).

Table I-4 Recommendations for 2032 SR 316 GP Interchanges

Loc #	Project	County	P.I. No.	Description	Overpass Bridge
13	Cedars Road Interchange	Gwinnett	0004869	Single Point or Compressed Diamond Interchange	Six Lanes Wide
14	US 29/SR 8 Interchange	Gwinnett	0004869	Standard Diamond Interchange	Six Lanes Wide
15	Drowning Creek Interchange	Gwinnett	0004869	Standard Diamond Interchange	Four Lanes Wide
27	Bogart Parkway	Oconee	0007685	Standard Diamond Interchange	Six Lanes Wide
30	Jimmy Daniel Road Interchange	Oconee	0007685	Standard Diamond Interchange	Three Lanes Wide
31	Oconee Connector Interchange	Oconee	0007685	Split Diamond Interchange and Collector Distributor Roads to SR 10	Six Lanes Wide
32	SR 10/Athens Loop Interchange	Oconee	0007685	Partial Cloverleaf Interchange and CV Roads to Oconee Connector	Seven Lanes Wide

Table I-5 Recommendations for 2032 SR 316 HOV Interchanges

Loc #	Project	County	P.I. No.	Description	Overpass Bridge
7	Hi Hope Road Interchange	Gwinnett	0004869	Full Drop HOV Interchange	Six Lanes Wide
33	Harbins Road Interchange	Gwinnett	0004869	Partial Drop HOV Interchange	Four Lanes Wide
16	Kilcrease Road Interchange	Barrow	N/A	Full Drop HOV Interchange	Six Lanes Wide
18	Carl Bethlehem Road Interchange	Barrow	N/A	Full Drop HOV Interchange	Six Lanes Wide
20	Harry McCarty Road Interchange	Barrow	N/A	Full Drop HOV Interchange	Four Lanes Wide
22	Harrison Mill Road Interchange	Barrow	N/A	Full Drop HOV Interchange	Four Lanes Wide
25	Barber Creek Road Interchange	Barrow	N/A	Full Drop HOV Interchange	Four Lanes Wide
35	Dials Mill Road Interchange	Oconee	N/A	Full Drop HOV Interchange	Four Lanes Wide
28	Mars Hill Interchange	Oconee	N/A	Full Drop HOV Interchange	Four Lanes Wide
36	Virgil Langford Road Interchange	Oconee	N/A	Full Drop HOV Interchange	Six Lanes Wide

The proposed Implementation Plan prioritizes projects into three groups, Tiers I, II and III. Tier I projects address immediate, significant deficiencies and should be implemented as part of the current 6-year Transportation Improvement Program (TIP) or as soon as the Plan Development Process steps have been completed, right-of-way has been acquired and funding for all phases has been allocated to the project. Tier II projects address anticipated, significant deficiencies and should be implemented shortly after the current 6-year TIP time frame. Tier III projects address anticipated operational issues and should be implemented within the next twenty (20) years. The preliminary

classification of projects into Tiers I, II and III are listed in **Tables I-6** through **I-8**, respectively.

Table I-6 Tier I Highway Improvements along SR 316

Loc #	Project	County	P.I. No.	Description	Comment
2	SR 316 HOV Lanes	Gwinnett	0003168	Extension of HOV Lanes to West Progress Center Avenue	Construction to Begin in 2012
3	Herrington Road HOV Interchange	Gwinnett	0003168	Full Drop HOV Only Interchange at existing overpass	Construction to Begin in 2012
4	Lawrenceville-Suwanee Road HOV Interchange	Gwinnett	0003168	Partial Drop HOV Only Interchange at existing overpass (west side)	Construction to Begin in 2012
5	SR 120 Inter-change Bridge	Gwinnett	0003168	New bridge over SR 316	Construction to Begin in 2012
6	Walther Boulevard HOV Interchange	Gwinnett	0003168	Full Drop HOV Only Interchange at existing intersection	Construction to Begin in 2012
7	Hi Hope Road HOV Interchange	Gwinnett	0003168	Partial Drop HOV Only Interchange at existing overpass (west side)	Construction to Begin in 2012
7	Hi Hope Rd Widening	Gwinnett	N/A	Widen Hi Hope Rd/Hurricane Shoals Rd to four lanes from Airport Rd to Hi Hope Rd/Hurricane Shoals Rd split	Addition to PI # 0003168
7	Hurricane Shoals Rd/Hi Hope Rd Traffic Signal & Left Turn Lane	Gwinnett	N/A	Construct intersection improvements	Addition to PI # 0003168
8	Collins Hill Road Interchange	Gwinnett	0004086	Split Diamond Interchange (Western half) with CD Roads	Under Design
9	SR 20 Interchange	Gwinnett	0004086	Split Diamond Interchange (Eastern half) with CD Roads	Under Design
9	SR 20 Interchange Right Turn Lane	Gwinnett	N/A	Construct second SR 20 SB right lane	Addition to PI # 0004086
10	Sugarloaf Parkway Extension	Gwinnett	GW-308A3	New alignment with half cloverleaf interchange at SR 316	Under Design by Gwinnett County
37	Fence Rd Right Turn Lane	Gwinnett	N/A	Construct Fence Rd SB right turn lane	Addition to PI # 0004869
16	Kilcrease Rd Right Turn Lane	Barrow	N/A	Construct Kilcrease Rd SB right turn lane	Addition to PI # 122870
16	Kilcrease Rd/Fred Kilcrease Rd Left Turn Lane	Barrow	N/A	Construct Kilcrease Rd SB left turn lane	Addition to PI # 122870
35	Dials Mill Road Traffic Signal	Oconee	N/A	Construct traffic signal at existing SR 316 intersection	Addition to PI # 122870
38	SR 10/Monroe Hwy Interchange Traffic Signal	Oconee	N/A	Construct traffic signal at SR 316 WB ramp terminal intersection	
30	Jimmy Daniel Rd/SR 316 Left Turn Lane	Oconee	N/A	Construct Jimmy Daniel Rd SB left turn lane	
12	Jennings Mill Parkway	Oconee	0001098	New multi-lane highway connecting with SR 316 at Oconee Connector	Under Design

Table I-7 Tier II Highway Improvements along SR 316

Loc #	Project	County	P.I. No.	Description	Comment
12A	SR 316 GP Lane Widening Projects	Gwinnett	122750, 122710, 122760, and 122770	Widening existing GP lanes from four through lanes to six through lanes plus auxiliary lanes	Long Range
N/A	SR 316 GP Lane Widening Project	Gwinnett	N/A	Auxiliary Lanes from Boggs Road to Riverside Parkway	Not Currently Programmed
N/A	HOV Lane Extension	Gwinnett	0004869	Eastern extension of HOV Lanes to west of Drowning Creek Road	Final Programmed HOV Extension
7	Hi Hope Road Interchange	Gwinnett	0004869	New Full Drop HOV Interchange	Part of HOV Extension
33	Harbins Road Interchange	Gwinnett	0004869	New Partial Drop HOV	Part of HOV Extension
13	Cedars Road Interchange	Gwinnett	0004869	New GP Interchange (Single Point Diamond)	Part of HOV Extension
14	US 29/SR 8 Interchange	Gwinnett	0004869	New GP Diamond Interchange	Part of HOV Extension
10	Sugarloaf Parkway Extension	Gwinnett	0006924	New alignment north of SR 316 with northern half of Cloverleaf Interchange	Future Design by Gwinnett County
15	Drowning Creek Interchange	Gwinnett	0004869	New GP Diamond Interchange	Part of HOV Extension
N/A	HOV Lane Extension	Gwinnett/ Barrow	N/A	Eastern extension of HOV Lanes from Drowning Creek Road to Carl Bethlehem Road	Not Programmed
16	Kilcrease Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
17	Patrick Mill Road Interchange	Barrow	0006327	New GP Diamond Interchange for West Winder Bypass	Concept Approved
18	Carl Bethlehem Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
19	SR 81 Interchange	Barrow	0008429	New GP Interchange	Under Concept Design
20	Harry McCarty Road Grade Separation	Barrow	122870	New grade separation	Long Range
21	SR 11 Interchange	Barrow	0008430	New GP Interchange with widening of SR 11 south of SR 316	Under Concept Design
22	Harrison Mill Road Grade Separation	Barrow	122870	New grade separation	Long Range
23	SR 53 Interchange	Barrow	0008431	New GP Interchange	Under Concept Design
24	SR 211 Interchange	Barrow	122870	New GP Interchange	Long Range
25	Barber Creek Road Grade Separation	Barrow	122870	New grade separation	Long Range
26	Dial Rd/Craft Rd Grade Separation	Barrow	122870	New grade separation	Long Range
28	Mars Hill Grade Separation	Oconee	0007685	New grade separation	Long Range

Table I-7 Tier II Highway Improvements along SR 316 (continued)

29	Julian Drive Grade Separation	Oconee	0007685	New grade separation	Long Range
30	Jimmy Daniel Road Interchange	Oconee	0007685	New GP Interchange	Long Range
31	Oconee Connector Interchange	Oconee	0007685	New GP Interchange and CD Roads to SR 10	Long Range
32	SR 10/Athens Loop Interchange	Oconee	0007685	Modification of existing Interchange and CD Roads to Oconee Connector	Long Range

Table I-8 Tier III Highway Improvements along SR 316

Loc #	Project	County	P.I. No.	Description	Comment
N/A	HOV Lane Extension	Barrow/ Oconee	N/A	Eastern extension of HOV Lanes to west of SR 10, Athens Loop	Not Programmed
20	Harry McCarty Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
22	Harrison Mill Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
34	Wall Road Grade Separation	Barrow	N/A	New grade separation	Not Programmed
25	Barber Creek Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
27	Bogart Parkway Interchange	Oconee	N/A (Oconee County project)	New GP Interchange	Long Range
35	Dials Mill Road Interchange	Oconee	N/A	New Full Drop HOV Interchange	Not Programmed
28	Mars Hill Interchange	Oconee	N/A	New Full Drop HOV Interchange	Not Programmed
36	Virgil Langford Road Interchange	Oconee	N/A	New Full Drop HOV Interchange	Not Programmed

The above Implementation Plan is summarized in **Table I-9** which categorizes the improvements between the 2015 E+C, 2032 E+C and 2032 Build networks that were used in the CORSIM simulation analysis. The 2032 E+C and 2032 Build improvements are illustrated in **Figures I-1 and I-2**, respectively.

Table I-9 Summary of Implementation Plan

Current Intersection name	Current Programming	County	2015 E+C Network	2032 E+C Network	2032 Build Network
I-85 and Boggs Road	Under construction (HOV interchange included)	Gwinnett	As constructed	Same as 2015 E+C	Same as 2015 E+C
Herrington Road	HOV Interchange (PI 0003168)	Gwinnett	HOV interchange as concepted	Same as 2015 E+C	Same as 2015 E+C
Sugarloaf Parkway		Gwinnett	As existing	As existing	As existing
Riverside Parkway	PI 122750 (widening) project begins	Gwinnett	As existing	Add one GP lane each direction to east of Walther Blvd	Same as 2032 E+C
Lawrenceville-Suwanee Rd	HOV Interchange (PI 0003168) (half diamond - west side only); Within bounds of PI 122750 (widening)	Gwinnett	Partial HOV interchange (westbound) as concepted	Add SB left turn lane at Lawrenceville-Suwanee/SR 120 Intersection	Same as 2032 E+C
SR 120	New bridge (PI 0003168); Within bounds of PI 122750 (widening)	Gwinnett	New bridge as concepted	Add WB right turn lane at WB ramp terminal intersection	Same as 2032 E+C
Walther Blvd/ Hurricane Shoals	HOV Interchange (PI 0003168); PI 122750 (widening) project ends east of Walther Blvd; PI 122710 (widening + CDs) begins east of Walther Blvd	Gwinnett	Full HOV interchange as concepted	Add traffic signal at ramp terminal intersection and add one GP lane each direction to east of SR 20	Same as 2032 E+C
Collins Hill Rd	Interchange (PI 0004086) - Part of PI 0003168 (includes CD Road to SR 20); Within bounds of PI 122710 (widening+CDs)	Gwinnett	Split diamond to SR 20 (PI 0004086)	Same as 2015 E+C	Same as 2015 E+C
SR 20	Interchange (PI 0004086) - Part of PI 0003168 (includes CD Road to Collins Hill Rd); PI 122710 (widening+CDs) project ends east of SR 20; PI 122760 (widening) project begins east of SR 20	Gwinnett	Split diamond from Collins Hill (PI 0004086) as concepted except for additional SB right turn lane	Add one GP lane each direction to west of Progress Center Avenue	Same as 2032 E+C
Hi Hope Road	HOV Interchange (PI 0003168) (half diamond - west side only); Within boundaries of PI 122760 (widening)	Gwinnett	Half drop HOV interchange (westbound) as concepted (PI 0003168) (6-lane bridge); Widen Hi Hope Rd/Hurricane Shoals Rd to 4 lanes (Airport Rd to split)	Same as 2015 E+C	Full HOV interchange (PI 0004869) (6-lane bridge)
CR 183/ West Progress Center Ave (north) & Airport Rd (south)	HOV Interchange (PI 0003168) project ends; HOV project (PI 0004869) project begins; PI 122760 (widening) project ends west of Progress Center; PI 122770 (widening) project begins west of Progress Center	Gwinnett	termination (0003168) as concepted; HOV entrance & exit merge (PI 0003168)	Add one GP lane each direction to east of Cedars Road	Remove direct merge access
Cedars Road	Within bounds of PI 0004869 (HOV lanes); PI 122770 (widening) project ends east of Cedars Rd; PI 0006937 (widening) project begins	Gwinnett	As existing	SOV Interchange - (not programmed individually, but as part of HOV project - PI 0004869) tight urban diamond or SPUI (6-lane bridge)	Same as 2032 E+C
Hurricane Trail	Within bounds of PI 0004869 (HOV lanes) - Within bounds of PI 0006937 (widening)	Gwinnett	As existing	Termination (not programmed individually, but as part of HOV project - PI 0004869)	Direct Merge access to HOV / Termination of intersection (PI 0004869)
Fence Road	Within bounds of PI 0004869 (HOV lanes) - Within bounds of PI 0006937 (widening) - design includes direct truck access for Publix (inbound/outbound in both east and west directions)	Gwinnett	Add SB right turn lane	Termination (not programmed individually, but as part of HOV project - PI 0004869)	Same as 2032 E+C
Winder Hwy & US 29 / SR 8 (north)	Within bounds of PI 0004869 (HOV lanes) - Within bounds of PI 0006937 (widening)	Gwinnett	As existing	SOV Interchange (not programmed individually, but as part of HOV project - PI 0004869) (6-lane bridge)	Same as 2032 E+C
Sugarloaf Parkway Extension	Within bounds of PI 0004869 (HOV lanes) - Within bounds of PI 0006937 (widening); PI 0006923, 0006924 (new construction "Sugarloaf Parkway Extension") begin/end at SR 316	Gwinnett	Interchange & Sugarloaf Pkwy Ext. (southern connection - TIP# GW-308A3) - Clover leaf concepted for this project without northern connection	Clover leaf Interchange & Sugarloaf Pkwy Ext.(northern connection - PI 0006924)	Same as 2032 E+C
Harbins Road	Within bounds of PI 0004869 (HOV lanes) - Within bounds of PI 0006937 (widening);	Gwinnett	As existing	Termination (not programmed individually, but as part of HOV project - PI 0004869)	Partial HOV Interchange (Westbound) - PI 0004869 (4-lane bridge)
Drowning Creek Road	Within bounds of PI 0004869 (HOV lanes) - PI 0006937 (widening) project ends;	Gwinnett	As existing	SOV Interchange (not programmed individually, but as part of HOV project - PI 0004869) (4-lane bridge)	Direct HOV merge access west of intersection
Kilcrease Road / CR 74	Grade Separation (122870);	Barrow	Add SB right turn lane at SR 316 and SB left turn lane at Fred Kilcrease Rd	grade seperation (PI 122870)	Full HOV interchange (not programmed) (6-lane bridge)
Patrick Mill Road / CR 93	Patrick Mill Road / W. Winder Bypass interchange (PI 0006327)	Barrow	As existing	W. Winder Bypass & SOV interchange (PI 0006327) as concepted	Same as 2032 E+C
Carl Bethlehem Road	Grade Separation (122870)	Barrow	As existing	grade seperation (PI 122870)	Full HOV interchange (not programmed) (6-lane bridge)
SR 81 / Charles Floyd Rd	Interchange - PI 0008429 - task order (Split out of PI 122870);	Barrow	Frontage Rd (81 to Harry McCarty) under CST	SOV Interchange (PI 0004869)	Same as 2032 E+C
Harry McCarty Rd / CR 110	Grade Separation (122870);	Barrow	As existing	grade seperation (PI 122870)	Full HOV interchange (not programmed) (4-lane bridge)
SR 11	Interchange - PI 0008430 - task order (Split out of PI 122870); PI 0007832 (widening of SR 11 south of SR 316) project begins at SR 316	Barrow	As existing	SOV interchange (0008430); SR 11 widening, south of 316 (0007832)	Same as 2032 E+C
Harrison Mill Rd / CR 144	Grade Separation (122870)	Barrow	As existing	grade seperation (PI 122870)	Full HOV interchange (not programmed) (4-lane bridge)
Smith Cemetary Rd (north) / Ode Pepers Rd (south)	Interchange or Termination (PI 122870)	Barrow	As existing	Termination (122870)	Same as 2032 E+C
Jackson Trail Road / CR 139	Termination (PI 122870)	Barrow	As existing	Termination (122870)	Same as 2032 E+C
Hog Mountain Rd / SR 53	Interchange - PI 0008431 - task order (Split out of PI 122870)	Barrow	As existing	SOV interchange (0008431)	Same as 2032 E+C
Wall Road / CR 159	Termination (122870)	Barrow	As existing	termination (122870)	grade seperation (not programmed)
Bethlehem St & SR 211 (north)	Interchange (122870)	Barrow	As existing	SOV interchange (122870) (3-lane bridge)	Same as 2032 E+C except for direct merge access to HOV (not programmed)
Barber Creek Road / CR 329	Grade Separation (122870)	Barrow	As existing	grade seperation (PI 122870)	Full HOV interchange (not programmed) (4-lane bridge)
Dial Road / Craft Road / CR 214		Barrow	As existing	grade seperation (122870)	Same as 2032 E+C
Dials Mill Ext / CR 58	Grade separation or termination (0007685)	Oconee	Add traffic signal	termination (0007685)	Same as 2032 E+C
Dials Mill Rd / CR 60	Termination (0007685)	Oconee	As existing	Termination (0007685)	Full HOV interchange (not programmed) (4-lane bridge)
Pete Dickens Rd / CR 52		Oconee	No intersection	No intersection	No intersection
Bogart Parkway		Oconee	As existing	SOV interchange (0007685) (6-lane bridge)	Same as 2032 E+C
McNutt Creek Road	Grade Separation (0007685)	Oconee	As existing	termination (0007685)	Same as 2032 E+C
Mars Hill / CR 273	Grade Separation (0007685)	Oconee	As existing	grade seperation (0007685)	Full HOV interchange (not programmed) (4-lane bridge)
US 78 / SR 10	Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	Add traffic signal at WB ramp terminal intersection	As existing	As existing
Julian Dr / CR 20	Grade Separation (0007685); Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	As existing	grade seperation (0007685)	Same as 2032 E+C
Jimmy Daniel Road / CR 55	Interchange w/ or W/out CD (0007685); Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	Add SB left turn lane	SOV interchange (0007685) (3-lane bridge) and add auxiliary lane in each direction to Oconee Connector	Same as 2032 E+C
Virgil Langford Rd / CR 37	Termination (0007685); Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	As existing	Termination (0007685)	Full HOV interchange (not programmed) (6-lane bridge)
Oconee Connector	Interchange w/ or W/out CD "Epps Bridge Road Extension" (0007685); PI 0001098 (Jennings Mill Parkway extension) ends north of SR 316 & Oconee Connector interchange; PI 142060 (widening of SR 53 & Mars Hill Rd) intersects SR 316; Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	Jennings Mill (0001098)	SOV interchange (0007685); CD road to SR 10 Loop; SR 53 & Mars Hill widening (142060) (6-lane bridge)	Same as 2032 E+C
Epps Bridge Road / CR 261	Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	As existing	CD Road to SR 10 Loop	Same as 2032 E+C
SR 10 Loop / Athens Bypass	Modify existing interchange w/ CD (0007685); Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	As existing	Interchange Modification (0007685) (6-lane bridge)	Add one westbound SR 316 lane and widen bridge to 7 lanes

Figure I-1 2032 Existing Plus Committed Improvements

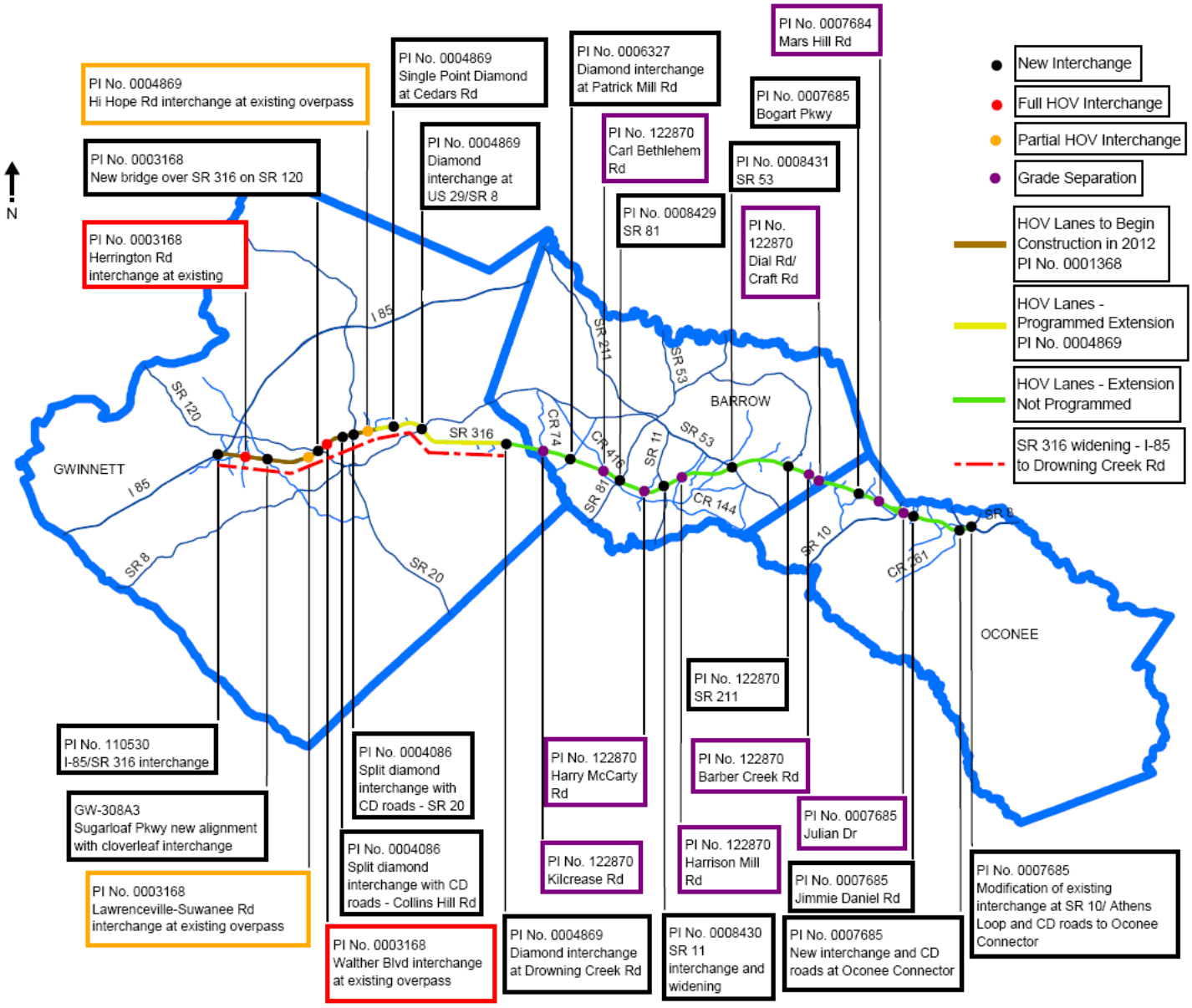
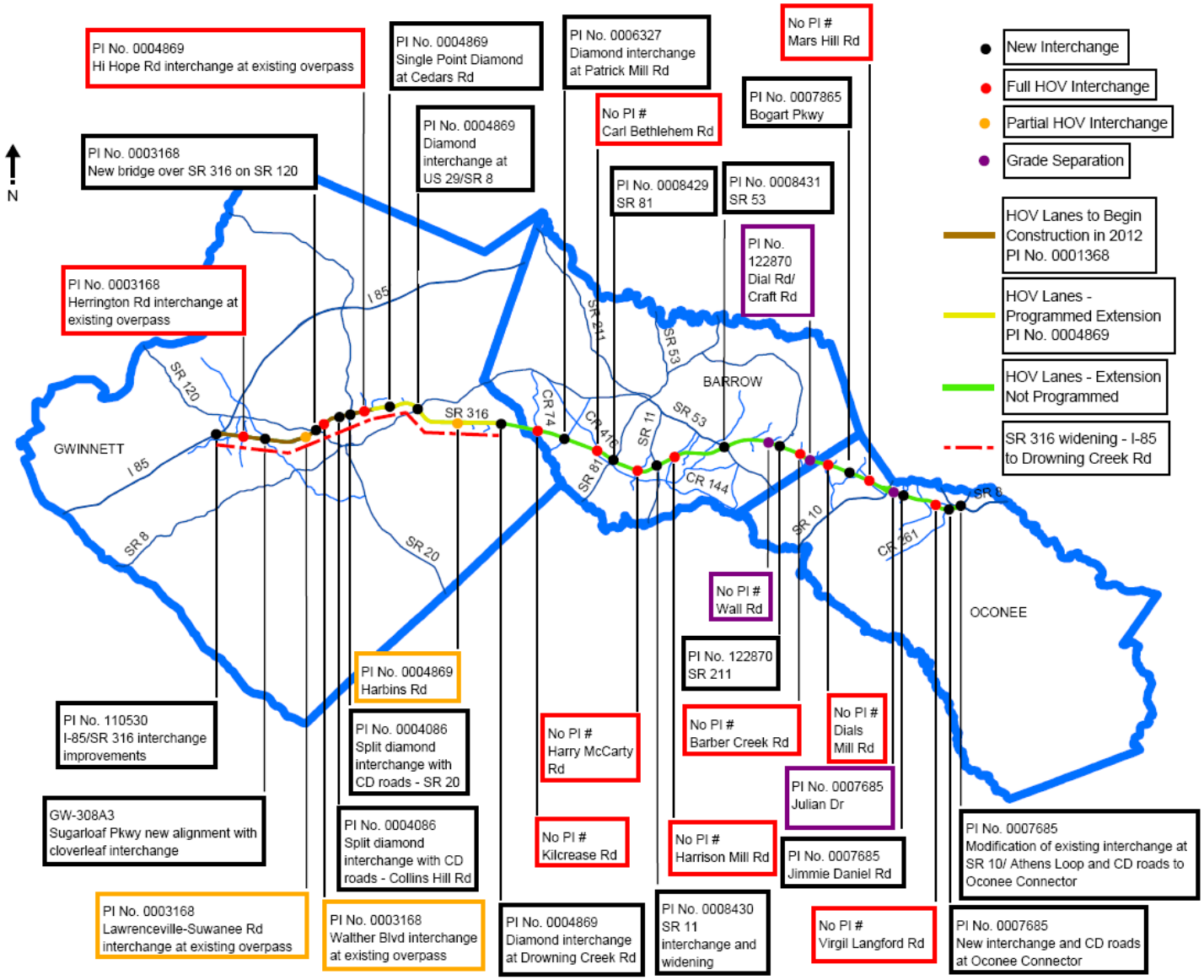


Figure I-2 2032 Build Improvements



SECTION II PROJECT DESCRIPTION

INTRODUCTION

The SR 316 Implementation Plan is a study conducted by the Georgia Department of Transportation (GDOT) of planned and programmed transportation improvements along the SR 316/University Parkway Corridor in Gwinnett, Barrow and Oconee Counties, Georgia. The roughly 40-mile corridor begins in Athens, Georgia at the beginning of the state route at the SR 10, Athens Loop and ends at the termination of the state route at Interstate 85 in Gwinnett County, Georgia (see **Figure II-1**). It serves as a major transportation conduit between the University of Georgia, the city of Athens and the Atlanta Metropolitan area. This corridor has experienced substantial growth in traffic volumes over the last several decades and is in need of significant traffic capacity improvements.

BACKGROUND

Several studies, design and construction projects have been performed by GDOT that included the SR 316 corridor. Four of these GDOT sponsored projects are as follows:

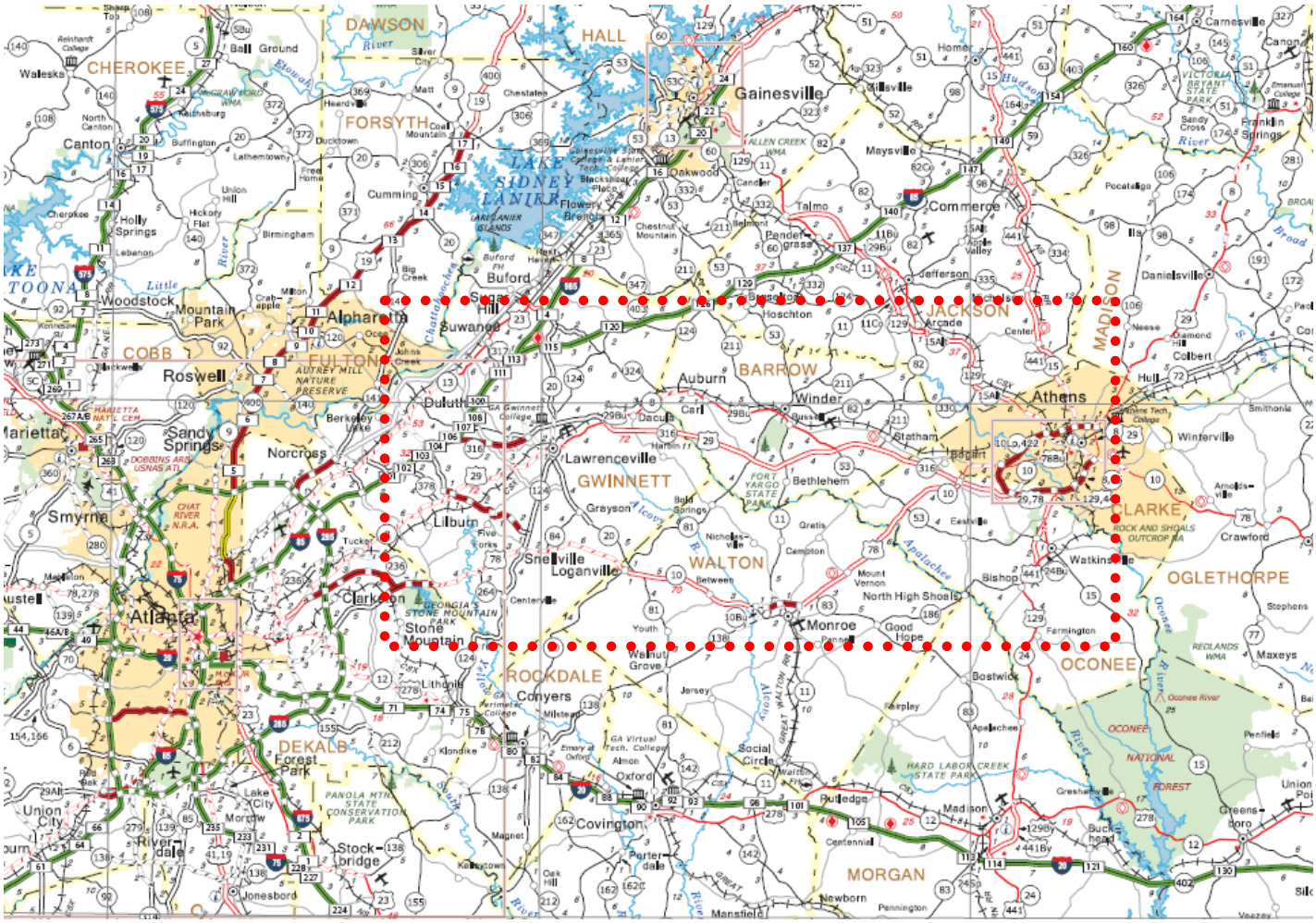
- State Route 316 Corridor Analysis
- HOV Strategic Implementation Plan for the Atlanta Region
- SR 316/I-85 Interchange Reconstruction
- SR 316 Grade Separation Projects

State Route 316 Corridor Analysis

The "State Route 316 Corridor Analysis" study, completed in February, 2002, evaluated safety, congestion, economic development and interconnectivity issues within the corridor. This 2001 study encompassed the same study limits as this SR 316 Implementation Plan. This study concluded that traffic, population and employment in the study area were expected to double by the year 2025. The report included the following list of recommended improvements:

- Extend the existing four-lane SR 316 freeway from SR 120 to SR 10, Athens Loop
- Construct one auxiliary freeway lane in each direction between SR 120 and Boggs Road interchanges in Gwinnett County
- Construct a barrier separated high occupancy vehicle facility in the median of SR 316 from I-85 to SR 10 (one HOV lane in each direction with HOV-only interchanges)
- Construct new collector-distributor roads in each direction between SR 120 and Winder Highway./SR 8 in Gwinnett County

Figure II-1 Study Area Map



HOV Strategic Implementation Plan for the Atlanta Region

The "HOV Strategic Implementation Plan for the Atlanta Region" evaluated the construction of HOV facilities throughout the Atlanta metropolitan region. SR 316 in Gwinnett and Barrow Counties was one of the corridors included in this study. This study prioritized the potentially feasible HOV projects into seven levels called tiers. The study prioritized the construction of HOV facilities along SR 316 between I-85 and US 78 into multiple tiers. The final prioritization recommendations for SR 316 HOV facilities were as follows:

- From I-85 to SR 20 (Gwinnett County) – Tier 1
- From SR 20 to Drowning Creek Road (Gwinnett County) – Tier 6
- From Drowning Creek Road to SR 11 (Gwinnett County) – Tier 7
- From SR 11 to US 78 (Gwinnett and Barrow Counties) – Tier 7

At the request of the GDOT Office of Urban Design, an implementation plan is needed to provide project recommendations that bridge the results of these two planning studies.

I-85/SR 316 Interchange Reconstruction

In 2006, GDOT began reconstruction of the I-85/SR 316 Interchange (PI No. 110530). These improvements included new HOV lanes along SR 316 and collector-distributor roads along I-85. Crews will construct 13 bridges including a new flyover bridge from SR 316 west to Pleasant Hill Road (eliminating the need to enter I-85) and a flyover bridge from SR 316 to I-85 southbound. The current SR 316 westbound entrance ramp to I-85 southbound will become an HOV only ramp.

Approximately 17 miles of HOV lanes will be added along I-85 north and southbound and on SR 316 east and westbound. Approximately 11 miles of new collector-distributor lanes (similar to access roads that run parallel to I-85) will be built.

SR 316 Grade Separation Projects

GDOT is currently in the concept phase for three grade separation projects on SR 316 in Barrow County. These projects will grade separate the following SR 316 intersections prior to the construction of the full freeway system:

- SR 81/Loganville Highway – PI No. 008429
- SR 11/Winder-Monroe Highway – PI No. 008430
- SR 53/Hog Mountain Road – PI No. 008431

At all three locations, GDOT is evaluating the feasibility of standard diamond and partial cloverleaf interchange configurations. GDOT is also considering interim at-grade type improvements at these locations to partially relieve traffic congestion prior to the construction of the final grade separation structures.

PURPOSE OF THE STUDY

The purpose of this study is to develop tools for GDOT to evaluate the currently planned and other potential highway improvement projects within the SR 316 corridor to determine an implementation plan for these projects. This plan will provide current and future year traffic, corridor level of service (LOS), accident data and a comprehensive review of projects in the SR 316 corridor. Projects in the construction work program

(CWP) and in Long Range (LR) will be evaluated to determine if they will address the needs of the corridor in the most efficient way.

STAKEHOLDER IDENTIFICATION

The stakeholders coordinated with during this study included the following local governments:

- Gwinnett County Department of Transportation
- Barrow County Public Works Department
- Oconee County Public Works Department

The planning team met with elected official and/or staff at Barrow and Gwinnett Counties on August 6, 2007 and with Oconee County on August 8, 2007. The county representatives provided input related to the major land development plans and proposed roadway improvements on SR 316 in their respective counties.

SECTION III DATA COLLECTION

CONSTRUCTION PLANS AND REPORTS

The planning team collected plans for all the roadway projects along the SR 316 corridor. These plans ranged between concept plans for the Barrow County SR 316 grade separation projects to construction plans for other SR 316 related projects in Gwinnett and Oconee Counties.

SR 316 TRAVEL DEMAND MODELS

The planning team collected the Athens-Clarke County Travel Demand Models, the Atlanta Regional Travel Demand Models and the SR 316 travel demand models previously prepared during the "State Route 316 Corridor Analysis" study. These models were used as the basis for developing a more refined travel demand model for this study.

TRAFFIC DATA COLLECTION

GDOT's traffic data collection contractor performed all the traffic freeway mainline classification counts, ramp counts, arterial counts and intersection turning movement counts throughout the entire corridor in the first half of 2007. GDOT also provided historical accident data in the corridor for the time period from January, 2001 to December, 2005.

SECTION IV PROGRAMMED AND FUTURE PROJECTS

For the purposes of this study, programmed and future highway improvement projects used in the implementation analysis fell into the three following categories:

1. Programmed projects scheduled to be completed before 2015
2. Programmed General Purpose (GP) projects scheduled to be completed between 2015 and 2032
3. Eastern expansion of SR 316 HOV system to SR 10 (Athens Loop)

Table IV-1 lists the programmed projects scheduled to be completed before 2015. These projects can be described in general terms by the eastern expansion of SR 316 GP and HOV freeway facilities to east of Hi Hope Road in Gwinnett County. **Table IV-2** lists the GP programmed projects scheduled to be completed between 2015 and 2032. These projects can be described in general terms by widening the SR 316 GP lanes from four through lanes to six through lanes from Riverside Parkway to Drowning Creek Road. It does not include adding one auxiliary lane between Boggs Road and Riverside Parkway, which is not currently programmed but is recommended in the 2002 "State Route 316 Corridor Analysis" study. It also includes the eastern expansion of new SR 316 GP interchanges to the SR 10 Athens Loop in Oconee County, which includes a new GP interchange at Bogart Parkway (at the special request of Oconee County even though it is not currently programmed by the Athens MPO). Note that a Bogart Parkway roadway does not currently exist. Therefore, the programming of an interchange at this location is contingent upon the inclusion of a Bogart Parkway road construction project being included in the Athens MPO Transportation Plan. **Table IV-3** lists the proposed HOV interchanges associated with the expansion of SR 316 HOV lanes to the SR 10 Athens Loop. All of the tables include location numbers for each specific highway improvement, which can be used to identify the projects on the respective Gwinnett, Barrow, and Oconee County highway maps, see **Figures IV-1**, **IV-2** or **IV-3**.

Table IV-1 2015 Programmed Highway Improvements along SR 316

Loc #	Project	County	P.I. No.	Description	Comment
1	I-85/SR 316 Interchange	Gwinnett	110530	Expansion of HOV Lanes on I-85 & SR 316 & Interchange Improvements	Recently Constructed
2	SR 316 HOV Lanes	Gwinnett	0003168	Extension of HOV Lanes to West Progress Center Avenue	Construction to Begin in 2012
3	Herrington Road HOV Interchange	Gwinnett	0003168	Full Drop HOV Only Interchange at existing overpass	Construction to Begin in 2012
4	Lawrenceville-Suwanee Road HOV Interchange	Gwinnett	0003168	Partial Drop HOV Only Interchange at existing overpass (west side)	Construction to Begin in 2012
5	SR 120 Inter-change Bridge	Gwinnett	0003168	New bridge over SR 316	Construction to Begin in 2012
6	Walther Boulevard HOV Interchange	Gwinnett	0003168	Full Drop HOV Only Interchange at existing intersection	Construction to Begin in 2012
7	Hi Hope Road HOV Interchange	Gwinnett	0003168	Partial Drop HOV Only Interchange at existing overpass (west side)	Construction to Begin in 2012
8	Collins Hill Road Interchange	Gwinnett	0004086	Split Diamond Interchange (Western half) with CD Roads	Under Design
9	SR 20 Interchange	Gwinnett	0004086	Split Diamond Interchange (Eastern half) with CD Roads	Under Design
10	Sugarloaf Parkway Extension	Gwinnett	GW-308A3	New alignment with half cloverleaf interchange at SR 316	Under Design by Gwinnett County
11	SR 81 Frontage Road	Barrow	N/A	Frontage Road between SR 81 and Harry McCarty Road	Recently Constructed
12	Jennings Mill Parkway	Oconee	0001098	New multi-lane highway connecting with SR 316 at Oconee Connector	Under Design

Table IV-2 2032 Programmed GP Highway Improvements along SR 316

Loc #	Project	County	P.I. No.	Description	Comment
12A	SR 316 Widening	Gwinnett	122750	New GP Lanes (Widen from 4 to 6 lanes) Riverside Pkwy to east of Walther Blvd	Long Range
12A	SR 316 Widening	Gwinnett	122710	New GP Lanes (Widen from 4 to 6 lanes) East of Walther Blvd to east of SR 20	Long Range
12A	SR 316 Widening	Gwinnett	122760	New GP Lanes (Widen from 4 to 6 lanes) East of SR 20 to West of Progress Center Ave	Long Range
12A	SR 316 Widening	Gwinnett	122770	New GP Lanes (Widen from 4 to 6 lanes) West of Progress Center Ave to East of Cedars Rd	Long Range
12A	SR 316 Widening	Gwinnett	0006937	New GP Lanes (Widen from 4 to 6 lanes) East of Cedars Rd to Drowning Creek Rd	Long Range
13	Cedars Road Interchange	Gwinnett	0004869	New GP Interchange (Single Point Diamond)	Part of HOV Extension
14	US 29/SR 8 Interchange	Gwinnett	0004869	New GP Diamond Interchange	Part of HOV Extension

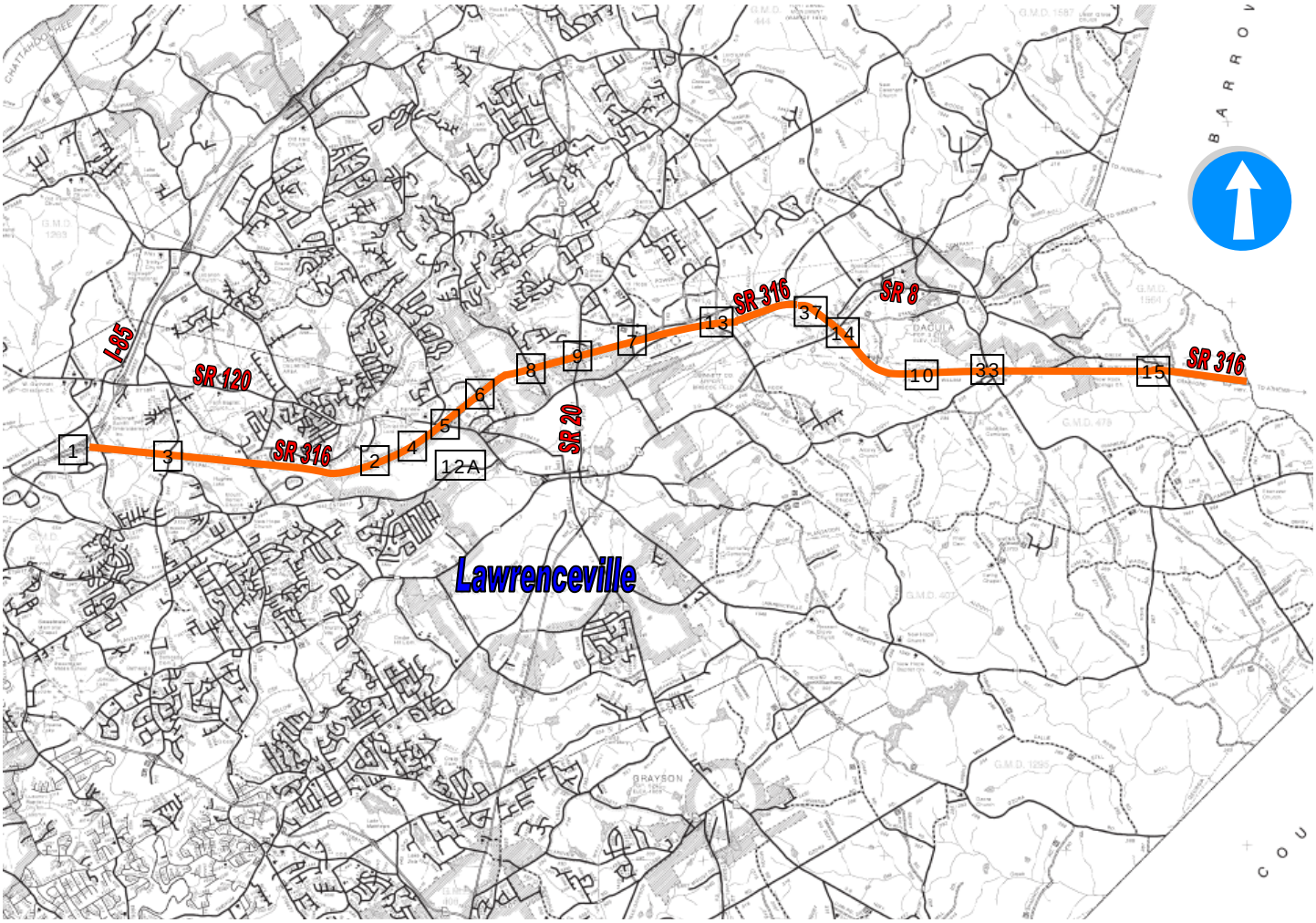
Table IV-2 2032 Programmed GP Highway Improvements along SR 316 (continued)

10	Sugarloaf Parkway Extension	Gwinnett	0006924	New alignment north of SR 316 with northern half of Cloverleaf Interchange	Future Design by Gwinnett County
15	Drowning Creek Interchange	Gwinnett	0004869	New GP Diamond Interchange	Part of HOV Extension
16	Kilcrease Road Grade Separation	Barrow	122870	New grade separation	Long Range
17	Patrick Mill Road Interchange	Barrow	0006327	New GP Diamond Interchange for West Winder Bypass	Concept Approved
18	Carl Bethlehem Road Grade Separation	Barrow	122870	New grade separation	Long Range
19	SR 81 Interchange	Barrow	0008429	New GP Interchange	Under Concept Design
20	Harry McCarty Road Grade Separation	Barrow	122870	New grade separation	Long Range
21	SR 11 Interchange	Barrow	0008430	New GP Interchange with widening of SR 11 south of SR 316	Under Concept Design
22	Harrison Mill Road Grade Separation	Barrow	122870	New grade separation	Long Range
23	SR 53 Interchange	Barrow	0008431	New GP Interchange	Under Concept Design
24	SR 211 Interchange	Barrow	122870	New GP Interchange	Long Range
25	Barber Creek Road Grade Separation	Barrow	122870	New grade separation	Long Range
26	Dial Road/Craft Road Grade Separation	Barrow	122870	New grade separation	Long Range
27	Bogart Parkway	Oconee	N/A (Oconee County project)	New GP Interchange	Long Range
28	Mars Hill Grade Separation	Oconee	0007685	New grade separation	Long Range
29	Julian Drive Grade Separation	Oconee	0007685	New grade separation	Long Range
30	Jimmy Daniel Road Interchange	Oconee	0007685	New GP Interchange	Long Range
31	Oconee Connector Interchange	Oconee	0007685	New GP Interchange and CV Roads to SR 10	Long Range
32	SR 10/Athens Loop Interchange	Oconee	0007685	Modification of existing GP Interchange and CD Roads to Oconee Connector	Long Range

Table IV-3 2032 HOV Highway Improvements along SR 316

Loc #	Project	County	P.I. No.	Description	Comment
N/A	HOV Lane Extension	Gwinnett	0004869	Eastern extension of HOV Lanes to west of Drowning Creek Road	Final Programmed HOV Extension
N/A	HOV Lane Extension	Gwinnett/ Barrow/ Oconee	N/A	Eastern extension of HOV Lanes to west of SR 10, Athens Loop	Not Programmed
7	Hi Hope Road Interchange	Gwinnett	0004869	New Full Drop HOV Interchange	Part of HOV Extension
33	Harbins Road Interchange	Gwinnett	0004869	New Partial Drop HOV	Part of HOV Extension
16	Kilcrease Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
18	Carl Bethlehem Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
20	Harry McCarty Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
22	Harrison Mill Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
34	Wall Road Grade Separation	Barrow	N/A	New grade separation	Not Programmed
25	Barber Creek Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
35	Dials Mill Road Interchange	Oconee	N/A	New Full Drop HOV Interchange	Not Programmed
28	Mars Hill Interchange	Oconee	N/A	New Full Drop HOV Interchange	Not Programmed
36	Virgil Langford Road Interchange	Oconee	N/A	New Full Drop HOV Interchange	Not Programmed

