WEST 526 LOWCOUNTRY CORRIDOR

Appendix B

Alternatives Development Traffic Analysis Report

WEST 526 LOWCOUNTRY CORRIDOR

ALTERNATIVES DEVELOPMENT TRAFFIC ANALYSIS REPORT

Project Limits: I-526 between Paul Cantrell Boulevard and Virginia Avenue and I-26 between Montague Avenue and Aviation Avenue

Prepared for the South Carolina Department of Transportation and the Federal Highway Administration

SCDOT South Carolina Department of Transportation

FHWA

Prepared by Stantec Consulting Services Inc.

Stantec

October 2020

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SIGN-OFF SHEET

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Prepared by _____
(signature)
Joshua Mitchell, PE

Reviewed by _____
(signature)
Jim Fisher, PE

Approved by _____
(signature)
Rick Day, PE, PTOE

1.0 INTRODUCTION

The purpose of this report is to document the traffic analysis process by which I-526 Lowcountry Corridor West (526 LCC West) preliminary and reasonable alternatives were screened and carried forward. Information discussed in this report is derived from the *I-526 Lowcountry Corridor West Traffic Analysis Technical Record*, the *I-526 Lowcountry Corridor West Interchange Modification Report,* and the *Draft Environmental Impact Statement (DEIS)*.

This document details the methodology for collecting existing traffic volume data as well as utilizing the local metropolitan planning organization's travel demand model to forecast design year traffic volumes for the project study area both with and without the anticipated project improvements. The document then discusses the screening of preliminary alternatives along the I-526 mainline, at the I-526 & I-26 System Interchange, and at the service interchanges along I-526 which required improvements according to the project's purpose, need, and priorities.

1.1 PROJECT PURPOSE, NEED, AND PRIORITIES

The purpose of the I-526 Lowcountry Corridor West (526 LCCW) project is to increase capacity (thereby relieving traffic congestion and improving operations) at the I-526 & I-26 System Interchange and along the I-526 corridor from Paul Cantrell Boulevard to Virginia Avenue. According to the *2014 South Carolina Multimodal Transportation Plan*[1], SCDOT currently ranks the segment of I-526 between I-26 and Virginia Avenue as the most congested segment of interstate highway in the State. The remainder of the I-526 Lowcountry Corridor West project, from I-26 to Paul Cantrell Boulevard, ranks among the top ten of the state's most congested corridors. Forecasts show that segments of that corridor will continue to be among the state's most congested in 2040. Due to geometric deficiencies, the System Interchange of I-526 & I-26 is the major source of the congestion.

The I-526 & I-26 System Interchange is listed as the #2 project in the 2035 Charleston Area Transportation Study (CHATS) Long Range Transportation Plan (LRTP) Ranked List of Candidate Transportation Projects, is the #6 project on SCDOT's ACT 114 Interstate Capacity List, and is listed in SCDOT's *State Transportation Improvement Plan 2017-2022*[2]. Congestion was detailed in SCDOT's *Corridor Analysis for I-526 Between North Charleston and West Ashley*[3] and in the Interstate Plan portion of SCDOT's 2014 Multimodal Transportation Plan[1], which lists four segments within this project corridor among the top 20 most congested interstate segments. The need of this project is derived from the following factors, described in greater detail in the *I-526 Lowcountry Corridor West Draft Environmental Impact Statement (DEIS)*:

- Growth in population and employment;
- Decreased mobility and increased traffic congestion;
- Existing traffic conditions;
- Projected traffic conditions; and
- Geometric deficiencies.

[1] *https://www.scdot.org/Multimodal/default.aspx* | [2]*https://www.scdot.org/inside/pdf/planning/STIP_DDR_2017.pdf*
[3] *https://www.526lowcountrycorridor.com/west/planning-studies/*

To meet the purpose and need, SCDOT established the following two priorities for the I-526 LCCW project. These priorities were used to guide the screening of preliminary alternatives to form reasonable alternatives limited only to those which accomplished these goals and priorities.

1. **Replacement/Improvement of the I-526 & I-26 System Interchange.**
    - ❖ To significantly improve operations for both interstate corridors.
2. **Improve Mainline Capacity along I-526, defined as:**
    - ❖ Eliminate queueing/back up of traffic exiting the freeway by improving auxiliary lanes and ramp termini. This will exclude improvements specifically designed to improve the flow of traffic that is entering the freeway.
    - ❖ Provide freeway capacity, excluding cross street improvements, necessary to accommodate forecasted traffic demand. More specifically, assume that improvements will be made by others (local governments, etc.) to fund future improvements allowing additional traffic to enter the freeway. This assumption will be translated into the number of general-purpose lanes, as well as weaving, merging and diverging operations throughout the corridor. This is considered integral to maintaining mainline capacity.

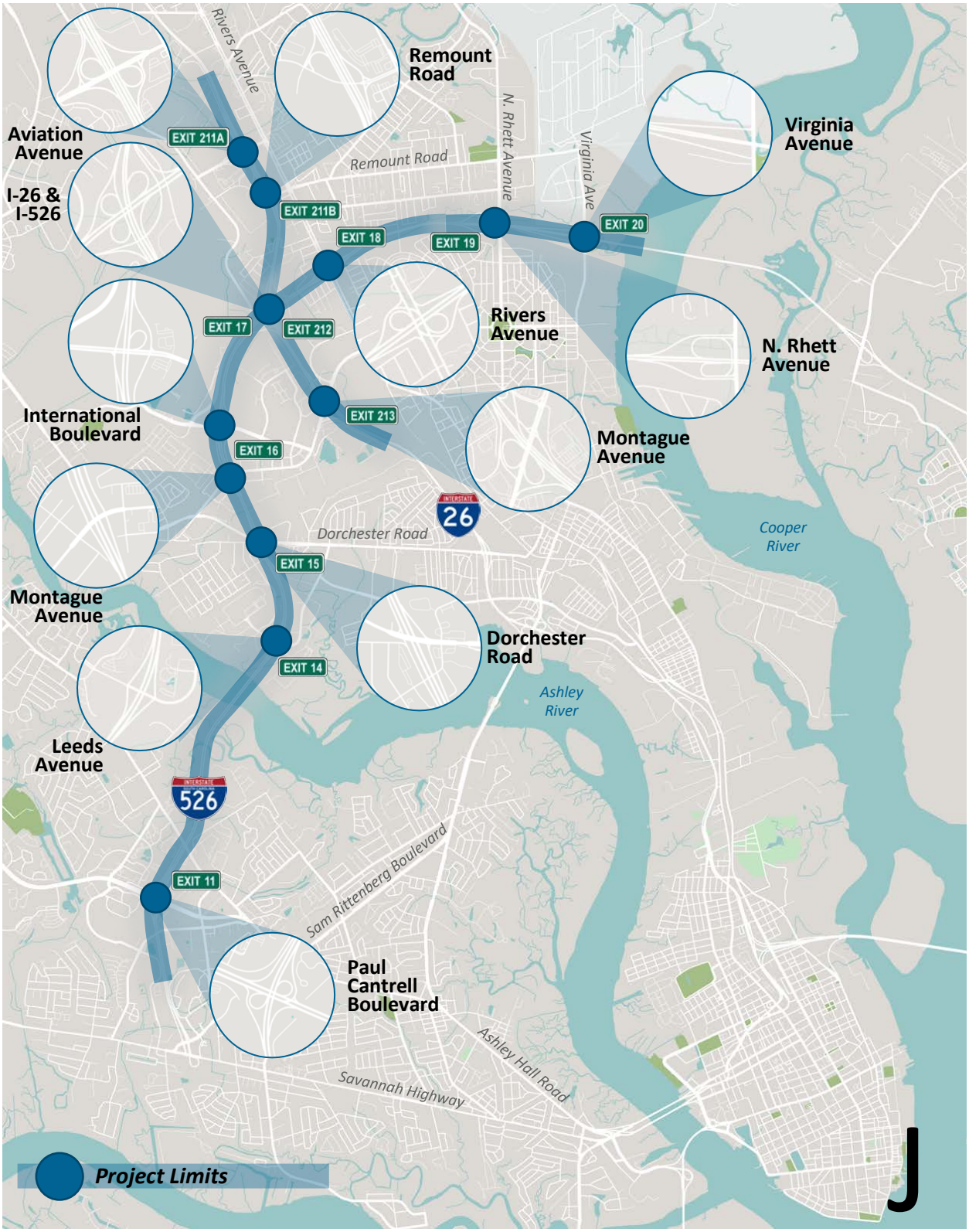
1.2 Study Area

The study area for the I-526 Lowcountry Corridor West project includes the mainline of **I-526** *between Paul Cantrell Boulevard and Virginia Avenue* and **I-26** *between Montague Avenue and Aviation Avenue*, including the following interchanges, as shown in **Figure 1.**

- ❖ I-526 & Paul Cantrell Boulevard (Including Magwood Dr) Exit 11
- ❖ I-526 & Leeds Avenue Exit 14
- ❖ I-526 & Dorchester Road/Paramount Drive Exit 15
- ❖ I-526 & W. Montague Avenue/International Boulevard Exit 16
- ❖ I-526 & I-26 System Interchange Exit 17/Exit 212
- ❖ I-526 & Rivers Avenue Exit 18
- ❖ I-526 & N. Rhett Avenue Exit 19
- ❖ I-526 & Virginia Avenue Exit 20
- ❖ I-26 & Aviation Avenue Exit 211A
- ❖ I-26 & Remount Road Exit 211B
- ❖ I-26 & Montague Avenue Exit 213

In addition to the interchanges listed above, analyses were conducted at the interchanges of I-526 & US 17/Sam Rittenberg Boulevard (Exit 10), I-26 & Ashley Phosphate Road (Exit 209), and I-26 & Dorchester Road (Exit 215) in order to capture adjacent upstream/downstream interchanges to the interchanges in the project limits. The adjacent interchange on I-526 to the east of Virginia Avenue (I-526 & Clements Ferry Road – Exit 23) was not included in the analysis as it's distance from the project (approximately three miles) and the barrier created by the bridge crossing the Cooper River effectively limits its influence on the project interchange operations.

Figure 1 – I-526 Lowcountry Corridor West Project Limits



2.0 BASE YEAR TRAFFIC CONDITIONS

The first step in the traffic analysis was to determine the base year design hour (AM and PM peak) traffic volumes throughout the study area. This included interstate mainline and ramp volumes (along I-526 and I-26) as well as intersection turning movement counts at the ramp terminal intersections as well as those intersections included in the study area due to their being significant intersections adjacent to the ramp terminals. Once the necessary hourly data was collected for each of these movements, the design hour(s) were determined using Automatic Traffic Recorder Data in the study area. Using the selected design hour(s), volumes in the study area were adjusted based on the comparison of the design hour volumes to the volumes counted for this project. Once these adjustments were made based on the design hour(s), AM and PM peak hour volumes were balanced between interchanges and intersections. Finally, peak hour factors and heavy vehicle percentages along the interstate(s), at ramps, and at study area intersections were determined.

2.1 DATA COLLECTION

Mainline hourly volumes, ramp hourly volumes, and peak period intersection turning movement counts were collected throughout the study area.

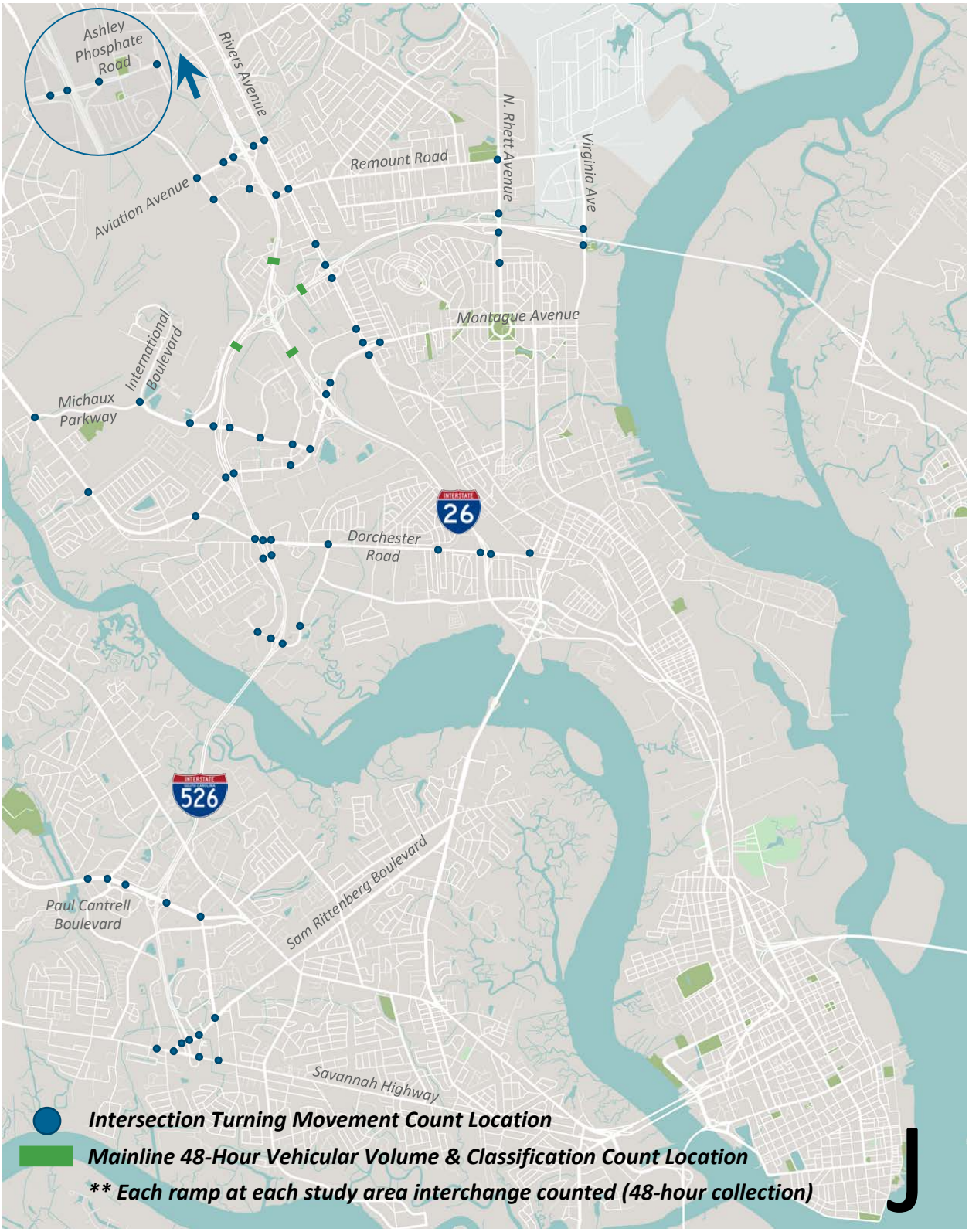
Each ramp at each study area interchange was counted for 48-hours (at 15-minute intervals) in May of 2015 using pneumatic tube counting devices.

Mainline volumes and vehicular classifications were also collected in May of 2015 at four locations: two along I-526 (one east and one west of the I-526 & I-26 System interchange) and two along I-26 (one north and one south of the I-526 & I-26 System interchange), as shown in **Figure 2.**

AM and PM peak period (7:00 – 9:00 AM and 4:00 – 6:00 PM) turning movement counts were also collected in May of 2015 at all ramp terminal intersections and significant adjacent intersections to study area interchange ramps, which are indicated in **Figure 2.**

The four mainline vehicular count and classification 48-hour volumes can be found in **Appendix 2.1.** The ramp 48-hour vehicular volumes can be found in **Appendix 2.2.** The AM and PM peak period intersection turning movement count volumes can be found in **Appendix 2.3.** With this data collected, the AM and PM design hours were selected.

Figure 2 – I-526 Lowcountry Corridor West Volume Collection Locations Design Hour Selection



As required in the most current version (at the time of analysis) of the American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on Design Standards Interstate System*, 5th Edition (January 2005), the 30th Design Hour shall be used to determine the appropriate traffic volume used for the design. The most current versions (at the time of analysis) of the Transportation Research Board's Highway Capacity Manual 2010 and the Institute of Transportation Engineers' (ITE) *Traffic Engineering Handbook*, 6th Edition (2012) have nearly identical language with respect to the selection of the design hour volume.

The 30th highest hourly volume is determined by listing traffic volumes for every hour of every day in a calendar year in descending order from highest to lowest. The 30th volume in this list is the 30th highest-hour volume. Graphing the volumes in descending order can show a large variation in volumes, generally taking the form of a curve that initially descends steeply and ends in a more gently declining, almost linear slope. The design hour is usually selected from the "knee of the curve" – the area between the initial steep descent and the more gradually declining linear slope. The reason for this is described in the *Highway Capacity Manual*, "The selection of an appropriate hour for planning, design, and operational purposes is a compromise between providing an adequate level of service (LOS) for every (or almost every) hour of the year and economic efficiency." Simply put, building a highway to accommodate traffic volumes on the initial steep slope of the volume curve can be very expensive and provide under-used capacity. Some measure of infrequent congestion under exceptional circumstances may be appropriate and allowable from a design standpoint.

Standard practice in urban areas is to base highway design on an hour between the 30th and 100th highest hour of the year. This range of hours generally falls within the "knee" in the graphed curve of the volume data. In standard practice, the knee is assumed to occur at the 30th highest hour which is why this hour is used as the basis for estimates of design-hour volume. The 30th highest hour may or may not be the correct choice to identify the design-hour volume.

A review was conducted of available traffic data for the year 2015 from Automatic Traffic Recorder (ATR) stations 34 and 46 along I-526 and stations 31 and 71 along I-26, as shown in **Figure 3.**

The base year traffic volumes along I-526 and I-26 were reviewed to determine if the use of the 30th to 100th highest hour was appropriate for the base year conditions and context of the improvement. The I-26 and I-526 hourly volume data for the four permanent count stations is illustrated in **Figure 4** and found in **Appendix 2.4.** The results of the review indicated that the majority of the highest 30 hours and 100 hours on I-26 are Friday afternoons, which is likely due to the high amount of tourist traffic coming into the Charleston area for the weekends during the normal commuter afternoon peak heading out of the Charleston area via I-26 westbound. The majority of the highest 30 hours and 100 hours on I-526 are on Wednesday mornings, likely due to the local morning rush hour commute.

To determine a uniform design hour between I-526 and I-26, a comparison of the 30th to 100th design hours between all four permanent counts stations was completed. Two dates were found to be shared among all four permanent count stations: June 17th and May 14th, 2015. Since June 17th is during the summer, it was determined not to represent "typical" traffic. Therefore, May 14th was used as the "design day." It is shared among all four permanent count stations, occurs on a Thursday, does not occur during any major events, and is between the 30th to 100th design hours for all four stations, as shown in **Figure 4**. The design hours for the AM peak (7:00-8:00 AM) and PM peak (4:00-5:00 PM) hours of this day were used for analysis because the majority of the peak hours of the intersections and ramps counted for this project fall within these peak hours.

Figure 3 – Automatic Traffic Recorder Stations

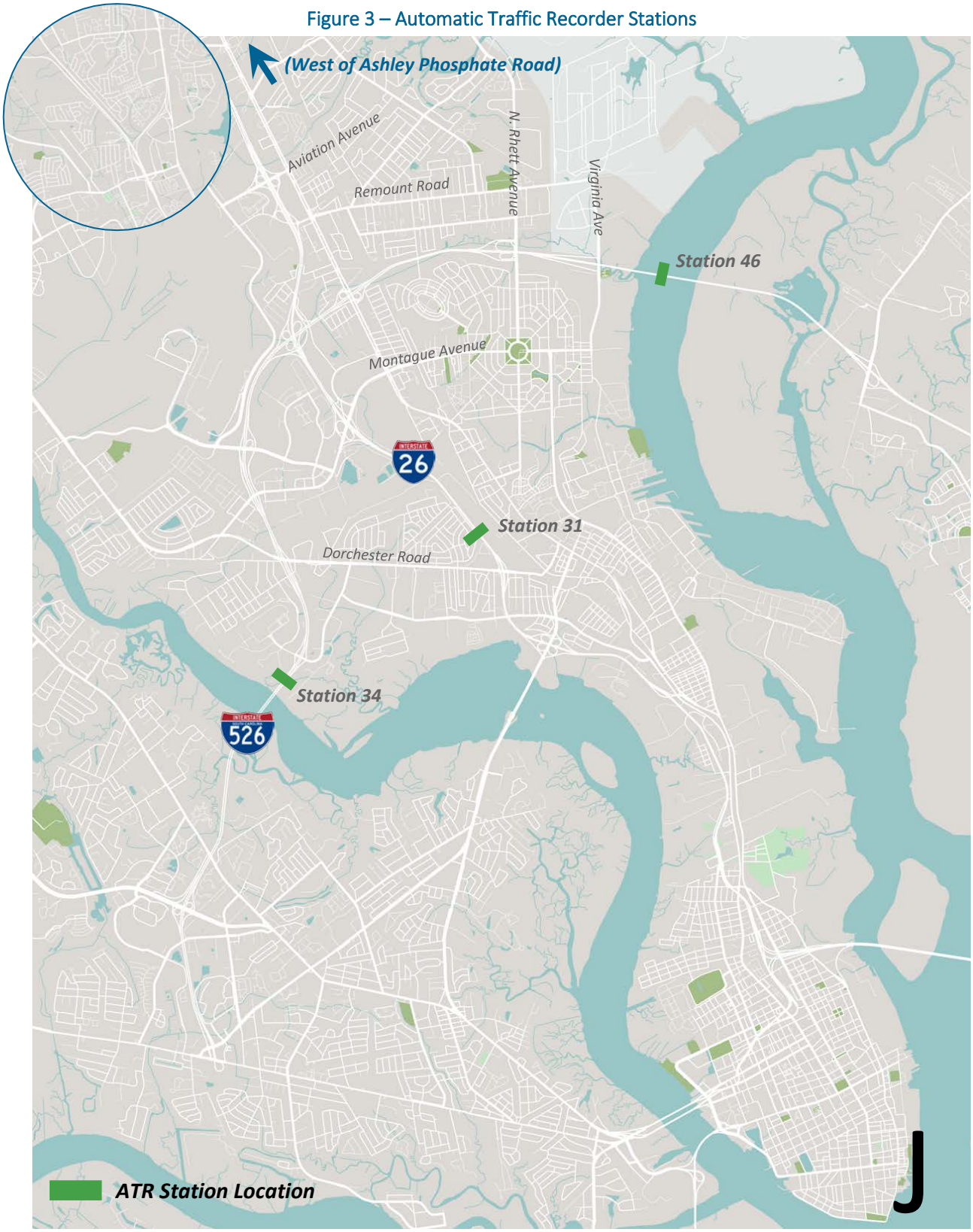
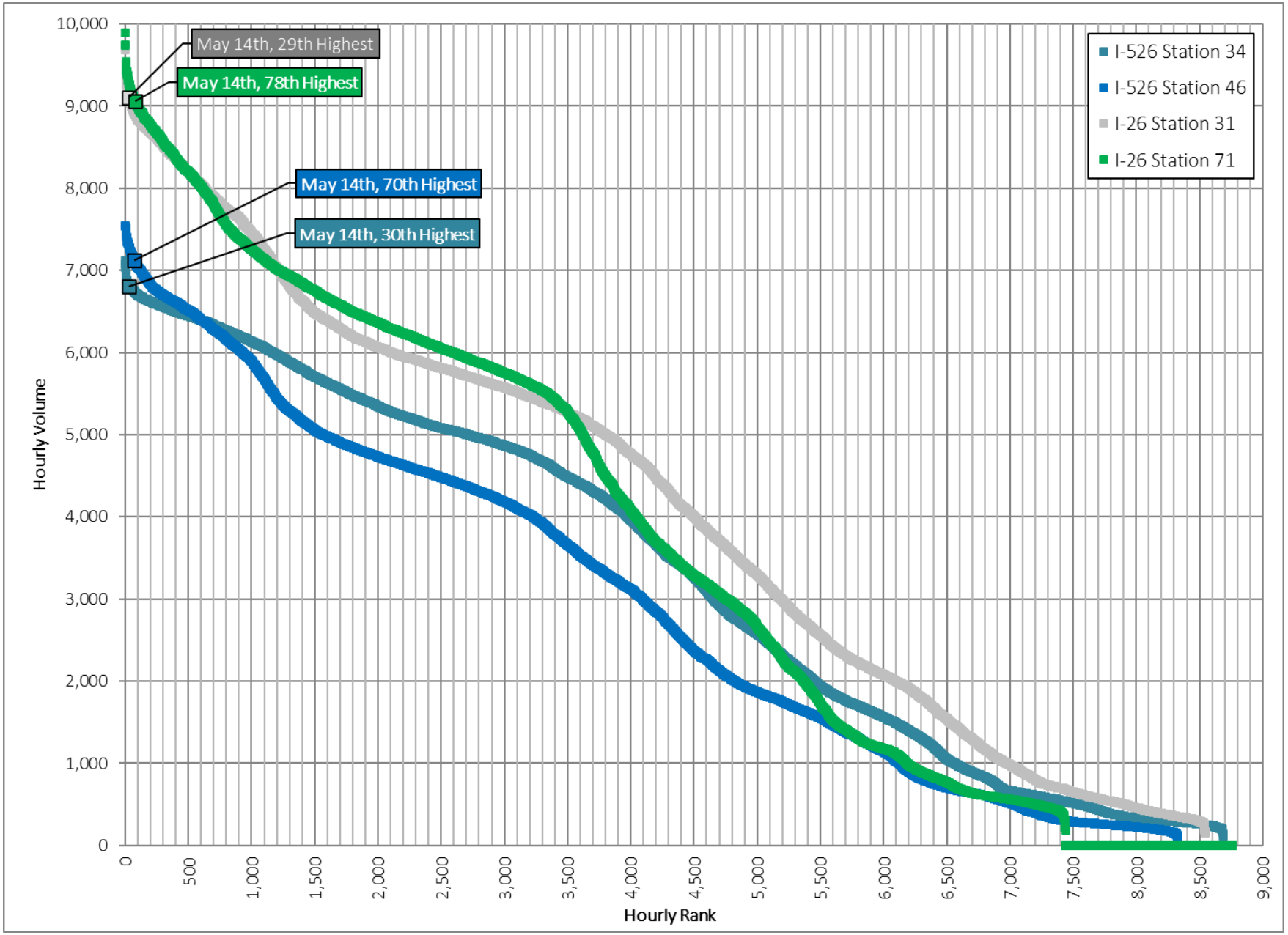


Figure 4 – 2015 ATR Station Two-Way Hourly Volumes



2.2 Base Year Condition Traffic Volume Development

Application of Design Hour Adjustment

Based on the selection of the design day as described above, the AM and PM peak hour volumes at the stations on the day the project counts were collected (May 6th, 2015) were compared with the design hour volumes of the design day (May 14th, 2015), to determine a design hour adjustment. As shown in **Table 1** below, the differences between the design day and count day counts at the four different ATR stations vary by station, direction, and peak hour. Two separate adjustment factors were determined for the project peak hour volumes: one for volumes along I-526 and one for volumes along I-26. As indicated in the table, the average adjustment percentage along I-526 is 2.08%. That is, the volumes on the design day were generally 2.08% higher than the volumes collected on the day of the data collection for the project. Therefore, this 2.08% adjustment percentage was applied to all mainline and ramp volumes along I-526 within the project study area to *increase* the project counts to align with the design day. Along I-26, however, the design day volumes were found to be generally slightly less than the volumes on the day of the data collection for the project. Therefore, in an effort to be conservative, the project counts along I-26 *were not* adjusted.

Table 1 – Design Hour Adjustment Factors

Station 34				
I-526 (west of System Interchange)		Count Day 6-May (veh/hr)	Design Day 14-May (veh/hr)	Adjustment % (Design Day / Count Day)
AM Peak	EB	3,989	3,959	-0.76%
	WB	2,893	2,850	-1.51%
PM Peak	EB	2,967	3,067	3.26%
	WB	3,573	3,533	-1.13%
Station 46				
I-526 (east of System Interchange)		Count Day 6-May (veh/hr)	Design Day 14-May (veh/hr)	Adjustment % (Design Day / Count Day)
AM Peak	EB	3,482	3,534	1.47%
	WB	3,471	3,591	3.34%
PM Peak	EB	3,101	3,449	10.09%
	WB	2,964	3,021	1.89%
			I-526 Average Adjustment %	2.08%
Station 31				
I-26 (south of System Interchange)		Count Day 6-May (veh/hr)	Design Day 14-May (veh/hr)	Adjustment % (Design Day / Count Day)
AM Peak	EB	5,790	5,444	-6.36%
	WB	3,288	3,310	0.67%
PM Peak	EB	3,781	3,692	-2.41%
	WB	5,443	5,409	-0.63%
Station 71				
I-26 (north of System Interchange)		Count Day 6-May (veh/hr)	Design Day 14-May (veh/hr)	Adjustment % (Design Day / Count Day)
AM Peak	EB	5,311	5,126	-3.61%
	WB	2,759	2,819	2.13%
PM Peak	EB	3,345	3,017	-10.87%
	WB	5,607	5,888	4.77%
			I-26 Average Adjustment %	-2.04%

Balancing between Intersections

Once the adjustment factor was applied to the I-526 mainline and ramp volumes, the volumes between interchanges and between intersections were balanced. Balancing of approach and departure volumes between intersections was important for microsimulation traffic modeling purposes, due to the fact that the microsimulation traffic model must account for each individual vehicle entering and exiting the study area.

Therefore, if minor driveways not anticipated to produce significant traffic volumes existed between project study area intersections, the approach and departure volumes between these project study area intersections were balanced. However, if driveways to significant traffic generators were present between the project study area intersections, no balancing of approach and departure volumes was completed. In the instances for which traffic volumes were not balanced between project study area intersections due to these major traffic generators, the microsimulation traffic model included additional nodes to account for this imbalance in order to allow the microsimulation traffic model to account for each vehicle in and out of the network.

To maintain consistency, this balancing process (between the same intersections) was completed for the future year traffic volume development as well.

Base Year Condition Traffic Volumes

Following the design hour adjustments and intersection balancing described above, 2015 Base Year Condition volumes were complete. These existing AM and PM, adjusted, balanced, peak design hour volumes can be seen in **Figure 5** through **Figure 10** on the following pages.