Figure IV-1 Gwinnett County Highway Map



LEGEND

State Route 316

10 Location #

Figure IV-2 Barrow County Highway Map

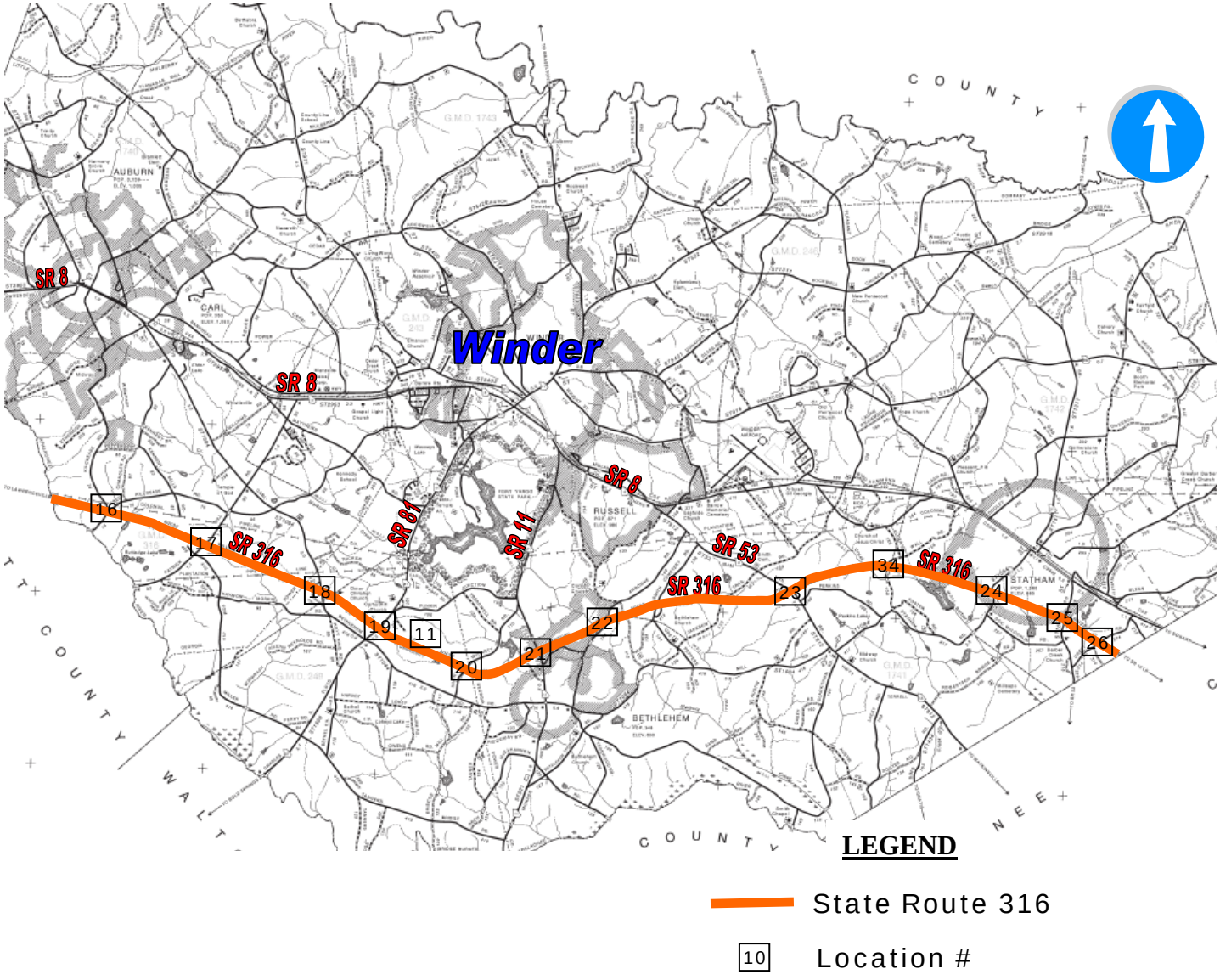
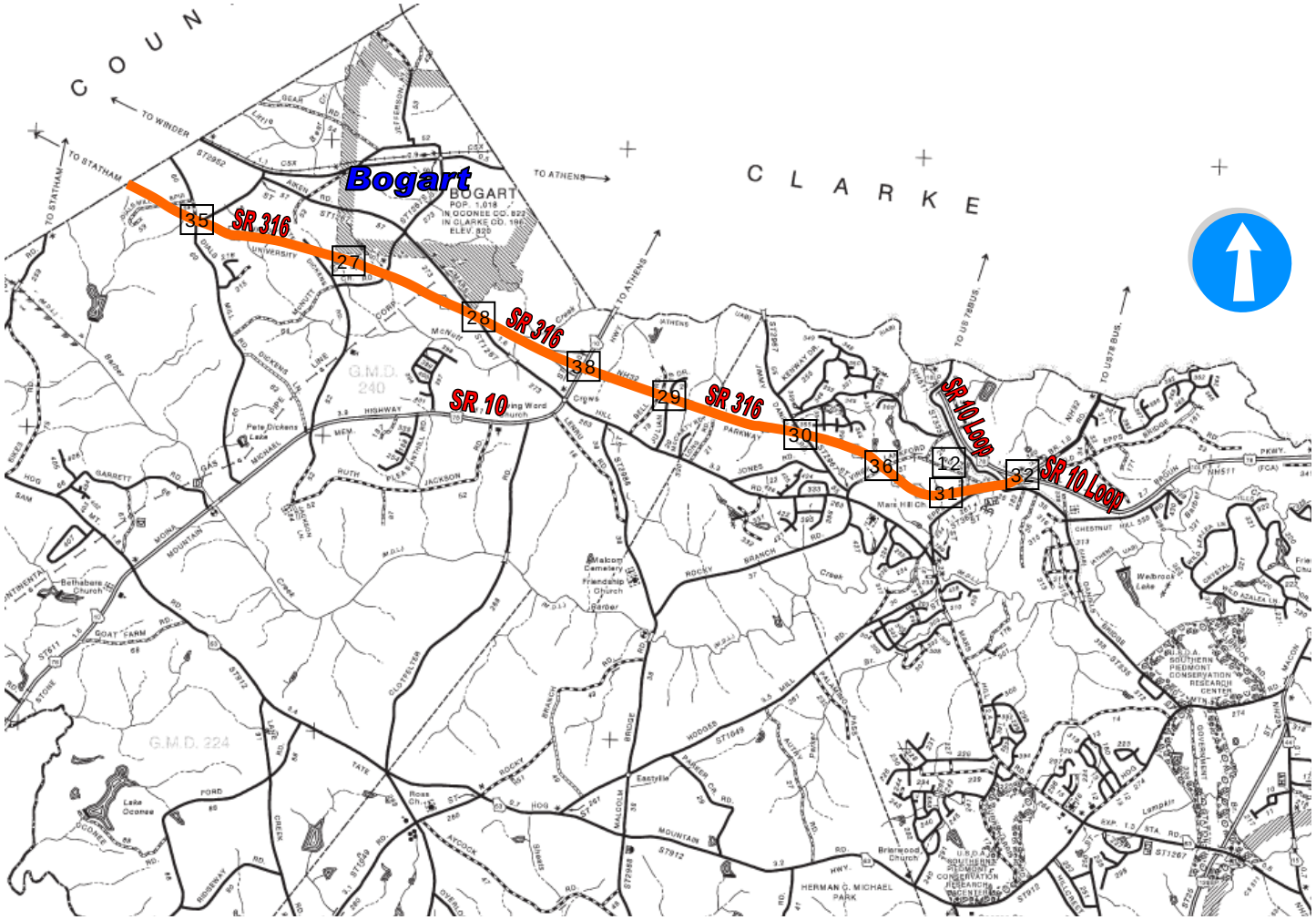


Figure IV-3 Oconee County Highway Map



LEGEND

State Route 316

10 Location #

Access Termination Along SR 316

Below is a list of roads that currently intersect SR 316 and would lose access with the implementation of the GP and HOV improvements. The locations with comments indentify specific access issues at each location. If no comment is listed, convenient alternate access can be provided by existing or proposed interchanges.

- University Center Lane
- Driveway across from University Center Lane – Commercial drive for a car dealership, which currently has no alternate access. Access could be granted through an extension of Hillcrest Green Drive.
- Driveway East of Collins Hill Road – Commercial drive for a RV dealership with no other access. It is a large property that could possibly connect to Park Access Drive in the front, if the road were extended, or to Buford Drive located along the back of the property, but this would probably require repositioning of the building.
- Unimproved driveway East of Collins Hill Road across from RV dealership – This is a large parcel that could be connected to either Buford Drive or Collins Hill Road by a new access road.
- Hosea Rd
- Wimberly Way
- Progress Center Avenue
- Driveway East of Cedars Rd – Access to Gwinnett County Airport (Briscoe Field) runway approach surface lights. Alternate access could be created from Cedars Road.
- Hurricane Trail
- Fence Road
- Oak Valley Road – Connect toWest Drowning Creek Road with new access road.
- Williams Farm Drive – Connect to Drowning Creek Road with new access road.
- Ode Pepper Road – Access would be provided via Smith Mill Road (SR 324).
- Smith Cemetery Road – Access would be provided via Hog Mountain Road (SR 53).
- Jackson Trail Road (North of SR 316) – Same as Smith Cemetery Road.
- Jackson Trail Road (South of SR 316) – Same as Ode Pepper Road.
- Wall Road/Elder Road

- McCarty Road (North of SR 316) – Access via Price Street.
- McCarty Road (South of SR 316) – Access via Bethlehem Road (SR 211) with new access road.
- Crowe Road
- Dials Mill Road – Access via a new frontage road network that Oconee County has planned to construct.
- Pete Dickens Road – Same as Dials Mill Road
- McNutt Creek Road – Same as Dials Mill Road
- Virgil Langford Road (North of SR 316)– Access via Oconee Connector.
- Virgil Langford Road (South of SR 316) – Access via Mars Hill Road.

SECTION V TRAFFIC FORECASTS

Traffic forecasts for this study were estimated using a combination of current traffic counts and traffic projections taken from a corridor travel demand model that was prepared specifically for this study. The traffic forecast methodology is summarized in further detail in this section.

CORRIDOR TRAVEL DEMAND MODEL

SR 316 travels through two MPO's – Atlanta Regional Commission (ARC) and Madison Athens-Clarke Oconee Regional Transportation Study (MACORTS). In 2001, a corridor model was developed for SR 316 by another consultant for GDOT. This previous model was not updated for this study for several reasons. At that time, Barrow County was not a part of ARC's travel demand model and special procedures, outside of the TP+/Cube software package, were developed to accommodate the analysis. Another reason for developing a new model is the fact that both ARC and MACORTS have revised their travel demand models since 2001. Finally, the previous model did not follow GDOT's established modeling process; therefore, a new corridor-based travel demand model was developed for the SR 316.

The following models served as a base for the SR 316 Corridor Model:

- ARC's 20-County Model – 2005, 2015, and 2030
- MACORTS Model – 2000, 2030

The entire portion of Gwinnett and Barrow County were extracted from the ARC model and a portion of Oconee and Clarke County were extracted from the MACORTS model. The extracted portions of these two models were then merged to form a single corridor-based model.

While the MACORTS model was developed using GDOT's modeling procedures, ARC's model is more detailed due to mode choice options and monitoring air quality needs. Look-up tables were developed to convert ARC's model data into GDOT's format. This was done to convert the facility type classifications and the socioeconomic data. The following table shows how the facility types were changed from ARC's nomenclature to GDOT's.

Table V-1 Facility Type Conversion

ARC's Travel Demand Model		GDOT's Travel Demand Model	
Code	**Description**	**Code**	**Description**
0	Zone Centroid Connectors	32	Centroid Connector
1	Interstate / Freeway Free Flow	1	Interstate
2	Parkway	4	Parkway
3	HOV Buffer Separated	2	Freeway
4	HOV Barrier Separated	2	Freeway
5	High Speed Ramp / CD Road	6	Freeway to Freeway Ramp
6	Medium Speed Ramp	6	Freeway to Freeway Ramp
7	Low Speed Ramp	8	Freeway Exit Ramp
8	Loop Ramp	6	Freeway to Freeway Ramp
9	Off Ramp w/ Intersection	8	Freeway Exit Ramp
10	On Ramp w/ Intersection	7	Freeway Entrance Ramp
11	Expressway	3	Expressway
12	Principal Arterial - Class I	11	Principal Arterial – Class I
13	Principal Arterial - Class II	12	Principal Arterial – Class II
14	Minor Arterial - Class I	13	Minor Arterial – Class I
15	Minor Arterial - Class II	14	Minor Arterial – Class II
16	HOV - Arterial (all classes)	12	Principal Arterial – Class II
17	Major Collector	21	Major Collector
18	Minor Collector	22	Minor Collector
19	Planned Ramps w/ Intersections	-	Not Needed
20	Planned Directional Ramps	-	Not Needed

Adjustments to the socioeconomic data were also necessary. The ARC model uses additional socioeconomic fields to classify their data. The table below shows the ARC classifications and how they were adapted to GDOT's classifications.

Table V-2 Socioeconomic Data Conversion

ARC	GDOT
Zone	N
Construct_EMP	Not Used
Manuf_EMP	MANUF
TCU_EMP	SERVICE
Whlsale_EMP	WHOLE
Retail_EMP	RETAIL
Fire_EMP	SERVICE
Serv_EMP	SERVICE
Tot Private_EMP	Note Used
Govrnment_EMP	SERVICE
TOTAL_EMP	TOTEMP
Population	POP
Households	HH
Univ_Enroll	SCHOOL
Acres	ACRES

The only change necessary with the MACORTS socioeconomic data was to combine the 'School' field with the 'University' field.

MODEL VALIDATION AND CALIBRATION

The SR 316 travel demand model was calibrated and validated by comparing model outputs to expected targets in processes of trip generation, trip distribution and trip assignment. The primary sources used as calibration targets for checking the reasonableness of model parameters and results include:

- *National Cooperative Highway Research Program (NCHRP) Report 365 Travel Estimation Techniques for Urban Planning*
- *Model Validation and Reasonableness Checking Manual, Travel Model Improvement Program, Federal Highway Administration*
- *Calibration and Adjustment of System Planning Models, USDOT, Federal Highway Administration*

Trip Generation

The primary targets GDOT uses for validating the trip generation process and the SR 316 corridor travel demand model trip generation results are compared in **Table V-3**. Except for Home-Based Work (HBW) trips that have a production/attraction (P/A) ratio slightly higher than GDOT range, all other model results agree with GDOT target ranges or values. This means that before balancing trips, the HBW production trips are 20 percent higher than the HBW attraction trips.

Table V-3 Trip Generation Validation

Calibration Measure	Target Range / Value	SR 316 Model
Socio-Economic Data		
Persons / Household	2 - 4	2.8
Workers / Household	1 - 3	1.2
Trip Generation		
Person Trips Per Household	8.5 - 9.2	9.0
Person Trips Per Person	3 - 4	3.2
HBW Trips / Employee	< 2	0.4
Shopping Trips / Retail Employment	-	10.5
P/A Ratio Before Balancing (HBW)	0.9 - 1.1	1.2
P/A Ratio Before Balancing Home-Based Other (HBO)	0.9 - 1.1	1.1
P/A Ratio Before Balancing Home-Based Shopping (HBS)	0.9 - 1.1	1.1
P/A Ratio Before Balancing Non-Home-Based (NHB)	0.9 - 1.1	0.9

Trip Distribution

The Census Transportation Planning Package (CTPP) 2000 Journey to Work (JTW) data shows the average motorized non-public-transportation Journey to Work trip length in Gwinnett, Barrow, Clarke and Oconee counties. Since the Internal-External (I-E) trips were grouped into a separate trip purpose in the SR 316 corridor model, which included part of the HBW trips, an adjusted CTPP Journey to Work trip length was estimated to include the internal-internal (I-I) work trips only. The average trip length for other trip purposes such as Home-Based Other, Home-Based Shopping and Non-Home-Based (HBO, HBS and NHB), were estimated for the SR 316 study area based on equations from *Calibration and Adjustment of System Planning Models* and *NCHRP Report 365*. In the trip distribution process, the friction factors for different trip purposes (HBW, HBO, HBS, NHB, Truck (TRK), IE and Internal-External Truck (IETRK)) were iteratively calibrated by comparing the modeled average trip length with the adjusted CTPP target values.

Table V-4 shows the estimated friction factors, resulting average trip length and calibration target values by different trip purposes.

Table V-4 Trip Distribution Validation

Estimates for Friction Factor Parameters							
Trip Purpose	HBW	HBO	HBS	NHB	TRK	IE	IETRK
Parameter	0.100	0.100	0.100	0.120	0.100	0.170	0.200
Mean Trip Length							
Target	24.0	21.9	21.6	17.7	25.0	30.0	35.0
Model	26.4	21.9	21.6	18.0	26.9	29.4	36.7

Trip Assignment

In the trip assignment process, calibration efforts were measured by a variety of statistics, including system-wide vehicle miles of travel (VMT), VMT by functional class, system-wide percent deviation of traffic, percent deviation of traffic by functional class, percent deviation of traffic by screenline, and system-wide coefficient of determination. All these statistics were generated by comparing model estimated traffic volumes, average trip lengths, and vehicle miles of travel with observed values.

Link Volume Percent Deviation

The Percent Deviation method is described in the technical report titled *Calibration and Adjustment of System Planning Models*, FHWA-ED-90-015. This method is used to calibrate a model for system-wide studies. It is based on the expectation that the travel demand model should accurately predict the number of through-lanes required to provide a specified level of service for a given facility. Traffic assignment deviation should not result in a design deviation of more than one highway travel lane. Therefore, the

expected accuracy of the model increases as the average annual daily traffic (AADT) on a facility increases. The percent deviation is calculated as follows:

Percent Deviation = [(Base Year Assignment – Base Year Count)/Base Year Count]*100

Figures V-1 and **V-2** show the deviation between the year 2007 volumes assigned by the model and observed traffic counts for the study area.

Maximum desired deviation is represented by the red thick sloping curve in **Figure V-1**. In the SR 316 model, the following equation, provided by GDOT, was used to estimate the Maximum Desirable Deviation for individual links:

$$\text{Maximum Desirable \% Deviation}_{links} = 38.262 * \left(\frac{AADT_{Two-Way}}{10000} \right)^{-0.4361}$$

Figure V-1 Traffic Assignment Percent Deviation

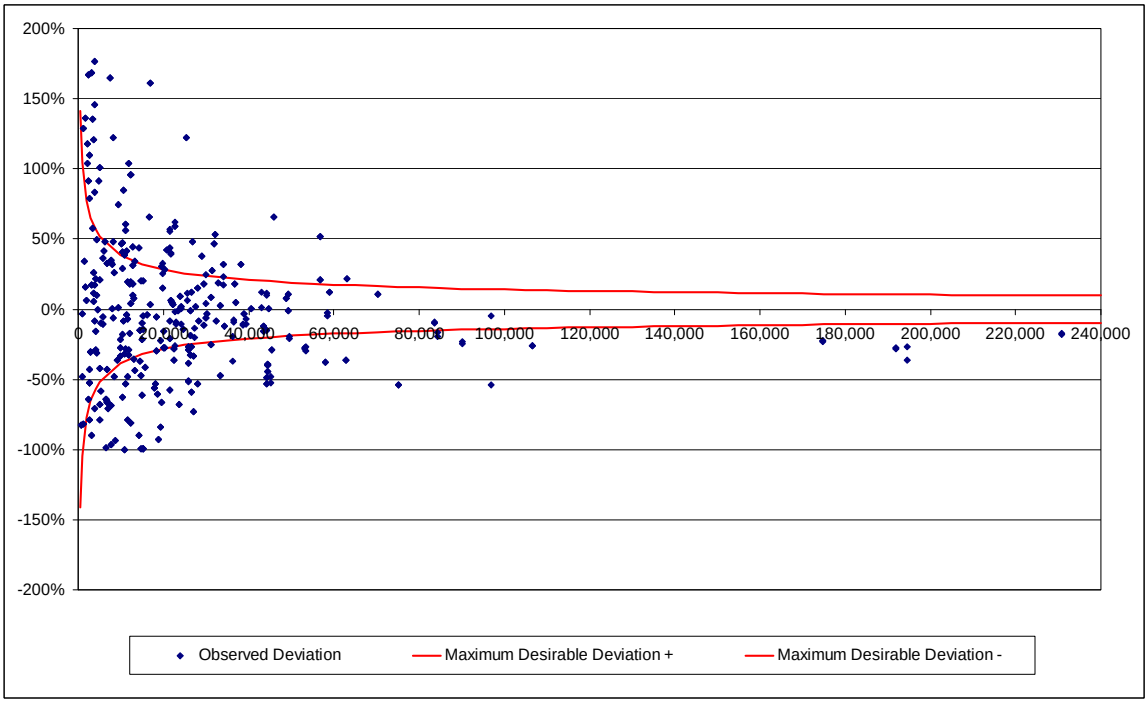


Figure V-1 indicates that most of the link-level model deviation points are concentrated between maximum desirable deviation positive line and maximum desirable deviation negative line. The following conclusions are drawn from the graph:

- Most of the model highway links were assigned volumes which were in reasonable agreement with traffic counts;
- Observed traffic counts for most of the highway links were under 100,000 per day; and,

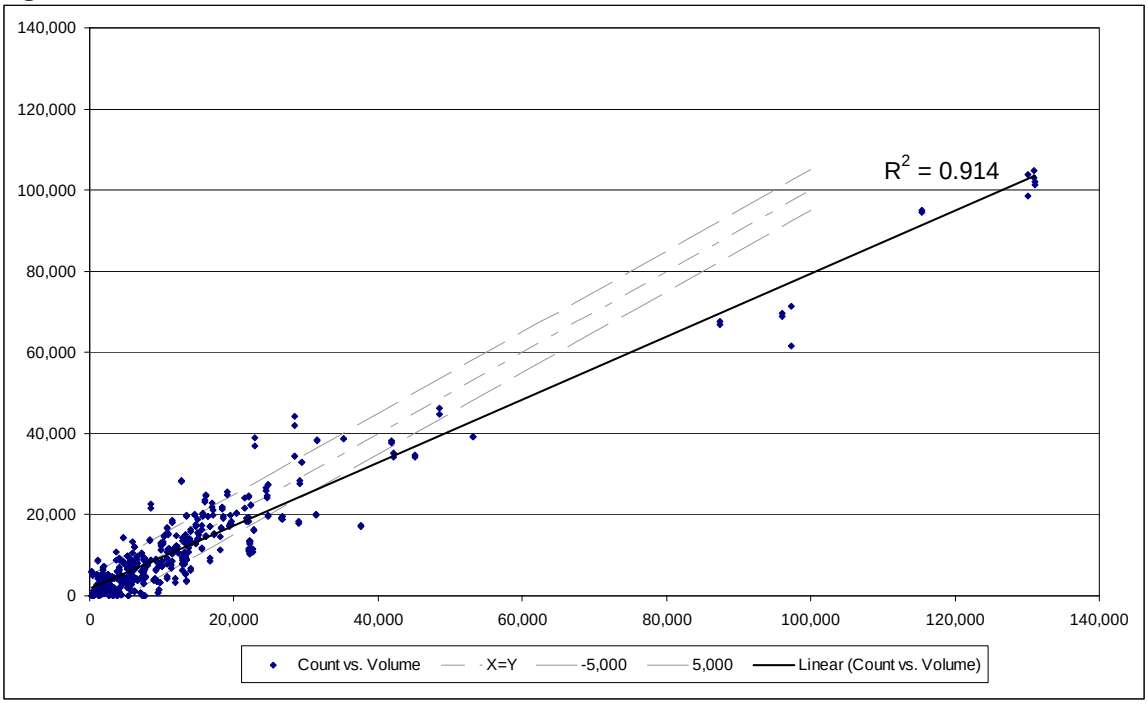
- There are a few links where deviation points are located outside of the maximum desirable deviation curves. Most of these occur on facilities with low daily traffic volumes. In addition, noticeable negative deviations are observed on several links with extremely high volumes along I-85. These underestimated traffic volumes were mainly due to the external-external (E-E) trip loss on I-85 caused by the Fratar algorithm. Since the model was calibrated to existing conditions along SR 316, the E-E trip loss is not expected to significantly affect the travel demand estimations on SR 316.

R-Square / Scatter Plot

The linear correlation coefficient (R^2) is another indicator of how closely modeled volumes approach traffic counts. According to *the Model Validation and Reasonableness Checking Manual, FHWA,* Feb, 1997, systemwide R^2 should be greater than 0.88 for a reasonably validated model. The R^2 value for the SR 316 model was 0.91.

A scatter plot of modeled volumes versus traffic counts helps identify outliers. **Figure V-2** presents the scatter plots of modeled volumes versus traffic counts. As indicated in the figure, most modeled volumes are within +/- 5,000 of the corresponding traffic counts. The +/- 5,000 range is a randomly selected range utilized to illustrate and reference data variations.

Figure V-2 Scatter Plot of Modeled Volume versus Traffic Counts



Vehicle-Miles of Travel (VMT)

Comparing the assigned VMT to the observed VMT provides another method to check the reasonableness of the assignment. Assigned VMT is simply the product of the link

volume and the link distance, summed over the desired facility type. The observed VMT is a product of a comprehensive traffic count program.

Table V-5 shows VMT statistics aggregated by functional classification for both modeled VMT and actual VMT of 2005 for the SR 316 study area. The actual VMT was taken from GDOT's Report 445 listing VMT summarized by Gwinnett, Barrow, Clarke and Oconee Counties. It is noted that the SR 316 study area does not cover the entire Clarke County and Oconee County. Therefore, the model may produce VMT with noticeable deviations from observed values.

Table V-5 SR 316 Model VMT

Facility Type	VMT		Error		VMT Distribution	
	Observed[(1)]	Model	Difference	Percent	Observed	Model
Interstates	6,611,518	5,671,014	-940,503	-14.2%	33.7%	27.3%
Principal Arterial	4,678,575	6,718,353	2,039,778	43.6%	23.9%	32.3%
Minor Arterial	5,328,250	4,325,255	-1,002,995	-18.8%	27.2%	20.8%
Collector	2,977,634	4,082,655	1,105,021	37.1%	15.2%	19.6%
Total VMT	19,595,977	20,797,278	1,201,301	6.1%	100.0%	100.0%

(1): Observed values were obtained from GDOT report 445-2000.

Screenline Comparisons

Screenline analyses were performed as another indicator to assess model reasonableness. Nine screen lines were established to intercept major traffic flows through the SR 316 study area. Assigned volumes in the base year model were compared with the 2007 traffic counts at each screenline crossing. The maximum desirable deviation for screenlines used for model calibration was from NCHRP Report 255.

Table V-6 Screenline Analysis

Screenline	Traffic Count	Modeled Volume	Deviation%	Max. Deviation%
Screenline 1 - Eastern Barrow County	17,220	27,071	57.2%	48.5%
Screenline 2 - South of Athens	108,330	115,262	6.4%	24.1%
Screenline 3 - Eastern Gwinnett County	95,560	107,400	12.4%	25.2%
Screenline 4 - South of Barrow County	27,100	25,965	-4.2%	40.8%
Screenline 5 - West to Athens Loop	67,440	68,007	0.8%	28.8%
Screenline 6 - West of Athens	161,390	128,240	-20.5%	20.7%
Screenline 7 - East of Lawrenceville	40,000	30,656	-23.4%	35.2%
Screenline 8 - West-South of Clark County	133,010	113,824	-14.4%	22.3%
Screenline 9 - SR 316	712,180	605,224	-15.0%	11.7%
Total	3,480,185	2,979,368	-14.4%	6.4%

2015 AND 2032 MODELS

In addition to the existing (2007) model, models were developed for the analysis years of 2015 and 2032. The 2015 and 2032 model networks were modified to include the committed projects as previously detailed in **Tables IV-1** through **IV-3**. These networks serve as the 2015 Existing and Committed (E+C), and 2032 E+C models. The 2015 E+C model included all GP and HOV projects that were currently programmed to be completed before 2015. The 2032 E+C model included the improvements from the 2015 E+C model plus any other GP improvements that were currently programmed to be completed before 2032. The 2032 E+C improvements would convert the entire SR 316 corridor, from I-85 to SR 10 Loop in Athens, to a limited access facility.

The 2032 E+C scenario serves as a baseline to the 2032 Build scenario. The 2032 Build scenario included all the 2032 E+C improvements plus HOV improvements to extend the HOV lanes from Hi-Hope Road to SR 10 Loop in Athens. The purpose of this scenario is to measure the benefit of providing HOV lanes and HOV access points along the entire SR 316 corridor.

TRAFFIC FORECASTING METHODOLOGY

The SR 316 model forecasts daily volumes, therefore, only Average Daily Traffic (ADT) volumes were generated. The future ADT's were calculated by using the increase in ADT predicted by the model from the base year to the future year. Then that increase was added to the existing ADT to calculate the future ADT. In some cases where the increase was very low, a minimum percent increase was assumed. Unless there was a specific network change that would significantly reduce traffic growth, the minimum increase was 10% for the 2015 ADT's and 15% for the 2032 ADT's. The future DHV's were calculated by multiplying the existing, mirrored AM and PM peak hour volumes by the ratio of the existing and future ADT's. AM DHV's are mirrored (reverse of) PM DHV's.

The traffic volume diagrams for Existing, 2015 E+C, 2032 E+C and 2032 Build are included in **Appendix A**.

SECTION VI CORSIM MODELING AND TRAFFIC ANALYSIS

Traffic conditions within the SR 316 corridor were analyzed for the future years of 2015 and 2032 under various conditions. The traffic operations analyses followed the procedures defined by the 2000 Highway Capacity Manual and were performed using Synchro, a traffic signal timing optimization computer software. The capacity analyses were supplemented by operational analyses using the CORSIM traffic micro-simulation computer software. The traffic analysis methodology and results are summarized in this section.

TRAFFIC ANALYSIS AND SIMULATION METHODOLOGY

The modeling process flow chart outlining the process used for this study is illustrated in **Figure VI-1**. This flow chart identifies seven distinct steps that must be followed to develop reasonably accurate simulation models. These steps include:

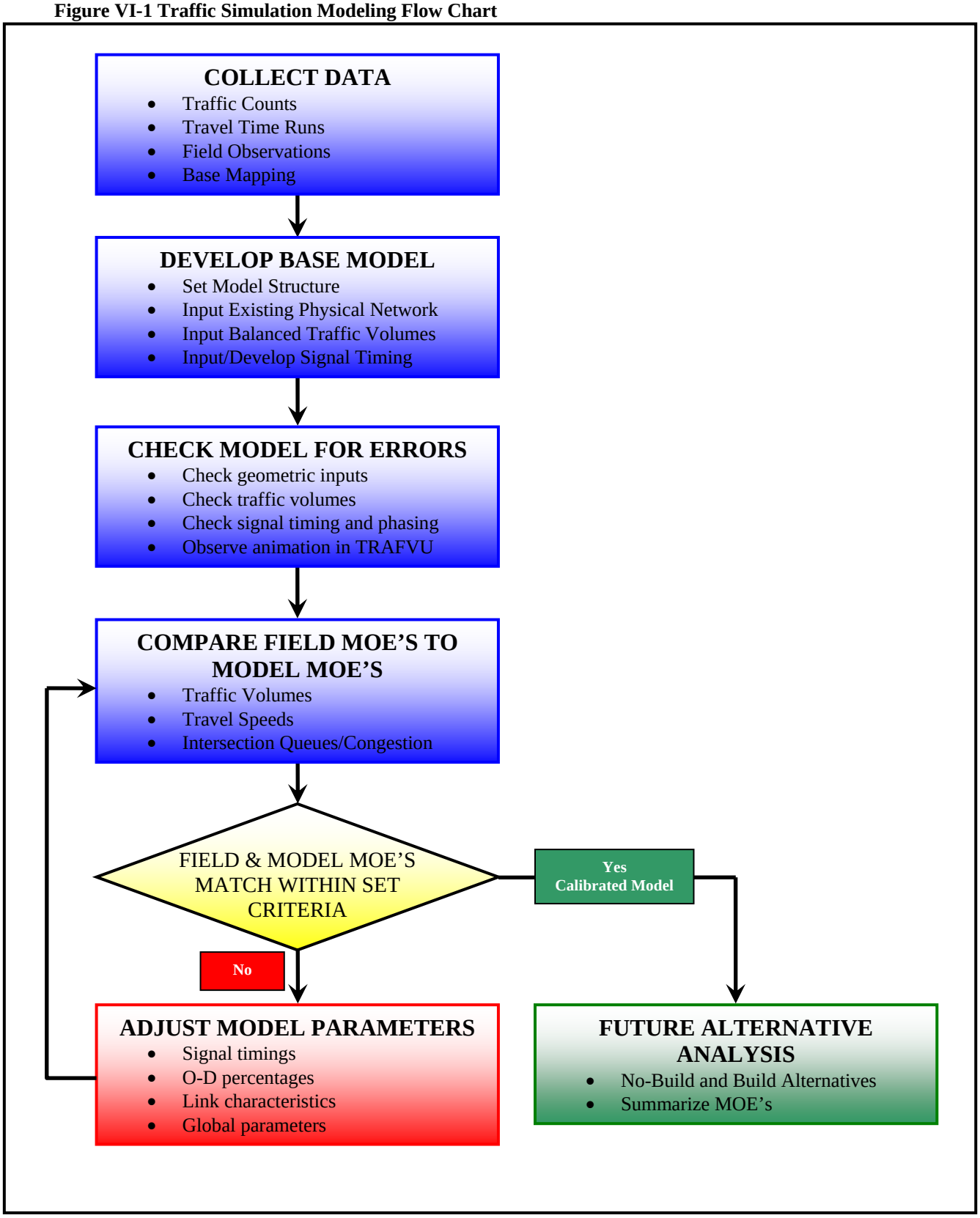
1. Data Collection
2. Base Model Creation
3. Model Checking
4. Comparison of Field and Model Results
5. Determination of Model Calibration
6. Model Adjustments
7. Alternatives Analysis

The initial step, collection of accurate existing data, is critical to the successful calibration of micro-simulation models. If one physical characteristic is misrepresented, it is very difficult to produce a simulation model that replicates existing conditions. For example, to more accurately assess existing travel speeds, in this study these speeds were measured by a test vehicle with a global positioning system (GPS) receiver tethered to a laptop computer. While traffic volumes were measured with electronic counting equipment, intersection congestion and queues were qualitatively documented. For all the existing traffic signals where current timings were available, the actual timings were used to develop the arterial sections of the CORSIM model. Signal timings for future models were developed using Synchro to optimize the future traffic operations.

The existing CORSIM roadway network was developed by importing aerial maps into MicroStation and measuring coordinates of the predetermined CORSIM network nodes. For the freeway network, these coordinates were then entered into CORSIM graphically by using the graphical interface software, TRAFED, and for the arterial network, they were entered into Synchro. After existing signal timings were entered into Synchro, the arterial network was translated to CORSIM using Synchro's translation function.

After the CORSIM input data was checked for errors, the AM and PM models were run five times each and the results were averaged. Each time the model was run, a new random seed number was used to generate the simulated traffic volumes. The averaged output data from each of the five peak hour models were compared with actual measured conditions. The comparisons of total travel time through the corridor varied between 7

Figure VI-1 Traffic Simulation Modeling Flow Chart



and 18 percent, which is less than the 20 percent maximum necessary for calibration. The results of the model calibration are included in **Appendix B**.

The next step was to code the programmed GP and HOV improvements into CORSIM and Synchro for the future highway network for the 2015 E+C models. After the network changes were made, the 2015 AM and PM peak hour traffic volumes were coded into CORSIM for the freeway network and into Synchro for the arterial network. Traffic signal timing was optimized for all the 2015 signalized intersections using Synchro. The arterial network, traffic volumes and signal timing for the AM and PM peak hour periods were then translated from Synchro to CORSIM. The arterial and freeway CORSIM models for each peak hour were then combined to run as single models for each peak hour. After running each model for simulated peak hour, traffic operations throughout the SR 316 were observed using TRAFVU. All the traffic bottleneck locations were evaluated to determine if minor transportation improvements could significantly reduce the simulated congestion problem. Typical types of minor improvements included new traffic signals and intersection turn lanes. If these improvements did not reduce congestion at the bottleneck, such that it did not impact adjacent intersections or other roads, then more substantial improvements were implemented. These more costly improvements were typically adding through lanes to the crossing routes in the vicinity of SR 316. The changes for the 2015 E+C network are listed in **Table VI-1** (See **Figures IV-1** through **IV-3** for locations of improvements).

Similar approaches were used for the modeling of the 2032 E+C and 2032 Build CORSIM models. The programmed projects were added to the 2032 E+C models, and then based on preliminary CORSIM runs, supplemental improvements were made to these models. The supplemental improvements made to the 2032 E+C models are listed in **Table VI-2** (See **Figures IV-1** through **IV-3** for locations of improvements). The proposed future HOV improvements were added to create the 2032 Build CORSIM models. Then supplemental improvements were made to these models, see **Table VI-3** (See **Figures IV-1** through **IV-3** for locations of improvements). The CORSIM input and output files for the final versions of the CORSIM models for 2007, 2015 E+C, 2032 E+C and 2032 Build conditions have been copied to a DVD, which is attached at the end of this report.

Table VI-1 Supplemental 2015 E+C Highway Improvements along SR 316

Loc #	Project	County	Description	Comment
4	Lawrenceville-Suwanee/SR 316 HOV Interchange Traffic Signal	Gwinnett	New traffic signal at SR 316 HOV ramp terminal intersection	
9	SR 20/SR 316 Interchange Right Turn Lane	Gwinnett	Convert outside SR 20 SB through lane to shared right and through lane	SR 20 SB dual right turns
7	Hi Hope Rd Widening	Gwinnett	Widen Hi Hope Rd to four lanes south of Hurricane Shoals Rd	
7	Hurricane Shoals Rd/Hi Hope Rd Traffic Signal & Left Turn Lane	Gwinnett	New traffic signal and WB left turn lane at existing intersection	Hurricane Shoals Rd WB dual left turns
37	Fence Rd/SR 316 Right Turn Lane	Gwinnett	New Fence Rd SB right turn lane	
16	Kilcrease Rd/SR 316 Right Turn Lane	Barrow	New Kilcrease Rd SB right turn lane	
16	Kilcrease Rd/Fred Kilcrease Rd Left Turn Lane	Barrow	New Kilcrease Rd SB left turn lane	
35	Dials Mill Road Traffic Signal	Oconee	New traffic signal at existing SR 316 intersection	
38	SR 10/Monroe Hwy/SR 316 Interchange Traffic Signal	Oconee	New traffic signal at SR 316 WB ramp terminal intersection	
30	Jimmy Daniel Rd/SR 316 Left Turn Lane	Oconee	New Jimmy Daniel Rd SB left turn lane	

Table VI-2 Supplemental 2032 E+C Highway Improvements along SR 316

Loc #	Project	County	Description	Comment
5	Lawrenceville-Suwanee/ SR 120 Left Turn Lane	Gwinnett	New Lawrenceville-Suwanee SB left turn lane	Lawrenceville-Suwanee SB dual left turns
9	SR 120/SR 316 Interchange Right Turn Lane	Gwinnett	New SR 316 WB ramp terminal intersection right lane	
6	Walther Boulevard/SR 316 HOV Interchange Traffic Signal	Gwinnett	New traffic signal at SR 316 HOV ramp terminal intersection	
7	Hi Hope Rd Widening	Gwinnett	Widen Hi Hope Rd/Hurricane Shoals Rd to four lanes from Airport Rd to Hi Hope Rd/Hurricane Shoals Rd split	Addition to PI # 0003168
32	SR 10/Athens Loop Interchange	Oconee	Widen SR 316 to six lanes through the interchange	Widen bridge to seven lanes

Table VI-3 Supplemental 2032 Build Highway Improvements along SR 316

Loc #	Project	County	Description	Comment
3	Herrington Rd/SR 316 HOV Interchange Traffic Signal	Gwinnett	New traffic signal at SR 316 HOV ramp terminal intersection	
7	Hi Hope Rd/SR 316 HOV Interchange Traffic Signal	Gwinnett	New traffic signal at SR 316 HOV ramp terminal intersection	
14	US 29/SR 8 Interchange Bridge Widening	Gwinnett	Widen US 29/SR 8 bridge over SR 316 to six lanes	
33	Harbins Rd/SR 316 HOV Interchange Traffic Signal	Gwinnett	New traffic signal at SR 316 HOV ramp terminal intersection	
16	Kilcrease Rd/SR 316 HOV Interchange Widening	Barrow	Widen Kilcrease Rd to four lanes in the vicinity of SR 316	
16	Kilcrease Rd/SR 316 HOV Interchange Traffic Signal	Barrow	New traffic signal at SR 316 HOV ramp terminal intersection	
16	Barrow Industrial Rd/Kilcrease Rd Traffic Signal	Barrow	New traffic signal at existing intersection	
17	Kennedy Rd/Patrick Mill Rd Intersection Traffic Signal and Left Turn Lane	Barrow	New traffic signal and Patrick Mill Rd SB left turn lane at existing intersection	
18	Carl Bethlehem Rd/SR 316 HOV Interchange Traffic Signal	Barrow	New traffic signal at SR 316 HOV ramp terminal intersection	
35	Dials Mill Rd/SR 316 HOV Interchange Traffic Signal	Oconee	New traffic signal at SR 316 HOV ramp terminal intersection	
38	Mars Hill Rd/SR 10/Monroe Hwy Widening	Oconee	Widened Mars Hill Rd to four lanes east of SR 10	Mars Hill Rd WB dual left turns
36	Virgil Langford Rd/SR 316 HOV Interchange Widening	Oconee	Widen Virgil Langford Rd to four lanes in the vicinity of SR 316	
36	Virgil Langford Rd/SR 316 HOV Interchange Traffic Signal	Oconee	New traffic signal at SR 316 HOV ramp terminal intersection	
32	SR 10/Athens Loop Interchange Widening	Oconee	Add one SR 10 WB through lane east of interchange	
32	SR 10/Athens Loop Interchange Left Turn Lane	Oconee	New SR 10 NB ramp terminal intersection left turn lane	SR 10 Loop NB ramp triple left turns

LEVEL OF SERVICE

Based on the GP and HOV roadway improvements identified in **Section IV** and the previous tables in **Section VI**, the level of service (LOS) was calculated for the critical segments of SR 316. For the freeway segments, LOS is based on the cumulative density of vehicles on the roadways (Vehicles/Mile/Lane). The average travel speed was also calculated for these segments. The LOS of critical segments of SR 316 or intersections, which would experience unacceptable levels of service (LOS E or F), are identified in **Tables VI-4** and **VI-5,** respectively. Most of the full access, unsignalized intersections along SR 316 will experience heavy delays for the cross streets in the future planning

years. The results for the freeway segments for the 2015 E+C, 2032 E+C and 2032 Build conditions were summarized in **Appendix C**.

Table VI-4 Level of Service for Critical Segments along SR 316

Facility	Location	2015 E+C Level of Service*		2032 E+C Level of Service*		2032 Build Level of Service*	
		AM	PM	AM	PM	AM	PM
SR 316 WB	After Riverside Dr. Off-Ramp	E					
SR 316 WB	Before Riverside Dr. On-Ramp	E					
SR 316 WB	After Riverside Dr. On-Ramp	E					
SR 316 WB	Before Duluth Hwy Off-Ramp	F					
SR 316 WB	Before Sugarloaf Ext CD Rd Off-Ramp			E			
SR 316 WB	After Drowning Creek Rd Off-Ramp			E			
SR 316 WB	Before Drowning Creek Rd On-Ramp			E			
SR 316 WB	After Loganville Hwy SR 81 On-Ramp			E			
SR 316 WB	Before Monroe Hwy SR 10 Off-Ramp						E
SR 316 WB	Before Oconee Conn CD Rd Off-Ramp						E
SR 316 WB	After Oconee Conn CD Rd Off-Ramp						E
SR 316 EB	Before Sugarloaf Parkway Off-Ramp				E		E
SR 316 EB	Before Riverside Dr. Off-Ramp		E				
SR 316 EB	After Riverside Dr. Off-Ramp		F				
SR 316 EB	Before Riverside Dr. On-Ramp		F				
SR 316 EB	After Riverside Dr. On-Ramp		F				
SR 316 EB	Before Duluth Hwy Off-Ramp		F				
SR 316 EB	After Duluth On-Ramp		E				
SR 316 EB	Before Collins Hill / SR 20 CD Rd On-Ramp		F				
SR 316 EB	After Collins Hill / SR 20 CD Rd On-Ramp		F				
SR 316 EB	Before HOV Direct Merge (West Progress Center)		F				
SR 316 EB	After HOV Direct Merge (West Progress Center)		F				
SR 316 EB	After Sugarloaf Ext CD Rd On-Ramp				E		
SR 316 EB	After Monroe Hwy SR 10 On-Ramp			E			
SR 10 Loop SB	Before SR 316 Off-Ramp	E	F				
SR 10 Loop NB	Before SR 316 Off-Ramp	F	F		F		F

*Note: Time periods where no level of service is given are LOS D or better.

Table VI-5 Level of Service for Critical Intersections along SR 316

Intersection	Approach	2015 E+C Level of Service*		2032 E+C Level of Service*		2032 Build Level of Service*	
		AM	PM	AM	PM	AM	PM
SR 316 WB Ramp @ Sugarloaf Parkway	Westbound	F		F	F	F	E
SR 316 EB Ramp @ Sugarloaf Parkway	Northbound			E		E	
SR 316 WB Ramp @ Duluth Highway	Westbound					E	
SR 316 EB Ramp @ Duluth Highway	Northbound		E			F	
SR 316 @ Cedars Road	Northbound	F					
	Southbound		F				
	Eastbound		F				
	Westbound		F				
SR 316 @ Hurricane Trail	Southbound		E				
SR 316 @ SR 8 Winder Highway	Northbound		F				
	Southbound	E	F				
SR 316 @ Harbins Road	Northbound	F	E				
	Southbound	F					
	Westbound	E					
SR 316 @ Kilcrease Road	Southbound	E					
SR 316 @ Carl Bethlehem Road	Northbound	F	E				
	Southbound		F				
SR 316 @ SR 81	Southbound	E	E				
	Eastbound	E	F				
	Westbound	F	F				
SR 316 @ SR 11	Northbound		E				
	Southbound	E	F				
	Eastbound	F					
	Westbound	F					
SR 316 @ Jimmie Daniel Road	Southbound		E				
	Westbound		E				
SR 316 @ Oconee Connector	Northbound	E	F				
	Southbound		E				
	Westbound		E				
SR 10 Loop SB Ramp @ SR 316	Southbound	F	F				
SR 10 Loop NB Ramp @ SR 316	Northbound	F	E				
	Westbound		F		F		
SR 316 HOV Ramp @ Lawrenceville-Suwannee Road	Northbound		E				
	Eastbound			E	E	E	
SR 316 EB Ramp @ Cedars Road	Eastbound				E		
SR 316 EB Ramp @ Cedars Road (Single Point Urban Interchange)	Eastbound						F
	Westbound						E
SR 316 WB Ramp @ SR 8 Winder Highway	Westbound				F		
SR 316 EB Ramp @ SR 8 Winder Highway	Eastbound				E		
SR 316 @ Virgil Langford Road	Southbound	F	E				

*Note: Time periods where no level of service is given are LOS D or better.

SECTION VII STUDY RECOMMENDATIONS

PROGRAMMED HIGHWAY IMPROVEMENTS

The evaluation of future traffic demand along the SR 316 corridor clearly justified implementation of all the currently programmed highway improvements except for the widening of GP lanes from Cedars Road to Drowning Creek Road (PI No. 0006937). The 2015 E+C model clearly demonstrated the need for the eastern expansion of SR 316 GP interchanges to Drowning Creek Road in Gwinnett County and three grade separations currently under concept design in Barrow County (SR 81, SR 11 and SR 53). These existing at-grade intersections fail by 2015 without any further improvements.

The preliminary recommendations for future GP and HOV interchange configurations are listed in **Tables VII-1** and **VII-2**, respectively (See **Figures IV-1** through **IV-3** for locations of improvements).

Since the projected HOV volumes are much lower than the GP volumes, the proposed HOV improvements will have a lower benefit to cost ratio than the GP projects. However, the HOV projects will promote the increase in HOV usage within the study area. The classification of GP and HOV improvements into three levels of priority is outlined hereinafter in the subsection, **Implementation Plan**.