Figure 5 – 2015 Base Year Peak Hour Traffic Volumes (Sheet 1 of 6)

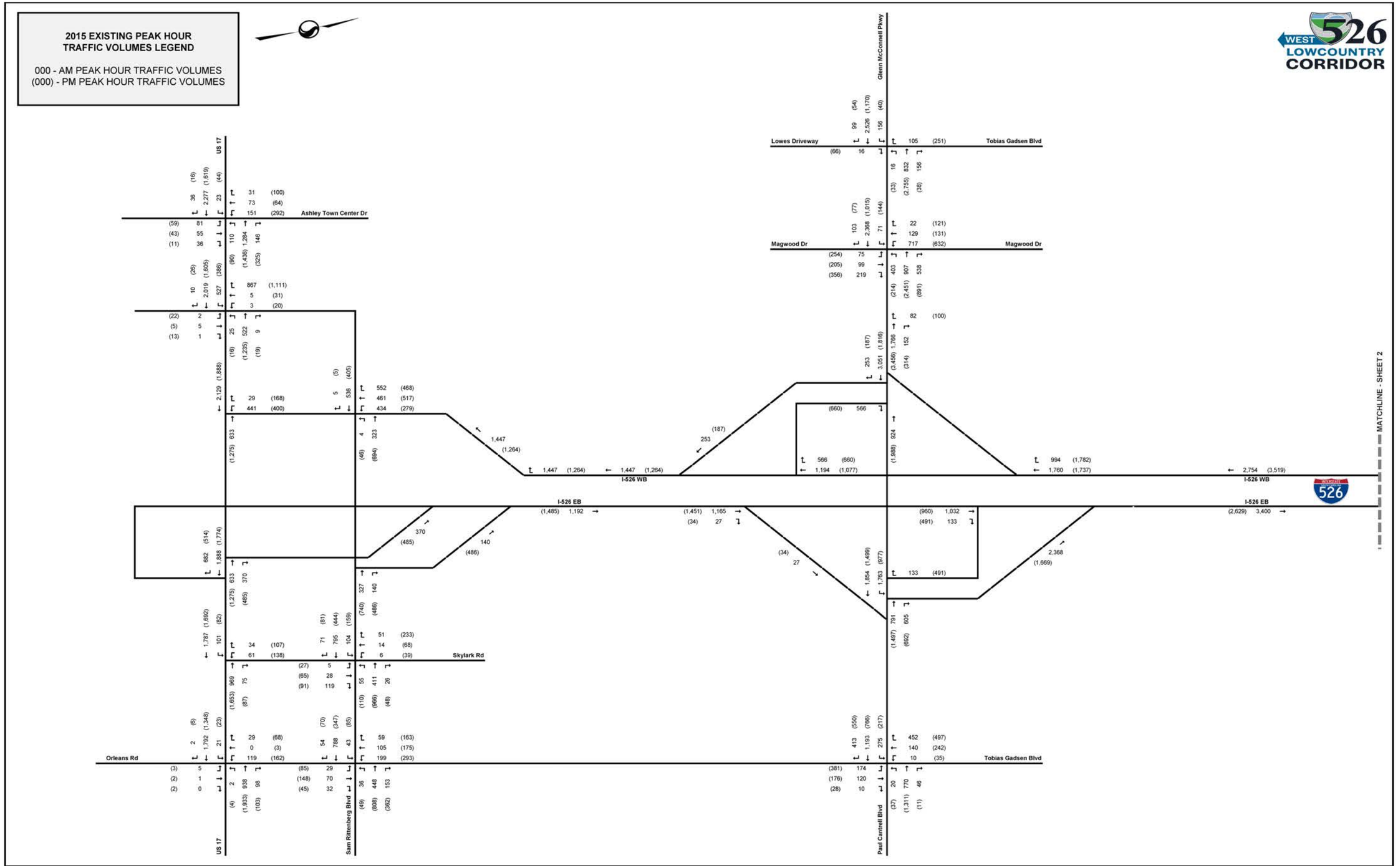


Figure 6 – 2015 Base Year Peak Hour Traffic Volumes (Sheet 2 of 6)

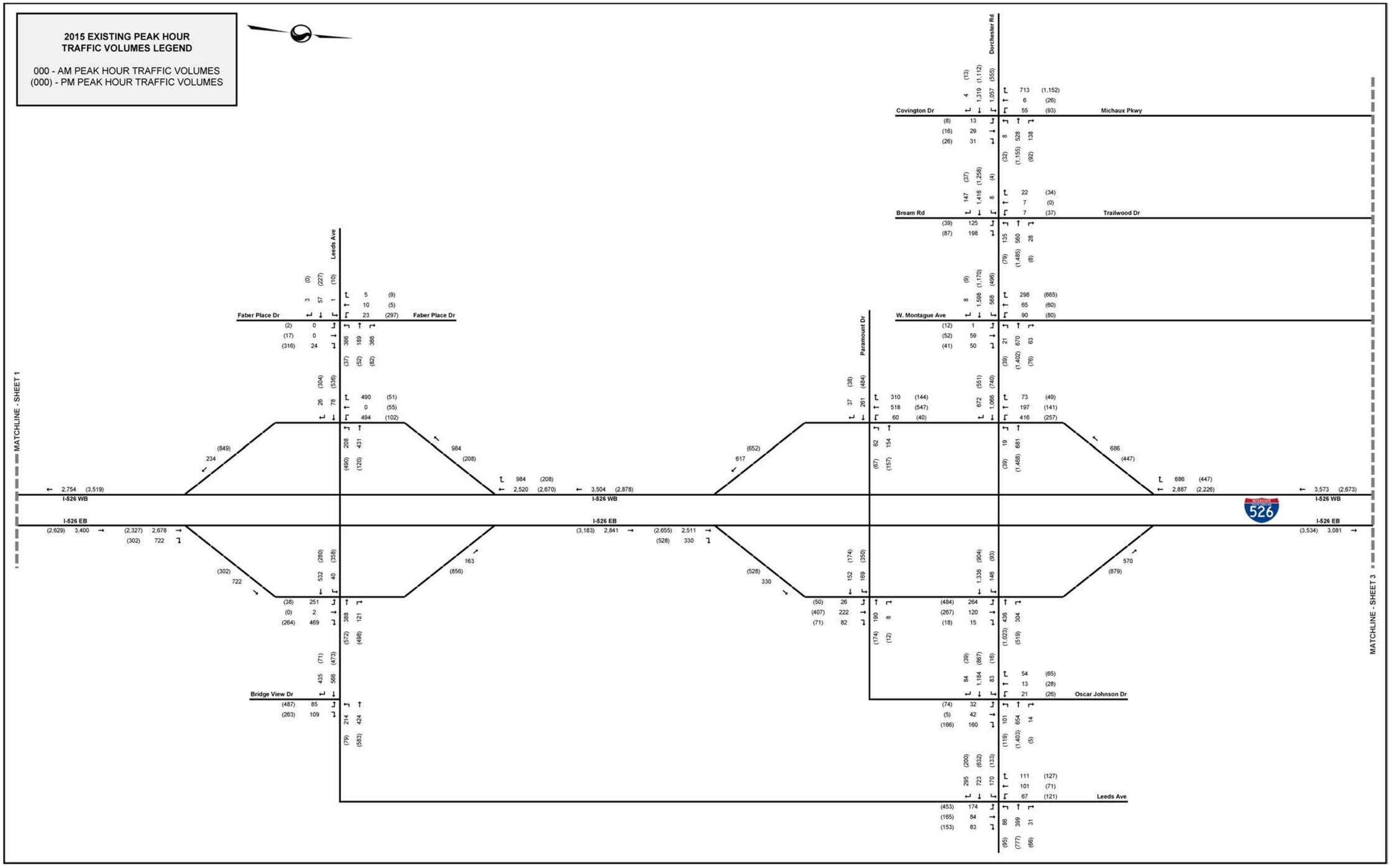


Figure 7 – 2015 Base Year Peak Hour Traffic Volumes (Sheet 3 of 6)

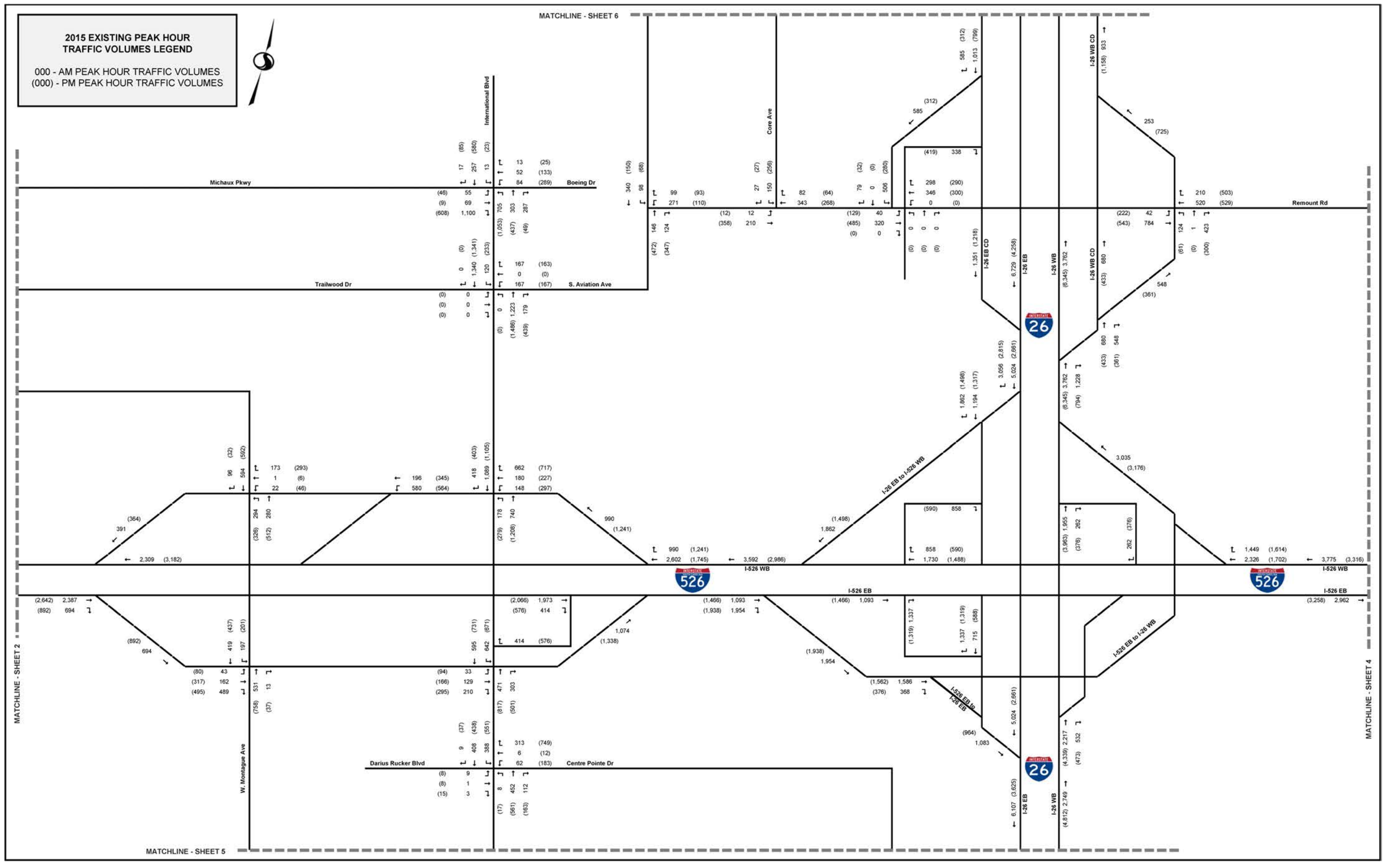


Figure 8 – 2015 Base Year Peak Hour Traffic Volumes (Sheet 4 of 6)

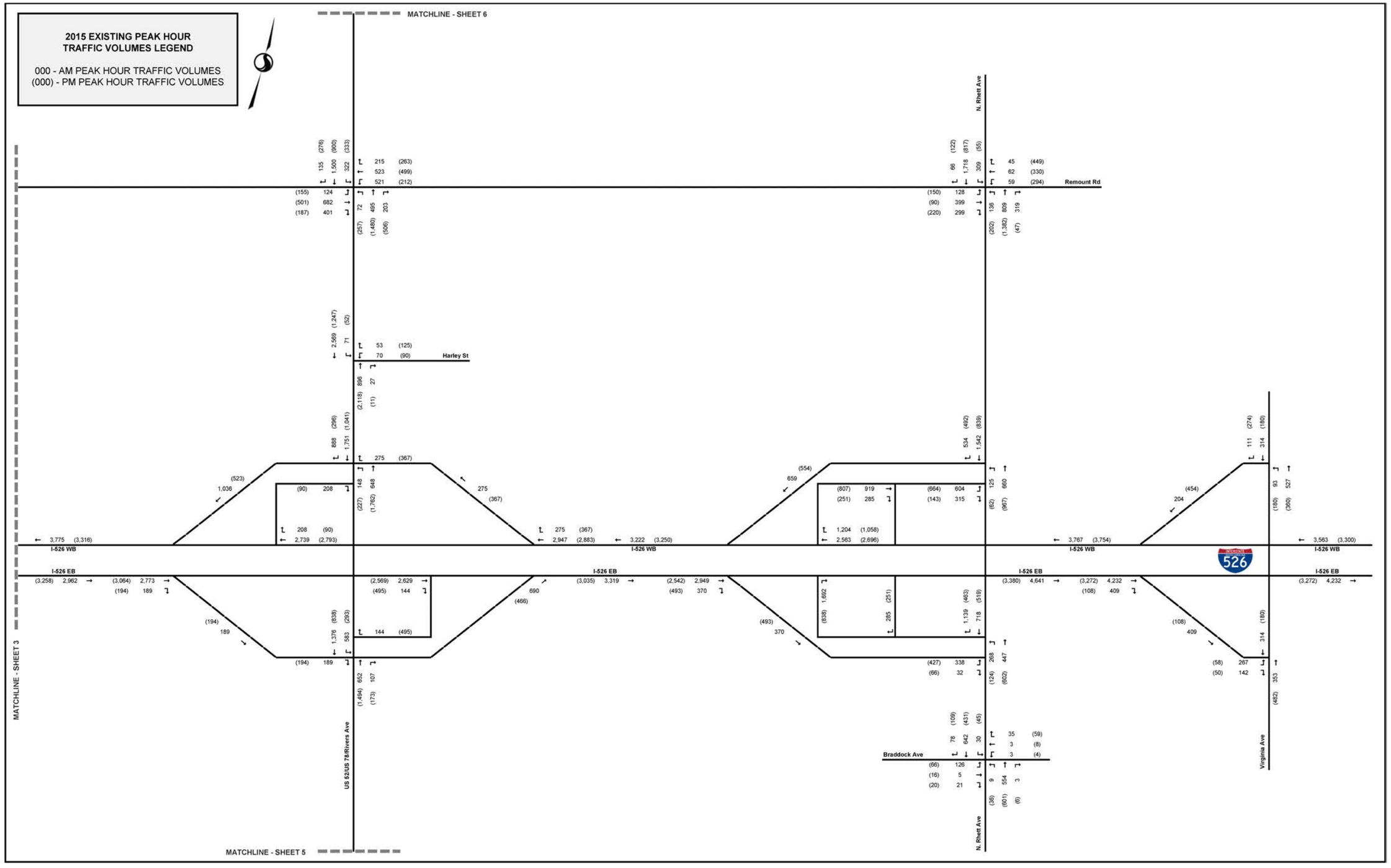


Figure 9 – 2015 Base Year Peak Hour Traffic Volumes (Sheet 5 of 6)

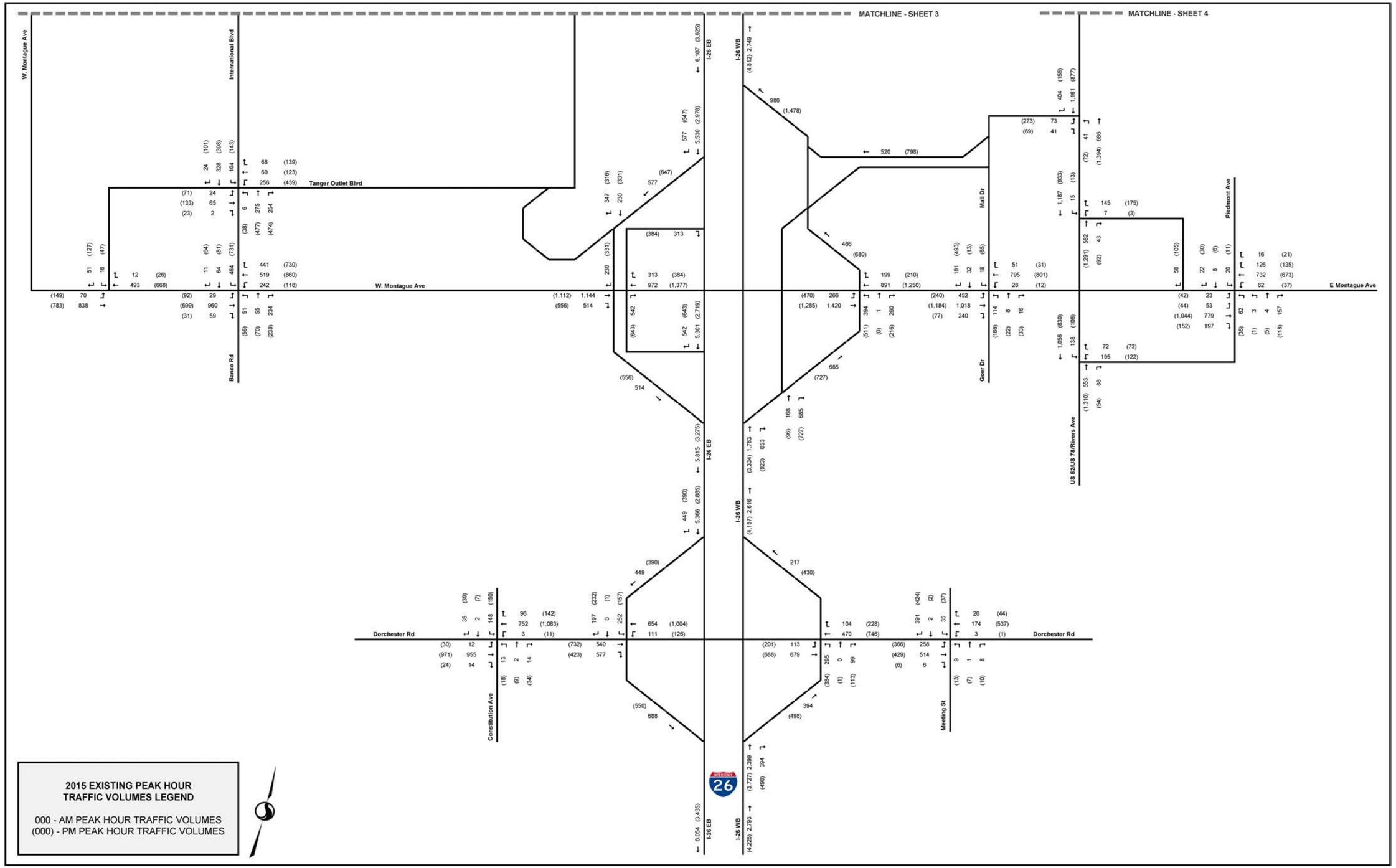
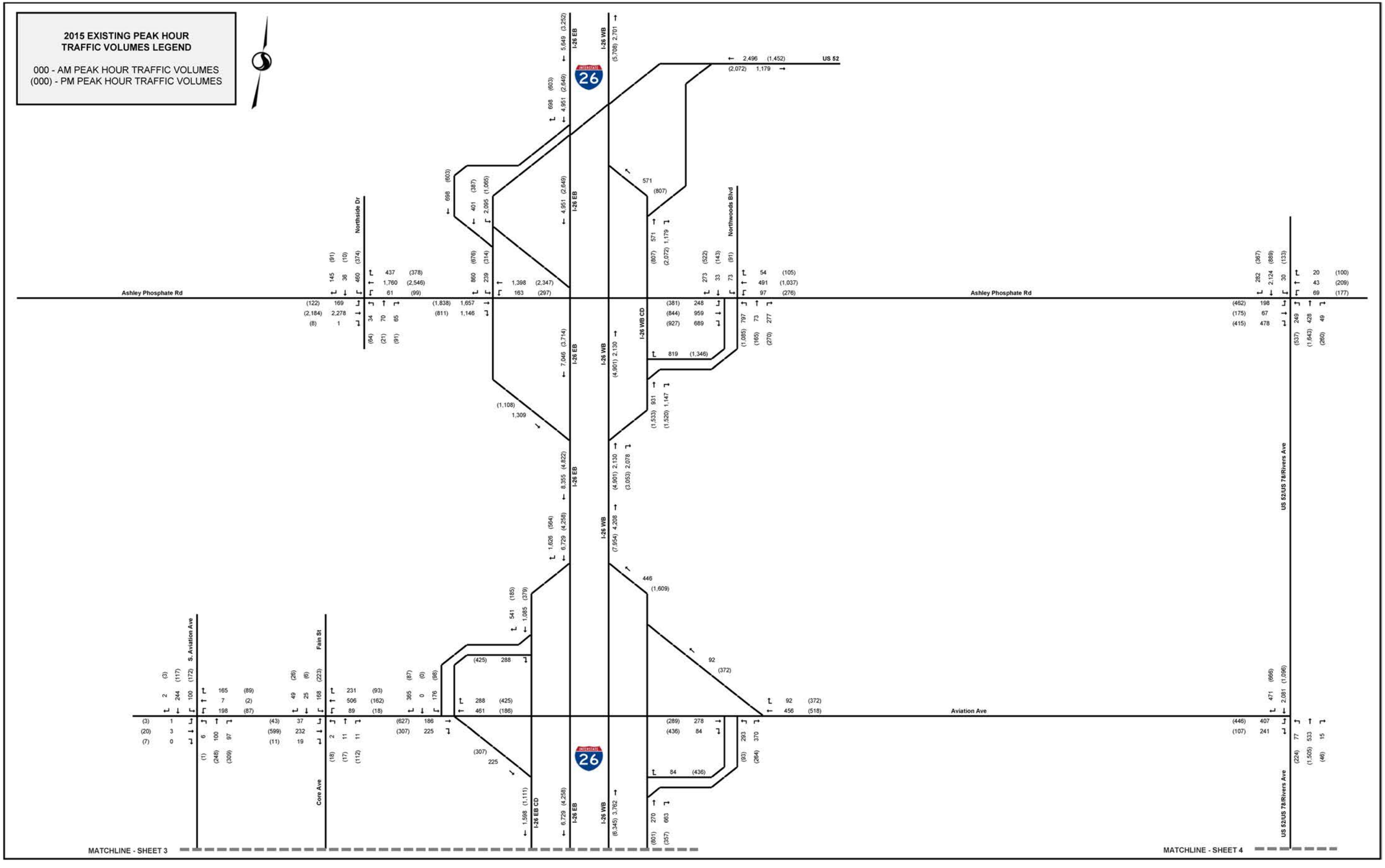


Figure 10 – 2015 Base Year Peak Hour Traffic Volumes (Sheet 6 of 6)



2.3 HEAVY VEHICLE PERCENTAGES

Interstate Mainline Heavy Vehicle Percentages

Forty-eight (48)-hour directional classification counts were collected at the four mainline legs of the I-526 and I-26 System interchange in May of 2015, the locations of which were illustrated previously in **Figure 2.** Directional mainline heavy vehicle percentages were calculated for the AM and PM peak hours and then averaged for both days. To validate the heavy vehicle percentages, the 48-hour directional classification counts volumes were checked against Automatic Traffic Recorder (ATR) data. Weekly ATR truck classification data was compiled from three (3) stations in the project study area for the week of May 1 to May 7, 2016. From this data, it was determined that a minimum of 5% heavy vehicles would be used for the I-526 and I-26 mainlines. The 2015 base year mainline heavy vehicle percentages are shown in **Table 2.** It is important to note that the peak hour for all traffic does not correspond to the peak hour for truck traffic within the 526 LCCW project limits.

Table 2 – 2015 Base Year Interstate Mainline Heavy Vehicle Percentages

I-526 Mainline				
Direction	West of I-26		East of I-26	
	AM	PM	AM	PM
EB	5.0%	5.0%	12.0%	7.0%
WB	5.0%	5.0%	9.0%	13.0%
I-26 Mainline				
Direction	West of I-526		East of I-526	
	AM	PM	AM	PM
EB	5.0%	5.0%	5.0%	6.0%
WB	7.0%	6.0%	9.0%	5.0%

Interstate Ramp Heavy Vehicle Percentages

Four-hour turning movement counts at each intersection throughout the study area were collected and utilized to determine the heavy vehicle percentages for the on- and off-ramps along I-526 and I-26. The 2015 Base Year interchange ramp heavy vehicle percentages are shown in **Table 3.**

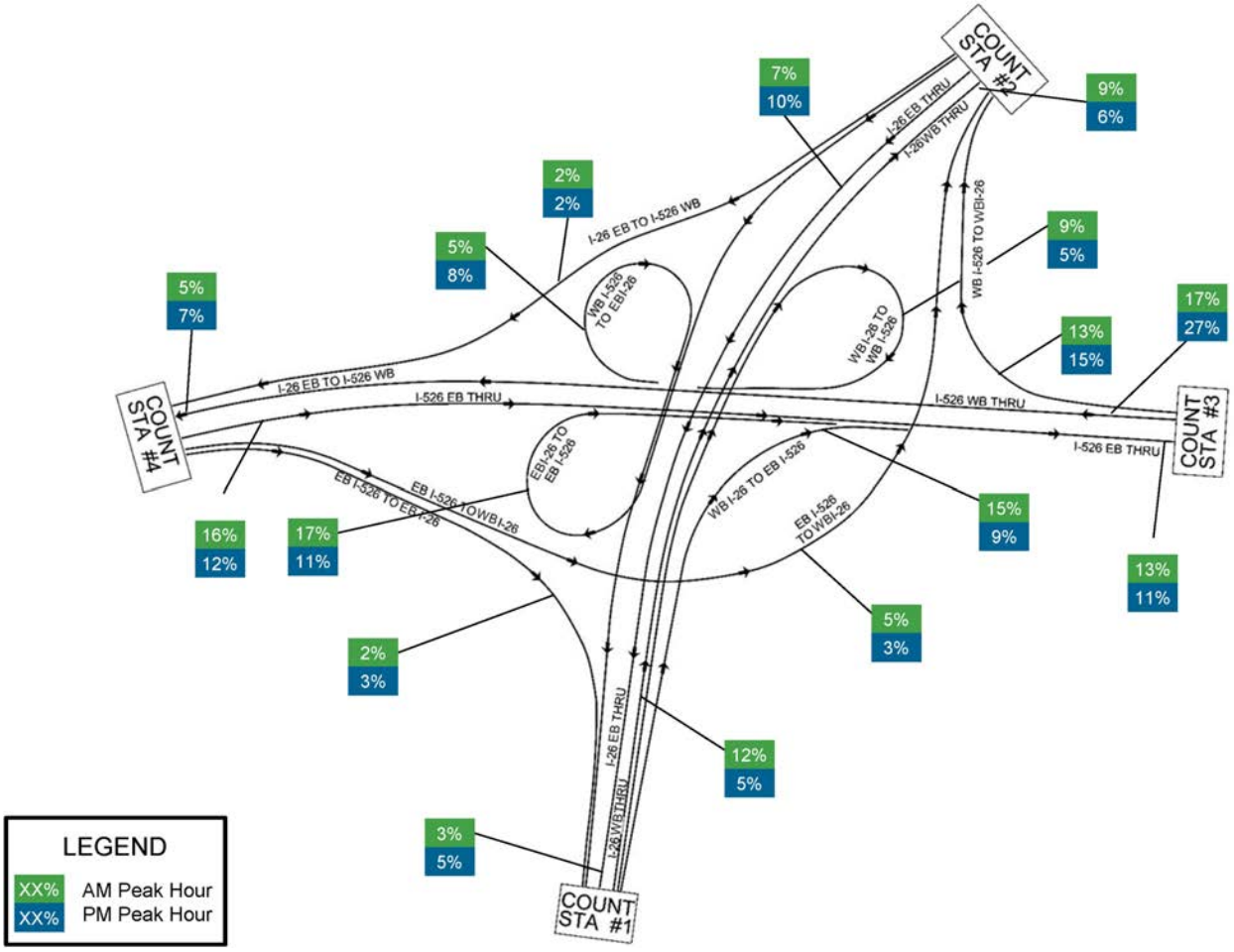
Table 3 – 2015 Base Year Interstate Ramp Heavy Vehicle Percentages

I-526 Eastbound					
Off-Ramp:	AM	PM	On Ramp:	AM	PM
Glenn McConnell	2.00%	2.00%	Glenn McConnell	2.00%	3.00%
Glenn McConnell WB (loop)	3.00%	3.00%			
Leeds	6.00%	12.00%	Leeds	2.00%	2.00%
Dorchester	3.00%	2.00%	Dorchester	2.00%	2.00%
Paramount	3.00%	3.00%	Paramount	2.00%	2.00%
Montague	4.00%	2.00%	Montague/International	2.00%	2.00%
International	3.00%	3.00%			
I-26 EB	2.00%	3.00%	I-26 EB	17.00%	11.00%
I-26 WB	5.00%	3.00%	I-26 WB	15.00%	9.00%
Rivers SB	4.00%	3.00%	Rivers	6.00%	2.00%
Rivers NB (loop)	2.00%	2.00%			
Rhett	9.00%	6.00%	Rhett (loop)	2.00%	2.00%
I-526 Westbound					
Off-Ramp:	AM	PM	On Ramp:	AM	PM
Rhett (loop)	8.00%	7.00%	Rhett	2.00%	2.00%
Rivers NB	4.00%	5.00%	Rivers	5.00%	3.00%
Rivers SB (loop)	2.00%	2.00%			
I-26 WB	13.00%	15.00%	I-26 WB	9.00%	5.00%
I-26 EB	5.00%	8.00%	I-26 EB	2.00%	2.00%
Montague/International	13.00%	9.00%	International	2.00%	2.00%
			Montague	2.00%	2.00%
Dorchester	8.00%	6.00%	Dorchester	2.00%	2.00%
Paramount	3.00%	3.00%	Paramount	2.00%	2.00%
Leeds	2.00%	6.00%	Leeds	2.00%	2.00%
Glenn McConnell WB	2.00%	2.00%	Glenn McConnell	2.00%	2.00%
Glenn McConnell EB (loop)	2.00%	2.00%			
I-26 Eastbound					
Off-Ramp:	AM	PM	On Ramp:	AM	PM
Ashley Phosphate	5.00%	5.00%	Ashley Phosphate	2.00%	2.00%
Aviation	5.00%	7.00%	Aviation WB (loop)	2.00%	2.00%
			Aviation EB	2.00%	2.00%
Remount	7.00%	8.00%	Remount (loop)	2.00%	2.00%
Montague SB	2.00%	2.00%	Montague SB (loop)	2.00%	2.00%
Montague NB (loop)	2.00%	2.00%	Montague NB	2.00%	2.00%
I-26 Westbound					
Off-Ramp:	AM	PM	On Ramp:	AM	PM
Dorchester	5.00%	3.00%	Dorchester	2.00%	2.00%
Montague	5.00%	3.00%	Montague	24.00%	7.00%
Remount	4.00%	2.00%	Remount	2.00%	2.00%
Aviation	4.00%	7.00%	Aviation EB (loop)	2.00%	2.00%
			Aviation WB	2.00%	2.00%
Ashley Phosphate	2.00%	2.00%	Ashley Phosphate	6.00%	5.00%

System Interchange Heavy Vehicle Percentages

As previously discussed, mainline counts were collected at four locations at the System intersection. Classification counts were also collected at the ramps throughout the System interchange. **Figure 11** shows the base year total volume and heavy vehicle volumes collected, with resulting heavy vehicle percentages for each movement through the System interchange for the AM and PM peak hours, respectively.

Figure 11 – 2015 Base Year I-526 & I-26 System Interchange Heavy Vehicle Percentages



Intersection Heavy Vehicle Percentages

Heavy vehicle percentages at surface street intersections throughout the study area were based on the turning movement counts collected (found in **Appendix 2.3**).

2.4 Peak Hour Factors

For mainline interstate operations, 0.94 was assumed to be the peak hour factor, based on observed conditions in the base year mainline 48-hour counts. Peak hour factors at surface street intersections throughout the study area were based on turning movement counts collected (found in **Appendix 2.3**).

2.5 ORIGIN/DESTINATION PATTERNS

Base year origin/destination patterns were determined through the use of Bluetooth signal data collection technology by placing Bluetooth signal detectors throughout the corridor, as shown in **Figure 12** below**.** These detectors were able to detect the signal of Bluetooth enabled devices in vehicles as they travel past and track these devices by unique identification codes as they passed other Bluetooth detectors throughout the study area. Data from these devices was collected for seven days, however the data from the Tuesday, Wednesday, and Thursday AM and PM peak hours was used to determine AM and PM peak origin/destination percentages throughout the network, as these days most closely represent typical traffic conditions. The peak hour origin/destination percentages throughout the network are shown in **Table 4.**

Figure 12 – Bluetooth Signal Detector Locations

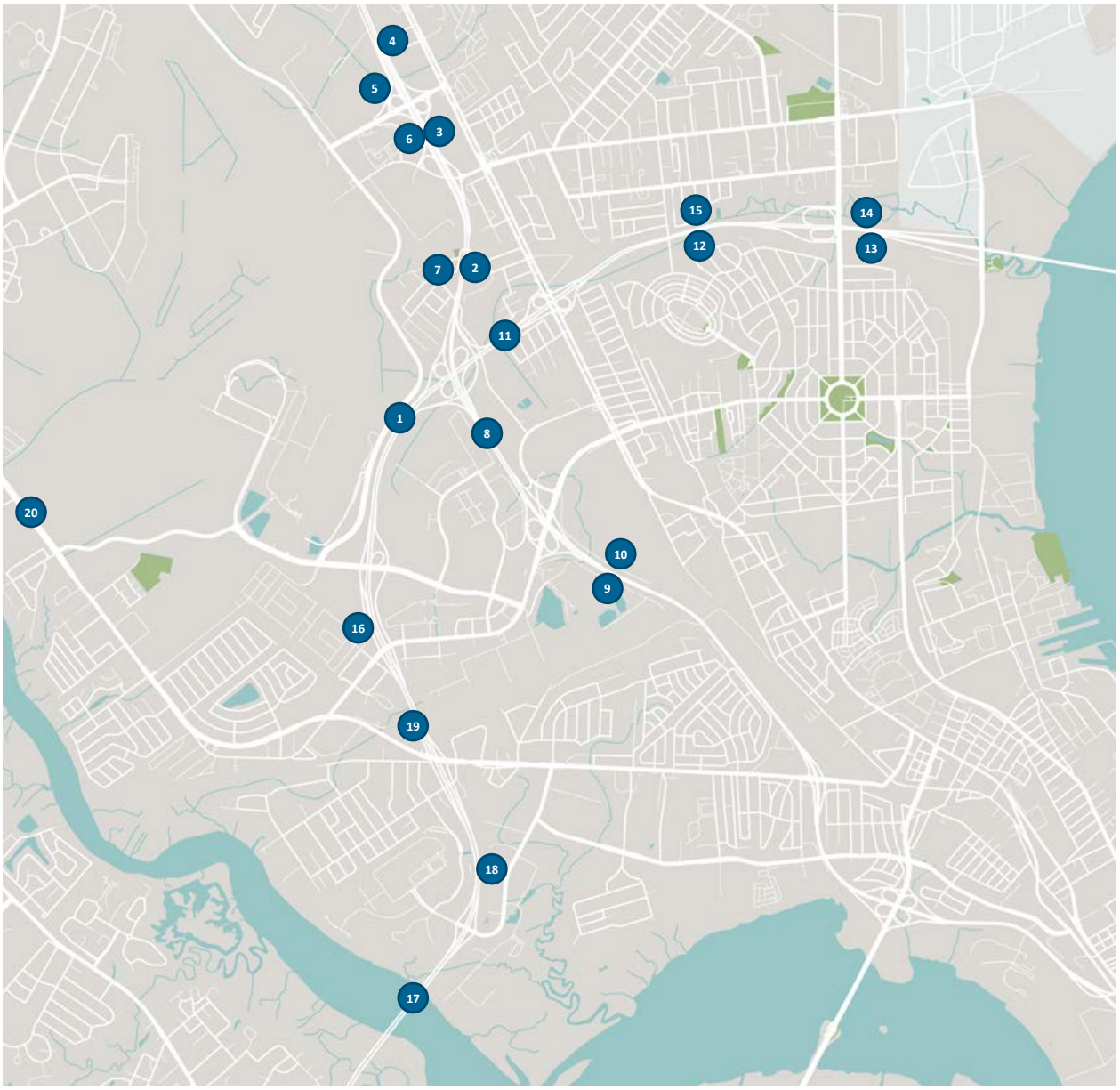


Table 4 – Origin-Destination Percentages (Peak Hour of Tue/Wed/Thu Data)

ORIGIN	DESTINATION: I-26 To Summer-ville	US 52	Ashley Phos-phate	Aviation Ave	Remount Rd	I-26 East of I-526	Rivers Ave	I-526 East of Virginia	Intl. Blvd	Mont. Ave (@ 526)	Dorch-ester Rd	Leeds Ave	Glenn McConn. Pkwy	Sam Ritt-enberg Blvd	US 17
I-26 W. of Ashley Phosphat.	34.3%			7.5%	6.9%	22.4%	0.2%	13.0%	2.4%	0.5%	4.2%	2.7%	3.1%	0.8%	1.9%
	61.6%			2.2%	3.8%	19.4%	0.9%	3.4%	2.3%	0.3%	1.5%	0.4%	2.6%	0.3%	1.2%
Aviation Ave	28.3%	6.3%			3.9%	47.1%	0.2%	5.1%	0.3%	0.4%	2.8%	0.1%	3.1%	0.8%	1.8%
	50.4%	11.6%			3.9%	20.1%	0.4%	4.2%	3.9%	0.4%	1.0%	0.3%	2.3%	0.3%	1.0%
Remount Rd	22.9%	5.0%	9.1%			48.6%	0.1%	5.2%	0.3%	0.4%	2.8%	0.1%	3.0%	0.8%	1.8%
	36.2%	10.1%	11.7%			28.1%	0.7%	3.9%	2.6%	0.4%	1.1%	0.7%	2.9%	0.4%	1.3%
I-26 West of I-526	18.7%	4.2%	7.9%	8.3%		46.5%	0.2%	5.1%	1.0%	0.7%	2.4%	0.1%	2.6%	0.7%	1.6%
	29.3%	13.4%	10.8%	2.7%		29.8%	0.5%	4.1%	2.6%	0.7%	1.0%	0.6%	2.9%	0.4%	1.3%
Rivers Ave	15.6%	0.8%	2.2%	1.8%	2.8%	12.9%		50.0%	1.9%	1.8%	3.8%	1.0%	2.9%	0.7%	1.7%
	14.3%	1.6%	4.8%	2.2%	1.6%	9.3%		44.3%	6.5%	2.3%	3.2%	1.1%	5.7%	0.7%	2.5%
I-526 East of Rivers	10.5%	1.5%	3.1%	2.4%	0.8%	8.8%		NA	2.3%	2.5%	3.8%	1.2%	3.5%	0.9%	2.1%
	14.7%	1.9%	5.1%	2.1%	0.6%	10.6%		43.0%	6.1%	3.5%	2.0%	0.9%	6.0%	0.8%	2.7%
I-526 West of I-26	10.9%	3.7%	5.7%	1.7%	2.0%	6.0%	3.9%	31.6%		4.3%	7.2%	5.4%	9.6%	2.4%	5.7%
	10.2%	4.0%	3.4%	3.1%	2.5%	5.9%	5.1%	10.1%		3.9%	7.7%	1.6%	26.9%	3.5%	12.0%
Intl. Blvd	11.5%	3.5%	5.2%	7.5%	4.9%	4.5%	1.0%	22.3%			9.7%	15.0%	8.0%	2.0%	4.8%
	6.2%	6.0%	3.6%	3.1%	1.5%	5.9%	7.4%	12.7%			10.5%	4.2%	24.6%	3.2%	11.0%
Mont. Ave (@ 526)	9.6%	2.1%	5.2%	6.1%	4.1%	4.3%	1.0%	18.2%	9.3%			12.0%	15.3%	3.9%	9.1%
	11.9%	3.0%	1.9%	1.5%	1.2%	4.0%	4.0%	11.7%	8.0%			5.9%	29.7%	3.9%	13.3%
Dorch-ester Rd	8.9%	2.3%	4.0%	5.1%	2.8%	8.8%	1.4%	16.7%	7.3%	6.7%			19.5%	5.0%	11.6%
	4.0%	1.8%	1.4%	0.6%	0.6%	7.0%	2.1%	4.8%	12.7%	8.3%			35.9%	4.7%	16.1%
Leeds Ave	10.1%	2.3%	5.4%	5.3%	3.6%	4.3%	0.8%	17.9%	7.3%	6.7%	3.1%		18.0%	4.6%	10.7%
	1.1%	0.8%	0.3%	0.2%	0.1%	1.8%	0.7%	1.7%	12.6%	8.2%	7.4%		41.2%	5.4%	18.4%
Glenn McConn. Pkwy	9.7%	2.2%	5.2%	2.6%	3.0%	2.4%	8.1%	16.7%	7.0%	4.6%	6.1%			7.1%	25.1%
	7.0%	5.1%	1.9%	1.7%	1.9%	4.3%	11.0%	17.6%	7.1%	4.6%	6.2%			7.0%	24.8%
Sam Ritt-enberg. Blvd	12.0%	2.8%	6.5%	2.3%	2.6%	1.5%	5.1%	16.7%	19.3%	9.0%	14.7%	7.6%			
	8.8%	6.4%	2.4%	1.6%	1.9%	5.7%	13.6%	22.6%	14.1%	6.7%	10.9%	5.4%			
US 17	12.0%	2.8%	6.5%	2.3%	2.6%	1.5%	5.1%	16.7%	19.3%	9.0%	14.7%	7.6%			
	8.8%	6.4%	2.4%	1.6%	1.9%	5.7%	13.6%	22.6%	14.1%	6.7%	10.9%	5.4%			

LEGEND	
	AM Peak Hour Percentage
	PM Peak Hour Percentage

3.0 Design Year Traffic Projections

3.1 Travel Demand Model Validation

The 526 LCC West Project forecast was completed using a base year of 2015 and a design year of 2050, in coordination with the forecast for an adjoining section of I-526 that is currently in the corridor study phase under FHWA's Planning and Environmental Linkages (PEL) framework. That segment, which extends from North Rhett Avenue to US 17 in Mount Pleasant, is referred to as the 526 Lowcountry Corridor EAST (526 LCC East).

3.1.1 CHATS Travel Demand Model

The initiation of traffic forecasts coincided with the release of a new version of the Charleston Area Transportation Study (CHATS) Travel Demand Model (TDM) by the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG). This version of the model is referred to as the *CHATS Interim TDM*, and it was released by BCDCOG to the project team on March 9, 2018.

The *CHATS Interim TDM* incorporates committed projects in future analysis years and includes major regional developments that were not included in the previous version of the TDM. The *CHATS Interim TDM* has a horizon year of 2040, so a trend analysis was conducted for the socioeconomic data in the model to extend growth to the 2050 design year. This trend analysis is documented by the 526 LCC East Project team in the

"526 Lowcountry Corridor East Technical Memorandum: CHATS Model Modification" approved by SCDOT in September 2018.

This *CHATS Interim TDM* with socioeconomic forecasts extended to the year 2050, was the model which was utilized for traffic projections in this LCC West project for the two future year scenarios: 2050 No Build Conditions and 2050 Build Conditions. Prior to the future year scenario modeling however, the base year model was evaluated to validate that the model conditions represented existing geometry and roadway connectivity.

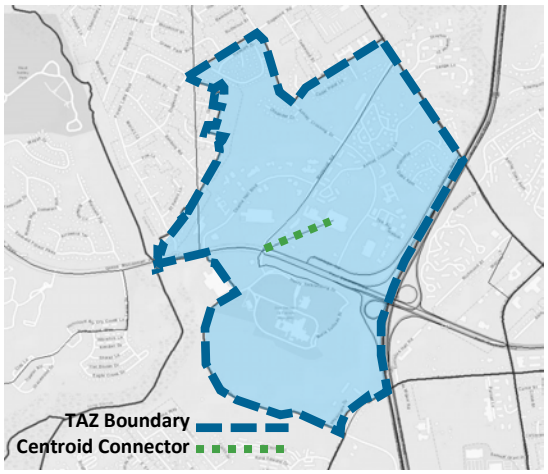
3.1.1.1 TDM Base Year Evaluation

Digital aerial orthophotography and LIDAR surveys were performed in late 2015 and early 2016. The 2015 network conditions in the *CHATS Interim TDM* were reviewed for consistency with this survey, specifically with the number of lanes on the freeway, arterial, and collector links. No changes were necessary to the highway network for the 2015 base year.

3.1.1.1.1 Traffic Analysis Zone and Centroid Connector Review

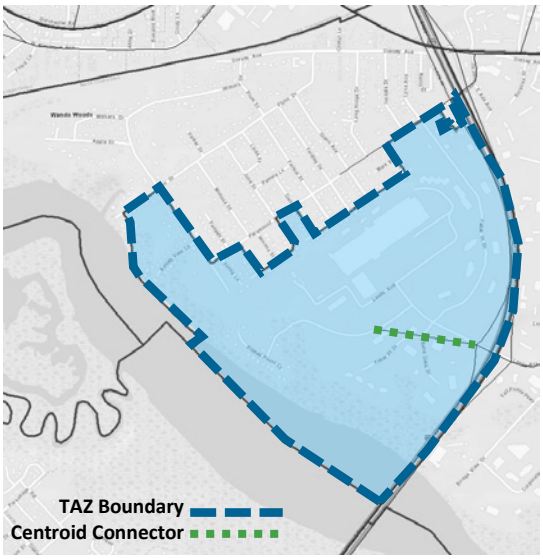
A review was completed of the TDM's Traffic Analysis Zones (TAZ), specifically those that connected to the study area network. While none of the TAZs were modified for the base year, three TAZ centroid connectors were found to be connected to the highway network at locations that differed significantly from actual conditions. These included TAZ 615 near the intersection of Paul Cantrell Boulevard and Magwood Drive, TAZ 427 on Leeds Avenue west of I-526, and TAZ 347 bordered by International Boulevard and Montague Avenue. These conditions are illustrated in **Figure 13**, **Figure 14**, and **Figure 15**, respectively.

Figure 13 – TAZ 615 Near Paul Cantrell Boulevad and Magwood Drive



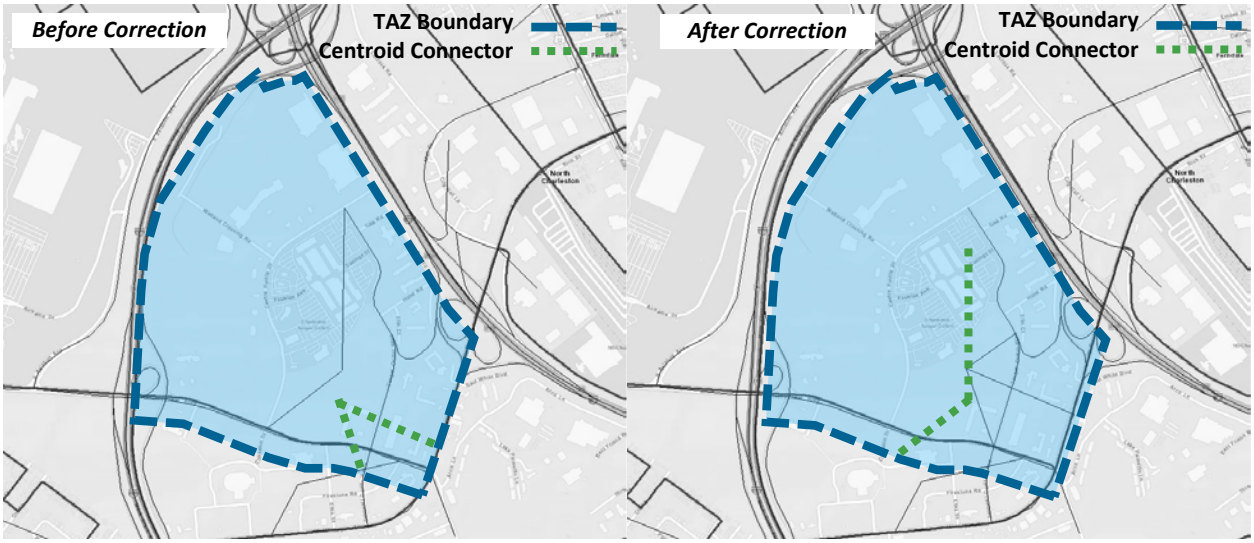
TAZ 615 extends from I-526 on the east to beyond Magwood Drive on the west, and from Ashley River Road on the north to Henry Tecklenburg Drive and Savage Road on the south. This is shown in **Figure 13**. The centroid is connected to the intersection of Paul Cantrell Boulevard and Magwood Drive in the *CHATS Interim TDM*. Since the daily observed and modeled volumes on the roads connecting at this point are within an acceptable level of difference, the TAZ structure and centroid connector were not changed. The new trips generated in the future conditions model have been manually reassigned among the north and south legs of Magwood Drive, to reflect the amount of developable land after 2015 within this TAZ.

Figure 14 – TAZ 427 on Leeds Avenue West of I-526



TAZ 427 is located between Paramount Drive and Leeds Avenue and between I-526 and Faber Place. This is shown in **Figure 14**. The placement of the centroid connector in the *CHATS Interim TDM* assigns this entire area to the I-526/Leeds Avenue Interchange. Modeled 2015 volumes for Leeds Avenue are 102% higher than the SCDOT AADT west of I-526, and 36% higher east of I-526. The difference between model and historical values on Leeds Avenue and Dorchester Road indicates that the model is not assigning traffic to Paramount Drive due to the placement of the centroid connector. A comparison of the freeway segments on either side of the Dorchester Avenue and Leeds Avenue interchanges indicates that the adjustments may be manually redistributed within TAZ 427. Base year turning movement counts were used to perform this redistribution.

Figure 15 – TAZ 347 along International Boulevard and Montague Avenue



TAZ 347 encompasses the retail development known as Centre Pointe, located between I-526 and Montague Avenue, and between I-26 and International Boulevard. This area includes a shopping mall, a Walmart superstore, and out parcel development such as restaurants and specialty retail, and office space. The *CHATS Interim TDM* shows a large portion of the TAZ trips assigned directly to Montague Avenue, which does not reflect the actual conditions. The TAZ centroid connector was reassigned to International Boulevard. The conditions before and after this correction are shown in **Figure 15**.

3.1.1.1.2 Traffic Volume Output Validation

A comparison was made between 2015 historical AADT volumes obtained from SCDOT, and the modeled 2015 base year volumes for those segments within the 526 LCC West project limits. The National Cooperative Highway Research Program (NCHRP) Report 765 entitled "Analytical Travel Forecasting Approaches for Project-Level Planning and Design" was referenced for applicable standards for acceptable error between the observed (SCDOT AADT) and the modeled (*CHATS Interim TDM*) daily volumes. There are several state or regional transportation agencies that have established maximum percentages of error. NCHRP Report 765 references Florida standards, which are reflected in this memorandum as "Acceptable" or "Preferable". The specific values are taken from the Florida Department of Transportation (FDOT) "2014 Project Forecasting Handbook". Comparisons between observed (SCDOT AADT) volumes and modeled (CHATS) volumes for the base year were limited to two-way daily values, as directional and peak hour count data was not available for the base year throughout the study area network. The base year observed and modeled daily volumes for the study area segments are shown in **Table 5**. The volume to count ratio and facility type is also listed for reference. The results of two numerical methods of comparison are shown in **Table 6** and **Table 7** for the 526 LCC West project study area. The Percentage Root Mean Square Error (%RMSE) is a commonly accepted method used to compare forecasting errors of models within a particular set of data. **Table 6** shows the %RMSE of each volume group. This is an appropriate application for this method of comparison, since %RMSE is scale dependent. **Table 7** lists the percent error between observed and model volumes by facility type (e.g. freeway, major arterial, minor arterial, and collector). Note that the classifications, initially listed in **Table 5**, are based on current SCDOT classifications. Those arterials classified as "principal" by SCDOT were considered "major" by FDOT standards. All other arterials were considered "minor".

Table 5 – Base Year Observed (SCDOT) and Modeled (CHATS) Volumes with Facility Type

Segment Facility Type	Description	2015 SCDOT AADT	2015 CHATS AADT	Volume to Count Ratio	% Error
Freeway	Sam Rittenberg Blvd (SC-7) to Paul Cantrell Blvd (SC-461)	39,400	29,291	0.74	-26%
Freeway	Paul Cantrell Blvd (SC-461) to Leeds Ave (SC-475)	79,200	82,397	1.04	4%
Freeway	Leeds Ave (SC-475) to Dorchester Rd (SC-642)	78,800	84,352	1.07	7%
Freeway	Dorchester Road (SC-642) to Montague Ave (SC-62)	80,700	78,313	0.97	-3%
Freeway	Montague Ave (SC-62) to International Blvd	68,100	65,367	0.96	-4%
Freeway	International Blvd to I-26	89,000	86,376	0.97	-3%
Freeway	I-26 to Rivers Ave (US-52)	77,200	66,240	0.86	-14%
Freeway	Rivers Ave (US 52) to N. Rhett Ave (S-60)	75,600	73,933	0.98	-2%
Freeway	N. Rhett Ave (S-60) to Virginia Ave (S-58)	80,500	88,875	1.10	10%
Freeway	Virginia Ave (S-58) to Clements Ferry Rd (S-33)	68,900	87,441	1.27	27%
Freeway	Cosgrove Ave (SC-7) to Dorchester Rd (SC-642)	99,300	86,036	0.87	-13%
Freeway	Dorchester Rd (SC-642) to Montague Ave (S-62)	97,400	88,458	0.91	-9%
Freeway	Montague Ave (S-62) to I-526	96,300	86,943	0.90	-10%
Freeway	I-526 to Remount Rd (S-13)	142,100	146,535	1.03	3%
Freeway	Remount Rd (S-13) to Aviation Ave (S-1342)	128,400	139,321	1.09	9%

Segment Facility Type	Description		2015 SCDOT AADT	2015 CHATS AADT	Volume to Count Ratio	% Error
Freeway	Aviation Ave (S-1342) to Ashley Phosphate Ave (S-75)		137,700	143,756	1.04	4%
Freeway	US 78 to US 52 Connector		102,600	100,450	0.98	-2%
Collector	Ashley Town Center Dr	E of US 17	5,600	6,881	1.23	23%
Collector	Virginia Ave	E of I-526	6,200	10,278	1.66	66%
Arterial-Minor	Remount Rd	W of I-26	6,600	6,575	1.00	0%
Arterial-Principal	W. Aviation Ave	W of I-26	7,900	5,062	0.64	-36%
Arterial-Principal	Dorchester Rd	E of I-26	8,600	10,998	1.28	28%
Collector	Leeds Ave	W of I-526	8,700	17,562	2.02	102%
Arterial-Minor	Montague Ave	W of I-526	9,300	14,163	1.52	52%
Collector	S. Aviation Avenue	S of Remount	9,400	2,152	0.23	-77%
Collector	Leeds Ave	S of SC 642	11,600	12,589	1.09	9%
Arterial-Principal	Virginia Ave	W of I-526	13,100	10,445	0.80	-20%
Arterial-Principal	Remount Rd	W of N Rhett	14,200	17,755	1.25	25%
Arterial-Minor	Montague Ave	E of I-526	15,000	15,821	1.05	5%
Arterial-Minor	N. Rhett Ave	E of I-526	15,000	27,304	1.82	82%
Collector	Leeds Ave	E of I-526	15,100	20,499	1.36	36%
Collector	Magwood Drive	N of Paul Cantrell	15,600	19,576	1.25	25%
Arterial-Minor	Montague Ave	E of I-26	19,100	24,274	1.27	27%
Arterial-Principal	Dorchester Rd	E of I-526	19,300	24,714	1.28	28%
Arterial-Principal	Dorchester Rd	W of I-26	19,300	14,828	0.77	-23%
Arterial-Minor	Ashley River Rd	E of I-526	20,700	19,061	0.92	-8%
Collector	Michaux Parkway	E of Dorchester	21,800	20,381	0.93	-7%
Arterial-Principal	Remount Rd	E of I-26	24,000	23,220	0.97	-3%
Arterial-Principal	SC 7	E of I-526	24,200	23,468	0.97	-3%
Arterial-Principal	W. Aviation Ave	E of I-26	24,300	24,946	1.03	3%
Arterial-Principal	Dorchester Rd	W of I-526	24,700	30,027	1.22	22%
Arterial-Minor	Ashley River Rd	W of I-526	25,900	23,882	0.92	-8%
Arterial-Minor	International Blvd	E of I-526	26,100	30,218	1.16	16%
Arterial-Principal	SC 7	W of I-526	26,900	25,252	0.94	-6%
Arterial-Principal	Rivers Ave	E of I-526	27,100	19,970	0.74	-26%
Arterial-Principal	Remount Rd	E of Rivers	28,100	31,616	1.13	13%
Arterial-Minor	N. Rhett Ave	N of Remount	30,300	50,561	1.67	67%
Arterial-Principal	Rivers Ave	W of I-526	31,600	35,512	1.12	12%
Arterial-Minor	N. Rhett Ave	W of I-526	32,000	58,960	1.84	84%
Arterial-Minor	Montague Ave	W of I-26	34,100	40,374	1.18	18%
Expwy-D	Paul Cantrell Blvd	E of I-526	36,800	42,279	1.15	15%
Arterial-Principal	Dorchester Rd	W of Michaux	38,600	48,546	1.26	26%
Arterial-Minor	International Blvd	W of I-526	39,200	48,375	1.23	23%
Arterial-Principal	US 17	E of I-526	39,600	44,605	1.13	13%
Arterial-Principal	US 52	NE of I-26	39,800	33,817	0.85	-15%
Arterial-Minor	Ashley Phosphate Rd	E of I-26	44,900	44,700	1.00	0%
Expwy-D	Paul Cantrell Blvd	W of Magwood	47,700	50,322	1.05	5%
Arterial-Principal	US 17	W of I-526	50,100	44,984	0.90	-10%
Expwy-D	Paul Cantrell Blvd	W of I-526	56,000	64,393	1.15	15%
Arterial-Minor	Ashley Phosphate Rd	W of I-26	62,000	61,657	0.99	-1%

Table 6 – Base Year Root Mean Square Error (%RMSE) by Volume Group

Volume Group	ADT		Number of Segments	%RMSE		
	From	To		Actual	Acceptable[1]	Preferable[1]
1	0	5,000	0	-	100.0%	45.0%
2	5,000	10,000	8	66.3%	45.0%	35.0%
3	10,000	15,000	3	24.8%	35.0%	27.0%
4	15,000	20,000	7	39.9%	30.0%	25.0%
5	20,000	30,000	11	14.0%	27.0%	15.0%
6	30,000	50,000	12	31.6%	25.0%	15.0%
7	50,000	60,000	2	18.5%	20.0%	10.0%
8	60,000	+	17	9.1%	19.0%	10.0%
All			60	17.4%	45.0%	35.0%

[1]*Source: Cambridge Systematics, Inc. FSUTMS-Cube Framework Phase II: Model Calibration and Validation Standards. Prepared for Florida Department of Transportation Systems Planning Office, 2008*

Table 7 – Base Year Percent Error and %RMSE by Facility Class

Facility Type	Number of Segments	% Error Standard		Actual	Model
		Acceptable[1]	Preferable[1]		%RMSE (actual)
Freeway	17	+/- 7%	+/- 6%	0.5%	9.6%
Major Arterial	21	+/- 15%	+/- 10%	4.1%	17.2%
Minor Arterial	14	+/- 15%	+/- 10%	22.5%	39.4%
Collector	8	+/-25%	+/- 20%	16.9%	45.2%
All	60	+/- 20%	+/- 15	4.6%	17.4%

[1]*Source: Cambridge Systematics, Inc. FSUTMS-Cube Framework Phase II: Model Calibration and Validation Standards. Prepared for Florida Department of Transportation Systems Planning Office, 2008*

The 2015 base year model results for the freeway volumes are within reasonable limits of the observed daily volumes based on the following:

- The segment of I-526 between Sam Rittenberg Boulevard and US 17, and the segment east of Virginia Avenue are beyond the generally accepted maximum error, at -26% and 27%, respectively, when compared to the observed volumes. Each of these segments is beyond the project termini. A separate forecast has been prepared for the latter segment as part of the LCC East corridor study (PEL) project, and peak hour design volumes have been coordinated/balanced between the two projects.

- The percentage error for the segments of I-526 between I-26 and Rivers Avenue, and between North Rhett Avenue and Virginia Avenue, at -14% and 10% respectively, are greater than acceptable for the facility class (freeway). However, the percentage error and the %RMSE of the high-volume group and freeway facility groups indicate acceptable results based on the FDOT standard.

- The model produces imbalances in volumes from segment to segment of freeway. Small percentages of error that fall within acceptable ranges produce larger percentages of error on adjacent arterials and connectors. Since the design (peak) hour has been established based on historical trends in freeway volumes, these imbalances are addressed and corrected more accurately at the peak hour level.

- New trips generated for the design year using the *CHATS Interim TDM* are based on link capacity and trip generation associated with growth in socioeconomic elements (employment, residential units, schools, etc.). An adjustment was made to the design year volumes produced by the model which reflected the difference between the base year observed and base year modeled volumes. This method was used because of the large error produced by the model in the base year volumes for many of the links within the study area. Values in **Table 5** show that daily volumes for some collectors and arterials that interchange with I-526 are exceed observed volumes by over 100 percent.

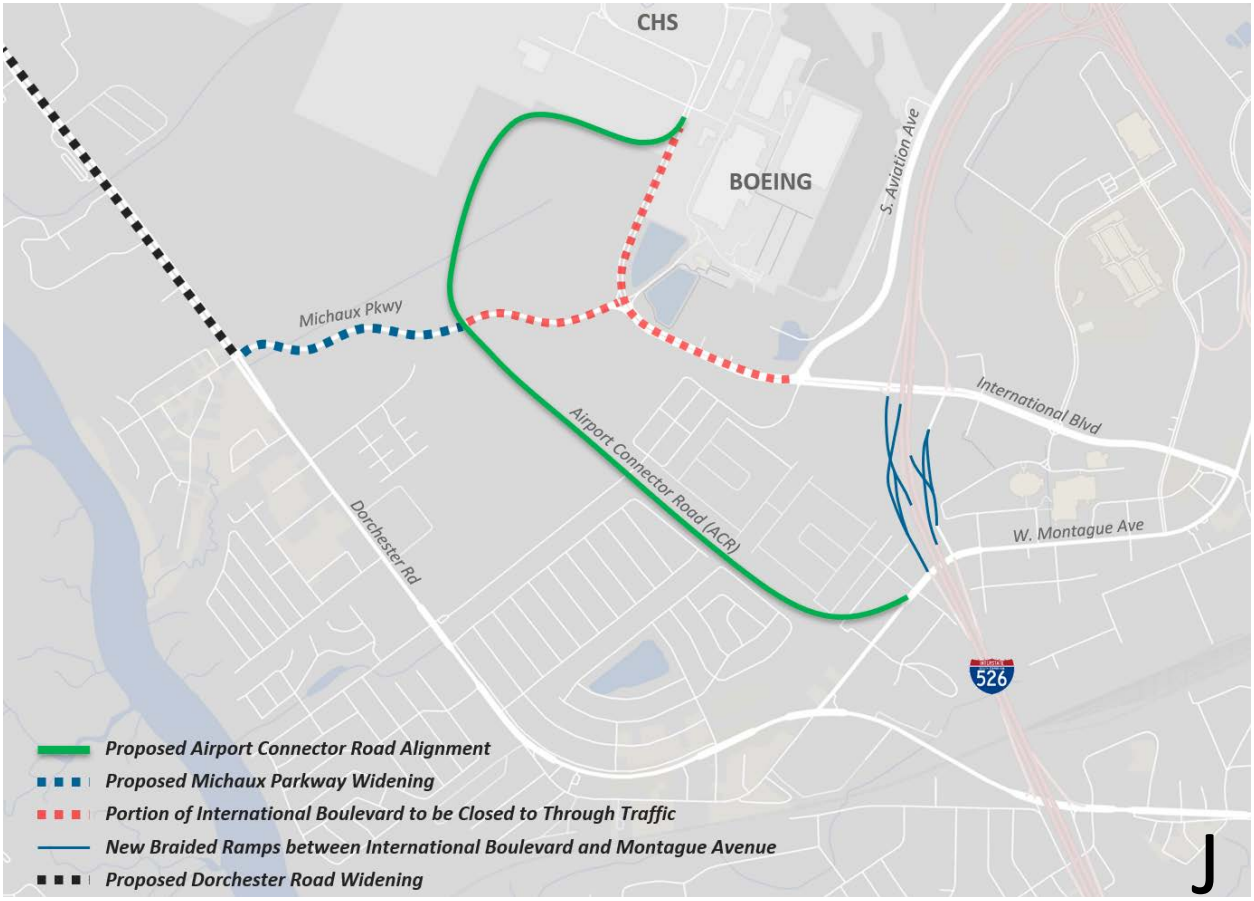
3.1.1.2 TDM Conditions for Future Forecast

With the base year model geometry and output volumes validated, the future year 2050 No Build and Build models were evaluated to ensure that the appropriate regional projects were included in each. There are projects in the region that will influence traffic operations within the 526 Lowcountry Corridor West (LCC West) project corridor. These projects will be completed prior to or concurrent with LCC West or completed within the 20-year period following the LCC West opening year. This section describes the assumptions of how these projects were considered in each of the future scenarios that were analyzed in the TDM. Below are descriptions of all regional projects considered for inclusion in either the 2050 No Build, the 2050 Build, or both 2050 No Build and Build models. Following the descriptions of these projects is a table which details which projects were included in each future year modeling scenario.

3.1.1.2.1 Project Descriptions

Airport Connector Road from Montague Avenue to Charleston International Airport (CHS) – This project is funded by Charleston County, and includes a new alignment road from Montague Avenue to CHS. This will be done in conjunction with the closure of International Boulevard west of South Aviation Avenue. The west leg of the International Boulevard and South Aviation Avenue intersection will become one of the main entrances to Boeing. This concept is illustrated in **Figure 16**.

Figure 16 – Airport Connector Road (ACR) Study Area



Airport Connector Road I-26 Ramps – The braided ramps, shown in **Figure 16**, along I-526 between International Boulevard and Montague Avenue were part of the I-526 concept development and are required to eliminate the failing weave between these two closely spaced interchanges. The Airport Connector Road project overloads the current I-526 Interchange at Montague Avenue, and a diverging diamond interchange (DDI) concept was developed to work in conjunction with the braided ramps.

Airport Connector Road I-526 Widening – Through discussions between Charleston County and SCDOT, the DDI on Montague Avenue below I-526, and the braided ramps will be advanced to coincide with the construction of the new alignment from Montague Avenue to CHS. In order to avoid overlapping the work at this interchange with the adjoining sections of LCC West, the option to include the mainline widening is being considered. It is anticipated that the additional lanes would not be used until the adjoining section(s) of I-526 are completed.

Michaux Parkway Widening – Michaux Parkway will be widened by Charleston County from two to four lanes between Dorchester Road and ACR, as shown in **Figure 16**. The remaining portion of Michaux Parkway between the Airport Connector Road and International Boulevard will be converted to a Boeing plant entrance.

Dorchester Road Widening – This is a project funded by Charleston County to widen Dorchester Road from four lanes to six lanes from the Dorchester County line to Michaux Parkway, as shown in **Figure 16**.