SUPPLEMENTAL HIGHWAY IMPROVEMENTS

Since the modeling strategy employed by this study incorporated all of the programmed and future projects within the SR 316 corridor in the various CORSIM models, interpretations of the results of these simulation model runs are limited to the ability of these improvements to meet future traffic demands and identifying the specific shortfalls associated with these improvements. Many of these shortfalls, but not all, were addressed by the supplemental highway improvements identified in **Section VI**.

With major trip destinations on both ends of the corridor (Metro Atlanta and University of Georgia), the future traffic volumes along the corridor are the highest on each end and drop off slightly in the middle sections of the study area. Therefore, the greatest needs are located at each end. The short-term needs on the west end of the corridor are being addressed by the eastern expansion of freeway type facilities on SR 316.

Table VII-1 Recommendations for 2032 SR 316 GP Interchanges

Loc #	Project	County	P.I. No.	Description	Overpass Bridge
13	Cedars Road Interchange	Gwinnett	0004869	Single Point or Compressed Diamond Interchange	Six Lanes Wide
14	US 29/SR 8 Interchange	Gwinnett	0004869	Standard Diamond Interchange	Six Lanes Wide
15	Drowning Creek Interchange	Gwinnett	0004869	Standard Diamond Interchange	Four Lanes Wide
27	Bogart Parkway	Oconee	N/A (Oconee County project)	Standard Diamond Interchange	Six Lanes Wide
30	Jimmy Daniel Road Interchange	Oconee	0007685	Standard Diamond Interchange	Three Lanes Wide
31	Oconee Connector Interchange	Oconee	0007685	Split Diamond Interchange and Collector Distributor Roads to SR 10	Six Lanes Wide
32	SR 10/Athens Loop Interchange	Oconee	0007685	Partial Cloverleaf Interchange and CD Roads to Oconee Connector	Seven Lanes Wide

Table VII-2 Recommendations for 2032 SR 316 HOV Interchanges

Loc #	Project	County	P.I. No.	Description	Overpass Bridge
7	Hi Hope Road Interchange	Gwinnett	0004869	Full Drop HOV Interchange (from HOV Strategic Implementation Plan for the Atlanta Region-2003)	Six Lanes Wide
33	Harbins Road Interchange	Gwinnett	0004869	Partial Drop HOV Interchange (from State Route 316 Corridor Analysis-2002)	Four Lanes Wide
16	Kilcrease Road Interchange	Barrow	N/A	Full Drop HOV Interchange (from State Route 316 Corridor Analysis-2002)	Six Lanes Wide
18	Carl Bethlehem Road Interchange	Barrow	N/A	Full Drop HOV Interchange (from State Route 316 Corridor Analysis-2002)	Six Lanes Wide
20	Harry McCarty Road Interchange	Barrow	N/A	Full Drop HOV Interchange (from State Route 316 Corridor Analysis-2002)	Four Lanes Wide
22	Harrison Mill Road Interchange	Barrow	N/A	Full Drop HOV Interchange (from State Route 316 Corridor Analysis-2002)	Four Lanes Wide
25	Barber Creek Road Interchange	Barrow	N/A	Full Drop HOV Interchange (from State Route 316 Corridor Analysis-2002)	Four Lanes Wide
35	Dials Mill Road Interchange	Oconee	N/A	Full Drop HOV Interchange (from State Route 316 Corridor Analysis-2002)	Four Lanes Wide
28	Mars Hill Interchange	Oconee	N/A	Full Drop HOV Interchange (from State Route 316 Corridor Analysis-2002)	Four Lanes Wide
36	Virgil Langford Road Interchange	Oconee	N/A	Full Drop HOV Interchange (from State Route 316 Corridor Analysis-2002)	Six Lanes Wide

SR 316/SR 10 LOOP INTERCHANGE

The bottleneck point on the east end is the SR 316/SR 10 Loop interchange. The only short term project programmed to relieve this choke point is the construction of Jennings Mill Parkway. Since this alignment connects SR 316 to an interchange further north along the Athens Loop, this project will reduce some of the interchange movements (eastbound to northbound and southbound to westbound), but will have limited benefit for the heaviest movements (eastbound to southbound and northbound to westbound).

This study only considered lower costs solutions to this problem (widening the SR 316 bridge and triple left turns for the northbound to westbound movement); however, these proposed improvements would not address the disparity between the future interchange type and the approach facilities. The existing SR 316/SR 10 Loop partial diamond/partial cloverleaf interchange is consistent with the existing intersection of a limited access highway (SR 10 Loop) and an arterial highway (SR 316). The nature of this intersection will change when SR 316 also becomes a limited access highway, and three out of the four legs of this interchange are limited access, free flow facilities. Consideration should be given to creating free flow connections for all the movements between the limited access approaches. This may require eliminating arterial access to this interchange from the east and converting it to a full system to system trumpet interchange by 2032. Access to the east of the SR 10 Loop could be provided by the new Jennings Mill Parkway.

IMPLEMENTATION PLAN

The proposed Implementation Plan prioritizes projects into three groups, Tiers I, II and III. Tier I projects address immediate, significant deficiencies and should be implemented as part of the current 6-year TIP or as soon as the Plan Development Process steps have been completed, right-of-way has been acquired and funding for all phases has been allocated to the project. The Tier I projects included in **Table VII-3** that are not currently programmed were added to address localized congestion and operational problems. Tier II projects address anticipated, significant deficiencies and should be implemented shortly after the current 6-year TIP time frame. Tier III projects address anticipated operational issues and should be implemented within the next twenty (20) years. The Tier III HOV projects included in **Table VII-5** that are not currently programmed were added to increase the overall corridor traffic capacity on SR 316.

Table VII-3 Tier I Highway Improvements along SR 316

Loc #	Project	County	P.I. No.	Description	Comment
2	SR 316 HOV Lanes	Gwinnett	0003168	Extension of HOV Lanes to West Progress Center Avenue	Construction to Begin in 2012
3	Herrington Road HOV Interchange	Gwinnett	0003168	Full Drop HOV Only Interchange at existing overpass	Construction to Begin in 2012
4	Lawrenceville-Suwanee Road HOV Interchange	Gwinnett	0003168	Partial Drop HOV Only Interchange at existing overpass (west side)	Construction to Begin in 2012
5	SR 120 Inter-change Bridge	Gwinnett	0003168	New bridge over SR 316	Construction to Begin in 2012
6	Walther Boulevard HOV Interchange	Gwinnett	0003168	Full Drop HOV Only Interchange at existing intersection	Construction to Begin in 2012
7	Hi Hope Road HOV Interchange	Gwinnett	0003168	Partial Drop HOV Only Interchange at existing overpass (west side)	Construction to Begin in 2012
7	Hi Hope Rd Widening	Gwinnett	N/A	Widen Hi Hope Rd/Hurricane Shoals Rd to four lanes from Airport Rd to Hi Hope Rd/Hurricane Shoals Rd split	Addition to PI # 0003168
7	Hurricane Shoals Rd/Hi Hope Rd Traffic Signal & Left Turn Lane	Gwinnett	N/A	Construct intersection improvements	Addition to PI # 0003168
8	Collins Hill Road Interchange	Gwinnett	0004086	Split Diamond Interchange (Western half) with CD Roads	Under Design
9	SR 20 Interchange	Gwinnett	0004086	Split Diamond Interchange (Eastern half) with CD Roads	Under Design
9	SR 20 Interchange Right Turn Lane	Gwinnett	N/A	Construct second SR 20 SB right lane	Addition to PI # 0004086
10	Sugarloaf Parkway Extension	Gwinnett	GW-308A3	New alignment with half cloverleaf interchange at SR 316	Under Design by Gwinnett County
37	Fence Rd Right Turn Lane	Gwinnett	N/A	Construct Fence Rd SB right turn lane	Addition to PI # 0004869
16	Kilcrease Rd Right Turn Lane	Barrow	N/A	Construct Kilcrease Rd SB right turn lane	Addition to PI # 122870
16	Kilcrease Rd/Fred Kilcrease Rd Left Turn Lane	Barrow	N/A	Construct Kilcrease Rd SB left turn lane	Addition to PI # 122870
35	Dials Mill Road Traffic Signal	Oconee	N/A	Construct traffic signal at existing SR 316 intersection	Addition to PI # 122870
38	SR 10/Monroe Hwy Interchange Traffic Signal	Oconee	N/A	Construct traffic signal at SR 316 WB ramp terminal intersection	
30	Jimmy Daniel Rd/SR 316 Left Turn Lane	Oconee	N/A	Construct Jimmy Daniel Rd SB left turn lane	
12	Jennings Mill Parkway	Oconee	0001098	New multi-lane highway connecting with SR 316 at Oconee Connector	Under Design

Table VII-4 Tier II Highway Improvements along SR 316

Loc #	Project	County	P.I. No.	Description	Comment
12A	SR 316 GP Lane Widening Projects	Gwinnett	122750, 122710, 122760, and 122770	Widening existing GP lanes from four through lanes to six through lanes plus auxiliary lanes	Long Range
N/A	SR 316 GP Lane Widening Project	Gwinnett	N/A	Auxiliary Lanes from Boggs Road to Riverside Parkway	Not Currently Programmed
N/A	HOV Lane Extension	Gwinnett	0004869	Eastern extension of HOV Lanes to west of Drowning Creek Road	Final Programmed HOV Extension
7	Hi Hope Road Interchange	Gwinnett	0004869	New Full Drop HOV Interchange	Part of HOV Extension
33	Harbins Road Interchange	Gwinnett	0004869	New Partial Drop HOV	Part of HOV Extension
13	Cedars Road Interchange	Gwinnett	0004869	New GP Interchange (Single Point Diamond)	Part of HOV Extension
14	US 29/SR 8 Interchange	Gwinnett	0004869	New GP Diamond Interchange	Part of HOV Extension
10	Sugarloaf Parkway Extension	Gwinnett	0006924	New alignment north of SR 316 with north half of Cloverleaf Interchange	Future Design by Gwinnett County
15	Drowning Creek Interchange	Gwinnett	0004869	New GP Diamond Interchange	Part of HOV Extension
N/A	HOV Lane Extension	Gwinnett/ Barrow	N/A	East exten. of HOV Lanes- Drowning Creek Rd to Carl Bethlehem Rd	Not Programmed
16	Kilcrease Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
17	Patrick Mill Road Interchange	Barrow	0006327	New GP Diamond Interchange for West Winder Bypass	Concept Approved
18	Carl Bethlehem Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
19	SR 81 Interchange	Barrow	0008429	New GP Interchange	Under Concept Design
20	Harry McCarty Road Grade Separation	Barrow	122870	New grade separation	Long Range
21	SR 11 Interchange	Barrow	0008430	New GP Interchange with widening of SR 11 south of SR 316	Under Concept Design
22	Harrison Mill Road Grade Separation	Barrow	122870	New grade separation	Long Range
23	SR 53 Interchange	Barrow	0008431	New GP Interchange	Under Concept Design
24	SR 211 Interchange	Barrow	122870	New GP Interchange	Long Range
25	Barber Creek Road Grade Separation	Barrow	122870	New grade separation	Long Range
26	Dial Rd/Craft Rd Grade Separation	Barrow	122870	New grade separation	Long Range
28	Mars Hill Grade Separation	Oconee	0007685	New grade separation	Long Range
29	Julian Drive Grade Separation	Oconee	0007685	New grade separation	Long Range

Table VII 4 Tier II Highway Improvements along SR 316 (continued)

30	Jimmy Daniel Road Interchange	Oconee	0007685	New GP Interchange	Long Range
31	Oconee Connector Interchange	Oconee	0007685	New GP Interchange and CD Roads to SR 10	Long Range
32	SR 10/Athens Loop Interchange	Oconee	0007685	Modification of existing Interchange and CD Roads to Oconee Connector	Long Range
34	Wall Road Grade Separation	Barrow	N/A	New grade separation	Not Programmed

Table VII-5 Tier III Highway Improvements along SR 316

Loc #	Project	County	P.I. No.	Description	Comment
N/A	HOV Lane Extension	Barrow/ Oconee	N/A	Eastern extension of HOV Lanes to west of SR 10, Athens Loop	Not Programmed
20	Harry McCarty Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
22	Harrison Mill Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
25	Barber Creek Road Interchange	Barrow	N/A	New Full Drop HOV Interchange	Not Programmed
27	Bogart Parkway Interchange	Oconee	N/A (Oconee County project)	New GP Interchange	Long Range
35	Dials Mill Road Interchange	Oconee	N/A	New Full Drop HOV Interchange	Not Programmed
28	Mars Hill Interchange	Oconee	N/A	New Full Drop HOV Interchange	Not Programmed
36	Virgil Langford Road Interchange	Oconee	N/A	New Full Drop HOV Interchange	Not Programmed

The above Implementation Plan is summarized in Table VII-6 which categorizes the improvements between the 2015 E+C, 2032 E+C and 2032 Build networks that were used in the CORSIM simulation analysis. The 2032 E+C and 2032 Build improvements are illustrated in **Figures VII-1 and VII-2**, respectively.

Table VII-6 Summary of Implementation Plan

Current Intersection name	Current Programming	County	2015 E+C Network	2032 E+C Network	2032 Build Network
I-85 and Boggs Road	Under construction (HOV interchange included)	Gwinnett	As constructed	Same as 2015 E+C	Same as 2015 E+C
Herrington Road	HOV Interchange (PI 0003168)	Gwinnett	HOV interchange as concepted	Same as 2015 E+C	Same as 2015 E+C
Sugarloaf Parkway		Gwinnett	As existing	As existing	As existing
Riverside Parkway	PI 122750 (widening) project begins	Gwinnett	As existing	Add one GP lane each direction to east of Walther Blvd	Same as 2032 E+C
Lawrenceville-Suwanee Rd	HOV Interchange (PI 0003168) (half diamond - west side only); Within bounds of PI 122750 (widening)	Gwinnett	Partial HOV interchange (westbound) as concepted	Add SB left turn lane at Lawrenceville-Suwanee/SR 120 Intersection	Same as 2032 E+C
SR 120	New bridge (PI 0003168); Within bounds of PI 122750 (widening)	Gwinnett	New bridge as concepted	Add WB right turn lane at WB ramp terminal intersection	Same as 2032 E+C
Walther Blvd/ Hurricane Shoals	HOV Interchange (PI 0003168); PI 122750 (widening) project ends east of Walther Blvd; PI 122710 (widening + CDs) begins east of Walther Blvd	Gwinnett	Full HOV interchange as concepted	Add traffic signal at ramp terminal intersection and add one GP lane each direction to east of SR 20	Same as 2032 E+C
Collins Hill Rd	Interchange (PI 0004086) - Part of PI 0003168 (includes CD Road to SR 20); Within bounds of PI 122710 (widening+CDs)	Gwinnett	Split diamond to SR 20 (PI 0004086)	Same as 2015 E+C	Same as 2015 E+C
SR 20	Interchange (PI 0004086) - Part of PI 0003168 (includes CD Road to Collins Hill Rd); PI 122710 (widening+CDs) project ends east of SR 20; PI 122760 (widening) project begins east of SR 20	Gwinnett	Split diamond from Collins Hill (PI 0004086) as concepted except for additional SB right turn lane	Add one GP lane each direction to west of Progress Center Avenue	Same as 2032 E+C
Hi Hope Road	HOV Interchange (PI 0003168) (half diamond - west side only); Within boundaries of PI 122760 (widening)	Gwinnett	Half drop HOV interchange (westbound) as concepted (PI 0003168) (6-lane bridge); Widen Hi Hope Rd/Hurricane Shoals Rd to 4 lanes (Airport Rd to split)	Same as 2015 E+C	Full HOV interchange (PI 0004869) (6-lane bridge)
CR 183/ West Progress Center Ave (north) & Airport Rd (south)	HOV Interchange (PI 0003168) project ends; HOV project (PI 0004869) project begins; PI 122760 (widening) project ends west of Progress Center; PI 122770 (widening) project begins west of Progress Center	Gwinnett	termination (0003168) as concepted; HOV entrance & exit merge (PI 0003168)	Add one GP lane each direction to east of Cedars Road	Remove direct merge access
Cedars Road	Within bounds of PI 0004869 (HOV lanes); PI 122770 (widening) project ends east of Cedars Rd; PI 0006937 (widening) project begins	Gwinnett	As existing	SOV Interchange - (not programmed individually, but as part of HOV project - PI 0004869) tight urban diamond or SPUI (6-lane bridge)	Same as 2032 E+C
Hurricane Trail	Within bounds of PI 0004869 (HOV lanes) - Within bounds of PI 0006937 (widening)	Gwinnett	As existing	Termination (not programmed individually, but as part of HOV project - PI 0004869)	Direct Merge access to HOV / Termination of intersection (PI 0004869)
Fence Road	Within bounds of PI 0004869 (HOV lanes) - Within bounds of PI 0006937 (widening) - design includes direct truck access for Publix (inbound/outbound in both east and west directions)	Gwinnett	Add SB right turn lane	Termination (not programmed individually, but as part of HOV project - PI 0004869)	Same as 2032 E+C
Winder Hwy & US 29 / SR 8 (north)	Within bounds of PI 0004869 (HOV lanes) - Within bounds of PI 0006937 (widening)	Gwinnett	As existing	SOV Interchange (not programmed individually, but as part of HOV project - PI 0004869) (6-lane bridge)	Same as 2032 E+C
Sugarloaf Parkway Extension	Within bounds of PI 0004869 (HOV lanes) - Within bounds of PI 0006937 (widening); PI 0006923, 0006924 (new construction "Sugarloaf Parkway Extension") begin/end at SR 316	Gwinnett	Interchange & Sugarloaf Pkwy Ext. (southern connection - TIP# GW-308A3) - Clover leaf concepted for this project without northern connection	Clover leaf Interchange & Sugarloaf Pkwy Ext.(northern connection - PI 0006924)	Same as 2032 E+C
Harbins Road	Within bounds of PI 0004869 (HOV lanes) - Within bounds of PI 0006937 (widening);	Gwinnett	As existing	Termination (not programmed individually, but as part of HOV project - PI 0004869)	Partial HOV Interchange (Westbound) - PI 0004869 (4-lane bridge)
Drowning Creek Road	Within bounds of PI 0004869 (HOV lanes) - PI 0006937 (widening) project ends;	Gwinnett	As existing	SOV Interchange (not programmed individually, but as part of HOV project - PI 0004869) (4-lane bridge)	Direct HOV merge access west of intersection
Kilcrease Road / CR 74	Grade Separation (122870);	Barrow	Add SB right turn lane at SR 316 and SB left turn lane at Fred Kilcrease Rd	grade seperation (PI 122870)	Full HOV interchange (not programmed) (6-lane bridge)
Patrick Mill Road / CR 93	Patrick Mill Road / W. Winder Bypass interchange (PI 0006327)	Barrow	As existing	W. Winder Bypass & SOV interchange (PI 0006327) as concepted	Same as 2032 E+C
Carl Bethlehem Road	Grade Separation (122870)	Barrow	As existing	grade seperation (PI 122870)	Full HOV interchange (not programmed) (6-lane bridge)
SR 81 / Charles Floyd Rd	Interchange - PI 0008429 - task order (Split out of PI 122870);	Barrow	Frontage Rd (81 to Harry McCarty) under CST	SOV Interchange (PI 0004869)	Same as 2032 E+C
Harry McCarty Rd / CR 110	Grade Separation (122870);	Barrow	As existing	grade seperation (PI 122870)	Full HOV interchange (not programmed) (4-lane bridge)
SR 11	Interchange - PI 0008430 - task order (Split out of PI 122870); PI 0007832 (widening of SR 11 south of SR 316) project begins at SR 316	Barrow	As existing	SOV interchange (0008430); SR 11 widening, south of 316 (0007832)	Same as 2032 E+C
Harrison Mill Rd / CR 144	Grade Separation (122870)	Barrow	As existing	grade seperation (PI 122870)	Full HOV interchange (not programmed) (4-lane bridge)
Smith Cemetary Rd (north) / Ode Pepers Rd (south)	Interchange or Termination (PI 122870)	Barrow	As existing	Termination (122870)	Same as 2032 E+C
Jackson Trail Road / CR 139	Termination (PI 122870)	Barrow	As existing	Termination (122870)	Same as 2032 E+C
Hog Mountain Rd / SR 53	Interchange - PI 0008431 - task order (Split out of PI 122870)	Barrow	As existing	SOV interchange (0008431)	Same as 2032 E+C
Wall Road / CR 159	Termination (122870)	Barrow	As existing	termination (122870)	grade seperation (not programmed)
Bethlehem St & SR 211 (north)	Interchange (122870)	Barrow	As existing	SOV interchange (122870) (3-lane bridge)	Same as 2032 E+C except for direct merge access to HOV (not programmed)
Barber Creek Road / CR 329	Grade Separation (122870)	Barrow	As existing	grade seperation (PI 122870)	Full HOV interchange (not programmed) (4-lane bridge)
Dial Road / Craft Road / CR 214		Barrow	As existing	grade seperation (122870)	Same as 2032 E+C
Dials Mill Ext / CR 58	Grade separation or termination (0007685)	Oconee	Add traffic signal	termination (0007685)	Same as 2032 E+C
Dials Mill Rd / CR 60	Termination (0007685)	Oconee	As existing	Termination (0007685)	Full HOV interchange (not programmed) (4-lane bridge)
Pete Dickens Rd / CR 52		Oconee	No intersection	No intersection	No intersection
Bogart Parkway		Oconee	As existing	SOV interchange (0007685) (6-lane bridge)	Same as 2032 E+C
McNutt Creek Road	Grade Separation (0007685)	Oconee	As existing	termination (0007685)	Same as 2032 E+C
Mars Hill / CR 273	Grade Separation (0007685)	Oconee	As existing	grade seperation (0007685)	Full HOV interchange (not programmed) (4-lane bridge)
US 78 / SR 10	Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	Add traffic signal at WB ramp terminal intersection	As existing	As existing
Julian Dr / CR 20	Grade Separation (0007685); Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	As existing	grade seperation (0007685)	Same as 2032 E+C
Jimmy Daniel Road / CR 55	Interchange w/ or W/out CD (0007685); Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	Add SB left turn lane	SOV interchange (0007685) (3-lane bridge) and add auxiliary lane in each direction to Oconee Connector	Same as 2032 E+C
Virgil Langford Rd / CR 37	Termination (0007685); Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	As existing	Termination (0007685)	Full HOV interchange (not programmed) (6-lane bridge)
Oconee Connector	Interchange w/ or W/out CD "Epps Bridge Road Extension" (0007685); PI 0001098 (Jennings Mill Parkway extension) ends north of SR 316 & Oconee Connector interchange; PI 142060 (widening of SR 53 & Mars Hill Rd) intersects SR 316; Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	Jennings Mill (0001098)	SOV interchange (0007685); CD road to SR 10 Loop; SR 53 & Mars Hill widening (142060) (6-lane bridge)	Same as 2032 E+C
Epps Bridge Road / CR 261	Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	As existing	CD Road to SR 10 Loop	Same as 2032 E+C
SR 10 Loop / Athens Bypass	Modify existing interchange w/ CD (0007685); Consideration of CD roads north/south from US 78 interchange to SR 10 Loop	Oconee	As existing	Interchange Modification (0007685) (6-lane bridge)	Add one westbound SR 316 lane and widen bridge to 7 lanes

Figure VII-1 2032 Existing Plus Committed Improvements

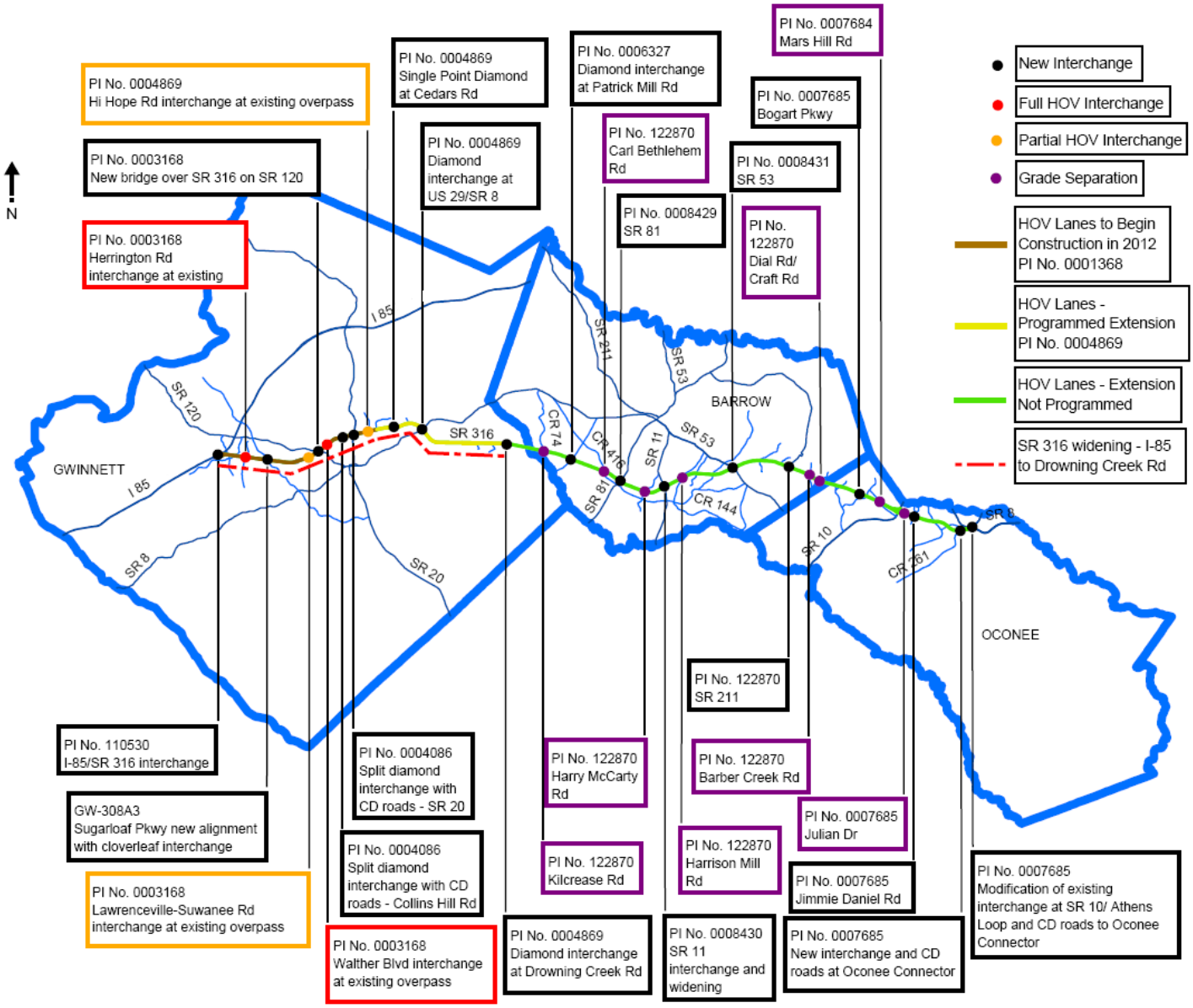
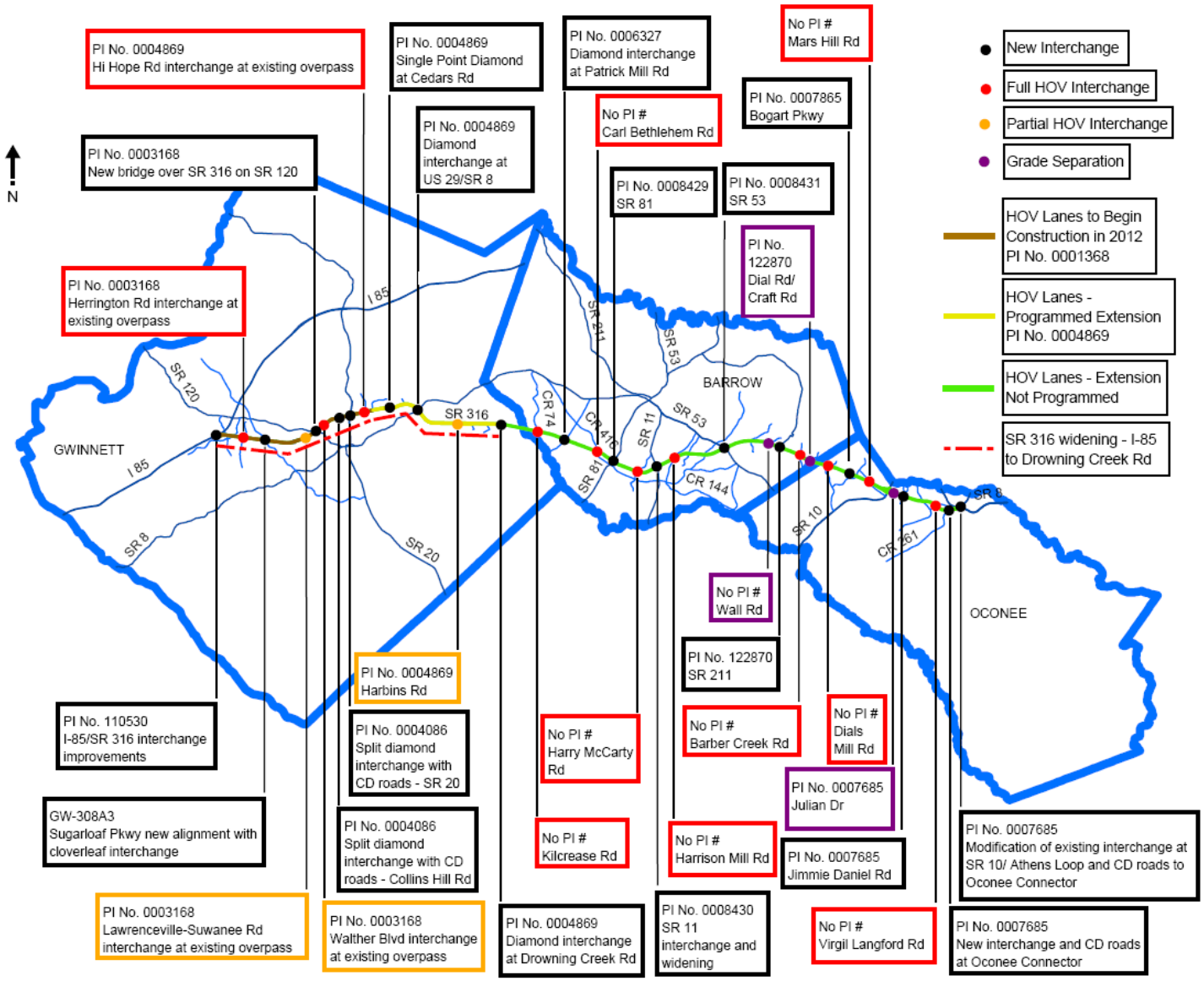


Figure VII-2 2032 Build Improvements



APPENDIX A

FUTURE TRAFFIC VOLUMES

Figure A-1 2015 E+C Average Daily Traffic

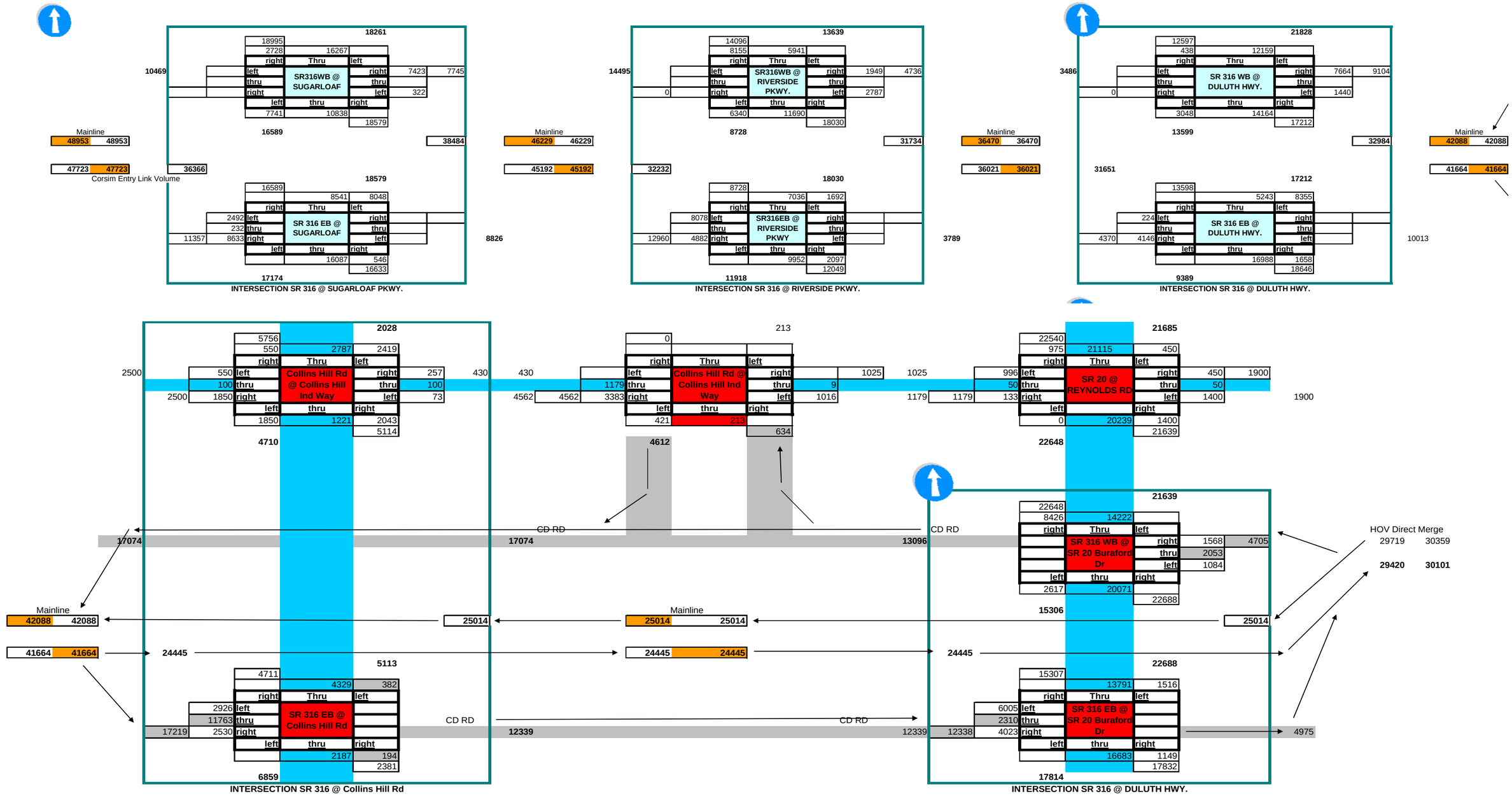


Figure A-1 2015 E+C Average Daily Traffic (continued)

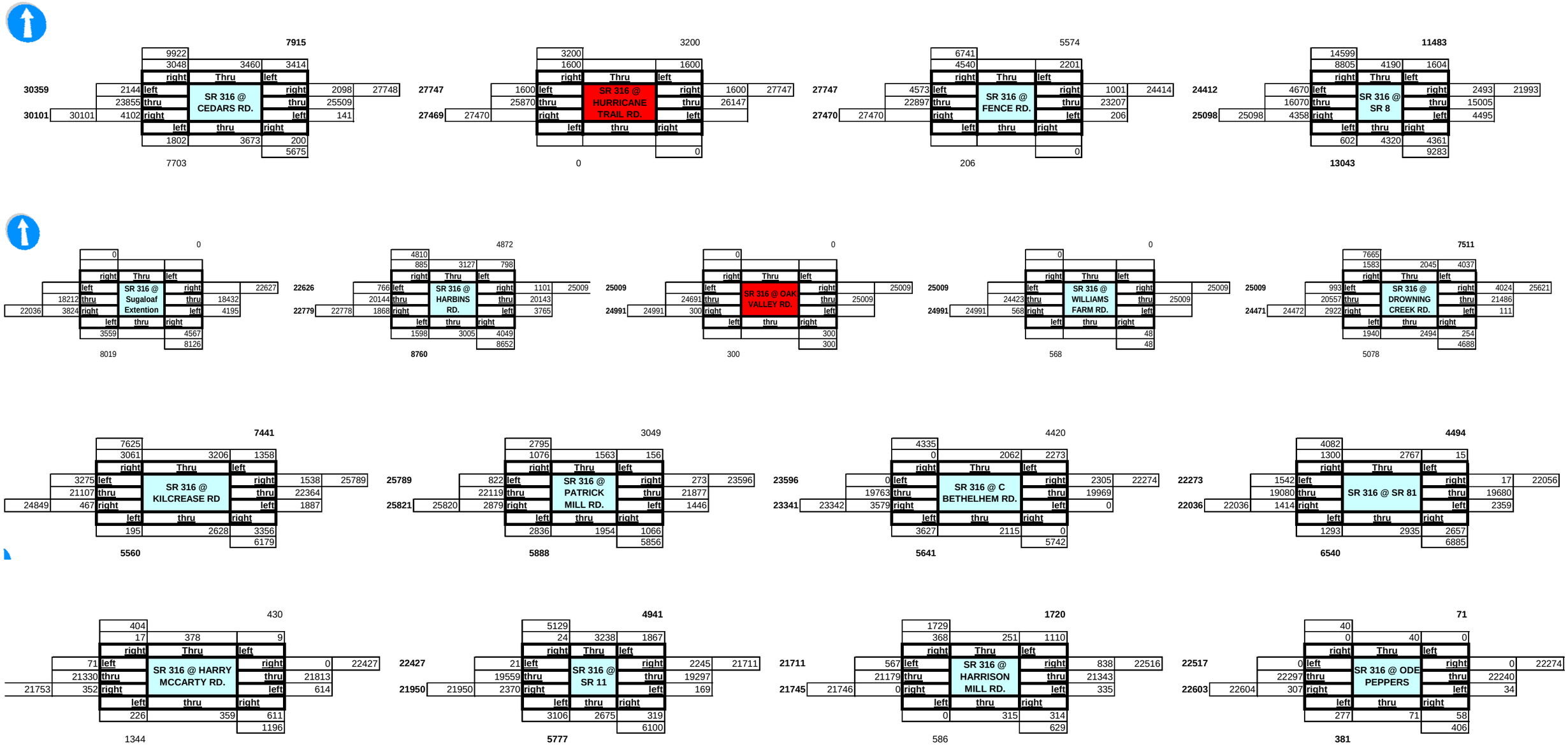


Figure A-1 2015 E+C Average Daily Traffic (continued)

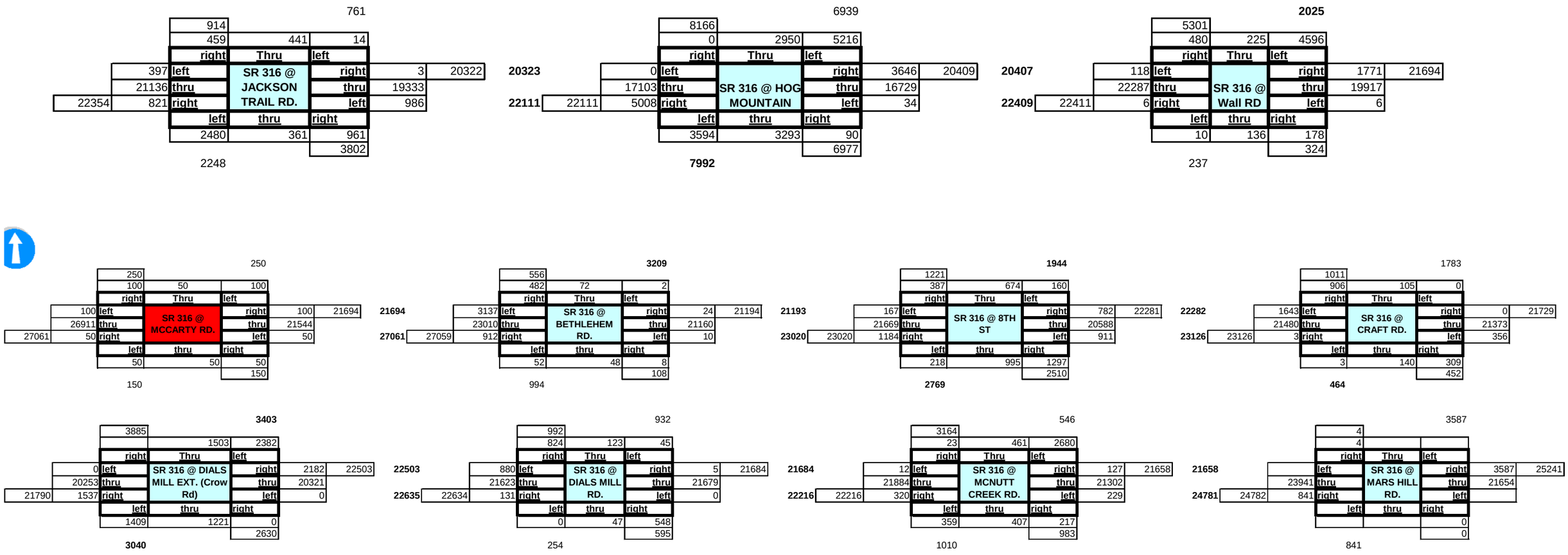
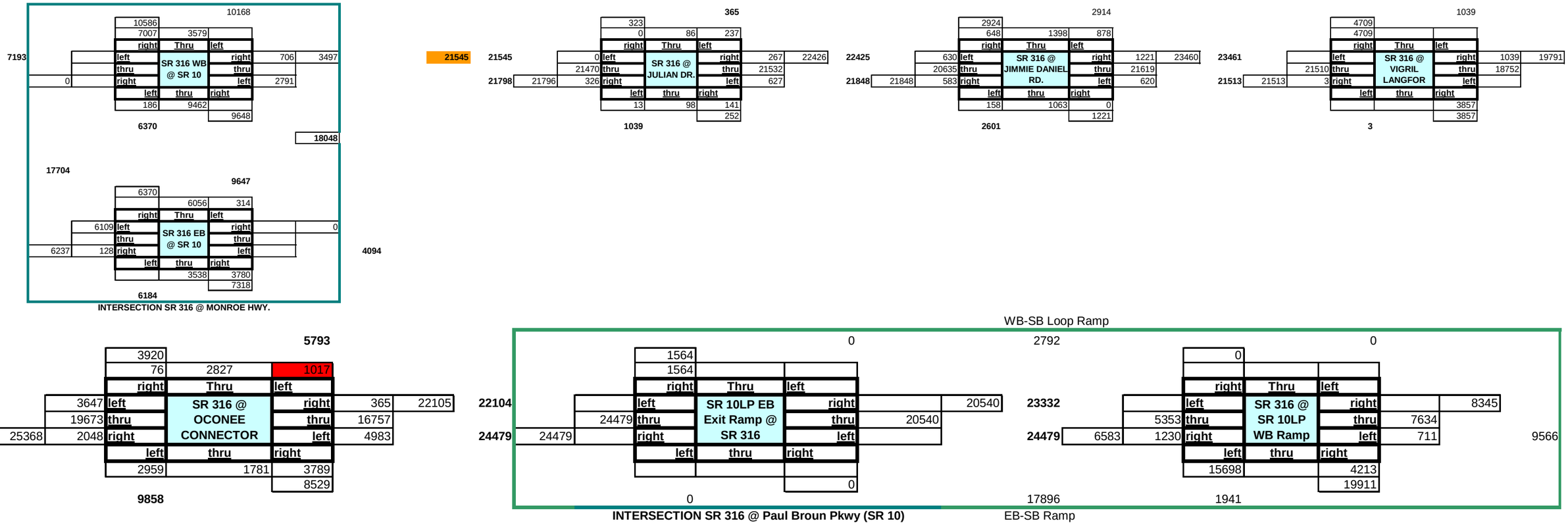


Figure A-1 2015 E+C Average Daily Traffic (continued)



Note: 2012 E+C model shows SB-EB LT removed

Figure A-2 2032 E+C Average Daily Traffic

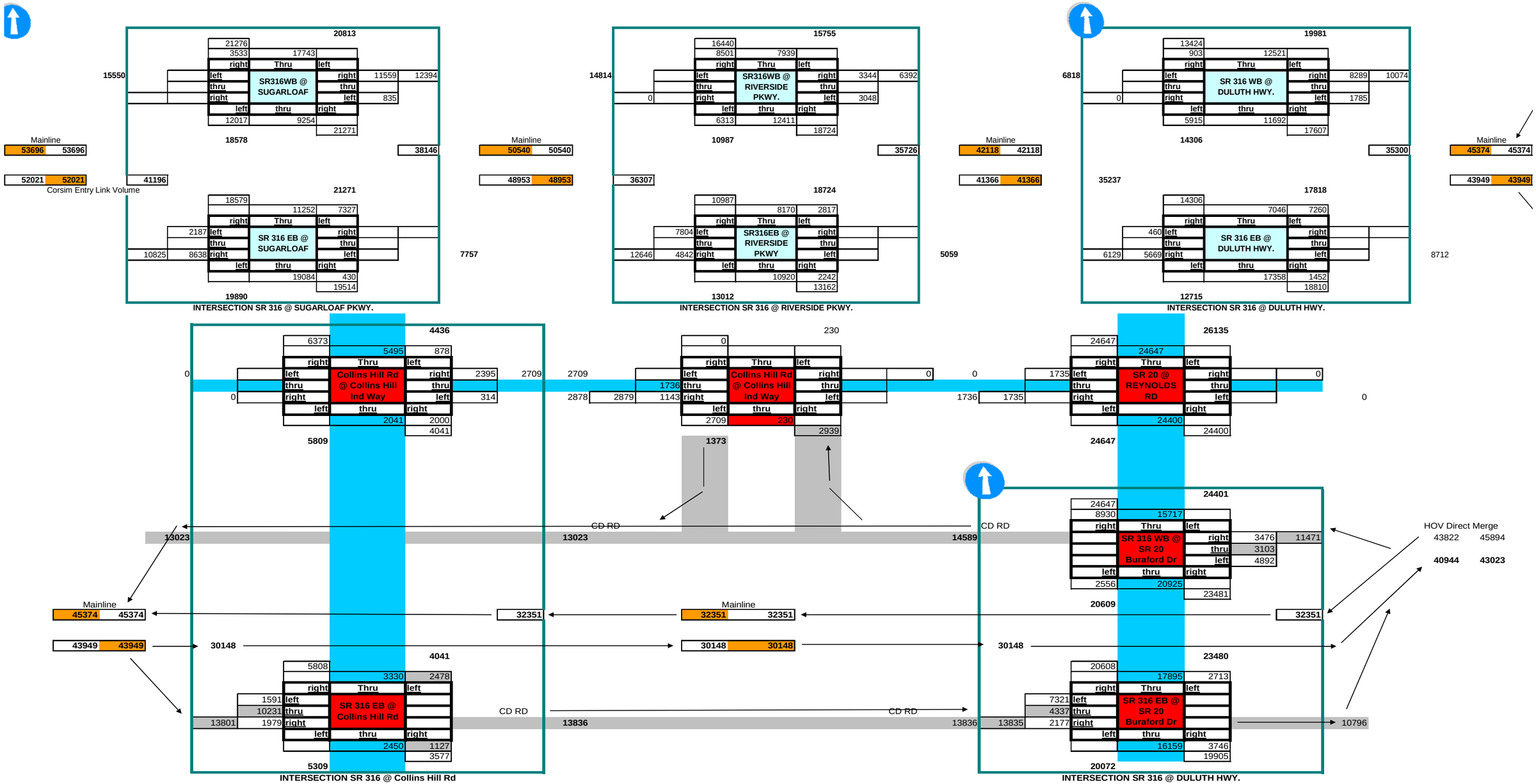


Figure A-2 2032 E+C Average Daily Traffic (continued)

Figure A-2 2032 E+C Average Daily Traffic (continued)

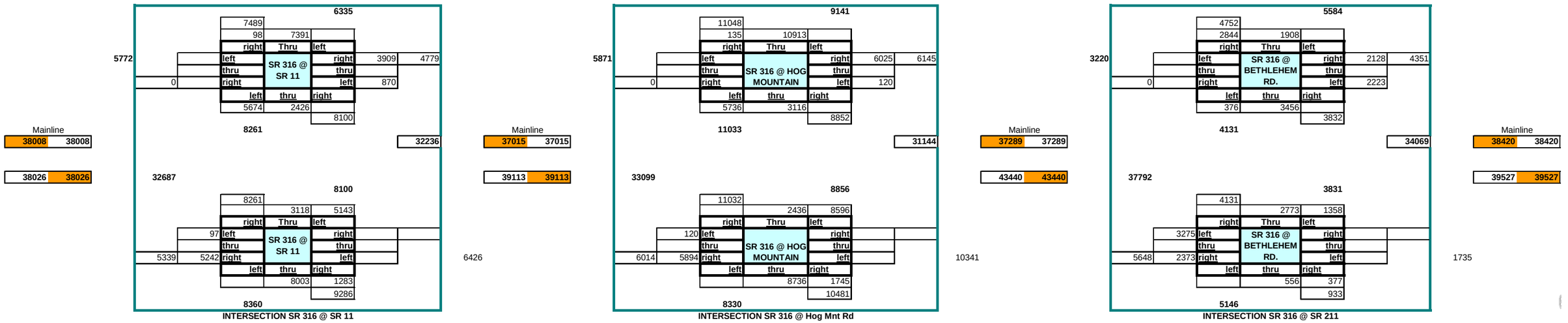
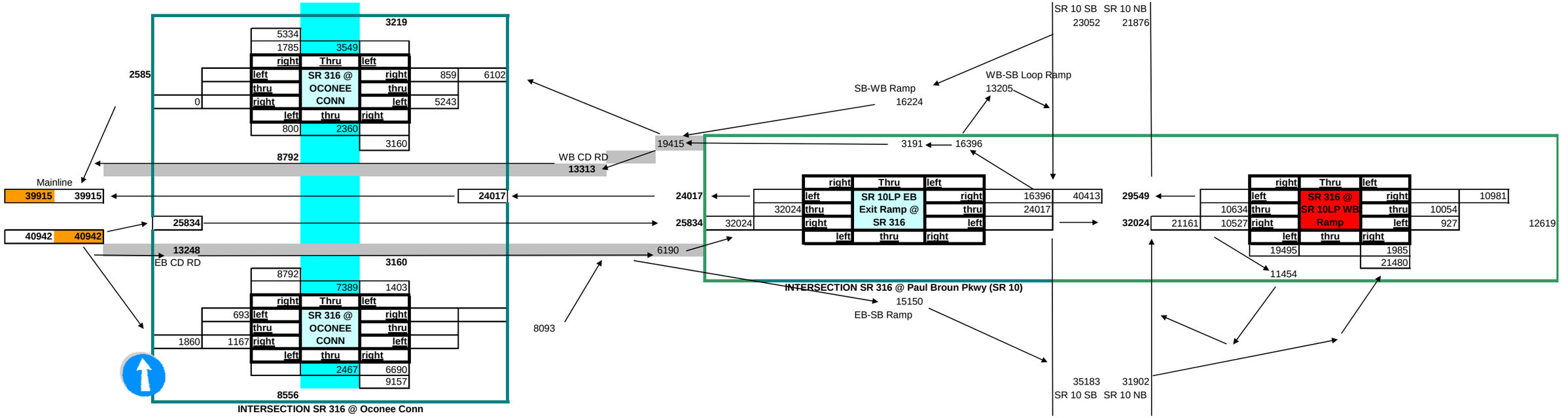
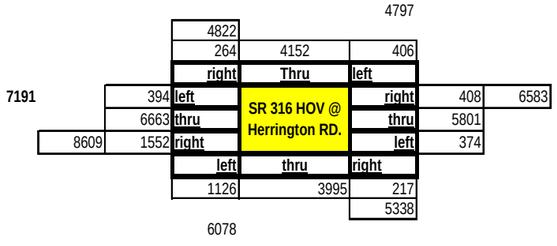
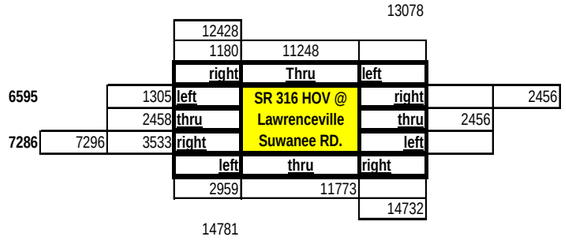
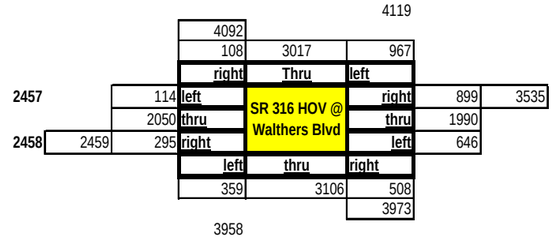


Figure A-2 2032 E+C Average Daily Traffic (continued)









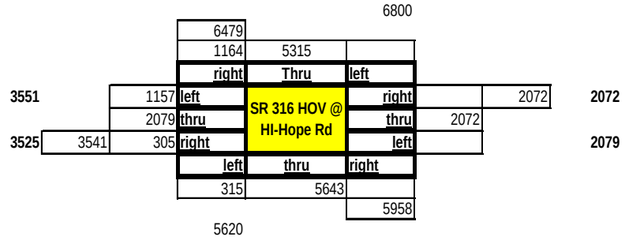


Figure A-3 2032 Build Average Daily Traffic

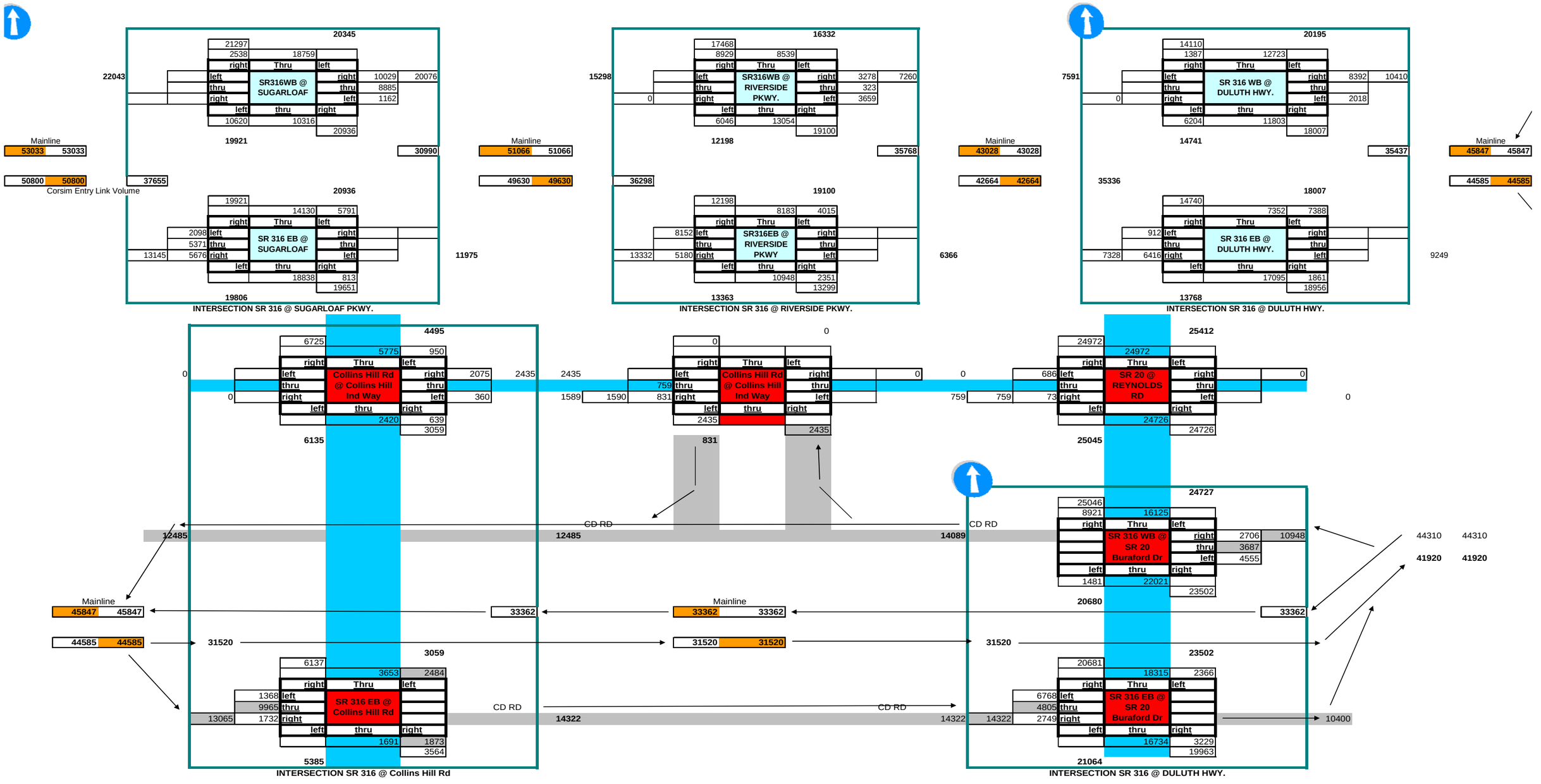


Figure A-3 2032 Build Average Daily Traffic (continued)

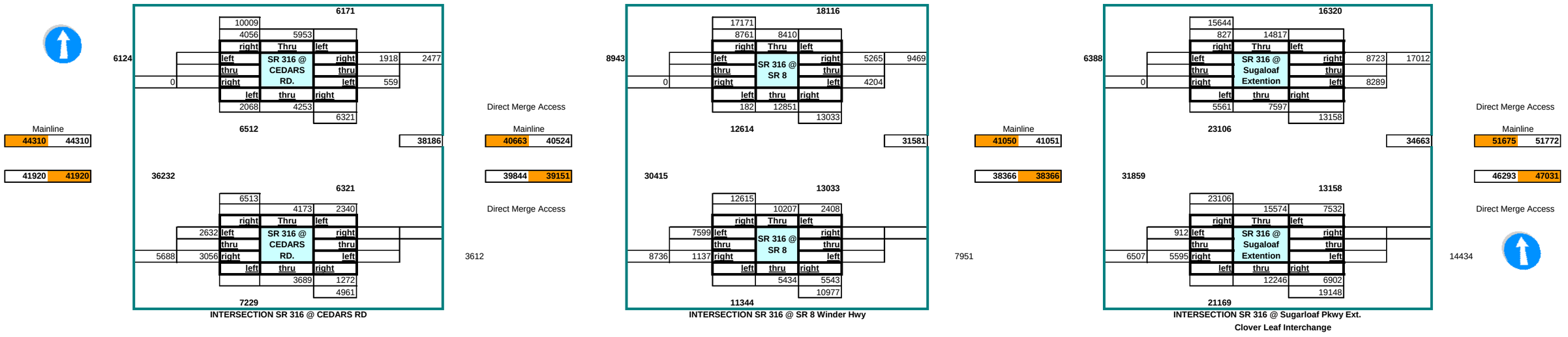
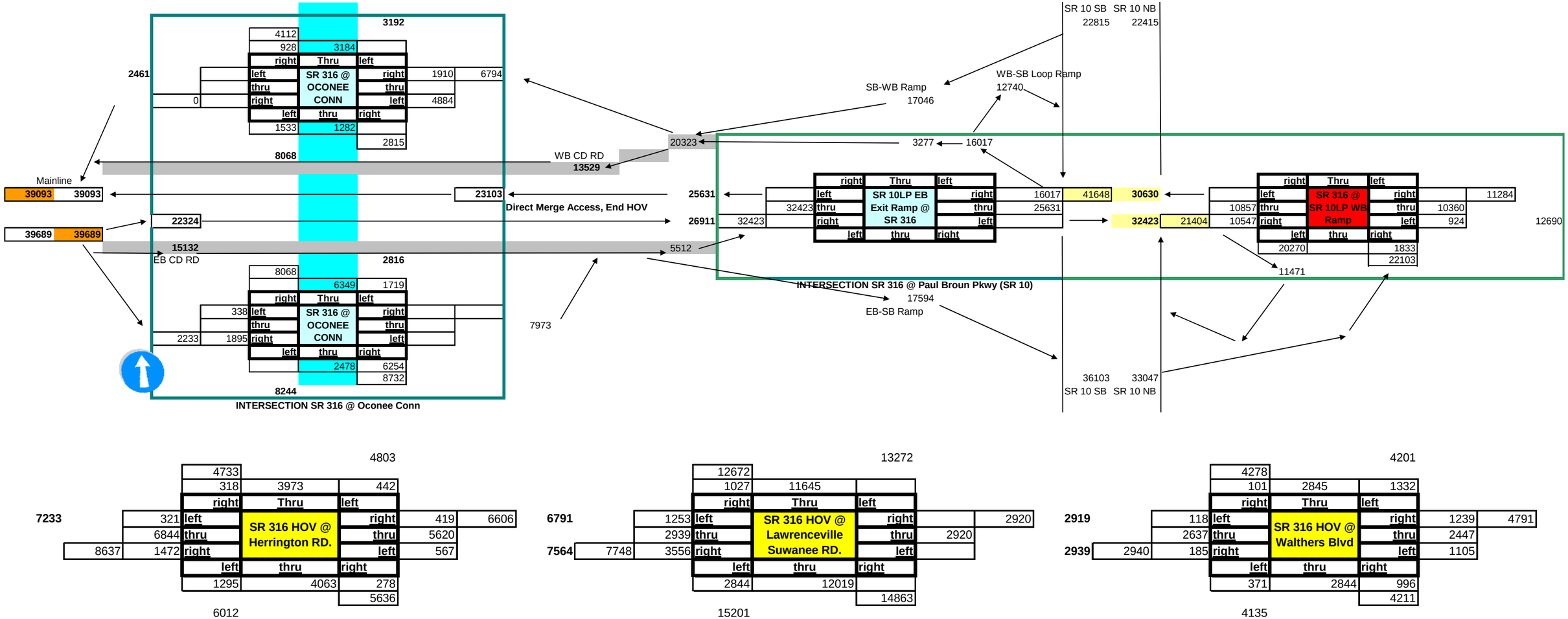


Figure A-3 2032 Build Average Daily Traffic (continued)

Figure A-3 2032 Build Average Daily Traffic (continued)



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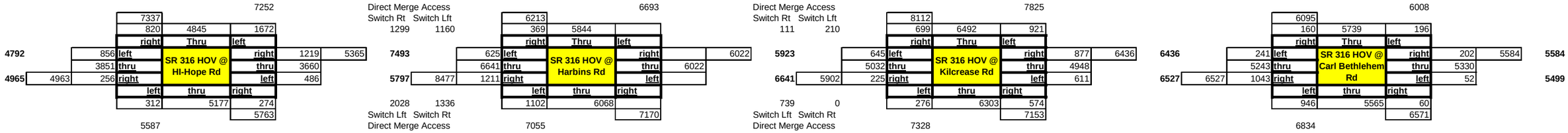
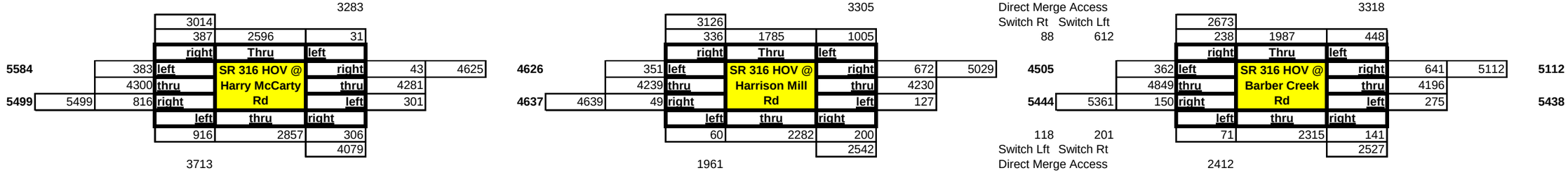




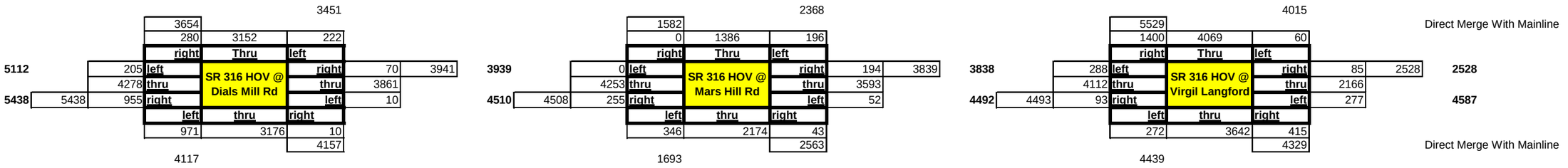


Figure A-4 2015 E+C AM Design Hourly Traffic

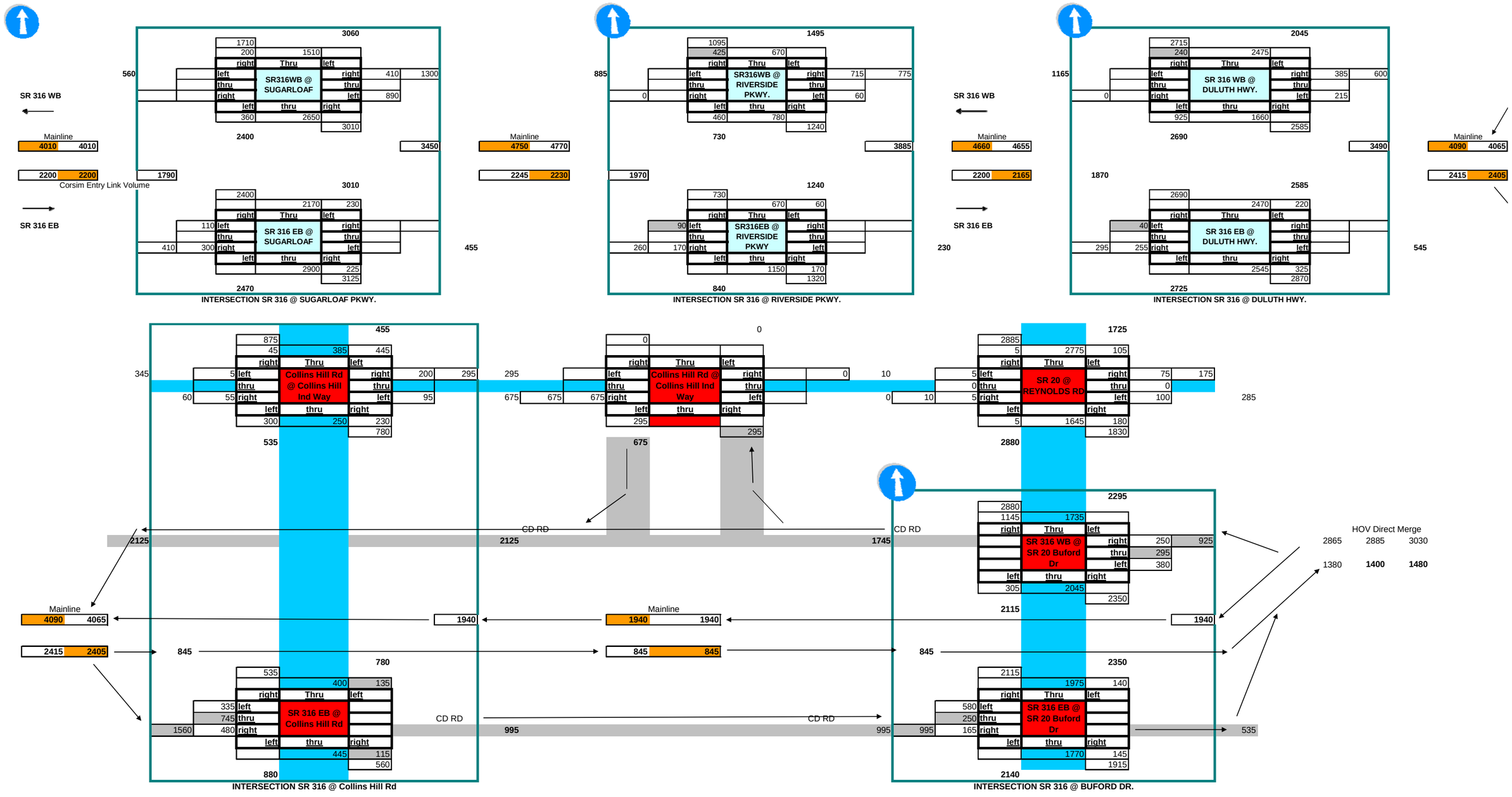
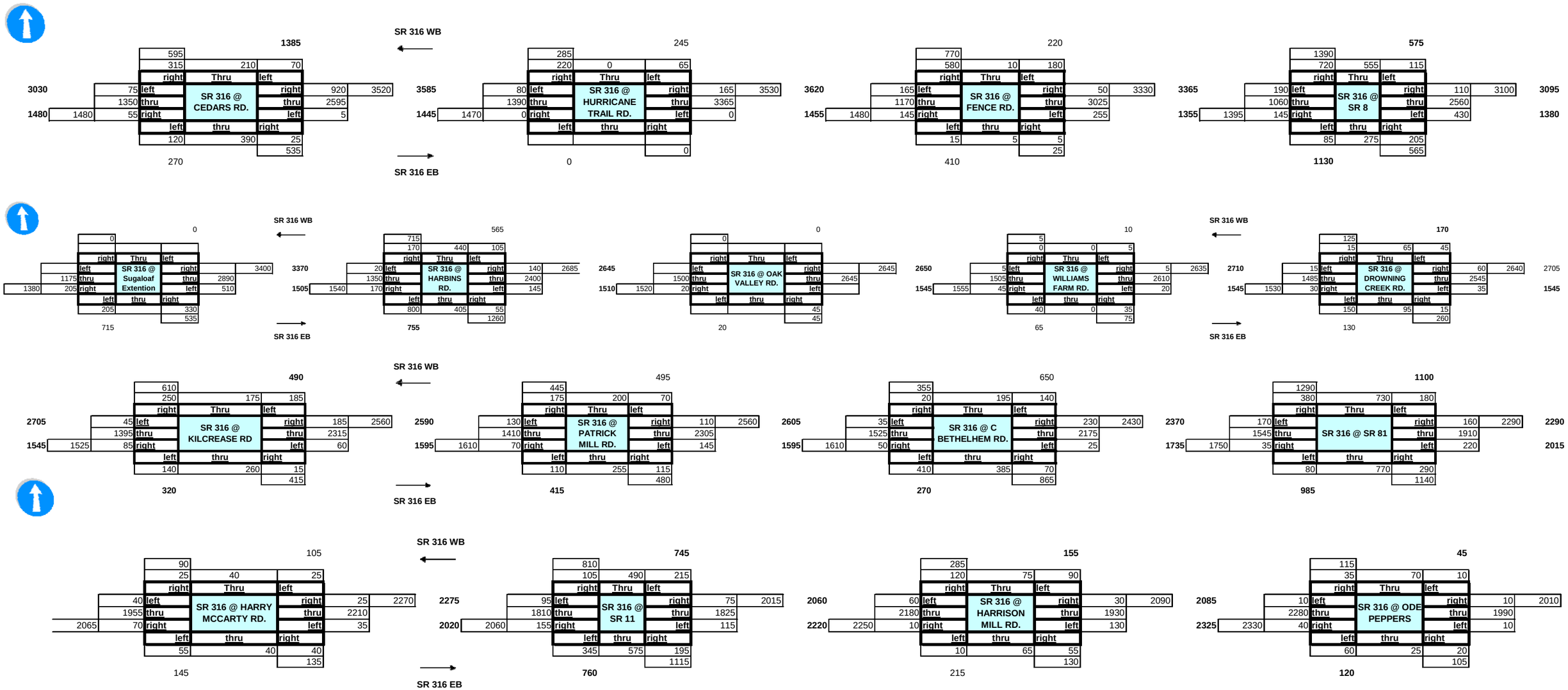


Figure A-4 2015 E+C AM Design Hourly Traffic (continued)



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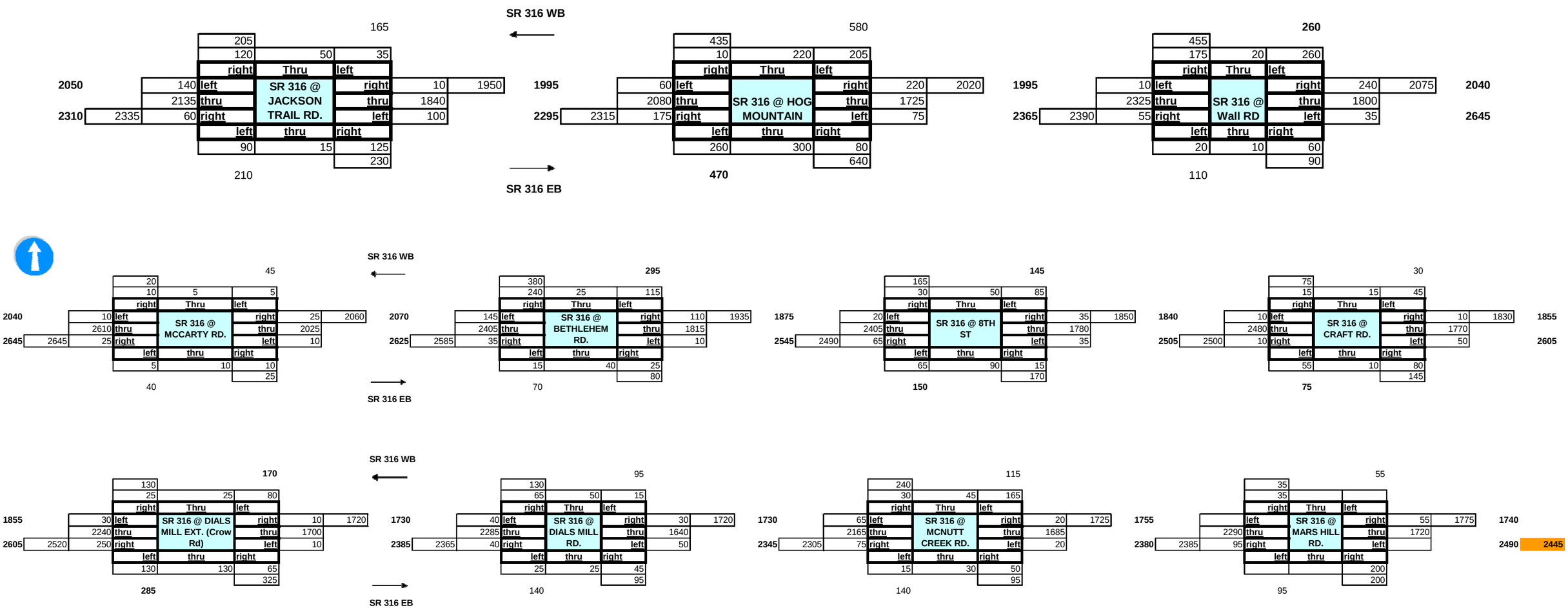


Figure A-4 2015 E+C AM Design Hourly Traffic (continued)

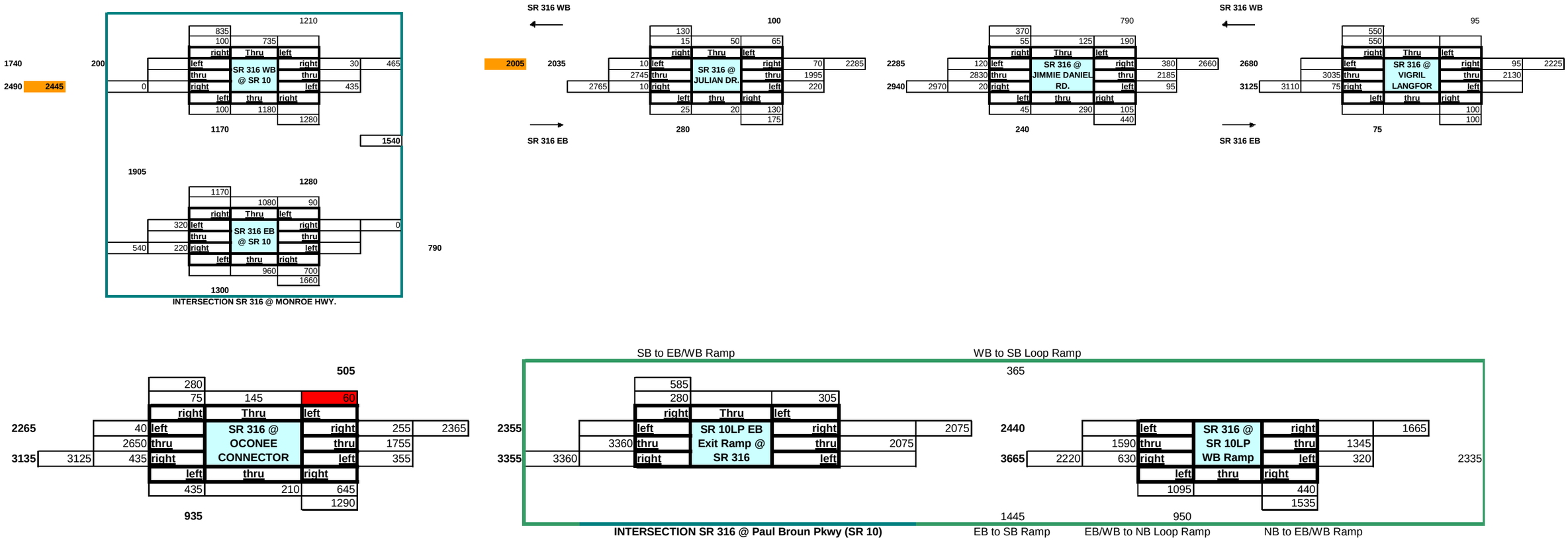
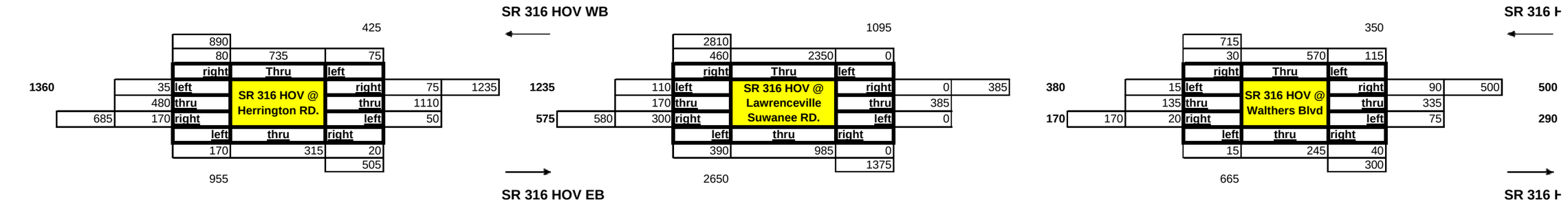


Figure A-4 2015 E+C AM Design Hourly Traffic (continued)



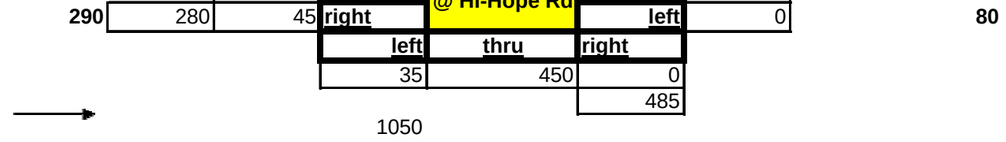


Figure A-5 2015 E+C PM Design Hourly Traffic

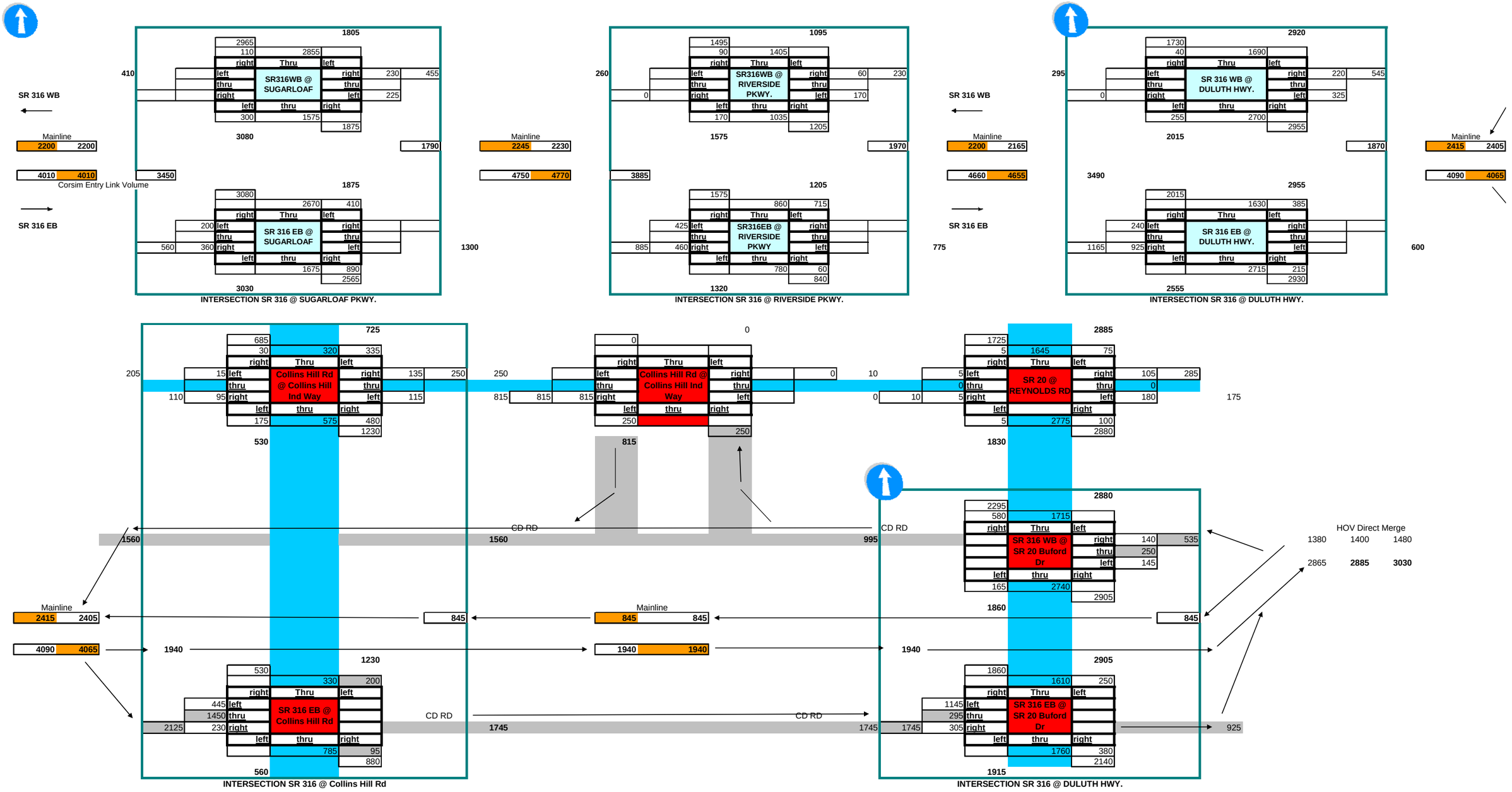


Figure A-5 2015 E+C PM Design Hourly Traffic (continued)

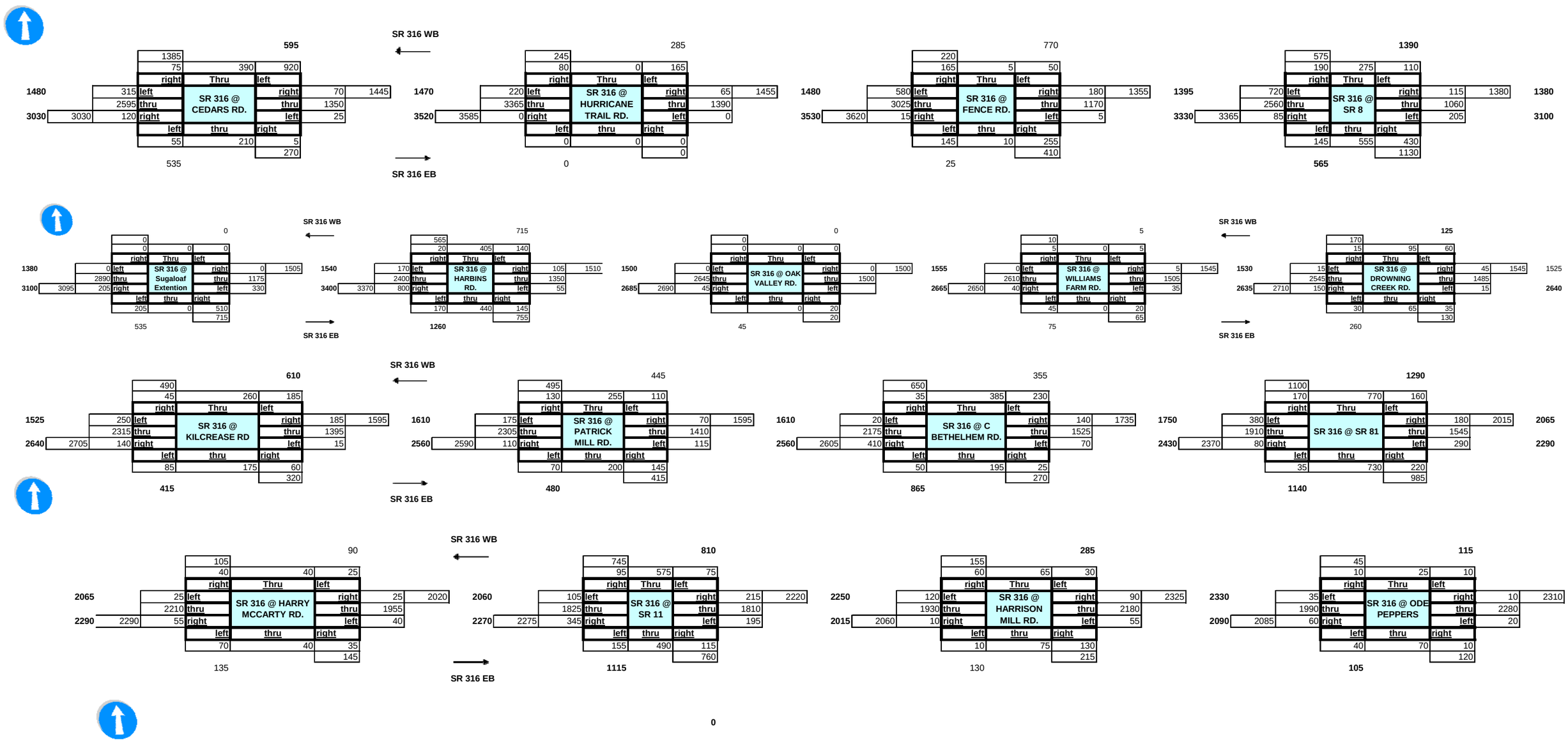


Figure A-5 2015 E+C PM Design Hourly Traffic (continued)

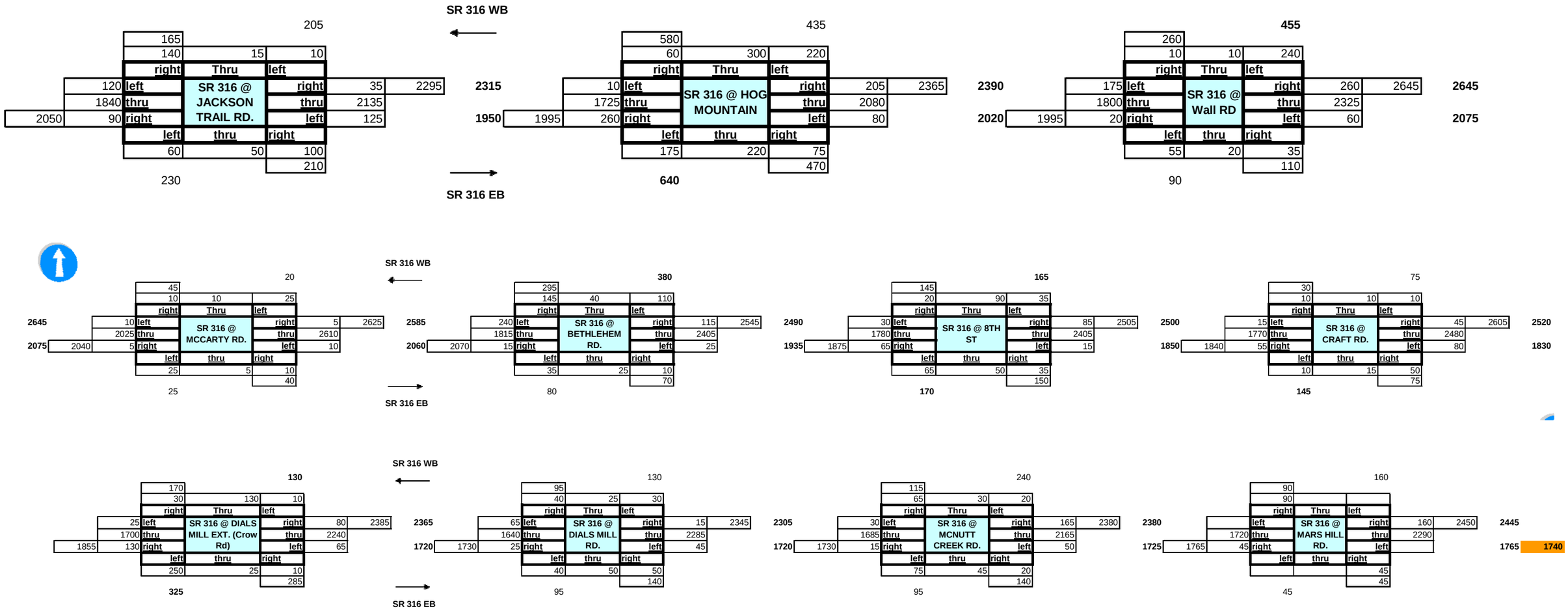


Figure A-5 2015 E+C PM Design Hourly Traffic (continued)

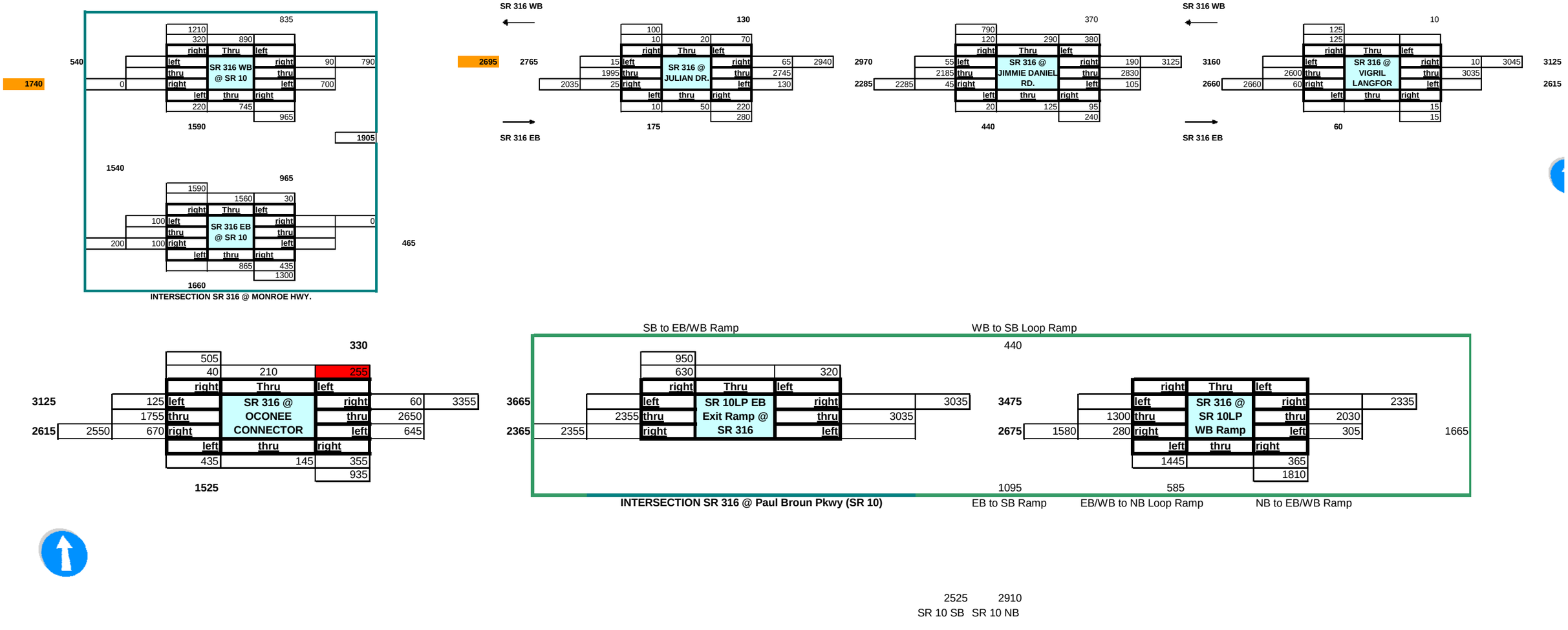


Figure A-5 2015 E+C PM Design Hourly Traffic (continued)