I-26 Widening from I-526 to Port Access Road – This project involves widening I-26 from six lanes to eight lanes. LCC West would connect directly to this project. Note that this project was not included in the future models based on input from SCDOT that the project is not likely to be built.

Glenn McConnel Parkway Widening – This is a project funded by Charleston County that includes widening from four lanes to six lanes between Bees Ferry Road and Essex Farms Drive. The remainder of the corridor, from Essex Farms Drive to I-526, is already six lanes.

Palmetto Commerce Interchange – This is a project funded by Charleston County and/or the SC Department of Commerce, which will result in a new interchange on I-26 approximately 1 mile east of the US 78 Interchange.

Palmetto Commerce Parkway Phase 3 – his Charleston County project will extend Palmetto Commerce Parkway from its current terminus at Ashley Phosphate Road to Remount Road. One of the conceptual alignments is shown in **Figure 18**. The project is funded by Charleston County and the SC Department of Commerce.

526 Lowcountry Corridor East (LCC East) – This project adjoins the 526 LCC West project at the Cooper River and extends to US 17 North in Mount Pleasant, as shown in **Figure 17**. The project is currently identified as a corridor planning study under FHWA's Planning and Environmental Linkages (PEL) framework. The assumed conditions of the 526 LCC East project in the design year include 8-lanes between Virginia Avenue and Clements Ferry Road and 6-lanes between Clements Ferry Road and Long Point Road.

Figure 17 – 526 Lowcountry Corridor West and East

Lowcountry Rapid Transit – This is a planned project for a 23-mile bus rapid transit corridor between Summerville and Charleston. The project will parallel I-26 in the US 78 right of way**.**

Mark Clark Extension – This project involves extending I-526 past US 17 in West Ashley. The project at this time is assumed to include the construction of a Single Point Urban Interchange (SPUI) at the I-526 intersection with US 17 (Savannah Highway), as shown in **Figure 19**.

Figure 18 – Palmetto Commerce Parkway Phase 3 Potential Alignment

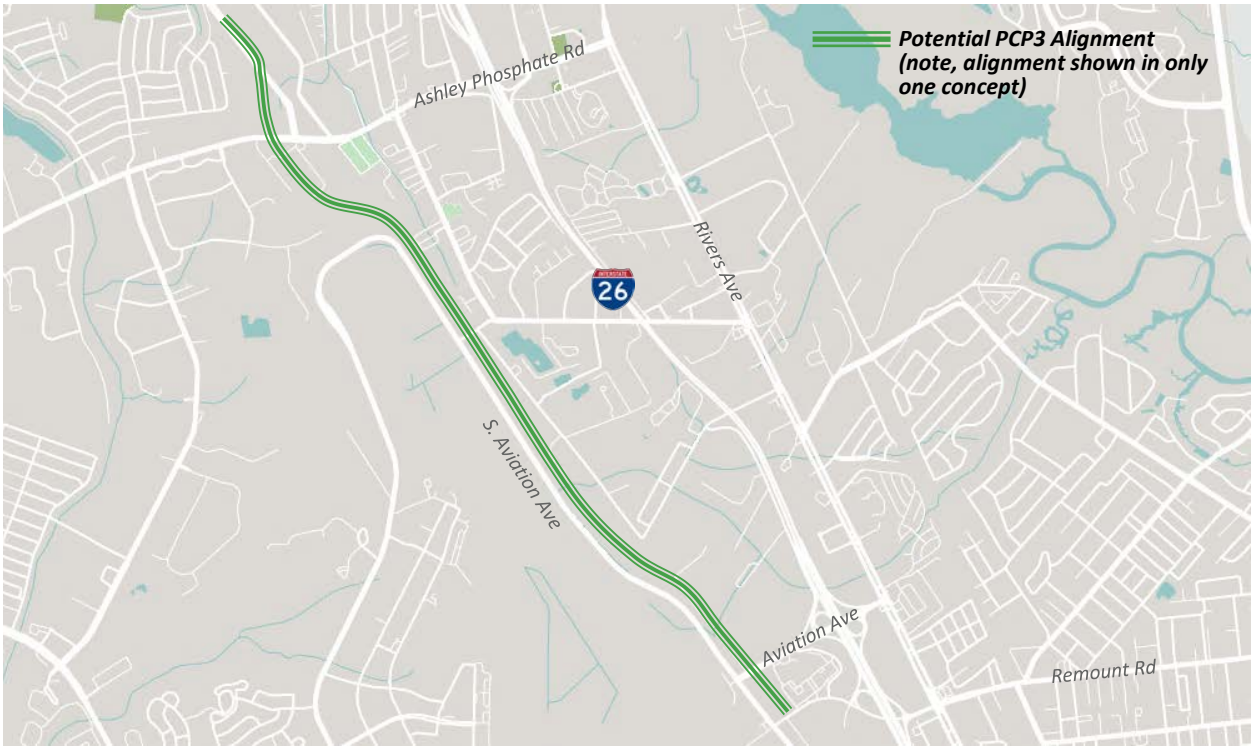


Figure 19 – Mark Clark Expressway Alternative Geometry at I-526 & US 17

Table 8 indicates the assumed condition for the future No Build and Build conditions for the 2050 Travel Demand forecast. A check mark, "✓", indicates that this project was included in the CHATS model geometry modeled to project future traffic projections for each condition.

Table 8 – Assumed Conditions for Committed Projects included in TDM Forecast

Project	LCC West No-Build	LCC West Build	Project Design Year
I-526 Lowcountry Corridor West (*This Project*)		✓	2050
Mark Clark Extension	✓	✓	Unknown
Airport Connector Road from Montague to CHS	✓	✓	2045
Airport Connector Road I-526 Ramps	✓	✓	2050[1]
Airport Connector Road I-526 Widening		✓	2050[1]
I-26 Widening from I-526 to Port Access Road			Unknown
Dorchester Road Widening	✓	✓	Unknown
Glenn McConnell Parkway Widening	✓	✓	Unknown
Palmetto Commerce Interchange	✓	✓	2040
Palmetto Commerce Parkway Phase 3	✓	✓	2045
526 Lowcountry Corridor East (LCC East)		✓	2050[1]
Lowcountry Rapid Transit	✓	✓	2025[2]

[1] *Design year updated with the rest of the LCC West network.*

[2] *Federal Transit Agency bases design on opening year, in this case 2025.*

As shown in **Table 8**, the geometric revisions to the future year 2050 No Build CHATS model were made to represent the regional projects anticipated, with four exceptions:

- I-526 Lowcountry Corridor West was not included in the future No Build modeling as it is the subject of this project's Build analysis.
- Airport Connector Road I-526 Widening was not included in the future No Build modeling as it is a widening of a section of I-526, related to the 526 LCC West project.
- I-26 Widening from I-526 to Port Access Road was not included in the future No Build modeling as it is not anticipated to be completed prior to the 2050 design year.
- I-526 Lowcountry Corridor East was not included in the future No Build modeling as it is not anticipated to be completed prior to (or without completion of) the 526 LCC West project.

The geometric revisions made to the future year 2050 Build CHATS model included all regional projects anticipated, with one exception:

- I-26 Widening from I-526 to Port Access Road was not included in the future Build modeling as it is not anticipated to be completed prior to the 2050 design year.

Finally, while the design year of the Mark Clark Extension project is uncertain, it was included in both the No Build and Build future models, as it is not dependent on the completion of the 526 LCC West project. It is anticipated to increase traffic demand volumes along I-526, and was therefore included in both No Build and build scenarios.

3.2 2050 Design Year Traffic Volume Projections

The purpose of this section is to recommend projected 2050 Design Year No Build and Build Condition Annual Average Daily Traffic (AADT) as well as AM and PM peak design hour traffic volumes for the 526 LCCW project. For freeway segments, the interchanges generally define the ends of these segments. For cross streets, volumes and growth were evaluated beyond the interchange ramps. The CHATS model includes a large number of segments which are consistent with the nodes in the study area. The study segments of I-526 and I-26 are listed in **Table 9.**

Table 9 – I-526 and I-26 Corridor Segments

Facility	Segment Number	Count Station No.	Segment Description
I-526	1	2501	Sam Rittenberg Blvd (SC 7) to Paul Cantrell Blvd (SC 461)
	2	2505	Paul Cantrell Blvd (SC 461) to Leeds Ave (SC 475)
	3	2507	Leeds Ave (SC-475) to Dorchester Rd (SC-642)
	4	2509	Dorchester Road (SC-642) to Montague Ave (SC-62)
	5	2511	Montague Ave (SC-62) to International Blvd
	5A	2511	International Blvd to I-26
	6	2513	I-26 to Rivers Ave (US-52)
	7	2515	Rivers Ave (US-52) to N. Rhett Ave (S-60)
	8	2516	N. Rhett Ave (S-60) to Virginia Ave (S-58)
	9	2517	Virginia Ave (S-58) to Clements Ferry Rd (S-33)
I-26	1	2201	Cosgrove Ave (SC 7) to Dorchester Rd (SC 642)
	2	2197	Dorchester Rd (SC 642) to Montague Ave (S-62)
	3	2196	Montague Ave (S-62) to I-526
	4	2195	I-526 to Remount Rd (S-13)
	5	2193	Remount Rd (S-13) to Aviation Ave (S-1342)
	6	2191	Aviation Ave (S-1342) to Ashley Phosphate Ave (S-75)
	7	2187	US 78 to US 52 Connector

3.2.1 Travel Demand Forecasting

The Charleston Area Transportation Study (CHATS) travel demand model has a base year of 2015, and includes analysis years of 2015, 2020, 2030, and 2040. Forecasts for 2050 were based on a trend analysis within the model completed by CDM Smith and documented in the CHATS Modification Technical Memorandum. The CHATS model was used to compare base year (2015) to horizon year (2050) daily volumes along the I-526 and I-26 corridors as well as at study area cross-streets. Projected 2050 Design Year traffic volumes were developed for both No Build and Build conditions. Modeling of the 2050 Design Year No Build conditions included modeling the geometry of the I-526 corridor in its existing conditions, generally consisting of 2 lanes in each direction, with auxiliary lanes that exist today.

Modifications for Build Conditions incorporated 526 LCCW design concepts. Specifically, the collector-distributor (C-D) concept that was a key element in function of System Interchange at I-26. Under the C-D concept, westbound I-526 traffic bound for I-26 enters a new C-D road near the North Rhett Avenue Interchange. Traffic from North Rhett and Virginia Avenue have access to both the C-D road, and to the existing westbound lanes of I-526, which would be designated for traffic continuing west beyond I-26 or which will exit at Rivers Avenue. Traffic entering eastbound I-526 from I-26 will also utilize a C-D road which will merge with the existing eastbound I-526 lanes in the vicinity of North Rhett Avenue. Both No Build and Build Conditions included all other regional projects as listed in **Table 8** in the previous section.

Trip generation within the CHATS model is driven by the land use plans of the municipalities along and connected to the I-526 Lowcountry Corridor. These land use plans were developed by each of the municipalities in conformance with the 1994 State Comprehensive Planning Act (SC Code Title 6, Chapter 29). The traffic forecast differs between the 2050 No Build and 2050 Build alternatives due to capacity differences in each, but the projected land use along and within the connected communities is the same.

As discussed in the previous section, the Airport Connector Road (ACR) is a project that will result in relocating the I-526 access point to the Charleston International Airport (CHS) from the International Boulevard interchange to the West Montague Avenue interchange. The project will include removal of through traffic on International Boulevard between South Aviation Avenue and Michaux Parkway. Upon review of the CHATS model in the vicinity of this project, it was determined that one single Traffic Analysis Zone (TAZ #346) encompasses CHS, Boeing, and much of Joint Base Charleston. The socioeconomic (SE) data assigned to this TAZ does not accurately reflect the combined employment forecast within it, and therefore would not be expected to produce reasonable trip generation.

An independent *Airport Connector Road (ACR) Traffic Study* was under way concurrently with the traffic analysis for this I-526 Lowcountry Corridor West project. The ACR project team completed a traffic analysis for the ACR project which forecasted traffic distribution and volumes along the new ACR, Dorchester Road, West Montague Avenue, International Boulevard, and South Aviation Avenue. This ACR forecast quantified trips by origin and destination, distinguishing between volumes of regular commuters, those originating or terminating at Boeing, and those originating or terminating at the Airport.

The data collection and analysis completed for this independent ACR project, which included input from Charleston County Aviation Authority staff and Boeing, was deemed to be more accurate than the trip generation from the TAZ SE data within the BCDCOG CHATS travel demand model. The SE data was therefore removed/zeroed out of this TAZ for future year modeling. The redistribution of the commuter, Boeing and CHS traffic was then applied at the peak hour level for both No Build and Build Condition traffic volumes. This approach is also supported by the distinctly differing peaks generated by pass-through commuters (traditional peaks), airport patrons (influenced by flight times) and Boeing (shift changes that are offset from traditional peaks). The AM and PM peak hour volumes associated with Boeing and the Airport resulting from this independent Airport Connector Road study are shown in **Appendix 3.1**. In order to project AADT associated with these peak hour volumes throughout the network, a K-factor of 0.90 was assumed based on the average K-factor throughout the network. As a matter of reference, this detailed trip generation process for the Charleston International Airport (CHS) and Boeing land uses resulted in 46,244 daily trips traveling to and from the CHS and Boeing sites in the 2050 design year. Comparatively, the socioeconomic data from the TAZ within the CHATS model generates 77,422 daily trips in the design year, almost 70% higher.

3.2.1.1 Base Year Comparison

The base year of the *CHATS Interim TDM* is 2015. A comparison of the 2015 AADT from the model and those from the SCDOT counts reveal varying degrees of model error from the historical count. The magnitude of model error varies, as illustrated in **Table 10.**

Table 10 – SCDOT vs. CHATS 2015 AADT

Roadway	Segment	2015 SCDOT AADT	2015 CHATS AADT	Percent Error
I-526	1	39,400	29,291	-26%
	2	79,200	82,397	4%
	3	78,800	84,352	7%
	4	80,700	78,313	-3%
	5	68,100	65,367	-4%
	5A	89,000	86,376	-3%
	6	77,200	66,240	-14%
	7	75,600	73,933	-2%
	8	80,500	88,875	10%
	9	68,900	87,441	27%
I-26	1	99,300	86,036	-13%
	2	97,400	88,458	-9%
	3	96,300	86,943	-10%
	4	142,100	146,535	3%
	5	128,400	139,321	9%
	6	137,700	143,756	4%
	7	102,600	100,450	-2%
US 17	W of I-526	50,100	44,984	-10%
	E of I-526	39,600	44,605	13%
SC 7	W of I-526	26,900	25,252	-3%
	E of I-526	24,200	23,468	-3%
Ashley Town Center Dr	E of US 17	5,600	6,881	23%
Paul Cantrell Blvd	W of Magwood	43,800	50,322	15%
	W of I-526	56,000	64,393	15%
	E of I-526	36,800	42,279	15%
Ashley River Rd	W of I-526	25,900	23,882	-8%
	E of I-526	20,700	19,061	-8%
Leeds Ave	W of I-526	8,700	17,562	102%
	E of I-526	15,100	20,499	36%
	S of SC 642	11,600	12,589	9%
Dorchester Rd	W of I-526	24,700	30,027	22%
	E of I-526	19,300	24,714	28%
	W of I-26	19,300	14,828	-23%
	E of I-26	8,600	10,998	28%
	W of Michaux	38,600	48,546	26%
Michaux Pkwy	E of Dorchester	21,800	20,381	-7%
Montague Ave	W of I-526	9,300	14,163	6%
	E of I-526	15,000	15,821	5%
	W of I-26	34,100	40,374	18%
	E of I-26	19,100	24,274	18%
International Blvd	W of I-526	39,200	48,375	23%
	E of I-526	26,100	30,218	16%
Airport Connector Rd	N of Montague	NA	NA	NA

Roadway	Segment	2015 SCDOT AADT	2015 CHATS AADT	Percent Error
S. Aviation Ave	S of Remount	9,400	2,152	-77%
Rivers Ave	W of I-526	31,600	35,512	12%
	E of I-526	27,100	19,970	-26%
N. Rhett Ave	W of I-526	32,000	58,960	84%
	E of I-526	15,000	27,304	84%
	N of Remount	30,300	50,561	67%
Virginia Ave	W of I-526	13,100	10,445	-20%
	E of I-526	6,200	10,278	66%
Remount Rd	W of I-26	6,600	6,575	-3%
	E of I-26	24,000	23,220	-3%
	E of Rivers	28,100	31,616	13%
	W of N Rhett	14,200	17,755	25%
W. Aviation Ave	W of I-26	7,900	5,062	-36%
	E of I-26	24,300	24,946	3%
Ashley Phosphate Rd	W of I-26	62,000	61,657	-1%
	E of I-26	44,900	44,700	0%
US 52 Connector	NE of I-26	39,800	33,817	-15%

Modifications to and evaluation of the base year conditions in the *CHATS Interim TDM* are documented in **Section 3.1.1.1 – TDM Base Year Evaluation**. The validation process indicates that the deviation of base year modeled volumes from the historical counts is reasonable, given the following:

The segments within the freeway facility class (I-526 and I-26) meet generally accepted standard for modeled volume when considered as a group within the project study area. The freeway segments all fall within a volume group that exceeds 60,000 vehicles per day, except that portion of I-526 between Sam Rittenberg Boulevard and US 17/Savannah Highway. This volume group meets generally accepted standards for modeled volume. The segment that falls in a lower volume group is outside the project termini. The method for balancing future volumes in the network (peak hour) begins with freeway volume and balances "outward" toward arterial and collector streets in the first iteration. Minor adjustments back to the freeway were made, but the freeway mainline volumes are not substantially changed after the model growth (added trips, 2050) is added. Horizon year AADTs are calculated by identifying new trips generated by the CHATS model as a result of SE growth, and adding these trips to the base year counts (SCDOT AADT), more particularly illustrated by the following formulas:

No Build Conditions:

2050 No Build $AADT_{adj}$ = 2015 SCDOT ADT + (2050 No Build CHATS ADT – 2015 CHATS ADT) + Boeing/Airport ADT

Build Conditions:

2050 Build $AADT_{adj}$ = 2015 SCDOT ADT + (2050 CHATS ADT – 2015 CHATS ADT) + Boeing/Airport ADT

Therefore, 2050 No-Build $AADT_{adj}$ and 2050 Build $AADT_{adj}$ are the CHATS model ADT for each scenario in the 2050 forecast adjusted to the base year count volumes. The model volumes are adjusted to the base year counts, assuming their accuracy in accordance with the "Traffic Monitoring Guide" published by the Federal Highway Administration (FHWA). The CHATS No Build and Build 2050 $AADT_{adj}$ for each roadway segment is shown in **Table 11** and **Table 12,** respectively.

Table 11 – 2050 No Build Adjusted CHATS AADT

Corridor	Segment	CHATS		SCDOT	CHATS (Adjusted)		
		2015 AADT	2050 No Build AADT	2015 AADT	Boeing/ Airport AADT	2050 No Build $AADT_{adj}$	Annual Growth*
I-526	1	29,291	46,302	39,400	3,444	59,855	1.48%
	2	82,397	99,117	79,200	10,183	106,103	0.97%
	3	84,352	100,208	78,800	10,183	104,839	0.94%
	4	78,313	91,674	80,700	7,844	101,905	0.75%
	5	65,367	78,622	68,100	5,589	86,244	0.80%
	5A	86,376	90,308	89,000	16,106	109,038	0.64%
	6	66,240	72,164	77,200	6,789	89,913	0.47%
	7	73,933	96,041	75,600	6,789	104,497	1.09%
	8	88,875	123,661	80,500	6,789	122,075	1.48%
	9	87,441	121,777	68,900	6,789	110,025	1.71%
I-26	1	86,036	110,294	99,300	2,861	126,419	0.78%
	2	88,458	120,578	97,400	8,878	138,398	1.20%
	3	86,943	121,411	96,300	1,344	132,112	1.06%
	4	146,535	185,915	142,100	7,972	189,452	0.95%
	5	139,321	176,395	128,400	7,972	173,446	1.00%
	6	143,756	178,606	137,700	7,972	180,522	0.89%
	7	100,450	143,729	102,600	5,022	150,901	1.35%
US 17	W of I-526	44,984	54,924	50,100	1,411	61,451	0.65%
	E of I-526	44,605	52,518	39,600	1,183	48,696	0.66%
SC 7	W of I-526	25,252	37,053	26,900	500	38,301	1.35%
	E of I-526	23,468	37,887	24,200	850	39,469	1.80%
Ashley Town Ctr Dr	E of US 17	6,881	8,839	5,600	-	7,558	1.00%
Paul Cantrell Blvd	W of Magwood	50,322	72,320	43,800	4,572	70,370	1.73%
	W of I-526	64,393	84,837	56,000	4,572	81,016	1.28%
	E of I-526	42,279	47,940	36,800	2,167	44,628	0.61%
Ashley River Rd	W of I-526	23,882	29,071	25,900	-	31,089	0.57%
	E of I-526	19,061	23,072	20,700	-	24,711	0.55%
Leeds Ave	W of I-526	17,562	23,613	8,700	-	14,751	1.99%
	E of I-526	20,499	24,894	15,100	-	19,495	0.83%
	S of SC 642	12,589	17,445	11,600	-	16,456	1.20%
Dorchester Rd	W of I-526	30,027	37,591	24,700	2,722	34,986	1.19%
	E of I-526	24,714	30,309	19,300	444	25,339	0.89%
	W of I-26	14,828	17,318	19,300	444	22,234	0.43%
	E of I-26	10,998	16,591	8,600	-	14,193	1.86%
	W of Michaux	48,546	49,148	38,600	6,572	45,774	0.53%

Corridor	Segment	CHATS		SCDOT	CHATS (Adjusted)		
		2015 AADT	2050 No Build AADT	2015 AADT	Boeing/ Airport AADT	2050 No Build $AADT_{adj}$	Annual Growth*
Michaux Pkwy	E of Dorchester	20,381	15,146	21,800	7,433	23,998	0.29%
Montague Ave	W of I-526	14,163	26,174	9,300	19,778	45,189	6.78%
	E of I-526	15,821	22,274	15,000	5,778	27,231	2.33%
	W of I-26	40,374	38,169	34,100	7,533	39,428	0.45%
	E of I-26	24,274	25,010	19,100	-	21,236	0.10%
International Blvd	W of I-526	48,375	7,475	39,200	12,500	19,975	-1.40%
	E of I-526	30,218	24,582	26,100	4,422	24,886	-0.13%
Airport Connector Rd	W of W. Mont.	N/A	17,936	N/A	21,889	39,825	NA
S. Aviation Ave	S of Remount	2,152	7,475	9,400	3,061	17,784	2.55%
Rivers Ave	W of I-526	35,512	55,689	31,600	-	51,777	1.82%
	E of I-526	19,970	27,166	27,100	-	34,296	0.76%
N. Rhett Ave	W of I-526	58,960	76,787	32,000	-	49,827	1.59%
	E of I-526	27,304	39,259	15,000	-	26,755	2.31%
	N of Remount	50,561	72,960	30,300	-	52,699	2.11%
Virginia Ave	W of I-526	10,445	13,754	13,100	-	16,409	0.72%
	E of I-526	10,278	14,307	6,200	-	10,229	1.86%
Remount Rd	W of I-26	6,575	24,228	6,600	-	24,453	7.42%
	E of I-26	23,220	38,366	24,000	-	39,146	1.80%
	E of Rivers	31,616	38,060	28,100	-	34,544	0.66%
	W of N Rhett	17,755	22,229	14,200	-	18,674	0.90%
W. Aviation Ave	W of I-26	5,062	18,713	7,900	-	21,551	4.94%
	E of I-26	24,946	38,057	24,300	-	37,411	1.54%
Ashley Phosphate Rd	W of I-26	61,657	52,127	62,000	-	52,470	-0.44%
	E of I-26	44,700	57,775	44,900	-	57,975	0.83%
US 52 Connector	NE of I-26	33,817	39,044	39,800	2,950	47,977	0.59%

** Annual growth is average linear rate*

Table 12 – 2050 Build Adjusted CHATS AADT

Corridor	Segment	CHATS		SCDOT	CHATS (Adjusted)		
		2015 AADT	2050 Build AADT	2015 AADT	Boeing/ Airport AADT	2050 Build $AADT_{adj}$	Annual Growth*
I-526	1	29,291	54,892	39,400	3,444	68,445	2.11%
	2	82,397	129,742	79,200	10,183	136,728	2.08%
	3	84,352	129,411	78,800	10,183	134,042	2.00%
	4	78,313	116,940	80,700	7,844	127,171	1.65%
	5	65,367	101,920	68,100	5,589	109,542	1.79%
	5A	86,376	108,021	89,000	16,106	126,751	1.21%
	6	66,240	98,483	77,200	6,789	116,232	1.44%
	7	73,933	118,137	75,600	6,789	126,593	1.93%
	8	88,875	149,859	80,500	6,789	148,273	2.41%
	9	87,441	145,576	68,900	6,789	133,824	2.69%
I-26	1	86,036	106,187	99,300	2,861	122,312	0.66%
	2	88,458	113,583	97,400	8,878	131,403	1.00%
	3	86,943	116,153	96,300	1,344	126,854	0.91%
	4	146,535	182,805	142,100	7,972	186,342	0.89%
	5	139,321	179,531	128,400	7,972	176,582	1.07%
	6	143,756	183,082	137,700	7,972	184,998	0.98%
	7	100,450	146,188	102,600	5,022	153,360	1.41%
US 17	W of I-526	44,984	54,293	50,100	1,411	60,820	0.61%
	E of I-526	44,605	52,201	39,600	1,183	48,379	0.63%
SC 7	W of I-526	25,252	36,452	26,900	500	37,700	1.29%
	E of I-526	23,468	35,596	24,200	850	37,178	1.53%
Ashley Town Ctr Dr	E of US 17	6,881	9,007	5,600	-	7,726	1.08%
Paul Cantrell Blvd	W of Magwood	50,322	71,011	43,800	4,572	69,061	1.65%
	W of I-526	64,393	107,606	56,000	4,572	103,785	2.44%
	E of I-526	42,279	55,048	36,800	2,167	51,736	1.16%
Ashley River Rd	W of I-526	23,882	16,388	25,900	-	18,406	-0.83%
	E of I-526	19,061	16,388	20,700	-	18,027	-0.37%
Leeds Ave	W of I-526	17,562	23,664	8,700	-	14,802	2.00%
	E of I-526	20,499	32,212	15,100	-	26,813	2.22%
	S of SC 642	12,589	13,307	11,600	-	12,318	0.18%
Dorchester Rd	W of I-526	30,027	37,404	24,700	2,722	34,799	1.17%
	E of I-526	24,714	26,367	19,300	444	21,397	0.31%
	W of I-26	14,828	16,950	19,300	444	21,866	0.38%
	E of I-26	10,998	15,965	8,600	-	13,567	1.65%
	W of Michaux	48,546	51,213	38,600	6,572	47,839	0.68%

Corridor	Segment	CHATS		SCDOT	CHATS (Adjusted)		
		2015 AADT	2050 Build AADT	2015 AADT	Boeing/ Airport AADT	2050 Build $AADT_{adj}$	Annual Growth*
Michaux Pkwy	E of Dorchester	20,381	17,617	21,800	7,433	26,469	0.61%
Montague Ave	W of I-526	14,163	29,692	9,300	19,778	48,707	7.53%
	E of I-526	15,821	20,259	15,000	5,778	25,216	1.95%
	W of I-26	40,374	36,950	34,100	7,533	38,209	0.34%
	E of I-26	24,274	26,189	19,100	-	22,415	0.27%
International Blvd	W of I-526	48,375	10,312	39,200	12,500	22,812	-1.19%
	E of I-526	30,218	28,383	26,100	4,422	28,687	0.28%
Airport Connector Rd	W of W. Mont.	N/A	20,815	N/A	21,889	42,704	NA
S. Aviation Ave	S of Remount	2,152	10,312	9,400	3,061	20,621	3.41%
Rivers Ave	W of I-526	35,512	60,283	31,600	-	56,371	2.24%
	E of I-526	19,970	27,166	27,100	-	34,296	0.76%
N. Rhett Ave	W of I-526	58,960	83,711	32,000	-	56,751	2.21%
	E of I-526	27,304	36,435	15,000	-	23,931	1.76%
	N of Remount	50,561	75,824	30,300	-	55,563	2.38%
Virginia Ave	W of I-526	10,445	11,937	13,100	-	14,592	0.33%
	E of I-526	10,278	13,440	6,200	-	9,362	1.46%
Remount Rd	W of I-26	6,575	22,977	6,600	-	23,202	6.89%
	E of I-26	23,220	37,400	24,000	-	38,180	1.69%
	E of Rivers	31,616	37,227	28,100	-	33,711	0.57%
	W of N Rhett	17,755	23,199	14,200	-	19,644	1.10%
W. Aviation Ave	W of I-26	5,062	16,756	7,900	-	19,594	4.23%
	E of I-26	24,946	37,037	24,300	-	36,391	1.42%
Ashley Phosphate Rd	W of I-26	61,657	53,586	62,000	-	53,929	-0.37%
	E of I-26	44,700	54,885	44,900	-	55,085	0.65%
US 52 Connector	NE of I-26	33,817	39,692	39,800	2,950	48,625	0.63%

** Annual growth is average linear rate*

3.2.2 Recommended 2050 AADTs

As a matter of comparison to the projected growth rates from the CHATS model as noted in the tables above, the historical count data from available SCDOT stations through 2017 were analyzed. Historic counts, based on SCDOT station locations, are not located in every segment. Some cross streets, for example, only have historic counts on one side of the interstate. In these cases, the historic counts are predicted for the segment on the other side of the interstate proportionately, based on the relative CHATS volumes in the same year. Twenty years of data was evaluated where available. Portions of I-526 within the study area had been open just a few years at the beginning of this period and removing the first few years from the analysis was appropriate to avoid inclusion of major traffic reassignments in the trend data. Some of the cross streets were opened or had major expansions within the last 20 years and shorter analysis periods were used to determine reasonable trends. The historical count data was analyzed in the following categories:

- 2050 Trendline Projection: To account for significant anomalies, linear regression analysis was performed for the last 20 years of data (1997 to 2017). The slope of the trendline was then divided by the base year AADT to determine a projected linear growth rate.
- 20-Year Linear Growth: Linear growth was used based on the distribution of data points for the facilities, and for more direct comparison with the CHATS model data. This is a summary of the growth trends over the past 20 years and is useful to see how growth has developed within the area over time.
- 2007 to 2017 Linear Growth: This linear growth over the past 10 years was examined because it includes the combination of an economic recession followed by a strong recovery period.
- 2012 to 2017 Linear Growth: The growth trend of the past 5 years was evaluated because it reflects a period of overall economic growth for the region. The economic growth may correspond to growth within certain segments or cross streets, and not others.

The results of the various methods of illustrating trends in historical AADT are shown for each roadway segment in **Table 13**, alongside the resulting growth factors from the CHATS model analysis. Note that for the CHATS model growth, associated growth rates included for comparison are those calculated from the adjusted 2050 No Build and Build CHATS AADT.

Upon comparison of these growth factors, due to the substantial effort put into developing the 2050 future No Build CHATS model (including incorporating anticipated projects as listed previously), as well as the process of adjusting the future CHATS model AADTs according to base year SCDOT counts, the recommended AADTs for each segment (and associated growth rates) were taken to be the 2050 Adjusted No Build CHATS AADTs, with the exception that a minimum of 1.00% linear annual growth rate was used in an effort to be conservative (recognizing that a minimum amount of assumed growth is prudent on sections of the interstate and cross-streets that are currently or are anticipated to be capacity constrained, and as a result, have fewer trips applied by the CHATS model).

The recommended growth rates are listed in the last column of **Table 13**. Note that for N. Rhett Avenue and Virginia Avenue west of I-526, the recommended growth rates are 1.59% and 1.00%, for the No Build Conditions, respectively and 2.21% and 1.00% for the Build Conditions, respectively. After this growth rate analysis was concluded, additional data became available via the Public Comment Period from the South Carolina State Ports Authority concerning increased truck traffic projected along these roadways west of I-526. A memorandum competed by CDM Smith in February 2020, titled “Trip Generation Data of Marine Terminal and Intermodal Facility in the Interim CHATS Model and Data received during public comment period for LCC West and East” concluded that with the maximum projected additional trucks along these roadways, the annual growth rates would be 1.35% and 0.95%, respectively. Therefore, because the growth rates based on the analysis in this report are greater than these percentages, no update to the recommended growth rates were made.

Table 14 shows the base year 2015 SCDOT AADT along with the recommended 2050 No Build and Build AADT for each segment of I-526 and I-26 as well as cross-streets in the study area.

Table 13 – Comparison of No Build and Build Condition Linear Annual Growth Rates

Corridor	Segment	SCDOT AADT				2050 No Build Conditions		2050 Build Conditions	
		2050 Trendline Projection	20-Year Historical	10-Year Historical	5-Year Historical	$CHATS_{adj}$ Model Growth	Recommended Growth Rate*	$CHATS_{adj}$ Model Growth	Recommended Growth Rate*
I-526	1	1.94%	3.70%	1.44%	0.79%	1.48%	**1.48%**	2.11%	**2.11%**
	2	1.34%	2.16%	0.96%	1.72%	0.97%	**1.00%**	2.08%	**2.08%**
	3	1.41%	2.14%	0.82%	1.44%	0.94%	**1.00%**	2.00%	**2.00%**
	4	1.43%	2.13%	0.98%	1.57%	0.75%	**1.00%**	1.65%	**1.65%**
	5	N/A	N/A	N/A	N/A	0.80%	**1.00%**	1.79%	**1.79%**
	5A	1.42%	2.31%	1.42%	1.72%	0.64%	**1.00%**	1.21%	**1.21%**
	6	1.43%	2.93%	1.51%	1.96%	0.47%	**1.00%**	1.44%	**1.44%**
	7	1.59%	3.23%	1.67%	2.48%	1.09%	**1.09%**	1.93%	**1.93%**
	8	1.95%	4.49%	2.39%	3.52%	1.48%	**1.48%**	2.41%	**2.41%**
	9	2.35%	5.28%	1.69%	2.80%	1.71%	**1.71%**	2.69%	**2.69%**
I-26	1	1.15%	2.03%	1.40%	3.16%	0.78%	**1.00%**	0.66%	**1.00%**
	2	1.10%	1.97%	1.26%	2.96%	1.20%	**1.20%**	1.00%	**1.00%**
	3	0.95%	2.02%	1.60%	4.36%	1.06%	**1.06%**	0.91%	**1.00%**
	4	0.91%	2.13%	1.69%	4.68%	0.95%	**1.00%**	0.89%	**1.00%**
	5	0.90%	1.89%	1.14%	4.34%	1.00%	**1.00%**	1.07%	**1.07%**
	6	1.43%	3.10%	2.87%	5.78%	0.89%	**1.00%**	0.98%	**1.00%**
	7	2.04%	3.93%	1.68%	3.05%	1.35%	**1.35%**	1.41%	**1.41%**
US 17	W of I-526	N/A	N/A	N/A	2.06%	0.65%	**1.00%**	0.61%	**1.00%**
	E of I-526	-0.22%	0.46%	-0.35%	1.73%	0.66%	**1.00%**	0.63%	**1.00%**
SC 7	W of I-526	N/A	N/A	N/A	N/A	1.35%	**1.35%**	1.29%	**1.29%**
	E of I-526	-0.33%	0.08%	-0.26%	-0.79%	1.80%	**1.80%**	1.53%	**1.53%**
Ashley Town Ctr Dr	E of US 17	N/A	N/A	-2.91%	1.40%	1.00%	**1.00%**	1.08%	**1.08%**
Paul Cantrell Blvd	W of Magwood	N/A	N/A	N/A	N/A	1.73%	**1.73%**	1.65%	**1.65%**
	W of I-526	N/A	N/A	N/A	N/A	1.28%	**1.28%**	2.44%	**2.44%**
	E of I-526	0.68%	1.35%	0.68%	1.10%	0.61%	**1.00%**	1.16%	**1.16%**
Ashley River Rd	W of I-526	N/A	N/A	N/A	N/A	0.57%	**1.00%**	-0.83%	**1.00%**
	E of I-526	-0.77%	-0.21%	-1.78%	-0.48%	0.55%	**1.00%**	-0.37%	**1.00%**
Leeds Ave	W of I-526	-0.21%	0.64%	-1.29%	2.56%	1.99%	**1.99%**	2.00%	**2.00%**
	E of I-526	-0.91%	0.17%	-1.43%	2.29%	0.83%	**1.00%**	2.22%	**2.22%**
	S of SC 642	-0.67%	-0.21%	-0.87%	1.28%	1.20%	**1.20%**	0.18%	**1.00%**
Dorchester Rd	W of I-526	-0.84%	-0.41%	-1.64%	0.85%	1.19%	**1.19%**	1.17%	**1.17%**
	E of I-526	-0.23%	0.48%	0.59%	3.10%	0.89%	**1.00%**	0.31%	**1.00%**
	W of I-26	-0.23%	0.48%	0.59%	3.10%	0.43%	**1.00%**	0.38%	**1.00%**
	E of I-26	-0.17%	-0.70%	0.15%	1.25%	1.86%	**1.89%**	1.65%	**1.65%**
	W of Michaux	0.40%	0.29%	-0.16%	-0.41%	0.53%	**1.00%**	0.68%	**1.00%**

Corridor	Segment	SCDOT AADT				2050 No Build Conditions		2050 Build Conditions	
		2050 Trendline Projection	20-Year Historical	10-Year Historical	5-Year Historical	$CHATS_{adj}$ Model Growth	Recommended Growth Rate*	$CHATS_{adj}$ Model Growth	Recommended Growth Rate*
Michaux Pkwy	E of Dorchester	N/A	N/A	N/A	N/A	0.29%	**1.00%**	0.61%	**1.00%**
Montague Ave	W of I-526	N/A	N/A	N/A	N/A	6.78%	**6.78%**	7.53%	**7.53%**
	E of I-526	-0.12%	0.50%	0.55%	3.88%	2.33%	**2.33%**	1.95%	**1.95%**
	W of I-26	1.99%	2.68%	0.85%	2.66%	0.45%	**1.00%**	0.34%	**1.00%**
	E of I-26	N/A	N/A	N/A	N/A	0.10%	**1.00%**	0.27%	**1.00%**
International Blvd	W of I-526	N/A	N/A	2.41%	3.84%	-1.40%	**-1.40%**	-1.19%	**-1.19%**
	E of I-526	N/A	N/A	N/A	0.70%	-0.13%	**1.00%**	0.28%	**1.00%**
Airport Connector Rd	W of W. Mont.	N/A	NA	N/A	N/A	NA	**NA**	NA	**NA**
S. Aviation Ave	S of Remount	N/A	N/A	N/A	N/A	2.55%	**2.55%**	3.41%	**3.41%**
Rivers Ave	W of I-526	0.61%	0.79%	0.59%	-0.89%	1.82%	**1.82%**	2.24%	**2.24%**
	E of I-526	-0.58%	0.10%	0.68%	3.76%	0.76%	**1.00%**	0.76%	**1.00%**
N. Rhett Ave	W of I-526	0.80%	2.26%	1.23%	3.49%	1.59%	**1.59%**	2.21%	**2.21%**
	E of I-526	N/A	N/A	N/A	N/A	2.31%	**2.31%**	1.76%	**1.76%**
	N of Remount	2.09%	3.19%	0.59%	1.64%	2.11%	**2.11%**	2.38%	**2.38%**
Virginia Ave	W of I-526	2.32%	3.15%	3.68%	4.79%	0.72%	**1.00%**	0.33%	**1.00%**
	E of I-526	2.32%	2.07%	-0.17%	-2.15%	1.86%	**1.86%**	1.46%	**1.46%**
Remount Rd	W of I-26	N/A	N/A	N/A	N/A	7.42%	**7.42%**	6.89%	**6.89%**
	E of I-26	4.08%	3.30%	6.94%	-3.15%	1.80%	**1.80%**	1.69%	**1.69%**
	E of Rivers	-0.04%	0.15%	-1.32%	-0.14%	0.66%	**1.00%**	0.57%	**1.00%**
	W of N Rhett	-0.02%	0.11%	-1.27%	0.00%	0.90%	**1.00%**	1.10%	**1.10%**
W. Aviation Ave	W of I-26	N/A	N/A	N/A	N/A	4.94%	**4.94%**	4.23%	**4.23%**
	E of I-26	0.82%	0.12%	-2.83%	-4.24%	1.54%	**1.54%**	1.42%	**1.42%**
Ashley Phosphate Rd	W of I-26	0.87%	0.63%	0.39%	0.24%	-0.44%	**-0.44%**	-0.37%	**-0.37%**
	E of I-26	N/A	N/A	N/A	N/A	0.83%	**0.83%**	0.65%	**0.65%**
US 52 Connector	NE of I-26	0.81%	1.15%	1.43%	1.74%	0.59%	**0.59%**	0.63%	**0.63%**

** Recommended growth rate is average annual growth rate*
*** Negative growth rate for International Blvd was accepted due to reassignment of non-Boeing traffic to Airport Connector Road*
**** Negative growth rate for Ashley Phosphate Road was accepted due to reassignment of traffic due to PCP3*

Table 14 – Recommended 2050 AADTs along Segments of I-526, I-26, and Cross-Streets

Corridor	Segment	2015 SCDOT AADT	2050 No Build Conditions		2050 Build Conditions	
			Percent Linear Growth	Recommended AADT	Percent Linear Growth	Recommended AADT
I-526	1	39,400	1.48%	**59,800**	2.11%	**68,500**
	2	79,200	1.00%	**106,900**	2.08%	**136,900**
	3	78,800	1.00%	**106,400**	2.00%	**134,000**
	4	80,700	1.00%	**108,900**	1.65%	**127,300**
	5	67,400	1.00%	**91,000**	1.79%	**109,600**
	5A	89,000	1.00%	**120,200**	1.21%	**126,700**
	6	77,200	1.00%	**104,200**	1.44%	**116,100**
	7	75,600	1.09%	**104,400**	1.93%	**126,700**
	8	80,500	1.48%	**122,200**	2.41%	**148,400**
	9	68,900	1.71%	**110,100**	2.69%	**133,800**
I-26	1	99,300	1.00%	**134,100**	1.00%	**134,100**
	2	97,400	1.20%	**138,300**	1.00%	**131,500**
	3	96,300	1.06%	**132,000**	1.00%	**130,000**
	4	142,100	1.00%	**191,800**	1.00%	**191,800**
	5	128,400	1.00%	**173,300**	1.07%	**176,500**
	6	137,700	1.00%	**185,900**	1.00%	**185,900**
	7	102,600	1.35%	**151,100**	1.41%	**153,200**
US 17	W of I-526	50,100	1.00%	**67,600**	1.00%	**67,600**
	E of I-526	39,600	1.00%	**53,500**	1.00%	**53,500**
SC 7	W of I-526	26,000	1.35%	**38,300**	1.29%	**37,700**
	E of I-526	24,200	1.80%	**39,400**	1.53%	**37,200**
Ashley Town Ctr Dr	E of US 17	5,600	1.00%	**7,600**	1.08%	**7,700**
Paul Cantrell Blvd	W of Magwood	43,800	1.73%	**70,300**	1.65%	**69,100**
	W of I-526	56,000	1.28%	**81,100**	2.44%	**103,800**
	E of I-526	36,800	1.00%	**49,700**	1.16%	**51,700**
Ashley River Rd	W of I-526	25,900	1.00%	**35,000**	1.00%	**35,000**
	E of I-526	20,700	1.00%	**27,900**	1.00%	**27,900**
Leeds Ave	W of I-526	8,700	1.99%	**14,800**	2.00%	**14,800**
	E of I-526	15,100	1.00%	**20,400**	2.22%	**26,800**
	S of SC 642	11,600	1.20%	**16,500**	1.00%	**15,700**
Dorchester Rd	W of I-526	24,700	1.19%	**35,000**	1.17%	**34,800**
	E of I-526	19,300	1.00%	**26,100**	1.00%	**26,100**
	W of I-26	19,300	1.00%	**26,100**	1.00%	**26,100**
	E of I-26	8,600	1.89%	**14,300**	1.65%	**13,600**
	W of Michaux	38,600	1.00%	**52,100**	1.00%	**52,100**
Michaux Pkwy	E of Dorchester	21,800	1.00%	**29,400**	1.00%	**29,400**

Corridor	Segment	2015 SCDOT AADT	2050 No Build Conditions		2050 Build Conditions	
			Percent Linear Growth	Recommended AADT	Percent Linear Growth	Recommended AADT
Montague Ave	W of I-526	13,400	6.78%	**45,200**	7.53%	**48,700**
	E of I-526	15,000	2.33%	**27,200**	1.95%	**25,200**
Montague Ave	W of I-26	34,100	1.00%	**46,000**	1.00%	**46,000**
	E of I-26	20,500	1.00%	**27,700**	1.00%	**27,700**
International Blvd	W of I-526	39,200	-1.40%	**20,000**	-1.19%	**22,800**
	E of I-526	26,100	1.00%	**35,200**	1.00%	**35,200**
Airport Connector Rd	W of W. Montague	N/A	NA	**39,800**	NA	**42,700**
S. Aviation Ave	S of Remount	9,400	2.55%	**17,800**	3.41%	**20,600**
Rivers Ave	W of I-526	31,600	1.82%	**51,700**	2.24%	**56,400**
	E of I-526	27,100	1.00%	**36,600**	1.00%	**36,600**
N. Rhett Ave	W of I-526	32,000	1.59%	**49,800**	2.21%	**56,800**
	E of I-526	14,800	2.31%	**26,800**	1.76%	**23,900**
	N of Remount	30,300	2.11%	**52,700**	2.38%	**55,500**
Virginia Ave	W of I-526	13,100	1.00%	**17,700**	1.00%	**17,700**
	E of I-526	6,200	1.86%	**10,200**	1.46%	**9,400**
Remount Rd	W of I-26	6,800	7.42%	**24,500**	6.89%	**23,200**
	E of I-26	24,000	1.80%	**39,100**	1.69%	**38,200**
	E of Rivers	28,100	1.00%	**37,900**	1.00%	**37,900**
	W of N Rhett	14,200	1.00%	**19,200**	1.10%	**19,700**
W. Aviation Ave	W of I-26	7,900	4.94%	**21,600**	4.23%	**19,600**
	E of I-26	24,300	1.54%	**37,400**	1.42%	**36,400**
Ashley Phosphate Rd	W of I-26	62,000	-0.44%	**52,500**	-0.37%	**53,900**
	E of I-26	44,900	0.83%	**58,800**	0.65%	**55,100**
US 52	NE of I-26	39,800	0.59%	**48,000**	0.63%	**48,600**

3.2.3 2050 AM and PM Design Hour Development

For most of the corridor segments in the network, future 2050 No Build and Build AM and PM design hour volumes were developed by applying the base year K-factors for each respective corridor segment to the recommended 2050 No Build and Build AADTs, as described above. Directional design hour volumes were then developed by applying the base year D-factors for each respective corridor segment to the 2050 No Build DHVs. Due to some significant changes in the network (some of which are not directly associated with the I-526 Improvement Project) anticipated between the writing of this report and the 2050 design year, there were several segments for which the process to develop DHV and DDHV differed:

Glenn McConnell Parkway/Paul Cantrell Boulevard (W of Magwood Drive): Due to the significant changes anticipated concerning how traffic exiting I-526 is distributed to Paul Cantrell Boulevard/Glenn McConnell Parkway, the K-factor used to forecast DHV along this segment was assumed to be the same K-factor as the segment of Paul Cantrell Boulevard between I-526 and Magwood Drive.

Magwood Drive: The Traffic Analysis Zone (TAZ) for the area north and south of Glenn McConnell Parkway west of I-526 is constructed such that both the areas north and south of Glenn McConnell are represented in one large TAZ. Therefore, while the daily volumes from the model along Glenn McConnell/Paul Cantrell Boulevard are indicative of anticipated growth, the volumes along Magwood Drive are not split proportionately between traffic entering Paul Cantrell Boulevard from the north and from the south. Therefore, some judgements needed to be made about how the growth represented in the model would be assigned. Based on observed existing land use, the area to the north of Glenn McConnell Parkway is built out for the most part, with little opportunity for further development. Additionally, with the expectation that Ashley River Road will not be widened in the future, little traffic growth along Magwood Drive north of Glenn McConnell is expected. However, south of Glenn McConnell, there is ample opportunity for development, particularly within and along the existing ring road of Henry Tecklenburg Drive. Therefore, an assumption was made that 80% of the growth forecasted by the model for this large TAZ would be assigned to Magwood Drive south of Glenn McConnell Parkway while only 20% of the growth was assigned to Magwood Drive north of Glenn McConnell Parkway.

Montague Avenue (W of I-526): Due to the addition of the Airport Connector Road and the redistribution of traffic associated with it, the K and D factors along Montague Avenue west of I-526 were assumed based on the results of the previously performed traffic analysis for the Airport Connector Road project. Therefore, along this segment, the K-factor was 0.09 for the AM peak condition and 0.12 for the PM peak condition and the D-factors were 0.52 and 0.59 for the AM and PM peak conditions, respectively.

Airport Connector Road (new roadway): Due to the addition of the Airport Connector Road and the redistribution of traffic associated with it, the K and D factors along the Airport Connector Road were assumed based on the results of the previously performed traffic analysis for the Airport Connector Road project. Therefore, along this segment, the K-factor was 0.09 for the AM peak condition and 0.11 for the PM peak condition and the D-factor was 0.55 for the AM peak condition and 0.55 for the PM peak condition.

International Boulevard (W of I-526): Due to the addition of the Airport Connector Road and the redistribution of traffic associated with it, the K and D factors along the Airport Connector Road were assumed based on the results of the previously performed traffic analysis for the Airport Connector Road project. Therefore, along this segment, the K-factor was 0.09 for both the AM and PM peak conditions and the D-factor was 0.63 for the both the AM and PM peak conditions.

Remount Road and Aviation Ave (W of I-526): Due to the anticipated Palmetto Commerce Parkway (PCP) extension to Remount Road, directional splits along Remount Road and Aviation Avenue west of I-526 were reversed such that the peak directions were eastbound in the AM condition and westbound in the PM condition, This occurs because, with its completion, PCP becomes a parallel alternative to I-26 and Rivers Avenue between the Ladson Road and US 78 corridors and I-526. **Figure 18** illustrates the proposed alignment of Palmetto Commerce Parkway.

Finally, in order to maintain consistency with the 526 Lowcountry Corridor East, the projected Build Condition AM and PM 2050 DDHVs for the I-526 segment east of Virginia Avenue were balanced with projections for this segment. The No Build Condition AM and PM 2050 DDHVs for this same segment were not balanced with the projections with the 526 Lowcountry Corridor East project, as it is not included as a regional project in the CHATS model for the No Build Conditions, as explained previously.

With design hour volumes and directional design hour volumes established, ramp volumes and turning movement volumes at ramp termini and other adjacent intersections were developed according to the growth in DDHV on the segment(s) which they fed, with the objective of generally matching base year turning movement distributions at approaches, except where significant changes in land use or roadway network (i.e. International Boulevard, W. Montague Avenue, Airport Connector Road, etc.) justified otherwise. For new movements or new movement paths (i.e. the new elevated through movement along Glenn McConnell traveling westbound, or the new CD roadways along I-526 and I-26), percentages of the previously established DDHVs were assigned according to origin/destination matrices developed using Bluetooth sensor data collected in 2015.

With directional design hour volumes, ramp volumes and turning movement volumes established, a volume balancing process was completed to rectify any imbalances between segments or intersections.

3.2.4 2050 AM and PM Design Hour Volumes

The 2050 No Build Design Year AM and PM Peak Hour Design volumes are shown in **Figure 20, Figure 21, Figure 22, Figure 23, Figure 24,** and **Figure 25** below.

The 2050 Build Design Year AM and PM Peak Hour Design volumes are shown in **Figure 26**, **Figure 27**, **Figure 28**, **Figure 29**, **Figure 30**, and **Figure 31** below.

Figure 20 – 2050 No Build Peak Hour Traffic Volumes (Sheet 1 of 6)

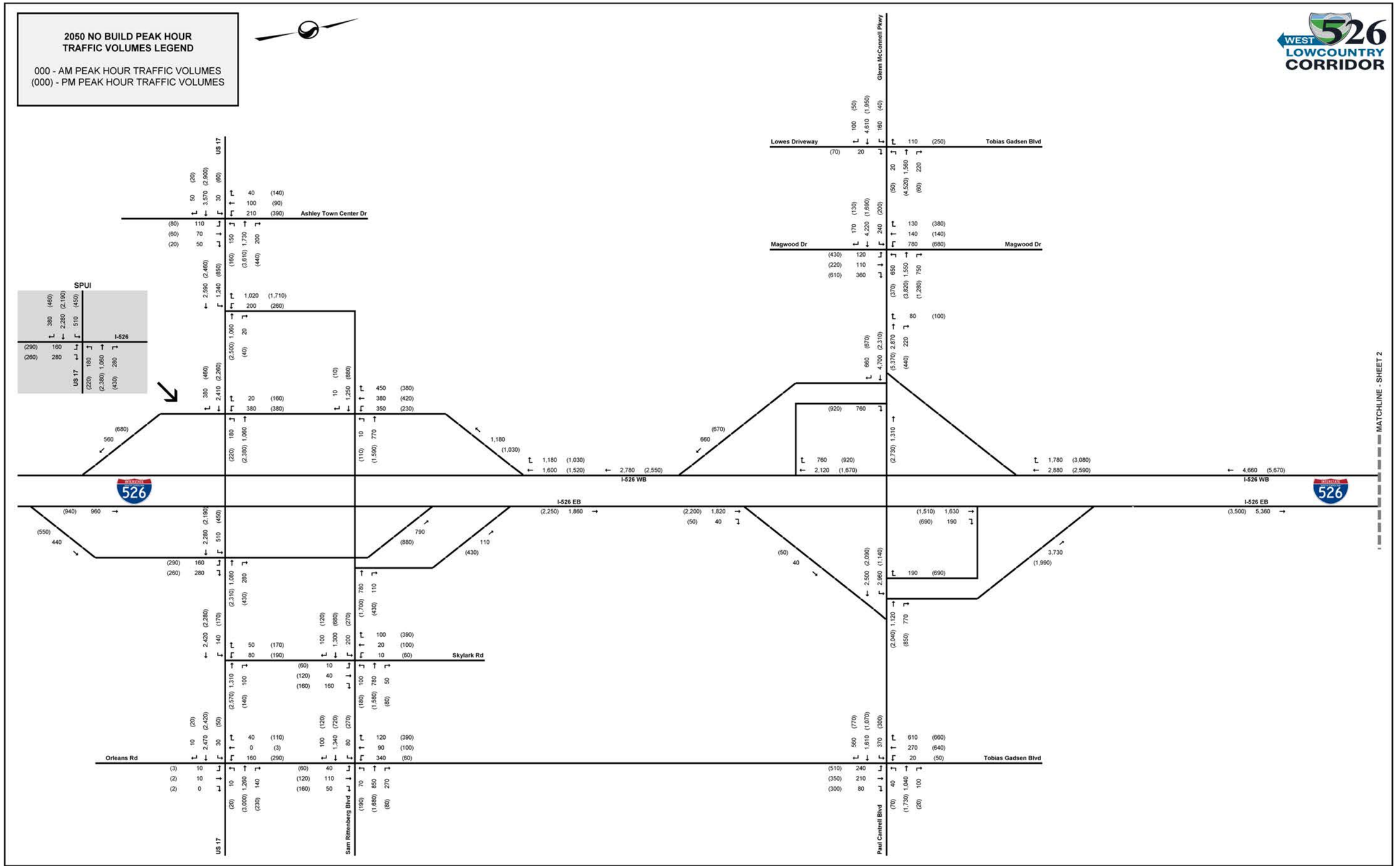


Figure 21 – 2050 No Build Peak Hour Traffic Volumes (Sheet 2 of 6)

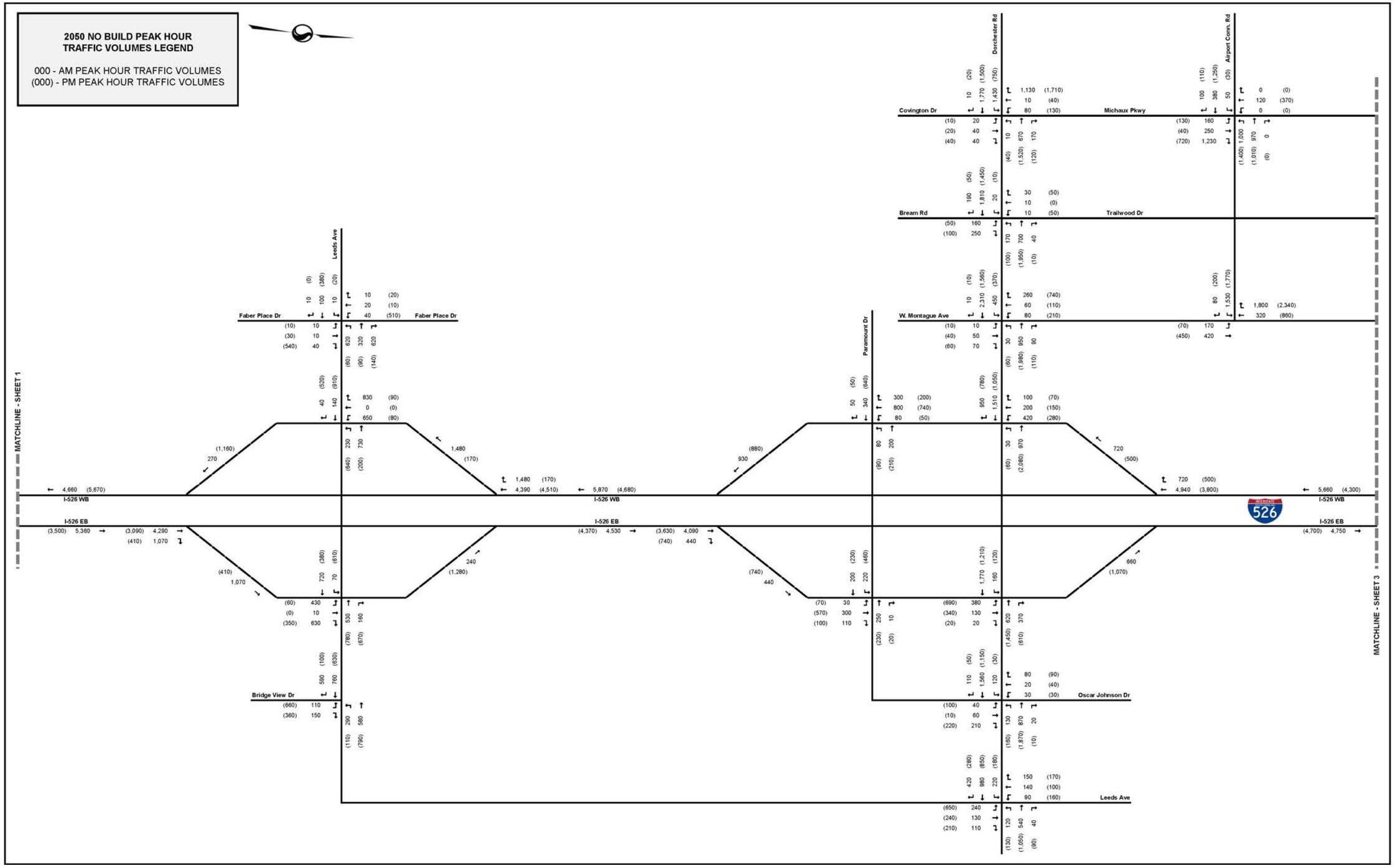


Figure 22 – 2050 No Build Peak Hour Traffic Volumes (Sheet 3 of 6)

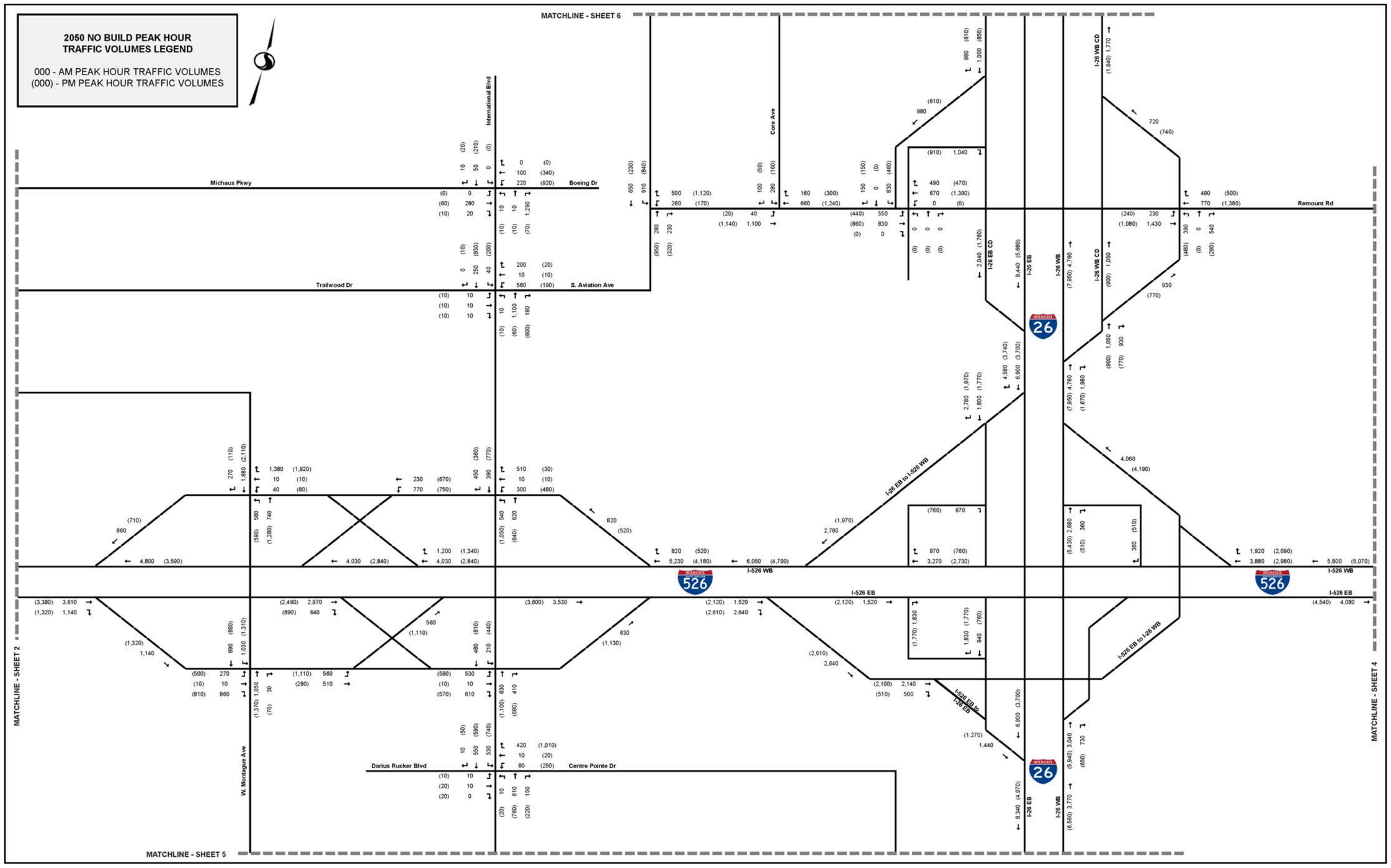


Figure 23 – 2050 No Build Peak Hour Traffic Volumes (Sheet 4 of 6)