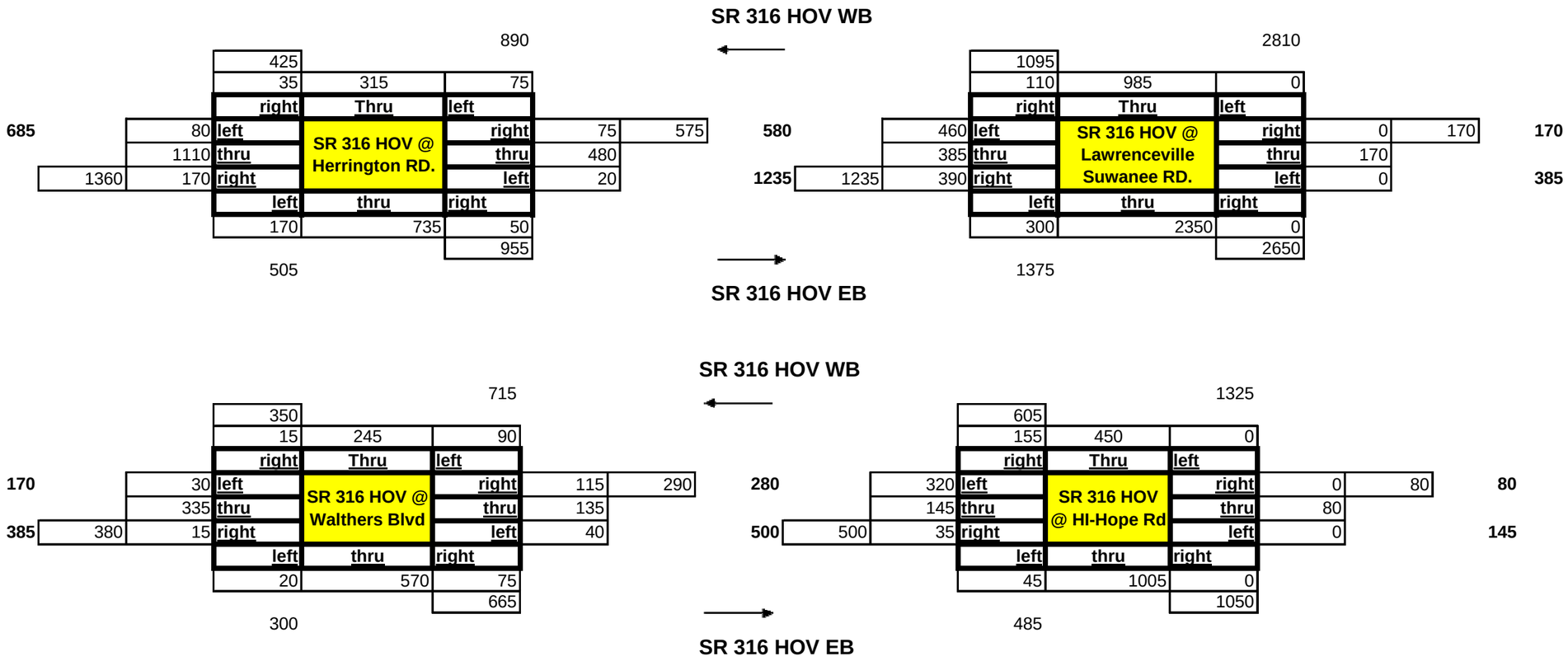


Figure A-6 2032 E+C AM Design Hourly Traffic

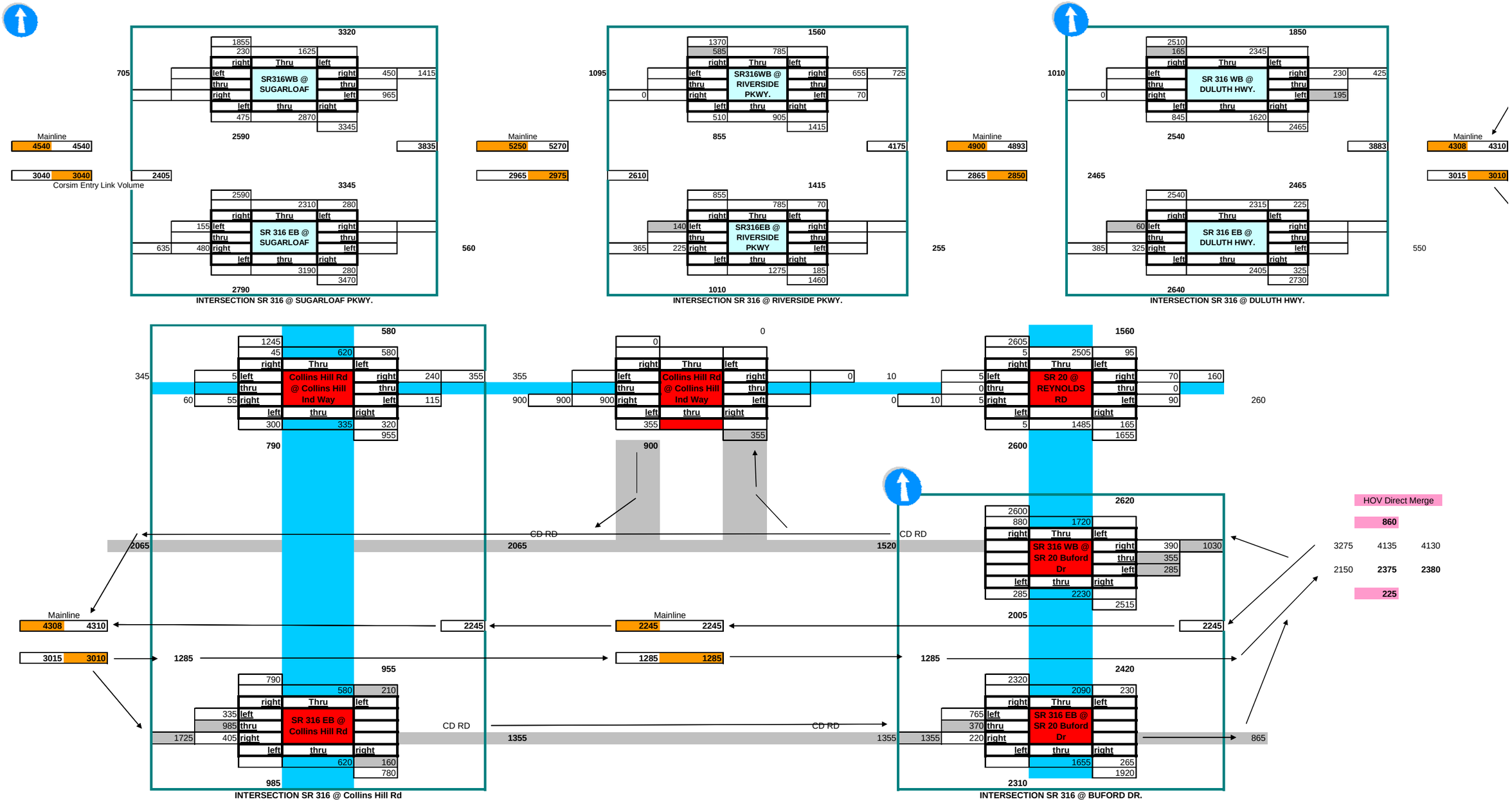
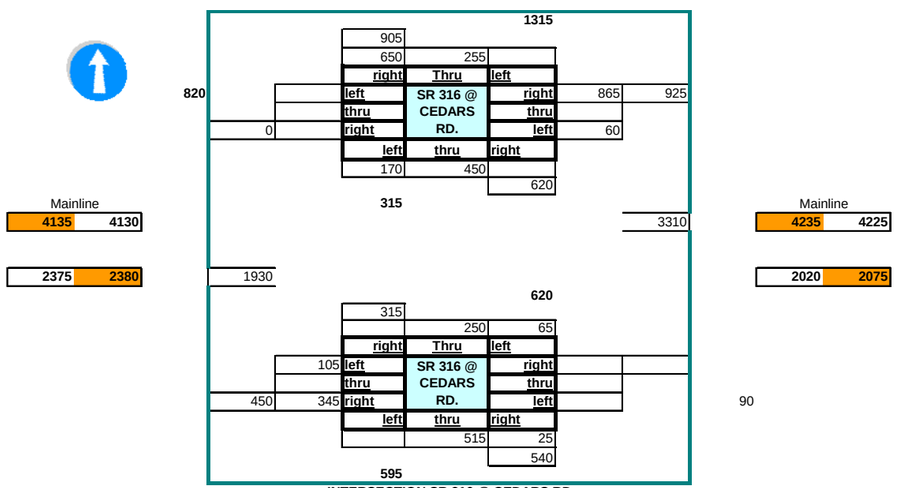
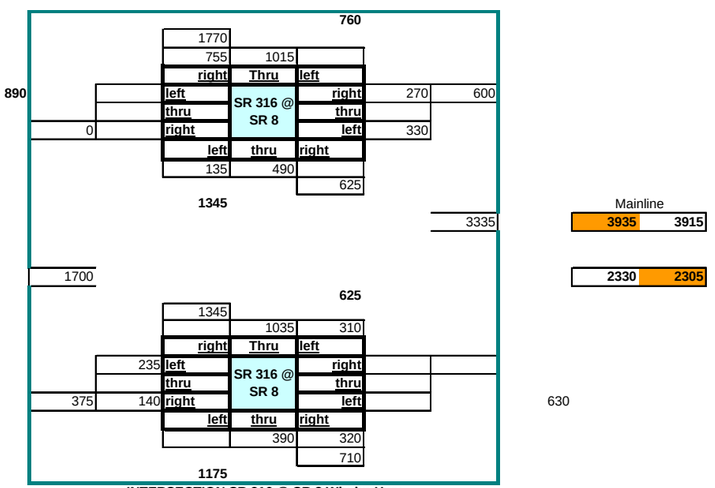


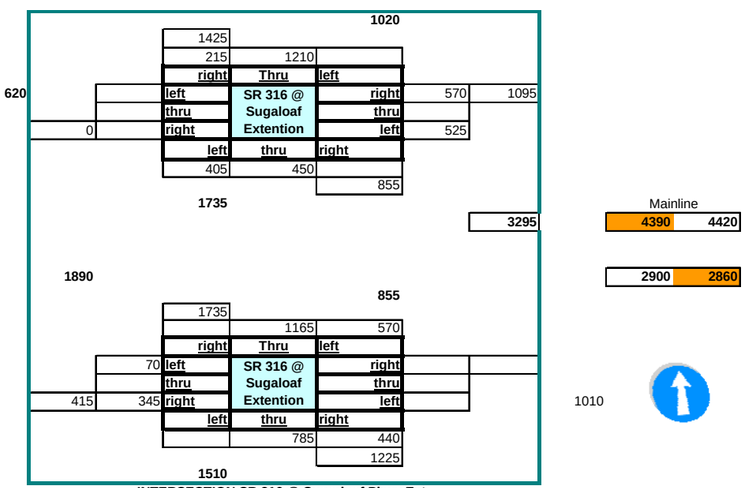
Figure A-6 2032 E+C AM Design Hourly Traffic (continued)



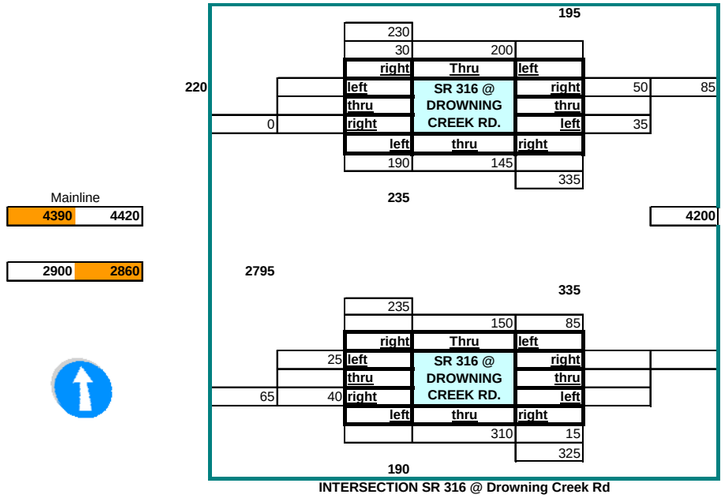
INTERSECTION SR 316 @ CEDARS RD



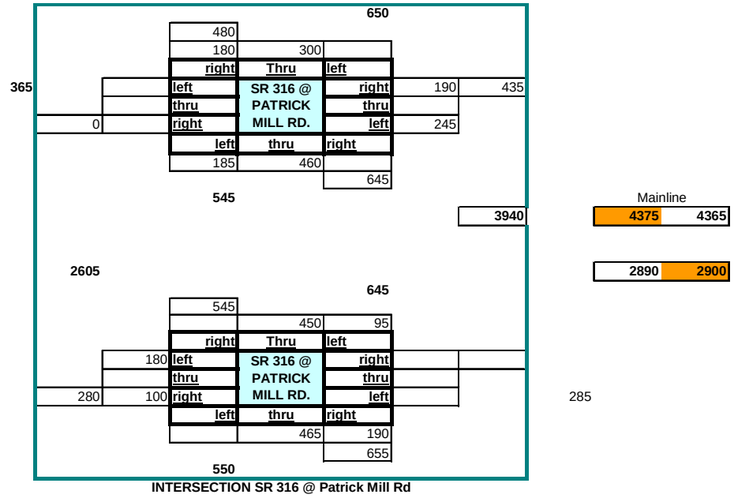
INTERSECTION SR 316 @ SR 8 Winder Hwy



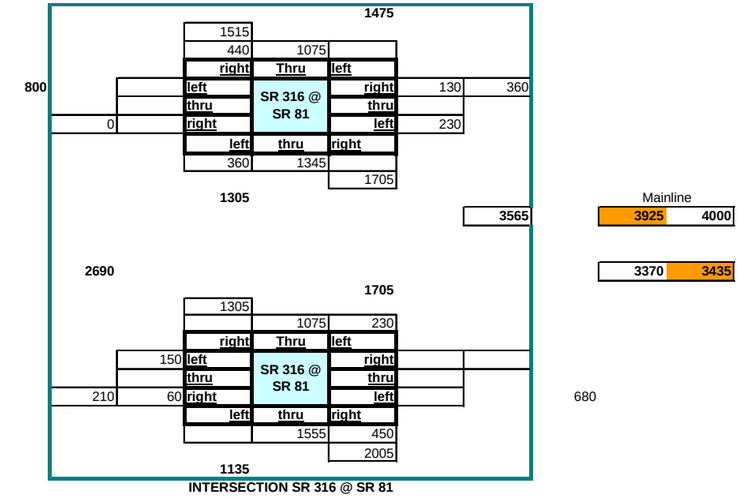
INTERSECTION SR 316 @ Sugarloaf Pkwy Ext.
Clover Leaf Interchange



INTERSECTION SR 316 @ Drowning Creek Rd



INTERSECTION SR 316 @ Patrick Mill Rd



INTERSECTION SR 316 @ SR 81

Figure A-6 2032 E+C AM Design Hourly Traffic (continued)

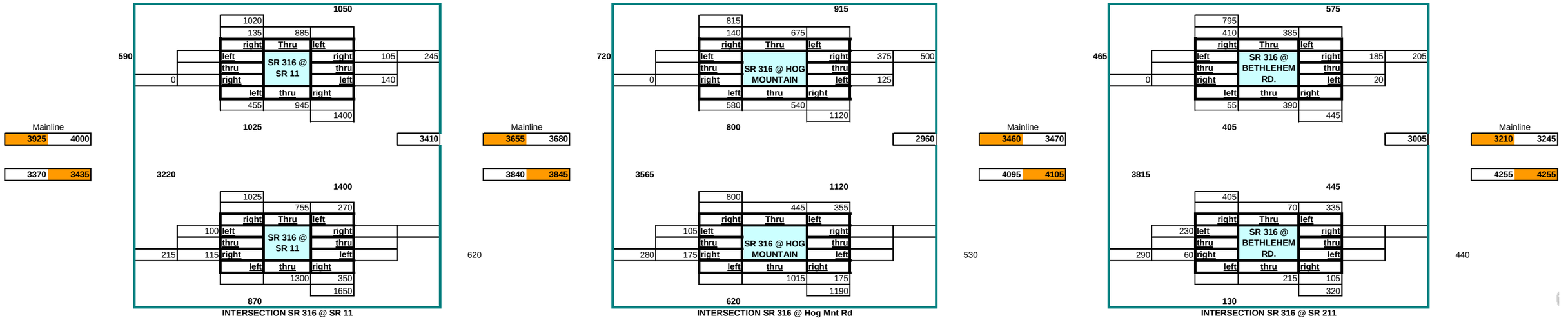
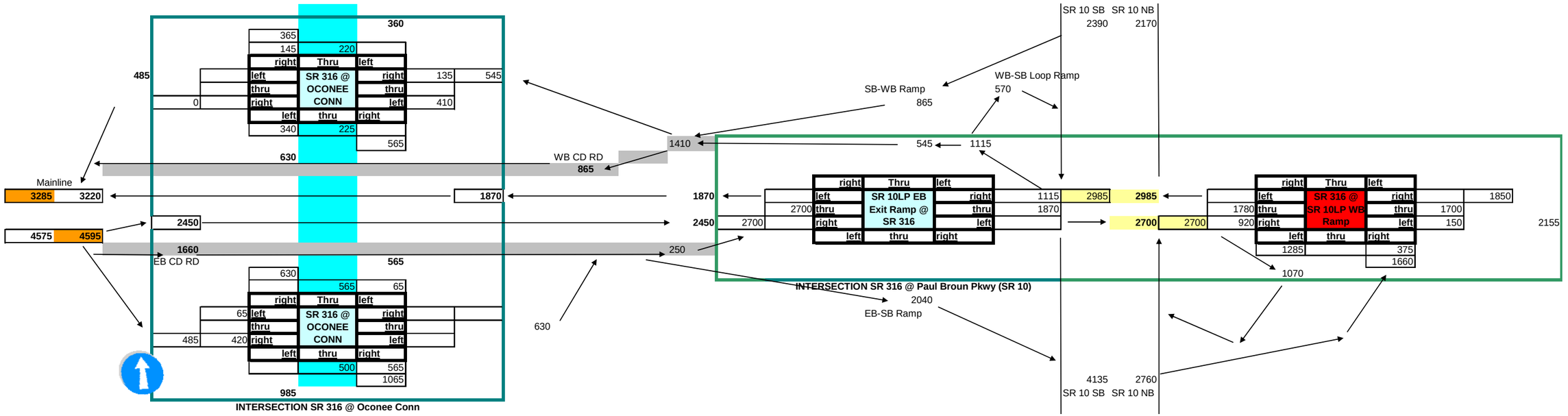
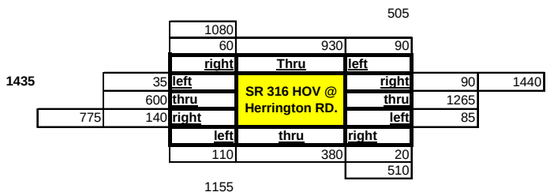
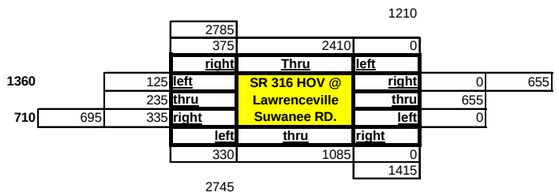
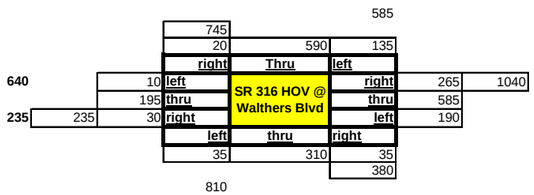


Figure A-6 2032 E+C AM Design Hourly Traffic (continued)









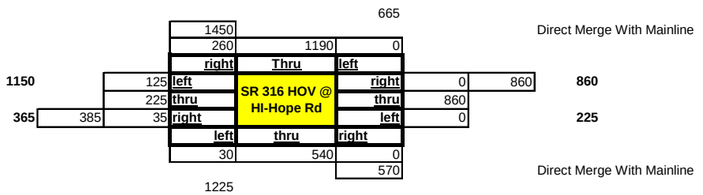


Figure A-7 2032 E+C PM Design Hourly Traffic

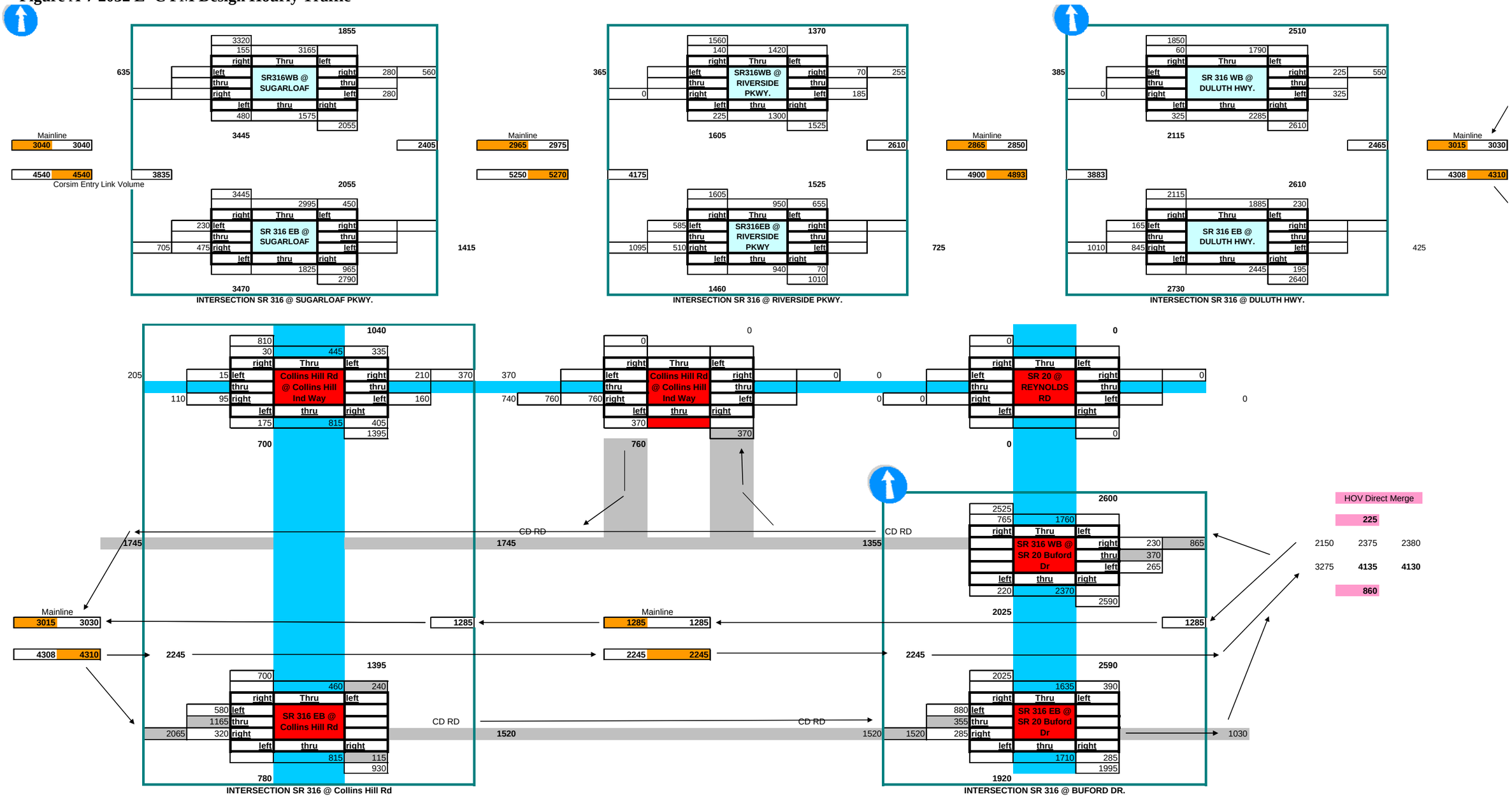
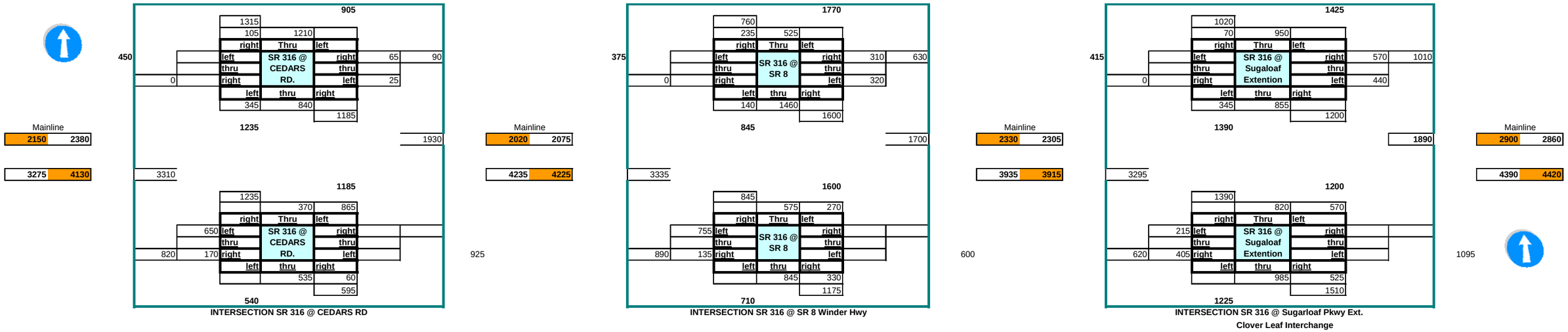


Figure A-7 2032 E+C PM Design Hourly Traffic (continued)



INTERSECTION SR 316 @ CEDARS RD

INTERSECTION SR 316 @ SR 8 Winder Hwy

INTERSECTION SR 316 @ Sugarloaf Pkwy Ext.
Clover Leaf Interchange

INTERSECTION SR 316 @ Drowning Creek Rd

INTERSECTION SR 316 @ Patrick Mill Rd

INTERSECTION SR 316 @ SR 81

Figure A-7 2032 E+C PM Design Hourly Traffic (continued)

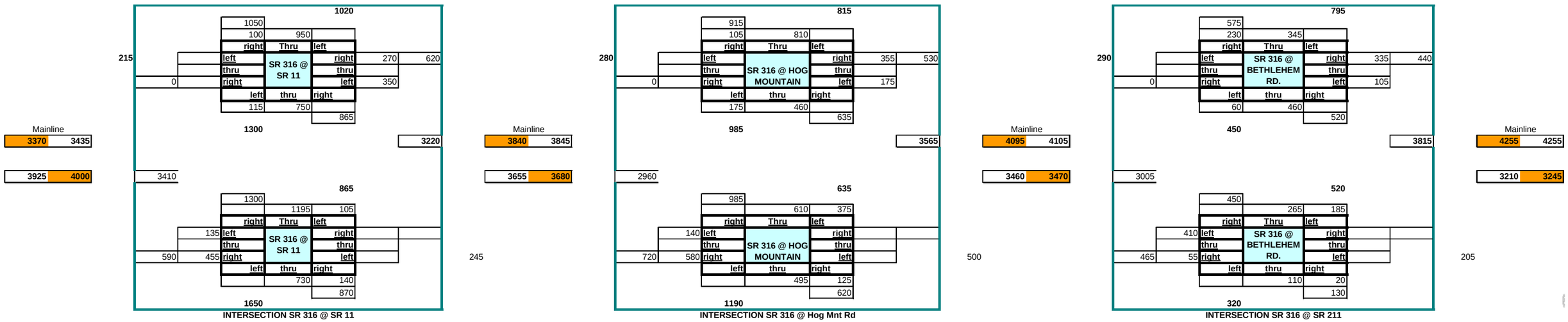


Figure A-7 2032 E+C PM Design Hourly Traffic (continued)

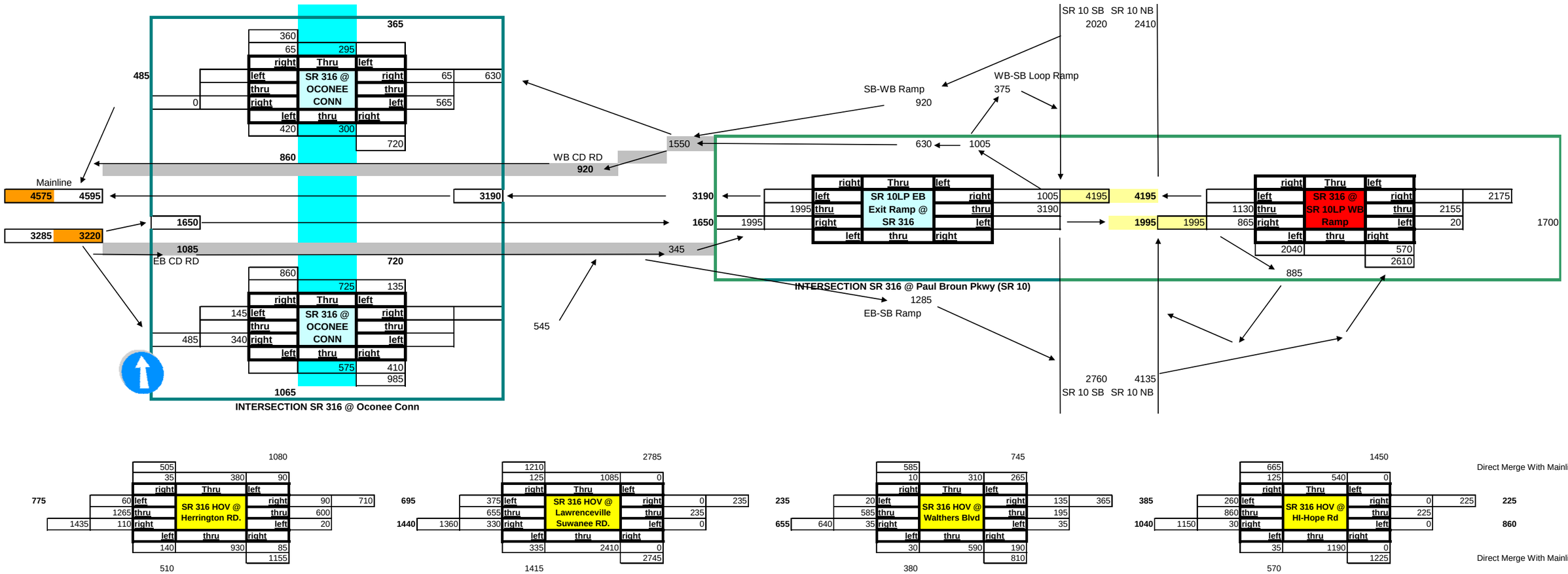


Figure A-8 2032 Build AM Design Hourly Traffic

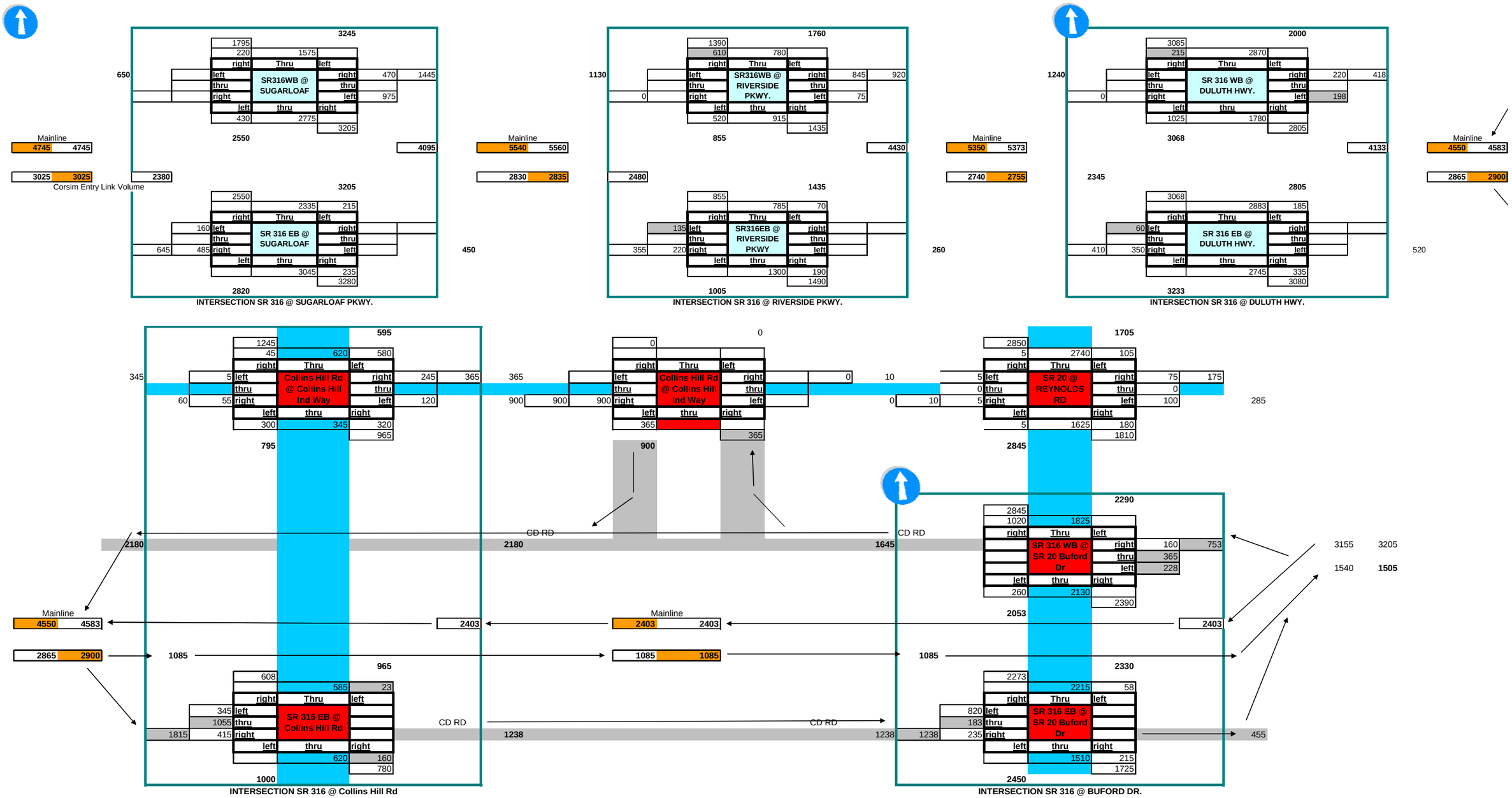


Figure A-8 2032 Build AM Design Hourly Traffic (continued)

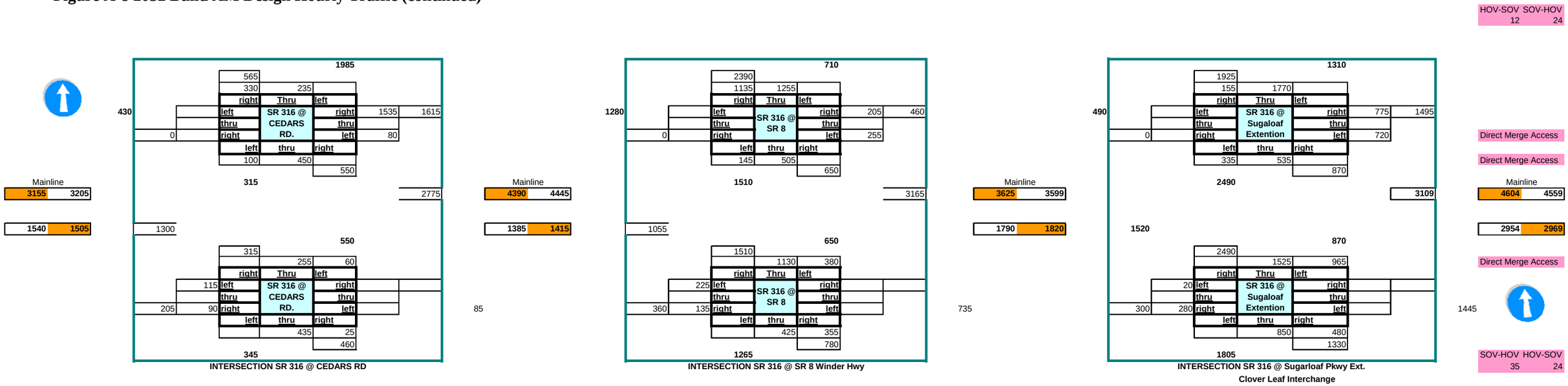
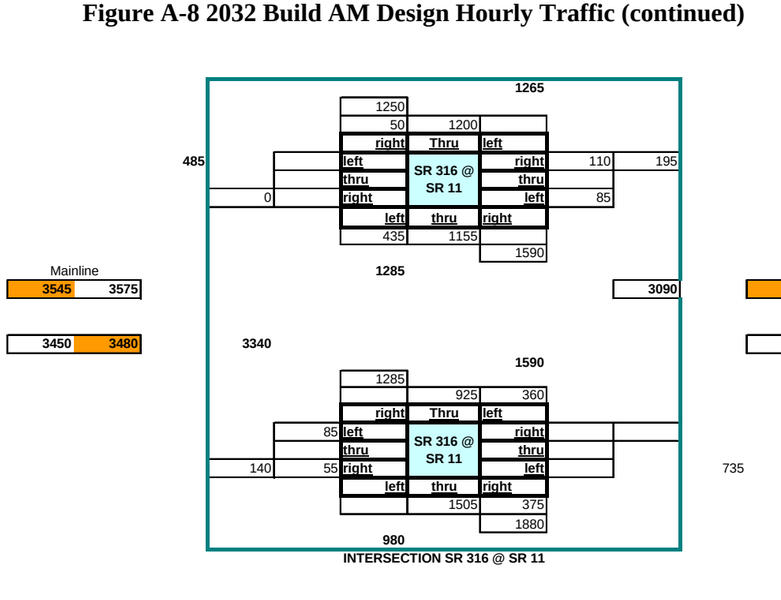
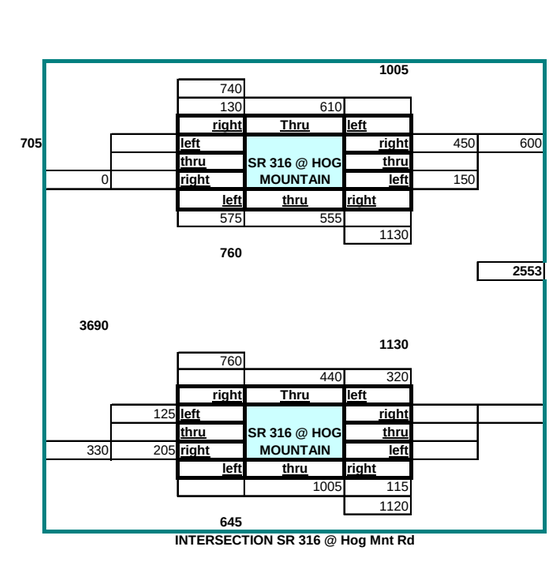
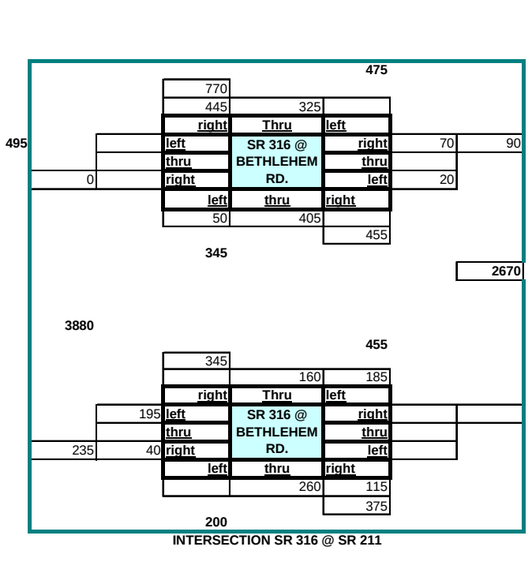
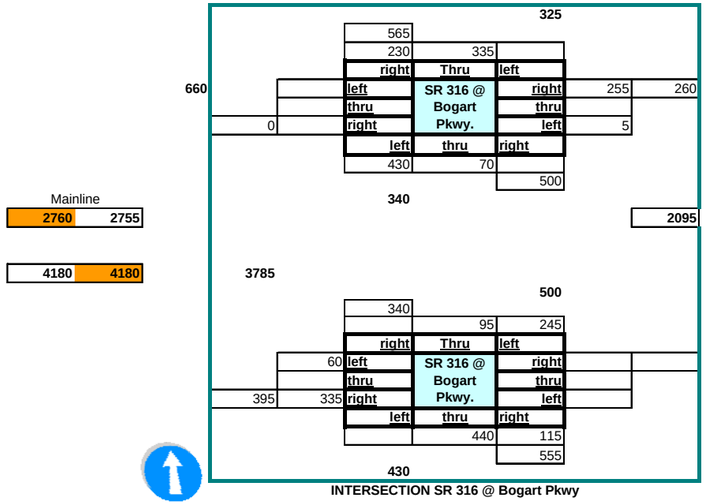


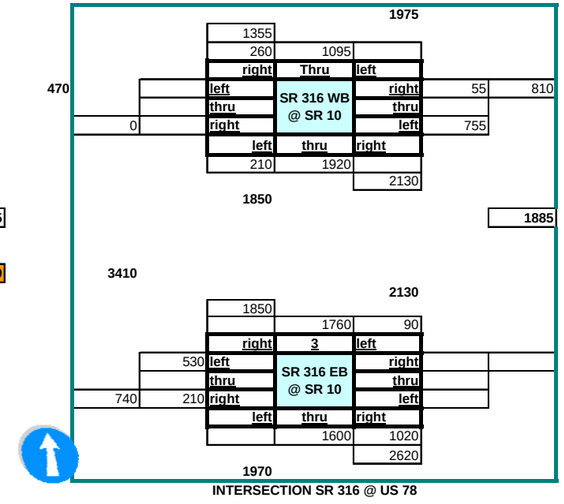
Figure A-8 2032 Build AM Design Hourly Traffic (continued)

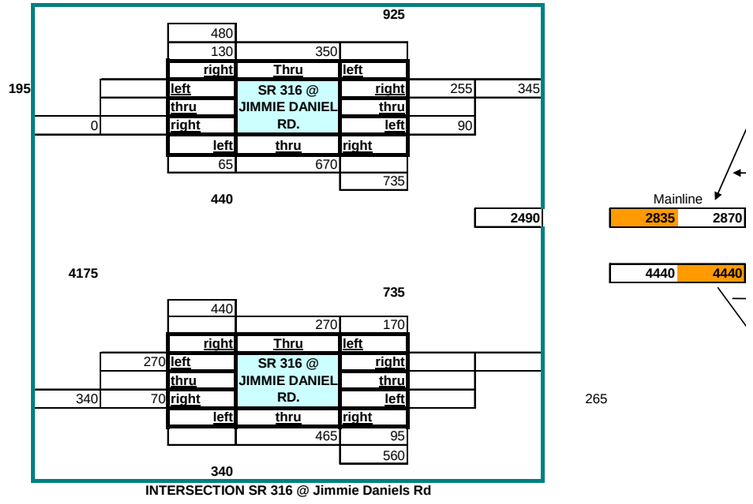












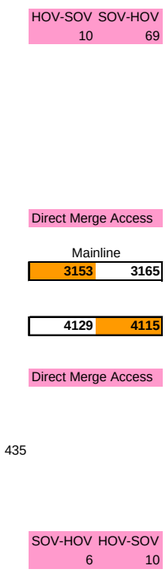


Figure A-8 2032 Build AM Design Hourly Traffic (continued)

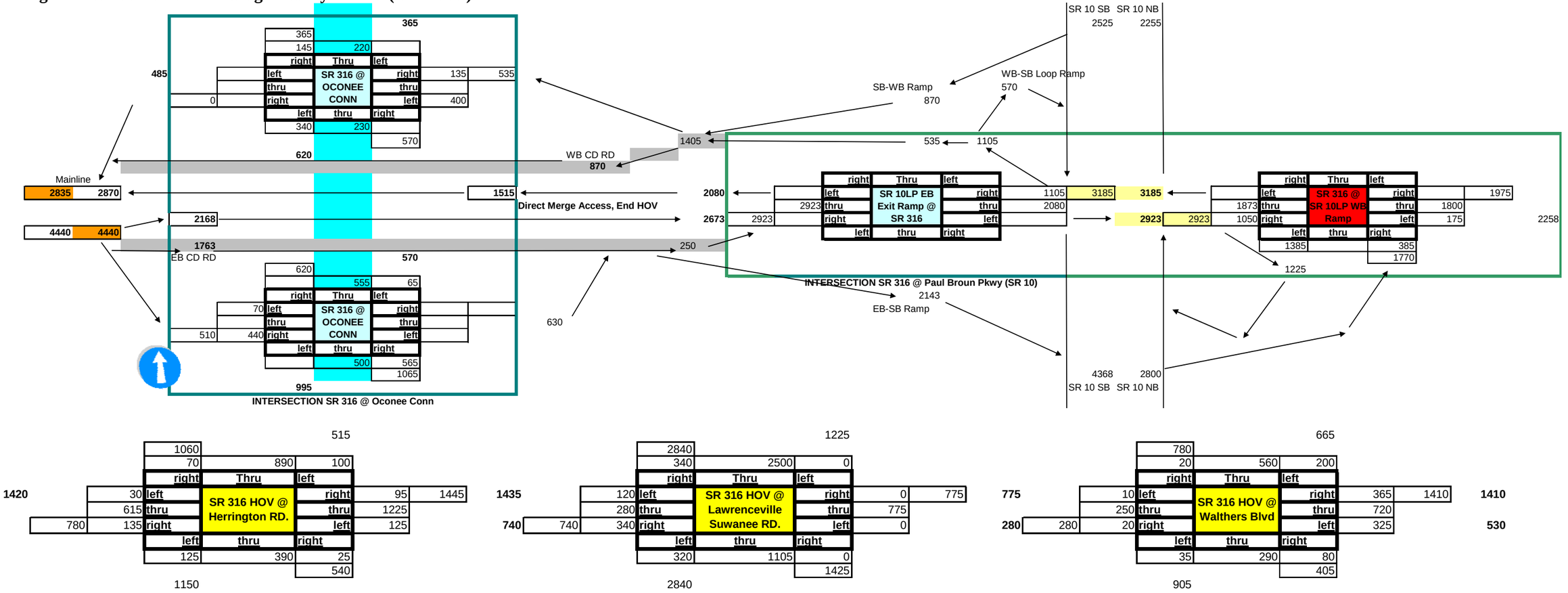
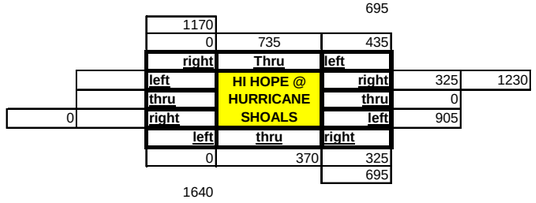
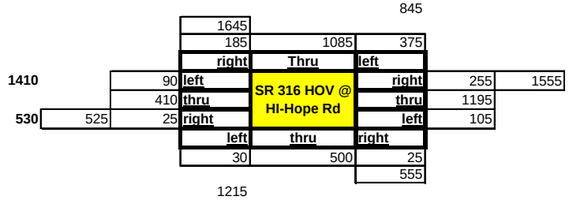
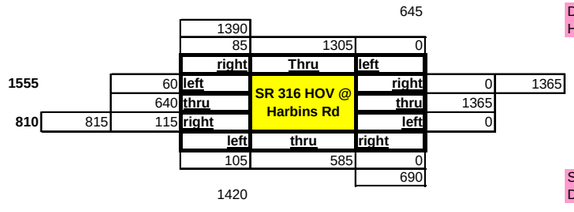


Figure A-8 2032 Build AM Design Hourly Traffic (continued)

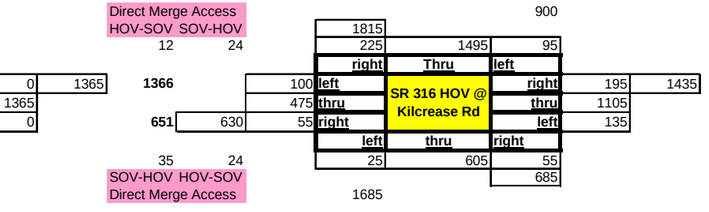


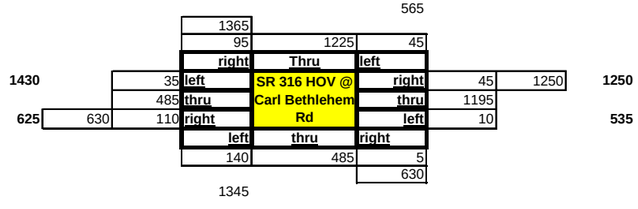
	Direct Merge Access ADT's	
WB	HOV-SOV	SOV-HOV
	111	210
D=	0.70	
EB	SOV-HOV	HOV-SOV
	739	500
D=	0.30	
K=	0.16	



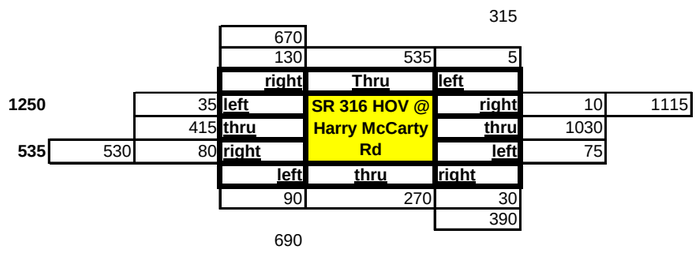


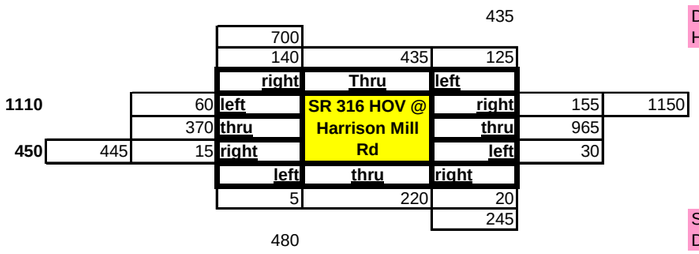
	Direct Merge Access	
	HOV-SOV	SOV-HOV
	12	24
1366		
651	630	
	35	24
	SOV-HOV	HOV-SOV
	Direct Merge Access	





	Direct Merge Access ADT's	
WB	HOV-SOV	SOV-HOV
	88	612
D=	0.70	
EB	SOV-HOV	HOV-SOV
	118	201
D=	0.30	
K=	0.16	





	Direct Merge Access	
	HOV-SOV	SOV-HOV
	10	69
1139		
515	515	
	6	10
	SOV-HOV	HOV-SOV
	Direct Merge Access	

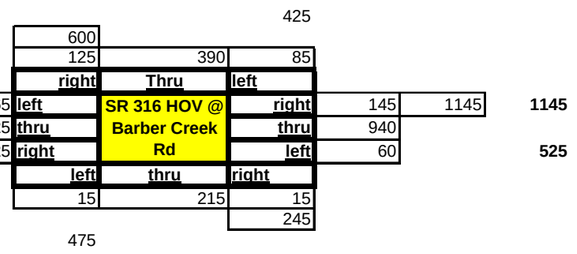


Figure A-8 2032 Build AM Design Hourly Traffic (continued)

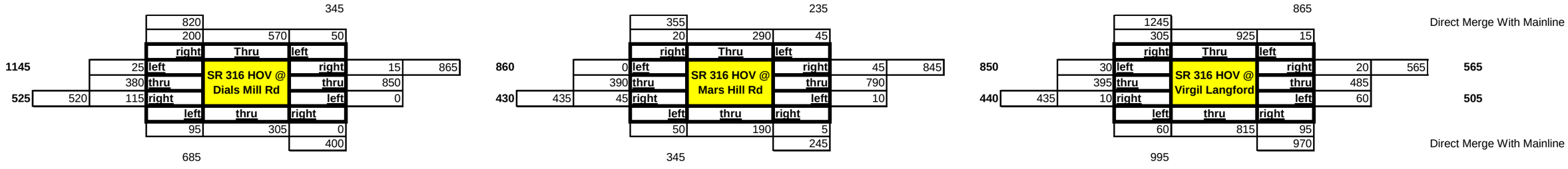


Figure A-9 2032 Build PM Design Hourly Traffic

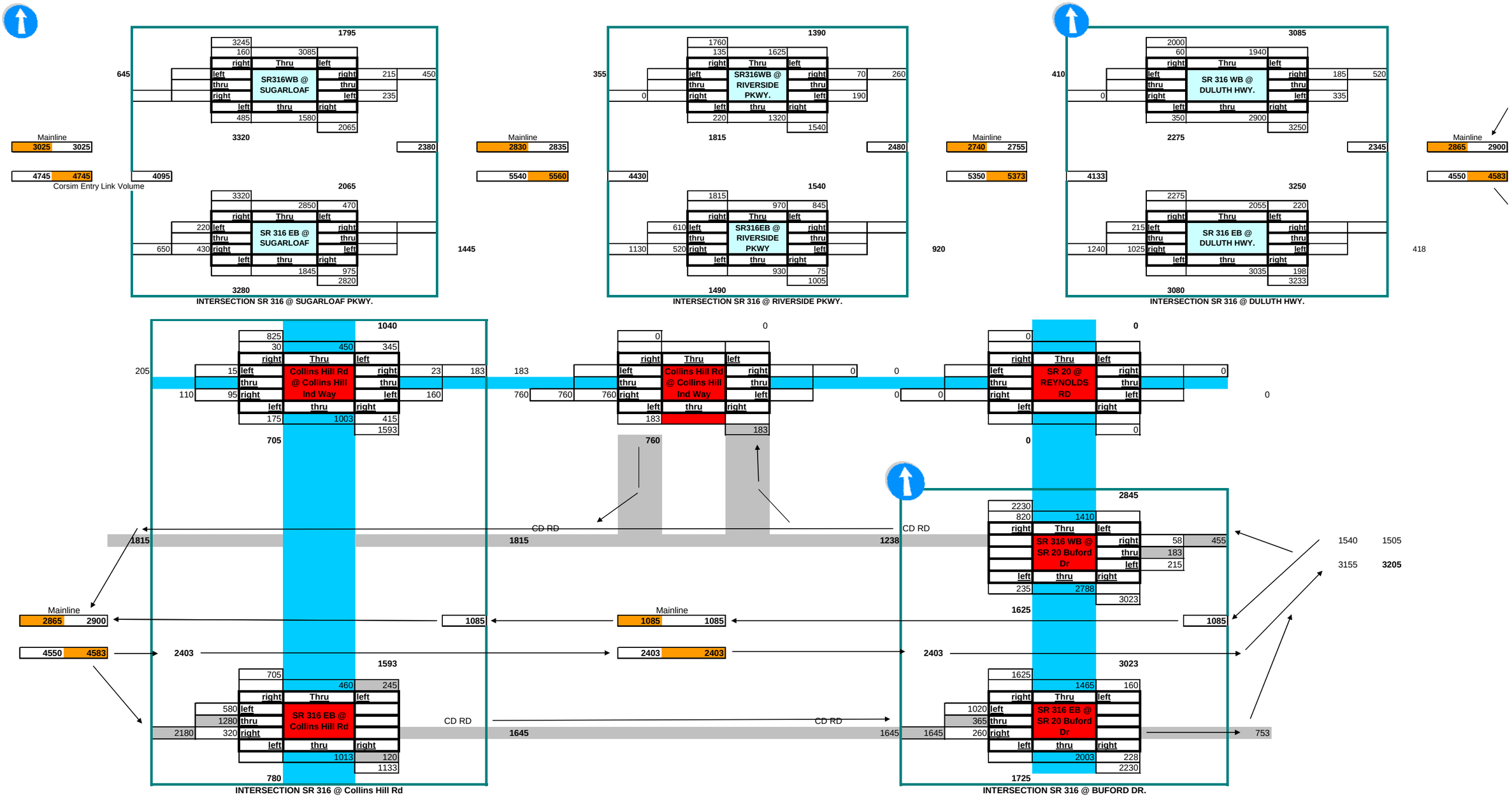


Figure A-9 2032 Build PM Design Hourly Traffic (continued)

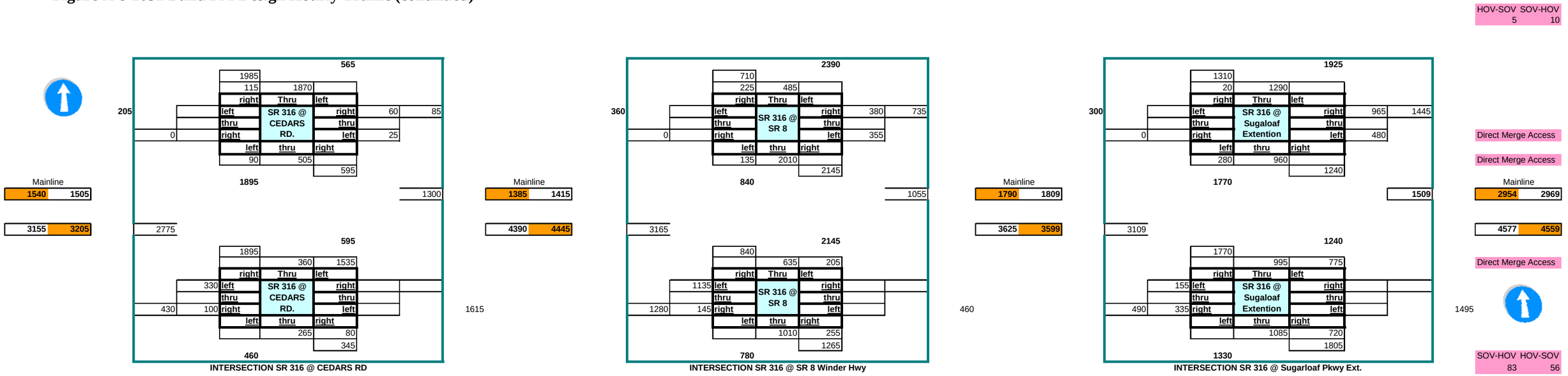


Figure A-9 2032 Build PM Design Hourly Traffic (continued)

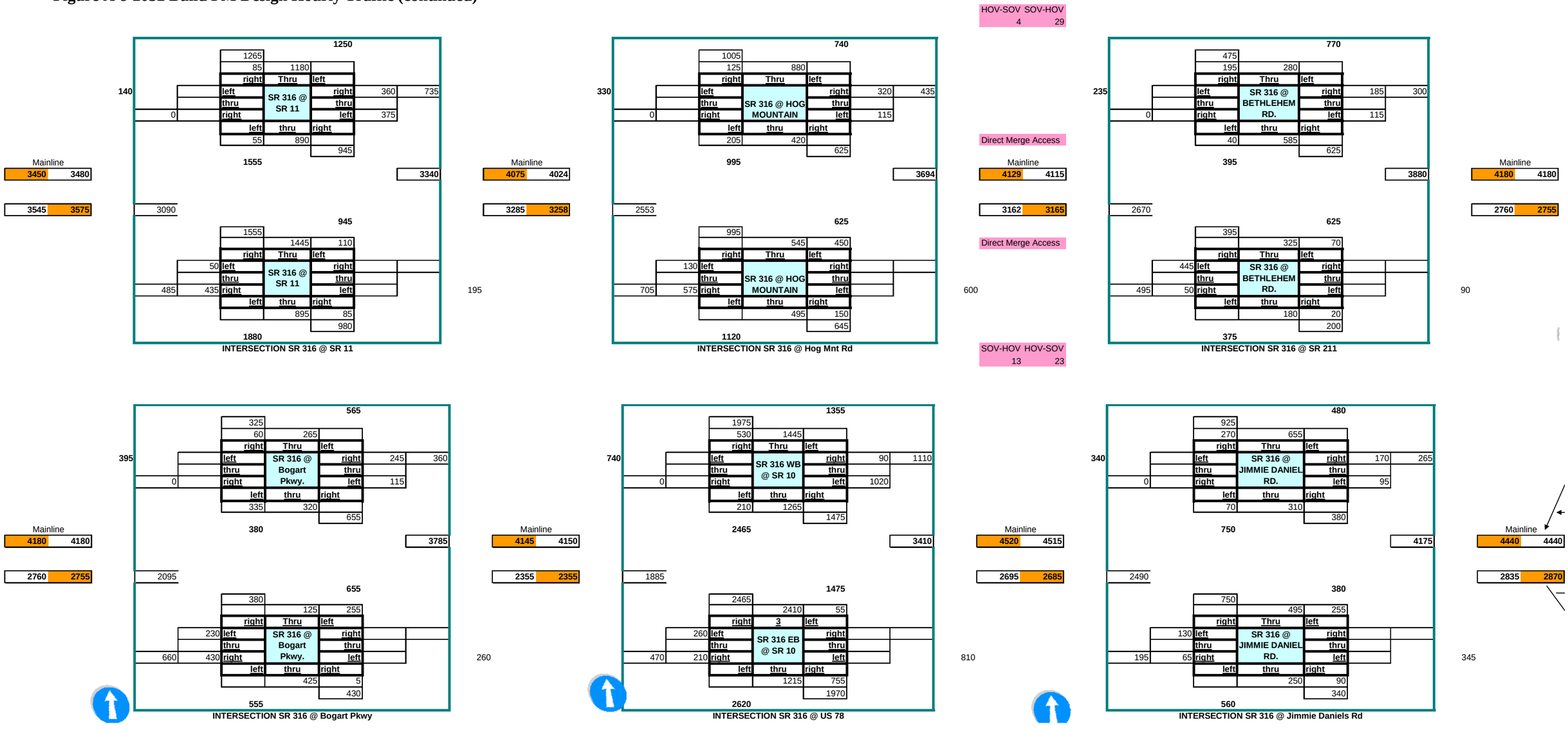


Figure A-9 2032 Build PM Design Hourly Traffic (continued)

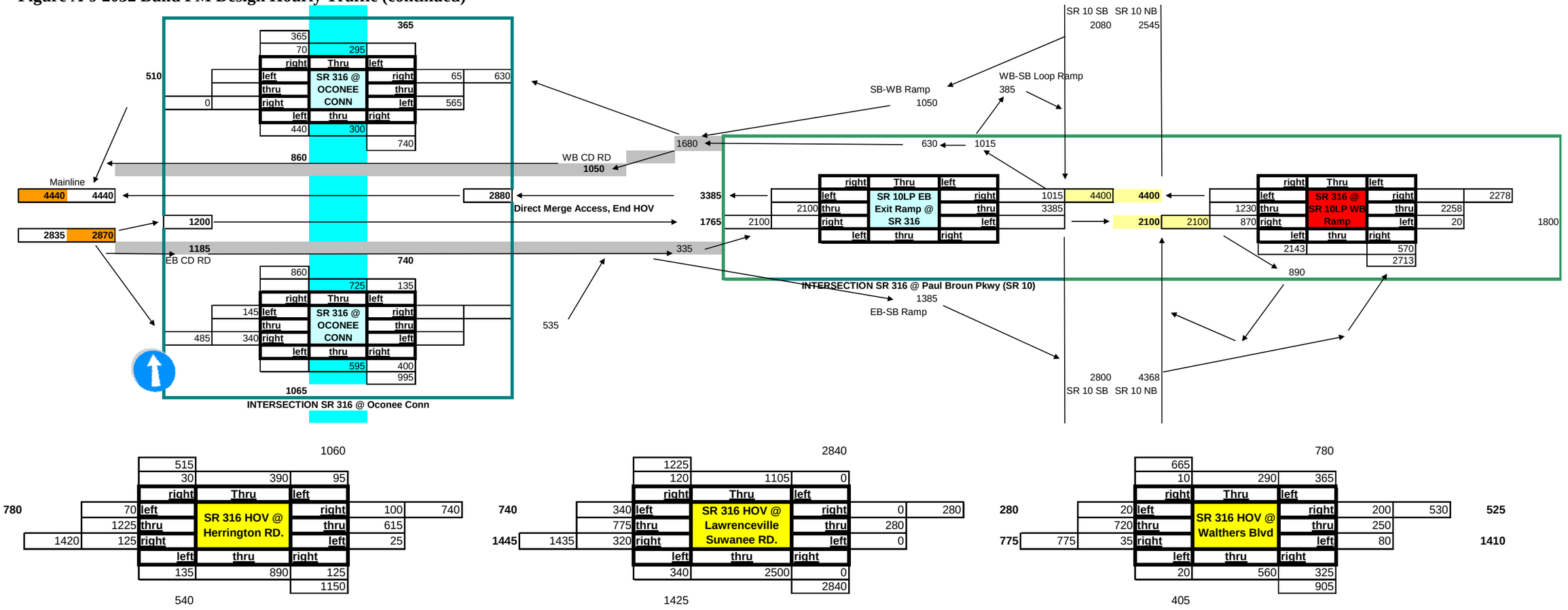
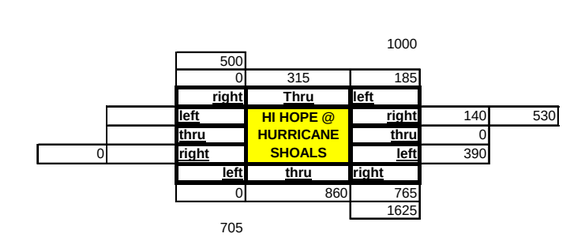


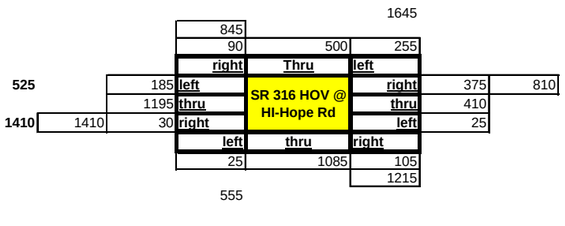
Figure A-9 2032 Build PM Design Hourly Traffic (continued)

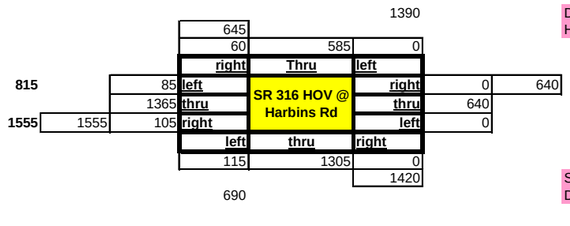


WB
D=
EB
D=
K=

Direct Merge Access ADT's

HOV-SOV	SOV-HOV
111	210
0.30	
SOV-HOV	HOV-SOV
739	500
0.70	
0.16	

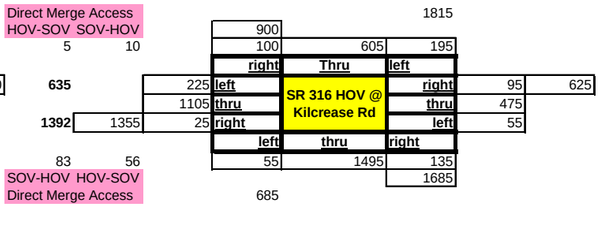


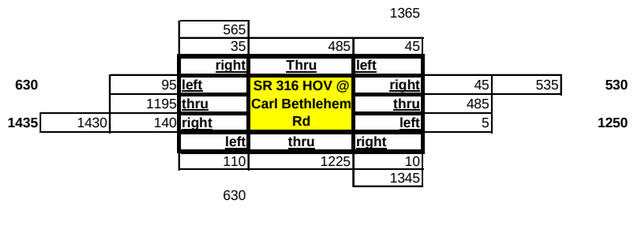


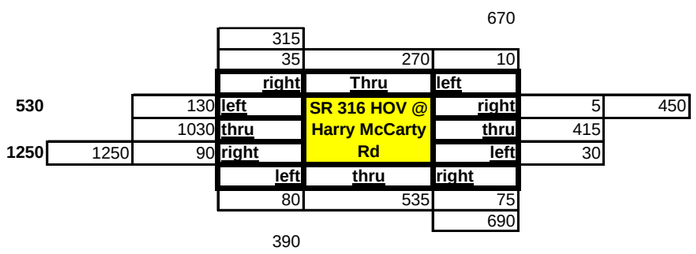
Direct Merge Access

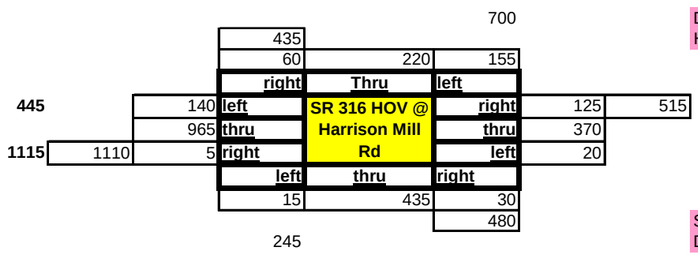
HOV-SOV	SOV-HOV
5	10
83	56

SOV-HOV HOV-SOV
Direct Merge Access









Direct Merge Access

HOV-SOV	SOV-HOV
4	29
13	23

SOV-HOV HOV-SOV
Direct Merge Access

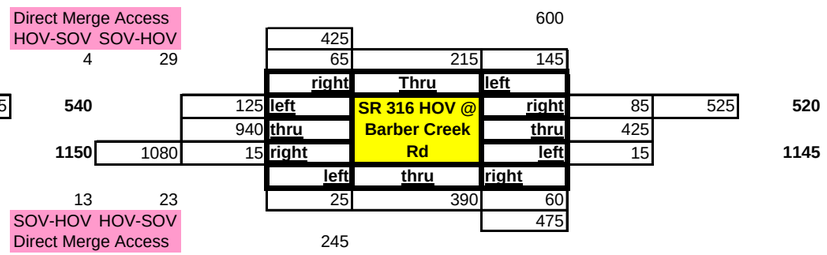
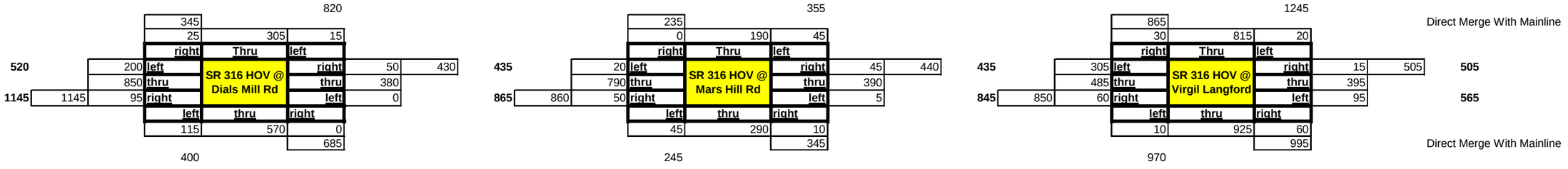


Figure A-9 2032 Build PM Design Hourly Traffic (continued)



APPENDIX B

CORSIM MODEL CALIBRATION

Table B-1 Corsim Model Calibration – Eastbound SR 316 AM Peak Hour

From	To	Beg. node	End node	Calculated AM Model Travel Time (Min)
Boggs Rd	Herrington Rd	1100	1103	0.910970886
Herrington Rd	Sugarloaf Pkwy	1103	1106	0.948280769
Sugarloaf Pkwy	Riverside Pkwy	1106	1114	0.977316929
Riverside Pkwy	Law-Suwa Rd	1114	1117	0.727149033
Law-Suwa Rd	Duluth Hwy	1117	1121	0.495553625
Duluth Hwy	Walther Rd	1121	1123	0.467219722
Walther Rd	Collins Hill Rd	1123	132	1.3705723
Collins Hill Rd	Buford Dr	132	136	3.015297847
Buford Dr	Hurricane Shoals Rd/Hi Hope Rd	136	141	1.347509951
Hurricane Shoals Rd/Hi Hope Rd	Progress Ctr Ave	141	150	0.552522029
Progress Ctr Ave	Cedars Rd	150	162	0.910819417
Cedars Rd	Hurricane Trail	162	168	1.079751268
Hurricane Trail	Fence Rd	168	171	0.639024508
Fence Rd	Winder Hwy/SR 8	171	174	0.943350866
Winder Hwy/SR 8	Harbins Rd	174	186	2.770440534
Harbins Rd	Oak Valley Rd	186	192	0.878983326
Oak Valley Rd	Williams Farm Dr	192	195	0.741591875
Williams Farm Dr	Drowning Creek Rd	195	201	0.779503105
Drowning Creek Rd	Fred Kilcrease Rd	201	210	2.133144491
Fred Kilcrease Rd	Patrick Mill Rd	210	224	1.492390744
Patrick Mill Rd	Carl Bethlehem Rd/SR 324	224	240	1.940025257
Carl Bethlehem Rd/SR 324	Charles S Floyd Rd/SR 81	240	246	1.42295611
Charles S Floyd Rd/SR 81	Harry McCarty Rd	246	253	1.460461819
Harry McCarty Rd	Christmas Ave/SR 11	253	260	1.332393182
Christmas Ave/SR 11	Harrison Mill Rd	260	272	1.16249517
Harrison Mill Rd	Ode Peppers Rd	272	277	0.745320915
Ode Peppers Rd	Jackson Trail Rd	277	282	0.905904672
Jackson Trail Rd	Hog Mountain Rd/SR 53	282	294	1.268471595
Hog Mountain Rd/SR 53	Wall Rd	294	304	1.46867978
Wall Rd	McCarty Rd	304	313	1.063362263
McCarty Rd	Bethlehem Rd	313	317	0.672091627
Bethlehem Rd	Barber Creek Rd	317	327	1.109358533
Barber Creek Rd	Craft Rd	327	333	0.572664884
Craft Rd	Dials Mill Ext	333	338	0.859014025
Dials Mill Ext	Dials Mill Rd	338	341	0.312830551
Dials Mill Rd	McNutt Creek Rd	341	354	1.429201098
McNutt Creek Rd	Mars Hill Rd	354	360	0.740424608
Mars Hill Rd	Monroe Hwy/SR 10	360	368	1.039292697
Monroe Hwy/SR 10	Julian Dr	368	390	0.842769134
Julian Dr	Jimmie Daniel Rd	390	399	1.270667598
Jimmie Daniel Rd	Virgil Langford Rd	399	404	0.858870082
Virgil Langford Rd	Oconee Connector	404	411	0.828844465
Oconee Connector	Jennings Mill Rd	411	414	0.33500726
Jennings Mill Rd	SR 10 Loop	414	415	0.608777522
SR 10 Loop	SR 10 Loop 2	415	420	0.537192301
SR 10 Loop 2	Jennings Mill Pkwy	420	424	0.349661595
	Model Average Travel Time (min)			**48.31813197**
	Travel Time - Field Run (min)			**40.81666667**
	Time Differential (min)			**7.501465303**
	Time Differential (percentage)			**18%**

Table B-2 Corsim Model Calibration – Eastbound SR 316 PM Peak Hour

From	To	Beg. node	End node	Calculated PM Model Travel Time (Min)
Boggs Rd	Herrington Rd	1100	1103	0.94546074
Herrington Rd	Sugarloaf Pkwy	1103	1106	0.989260524
Sugarloaf Pkwy	Riverside Pkwy	1106	1114	1.019605892
Riverside Pkwy	Law-Suwa Rd	1114	1117	0.755683486
Law-Suwa Rd	Duluth Hwy	1117	1121	0.506173204
Duluth Hwy	Walther Rd	1121	1123	0.487489442
Walther Rd	Collins Hill Rd	1123	132	2.020593682
Collins Hill Rd	Buford Dr	132	136	3.526678617
Buford Dr	Hurricane Shoals Rd/Hi Hope Rd	136	141	1.217435965
Hurricane Shoals Rd/Hi Hope Rd	Progress Ctr Ave	141	150	0.526821633
Progress Ctr Ave	Cedars Rd	150	162	1.092574828
Cedars Rd	Hurricane Trail	162	168	1.118336536
Hurricane Trail	Fence Rd	168	171	0.686210179
Fence Rd	Winder Hwy/SR 8	171	174	1.123084305
Winder Hwy/SR 8	Harbins Rd	174	186	2.836823332
Harbins Rd	Oak Valley Rd	186	192	0.897452336
Oak Valley Rd	Williams Farm Dr	192	195	0.783155937
Williams Farm Dr	Drowning Creek Rd	195	201	0.824570206
Drowning Creek Rd	Fred Kilcrease Rd	201	210	2.247926308
Fred Kilcrease Rd	Patrick Mill Rd	210	224	1.563629687
	Model Average Travel Time (min)			**25.16896684**
	Travel Time - Field Run (min)			**29.2**
	Time Differential (min)			**-4.031033161**
	Time Differential (percentage)			**-14%**

Table B-3 Corsim Model Calibration – Westbound SR 316 AM Peak Hour

To	From	Beg. node	End node	Calculated AM Model Travel Time (Min)
Boggs Rd	Herrington Rd	3104	3101	0.83823844
Herrington Rd	Sugarloaf Pkwy	3107	3104	0.820089455
Sugarloaf Pkwy	Riverside Pkwy	3114	3107	1.609680387
Riverside Pkwy	Law-Suwa Rd	3117	3114	0.747337324
Law-Suwa Rd	Duluth Hwy	3121	3117	0.501830501
Duluth Hwy	Walther Rd	3123	3121	0.479638694
Walther Rd	Collins Hill Rd	132	3123	1.065544131
Collins Hill Rd	Buford Dr	136	132	1.31870577
Buford Dr	Hurricane Shoals Rd/Hi Hope Rd	141	136	2.881319054
Hurricane Shoals Rd/Hi Hope Rd	Progress Ctr Ave	150	141	0.808441331
Progress Ctr Ave	Cedars Rd	162	150	1.013498064
Cedars Rd	Hurricane Trail	168	162	1.280762892
Hurricane Trail	Fence Rd	171	168	0.733551746
Fence Rd	Winder Hwy/SR 8	174	171	0.383230833
Winder Hwy/SR 8	Harbins Rd	186	174	3.449919618
Harbins Rd	Oak Valley Rd	192	186	1.442297642
Oak Valley Rd	Williams Farm Dr	195	192	0.773775508
Williams Farm Dr	Drowning Creek Rd	201	195	0.822816223
Drowning Creek Rd	Fred Kilcrease Rd	210	201	2.119475304
Fred Kilcrease Rd	Patrick Mill Rd	224	210	1.67069302
Patrick Mill Rd	Carl Bethlehem Rd/SR 324	240	224	1.95046709
Carl Bethlehem Rd/SR 324	Charles S Floyd Rd/SR 81	246	240	1.146133351
Charles S Floyd Rd/SR 81	Harry McCarty Rd	253	246	1.710061089
Harry McCarty Rd	Christmas Ave/SR 11	260	253	1.15375236
Christmas Ave/SR 11	Harrison Mill Rd	272	260	1.416537347
Harrison Mill Rd	Ode Peppers Rd	277	272	0.711530208
Ode Peppers Rd	Jackson Trail Rd	282	277	0.851774285
Jackson Trail Rd	Hog Mountain Rd/SR 53	294	292	1.12124849
Hog Mountain Rd/SR 53	Wall Rd	304	294	1.526175218
Wall Rd	McCarty Rd	313	304	1.042361354
McCarty Rd	Bethlehem Rd	317	313	0.552787365
Bethlehem Rd	Barber Creek Rd	327	317	1.142004433
Barber Creek Rd	Craft Rd	333	327	0.545806808
Craft Rd	Dials Mill Ext	338	333	0.847048275
Dials Mill Ext	Dials Mill Rd	341	338	0.304726591
Dials Mill Rd	McNutt Creek Rd	354	341	1.365338825
McNutt Creek Rd	Mars Hill Rd	360	354	0.700519606
Mars Hill Rd	Monroe Hwy/SR 10	368	360	1.005228539
Monroe Hwy/SR 10	Julian Dr	390	368	0.798632393
Julian Dr	Jimmie Daniel Rd	399	390	1.193194034
Jimmie Daniel Rd	Virgil Langford Rd	404	399	0.905393506
Virgil Langford Rd	Oconee Connector	411	404	0.441078146
Oconee Connector	Jennings Mill Rd	414	411	0.736085665
Jennings Mill Rd	SR 10 Loop	415	414	0.519608862
SR 10 Loop	SR 10 Loop 2	420	415	0.557317758
SR 10 Loop 2	Jennings Mill Pkwy	424	420	0.444282383
	Model Average Travel Time (min)			**49.44993992**
	Travel Time from Field Run (min)			**53.1**
	Time Differential (min)			**-3.65006008**
	Time Differential (percentage)			**-7%**

Table B-4 Corsim Model Calibration – Westbound SR 316 PM Peak Hour

To	From	Beg. node	End node	Calculated PM Model Travel Time (Min)
Patrick Mill Rd	Carl Bethlehem Rd/SR 324	240	224	1.978533822
Carl Bethlehem Rd/SR 324	Charles S Floyd Rd/SR 81	246	240	1.308395289
Charles S Floyd Rd/SR 81	Harry McCarty Rd	253	246	1.943188765
Harry McCarty Rd	Christmas Ave/SR 11	260	253	1.19197132
Christmas Ave/SR 11	Harrison Mill Rd	272	260	1.629215574
Harrison Mill Rd	Ode Peppers Rd	277	272	0.738933359
Ode Peppers Rd	Jackson Trail Rd	282	277	0.862580085
Jackson Trail Rd	Hog Mountain Rd/SR 53	294	292	1.144807105
Hog Mountain Rd/SR 53	Wall Rd	304	294	1.596828607
Wall Rd	McCarty Rd	313	304	1.067207282
McCarty Rd	Bethlehem Rd	317	313	0.547804266
Bethlehem Rd	Barber Creek Rd	327	317	1.146372188
Barber Creek Rd	Craft Rd	333	327	0.564840505
Craft Rd	Dials Mill Ext	338	333	0.863196718
Dials Mill Ext	Dials Mill Rd	341	338	0.316724608
Dials Mill Rd	McNutt Creek Rd	354	341	1.409342009
McNutt Creek Rd	Mars Hill Rd	360	354	0.723264193
Mars Hill Rd	Monroe Hwy/SR 10	368	360	1.055267622
Monroe Hwy/SR 10	Julian Dr	390	368	0.840579746
Julian Dr	Jimmie Daniel Rd	399	390	1.24703615
Jimmie Daniel Rd	Virgil Langford Rd	404	399	0.992254942
Virgil Langford Rd	Oconee Connector	411	404	0.435448054
Oconee Connector	Jennings Mill Rd	414	411	0.822437558
Jennings Mill Rd	SR 10 Loop	415	414	0.562259321
SR 10 Loop	SR 10 Loop 2	420	415	0.674346319
SR 10 Loop 2	Jennings Mill Pkwy	424	420	0.511587443
	Travel Time from Model			**26.17442285**
	Travel Time from Field Run (min)			**22.83333333**
	Time Differential (min)			**3.341089517**
	Time Differential (percentage)			**15%**

APPENDIX C

CORSIM LEVEL OF SERVICE SUMMARY

Table C-1 2015 E+C Freeway Segments AM Peak Hour Level of Service

Table C-1 2015 E+C Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 EB	Before Sugarloaf Off-Ramp	2202	60.8	17.0	C
SR 316 EB	After Sugarloaf Off-Ramp	1791	62.7	14.3	C
SR 316 EB	Before Sugarloaf On-Ramp	1791	62.6	14.3	C
SR 316 EB	After Sugarloaf On-Ramp	2238	61.5	12.1	C
SR 316 EB	Before Riverside Dr. Off-Ramp	2233	61.2	12.2	C
SR 316 EB	After Riverside Dr. Off-Ramp	1996	61.8	16.1	C
SR 316 EB	Before Riverside Dr. On-Ramp	2003	62.1	16.1	C
SR 316 EB	After Riverside Dr. On-Ramp	2229	61.8	12.0	C
SR 316 EB	Before Duluth Hwy Off-Ramp	2228	61.5	12.1	C
SR 316 EB	After Duluth Hwy Off-Ramp	1906	62.3	15.3	C
SR 316 EB	Before Duluth Hwy On-Ramp	1907	61.8	15.4	C
SR 316 EB	After Duluth On-Ramp	2385	56.6	19.8	C
SR 316 EB	Before Collins Hill / SR 20 CD Rd Off-Ramp	2385	55.3	17.3	C
SR 316 EB	After Collins Hill / SR 20 CD Rd Off-Ramp	849	63.7	6.7	C
Collins Hill /SR 20 CD Rd EB	Before Collins Hill Off-Ramp	1542	47.3	10.9	C
Collins Hill /SR 20 CD Rd EB	After Collins Hill Off-Ramp	746	49.5	7.5	C
Collins Hill /SR 20 CD Rd EB	Before Collins Hill On-Ramp				
Collins Hill /SR 20 CD Rd EB	After Collins Hill On-Ramp	1001	48.8	6.8	C
SR 316 EB	Before Collins Hill / SR 20 CD Rd On-Ramp	849	64.0	6.6	C
SR 316 EB	After Collins Hill / SR 20 CD Rd On-Ramp	1380	60.5	9.2	C
SR 316 EB	Before HOV Direct Merge	1378	63.3	10.9	C
SR 316 EB	After HOV Direct Merge	1468	63.5	7.7	C
SR 316 EB	Before Sugarloaf Ext EB to SB Off-Ramp	1164	61.0	7.1	C
SR 316 EB	After Sugarloaf Ext EB to SB Off-Ramp	993	62.6	7.9	C
SR 316 EB	Before Sugarloaf Ext NB to EB On-Ramp	989	62.6	7.9	
SR 316 EB	After Sugarloaf Ext NB to EB On-Ramp	1243	60.9	8.9	C
SR 316 HOV EB	Before Herrington Rd Off-Ramp	683	62.4	7.8	C
SR 316 HOV EB	After Herrington Rd Off-Ramp	481	63.2	7.6	C
SR 316 HOV EB	Before Herrington Rd On-Ramp	483	62.5	7.7	C
SR 316 HOV EB	After Herrington Rd On-Ramp	570	61.0	6.7	C
SR 316 HOV EB	Before Lawrenceville Suwanee Rd Off-Ramp	572	56.6	7.2	C
SR 316 HOV EB	After Lawrenceville Suwanee Rd Off-Ramp	168	63.5	2.6	C
SR 316 HOV EB	Before Walther Blvd Off-Ramp	168	61.7	1.9	C
SR 316 HOV EB	After Walther Blvd Off-Ramp	135	62.7	2.2	C

Table C-1 2015 E+C Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 HOV EB	Before Walther Blvd On-Ramp	135	62.5	2.2	C
SR 316 HOV EB	After Walther Blvd On-Ramp	287	56.4	2.8	C
SR 316 HOV EB	Before Hi-Hope Rd Off-Ramp	287	58.9	3.5	C
SR 316 HOV EB	After Hi-Hope Rd Off-Ramp	89	63.8	1.4	C
SR 316 WB	Before Sugarloaf Ext CD Rd Off-Ramp	2415	55.5	19.0	C
SR 316 WB	After Sugarloaf Ext CD Rd Off-Ramp	2053	61.4	16.7	C
Sugarloaf Extension CD Rd WB	Before NB to WB On-Ramp	354	47.8	7.4	C
Sugarloaf Ext CD Rd WB	After NB to WB On-Ramp	502	46.6	5.4	C
Sugarloaf Ext CD Rd WB	Before WB to SB Off-Ramp				
Sugarloaf Ext CD Rd WB	After WB to SB Off-Ramp	147	48.6	3.0	C
SR 316 WB	Before Sugarloaf Ext CD Rd On-Ramp	2059	61.1	16.8	C
SR 316 WB	After Sugarloaf Ext CD Rd On-Ramp	2208	58.9	12.6	C
SR 316 WB	Before HOV Diverge	2248	61.2	12.8	C
SR 316 WB	After HOV Diverge	2134	61.1	17.5	C
SR 316 WB	Before Collins Hill / SR 20 CD Rd Off-Ramp	2125	57.2	16.9	C
SR 316 WB	After Collins Hill / SR 20 CD Rd Off-Ramp	1447	61.1	11.9	C
Collins Hill /SR 20 CD Rd WB	Before Collins Hill Off-Ramp	1655	46.0	17.6	C
Collins Hill /SR 20 CD Rd WB	After Collins Hill Off-Ramp	1388	46.4	30.0	D
Collins Hill /SR 20 CD Rd WB	Before Collins Hill On-Ramp				
Collins Hill /SR 20 CD Rd WB	After Collins Hill On-Ramp	1942	40.5	30.0	D
SR 316 WB	Before Collins Hill / SR 20 CD Rd On-Ramp	1435	60.8	11.8	C
SR 316 WB	After Collins Hill / SR 20 CD Rd On-Ramp	3382	47.6	30.0	D
SR 316 WB	Before Duluth Hwy Off-Ramp	3383	59.5	26.9	C
SR 316 WB	After Duluth Hwy Off-Ramp	2896	60.9	23.8	C
SR 316 WB	Before Duluth Hwy On-Ramp	2896	61.7	23.5	C
SR 316 WB	After the Duluth Hwy On-Ramp	3960	59.5	22.2	C
SR 316 WB	Before Riverside Dr. Off-Ramp	3955	58.7	22.5	C
SR 316 WB	After Riverside Dr. Off-Ramp	3397	56.4	30.8	D
SR 316 WB	After Riverside Dr. Off-Ramp	3363	52.6	36.8	**E**
SR 316 WB	Before Riverside Dr. On-Ramp	3346	52.0	38.6	**E**
SR 316 WB	After Riverside Dr. On-Ramp	4169	48.1	36.0	**E**
SR 316 WB	Before Duluth Hwy Off-Ramp	4118	34.6	45.3	**F**
SR 316 WB	After Duluth Hwy Off-Ramp	3003	59.6	25.2	C
SR 316 WB	Before Duluth Hwy On-Ramp	3008	60.9	24.7	C
SR 316 WB	After Duluth On-Ramp	3278	59.1	24.9	C
SR 316 HOV WB	Before Hi-Hope Rd On Ramp	113	63.8	1.8	C
SR 316 HOV WB	After Hi-Hope Rd On Ramp	494	57.1	6.2	C
SR 316 HOV WB	Before Walther Blvd Off-Ramp	494	58.4	4.7	C

Table C-1 2015 E+C Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 HOV WB	After Walther Blvd Off-Ramp	330	62.2	5.3	C
SR 316 HOV WB	Before Walther Blvd On-Ramp	328	61.5	5.4	C
SR 316 HOV WB	After Walther Blvd On-Ramp	373	60.6	4.4	C
SR 316 HOV WB	Before Lawrenceville Suwanee Rd On-Ramp	375	60.6	6.2	C
SR 316 HOV WB	After Lawrenceville Suwanee Rd On-Ramp	1207	54.4	15.9	C
SR 316 HOV WB	Before Herrington Rd On-Ramp	1206	58.2	14.8	C
SR 316 HOV WB	After Herrington Rd On-Ramp	1079	59.2	18.2	C
SR 10 Loop SB	Before SR 316 Off-Ramp	1621	29.0	41.3	**E**
SR 10 Loop SB	After SR 316 Off-Ramp	1082	59.2	9.2	C
SR 10 Loop SB	After SR 316 WB to SB On-Ramp	1402	60.6	9.8	C
SR 10 Loop SB	After SR 316 EB to SB On-Ramp	2620	57.1	18.6	C
SR 10 Loop NB	Before SR 316 Off-Ramp	2267	13.5	74.4	**F**
SR 10 Loop NB	After SR 316 Off-Ramp	900	49.5	9.1	C
SR 10 Loop NB	Before SR 316 On-Ramp	902	59.6	7.6	C
SR 10 Loop NB	After SR 316 On-Ramp	1767	59.3	12.1	C

Table C-2 2015 E+C Freeway Segments PM Peak Hour Level of Service

Table C-2 2015 E+C Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 EB	Before Sugarloaf Off-Ramp	4010	57.7	32.5	D
SR 316 EB	After Sugarloaf Off-Ramp	3457	59.9	28.8	D
SR 316 EB	Before Sugarloaf On-Ramp	3458	60.0	28.8	D
SR 316 EB	After Sugarloaf On-Ramp	4700	54.5	29.1	D
SR 316 EB	Before Riverside Dr. Off-Ramp	4648	44.0	36.7	**E**
SR 316 EB	After Riverside Dr. Off-Ramp	3756	41.4	49.3	**F**
SR 316 EB	Before Riverside Dr. On-Ramp	3656	37.3	59.6	**F**
SR 316 EB	After Riverside Dr. On-Ramp	4278	30.5	59.4	**F**
SR 316 EB	Before Duluth Hwy Off-Ramp	4239	25.5	68.4	**F**
SR 316 EB	After Duluth Hwy Off-Ramp	3188	55.0	29.0	D
SR 316 EB	Before Duluth Hwy On-Ramp	3188	57.6	27.7	C
SR 316 EB	After Duluth On-Ramp	3751	48.8	36.0	**E**
SR 316 EB	Before Collins Hill / SR 20 CD Rd Off-Ramp	3760	52.0	29.0	D
SR 316 EB	After Collins Hill / SR 20 CD Rd Off-Ramp	1809	61.9	14.6	C
Collins Hill /SR 20 CD Rd EB	Before Collins Hill Off-Ramp	1959	48.3	13.5	C
Collins Hill /SR 20 CD Rd EB	After Collins Hill Off-Ramp	1342	49.2	13.6	C
Collins Hill /SR 20 CD Rd EB	After Collins Hill On-Ramp	1615	48.6	11.1	C
SR 316 EB	Before Collins Hill / SR 20 CD Rd On-Ramp	1441	5.6	132.5	**F**
SR 316 EB	After Collins Hill / SR 20 CD Rd On-Ramp	1969	6.8	122.2	**F**
SR 316 EB	Before HOV Direct Merge	1781	5.0	181.3	**F**
SR 316 EB	After HOV Direct Merge	1823	3.4	182.5	**F**
SR 316 EB	Before Sugarloaf Ext EB to SB Off-Ramp	1918	61.5	11.6	C
SR 316 EB	After Sugarloaf Ext EB to SB Off-Ramp	1789	62.1	14.4	C
SR 316 EB	Before Sugarloaf Ext NB to EB On-Ramp	1791	61.5	14.6	
SR 316 EB	After Sugarloaf Ext NB to EB On-Ramp	2306	55.3	18.2	C
SR 316 HOV EB	Before Herrington Rd Off-Ramp	1359	61.3	15.8	C
SR 316 HOV EB	After Herrington Rd Off-Ramp	1097	61.1	18.0	C
SR 316 HOV EB	Before Herrington Rd On-Ramp	1097	60.2	18.2	C
SR 316 HOV EB	After Herrington Rd On-Ramp	1212	58.9	14.7	C
SR 316 HOV EB	Before Lawrenceville Suwanee Rd Off-Ramp	1215	55.5	15.6	C
SR 316 HOV EB	After Lawrenceville Suwanee Rd Off-Ramp	380	62.9	6.0	C
SR 316 HOV EB	efore Walther Blvd Off-Ramp	379	60.9	4.5	C
SR 316 HOV EB	After Walther Blvd Off-Ramp	337	61.4	5.5	C
SR 316 HOV EB	Before Walther Blvd On-Ramp	336	61.0	5.5	C
SR 316 HOV EB	After Walther Blvd On-Ramp	490	57.7	4.7	C
SR 316 HOV EB	Before Hi-Hope Rd Off-Ramp	493	57.2	6.2	C
SR 316 HOV EB	After Hi-Hope Rd Off-Ramp	137	63.1	2.2	C
SR 316 WB	Before Sugarloaf Ext CD Rd Off-Ramp	1253	56.7	9.6	C
SR 316 WB	After Sugarloaf Ext CD Rd Off-Ramp	986	62.5	7.9	C
Sugarloaf Ext CD Rd WB	Before NB to WB On-Ramp	263	47.6	5.5	C

Table C-2 2015 E+C Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
Sugarloaf Ext CD Rd WB	After NB to WB On-Ramp	462	45.8	5.0	C
Sugarloaf Ext CD Rd WB	Before WB to SB Off-Ramp				
Sugarloaf Ext CD Rd WB	After WB to SB Off-Ramp	199	48.2	4.1	C
SR 316 WB	Before Sugarloaf Ext CD Rd On-Ramp	983	62.4	7.9	C
SR 316 WB	After Sugarloaf Ext CD Rd On-Ramp	1183	59.0	6.8	C
SR 316 WB	Before HOV Diverge	1274	61.8	7.2	C
SR 316 WB	After HOV Diverge	1210	61.7	9.8	C
SR 316 WB	Before Collins Hill / SR 20 CD Rd Off-Ramp	1209	57.8	9.5	C
SR 316 WB	After Collins Hill / SR 20 CD Rd Off-Ramp	753	62.0	6.1	C
Collins Hill /SR 20 CD Rd WB	Before Collins Hill Off-Ramp	920	46.9	9.6	C
Collins Hill /SR 20 CD Rd WB	After Collins Hill Off-Ramp	696	47.7	14.6	C
Collins Hill /SR 20 CD Rd WB	Before Collins Hill On-Ramp				
Collins Hill /SR 20 CD Rd WB	After Collins Hill On-Ramp	1393	43.2	20.1	C
SR 316 WB	Before Collins Hill / SR 20 CD Rd On-Ramp	748	62.5	6.0	C
SR 316 WB	After Collins Hill / SR 20 CD Rd On-Ramp	2141	55.6	16.3	C
SR 316 WB	Before Duluth Hwy Off-Ramp	2146	60.1	16.9	C
SR 316 WB	After Duluth Hwy Off-Ramp	1687	62.4	13.5	C
SR 316 WB	Before Duluth Hwy On-Ramp	1688	63.1	13.4	C
SR 316 WB	After the Duluth Hwy On-Ramp	1945	62.1	10.4	C
SR 316 WB	Before Riverside Dr. Off-Ramp	1944	62.0	10.5	C
SR 316 WB	After Riverside Dr. Off-Ramp	1734	62.7	13.8	C
SR 316 WB	Before Riverside Dr. On-Ramp	1732	62.4	13.9	C
SR 316 WB	After Riverside Dr. On-Ramp	1988	61.9	10.7	C
SR 316 WB	Before Duluth Hwy Off-Ramp	1986	61.3	10.8	C
SR 316 WB	After Duluth Hwy Off-Ramp	1596	62.7	12.7	C
SR 316 WB		1600	62.6	12.8	C
SR 316 WB	Before Duluth Hwy On-Ramp	1599	62.5	12.8	C
SR 316 WB	After Duluth On-Ramp	1780	61.4	13.0	C
SR 316 HOV WB	Before Hi-Hope Rd On Ramp	64	64.2	1.0	C
SR 316 HOV WB	After Hi-Hope Rd On Ramp	230	58.7	2.8	C
SR 316 HOV WB	Before Walther Blvd Off-Ramp	229	58.1	2.2	C
SR 316 HOV WB	After Walther Blvd Off-Ramp	107	64.0	1.7	C
SR 316 HOV WB	Before Walther Blvd On-Ramp	107	63.7	1.7	C
SR 316 HOV WB	After Walther Blvd On-Ramp	147	61.7	1.7	C
SR 316 HOV WB	Before Lawrenceville Suwanee Rd On-Ramp	147	63.1	2.3	C
SR 316 HOV WB	After Lawrenceville Suwanee Rd On-Ramp	526	57.0	6.6	C
SR 316 HOV WB	Before Herrington Rd On-Ramp	523	59.4	6.3	C
SR 316 HOV WB	After Herrington Rd On-Ramp	428	60.9	7.1	C
SR 10 Loop SB	Before SR 316 Off-Ramp	1051	3.8	135.6	**F**
SR 10 Loop SB	After SR 316 Off-Ramp	529	54.9	4.8	C
SR 10 Loop SB	After SR 316 WB to SB On-Ramp	848	58.7	6.1	C
SR 10 Loop SB	After SR 316 EB to SB On-Ramp	1858	57.6	13.1	C
SR 10 Loop NB	Before SR 316 Off-Ramp	2339	10.6	96.0	**F**
SR 10 Loop NB	After SR 316 Off-Ramp	885	50.1	8.8	C
SR 10 Loop NB	Before SR 316 On-Ramp	887	60.7	7.3	C
SR 10 Loop NB	After SR 316 On-Ramp	1349	60.4	9.0	C

Table C-3 2032 E+C Freeway Segments AM Peak Hour Level of Service

Table C-3 2032 E+C Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 EB	Before Sugarloaf Off-Ramp	3042	58.9	24.2	C
SR 316 EB	After Sugarloaf Off-Ramp	2397	61.5	19.5	C
SR 316 EB	Before Sugarloaf On-Ramp	2391	61.6	19.5	C
SR 316 EB	After Sugarloaf On-Ramp	2858	61.0	15.6	C
SR 316 EB	Before Riverside Dr. Off-Ramp	2861	60.0	13.8	C
SR 316 EB	After Riverside Dr. Off-Ramp	2502	60.5	13.8	C
SR 316 EB	Before Riverside Dr. On-Ramp	2504	61.4	13.6	C
SR 316 EB	After Riverside Dr. On-Ramp	2741	61.3	11.2	C
SR 316 EB	Before Duluth Hwy Off-Ramp	2736	61.1	11.2	C
SR 316 EB	After Duluth Hwy Off-Ramp	2378	61.7	12.8	C
SR 316 EB	Before Duluth Hwy On-Ramp	2376	60.9	13.0	C
SR 316 EB	After Duluth On-Ramp	2871	55.1	16.6	C
SR 316 EB	Before Collins Hill / SR 20 CD Rd Off-Ramp	2870	58.4	14.1	C
SR 316 EB	After Collins Hill / SR 20 CD Rd Off-Ramp	1251	63.3	6.6	C
Collins Hill /SR 20 CD Rd EB	Before Collins Hill Off-Ramp	1615	60.9	8.8	C
Collins Hill /SR 20 CD Rd EB	After Collins Hill Off-Ramp	913	63.9	7.1	C
Collins Hill /SR 20 CD Rd EB	After Collins Hill On-Ramp	1259	57.3	7.3	C
SR 316 EB	Before Collins Hill / SR 20 CD Rd On-Ramp	1253	63.3	6.6	C
SR 316 EB	After Collins Hill / SR 20 CD Rd On-Ramp	2059	60.5	9.8	C
SR 316 EB	Before HOV Direct Merge	2064	62.4	11.0	C
SR 316 EB	After HOV Direct Merge	2281	62.5	9.1	C
SR 316 EB	Before Cedar Rd Off-Ramp	2283	61.1	9.4	C
SR 316 EB	After Cedar Rd Off-Ramp	432	43.8	9.9	C
SR 316 EB	Before Cedar Rd On-Ramp	1848	62.5	14.8	C
SR 316 EB	After Cedar Rd On-Ramp	1937	62.0	11.4	C
SR 316 EB	Before Winder Hwy Off-Ramp	1938	61.3	12.9	C
SR 316 EB	After Winder Hwy Off-Ramp	1583	62.9	12.6	C
SR 316 EB	Before Winder Hwy On-Ramp	1585	62.7	12.6	C
SR 316 EB	After Winder Hwy On-Ramp	2228	59.6	13.6	C
SR 316 EB	Before Sugarloaf Ext CD Rd Off-Ramp	2222	56.3	15.3	C
SR 316 EB	After Sugarloaf Ext CD Rd Off-Ramp	1834	62.1	14.8	C
Sugarloaf Ext CD Rd EB	Before EB to SB Off-Ramp	387	49.2	3.9	C
Sugarloaf Ext CD Rd EB	After EB to SB Off-Ramp	63	49.9	1.3	C
Sugarloaf Ext CD Rd EB	Before SB to EB On-Ramp	63	49.7	1.3	C
Sugarloaf Ext CD Rd EB	After SB to EB On-Ramp	653	42.8	7.6	C
Sugarloaf Ext CD Rd EB	Before EB to NB Off-Ramp			0.0	
Sugarloaf Ext CD Rd EB	After EB to NB Off-Ramp	590	46.6	12.7	C