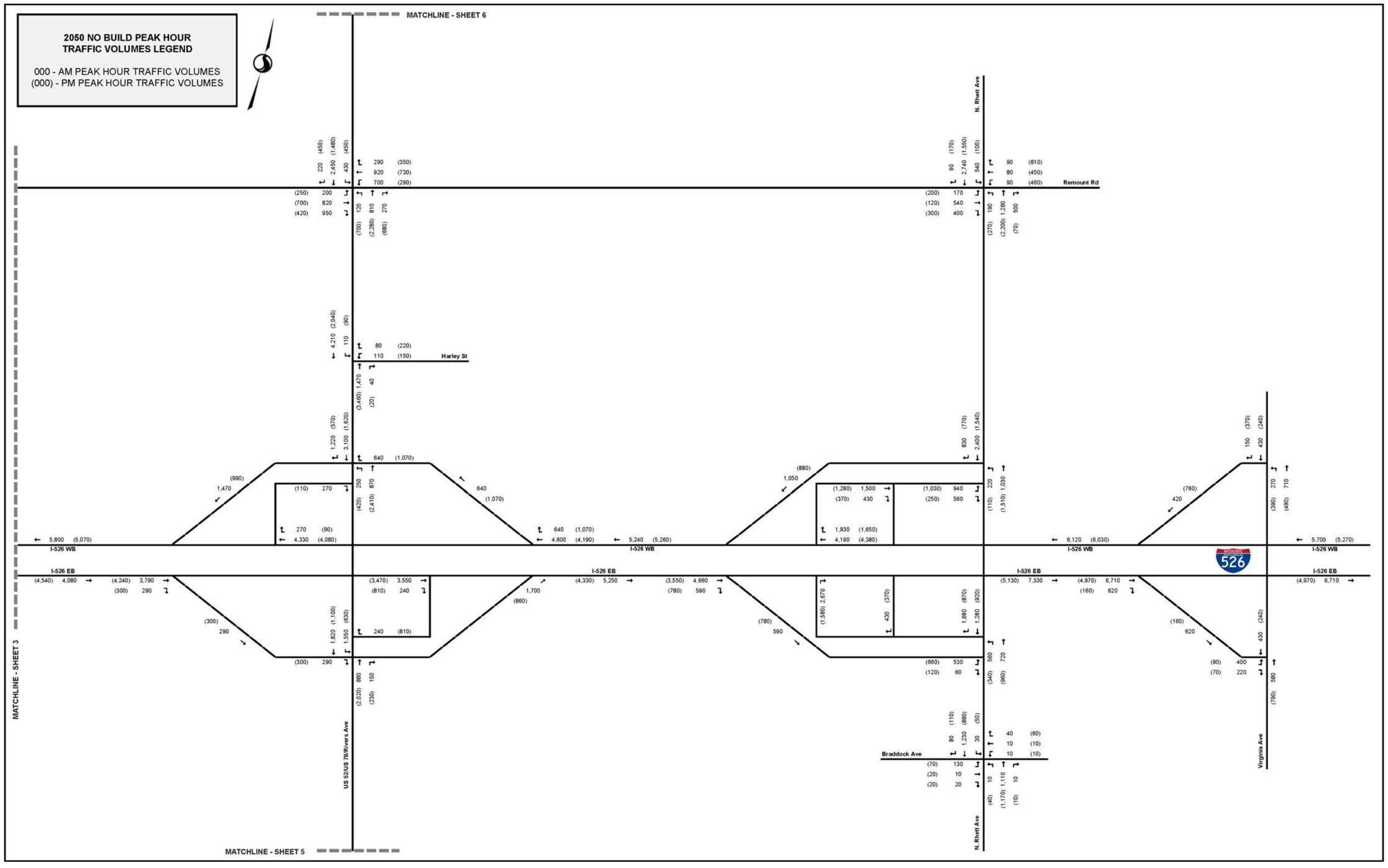


Figure 24 – 2050 No Build Peak Hour Traffic Volumes (Sheet 5 of 6)

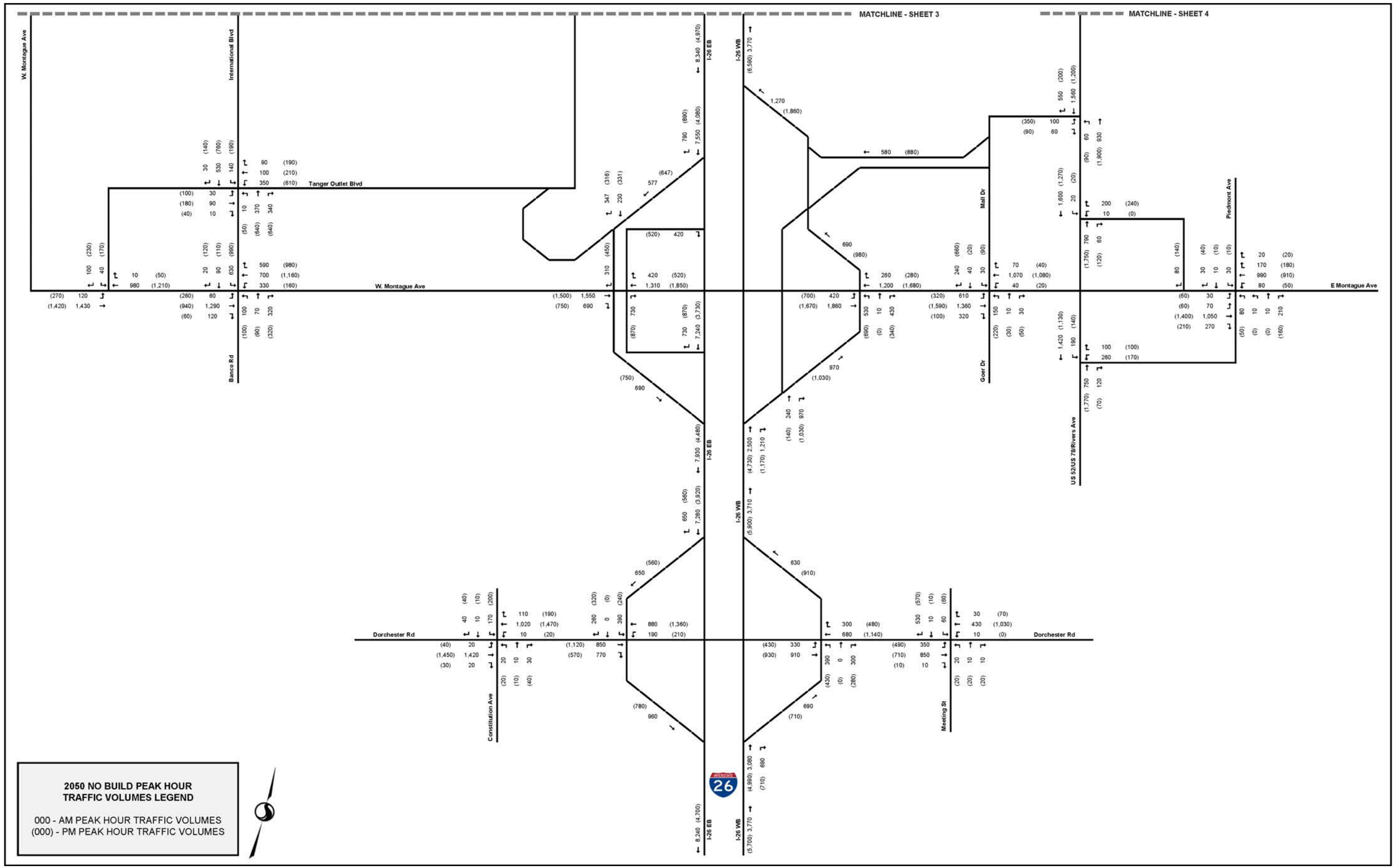


Figure 25 – 2050 No Build Peak Hour Traffic Volumes (Sheet 6 of 6)

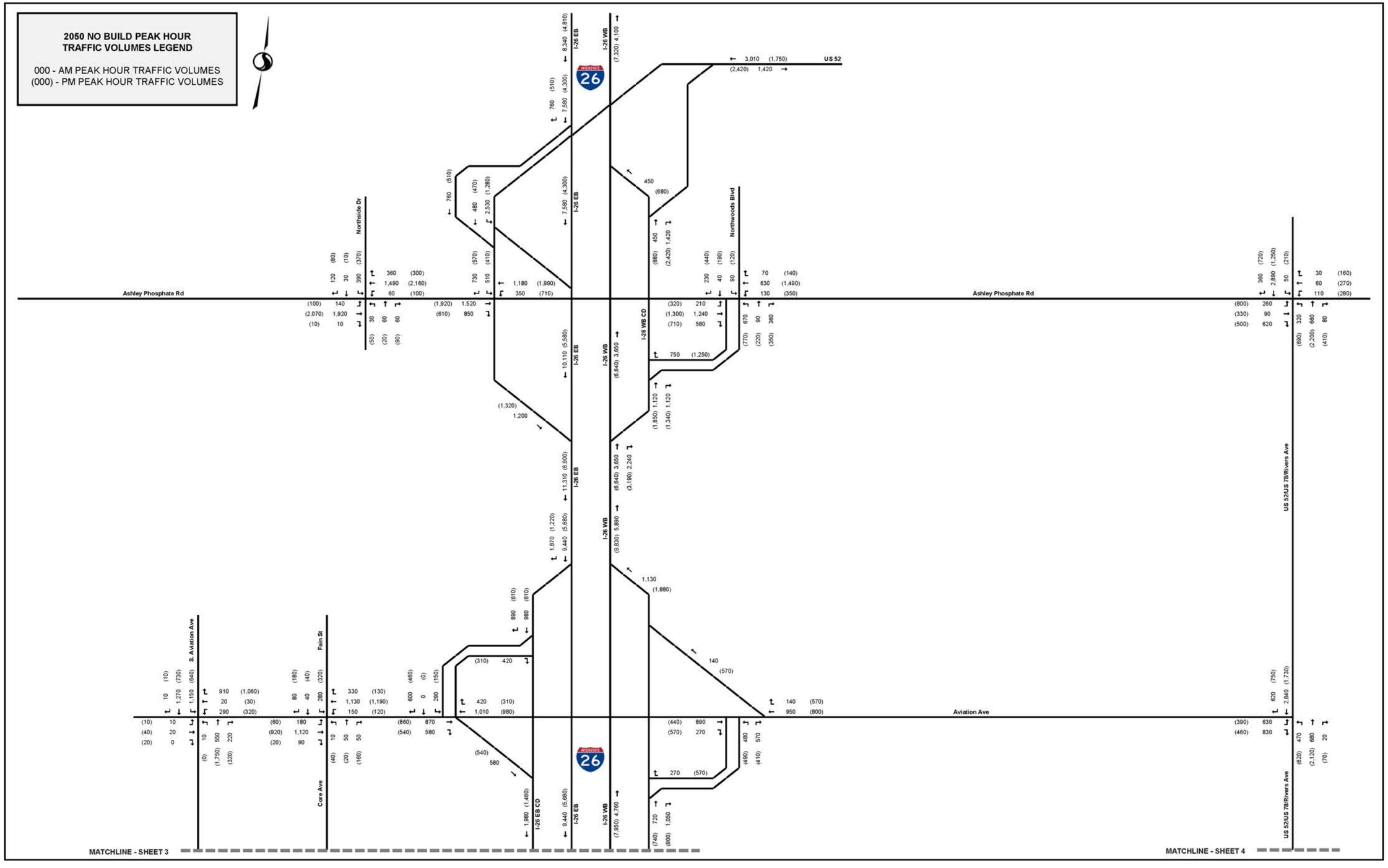


Figure 26 – 2050 Build Peak Hour Traffic Volumes (Sheet 1 of 6)

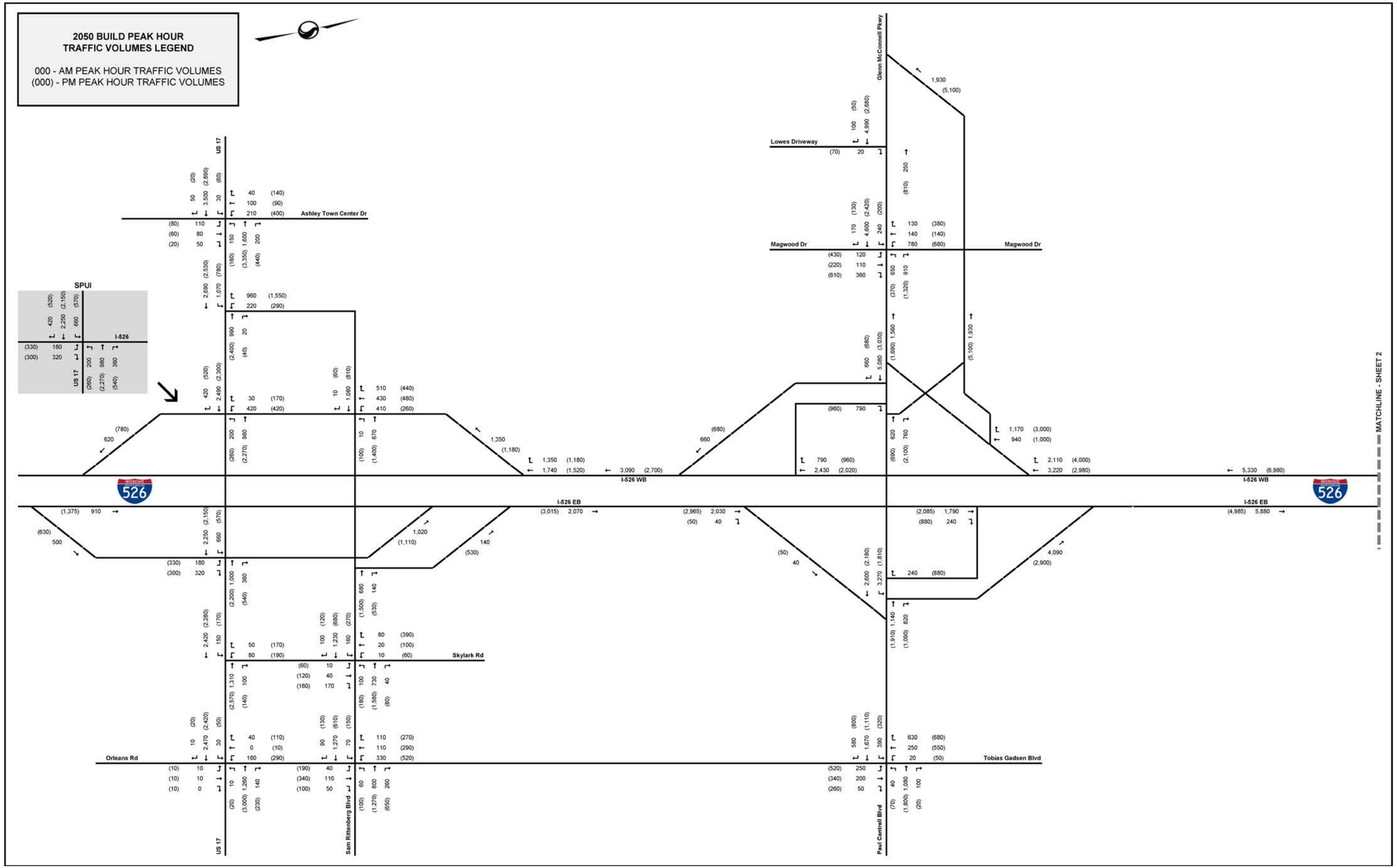


Figure 27 – 2050 Build Peak Hour Traffic Volumes (Sheet 2 of 6)

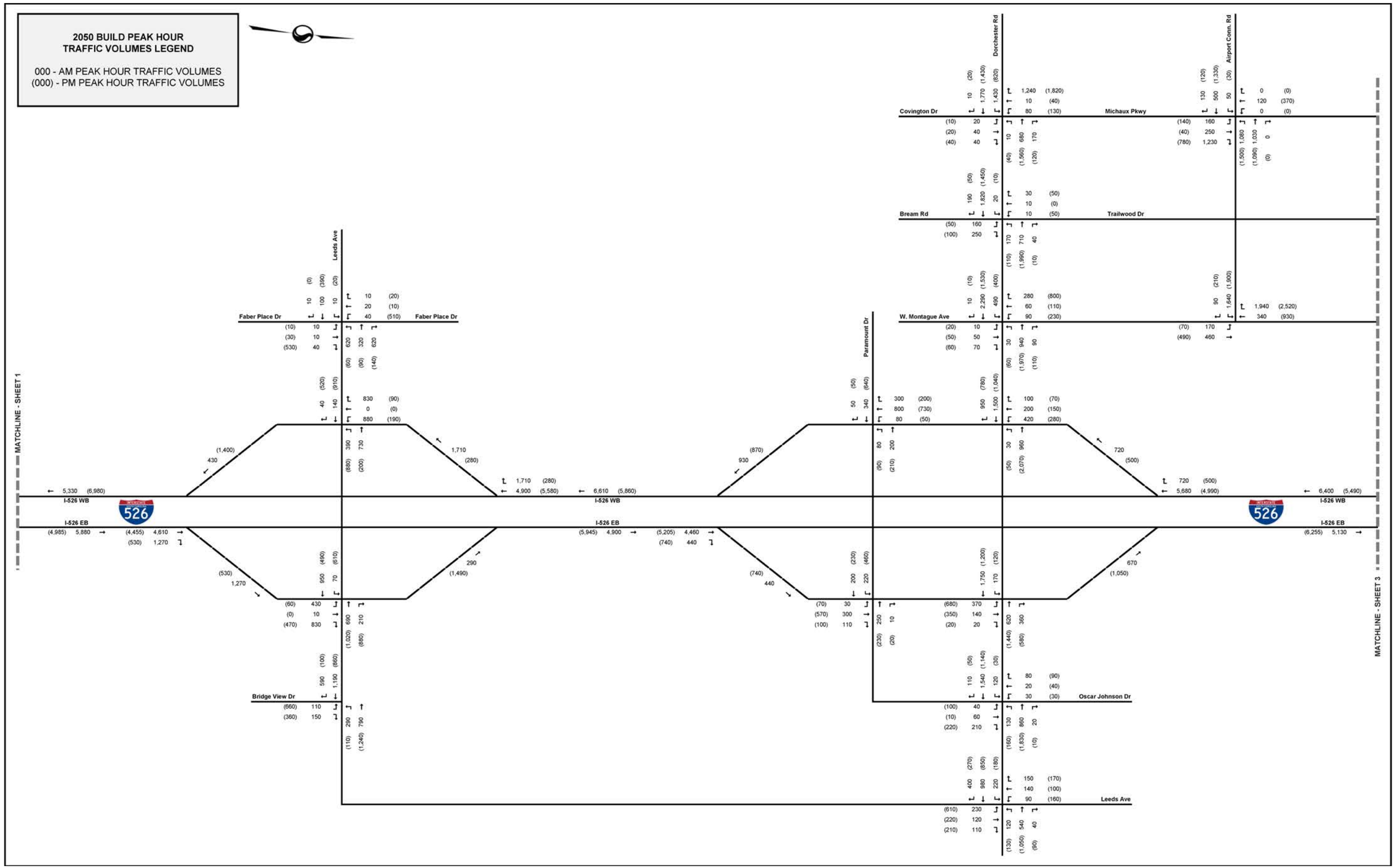


Figure 28 – 2050 Build Peak Hour Traffic Volumes (Sheet 3 of 6)

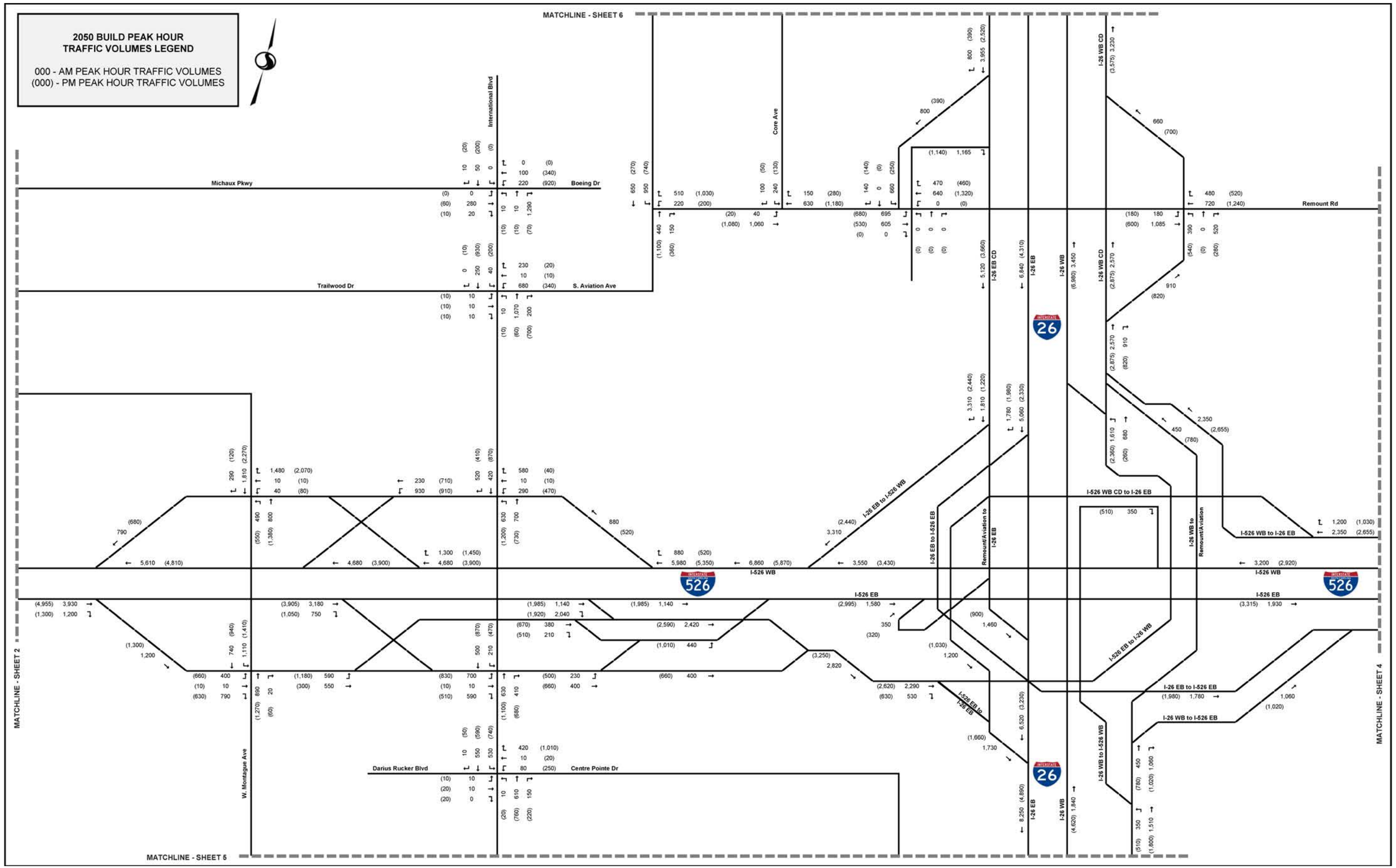


Figure 29 – 2050 Build Peak Hour Traffic Volumes (Sheet 4 of 6)

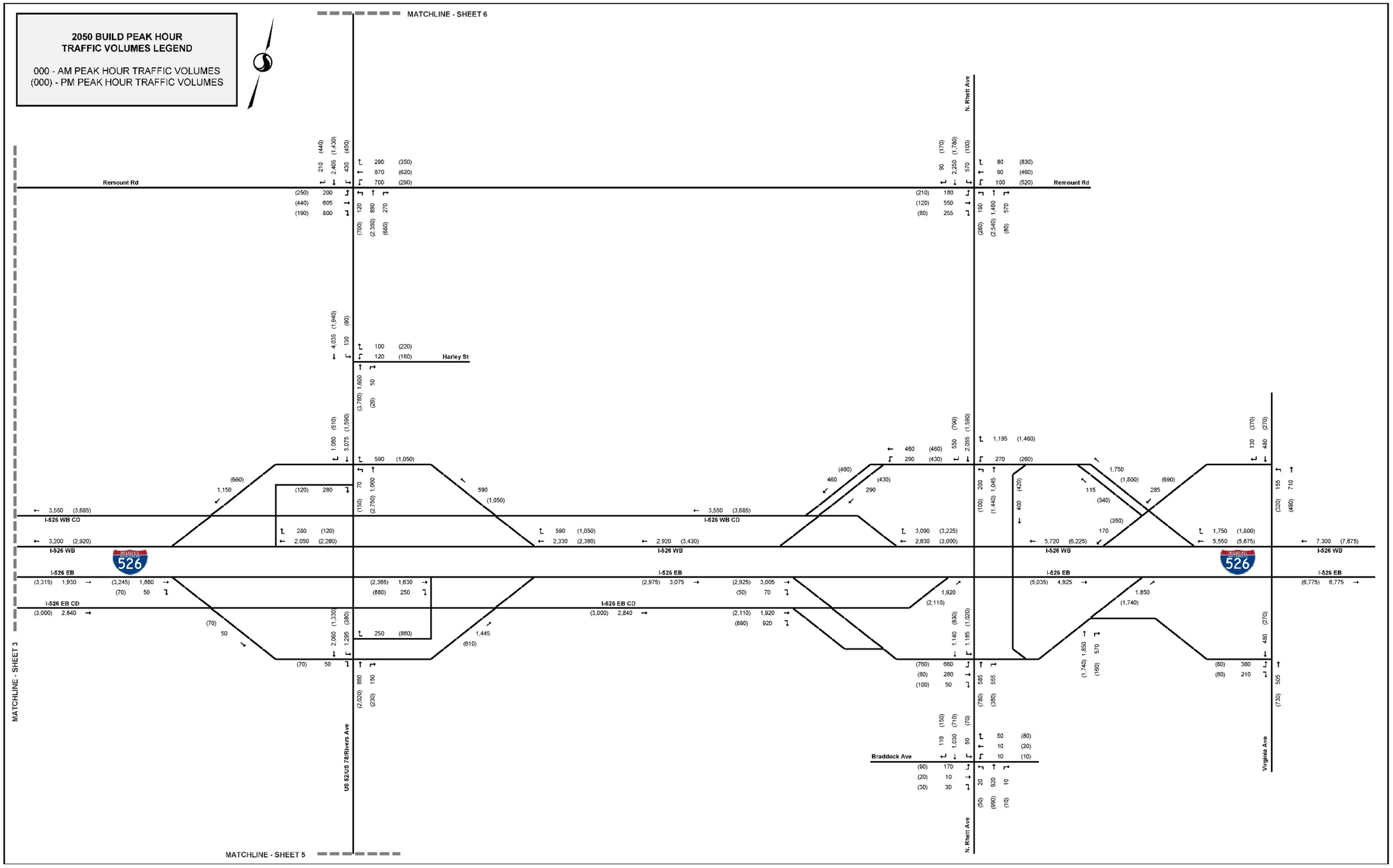


Figure 30 – 2050 Build Peak Hour Traffic Volumes (Sheet 5 of 6)

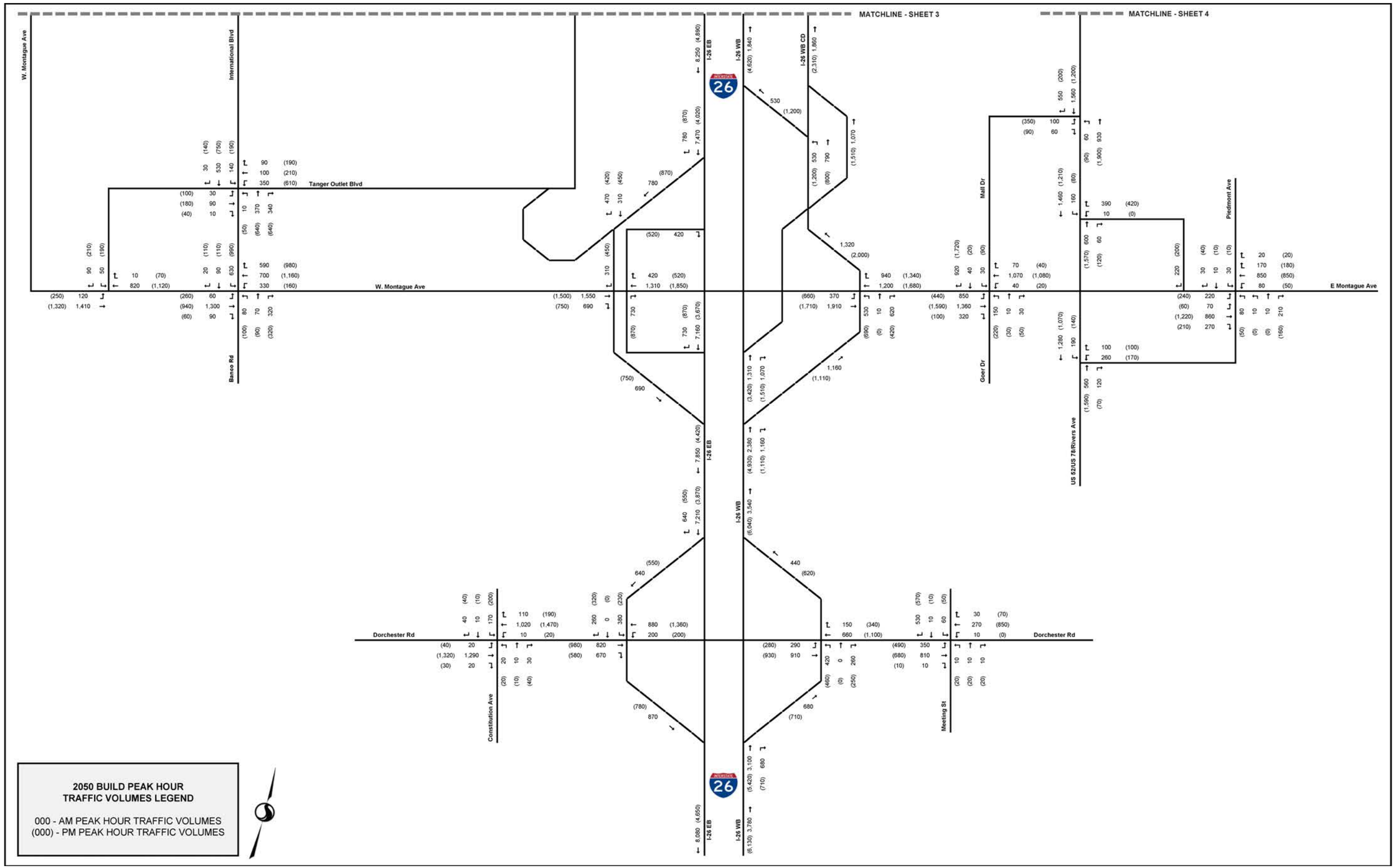
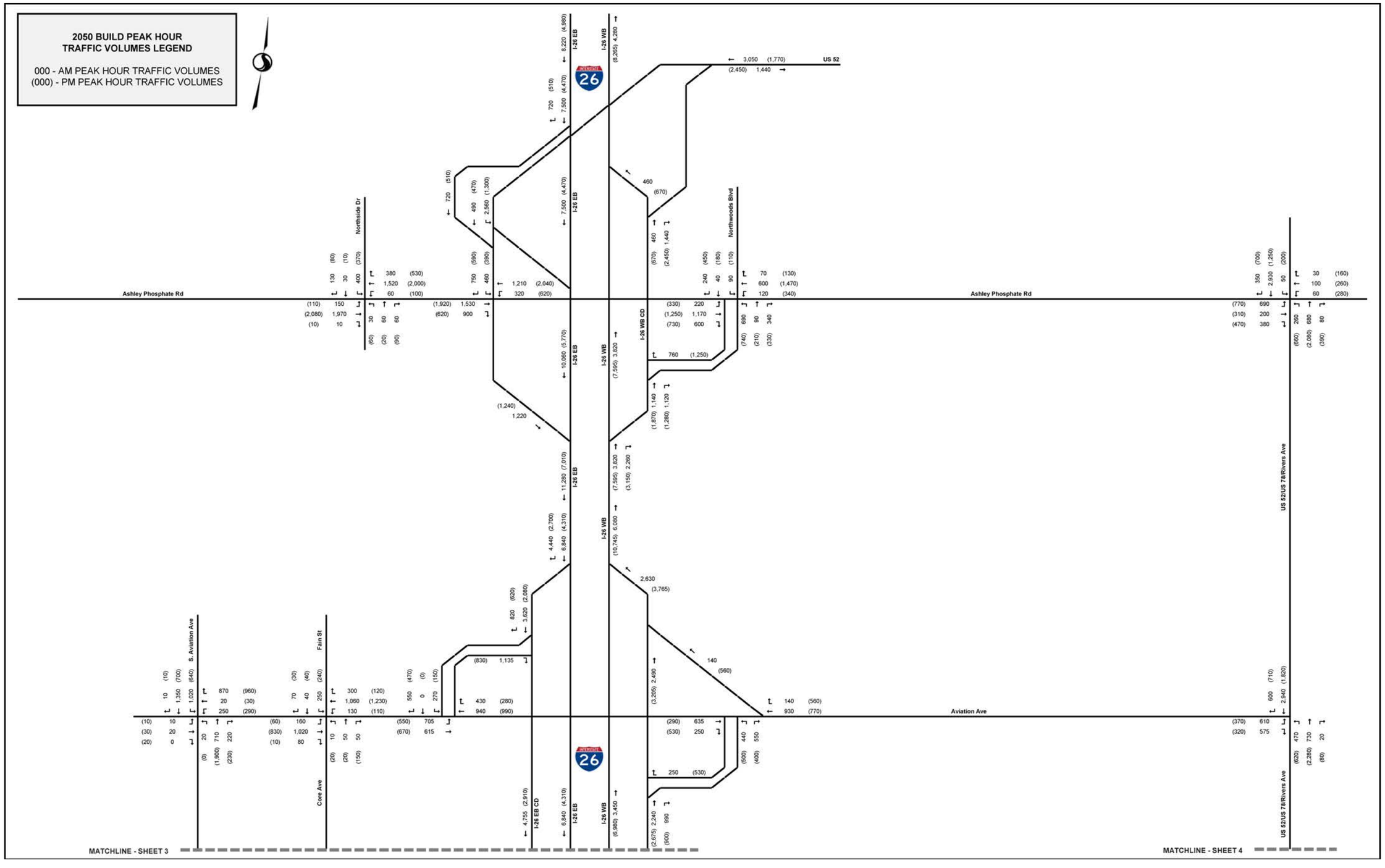


Figure 31 – 2050 Build Peak Hour Traffic Volumes (Sheet 6 of 6)



3.3 HEAVY VEHICLE PERCENTAGES

Interstate Mainline Heavy Vehicle Percentages

A separate evaluation of heavy vehicle traffic for the future conditions in the I-526 Lowcountry Corridor West study area is justified by significant freight initiatives in the region. The proposed Hugh K. Leatherman Sr. (HLT) Terminal is currently under development, which will increase the annual throughput capacity of the Port of Charleston by 1.4 million twenty-foot equivalent units (TEUs). This is a fifty-four (54%) increase above the current capacity of all container terminals in the Port of Charleston system.