Table C-3 2032 E+C Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
Sugarloaf Ext CD Rd EB	After NB to EB On-Ramp	1003	35.0	16.0	C
SR 316 EB	Before Sugarloaf Ext CD Rd On-Ramp	1831	62.3	14.7	C
SR 316 EB	After Sugarloaf Ext CD Rd On-Ramp	2831	57.3	21.8	C
SR 316 EB	Before Drowning Creek Rd Off-Ramp	2830	60.5	19.0	C
SR 316 EB	After Drowning Creek Rd Off-Ramp	2735	61.0	22.4	C
SR 316 EB	Before Drowning Creek Rd On-Ramp	2734	60.7	22.5	C
SR 316 EB	After Drowning Creek Rd On-Ramp	2835	60.2	17.1	C
SR 316 EB	Before Patrick Mill Rd Off-Ramp	2840	59.5	19.5	C
SR 316 EB	After Patrick Mill Rd Off-Ramp	2567	61.1	21.0	C
SR 316 EB	Before Patrick Mill Rd On-Ramp	2560	60.8	21.1	C
SR 316 EB	After Patrick Mill Rd On-Ramp	2833	59.2	17.4	C
SR 316 EB	Before Loganville Hwy SR 81 Off-Ramp	2832	59.9	19.6	C
SR 316 EB	After Loganville Hwy SR 81 Off-Ramp	2628	60.9	21.6	C
SR 316 EB	Before Loganville Hwy SR 81 On-Ramp	2621	60.6	21.6	C
SR 316 EB	After Loganville Hwy SR 81 On-Ramp	3312	55.4	24.7	C
SR 316 EB	Before Christmas Ave SR 11 Off-Ramp	3290	59.4	20.1	C
SR 316 EB	After Christmas Ave SR 11 Off-Ramp	3077	60.6	25.4	C
SR 316 EB	Before Christmas Ave SR 11 On-Ramp	3074	60.2	25.5	C
SR 316 EB	After Christmas Ave SR 11 On-Ramp	3713	54.1	29.7	D
SR 316 EB	Before Hog Mountain Rd SR 53 Off-Ramp	3669	58.6	26.9	C
SR 316 EB	After Hog Mountain Rd SR 53 Off-Ramp	3388	60.0	28.2	D
SR 316 EB	Before Hog Mountain Rd SR 53 On-Ramp	3381	59.9	28.3	D
SR 316 EB	After Hog Mountain Rd SR 53 On-Ramp	3889	54.9	27.6	C
SR 316 EB	Before Bethlehem Rd SR324 Off-Ramp	3851	58.2	27.3	C
SR 316 EB	After Bethlehem Rd SR324 Off-Ramp	3539	59.7	29.7	D
SR 316 EB	After Bethlehem Rd SR324 On-Ramp	3981	54.9	26.5	C
SR 316 EB	Before Bogart Pkwy Off-Ramp	3903	57.5	27.7	C
SR 316 EB	After Bogart Pkwy Off-Ramp	3525	60.0	29.4	D
SR 316 EB	Before Bogart Pkwy On-Ramp	3507	59.8	29.4	D
SR 316 EB	After Bogart Pkwy On-Ramp	3867	56.4	25.0	C
SR 316 EB	Before Monroe Hwy SR 10 Off-Ramp	3835	56.2	30.1	D
SR 316 EB	After Monroe Hwy SR 10 Off-Ramp	3173	60.7	26.1	C
SR 316 EB	Before Monroe Hwy SR 10 On-Ramp	3157	58.6	27.0	C
SR 316 EB	After Monroe Hwy SR 10 On-Ramp	4109	45.8	40.9	**E**
SR 316 EB	Before Jimmie Daniels Rd Off-Ramp	4086	59.0	23.8	C
SR 316 EB	After Jimmie Daniels Rd Off-Ramp	3795	60.2	31.5	D
SR 316 EB	Before Jimmie Daniels Rd On-Ramp	3783	59.7	31.7	D
SR 316 EB	After Jimmie Daniels Rd On-Ramp	4111	60.0	22.9	C
SR 316 EB	Before Oconee Conn Off-Ramp	4099	48.0	28.5	D
SR 316 EB	After Oconee Conn Off-Ramp	2113	62.3	17.0	C
Oconee Conn CD Rd EB	Before Oconee Conn On-Ramp	1520	46.3	32.9	D
Oconee Conn CD Rd EB	After Oconee Conn On-Ramp	2147	47.8	22.5	C
Oconee Conn CD Rd EB	Before SR 10 Loop EB-SB Off-Ramp	2140	43.9	24.4	C
Oconee Conn CD Rd EB	After SR 10 Loop EB-SB Off-Ramp	253	44.4	5.7	C

Table C-3 2032 E+C Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 EB	Before Oconee Conn CD RD On-Ramp	2101	61.2	17.2	C
SR 316 EB	After Oconee Conn CD RD On-Ramp	2353	55.8	14.1	C
SR 316 HOV EB	Before Herrington Rd Off-Ramp	775	62.6	8.8	C
SR 316 HOV EB	After Herrington Rd Off-Ramp	604	62.8	9.6	C
SR 316 HOV EB	Before Herrington Rd On-Ramp	604	62.0	9.7	C
SR 316 HOV EB	After Herrington Rd On-Ramp	715	60.4	8.5	C
SR 316 HOV EB	Before Lawrenceville Suwanee Rd Off-Ramp	714	56.6	9.0	C
SR 316 HOV EB	After Lawrenceville Suwanee Rd Off-Rp	238	63.1	3.8	C
SR 316 HOV EB	Before Walther Blvd Off-Ramp	237	61.3	2.8	C
SR 316 HOV EB	After Walther Blvd Off-Ramp	37	44.5	0.8	C
SR 316 HOV EB	Before Walther Blvd On-Ramp	201	61.8	3.3	C
SR 316 HOV EB	After Walther Blvd On-Ramp	376	56.7	3.6	C
SR 316 HOV EB	Before Hi-Hope Rd Off-Ramp	373	59.4	4.5	C
SR 316 HOV EB	After Hi-Hope Rd Off-Ramp	207	62.6	3.3	C
SR 316 WB	Before Oconee Conn CD Rd Off-Ramp	2979	43.5	23.0	C
SR 316 WB	After Oconee Conn CD Rd Off-Ramp	1881	47.4	19.8	C
Oconee Conn CD Rd WB	Before SR 10 Loop WB to SB Off-Ramp	1098	43.0	12.8	C
Oconee Conn CD Rd WB	After SR 10 Loop WB to SB Off-Ramp	542	44.1	12.3	C
Oconee Conn CD Rd WB	After SR 10 Loop SB to EB On-Ramp	1387	45.5	15.2	C
Oconee Conn CD Rd WB	Before Oconee Conn Off-Ramp	1387	47.1	14.7	C
Oconee Conn CD Rd WB	After Oconee Conn Off-Ramp	844	47.7	17.7	C
Oconee Conn CD Rd WB	Before Oconee Conn On-Ramp	843	44.6	18.9	C
Oconee Conn CD Rd WB	After Oconee Conn On-Ramp	1325	33.1	24.4	C
SR 316 WB	Before Oconee Conn CD RD On-Ramp	1882	62.1	15.1	C
SR 316 WB	After Oconee Conn CD RD On-Ramp	3203	56.7	18.8	C
SR 316 WB	Before Jimmie Daniels Rd Off-Ramp	3200	59.6	17.9	C
SR 316 WB	After Jimmie Daniels Rd Off-Ramp	2898	61.1	23.7	C
SR 316 WB	Before Jimmie Daniels Rd On-Ramp	2903	61.1	23.8	C
SR 316 WB	After Jimmie Daniels Rd On-Ramp	3111	60.2	17.2	C
SR 316 WB	Before Monroe Hwy SR 10 Off-Ramp	3111	58.4	24.2	C
SR 316 WB	After Monroe Hwy SR 10 Off-Ramp	2397	61.7	19.4	C
SR 316 WB	Before Monroe Hwy SR 10 On-Ramp	2398	61.5	19.5	C
SR 316 WB	After Monroe Hwy SR 10 On-Ramp	2830	58.6	21.3	C
SR 316 WB	Before Bogart Pkwy Off-Ramp	2837	60.2	19.2	C
SR 316 WB	After Bogart Pkwy Off-Ramp	2575	61.3	21.0	C
SR 316 WB	Before Bogart Pkwy On-Ramp	2576	61.1	21.1	C
SR 316 WB	After Bogart Pkwy On-Ramp	3235	57.9	20.3	C
SR 316 WB	Before Bethlehem Rd SR324 Off-Ramp	3240	59.4	22.2	C
SR 316 WB	After Bethlehem Rd SR324 Off-Ramp	3050	60.2	25.4	C
SR 316 WB	After Bethlehem Rd SR324 On-Ramp	3514	57.1	22.8	C
SR 316 WB	Before Hog Mountain Rd SR 53 Off-Ramp	3517	57.8	25.3	C
SR 316 WB	After Hog Mountain Rd SR 53 Off-Ramp	3031	60.7	25.0	C
SR 316 WB	Before Hog Mountain Rd SR 53 On-Ramp	3026	60.4	25.1	C
SR 316 WB	After Hog Mountain Rd SR 53 On-Ramp	3749	54.8	30.3	D

Table C-3 2032 E+C Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 WB	Before Christmas Ave SR 11 Off-Ramp	3762	58.3	27.6	C
SR 316 WB	After Christmas Ave SR 11 Off-Ramp	3508	59.9	29.3	D
SR 316 WB	Before Christmas Ave SR 11 On-Ramp	3505	59.3	29.6	D
SR 316 WB	After Christmas Ave SR 11 On-Ramp	4104	44.4	30.9	D
SR 316 WB	Before Loganville Hwy SR 81 Off-Ramp	4086	58.6	28.8	D
SR 316 WB	After Loganville Hwy SR 81 Off-Ramp	3740	59.9	31.2	D
SR 316 WB	Before Loganville Hwy SR 81 On-Ramp	3728	58.8	31.8	D
SR 316 WB	After Loganville Hwy SR 81 On-Ramp	4544	46.2	41.2	**E**
SR 316 WB	Before Patrick Mill Rd Off-Ramp	4497	57.7	31.8	D
SR 316 WB	After Patrick Mill Rd Off-Ramp	4069	59.7	34.1	D
SR 316 WB	Before Patrick Mill Rd On-Ramp	4056	59.5	34.1	D
SR 316 WB	After Patrick Mill Rd On-Ramp	4411	56.1	28.6	D
SR 316 WB	Before Drowning Creek Rd Off-Ramp	4327	57.8	30.5	D
SR 316 WB	After Drowning Creek Rd Off-Ramp	4223	58.6	36.0	**E**
SR 316 WB	Before Drowning Creek Rd On-Ramp	4197	58.5	35.9	**E**
SR 316 WB	After Drowning Creek Rd On-Ramp	4417	56.0	28.7	D
SR 316 WB	Before Sugarloaf Ext CD Rd Off-Ramp	4351	50.7	37.9	**E**
SR 316 WB	After Sugarloaf Ext CD Rd Off-Ramp	3288	60.7	27.1	C
Sugarloaf Ext CD Rd WB	Before WB to NB Off-Ramp	1055	48.9	10.8	C
Sugarloaf Ext CD Rd WB	After WB to NB Off-Ramp	509	48.8	10.4	C
Sugarloaf Ext CD Rd WB	After NB to WB On-Ramp	934	39.7	11.8	C
Sugarloaf Ext CD Rd WB	Before WB to SB Off-Ramp	934	39.7	11.8	
Sugarloaf Ext CD Rd WB	After WB to SB Off-Ramp	436	47.3	9.2	C
Sugarloaf Ext CD Rd WB	Before SB to WB On-Ramp	436	46.8	9.3	C
Sugarloaf Ext CD Rd WB	After SB to WB On-Ramp	634	39.2	9.0	C
SR 316 WB	Before Sugarloaf Ext CD Rd On-Ramp	3266	59.8	27.3	C
SR 316 WB	After Sugarloaf Ext CD Rd On-Ramp	3900	49.3	26.7	C
SR 316 WB	Before Winder Hwy Off-Ramp	3887	57.3	27.7	C
SR 316 WB	After Winder Hwy Off-Ramp	3296	61.4	26.9	C
SR 316 WB	Before Winder Hwy On-Ramp	3286	60.7	27.1	C
SR 316 WB	After Winder Hwy On-Ramp	4162	55.0	27.6	C
SR 316 WB	Before Cedar Rd Off-Ramp	4136	57.1	29.5	D
SR 316 WB	After Cedar Rd Off-Ramp	3290	61.2	26.9	C
SR 316 WB	Before Cedar Rd On-Ramp	3280	61.0	26.9	C
SR 316 WB	After Cedar Rd On-Ramp	4082	59.3	17.6	C
SR 316 WB	Before HOV Diverge	4081	59.9	17.0	C
SR 316 WB	After HOV Diverge	3253	59.9	18.1	C
SR 316 WB	Before Collins Hill / SR 20 CD Rd Off-Ramp	3240	58.7	17.3	C
SR 316 WB	After Collins Hill / SR 20 CD Rd Off-Ramp	2274	62.0	12.2	C
Collins Hill /SR 20 CD Rd WB	Before Collins Hill Off-Ramp	1454	59.8	12.0	C
Collins Hill /SR 20 CD Rd WB	After Collins Hill Off-Ramp	1126	61.4	18.4	C
Collins Hill /SR 20 CD Rd WB	Before Collins Hill On-Ramp			0.0	
Collins Hill /SR 20 CD Rd WB	After Collins Hill On-Ramp	1932	52.4	23.1	C
SR 316 WB	Before Collins Hill / SR 20 CD Rd On-Ramp	2261	58.8	12.8	C

Table C-3 2032 E+C Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 WB	After Collins Hill / SR 20 CD Rd On-Ramp	4179	40.8	30.5	D
SR 316 WB	Before Duluth Hwy Off-Ramp	4173	59.0	22.7	C
SR 316 WB	After Duluth Hwy Off-Ramp	3773	60.0	21.0	C
SR 316 WB	Before Duluth Hwy On-Ramp	3767	60.8	20.7	C
SR 316 WB	After the Duluth Hwy On-Ramp	4728	59.3	19.9	C
SR 316 WB	Before Riverside Dr. Off-Ramp	4721	57.9	20.4	C
SR 316 WB	After Riverside Dr. Off-Ramp	4060	59.1	17.2	C
SR 316 WB	Before Riverside Dr. On-Ramp	4046	59.4	22.7	C
SR 316 WB	After Riverside Dr. On-Ramp	5040	58.5	22.4	C
SR 316 WB	Before Duluth Hwy Off-Ramp	5008	55.3	30.4	D
SR 316 WB	After Duluth Hwy Off-Ramp	3699	60.2	30.7	D
SR 316 WB	Before Duluth Hwy On-Ramp	3691	59.8	30.9	D
SR 316 WB	After Duluth On-Ramp	3951	56.2	31.6	D
SR 316 HOV WB	Before Hi-Hope Rd On Ramp	817	61.7	13.3	C
SR 316 HOV WB	After Hi-Hope Rd On Ramp	1071	58.8	13.0	C
SR 316 HOV WB	Before Walther Blvd Off-Ramp	1071	56.8	10.4	C
SR 316 HOV WB	After Walther Blvd Off-Ramp	613	62.4	9.8	C
SR 316 HOV WB	Before Walther Blvd On-Ramp	609	61.1	10.0	C
SR 316 HOV WB	After Walther Blvd On-Ramp	661	60.2	7.8	C
SR 316 HOV WB	Before Lawrenceville Suwanee Rd On-Ramp	663	59.9	11.1	C
SR 316 HOV WB	After Lawrenceville Suwanee Rd On-Ramp	1368	53.4	18.3	C
SR 316 HOV WB	Before Herrington Rd On-Ramp	1344	52.7	19.2	C
SR 316 HOV WB	After Herrington Rd On-Ramp	1175	59.4	19.8	C
SR 10 Loop SB	Before SR 316 Off-Ramp	2386	61.0	19.0	C
SR 10 Loop SB	After SR 316 Off-Ramp	1544	63.2	12.2	C
SR 10 Loop SB	After SR 316 WB to SB On-Ramp	2100	59.8	14.9	C
SR 10 Loop SB	After SR 316 EB to SB On-Ramp	3982	52.5	30.7	D
SR 10 Loop NB	Before SR 316 Off-Ramp	2761	57.9	20.4	C
SR 10 Loop NB	After SR 316 Off-Ramp	1094	61.8	8.9	C
SR 10 Loop NB	Before SR 316 On-Ramp	1094	63.6	8.6	C
SR 10 Loop NB	After SR 316 On-Ramp	2045	60.4	13.7	C

Table C-4 2032 E+C Freeway Segments PM Peak Hour Level of Service

Table C-4 2032 E+C Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 EB	Before Sugarloaf Off-Ramp	4403	56.6	36.5	**E**
SR 316 EB	After Sugarloaf Off-Ramp	3703	59.6	31.1	D
SR 316 EB	Before Sugarloaf On-Ramp	3711	60.0	30.9	D
SR 316 EB	After Sugarloaf On-Ramp	5052	58.7	28.7	D
SR 316 EB	Before Riverside Dr. Off-Ramp	5055	52.7	27.8	C
SR 316 EB	After Riverside Dr. Off-Ramp	3980	54.6	24.3	C
SR 316 EB	Before Riverside Dr. On-Ramp	3979	59.5	22.3	C
SR 316 EB	After Riverside Dr. On-Ramp	4535	59.4	19.1	C
SR 316 EB	Before Duluth Hwy Off-Ramp	4536	58.8	19.3	C
SR 316 EB	After Duluth Hwy Off-Ramp	3604	60.2	20.0	C
SR 316 EB	Before Duluth Hwy On-Ramp	3598	59.0	20.3	C
SR 316 EB	After Duluth On-Ramp	3986	50.9	25.0	C
SR 316 EB	Before Collins Hill / SR 20 CD Rd Off-Ramp	3986	54.0	21.1	C
SR 316 EB	After Collins Hill / SR 20 CD Rd Off-Ramp	2078	62.1	11.2	C
Collins Hill /SR 20 CD Rd EB	Before Collins Hill Off-Ramp	1905	60.8	10.4	C
Collins Hill /SR 20 CD Rd EB	After Collins Hill Off-Ramp	1070	63.8	8.4	C
Collins Hill /SR 20 CD Rd EB	After Collins Hill On-Ramp	1415	57.2	8.2	C
SR 316 EB	Before Collins Hill / SR 20 CD Rd On-Ramp	2084	62.1	11.2	C
SR 316 EB	After Collins Hill / SR 20 CD Rd On-Ramp	3079	58.1	15.3	C
SR 316 EB	Before HOV Direct Merge	3077	61.0	16.8	C
SR 316 EB	After HOV Direct Merge	3891	60.9	16.0	C
SR 316 EB	Before Cedar Rd Off-Ramp	3890	57.9	16.9	C
SR 316 EB	After Cedar Rd Off-Ramp	726	43.3	16.8	C
SR 316 EB	Before Cedar Rd On-Ramp	3168	60.6	26.2	C
SR 316 EB	After Cedar Rd On-Ramp	4095	52.5	28.4	D
SR 316 EB	Before Winder Hwy Off-Ramp	4091	57.7	28.9	D
SR 316 EB	After Winder Hwy Off-Ramp	3211	61.3	26.2	C
SR 316 EB	Before Winder Hwy On-Ramp	3208	60.6	26.5	C
SR 316 EB	After Winder Hwy On-Ramp	3808	56.9	24.4	C
SR 316 EB	Before Sugarloaf Ext CD Rd Off-Ramp	3809	58.9	24.0	C
SR 316 EB	After Sugarloaf Ext CD Rd Off-Ramp	3184	61.0	26.1	C
Sugarloaf Ext CD Rd EB	Before EB to SB Off-Ramp	623	49.1	6.3	C
Sugarloaf Ext CD Rd EB	After EB to SB Off-Ramp	210	49.5	4.2	C
Sugarloaf Ext CD Rd EB	Before SB to EB On-Ramp	210	49.2	4.3	C
Sugarloaf Ext CD Rd EB	After SB to EB On-Ramp	791	42.2	9.4	C
Sugarloaf Ext CD Rd EB	After EB to NB Off-Ramp	582	46.5	12.5	C
Sugarloaf Ext CD Rd EB	After NB to EB On-Ramp	1097	34.1	17.9	C
SR 316 EB	Before Sugarloaf Ext CD Rd On-Ramp	3185	60.0	26.5	C
SR 316 EB	After Sugarloaf Ext CD Rd On-Ramp	4283	48.6	38.8	**E**
SR 316 EB	Before Drowning Creek Rd Off-Ramp	4286	58.4	29.9	D
SR 316 EB	After Drowning Creek Rd Off-Ramp	4052	59.4	34.1	D

Table C-4 2032 E+C Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 EB	Before Drowning Creek Rd On-Ramp	4051	59.1	34.3	D
SR 316 EB	After Drowning Creek Rd On-Ramp	4134	58.5	25.7	C
SR 316 EB	Before Patrick Mill Rd Off-Ramp	4125	57.4	29.3	D
SR 316 EB	After Patrick Mill Rd Off-Ramp	3797	59.3	31.9	D
SR 316 EB	Before Patrick Mill Rd On-Ramp	3799	59.4	32.0	D
SR 316 EB	After Patrick Mill Rd On-Ramp	4223	55.0	28.0	C
SR 316 EB	Before Loganville Hwy SR 81 Off-Ramp	4202	56.2	31.1	D
SR 316 EB	After Loganville Hwy SR 81 Off-Ramp	3414	60.8	28.1	D
SR 316 EB	Before Loganville Hwy SR 81 On-Ramp	3414	60.4	28.3	D
SR 316 EB	After Loganville Hwy SR 81 On-Ramp	3765	57.4	27.2	C
SR 316 EB	Before Christmas Ave SR 11 Off-Ramp	3750	57.5	23.7	C
SR 316 EB	After Christmas Ave SR 11 Off-Ramp	3149	60.9	25.9	C
SR 316 EB	Before Christmas Ave SR 11 On-Ramp	3152	60.7	26.0	C
SR 316 EB	After Christmas Ave SR 11 On-Ramp	3394	58.4	25.2	C
SR 316 EB	Before Hog Mountain Rd SR 53 Off-Ramp	3333	57.7	24.9	C
SR 316 EB	After Hog Mountain Rd SR 53 Off-Ramp	2617	61.5	21.3	C
SR 316 EB	Before Hog Mountain Rd SR 53 On-Ramp	2616	61.3	21.4	C
SR 316 EB	After Hog Mountain Rd SR 53 On-Ramp	3104	58.1	20.8	C
SR 316 EB	Before Bethlehem Rd SR324 Off-Ramp	3066	58.6	21.6	C
SR 316 EB	After Bethlehem Rd SR324 Off-Ramp	2586	61.2	21.2	C
SR 316 EB	After Bethlehem Rd SR324 On-Ramp	2780	59.8	17.0	C
SR 316 EB	Before Bogart Pkwy Off-Ramp	2693	58.4	18.8	C
SR 316 EB	After Bogart Pkwy Off-Ramp	2100	62.0	16.9	C
SR 316 EB	Before Bogart Pkwy On-Ramp	2094	61.8	17.0	C
SR 316 EB	After Bogart Pkwy On-Ramp	2346	60.2	14.2	C
SR 316 EB	Before Monroe Hwy SR 10 Off-Ramp	2323	59.5	17.2	C
SR 316 EB	After Monroe Hwy SR 10 Off-Ramp	1929	62.2	15.5	C
SR 316 EB	Before Monroe Hwy SR 10 On-Ramp	1921	61.4	15.7	C
SR 316 EB	After Monroe Hwy SR 10 On-Ramp	2654	55.6	21.8	C
SR 316 EB	Before Jimmie Daniels Rd Off-Ramp	2643	60.4	15.1	C
SR 316 EB	After Jimmie Daniels Rd Off-Ramp	2402	61.6	19.5	C
SR 316 EB	Before Jimmie Daniels Rd On-Ramp	2392	61.2	19.6	C
SR 316 EB	After Jimmie Daniels Rd On-Ramp	2695	60.7	14.8	C
SR 316 EB	Before Oconee Conn Off-Ramp	2692	54.5	16.5	C
SR 316 EB	After Oconee Conn Off-Ramp	1302	63.4	10.3	C
Oconee Conn CD Rd EB	Before Oconee Conn On-Ramp	963	46.8	20.6	C
Oconee Conn CD Rd EB	After Oconee Conn On-Ramp	1492	48.0	15.5	C
Oconee Conn CD Rd EB	Before SR 10 Loop EB-SB Off-Ramp	1490	46.7	15.9	C
Oconee Conn CD Rd EB	After SR 10 Loop EB-SB Off-Ramp	324	43.8	7.4	C
SR 316 EB	Before Oconee Conn CD RD On-Ramp	1295	62.8	10.3	C
SR 316 EB	After Oconee Conn CD RD On-Ramp	1618	56.9	9.5	C
SR 316 HOV EB	Before Herrington Rd Off-Ramp	1434	61.5	16.7	C
SR 316 HOV EB	After Herrington Rd Off-Ramp	1256	60.8	20.7	C
SR 316 HOV EB	Before Herrington Rd On-Ramp	1258	60.0	21.0	C

Table C-4 2032 E+C Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 HOV EB	After Herrington Rd On-Ramp	1426	58.3	17.5	C
SR 316 HOV EB	Before Lawrenceville Suwanee Rd Off-Ramp	1431	56.1	18.2	C
SR 316 HOV EB	After Lawrenceville Suwanee Rd Off-Ramp	693	62.2	11.1	C
SR 316 HOV EB	Before Walther Blvd Off-Ramp	691	59.8	8.3	C
SR 316 HOV EB	After Walther Blvd Off-Ramp	58	44.5	1.3	C
SR 316 HOV EB	Before Walther Blvd On-Ramp	630	59.6	10.6	C
SR 316 HOV EB	After Walther Blvd On-Ramp	1090	54.2	11.0	C
SR 316 HOV EB	Before Hi-Hope Rd Off-Ramp	1091	58.3	13.3	C
SR 316 HOV EB	After Hi-Hope Rd Off-Ramp	814	60.6	13.4	C
SR 316 WB	Before Oconee Conn CD Rd Off-Ramp	3342	45.3	24.8	C
SR 316 WB	After Oconee Conn CD Rd Off-Ramp	2545	47.5	26.8	C
Oconee Conn CD Rd WB	Before SR 10 Loop WB to SB Off-Ramp	795	43.5	9.1	C
Oconee Conn CD Rd WB	After SR 10 Loop WB to SB Off-Ramp	492	44.1	11.2	C
Oconee Conn CD Rd WB	After SR 10 Loop SB to EB On-Ramp	1407	45.5	15.5	C
Oconee Conn CD Rd WB	Before Oconee Conn Off-Ramp	1409	45.6	15.5	C
Oconee Conn CD Rd WB	After Oconee Conn Off-Ramp	804	47.9	16.8	C
Oconee Conn CD Rd WB	Before Oconee Conn On-Ramp	803	44.2	18.2	C
Oconee Conn CD Rd WB	After Oconee Conn On-Ramp	1272	32.4	24.0	C
SR 316 WB	Before Oconee Conn CD RD On-Ramp	2550	61.5	20.7	C
SR 316 WB	After Oconee Conn CD RD On-Ramp	3823	57.2	22.3	C
SR 316 WB	Before Jimmie Daniels Rd Off-Ramp	3820	58.8	21.7	C
SR 316 WB	After Jimmie Daniels Rd Off-Ramp	3517	60.2	29.2	D
SR 316 WB	Before Jimmie Daniels Rd On-Ramp	3518	60.3	29.2	D
SR 316 WB	After Jimmie Daniels Rd On-Ramp	3814	59.1	21.5	C
SR 316 WB	Before Monroe Hwy SR 10 Off-Ramp	3824	57.2	30.4	D
SR 316 WB	After Monroe Hwy SR 10 Off-Ramp	2980	61.2	24.3	C
SR 316 WB	Before Monroe Hwy SR 10 On-Ramp	2986	60.9	24.5	C
SR 316 WB	After Monroe Hwy SR 10 On-Ramp	3707	55.3	29.6	D
SR 316 WB	Before Bogart Pkwy Off-Ramp	3704	59.4	25.4	C
SR 316 WB	After Bogart Pkwy Off-Ramp	3381	60.5	27.9	C
SR 316 WB	Before Bogart Pkwy On-Ramp	3388	60.2	28.1	D
SR 316 WB	After Bogart Pkwy On-Ramp	3779	57.5	23.9	C
SR 316 WB	Before Bethlehem Rd SR324 Off-Ramp	3779	58.3	26.5	C
SR 316 WB	After Bethlehem Rd SR324 Off-Ramp	3445	59.9	28.7	D
SR 316 WB	After Bethlehem Rd SR324 On-Ramp	3739	57.5	24.1	C
SR 316 WB	Before Hog Mountain Rd SR 53 Off-Ramp	3737	57.3	27.2	C
SR 316 WB	After Hog Mountain Rd SR 53 Off-Ramp	3246	60.5	26.8	C
SR 316 WB	Before Hog Mountain Rd SR 53 On-Ramp	3251	60.4	26.9	C
SR 316 WB	After Hog Mountain Rd SR 53 On-Ramp	3523	58.7	26.6	C
SR 316 WB	Before Christmas Ave SR 11 Off-Ramp	3522	57.5	26.2	C
SR 316 WB	After Christmas Ave SR 11 Off-Ramp	2981	60.8	24.5	C
SR 316 WB	Before Christmas Ave SR 11 On-Ramp	2978	60.5	24.6	C
SR 316 WB	After Christmas Ave SR 11 On-Ramp	3192	56.5	18.8	C

Table C-4 2032 E+C Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 WB	Before Loganville Hwy SR 81 Off-Ramp	3167	58.5	22.4	C
SR 316 WB	After Loganville Hwy SR 81 Off-Ramp	2544	61.7	20.6	C
SR 316 WB	Before Loganville Hwy SR 81 On-Ramp	2536	61.1	20.8	C
SR 316 WB	After Loganville Hwy SR 81 On-Ramp	2748	59.8	19.2	C
SR 316 WB	Before Patrick Mill Rd Off-Ramp	2713	59.6	18.6	C
SR 316 WB	After Patrick Mill Rd Off-Ramp	2430	61.3	19.9	C
SR 316 WB	Before Patrick Mill Rd On-Ramp	2426	60.9	19.9	C
SR 316 WB	After Patrick Mill Rd On-Ramp	2701	59.3	16.6	C
SR 316 WB	Before Drowning Creek Rd Off-Ramp	2638	59.9	18.0	C
SR 316 WB	After Drowning Creek Rd Off-Ramp	2532	60.7	20.9	C
SR 316 WB	Before Drowning Creek Rd On-Ramp	2519	60.6	20.8	C
SR 316 WB	After Drowning Creek Rd On-Ramp	2582	60.0	15.7	C
SR 316 WB	Before Sugarloaf Ext CD Rd Off-Ramp	2524	56.5	19.7	C
SR 316 WB	After Sugarloaf Ext CD Rd Off-Ramp	1671	62.6	13.4	C
Sugarloaf Ext CD Rd WB	Before WB to NB Off-Ramp	840	48.7	8.6	C
Sugarloaf Ext CD Rd WB	After WB to NB Off-Ramp	364	48.7	7.5	C
Sugarloaf Ext CD Rd WB	After NB to WB On-Ramp	718	39.5	9.1	C
Sugarloaf Ext CD Rd WB	Before WB to SB Off-Ramp	718	39.5	9.1	C
Sugarloaf Ext CD Rd WB	After WB to SB Off-Ramp	354	47.6	7.4	C
Sugarloaf Ext CD Rd WB	Before SB to WB On-Ramp	354	47.1	7.5	C
Sugarloaf Ext CD Rd WB	After SB to WB On-Ramp	416	43.3	5.3	C
SR 316 WB	Before Sugarloaf Ext CD Rd On-Ramp	1660	62.0	13.4	C
SR 316 WB	After Sugarloaf Ext CD Rd On-Ramp	2074	57.1	12.3	C
SR 316 WB	Before Winder Hwy Off-Ramp	2064	60.3	14.0	C
SR 316 WB	After Winder Hwy Off-Ramp	1538	63.2	12.2	C
SR 316 WB	Before Winder Hwy On-Ramp	1535	62.7	12.2	C
SR 316 WB	After Winder Hwy On-Ramp	1903	61.0	11.4	C
SR 316 WB	Before Cedar Rd Off-Ramp	1887	61.9	12.5	C
SR 316 WB	After Cedar Rd Off-Ramp	1784	62.3	14.3	C
SR 316 WB	Before Cedar Rd On-Ramp	1777	62.1	14.3	C
SR 316 WB	After Cedar Rd On-Ramp	2203	60.8	9.2	C
SR 316 WB	Before HOV Diverge	2201	61.7	8.9	C
SR 316 WB	After HOV Diverge	1995	61.7	10.8	C
SR 316 WB	Before Collins Hill / SR 20 CD Rd Off-Ramp	1990	60.1	10.3	C
SR 316 WB	After Collins Hill / SR 20 CD Rd Off-Ramp	1221	63.1	6.5	C
Collins Hill /SR 20 CD Rd WB	Before Collins Hill Off-Ramp	1305	60.4	10.6	C
Collins Hill /SR 20 CD Rd WB	After Collins Hill Off-Ramp	940	61.9	15.2	C
Collins Hill /SR 20 CD Rd WB	Before Collins Hill On-Ramp			0.0	
Collins Hill /SR 20 CD Rd WB	After Collins Hill On-Ramp	1507	56.0	16.9	C
SR 316 WB	Before Collins Hill / SR 20 CD Rd On-Ramp	1210	62.6	6.4	C
SR 316 WB	After Collins Hill / SR 20 CD Rd On-Ramp	2714	55.2	14.6	C
SR 316 WB	Before Duluth Hwy Off-Ramp	2710	60.2	14.5	C
SR 316 WB	After Duluth Hwy Off-Ramp	2226	62.1	12.0	C

Table C-4 2032 E+C Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 WB	Before Duluth Hwy On-Ramp	2223	62.6	11.8	C
SR 316 WB	After the Duluth Hwy On-Ramp	2589	61.8	10.5	C
SR 316 WB	Before Riverside Dr. Off-Ramp	2585	61.6	10.5	C
SR 316 WB	After Riverside Dr. Off-Ramp	2326	62.2	9.4	C
SR 316 WB	Before Riverside Dr. On-Ramp	2320	61.7	12.5	C
SR 316 WB	After Riverside Dr. On-Ramp	2636	61.4	11.1	C
SR 316 WB	Before Duluth Hwy Off-Ramp	2640	60.8	14.5	C
SR 316 WB	After Duluth Hwy Off-Ramp	2145	62.1	17.3	C
SR 316 WB	Before Duluth Hwy On-Ramp	2136	61.8	17.3	C
SR 316 WB	After Duluth On-Ramp	2402	60.3	17.9	C
SR 316 HOV WB	Before Hi-Hope Rd On Ramp	206	63.7	3.2	C
SR 316 HOV WB	After Hi-Hope Rd On Ramp	357	60.4	4.2	C
SR 316 HOV WB	Before Walther Blvd Off-Ramp	352	58.5	3.3	C
SR 316 HOV WB	After Walther Blvd Off-Ramp	191	63.3	3.0	C
SR 316 HOV WB	Before Walther Blvd On-Ramp	192	62.9	3.0	C
SR 316 HOV WB	After Walther Blvd On-Ramp	236	61.6	2.7	C
SR 316 HOV WB	Before Lawrenceville Suwanee Rd On-Ramp	235	62.1	3.8	C
SR 316 HOV WB	After Lawrenceville Suwanee Rd On-Ramp	712	56.5	9.0	C
SR 316 HOV WB	Before Herrington Rd On-Ramp	710	58.8	8.6	C
SR 316 HOV WB	After Herrington Rd On-Ramp	591	60.2	9.8	C
SR 10 Loop SB	Before SR 316 Off-Ramp	2015	61.0	16.0	C
SR 10 Loop SB	After SR 316 Off-Ramp	1101	64.0	8.6	C
SR 10 Loop SB	After SR 316 WB to SB On-Ramp	1407	62.0	9.6	C
SR 10 Loop SB	After SR 316 EB to SB On-Ramp	2570	58.5	17.8	C
SR 10 Loop NB	Before SR 316 Off-Ramp	3009	15.1	85.7	**F**
SR 10 Loop NB	After SR 316 Off-Ramp	1090	50.9	10.7	C
SR 10 Loop NB	Before SR 316 On-Ramp	1091	60.7	9.0	C
SR 10 Loop NB	After SR 316 On-Ramp	1791	60.1	12.1	C

Table C-5 2032 Build Freeway Segments AM Peak Hour Level of Service

Table C-5 2032 Build Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 EB	Before Sugarloaf Off-Ramp	3022	59.0	24.0	C
SR 316 EB	After Sugarloaf Off-Ramp	2393	61.6	19.4	C
SR 316 EB	Before Sugarloaf On-Ramp	2398	61.7	19.4	C
SR 316 EB	After Sugarloaf On-Ramp	2805	61.3	15.3	C
SR 316 EB	Before Riverside Dr. Off-Ramp	2807	60.1	13.5	C
SR 316 EB	After Riverside Dr. Off-Ramp	2423	60.6	13.3	C
SR 316 EB	Before Riverside Dr. On-Ramp	2426	61.4	13.2	C
SR 316 EB	After Riverside Dr. On-Ramp	2672	61.3	10.9	C
SR 316 EB	Before Duluth Hwy Off-Ramp	2672	57.6	11.8	C
SR 316 EB	After Duluth Hwy Off-Ramp	2244	61.8	12.1	C
SR 316 EB	Before Duluth Hwy On-Ramp	2245	61.2	12.2	C
SR 316 EB	After Duluth On-Ramp	2667	56.3	15.1	C
SR 316 EB	Before Collins Hill / SR 20 CD Rd Off-Ramp	2665	57.6	13.3	C
SR 316 EB	After Collins Hill / SR 20 CD Rd Off-Ramp	897	63.3	4.7	C
Collins Hill /SR 20 CD Rd EB	Before Collins Hill Off-Ramp	1770	60.7	9.7	C
Collins Hill /SR 20 CD Rd EB	After Collins Hill Off-Ramp	1039	63.8	8.1	C
Collins Hill /SR 20 CD Rd EB	After Collins Hill On-Ramp	1215	57.6	7.0	C
SR 316 EB	Before Collins Hill / SR 20 CD Rd On-Ramp	897	63.7	4.7	C
SR 316 EB	After Collins Hill / SR 20 CD Rd On-Ramp	1340	62.7	6.2	C
SR 316 EB	Before Cedar Rd Off-Ramp	1339	62.4	7.1	C
SR 316 EB	After Cedar Rd Off-Ramp	1121	63.5	8.8	C
SR 316 EB	Before Cedar Rd On-Ramp	1121	63.4	8.8	C
SR 316 EB	After Cedar Rd On-Ramp	1193	63.0	7.2	C
SR 316 EB	Before Winder Hwy Off-Ramp	1194	61.6	7.9	C
SR 316 EB	After Winder Hwy Off-Ramp	834	63.8	6.5	C
SR 316 EB	Before Winder Hwy On-Ramp	836	63.7	6.6	C
SR 316 EB	After Winder Hwy On-Ramp	1563	59.4	9.6	C
SR 316 EB	Before Sugarloaf Ext CD Rd Off-Ramp	1559	61.1	9.5	C
SR 316 EB	After Sugarloaf Ext CD Rd Off-Ramp	1105	63.7	8.7	C
Sugarloaf Ext CD Rd EB	Before EB to SB Off-Ramp	453	48.6	4.7	C
Sugarloaf Ext CD Rd EB	After EB to SB Off-Ramp	29	50.4	0.6	C
Sugarloaf Ext CD Rd EB	Before SB to EB On-Ramp	29	50.4	0.6	C
Sugarloaf Ext CD Rd EB	After SB to EB On-Ramp	829	42.8	9.7	C
Sugarloaf Ext CD Rd EB	After EB to NB Off-Ramp	799	46.0	17.4	C
Sugarloaf Ext CD Rd EB	After NB to EB On-Ramp	1284	32.3	22.1	C
SR 316 EB	Before Sugarloaf Ext CD Rd On-Ramp	1104	63.4	8.7	C
SR 316 EB	After Sugarloaf Ext CD Rd On-Ramp	2387	58.0	18.1	C
SR 316 EB	Before SR 316 GP to HOV Diverge Ramp	2381	61.9	17.0	C
SR 316 EB	After SR 316 GP to HOV Diverge Ramp	2331	61.8	18.8	C
SR 316 EB	Before SR 316 HOV to GP Merge Ramp	2330	61.7	18.9	C

Table C-5 2032 Build Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 EB	After SR 316 HOV to GP Merge Ramp	2358	61.5	16.0	C
SR 316 EB	Before Drowning Creek Rd Off-Ramp	2357	61.4	15.7	C
SR 316 EB	After Drowning Creek Rd Off-Ramp	2199	61.9	17.7	C
SR 316 EB	Before Drowning Creek Rd On-Ramp	2204	61.7	17.9	C
SR 316 EB	After Drowning Creek Rd On-Ramp	2306	61.2	13.7	C
SR 316 EB	Before Patrick Mill Rd Off-Ramp	2306	60.4	15.6	C
SR 316 EB	After Patrick Mill Rd Off-Ramp	2011	61.8	16.3	C
SR 316 EB	Before Patrick Mill Rd On-Ramp	2002	61.6	16.3	C
SR 316 EB	After Patrick Mill Rd On-Ramp	2279	60.3	13.8	C
SR 316 EB	Before Loganville Hwy SR 81 Off-Ramp	2283	60.6	15.6	C
SR 316 EB	After Loganville Hwy SR 81 Off-Ramp	1931	62.3	15.5	C
SR 316 EB	Before Loganville Hwy SR 81 On-Ramp	1933	61.8	15.6	C
SR 316 EB	After Loganville Hwy SR 81 On-Ramp	2783	57.2	20.1	C
SR 316 EB	Before Christmas Ave SR 11 Off-Ramp	2780	60.4	16.7	C
SR 316 EB	After Christmas Ave SR 11 Off-Ramp	2615	61.0	21.4	C
SR 316 EB	Before Christmas Ave SR 11 On-Ramp	2613	60.8	21.5	C
SR 316 EB	After Christmas Ave SR 11 On-Ramp	3260	56.4	25.0	C
SR 316 EB	Before Hog Mountain Rd SR 53 Off-Ramp	3233	59.4	23.3	C
SR 316 EB	After Hog Mountain Rd SR 53 Off-Ramp	2867	61.0	23.5	C
SR 316 EB	Before Hog Mountain Rd SR 53 On-Rmp	2859	60.6	23.6	C
SR 316 EB	After Hog Mountain Rd SR 53 On-Ramp	3292	57.0	22.5	C
SR 316 EB	Before Bethlehem Rd SR324 Off-Ramp	3289	59.1	23.0	C
SR 316 EB	After Bethlehem Rd SR324 Off-Ramp	3035	60.2	25.3	C
SR 316 EB	After Bethlehem Rd SR324 On-Ramp	3337	57.8	21.0	C
SR 316 EB	Before Bogart Pkwy Off-Ramp	3307	58.5	23.1	C
SR 316 EB	After Bogart Pkwy Off-Ramp	2960	60.7	24.4	C
SR 316 EB	Before Bogart Pkwy On-Ramp	2950	60.4	24.5	C
SR 316 EB	After Bogart Pkwy On-Ramp	3301	57.4	21.0	C
SR 316 EB	Before Monroe Hwy SR 10 Off-Ramp	3280	57.1	25.4	C
SR 316 EB	After Monroe Hwy SR 10 Off-Ramp	2613	61.4	21.3	C
SR 316 EB	Before Monroe Hwy SR 10 On-Ramp	2598	60.2	21.6	C
SR 316 EB	After Monroe Hwy SR 10 On-Ramp	3679	49.0	34.1	D
SR 316 EB	Before Jimmie Daniels Rd Off-Ramp	3676	59.5	21.3	C
SR 316 EB	After Jimmie Daniels Rd Off-Ramp	3355	60.7	27.6	C
SR 316 EB	Before Jimmie Daniels Rd On-Ramp	3342	60.1	27.8	C
SR 316 EB	After Jimmie Daniels Rd On-Ramp	3599	60.6	19.8	C
SR 316 EB	Before Oconee Conn Off-Ramp	3589	49.5	24.2	C
SR 316 EB	After Oconee Conn Off-Ramp	1660	63.0	13.2	C
Oconee Conn CD Rd EB	Before Oconee Conn On-Ramp	1478	46.2	32.0	D
Oconee Conn CD Rd EB	After Oconee Conn On-Ramp	2097	47.7	22.0	C
Oconee Conn CD Rd EB	Before SR 10 Loop EB-SB Off-Ramp	2098	43.9	23.9	C
Oconee Conn CD Rd EB	After SR 10 Loop EB-SB Off-Ramp	222	44.0	5.0	C
SR 316 EB	Before SR 316 HOV End Lane Direct Merge	1657	62.8	13.2	C
SR 316 EB	After SR 316 HOV End Lane Direct	2092	61.8	11.5	C

Table C-5 2032 Build Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
	Merge				
SR 316 EB	Before Oconee Conn CD RD On-Ramp	2092	61.9	16.9	C
SR 316 EB	After Oconee Conn CD RD On-Ramp	2314	58.0	13.3	C
SR 316 HOV EB	Before Herrington Rd Off-Ramp	780	62.8	8.9	C
SR 316 HOV EB	After Herrington Rd Off-Ramp	618	62.9	9.8	C
SR 316 HOV EB	Before Herrington Rd On-Ramp	617	62.1	10.0	C
SR 316 HOV EB	After Herrington Rd On-Ramp	747	60.2	8.8	C
SR 316 HOV EB	Before Lawrenceville Suwanee Rd Off-Ramp	750	56.8	9.4	C
SR 316 HOV EB	After Lawrenceville Suwanee Rd Off-Ramp	281	62.9	4.5	C
SR 316 HOV EB	Before Walther Blvd Off-Ramp	279	61.2	3.3	C
SR 316 HOV EB	After Walther Blvd Off-Ramp	248	61.7	4.0	C
SR 316 HOV EB	Before Walther Blvd On-Ramp	248	61.3	4.1	C
SR 316 HOV EB	After Walther Blvd On-Ramp	530	55.3	5.3	C
SR 316 HOV EB	Before Hi-Hope Rd Off-Ramp	526	59.5	6.3	C
SR 316 HOV EB	After Hi-Hope Rd Off-Ramp	380	61.7	6.2	C
SR 316 HOV EB	Before Hi-Hope Rd On-Ramp	379	61.1	6.2	C
SR 316 HOV EB	After Hi-Hope Rd On-Ramp	777	56.9	9.8	C
SR 316 HOV EB	Before Harbins Rd Off-Ramp	778	58.0	9.6	C
SR 316 HOV EB	After Harbins Rd Off-Ramp	581	60.5	9.6	C
SR 316 HOV EB	Before SR 316 GP to HOV Merge Ramp	582	59.3	9.8	C
SR 316 HOV EB	After SR 316 GP to HOV Merge Ramp	634	59.6	5.3	C
SR 316 HOV EB	After SR 316 HOV to GP Diverge Ramp	606	59.5	10.2	C
SR 316 HOV EB	Before Kilcrease Rd Off-Ramp	609	58.1	7.5	C
SR 316 HOV EB	After Kilcrease Rd Off-Ramp	445	60.9	7.3	C
SR 316 HOV EB	Before Kilcrease Rd On-Ramp	443	59.6	7.5	C
SR 316 HOV EB	After Kilcrease Rd On-Ramp	616	57.5	7.6	C
SR 316 HOV EB	Before Carl Bethlehem Rd Off-Ramp	613	58.4	7.5	C
SR 316 HOV EB	After Carl Bethlehem Rd Off-Ramp	452	60.8	7.4	C
SR 316 HOV EB	Before Carl Bethlehem Rd On-Ramp	453	59.9	7.6	C
SR 316 HOV EB	After Carl Bethlehem Rd On-Ramp	500	59.2	6.1	C
SR 316 HOV EB	Before Harry McCarty Rd Off-Ramp	497	58.8	6.0	C
SR 316 HOV EB	After Harry McCarty Rd Off-Ramp	374	60.9	6.1	C
SR 316 HOV EB	Before Harry McCarty Rd On-Ramp	374	60.4	6.2	C
SR 316 HOV EB	After Harry McCarty Rd On-Ramp	406	59.8	4.9	C
SR 316 HOV EB	Before Harrison Mill Rd Off-Ramp	406	59.4	4.9	C
SR 316 HOV EB	After Harrison Mill Rd Off-Ramp	324	61.2	5.3	C
SR 316 HOV EB	Before Harrison Mill Rd On-Ramp	324	60.5	5.3	C
SR 316 HOV EB	After Harrison Mill Rd On-Ramp	467	58.6	5.7	C
SR 316 HOV EB	Before SR 316 HOV to GP Diverge Ramp	457	59.5	4.9	C
SR 316 HOV EB	After SR 316 HOV to GP Diverge Ramp	448	59.5	7.5	C
SR 316 HOV EB	Before Barber Creek Rd Off-Ramp	442	58.6	5.4	C
SR 316 HOV EB	After Barber Creek Rd Off-Ramp	357	60.7	5.9	C
SR 316 HOV EB	Before Barber Creek Rd On-Ramp	360	59.6	6.0	C

Table C-5 2032 Build Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 HOV EB	After Barber Creek Rd On-Ramp	465	58.4	5.7	C
SR 316 HOV EB	Before Dials Mill Rd Off-Ramp	463	59.0	5.6	C
SR 316 HOV EB	After Dials Mill Rd Off-Ramp	314	61.8	5.1	C
SR 316 HOV EB	Before Dials Mill Rd On-Ramp	311	60.5	5.1	C
SR 316 HOV EB	After Dials Mill Rd On-Ramp	370	59.6	4.4	C
SR 316 HOV EB	Before Mars Hill Rd Off-Ramp	370	60.0	4.4	C
SR 316 HOV EB	After Mars Hill Rd Off-Ramp	324	61.0	5.3	C
SR 316 HOV EB	Before Mars Hill Rd On-Ramp	322	60.3	5.3	C
SR 316 HOV EB	After Mars Hill Rd On-Ramp	373	59.7	4.6	C
SR 316 HOV EB	Before Virgil Langford Rd Off-Ramp	364	59.3	3.5	C
SR 316 HOV EB	After Virgil Langford Rd Off-Ramp	330	60.4	5.5	C
SR 316 HOV EB	Before Virgil Langford Rd On-Ramp	330	59.8	5.5	C
SR 316 HOV EB	After Virgil Langford Rd On-Ramp	442	57.1	4.0	C
SR 316 WB	Before Oconee Conn CD Rd Off-Ramp	3183	40.0	26.5	C
SR 316 WB	After Oconee Conn CD Rd Off-Ramp	2071	45.2	22.9	C
SR 316 WB	Before SR 316 HOV Lane Diverge	2068	61.8	12.0	C
SR 316 WB	After SR 316 HOV Lane Diverge	1486	62.6	11.9	C
Oconee Conn CD Rd WB	Before SR 10 Loop WB to SB Off-Ramp	1111	42.8	13.0	C
Oconee Conn CD Rd WB	After SR 10 Loop WB to SB Off-Ramp	535	44.0	12.2	C
Oconee Conn CD Rd WB	After SR 10 Loop SB to EB On-Ramp	1392	45.3	15.4	C
Oconee Conn CD Rd WB	Before Oconee Conn Off-Ramp	1392	46.9	14.9	C
Oconee Conn CD Rd WB	After Oconee Conn Off-Ramp	846	47.6	17.8	C
Oconee Conn CD Rd WB	Before Oconee Conn On-Ramp	847	44.0	19.3	C
Oconee Conn CD Rd WB	After Oconee Conn On-Ramp	1330	32.6	24.9	C
SR 316 WB	Before Oconee Conn CD RD On-Ramp	1480	62.6	11.8	C
SR 316 WB	After Oconee Conn CD RD On-Ramp	2811	56.3	16.6	C
SR 316 WB	Before Jimmie Daniels Rd Off-Ramp	2810	59.8	15.7	C
SR 316 WB	After Jimmie Daniels Rd Off-Ramp	2378	61.8	19.2	C
SR 316 WB	Before Jimmie Daniels Rd On-Ramp	2378	61.9	19.2	C
SR 316 WB	After Jimmie Daniels Rd On-Ramp	2577	60.9	14.1	C
SR 316 WB	Before Monroe Hwy SR 10 Off-Ramp	2577	58.7	20.0	C
SR 316 WB	After Monroe Hwy SR 10 Off-Ramp	1755	62.6	14.0	C
SR 316 WB	Before Monroe Hwy SR 10 On-Ramp	1753	62.4	14.0	C
SR 316 WB	After Monroe Hwy SR 10 On-Ramp	2213	59.8	16.3	C
SR 316 WB	Before Bogart Pkwy Off-Ramp	2217	61.1	14.8	C
SR 316 WB	After Bogart Pkwy Off-Ramp	1932	62.2	15.5	C
SR 316 WB	Before Bogart Pkwy On-Ramp	1933	62.0	15.6	C
SR 316 WB	After Bogart Pkwy On-Ramp	2593	59.1	16.0	C
SR 316 WB	Before Bethlehem Rd SR324 Off-Ramp	2602	60.6	17.5	C
SR 316 WB	After Bethlehem Rd SR324 Off-Ramp	2507	60.9	20.6	C
SR 316 WB	After Bethlehem Rd SR324 On-Ramp	2988	58.2	19.0	C
SR 316 WB	Before SR 316 GP to HOV Diverge Ramp	2986	60.0	18.7	C
SR 316 WB	After SR 316 GP to HOV Diverge Ramp	2747	61.1	22.5	C
SR 316 WB	Before Hog Mountain Rd SR 53 Off-Ramp	2749	58.7	19.5	C

Table C-5 2032 Build Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 WB	After Hog Mountain Rd SR 53 Off-Ramp	2144	62.0	17.3	C
SR 316 WB	Before Hog Mountain Rd SR 53 On-Ramp	2139	61.6	17.4	C
SR 316 WB	After Hog Mountain Rd SR 53 On-Ramp	2844	58.5	21.5	C
SR 316 WB	Before Christmas Ave SR 11 Off-Ramp	2853	59.7	20.4	C
SR 316 WB	After Christmas Ave SR 11 Off-Ramp	2653	60.8	21.8	C
SR 316 WB	Before Christmas Ave SR 11 On-Ramp	2646	60.5	21.9	C
SR 316 WB	After Christmas Ave SR 11 On-Ramp	3141	50.0	21.0	C
SR 316 WB	Before Loganville Hwy SR 81 Off-Ramp	3131	59.6	21.7	C
SR 316 WB	After Loganville Hwy SR 81 Off-Ramp	2726	61.2	22.3	C
SR 316 WB	Before Loganville Hwy SR 81 On-Ramp	2731	60.7	22.5	C
SR 316 WB	After Loganville Hwy SR 81 On-Ramp	3576	54.1	27.6	C
SR 316 WB	Before Patrick Mill Rd Off-Ramp	3541	59.0	24.5	C
SR 316 WB	After Patrick Mill Rd Off-Ramp	3241	60.4	26.9	C
SR 316 WB	Before Patrick Mill Rd On-Ramp	3243	60.0	27.0	C
SR 316 WB	After Patrick Mill Rd On-Ramp	3737	56.7	24.0	C
SR 316 WB	Before Drowning Creek Rd Off-Ramp	3694	58.7	25.7	C
SR 316 WB	After Drowning Creek Rd Off-Ramp	3475	59.8	29.1	D
SR 316 WB	Before Drowning Creek Rd On-Ramp	3466	59.7	29.0	D
SR 316 WB	After Drowning Creek Rd On-Ramp	3960	55.1	26.2	C
SR 316 WB	Before SR 316 GP to HOV Diverge Ramp	3956	56.5	27.0	C
SR 316 WB	After SR 316 GP to HOV Diverge Ramp	3920	58.5	33.5	D
SR 316 WB	Before SR 316 HOV to GP Merge Ramp	3916	59.2	33.1	D
SR 316 WB	After SR 316 HOV to GP Merge Ramp	3918	59.2	29.2	D
SR 316 WB	Before Sugarloaf Ext CD Rd Off-Ramp	3881	52.4	32.7	D
SR 316 WB	After Sugarloaf Ext CD Rd Off-Ramp	2490	61.8	20.2	C
Sugarloaf Ext CD Rd WB	Before WB to NB Off-Ramp	1382	48.5	14.3	C
Sugarloaf Ext CD Rd WB	After WB to NB Off-Ramp	676	48.3	14.0	C
Sugarloaf Ext CD Rd WB	Before NB to WB On-Ramp	676	48.3	14.0	C
Sugarloaf Ext CD Rd WB	After NB to WB On-Ramp	999	39.2	12.7	C
Sugarloaf Ext CD Rd WB	After WB to SB Off-Ramp	324	47.7	6.8	C
Sugarloaf Ext CD Rd WB	Before SB to WB On-Ramp	324	47.3	6.9	C
Sugarloaf Ext CD Rd WB	After SB to WB On-Ramp	478	40.2	6.6	C
SR 316 WB	Before Sugarloaf Ext CD Rd On-Ramp	2467	61.2	20.2	C
SR 316 WB	After Sugarloaf Ext CD Rd On-Ramp	2941	55.8	17.8	C
SR 316 WB	Before Winder Hwy Off-Ramp	2926	59.8	20.0	C
SR 316 WB	After Winder Hwy Off-Ramp	2444	62.0	19.7	C
SR 316 WB	Before Winder Hwy On-Ramp	2443	61.4	19.9	C
SR 316 WB	After Winder Hwy On-Ramp	3690	55.8	24.1	C
SR 316 WB	Before Cedar Rd Off-Ramp	3681	55.0	27.3	C
SR 316 WB	After Cedar Rd Off-Ramp	1956	63.0	15.5	C
SR 316 WB	Before Cedar Rd On-Ramp	1955	62.8	15.6	C
SR 316 WB	After Cedar Rd On-Ramp	2366	60.8	13.0	C
SR 316 WB	Before Collins Hill / SR 20 CD Rd Off-Ramp	2361	60.4	12.2	C

Table C-5 2032 Build Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 WB	After Collins Hill / SR 20 CD Rd Off-Ramp	1661	62.6	8.8	C
Collins Hill /SR 20 CD Rd WB	Before Collins Hill Off-Ramp	1595	60.0	13.1	C
Collins Hill /SR 20 CD Rd WB	After Collins Hill Off-Ramp	1243	61.7	20.2	C
Collins Hill /SR 20 CD Rd WB	Before Collins Hill On-Ramp			0.0	
Collins Hill /SR 20 CD Rd WB	After Collins Hill On-Ramp	2029	52.3	24.3	C
SR 316 WB	Before Collins Hill / SR 20 CD Rd On-Ramp	1649	60.8	9.0	C
SR 316 WB	After Collins Hill / SR 20 CD Rd On-Ramp	3678	46.5	23.5	C
SR 316 WB	Before Duluth Hwy Off-Ramp	3673	59.4	19.9	C
SR 316 WB	After Duluth Hwy Off-Ramp	3117	60.8	17.1	C
SR 316 WB	Before Duluth Hwy On-Ramp	3115	61.6	16.8	C
SR 316 WB	After the Duluth Hwy On-Ramp	4102	60.0	17.1	C
SR 316 WB	Before Riverside Dr. Off-Ramp	4098	57.9	17.7	C
SR 316 WB	After Riverside Dr. Off-Ramp	3042	61.3	12.4	C
SR 316 WB	Before Riverside Dr. On-Ramp	3031	60.4	16.7	C
SR 316 WB	After Riverside Dr. On-Ramp	3965	53.5	19.8	C
SR 316 WB	Before Duluth Hwy Off-Ramp	3925	42.4	34.2	D
SR 316 WB	After Duluth Hwy Off-Ramp	2600	61.1	21.3	C
SR 316 WB	Before Duluth Hwy On-Ramp	2594	61.4	21.1	C
SR 316 WB	After Duluth On-Ramp	2856	59.3	21.6	C
SR 316 HOV WB	Before Virgil Langford Rd Off-Ramp	582	35.5	7.9	C
SR 316 HOV WB	After Virgil Langford Rd Off-Ramp	497	51.5	9.7	C
SR 316 HOV WB	Before Virgil Langford Rd On-Ramp	498	60.7	8.2	C
SR 316 HOV WB	After Virgil Langford Rd On-Ramp	861	55.7	8.7	C
SR 316 HOV WB	Before Mars Hill Rd Off-Ramp	861	59.1	10.7	C
SR 316 HOV WB	After Mars Hill Rd Off-Ramp	801	59.8	13.4	C
SR 316 HOV WB	Before Mars Hill Rd On-Ramp	805	59.2	13.6	C
SR 316 HOV WB	After Mars Hill Rd On-Ramp	869	58.4	10.6	C
SR 316 HOV WB	Before Dials Mill Rd Off-Ramp	867	58.8	10.6	C
SR 316 HOV WB	After Dials Mill Rd Off-Ramp	852	59.0	14.4	C
SR 316 HOV WB	Before Dials Mill Rd On-Ramp	850	58.7	14.5	C
SR 316 HOV WB	After Dials Mill Rd On-Ramp	1145	55.6	14.7	C
SR 316 HOV WB	Before Barber Creek Rd Off-Ramp	1147	58.4	14.0	C
SR 316 HOV WB	After Barber Creek Rd Off-Ramp	891	60.5	14.7	C
SR 316 HOV WB	Before Barber Creek Rd On-Ramp	890	59.4	15.0	C
SR 316 HOV WB	After Barber Creek Rd On-Ramp	1026	58.0	12.7	C
SR 316 HOV WB	Before SR 316 GP to HOV Merge Ramp	1032	58.5	17.6	C
SR 316 HOV WB	After SR 316 GP to HOV Merge Ramp	1267	56.4	14.3	C
SR 316 HOV WB	Before Harrison Mill Rd Off-Ramp	1270	57.5	15.8	C
SR 316 HOV WB	After Harrison Mill Rd Off-Ramp	1039	59.8	17.3	C
SR 316 HOV WB	Before Harrison Mill Rd On-Ramp	1036	58.5	17.7	C
SR 316 HOV WB	After Harrison Mill Rd On-Ramp	1188	56.4	15.0	C
SR 316 HOV WB	Before Harry McCarty Rd Off-Ramp	1187	58.1	14.6	C
SR 316 HOV WB	After Harry McCarty Rd Off-Ramp	1077	59.1	18.2	C

Table C-5 2032 Build Freeway Segments AM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 HOV WB	Before Harry McCarty Rd On-Ramp	1077	58.4	18.4	C
SR 316 HOV WB	After Harry McCarty Rd On-Ramp	1298	55.6	16.7	C
SR 316 HOV WB	Before Carl Bethlehem Rd Off-Ramp	1287	58.0	15.9	C
SR 316 HOV WB	After Carl Bethlehem Rd Off-Ramp	1218	58.6	20.8	C
SR 316 HOV WB	Before Carl Bethlehem Rd On-Ramp	1218	58.0	21.0	C
SR 316 HOV WB	After Carl Bethlehem Rd On-Ramp	1440	54.4	18.9	C
SR 316 HOV WB	Before Kilcrease Rd Off-Ramp	1415	57.3	17.7	C
SR 316 HOV WB	After Kilcrease Rd Off-Ramp	1023	60.6	16.9	C
SR 316 HOV WB	Before Kilcrease Rd On-Ramp	1023	59.0	17.3	C
SR 316 HOV WB	After Kilcrease Rd On-Ramp	1263	55.2	16.4	C
SR 316 HOV WB	Before SR 316 GP to HOV Merge Ramp	1242	58.0	21.5	C
SR 316 HOV WB	After SR 316 GP to HOV Merge Ramp	1270	57.8	11.0	C
SR 316 HOV WB	After SR 316 HOV to GP Diverge Ramp	1251	57.8	21.7	C
SR 316 HOV WB	Before Harbins Rd On-Ramp	1251	57.9	21.7	C
SR 316 HOV WB	After Harbins Rd On-Ramp	1436	54.1	19.0	C
SR 316 HOV WB	Before Hi-Hope Rd Off-Ramp	1383	57.2	17.3	C
SR 316 HOV WB	After Hi-Hope Rd Off-Ramp	1030	60.3	17.1	C
SR 316 HOV WB	Before Hi-Hope Rd On Ramp	1027	59.1	17.4	C
SR 316 HOV WB	After Hi-Hope Rd On Ramp	1231	55.6	15.8	C
SR 316 HOV WB	Before Walther Blvd Off-Ramp	1222	55.1	12.3	C
SR 316 HOV WB	After Walther Blvd Off-Ramp	573	62.4	9.2	C
SR 316 HOV WB	Before Walther Blvd On-Ramp	568	61.1	9.3	C
SR 316 HOV WB	After Walther Blvd On-Ramp	621	59.9	7.4	C
SR 316 HOV WB	Before Lawrenceville Suwanee Rd On-Ramp	619	59.8	10.4	C
SR 316 HOV WB	After Lawrenceville Suwanee Rd On-Ramp	1251	53.2	16.8	C
SR 316 HOV WB	Before Herrington Rd On-Ramp	1228	58.0	15.1	C
SR 316 HOV WB	After Herrington Rd On-Ramp	1015	59.8	17.0	C
SR 10 Loop SB	Before SR 316 Off-Ramp	2522	60.7	20.2	C
SR 10 Loop SB	After SR 316 Off-Ramp	1664	63.1	13.2	C
SR 10 Loop SB	After SR 316 WB to SB On-Ramp	2240	59.6	15.9	C
SR 10 Loop SB	After SR 316 EB to SB On-Ramp	4112	50.5	33.0	D
SR 10 Loop NB	Before SR 316 Off-Ramp	2792	57.6	20.8	C
SR 10 Loop NB	After SR 316 Off-Ramp	1037	61.8	8.4	C
SR 10 Loop NB	Before SR 316 On-Ramp	1037	63.7	8.1	C
SR 10 Loop NB	After SR 316 On-Ramp	2008	60.5	13.5	C

Table C-6 2032 Build Freeway Segments PM Peak Hour Level of Service

Table C-6 2032 Build Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 EB	Before Sugarloaf Off-Ramp	4396	57.0	36.1	**E**
SR 316 EB	After Sugarloaf Off-Ramp	3801	59.5	31.9	D
SR 316 EB	Before Sugarloaf On-Ramp	3802	59.7	31.8	D
SR 316 EB	After Sugarloaf On-Ramp	5169	58.5	29.4	D
SR 316 EB	Before Riverside Dr. Off-Ramp	5166	53.6	27.9	C
SR 316 EB	After Riverside Dr. Off-Ramp	3992	55.1	24.1	C
SR 316 EB	Before Riverside Dr. On-Ramp	3997	59.4	22.4	C
SR 316 EB	After Riverside Dr. On-Ramp	4640	59.2	19.6	C
SR 316 EB	Before Duluth Hwy Off-Ramp	4640	58.5	19.8	C
SR 316 EB	After Duluth Hwy Off-Ramp	3564	60.2	19.8	C
SR 316 EB	Before Duluth Hwy On-Ramp	3561	59.1	20.1	C
SR 316 EB	After Duluth On-Ramp	3855	53.1	23.2	C
SR 316 EB	Before Collins Hill / SR 20 CD Rd Off-Ramp	3855	53.6	20.6	C
SR 316 EB	After Collins Hill / SR 20 CD Rd Off-Ramp	1889	62.0	10.1	C
Collins Hill /SR 20 CD Rd EB	Before Collins Hill Off-Ramp	1970	60.9	10.8	C
Collins Hill /SR 20 CD Rd EB	After Collins Hill Off-Ramp	1169	63.7	9.2	C
Collins Hill /SR 20 CD Rd EB	After Collins Hill On-Ramp	1521	57.2	8.9	C
SR 316 EB	Before Collins Hill / SR 20 CD Rd On-Ramp	1887	62.2	10.1	C
SR 316 EB	After Collins Hill / SR 20 CD Rd On-Ramp	2564	59.9	12.3	C
SR 316 EB	Before Cedar Rd Off-Ramp	2560	60.3	14.2	C
SR 316 EB	After Cedar Rd Off-Ramp	2133	61.8	17.3	C
SR 316 EB	Before Cedar Rd On-Ramp	2133	61.6	17.3	C
SR 316 EB	After Cedar Rd On-Ramp	3751	55.3	25.7	C
SR 316 EB	Before Winder Hwy Off-Ramp	3757	53.8	28.5	D
SR 316 EB	After Winder Hwy Off-Ramp	2325	62.3	18.7	C
SR 316 EB	Before Winder Hwy On-Ramp	2327	62.0	18.8	C
SR 316 EB	After Winder Hwy On-Ramp	2801	59.6	17.1	C
SR 316 EB	Before Sugarloaf Ext CD Rd Off-Ramp	2801	60.5	17.2	C
SR 316 EB	After Sugarloaf Ext CD Rd Off-Ramp	2229	62.3	17.9	C
Sugarloaf Ext CD Rd EB	Before EB to SB Off-Ramp	571	48.9	5.8	C
Sugarloaf Ext CD Rd EB	After EB to SB Off-Ramp	174	49.4	3.5	C
Sugarloaf Ext CD Rd EB	Before SB to EB On-Ramp	174	49.2	3.5	C
Sugarloaf Ext CD Rd EB	After SB to EB On-Ramp	707	42.4	8.3	C
Sugarloaf Ext CD Rd EB	After EB to NB Off-Ramp	533	46.6	11.4	C
Sugarloaf Ext CD Rd EB	After NB to EB On-Ramp	1219	32.3	21.0	C
SR 316 EB	Before Sugarloaf Ext CD Rd On-Ramp	2231	61.5	18.1	C
SR 316 EB	After Sugarloaf Ext CD Rd On-Ramp	3445	54.2	28.1	D
SR 316 EB	Before SR 316 GP to HOV Diverge Ramp	3446	60.3	25.2	C
SR 316 EB	After SR 316 GP to HOV Diverge Ramp	3353	60.4	27.7	C
SR 316 EB	Before SR 316 HOV to GP Merge Ramp	3353	60.3	27.8	C

Table C-6 2032 Build Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 EB	After SR 316 HOV to GP Merge Ramp	3423	59.7	24.0	C
SR 316 EB	Before Drowning Creek Rd Off-Ramp	3420	59.0	23.6	C
SR 316 EB	After Drowning Creek Rd Off-Ramp	2911	61.2	23.8	C
SR 316 EB	Before Drowning Creek Rd On-Ramp	2912	60.7	24.0	C
SR 316 EB	After Drowning Creek Rd On-Ramp	3121	59.6	19.1	C
SR 316 EB	Before Patrick Mill Rd Off-Ramp	3129	58.8	21.7	C
SR 316 EB	After Patrick Mill Rd Off-Ramp	2706	61.0	22.2	C
SR 316 EB	Before Patrick Mill Rd On-Ramp	2703	60.6	22.3	C
SR 316 EB	After Patrick Mill Rd On-Ramp	2971	59.2	18.3	C
SR 316 EB	Before Loganville Hwy SR 81 Off-Ramp	2958	58.2	21.1	C
SR 316 EB	After Loganville Hwy SR 81 Off-Ramp	2241	61.8	18.1	C
SR 316 EB	Before Loganville Hwy SR 81 On-Ramp	2236	61.3	18.2	C
SR 316 EB	After Loganville Hwy SR 81 On-Ramp	2605	59.2	18.2	C
SR 316 EB	Before Christmas Ave SR 11 Off-Ramp	2586	59.4	15.9	C
SR 316 EB	After Christmas Ave SR 11 Off-Ramp	2152	61.8	17.4	C
SR 316 EB	Before Christmas Ave SR 11 On-Ramp	2151	61.5	17.5	C
SR 316 EB	After Christmas Ave SR 11 On-Ramp	2351	60.3	16.9	C
SR 316 EB	Before Hog Mountain Rd SR 53 Off-Ramp	2320	59.5	16.7	C
SR 316 EB	After Hog Mountain Rd SR 53 Off-Ramp	1755	62.3	14.1	C
SR 316 EB	Before Hog Mountain Rd SR 53 On-Ramp	1754	62.0	14.2	C
SR 316 EB	After Hog Mountain Rd SR 53 On-Ramp	2370	59.0	15.7	C
SR 316 EB	Before Bethlehem Rd SR324 Off-Ramp	2361	59.7	16.3	C
SR 316 EB	After Bethlehem Rd SR324 Off-Ramp	1895	62.0	15.3	C
SR 316 EB	After Bethlehem Rd SR324 On-Ramp	1988	61.3	11.8	C
SR 316 EB	Before Bogart Pkwy Off-Ramp	1939	59.4	13.3	C
SR 316 EB	After Bogart Pkwy Off-Ramp	1431	62.8	11.4	C
SR 316 EB	Before Bogart Pkwy On-Ramp	1427	62.5	11.4	C
SR 316 EB	After Bogart Pkwy On-Ramp	1679	61.0	10.0	C
SR 316 EB	Before Monroe Hwy SR 10 Off-Ramp	1664	60.4	12.2	C
SR 316 EB	After Monroe Hwy SR 10 Off-Ramp	1293	62.8	10.3	C
SR 316 EB	Before Monroe Hwy SR 10 On-Ramp	1287	62.4	10.3	C
SR 316 EB	After Monroe Hwy SR 10 On-Ramp	2075	57.7	16.4	C
SR 316 EB	Before Jimmie Daniels Rd Off-Ramp	2071	61.1	11.7	C
SR 316 EB	After Jimmie Daniels Rd Off-Ramp	1882	62.3	15.1	C
SR 316 EB	Before Jimmie Daniels Rd On-Ramp	1880	61.9	15.2	C
SR 316 EB	After Jimmie Daniels Rd On-Ramp	2230	60.6	12.3	C
SR 316 EB	Before Oconee Conn Off-Ramp	2227	52.9	14.0	C
SR 316 EB	After Oconee Conn Off-Ramp	830	63.9	6.5	C
Oconee Conn CD Rd EB	Before Oconee Conn On-Ramp	986	46.9	21.0	C
Oconee Conn CD Rd EB	After Oconee Conn On-Ramp	1528	48.0	15.9	C
Oconee Conn CD Rd EB	Before SR 10 Loop EB-SB Off-Ramp	1526	46.6	16.4	C
Oconee Conn CD Rd EB	After SR 10 Loop EB-SB Off-Ramp	306	43.8	7.0	C
SR 316 EB	Before SR 316 HOV End Lane Direct Merge	827	63.8	6.5	C

Table C-6 2032 Build Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 EB	After SR 316 HOV End Lane Direct Merge	1271	62.8	6.9	C
SR 316 EB	Before Oconee Conn CD RD On-Ramp	1271	62.8	10.1	C
SR 316 EB	After Oconee Conn CD RD On-Ramp	1577	56.9	9.2	C
SR 316 HOV EB	Before Herrington Rd Off-Ramp	1418	61.4	16.5	C
SR 316 HOV EB	After Herrington Rd Off-Ramp	1232	60.9	20.2	C
SR 316 HOV EB	Before Herrington Rd On-Ramp	1232	59.9	20.6	C
SR 316 HOV EB	After Herrington Rd On-Ramp	1456	57.8	18.0	C
SR 316 HOV EB	Before Lawrenceville Suwanee Rd Off-Ramp	1454	56.6	18.4	C
SR 316 HOV EB	After Lawrenceville Suwanee Rd Off-Ramp	772	62.1	12.4	C
SR 316 HOV EB	Before Walther Blvd Off-Ramp	769	59.7	9.2	C
SR 316 HOV EB	After Walther Blvd Off-Ramp	713	60.0	11.9	C
SR 316 HOV EB	Before Walther Blvd On-Ramp	712	59.4	12.0	C
SR 316 HOV EB	After Walther Blvd On-Ramp	1400	51.8	14.8	C
SR 316 HOV EB	Before Hi-Hope Rd Off-Ramp	1396	58.1	17.2	C
SR 316 HOV EB	After Hi-Hope Rd Off-Ramp	1113	60.1	18.5	C
SR 316 HOV EB	Before Hi-Hope Rd On-Ramp	1112	59.1	18.8	C
SR 316 HOV EB	After Hi-Hope Rd On-Ramp	1453	54.3	19.1	C
SR 316 HOV EB	Before Harbins Rd Off-Ramp	1445	57.5	18.0	C
SR 316 HOV EB	After Harbins Rd Off-Ramp	1245	59.3	21.0	C
SR 316 HOV EB	Before SR 316 GP to HOV Merge Ramp	1240	57.8	21.5	C
SR 316 HOV EB	After SR 316 GP to HOV Merge Ramp	1330	58.0	11.5	C
SR 316 HOV EB	After SR 316 HOV to GP Diverge Ramp	1265	57.8	21.9	C
SR 316 HOV EB	Before Kilcrease Rd Off-Ramp	1262	57.4	15.7	C
SR 316 HOV EB	After Kilcrease Rd Off-Ramp	1009	60.2	16.7	C
SR 316 HOV EB	Before Kilcrease Rd On-Ramp	1012	58.7	17.2	C
SR 316 HOV EB	After Kilcrease Rd On-Ramp	1321	54.8	17.2	C
SR 316 HOV EB	Before Carl Bethlehem Rd Off-Ramp	1320	57.5	16.4	C
SR 316 HOV EB	After Carl Bethlehem Rd Off-Ramp	1055	60.0	17.6	C
SR 316 HOV EB	Before Carl Bethlehem Rd On-Ramp	1056	58.6	18.0	C
SR 316 HOV EB	After Carl Bethlehem Rd On-Ramp	1103	57.7	13.7	C
SR 316 HOV EB	Before Harry McCarty Rd Off-Ramp	1095	57.7	13.6	C
SR 316 HOV EB	After Harry McCarty Rd Off-Ramp	876	59.6	14.7	C
SR 316 HOV EB	Before Harry McCarty Rd On-Ramp	876	58.9	14.9	C
SR 316 HOV EB	After Harry McCarty Rd On-Ramp	956	57.5	11.9	C
SR 316 HOV EB	Before Harrison Mill Rd Off-Ramp	945	57.9	11.7	C
SR 316 HOV EB	After Harrison Mill Rd Off-Ramp	795	60.0	13.2	C
SR 316 HOV EB	Before Harrison Mill Rd On-Ramp	793	58.9	13.5	C
SR 316 HOV EB	After Harrison Mill Rd On-Ramp	970	57.0	12.2	C
SR 316 HOV EB	Before SR 316 HOV to GP Diverge Ramp	937	58.1	10.3	C
SR 316 HOV EB	After SR 316 HOV to GP Diverge Ramp	910	58.3	15.6	C
SR 316 HOV EB	Before Barber Creek Rd Off-Ramp	898	57.7	11.2	C
SR 316 HOV EB	After Barber Creek Rd Off-Ramp	779	59.5	13.1	C
SR 316 HOV EB	Before Barber Creek Rd On-Ramp	770	58.5	13.2	C

Table C-6 2032 Build Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 HOV EB	After Barber Creek Rd On-Ramp	988	55.6	12.7	C
SR 316 HOV EB	Before Dials Mill Rd Off-Ramp	982	58.0	12.1	C
SR 316 HOV EB	After Dials Mill Rd Off-Ramp	677	61.0	11.1	C
SR 316 HOV EB	Before Dials Mill Rd On-Ramp	674	59.7	11.3	C
SR 316 HOV EB	After Dials Mill Rd On-Ramp	686	59.2	8.3	C
SR 316 HOV EB	Before Mars Hill Rd Off-Ramp	678	58.6	8.3	C
SR 316 HOV EB	After Mars Hill Rd Off-Ramp	611	59.7	10.2	C
SR 316 HOV EB	Before Mars Hill Rd On-Ramp	608	58.9	10.3	C
SR 316 HOV EB	After Mars Hill Rd On-Ramp	665	58.3	8.4	C
SR 316 HOV EB	Before Virgil Langford Rd Off-Ramp	643	56.1	6.5	C
SR 316 HOV EB	After Virgil Langford Rd Off-Ramp	363	62.2	5.8	C
SR 316 HOV EB	Before Virgil Langford Rd On-Ramp	361	60.5	6.0	C
SR 316 HOV EB	After Virgil Langford Rd On-Ramp	449	57.7	4.0	C
SR 316 WB	Before Oconee Conn CD Rd Off-Ramp	4329	37.5	38.5	**E**
SR 316 WB	After Oconee Conn CD Rd Off-Ramp	3351	42.5	39.4	**E**
SR 316 WB	Before SR 316 HOV Lane Diverge	3366	60.4	19.9	C
SR 316 WB	After SR 316 HOV Lane Diverge	2865	61.1	23.5	C
Oconee Conn CD Rd WB	Before SR 10 Loop WB to SB Off-Ramp	978	43.3	11.3	C
Oconee Conn CD Rd WB	After SR 10 Loop WB to SB Off-Ramp	618	43.7	14.1	C
Oconee Conn CD Rd WB	After SR 10 Loop SB to EB On-Ramp	1663	45.3	18.3	C
Oconee Conn CD Rd WB	Before Oconee Conn Off-Ramp	1664	46.5	17.9	C
Oconee Conn CD Rd WB	After Oconee Conn Off-Ramp	1026	47.3	21.7	C
Oconee Conn CD Rd WB	Before Oconee Conn On-Ramp	1027	40.1	25.7	C
Oconee Conn CD Rd WB	After Oconee Conn On-Ramp	1529	29.2	31.9	D
SR 316 WB	Before Oconee Conn CD RD On-Ramp	2866	60.7	23.6	C
SR 316 WB	After Oconee Conn CD RD On-Ramp	4390	56.2	26.1	C
SR 316 WB	Before Jimmie Daniels Rd Off-Ramp	4385	56.4	25.9	C
SR 316 WB	After Jimmie Daniels Rd Off-Ramp	4056	58.3	34.8	D
SR 316 WB	Before Jimmie Daniels Rd On-Ramp	4062	59.5	34.1	D
SR 316 WB	After Jimmie Daniels Rd On-Ramp	4422	57.9	25.4	C
SR 316 WB	Before Monroe Hwy SR 10 Off-Ramp	4427	54.0	37.3	**E**
SR 316 WB	After Monroe Hwy SR 10 Off-Ramp	3239	60.9	26.6	C
SR 316 WB	Before Monroe Hwy SR 10 On-Ramp	3235	60.7	26.6	C
SR 316 WB	After Monroe Hwy SR 10 On-Ramp	3977	54.0	32.5	D
SR 316 WB	Before Bogart Pkwy Off-Ramp	3981	59.1	27.5	C
SR 316 WB	After Bogart Pkwy Off-Ramp	3584	60.4	29.6	D
SR 316 WB	Before Bogart Pkwy On-Ramp	3584	60.0	29.9	D
SR 316 WB	After Bogart Pkwy On-Ramp	3981	57.5	25.2	C
SR 316 WB	Before Bethlehem Rd SR324 Off-Ramp	3974	58.1	27.9	C
SR 316 WB	After Bethlehem Rd SR324 Off-Ramp	3671	59.7	30.7	D
SR 316 WB	After Bethlehem Rd SR324 On-Ramp	3905	57.6	25.1	C
SR 316 WB	Before SR 316 GP to HOV Diverge Ramp	3906	58.0	25.2	C
SR 316 WB	After SR 316 GP to HOV Diverge Ramp	3871	58.9	32.9	D
SR 316 WB	Before Hog Mountain Rd SR 53 Off-Ramp	3882	57.3	28.2	D

Table C-6 2032 Build Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 WB	After Hog Mountain Rd SR 53 Off-Ramp	3432	60.1	28.6	D
SR 316 WB	Before Hog Mountain Rd SR 53 On-Ramp	3429	60.0	28.6	D
SR 316 WB	After Hog Mountain Rd SR 53 On-Ramp	3752	57.5	29.0	D
SR 316 WB	Before Christmas Ave SR 11 Off-Ramp	3750	56.1	28.6	D
SR 316 WB	After Christmas Ave SR 11 Off-Ramp	3023	61.0	24.8	C
SR 316 WB	Before Christmas Ave SR 11 On-Ramp	3019	60.8	24.9	C
SR 316 WB	After Christmas Ave SR 11 On-Ramp	3154	57.9	18.2	C
SR 316 WB	Before Loganville Hwy SR 81 Off-Ramp	3129	57.8	22.4	C
SR 316 WB	After Loganville Hwy SR 81 Off-Ramp	2312	62.0	18.6	C
SR 316 WB	Before Loganville Hwy SR 81 On-Ramp	2301	61.6	18.7	C
SR 316 WB	After Loganville Hwy SR 81 On-Ramp	2685	59.3	18.9	C
SR 316 WB	Before Patrick Mill Rd Off-Ramp	2659	59.7	18.2	C
SR 316 WB	After Patrick Mill Rd Off-Ramp	2366	61.3	19.3	C
SR 316 WB	Before Patrick Mill Rd On-Ramp	2357	61.0	19.3	C
SR 316 WB	After Patrick Mill Rd On-Ramp	2647	59.5	16.2	C
SR 316 WB	Before Drowning Creek Rd Off-Ramp	2588	59.9	17.6	C
SR 316 WB	After Drowning Creek Rd Off-Ramp	2482	60.6	20.5	C
SR 316 WB	Before Drowning Creek Rd On-Ramp	2470	60.4	20.5	C
SR 316 WB	After Drowning Creek Rd On-Ramp	2591	59.6	15.8	C
SR 316 WB	Before SR 316 GP to HOV Diverge Ramp	2585	60.1	16.6	C
SR 316 WB	After SR 316 GP to HOV Diverge Ramp	2574	60.2	21.4	C
SR 316 WB	Before SR 316 HOV to GP Merge Ramp	2572	60.3	21.3	C
SR 316 WB	After SR 316 HOV to GP Merge Ramp	2564	60.2	18.9	C
SR 316 WB	Before Sugarloaf Ext CD Rd Off-Ramp	2536	53.7	20.9	C
SR 316 WB	After Sugarloaf Ext CD Rd Off-Ramp	1234	63.1	9.8	C
Sugarloaf Ext CD Rd WB	Before WB to NB Off-Ramp	1296	48.1	13.5	C
Sugarloaf Ext CD Rd WB	After WB to NB Off-Ramp	409	48.9	8.4	C
Sugarloaf Ext CD Rd WB	Before NB to WB On-Ramp	409	48.9	8.4	C
Sugarloaf Ext CD Rd WB	After NB to WB On-Ramp	706	39.8	8.9	C
Sugarloaf Ext CD Rd WB	After WB to SB Off-Ramp	297	48.1	6.2	C
Sugarloaf Ext CD Rd WB	Before SB to WB On-Ramp	296	47.8	6.2	C
Sugarloaf Ext CD Rd WB	After SB to WB On-Ramp	309	46.9	3.7	C
SR 316 WB	Before Sugarloaf Ext CD Rd On-Ramp	1226	63.0	9.7	C
SR 316 WB	After Sugarloaf Ext CD Rd On-Ramp	1532	58.7	8.8	C
SR 316 WB	Before Winder Hwy Off-Ramp	1528	59.7	10.4	C
SR 316 WB	After Winder Hwy Off-Ramp	796	64.0	6.2	C
SR 316 WB	Before Winder Hwy On-Ramp	790	63.9	6.2	C
SR 316 WB	After Winder Hwy On-Ramp	1156	61.3	6.9	C
SR 316 WB	Before Cedar Rd Off-Ramp	1148	63.1	7.4	C
SR 316 WB	After Cedar Rd Off-Ramp	1045	63.7	8.2	C
SR 316 WB	Before Cedar Rd On-Ramp	1042	63.6	8.2	C
SR 316 WB	After Cedar Rd On-Ramp	1174	62.7	6.2	C
SR 316 WB	Before Collins Hill / SR 20 CD Rd Off-Ramp	1164	62.2	5.8	C

Table C-6 2032 Build Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 WB	After Collins Hill / SR 20 CD Rd Off-Ramp	754	63.7	3.9	C
Collins Hill /SR 20 CD Rd WB	Before Collins Hill Off-Ramp	1187	60.4	9.6	C
Collins Hill /SR 20 CD Rd WB	After Collins Hill Off-Ramp	1004	61.8	16.3	C
Collins Hill /SR 20 CD Rd WB	Before Collins Hill On-Ramp			0.0	
Collins Hill /SR 20 CD Rd WB	After Collins Hill On-Ramp	1619	55.9	18.2	C
SR 316 WB	Before Collins Hill / SR 20 CD Rd On-Ramp	748	63.4	3.9	C
SR 316 WB	After Collins Hill / SR 20 CD Rd On-Ramp	2364	57.0	12.3	C
SR 316 WB	Before Duluth Hwy Off-Ramp	2359	59.6	12.7	C
SR 316 WB	After Duluth Hwy Off-Ramp	1651	62.8	8.8	C
SR 316 WB	Before Duluth Hwy On-Ramp	1650	63.4	8.7	C
SR 316 WB	After the Duluth Hwy On-Ramp	1930	62.3	7.8	C
SR 316 WB	Before Riverside Dr. Off-Ramp	1926	62.0	7.8	C
SR 316 WB	After Riverside Dr. Off-Ramp	1639	63.0	6.5	C
SR 316 WB	Before Riverside Dr. On-Ramp	1639	62.7	8.7	C
SR 316 WB	After Riverside Dr. On-Ramp	1928	61.9	8.1	C
SR 316 WB	Before Duluth Hwy Off-Ramp	1926	61.3	10.5	C
SR 316 WB	After Duluth Hwy Off-Ramp	1523	62.9	12.1	C
SR 316 WB		1525	62.8	12.1	C
SR 316 WB	Before Duluth Hwy On-Ramp	1525	62.7	12.2	C
SR 316 WB	After Duluth On-Ramp	1778	61.1	13.1	C
SR 316 HOV WB	Before Virgil Langford Rd Off-Ramp	504	37.0	6.5	C
SR 316 HOV WB	After Virgil Langford Rd Off-Ramp	394	54.6	7.2	C
SR 316 HOV WB	Before Virgil Langford Rd On-Ramp	391	62.0	6.3	C
SR 316 HOV WB	After Virgil Langford Rd On-Ramp	441	60.5	4.1	C
SR 316 HOV WB	Before Mars Hill Rd Off-Ramp	438	60.1	5.4	C
SR 316 HOV WB	After Mars Hill Rd Off-Ramp	385	61.0	6.3	C
SR 316 HOV WB	Before Mars Hill Rd On-Ramp	384	60.4	6.4	C
SR 316 HOV WB	After Mars Hill Rd On-Ramp	441	59.6	5.3	C
SR 316 HOV WB	Before Dials Mill Rd Off-Ramp	440	59.7	5.3	C
SR 316 HOV WB	After Dials Mill Rd Off-Ramp	382	60.7	6.3	C
SR 316 HOV WB	Before Dials Mill Rd On-Ramp	381	60.1	6.3	C
SR 316 HOV WB	After Dials Mill Rd On-Ramp	522	58.5	6.4	C
SR 316 HOV WB	Before Barber Creek Rd Off-Ramp	520	59.5	6.2	C
SR 316 HOV WB	After Barber Creek Rd Off-Ramp	397	61.2	6.5	C
SR 316 HOV WB	Before Barber Creek Rd On-Ramp	398	60.5	6.6	C
SR 316 HOV WB	After Barber Creek Rd On-Ramp	482	59.3	5.8	C
SR 316 HOV WB	Before SR 316 GP to HOV Merge Ramp	482	59.9	8.0	C
SR 316 HOV WB	After SR 316 GP to HOV Merge Ramp	516	59.9	5.5	C
SR 316 HOV WB	Before Harrison Mill Rd Off-Ramp	513	57.9	6.4	C
SR 316 HOV WB	After Harrison Mill Rd Off-Ramp	359	60.9	5.9	C
SR 316 HOV WB	Before Harrison Mill Rd On-Ramp	359	59.7	6.0	C
SR 316 HOV WB	After Harrison Mill Rd On-Ramp	433	58.7	5.3	C
SR 316 HOV WB	Before Harry McCarty Rd Off-Ramp	435	59.2	5.3	C

Table C-6 2032 Build Freeway Segments PM Peak Hour Level of Service

Facility	Location	Vehicles Discharged (Vehicles)	Speed Ave (mph)	Density Per Lane (Vehicle/ Mile/ Lane)	LOS
SR 316 HOV WB	After Harry McCarty Rd Off-Ramp	394	59.9	6.6	C
SR 316 HOV WB	Before Harry McCarty Rd On-Ramp	394	59.5	6.6	C
SR 316 HOV WB	After Harry McCarty Rd On-Ramp	515	58.3	6.3	C
SR 316 HOV WB	Before Carl Bethlehem Rd Off-Ramp	514	59.1	6.2	C
SR 316 HOV WB	After Carl Bethlehem Rd Off-Ramp	453	60.1	7.5	C
SR 316 HOV WB	Before Carl Bethlehem Rd On-Ramp	453	59.5	7.6	C
SR 316 HOV WB	After Carl Bethlehem Rd On-Ramp	609	57.8	7.5	C
SR 316 HOV WB	Before Kilcrease Rd Off-Ramp	601	58.1	7.4	C
SR 316 HOV WB	After Kilcrease Rd Off-Ramp	429	60.8	7.0	C
SR 316 HOV WB	Before Kilcrease Rd On-Ramp	425	59.7	7.1	C
SR 316 HOV WB	After Kilcrease Rd On-Ramp	588	58.1	7.2	C
SR 316 HOV WB	Before SR 316 GP to HOV Merge Ramp	585	59.1	9.9	C
SR 316 HOV WB	After SR 316 GP to HOV Merge Ramp	595	59.2	5.0	C
SR 316 HOV WB	After SR 316 HOV to GP Diverge Ramp	586	59.1	9.9	C
SR 316 HOV WB	Before Harbins Rd On-Ramp	578	58.8	9.9	C
SR 316 HOV WB	After Harbins Rd On-Ramp	769	56.9	9.7	C
SR 316 HOV WB	Before Hi-Hope Rd Off-Ramp	749	56.5	9.5	C
SR 316 HOV WB	After Hi-Hope Rd Off-Ramp	364	61.8	5.9	C
SR 316 HOV WB	Before Hi-Hope Rd On Ramp	361	61.0	5.9	C
SR 316 HOV WB	After Hi-Hope Rd On Ramp	466	59.1	5.6	C
SR 316 HOV WB	Before Walther Blvd Off-Ramp	467	55.5	4.7	C
SR 316 HOV WB	After Walther Blvd Off-Ramp	188	63.0	3.0	C
SR 316 HOV WB	Before Walther Blvd On-Ramp	187	62.4	3.0	C
SR 316 HOV WB	After Walther Blvd On-Ramp	222	61.1	2.6	C
SR 316 HOV WB	Before Lawrenceville Suwanee Rd On-Ramp	221	61.7	3.6	C
SR 316 HOV WB	After Lawrenceville Suwanee Rd On-Ramp	675	56.5	8.5	C
SR 316 HOV WB	Before Herrington Rd On-Ramp	670	58.8	8.1	C
SR 316 HOV WB	After Herrington Rd On-Ramp	550	60.3	9.1	C
SR 10 Loop SB	Before SR 316 Off-Ramp	2078	60.4	16.7	C
SR 10 Loop SB	After SR 316 Off-Ramp	1035	63.7	8.1	C
SR 10 Loop SB	After SR 316 WB to SB On-Ramp	1401	61.5	9.7	C
SR 10 Loop SB	After SR 316 EB to SB On-Ramp	2625	58.3	18.2	C
SR 10 Loop NB	Before SR 316 Off-Ramp	4178	33.3	53.9	**F**
SR 10 Loop NB	After SR 316 Off-Ramp	1568	56.9	13.8	C
SR 10 Loop NB	Before SR 316 On-Ramp	1569	61.7	12.7	C
SR 10 Loop NB	After SR 316 On-Ramp	2215	60.4	14.9	C