A record of decision (ROD) was issued for the HLT in April 2007, based in part on the condition that a direct access road (Port Access Road) be constructed to connect the new terminal on the Cooper River to Interstate 26. The Port Access Road is currently under construction, and the connection to I-26 is located approximately 4.1 miles south of the PROJECT study area boundary, and 5.2 miles south of Interstate 526. The purpose of this direct connection is to keep the increase in truck traffic generated by the new HLT off of local streets in the vicinity. The Federal Highway Administration (FHWA) approved the Interchange Modification Report (IMR) in September 2013 for the connection of the Port Access Road to I-26.

Another project affecting freight traffic from the new HLT is the proposed Navy Base Intermodal Container Transfer Facility (ICTF). This facility will include processing and classification railroad tracks, gantry cranes, container stacking areas, and related facilities to transfer containers to and from trains. A dedicated drayage road will connect the ICTF to the HLT. A Final Environmental Impact Statement (FEIS) has been prepared for this project and a Record of Decision (ROD) was issued by the Federal Railroad Administration June 2019. The opening year and design year for the FEIS were 2018 and 2038, respectively.

The Port Access Road IMR and the Intermodal Container Transfer Facility FEIS each capture elements of truck trip forecasts associated with the increased throughput which is expected to result from the completion of the HLT. Each incorporates the freight forecasts included in the permit authorizing the HLT.

Mainline 24-hour machine counts, including vehicle classifications, were taken at Stations 1, 2, 3 and 4 in 2011 for the *Corridor Analysis For I-526 Between North Charleston and West Ashley*. Mainline 48-hour machine counts were taken at the same locations in 2015. Ramp counts (24-hour) were taken in 2011 and again in 2015, however only the 2011 ramp counts included vehicle classification. The 2011 and 2015 mainline counts were proportionately similar, allowing the 2011 ramp counts to be adjusted to the 2015 base year conditions.

Since the studies referenced for the port expansion and intermodal terminal provide truck trip generation estimates including origin-destination, the additional trips were accounted for in the future year heavy vehicle percentages for the mainline and interchange ramps at the system interchange. The opening year and design year trip generation estimate from the Intermodal Container Transfer Facility FEIS, are documented in **Table 15** and **Table 16**.

Table 15 – Opening Year ITCF Trip Generation Truck Volumes

Direction	Total Port-Related Volume	Daily Total Truck Volume	AM Peak Hour Truck Volume	PM Peak Hour Truck Volume	AM Peak Hour Port-Related Trucks*	PM Peak Hour Port-Related Trucks*
I-26 WB Through	166	1,861	134	139	12	12
I-26 WB to I-526 WB	6	412	22	16	0	0
I-526 WB Through	925	2,115	122	182	53	80
I-526 WB to I-26 WB	3,816	2,726	129	165	181	231

** AM and PM Peak Hour Port-Related Trucks = Peak Hour Truck Volume X Total Port-Related volume/Daily Total Truck Volume*

Table 16 – Design Year ITCF Trip Generation Truck Volumes

Direction	Total Port-Related Volume	Daily Total Truck Volume	AM Peak Hour Truck Volume	PM Peak Hour Truck Volume	AM Peak Hour Port-Related Trucks*	PM Peak Hour Port-Related Trucks*
I-26 WB Through	3,069	1,861	134	139	221	229
I-26 WB to I-526 WB	24	412	22	16	1	1
I-526 WB Through	823	2,115	122	182	47	71
I-526 WB to I-26 WB	3,914	2,726	129	165	185	237

** AM and PM Peak Hour Port-Related Trucks = Peak Hour Truck Volume X Total Port-Related volume/Daily Total Truck Volume*

The percentage of truck traffic in the design year AM and PM peak hours was assumed to be the same as the percentage in the base year, except for the added trips from this new port terminal. The truck trips generated by the new port terminal contribute primarily to three major movements at the system interchange in the design year:

- I-26 Westbound Through: The Port Access Road, currently under construction, will connect the new port terminal to I-26 east of the 526 LCCW Project. This is one end of the origin-destination pair, with the other end being at warehouse and distribution centers along points west of I-526. These may be close to Charleston, to inland ports, or beyond.

- I-526 Westbound to I-26 Westbound: Among the new trips generated by the new port terminal, this is the other of the two major movements.

Truck traffic was distributed at the I-26 at I-526 system interchange using the trip generation and origin-destination data provided in the ICTF study. The projected future year mainline heavy vehicle percentages are shown in **Table 17.**

Table 17 – 2050 Design Year Projected Interstate Mainline Heavy Vehicle Percentages

I-526 Mainline				
Direction	West of I-26		East of I-26	
	AM	PM	AM	PM
EB	7.0%	5.0%	9.0%	6.0%
WB	5.0%	7.0%	13.0%	11.0%
I-26 Mainline				
Direction	West of I-526		East of I-526	
	AM	PM	AM	PM
EB	9.0%	9.0%	5.0%	7.0%
WB	9.0%	8.0%	17.0%	10.0%

Interstate Ramp Heavy Vehicle Percentages

The 2050 Design Year interchange ramp heavy vehicle percentages are shown in **Table 18.**

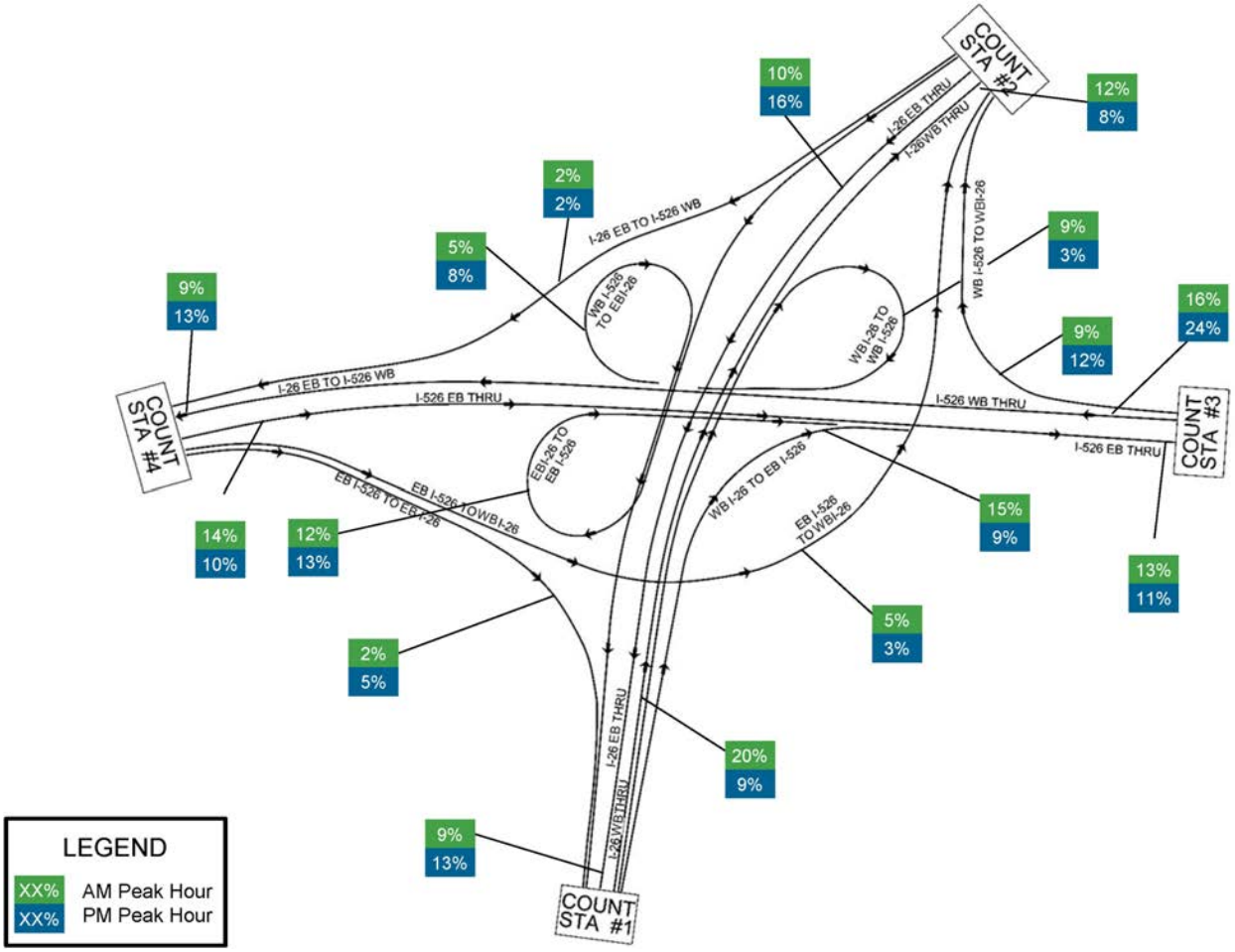
Table 18 – 2050 Design Year Projected Interstate Ramp Heavy Vehicle Percentages

I-526 Eastbound					
Off-Ramp:	AM	PM	On Ramp:	AM	PM
Glenn McConnell	2.00%	2.00%	Glenn McConnell	2.00%	3.00%
Glenn McConnell WB (loop)	3.00%	3.00%			
Leeds	6.00%	12.00%	Leeds	2.00%	2.00%
Dorchester	3.00%	2.00%	Dorchester	2.00%	2.00%
Paramount	3.00%	3.00%	Paramount	2.00%	2.00%
Montague	4.00%	2.00%	Montague/International	2.00%	2.00%
International	3.00%	3.00%			
I-26 EB	2.00%	5.00%	I-26 EB	12.00%	13.00%
I-26 WB	5.00%	3.00%	I-26 WB	15.00%	9.00%
Rivers SB	4.00%	3.00%	Rivers	6.00%	2.00%
Rivers NB (loop)	2.00%	2.00%			
Rhett	9.00%	6.00%	Rhett (loop)	2.00%	2.00%
I-526 Westbound					
Off-Ramp:	AM	PM	On Ramp:	AM	PM
Rhett (loop)	8.00%	7.00%	Rhett	2.00%	2.00%
Rivers NB	4.00%	5.00%	Rivers	5.00%	3.00%
Rivers SB (loop)	2.00%	2.00%			
I-26 WB	9.00%	12.00%	I-26 WB	9.00%	3.00%
I-26 EB	5.00%	8.00%	I-26 EB	2.00%	2.00%
Montague/International	13.00%	9.00%	International	2.00%	2.00%
			Montague	2.00%	2.00%
Dorchester	8.00%	6.00%	Dorchester	2.00%	2.00%
Paramount	3.00%	3.00%	Paramount	2.00%	2.00%
Leeds	2.00%	6.00%	Leeds	2.00%	2.00%
Glenn McConnell WB	2.00%	2.00%	Glenn McConnell	2.00%	2.00%
Glenn McConnell EB (loop)	2.00%	2.00%			
I-26 Eastbound					
Off-Ramp:	AM	PM	On Ramp:	AM	PM
Ashley Phosphate	5.00%	5.00%	Ashley Phosphate	2.00%	2.00%
Aviation	5.00%	7.00%	Aviation WB (loop)	2.00%	2.00%
			Aviation EB	2.00%	2.00%
Remount	7.00%	8.00%	Remount (loop)	2.00%	2.00%
Montague SB	2.00%	2.00%	Montague SB (loop)	2.00%	2.00%
Montague NB (loop)	2.00%	2.00%	Montague NB	2.00%	2.00%
I-26 Westbound					
Off-Ramp:	AM	PM	On Ramp:	AM	PM
Dorchester	5.00%	3.00%	Dorchester	2.00%	2.00%
Montague	5.00%	3.00%	Montague	2.00%	7.00%
Remount	4.00%	2.00%	Remount	2.00%	2.00%
Aviation	4.00%	7.00%	Aviation EB (loop)	2.00%	2.00%
			Aviation WB	2.00%	2.00%
Ashley Phosphate	2.00%	2.00%	Ashley Phosphate	6.00%	5.00%

System Interchange Heavy Vehicle Percentages

As previously discussed, mainline counts were collected at four locations at the System intersection. Classification counts were also collected at the ramps throughout the System interchange. **Figure 32** shows the projected total volume and heavy vehicle volumes, with resulting heavy vehicle percentages for each movement through the System interchange for the AM and PM peak hours, respectively.

Figure 32 – 2050 Design Year I-526 & I-26 System Interchange Heavy Vehicle Percentages



Intersection Heavy Vehicle Percentages

Heavy vehicle percentages at surface street intersections throughout the study area were based on the turning movement counts collected (found in **Appendix 2.3**).

3.4 Peak Hour Factors

For mainline interstate operations, 0.94 was assumed to be the peak hour factor, based on observed conditions in the base year mainline 48-hour counts.

Peak hour factors at surface street intersections throughout the study area were based on turning movement counts collected (found in **Appendix 2.3**).

4.0 PRELIMINARY ALTERNATIVES SCREENING

The development of the I-526 Lowcountry Corridor West project followed the procedures of the National Environmental Policy Act (NEPA). Preliminary alternatives were developed based on their ability to meet the future mobility needs of the corridor, and their traffic operation performance was evaluated to arrive at reasonable alternatives to be carried forward. A VISSIM microsimulation model was also used for screening, which uses base year traffic volumes and is calibrated to match the travel conditions through the study area network, including the freeway, ramps, and arterial streets. This model provides a dynamic view of capacity constraints within the system. Another version of the VISSIM model was then run using the design horizon year traffic volumes. The existing and future conditions models effectively illustrate the progressive breakdowns in traffic flow in the network and help initiate the prioritization of improvement alternatives.

The next level of analysis included the segmentation of the roadway network within the corridor in order to analyze capacity by static methods. The mainline segments of I-26 and I-526 were evaluated for level of service, expressed in traffic density. Mainline segments are divided by basic, merge, diverge, and weave operations. Basic segments are those least affected by vehicles entering, exiting, or weaving that may occur due to closely spaced interchanges, and provide the basis for determining the number of general-purpose lanes necessary to achieve a desired level of service for through traffic. Merge (entering), diverge (exiting) and weaving operations are evaluated in a manner similar to the basic segments. Those segments that fail by these analyses are often associated with geometric deficiencies, such as speed change, or auxiliary lanes that are too short. A high number of vehicular crashes are also prevalent in these areas. Basic, merge, diverge, and weave segments are each evaluated using Highway Capacity Software™ (HCS) by McTrans, which applies the procedures defined in the Highway Capacity Manual (HCM) 2010 published by the Transportation Research Board (TRB). The last piece of the static analysis is completed by evaluating the intersection operations within and near the service interchanges. These analyses provide level of service and delay at the intersections of ramps and surface streets using Synchro™ and Simtraffic™ by Trafficware. An important result from this analysis is the length of queue at each of the controlled intersections within an interchange.

This segmented analysis is used to evaluate the level of service throughout the network. The tools used are widely accepted for freeway and urban street operational analysis, and provided a degree of confidence that, once combined into one network-wide microsimulation model, would produce satisfactory results. This segmented analysis was performed for:

- No Build Conditions for Base Year AM and PM peak hours
- No Build Conditions for Design Year AM and PM peak hours
- Mainline Build Conditions for Design Year AM and PM peak hours, including the following:
  - One general purpose lane added in each direction
  - Two general-purpose lanes added in each direction
  - Various combinations of standard auxiliary lanes and braided ramps for interchange entrance/exit ramps

The I-526 & I-26 System interchange is not suited for static analysis, since there are no controlled intersections. Instead, the operations of this interchange were evaluated using a smaller, sub-area version of the VISSIM model. A similar model was used on a sub-area along Paul Cantrell Boulevard, encompassing the Paul Cantrell Boulevard & I-526 interchange, and the intersection of Paul Cantrell Boulevard & Magwood Drive. The proximity of these intersections and complex weaving operations required a dynamic tool for evaluation.

4.1 I-526 CORRIDOR

The following criteria were used for various inputs within the segment analysis:

- Design Hour Peak Hour Volumes (AM and PM peak hours).
- A peak hour factor of 0.94 was used for freeway segments and ramp areas.
- The proportion of heavy vehicles traveling on the freeway segments and ramp movements was based on averaged SCDOT data from the four 48-hour mainline count locations and balanced ramp movements between the two freeways.
- Based on the grades through the study area, the terrain was selected as "Level".
- Free-flow speed was set at the HCS default free-flow speed.

The analysis methodologies contained in the HCM for the various facility types and users describe the operational conditions in terms of a Level of Service (LOS). The following discussions and tables describe the HCM LOS criteria for the freeway, ramp merge, ramp diverge, and weave segments.

Basic Freeway Segments

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

Ramp Merge and Diverge Segments

Ramp-freeway junctions occur when merging maneuvers occur (on-ramps) or when diverging maneuvers occur (off-ramps). The operation of these merge and diverge areas are affected by several factors, including the operation of the adjacent freeway segment and the proximity and flow on adjacent ramps. Typically, the influence area of the ramps is 1,500 feet upstream of a diverge point and downstream from a merge point. As with freeway segments and weaving segments, the LOS of a merge or diverge area is related to the density of the segment. Regardless of the density, the merge or diverge areas are considered to operate at LOS F when the freeway demand exceeds the capacity of the upstream freeway segment (at diverge areas) or the downstream freeway segment (at merge areas), as well as when the ramp demand exceeds the ramp capacity.

Weave Segments

Weaving is defined as the crossing of two or more traffic streams traveling in the same direction along a significant length of highway. Weaving segments occur when merge segments are closely followed by diverge segments. The operation of a weave area is affected by several factors, including the length, width, and the configuration. As with freeway, merge, and diverge segments, the LOS of a weave area is related to the density of the segment. Regardless of the density, the weave area is considered to operate at LOS F when the freeway demand exceeds the capacity of the segment. Per the HCM, density thresholds in weaving segments are somewhat higher than those for similar basic freeway segments (or multilane highways). It is believed that drivers will tolerate higher densities in an area where lane-changing turbulence is expected than on basic segments. **Table 19** shows the HCM LOS criteria for all freeway segments.

Table 19 – Freeway, Merge/Diverge, and Weaving Segment LOS Criteria

LOS	HCM 2010 Level of Service Criteria Density (pc/mi/ln)			
	Freeway Segment (FS)	Merge/Diverge (M/D)	Weaving Segment (W)	Weaving Segment on CD Roads (W)
A	≤ 11	≤ 10	≤ 10	≤ 12
B	>11-18	>10-20	>10-20	>12-24
C	>18-26	>20-28	>20-28	>24-32
D	>26-35	>28-35	>28-35	>32-36
E	>35-45	>35	>35	>36
F	> 45 | v/c > 1	v/c > 1	v/c > 1	v/c > 1

The results of the freeway capacity analysis in the 526 Lowcountry Corridor West are summarized in **Table 20** and **Table 21** for the eastbound and westbound directions, respectively. The following scenarios were evaluated:

- Base Year Conditions
- Design Year No Build Conditions
- Design Year Build Conditions (6-Lanes: 3 lanes in each direction)
- Design year Build Conditions (8-Lanes: 4 lanes in each direction)

The results of the freeway analysis, as summarized in these tables, illustrate the following:

- The No Build alternative will not provide adequate freeway capacity for anticipated demand volumes in the design year.
- Three lanes in each direction will provide adequate basic freeway capacity, except for the following segments:
  - Eastbound
    - Segment 13 - Paul Cantrell Boulevard to Leeds Avenue - AM peak hour
  - Westbound
    - Segments 9 and 12 through Rivers Avenue Interchange - PM peak hour
    - Segment 27 through Leeds Avenue Interchange - PM peak hour
    - Segment 29 - Leeds Avenue to Paul Cantrell Boulevard - PM peak hour.
- Four general purpose lanes in each direction will provide adequate basic freeway capacity for I-526 within the project limits.
- Where interchange build alternatives significantly change the ramp/access configuration, the results of the Design Year No-Build and Design Year Build 3 Lanes may not accurately reflect the number of lanes needed. All alternatives for the I-26/I-526 interchange, for example, incorporate collector-distributor systems that remove much of the transferring traffic volume to and from I-26 from the general-purpose lanes that carry I-526 through traffic over I-26.

Therefore, the 8-general purpose lane alternative was carried forward as the sole reasonable alternative for the I-526 mainline capacity.

Table 20 – I-526 Eastbound Freeway Segment Analysis Results

Segment			AM Peak Hour LOS				PM Peak Hour LOS			
No.	Type	Description	Base Year (2-Lanes)	Design Year No Build (2-lanes)	Design Year Build (3-Lanes)	Design Year Build (4-Lanes)	Base Year (2-Lanes)	Design Year No Build (2-lanes)	Design Year Build (3-Lanes)	Design Year Build (4-Lanes)
1	FS	Between US 17 & Sam Rittenberg	A	B	B	B	A	A	A	A
2	M	US-17 WB On-Ramp	B	B	B	B	A	B	B	B
3	FS	Between US 17& SC 7	B	C	C	C	A	B	B	B
4	M	SC 7 WB On-Ramp	B	C	C	C	B	C	C	C
5	FS	Between SC 7 & Paul Cantrell	B	C	B	A	B	C	B	B
6	D	Paul Cantrell EB Off-Ramp	B	D	B	B	B	D	C	B
8	FS	Between Paul Cantrell Off-Ramps	B	C	B	A	B	C	B	A
9	D	Paul Cantrell WB Off-Ramp	B	C	B	B	B	C	B	B
11	FS	Paul Cantrell Off to On-Ramps	B	C	B	A	A	B	B	A
12	M	Paul Cantrell On-Ramp	D	F	F	E	C	F	D	D
13	FS	Paul Cantrell to SC 61	E	F	E	D	C	F	D	C
14	D	Leeds Off-Ramp	E	F	F	D	D	F	D	C
15	FS	Between Leeds Off & On-Ramps	D	F	D	C	C	E	C	B
16	W	Between Leeds & Paramount	B	E	D	C	C	E	E	D
17	FS	Between Paramount & Dorchester	C	F	D	C	C	F	D	C
18	W	Between Dorchester & Montague	C	F	E	D	C	F	F	F
19	FS	South of Montague Ave	C	F	D	C	C	F	C	B
20	D	International Blvd WB Off-Ramp	C	F	D	C	C	F	C	C
22	FS	North of International	C	E	C	B	C	D	C	B
23	W	Between International & I-26	C	F	F	F	C	F	F	F
24	FS	Between I-26 Off- & On-Ramp	A	C	C	A	B	C	B	B
25	M	I-26 EB On-Ramp	C	F	D	C	C	F	D	C
27	FS	Between I-26 EB & WB On-Ramps	C	E	C	B	D	F	C	C
28	W	Between I-26 & Rivers	C	E	D	C	C	E	D	C
29	FS	Between Rivers EB & WB Off-Ramps	C	F	C	C	C	F	D	C
30	D	Rivers Off-Ramp	C	F	C	B	C	F	C	C
32	FS	Between Rivers Off & On-Ramps	C	F	C	B	C	E	C	B
33	M	Rivers On-Ramp	D	F	D	C	C	F	C	C
35	FS	Between Rivers a& N Rhett	D	F	D	C	C	F	D	C
36	D	N Rhett Off-Ramp	E	F	D	C	D	F	D	C
38	FS	Between N Rhett Off & On-Ramps	C	F	D	C	C	E	C	B
39	M	N Rhett On-Ramp	F	F	F	D	C	F	D	C
40	FS	East of N Rhett Ave	C	F	F	D	B	D	D	C

Table 21 – I-526 Westbound Freeway Segment Analysis Results

Segment			AM Peak Hour LOS				PM Peak Hour LOS			
No.	Type	Description	Base Year (2-Lanes)	Design Year No Build (2-lanes)	Design Year Build (3-Lanes)	Design Year Build (4-Lanes)	Base Year (2-Lanes)	Design Year No Build (2-lanes)	Design Year Build (3-Lanes)	Design Year Build (4-Lanes)
1	FS	East of N Rhett Ave	C	E	E	E	D	F	F	F
2	D	N Rhett Off-Ramp	C	F	F	F	F	F	F	F
3	FS	Between N Rhett Off & On-Ramps	C	E	C	C	E	F	E	E
4	M	N Rhett On-Ramp	D	F	D	C	F	F	F	F
6	FS	Between N Rhett & Rivers	D	F	D	C	F	F	F	D
8	D	Rivers Off-Ramp	D	F	D	C	F	F	F	D
9	FS	Between Rivers EB & WB Off-Ramps	C	F	C	B	E	F	E	C
10	D	Rivers Off-Ramp	C	F	C	B	F	F	D	C
12	FS	Between Rivers Off & On-Ramps	C	E	C	B	E	F	E	C
13	W	Between Rivers & I-26	F	F	F	F	E	F	F	F
14	FS	Between I-26 WB Off and On-Ramps	C	D	C	B	C	E	C	B
15	W	Between I-26 WB & I-26 EB Ramps	C	E	C	C	C	E	D	C
16	FS	Between I-26 EB Off and On-Ramps	B	C	B	A	C	E	C	B
17	W	Between I-26 & International	C	F	F	F	D	F	E	D
18	FS	Between International Off & On-Ramps	C	E	C	B	C	F	C	C
19	M	International On-Ramp	C	F	D	C	D	F	D	C
21	FS	CD Between International & Montague	C	C	B	B	D	D	D	D
22	D	CD Diverge to I-526 WB	A	B	B	B	A	F	C	C
23	FS	Between Montague & Dorchester	A	F	D	C	A	F	D	C
24	W	Between Montague & Dorchester	C	F	E	C	C	F	E	D
25	FS	Between Dorchester On- & Off-Ramps	C	F	C	C	D	F	D	C
26	W	Between Paramount & Leeds	C	E	E	C	C	F	E	D
27	FS	Between Leeds Off & On-Ramps	C	E	C	B	D	F	E	D
28	M	Leeds On-Ramp	C	F	C	B	F	F	F	D
29	FS	Between Leeds & Paul Cantrell	C	E	C	B	F	F	F	D
30	D	I-526 Off-Ramp to Paul Cantrell	C	F	D	C	F	F	F	F
31	FS	Between Paul Cantrell Off-Ramps	B	C	B	B	C	F	D	D
32	D	Paul Cantrell Off-Ramp	B	C	C	C	C	F	D	D
34	FS	Between Paul Cantrell Off- & On-Ramps	A	B	A	A	B	E	C	C
35	M	Paul Cantrell On-Ramp	B	C	B	B	C	F	C	C
36	FS	South of Savage Road	A	C	B	B	B	E	C	C
37	FS	North of US 17	A	A	A	A	A	A	A	A

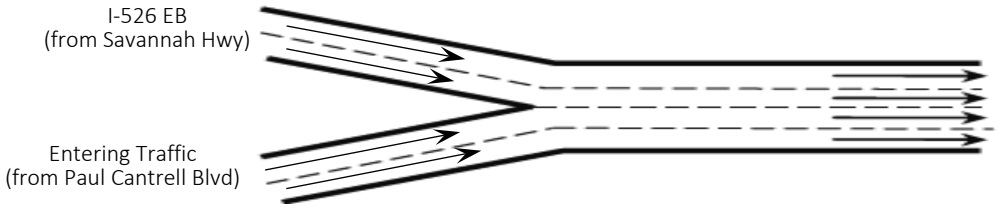
The preceding mainline operation tables included the LOS for merge, diverge, and weave operations. These tables, however, do not reflect any ramp or interchange improvements. Improvements in LOS that appear from one mainline build alternative to another are due to decreased density in the general-purpose lanes that result from added through capacity. As a result, even with the 8-lane widening alternative (the alternative carried forward as a reasonable alternative), there are still failures due to substandard ramps, either from a geometric or capacity perspective, particularly at:

- the Paul Cantrell Boulevard On-Ramp,
- between Dorchester Road and Montague Avenue,
- between International Boulevard & I-26, and
- between Rivers Avenue & I-26.

Paul Cantrell Boulevard represents a key transition-point in the project limits where interstate volumes change significantly (due to significant volumes both entering and exiting the interstate at this interchange). Therefore, the on-ramp and off-ramp transitions were evaluated to achieve acceptable projected level of service in the design year:

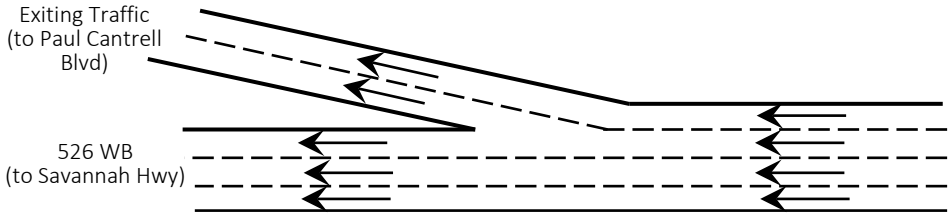
The AM peak hour merge failure (LOS E) exists for various interchange improvement alternatives at I-526 and Paul Cantrell Boulevard, and with mainline future build conditions of three or four lanes in each direction. The HCS analysis that produced the results in **Table 21** is based on the designated number of general purpose lanes (3 or 4) with the peak hour volume entering from the ramp. The deficiency was resolved by recognizing that only two general purpose lanes are required in the eastbound direction of I-526 prior to this merge. The solution involves adding the two additional eastbound mainline lanes to I-526 at this entrance ramp, required for the AM peak hour entering traffic volume. **Figure 33** is a schematic representation of this solution.

Figure 33 – I-526 EB Entrance Ramp/Add Lanes at Paul Cantrell Blvd



This PM peak hour diverge failure (LOS F) exists with either three or four lanes in each direction. Four westbound general-purpose lanes approach this exit from the Ashley River in the build alternative. Since three general purpose lanes are warranted beyond this exit, a solution to this capacity deficiency is to drop the outside westbound lane to the Paul Cantrell Exit. The second westbound lane from the right will be a decision lane, which can continue along I-526 toward Savannah Highway or take the inside lane on the two-lane exit ramp. This is illustrated schematically in **Figure 34**.

Figure 34 – I-526 WB Exit Ramp/Drop Lane at Paul Cantrell Blvd



Solutions along I-526 mainline west of the System interchange between Dorchester Road and Montague Avenue are included in the following discussion. The evaluated ramp geometry alternatives consisted of a combination of standard auxiliary lanes, and where necessary, braided ramps used to reduce congestion associated with merge, diverge, and weaving operations at the interchange ramps. Three alternatives were included for preliminary screening for the ramp configurations along the segment of I-526 between Dorchester Road and I-26, including the segments between I-26 and International Boulevard, between International Boulevard and Montague Avenue, and between Montague Avenue and Dorchester Road.

The circled numbers for each interstate segment refer to the segment numbers on the corresponding figures. Alternative 1 analysis results are shown in **Table 22** and **Figure 35**, Alternative 2 analysis results are shown in **Table 23** and **Figure 36**, and Alternative 3 analysis results are shown in **Table 24** and **Figure 37**. Alternatives 1 and 3 are projected to provide acceptable levels of service throughout the sub-area, however Alterative 2 is projected to have multiple segments of unacceptable LOS and/or substandard roadway design. **Alternative 3, a combination of elements of Alternatives 1 and 2, was carried forward as the sole reasonable alternative.**

Table 22 – I-526 Mainline Ramps Alternative 1 Screening

I-526 Westbound		Between I-26 & International			Between International & Montague		Between Montague & Dorchester
Braided Ramp Configuration *(System Interchange Alt 1 & 2 Compatible)#*	Type	CD Weave ①	CD Merge ②	ML Diverge ③	Diverge ④	Weave ⑤	Merge ⑥
	AM LOS	C	B	B	C	C	B
	PM LOS	B	B	C	C	D	C
Braided Ramp Configuration *(System Interchange Alt 3 & 4 Compatible)#*	Type	ML Diverge ③	ML Weave ③		Weave ⑤		Merge ⑥
	AM LOS	B	C		C		B
	PM LOS	B	C		D		C
I-526 EB		**Between Dorchester & Montague**	**Between Montague & International**		**Between International & I-26**		
Braided Ramps *(System Interchange Alts 1 – 4 compatible)#*	Type	Weave ①	Weave ②		ML Merge ③	CD Merge ④	CD Weave ④
	AM LOS	C	B		B	C	B
	PM LOS	C	B		B	C	B

ML = Mainline Lanes, CD = Collector Distributor Lanes

 # Refers to System Interchange Build Alternatives ***(Section 4.3 - I-526 & I-26 System Interchange)***

Figure 35 – I-526 Mainline Ramps Alternative 1 Schematic

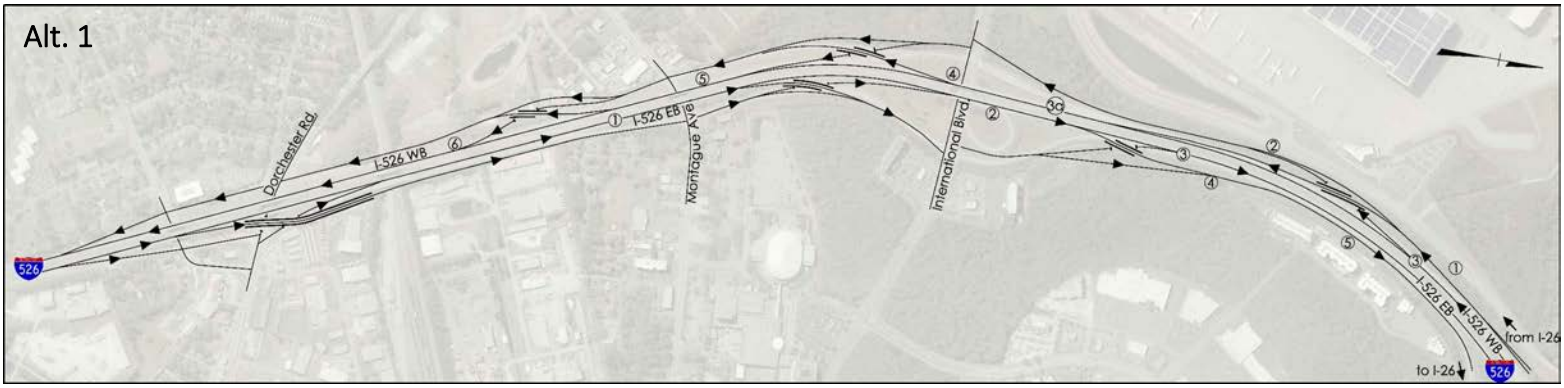


Table 23 – I-526 Mainline Ramps Alternative 2 Screening

I-526 Westbound		Between I-26 & International	Between International & Montague	Between Montague & Dorchester
Auxiliary Lanes *(System Interchange Alt 1 – 4 Compatible)#*	Type	Weave ①	Weave ②	Weave ③
	AM LOS	C	E*	C
	PM LOS	C	E*	C
I-526 EB		**Between Dorchester & Montague**	**Between Montague & International**	**Between International & I-26**
Braided Ramps *(System Interchange Alts 1 – 4 compatible)#*	Type	Weave ①	Weave ②	Weave ③
	AM LOS	C	D*	D
	PM LOS	D	D*	F

** Cannot design ramps within this area to SCDOT HDM design standards – highlighted in red (similar to LOS F) to indicate unacceptable design*

 # Refers to System Interchange Build Alternatives ***(Section 4.3 - I-526 & I-26 System Interchange)***

Figure 36 – I-526 Mainline Ramps Alternative 2 Schematic

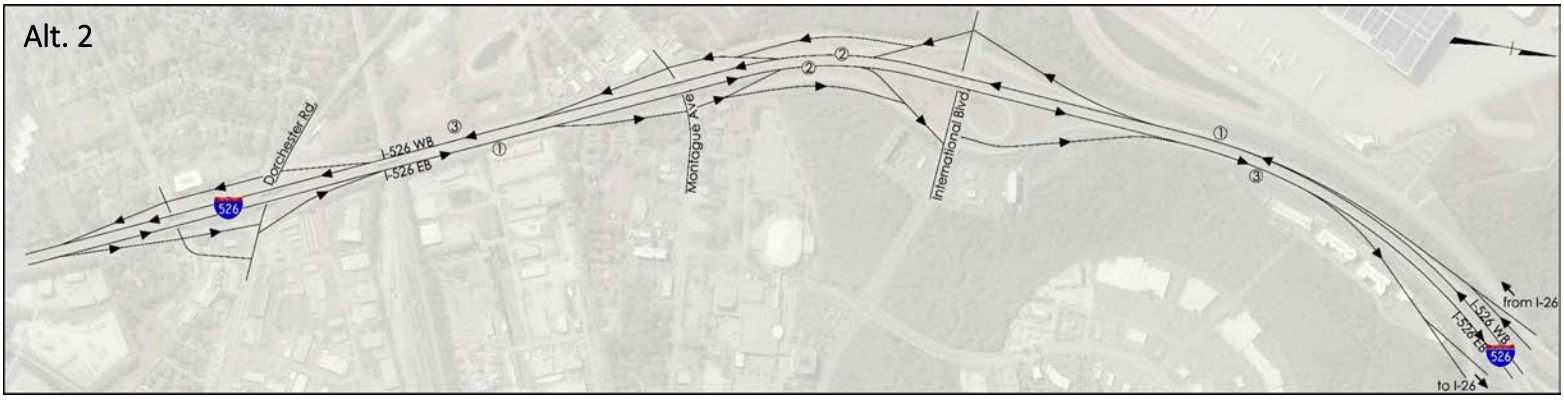


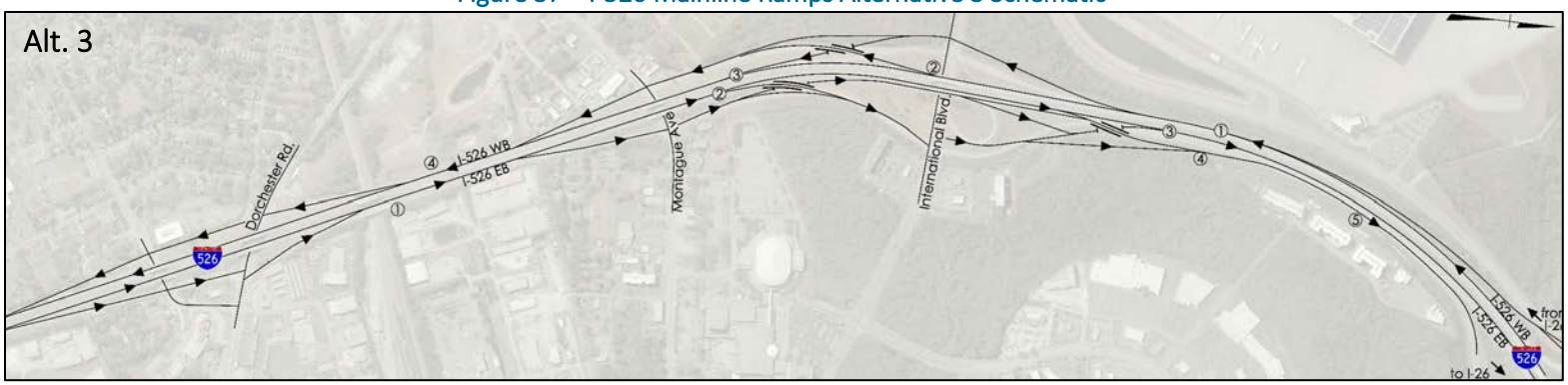
Table 24 – I-526 Mainline Ramps Alternative 3 Screening

I-526 Westbound		Between I-26 & International	Between International & Montague		Between Montague & Dorchester
Combination of Alts. 1 & 2 *(System Interchange Alt 1 – 4 Compatible)#*	Type	ML Weave ①	Diverge ②	Merge ③	Weave ④
	AM LOS	C	B	C	C
	PM LOS	C	B	C	C
I-526 EB		**Between Dorchester & Montague**	**Between Montague & International**	**Between International & I-26**	
Combination of Alts. 1 & 2 *(System Interchange Alts 1 – 4 compatible)#*	Type	Weave ①	Diverge ②	ML Merge ③	CD Merge ④	CD Weave ⑤
	AM LOS	C	C	B	C	B
	PM LOS	D	C	B	C	B

ML = Mainline Lanes, CD = Collector Distributor Lanes

 # Refers to System Interchange Build Alternatives ***(Section 4.3 - I-526 & I-26 System Interchange)***

Figure 37 – I-526 Mainline Ramps Alternative 3 Schematic



To address the unacceptable LOS identified between I-26 and Rivers Avenue, Origin-Destination patterns were evaluated for movements along I-526 east of I-26, and the eastbound and westbound lanes of I-26. The intent was to determine the eastbound or westbound traffic volumes east of North Rhett Avenue, which had I-26 as an origin (eastbound I-526) or destination (westbound I-526). Due to the geometric and potential structural challenges associated with this elevated portion of I-526, the potential to extend collector distributor lanes on separate parallel structures was evaluated. This is supported by the interchange concepts that have been developed for the System interchange at I-26 & I-526, which incorporates the I-526/Rivers Avenue interchange. This will be discussed in greater detail in **Section 4.3 - I-526 & I-26 System Interchange**. The results indicate that, by allowing I-26 bound traffic on westbound I-526 to exit to a collector distributor road between North Rhett and Virginia Avenue interchanges, including providing access from westbound entrance ramps from these interchange, the volume of the existing mainline traffic is sufficiently reduced to avoid widening the existing structure. The same is true for the eastbound lanes, for traffic coming from I-26. **Table 25** provides a summary of the capacity results for the existing general-purpose lanes, as well as the collector-distributor lanes, in each direction.

Table 25 – I-526 Collector-Distributor Lanes East of I-26

Peak Period	Direction	CD* Volume (% of Total)	GP* Volume (% of Total)	CD* Lanes	GP* Lanes	Design Year LOS	
						CD* Lanes	GP* Lanes
AM	EB	39%	61%	2	2	B	D
	WB	58%	42%	2	2	C	B
PM	EB	36%	64%	2	2	B	C
	WB	43%	57%	2	2	C	D

** GP = General-Purpose | CD = Collector-Distributor*

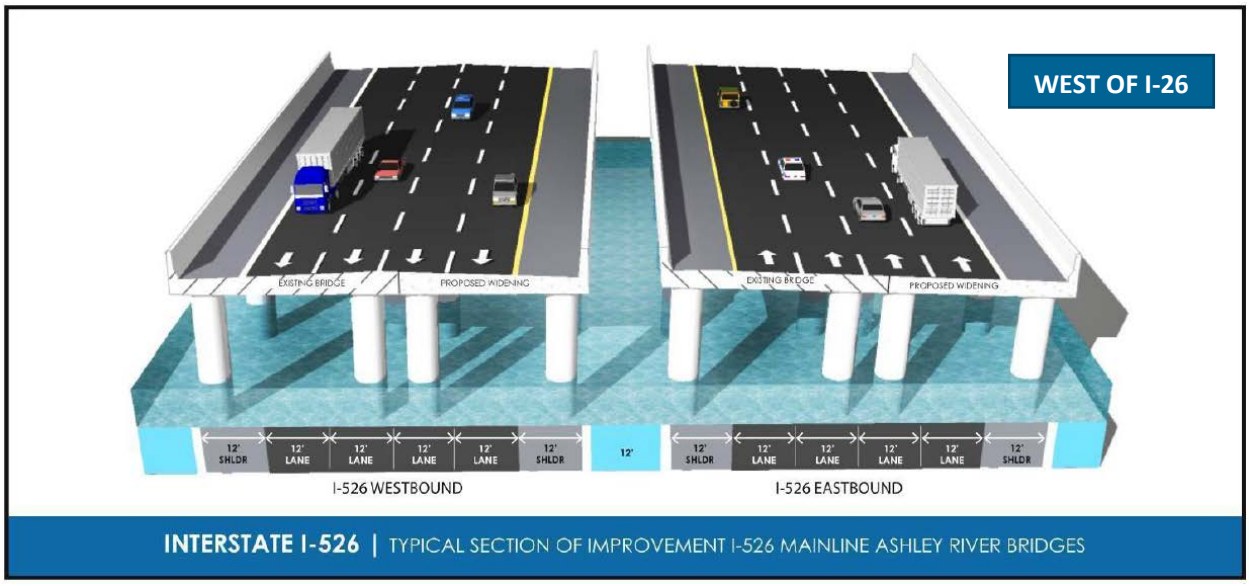
Additional solutions to the unacceptable LOS identified along I-526 between International Boulevard & I-26 and between I-26 & Rivers Avenue were addressed with improvements to the System Interchange, as discussed in the next section, **Section 4.3 – I-526 & I-26 System Interchange.**

4.1.1 Reasonable Alternative(s) Carried Forward

For the I-526 mainline corridor, **one reasonable alternative was carried forward** from the preliminary screening process, which included:

- Eight (8) General-Purpose Lanes (the typical cross-section of which is shown in **Figure 38**)
  - Widening of existing cross-section/bridges to four lanes in each direction between Paul Cantrell Boulevard and International Boulevard,
  - Additional Collector Distributor facility parallel to I-526 between International Boulevard & I-26 in the eastbound direction
  - Additional two-lane collector distributor facilities (in both directions) between I-26 and N. Rhett Avenue.
- Lane additions and lane drops to and from the eight I-526 general purpose lanes at the Paul Cantrell Boulevard interchange.
- Ramp Configuration Alternative 3 Between Dorchester Road and I-26 (as shown below in **Figure 39**):
  - No changes to Dorchester Road ramp configuration
  - Braided ramps between Montague Road and International Boulevard in both directions
  - A Braided ramp between International Boulevard and I-26 providing access to the proposed new Collector Distributor facility.

Figure 38 – I-526 Mainline Reasonable Alternative Typical Cross-Sections



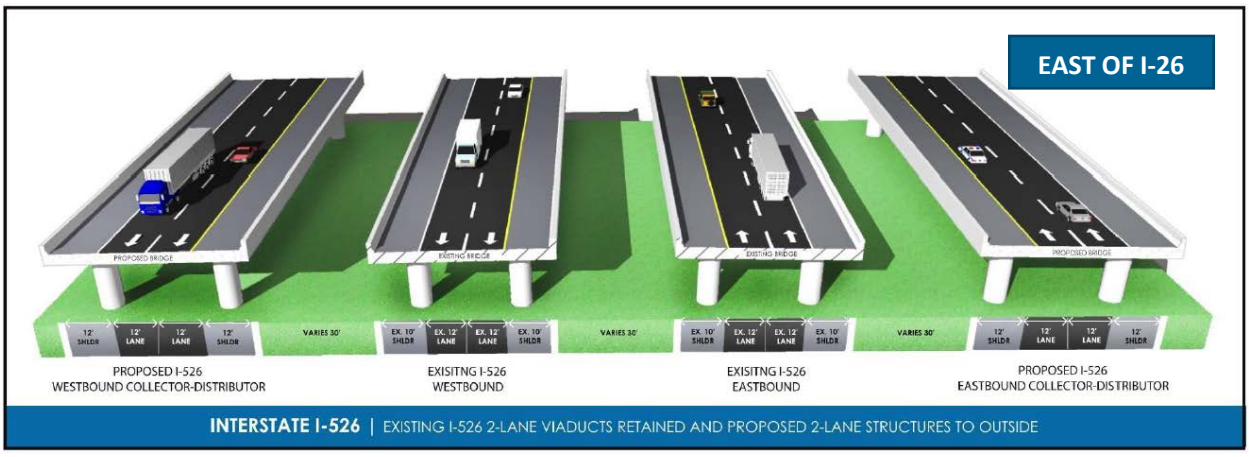
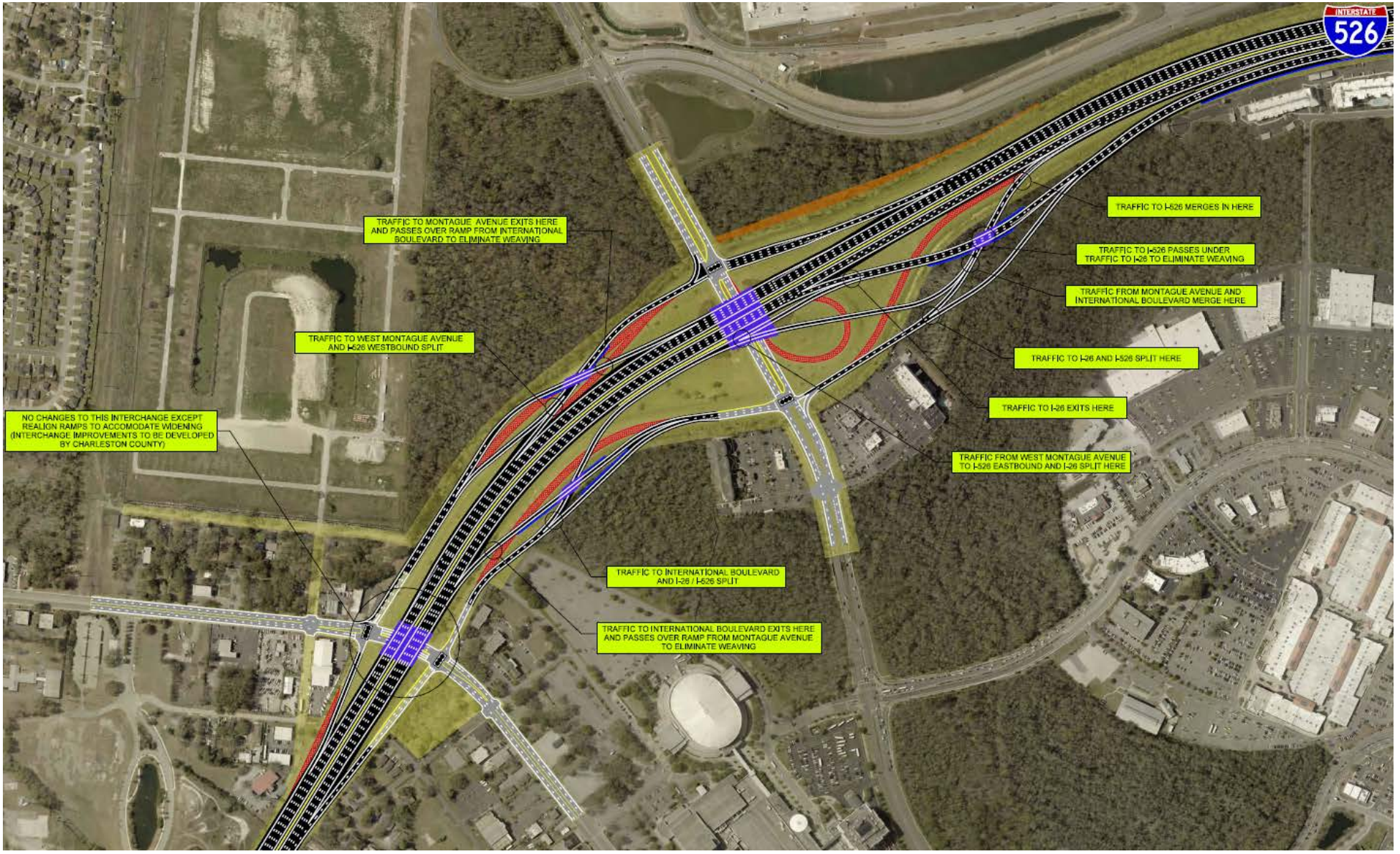


Figure 39 – I-526 West of System Interchange Reasonable Alternative



4.2 I-26 CORRIDOR

The approach taken to finding the best transition between I-26 corridor improvements and the I-526 corridor improvements can be summarized as follows:

- Provide an acceptable LOS in the horizon year for merge and diverge operations associated with access to and from the new System interchange.
- Capacity of I-26 through traffic will be evaluated, and previously planned but yet to be constructed capacity projects will be considered in that evaluation.
- Limit, if possible, significant changes to the Aviation, Remount and Montague interchanges on I-26, while identifying conditions that might be addressed by future capacity projects.

To accomplish these objectives, the ramps to/from the System interchange were modified to split origin-destination pairs in a way that best utilized the existing capacity of the general-purpose lanes and added capacity to the collector distributor system on I-26, by both adding C-D lanes and extending their limits. This approach limits the impacts to the three I-26 service interchanges (Aviation Avenue, Remount Road, and Montague Avenue) to changes in ramp geometry, and steepening berm slopes in the end spans to accommodate C-D road widening.

I-26 North of System Interchange

Three preliminary alternatives were screened for the CD roads configuration parallel to the I-26 mainline north of the System interchange:

Alternative 1 (**Table 26** and **Figure 40**):

Eastbound: Existing ramps with 3 lanes on CD and all I-526 bound traffic on CD
Westbound: Removal of loop ramp from Aviation Avenue interchange with 2 lanes on CD

Alternative 2 (**Table 27** and **Figure 41**):

Eastbound: Aviation Avenue and Remount Road ramps braided over CD and I-526 bound traffic on CD
Westbound: Existing ramp configuration with 2 lanes on CD

Alternative 3 (**Table 28** and **Figure 42**):

Eastbound: I-526 WB and Aviation Avenue and Remount Road traffic on CD and I-526 EB traffic on I-26
Westbound: Existing ramp configuration with 2 lanes on CD

Table 26 – I-26 CD Roads Alternative 1 Screening

I-26 EB Facility		West of CD Road		West of Aviation			East of Aviation	West of Remount		East of Remount			
CD	Type			Basic ②	Diverge ③	Basic ④	Weave ⑤	Basic ⑥	Merge ⑦	Basic ⑧	Diverge ⑨	Basic ⑩	Diverge ⑪
	AM LOS			E	D	E	E	E	D	D	D	D	C
	PM LOS			D	C	C	C	D	C	D	C	D	C
ML	Type	Basic	Diverge ①	Basic									Merge
	AM LOS	F	F	C									D
	PM LOS	D	F	B									B

I-26 WB Facility		East of CD Road		East of Remount		West of Remount	East of Aviation		West of Aviation		
CD	Type			Basic ①	Diverge ②	Basic ③	Weave ④	Basic ⑤		Merge ⑥	Basic ⑦
	AM LOS			C	C	D	C	C		C	C
	PM LOS			C	C	D	D	D		F	F
ML	Type	Basic	Merge	Basic							Merge ⑧
	AM LOS	B	A	B							C
	PM LOS	D	B	C							F

ML = Mainline Lanes, CD = Collector Distributor Lanes, DL = Decision Lane

Figure 40 – I-26 CD Road Alternative 1 Schematics

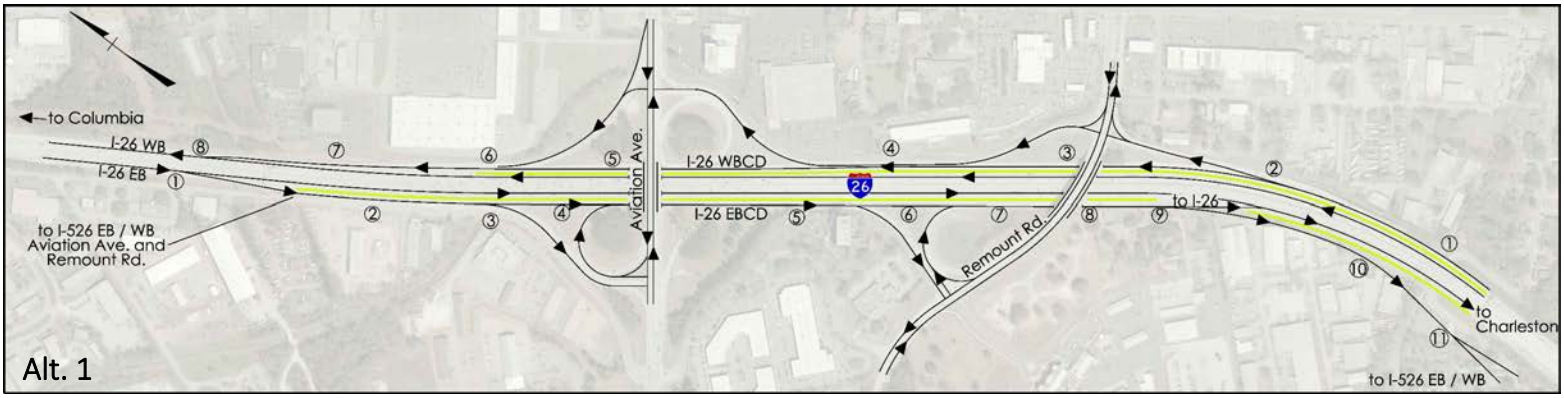


Table 27 – I-26 CD Roads Alternative 2 Screening

I-26 EB Facility		West of CD Road		West of Aviation		East of Aviation	West of Remount	East of Remount	
CD	Type			Basic ⑤				Merge ⑥	Basic ⑦
	AM LOS			D				C	D
	PM LOS			C				C	D
ML	Type	Basic ①	Diverge ②	Basic ③	Diverge ④	Basic		Merge ⑧	Basic ⑨
	AM LOS	F	F	D	D	C		D	D
	PM LOS	D	B	B	B	B		C	B

I-26 WB Facility		East of CD Road		East of Remount		West of Remount	East of Aviation			West of Aviation		
CD	Type			Basic ①	Diverge ②	Basic ③	Weave ④	Basic ⑤	Merge ⑥	Basic ⑦	Merge ⑧	Basic ⑨
	AM LOS			C	C	D	C	C	C	C	C	C
	PM LOS			C	C	D	D	D	D	E	F	F
ML	Type	Basic	Merge	Basic								Merge ⑩
	AM LOS	B	A	B								C
	PM LOS	D	B	C								F

ML = Mainline Lanes, CD = Collector Distributor Lanes, DL = Decision Lane

Figure 41 – I-26 CD Road Alternative 2 Schematics

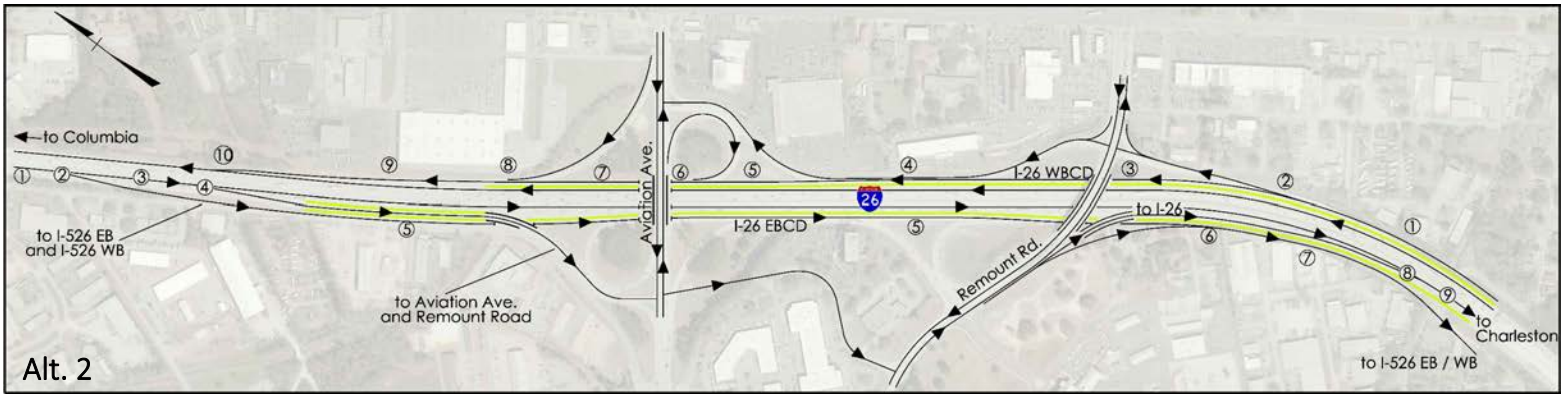


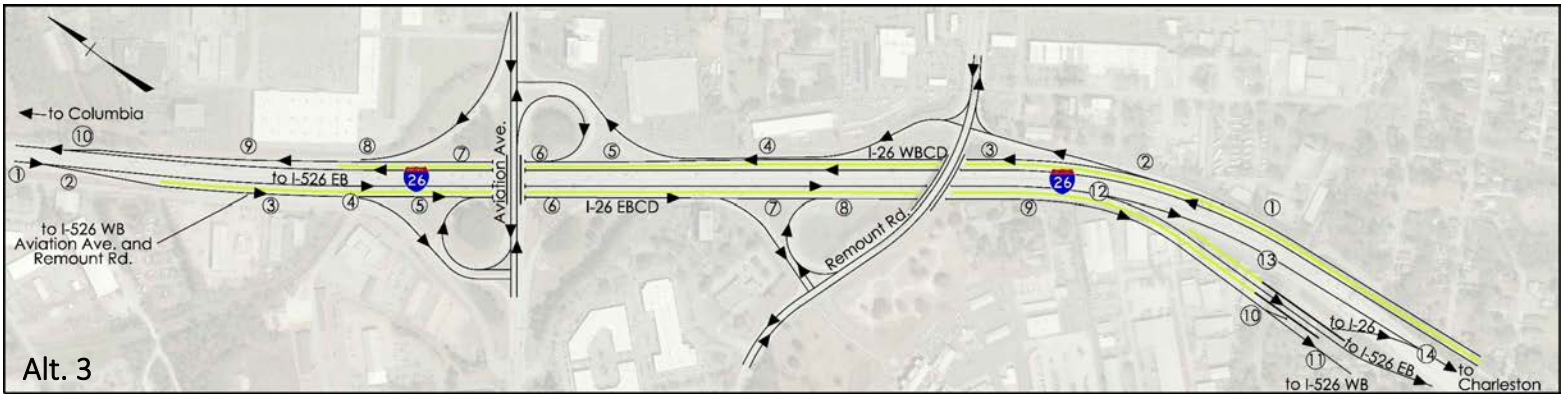
Table 28 – I-26 CD Roads Alternative 3 Screening

I-26 EB Facility		West of CD Road		West of Aviation			East of Aviation	West of Remount		East of Remount			
CD	Type			Basic ③	Diverge ④	Basic ⑤	Weave ⑥	Basic ⑦	Merge ⑧	Basic ⑨	Diverge ⑩	Basic ⑪	
	AM LOS			D	C	C	D	C	C	D	C	C	
	PM LOS			B	B	B	B	C	B	C	B	B	
ML	Type	Basic ①	Diverge ②	Basic							Diverge ⑫	Basic ⑬	Merge ⑭
	AM LOS	F	F	D							D	C	D
	PM LOS	D	B	C							C	B	B

I-26 WB Facility		East of CD Road		East of Remount		West of Remount	East of Aviation			West of Aviation		
CD	Type			Basic ①	Diverge ②	Basic ③	Weave ④	Basic ⑤	Merge ⑥	Basic ⑦	Merge ⑧	Basic ⑨
	AM LOS			C	C	D	C	C	C	C	C	C
	PM LOS			C	C	D	D	D	D	E	F	F
ML	Type	Basic	Merge	Basic								Merge ⑩
	AM LOS	B	A	B								C
	PM LOS	D	B	C								F

ML = Mainline Lanes, CD = Collector Distributor Lanes, DL = Decision Lane

Figure 42 – I-26 CD Road Alternative 3 Schematics



The System interchange alternatives at I-26 & I-526 rely on collector-distributor systems to separate volumes and reduce congestion due to merge, diverge and weaving movements. The eastbound I-26 traffic destined for eastbound I-526 will enter the C-D system west of the Aviation Avenue interchange and proceed under Remount Road. This will require widening the eastbound C-D road to three lanes. The berm slope (between roadway and end bent/abutment) will have to be steepened.

The same type of improvement is required in the westbound lanes of I-26, west of I-526. Traffic entering westbound I-26 from eastbound and westbound I-526 are being distributed between general-purpose and CD lanes to provide an acceptable LOS.

The collector-distributor roads servicing the System interchange at I-26 & I-526 begin (eastbound) and end (westbound) west of Aviation Avenue. The increased volumes bound for or received from the I-526 interchange will rely heavily on these C-D roads due to limited capacity in the general-purpose lanes.

As the volume from the System interchange increases and the C-D roads are widened to accommodate it, the number of merge locations needs to be reduced so that greater distance can be provided for these merges. The eastbound Aviation to eastbound I-26 diagonal entrance ramp will be removed. This movement will be combined on the loop ramp to eastbound I-26.

The loop entrance ramp from eastbound Aviation Avenue to westbound I-26 will be removed. This movement will be combined with the westbound aviation traffic entering westbound I-26 on the diagonal ramp.

No improvements at the Remount Road interchange are included in the alternatives development and only one alternative for the Aviation Avenue interchange is included (Alternative 3 from the preliminary screening)

I-26 South of System Interchange

Interchange alternatives for the Montague interchange are not driven as much by the need for additional capacity at this intersection. Instead, the need is based on the proximity of this intersection to the I-26 & I-526 interchange. As the throughput of the System interchange increases, the I-26 at Montague interchange will require modifications to receive the traffic.

Similar to the approach used along I-26 north of the System Interchange, a new westbound CD facility is proposed to begin at Montague Avenue (with access provided via the existing pavement of the Mall Drive ramp). This CD facility will collect traffic destined for I-526 eastbound and westbound, as well as traffic destined for either Aviation Avenue or Remount Road. Traffic continuing along I-26 will remain on the general-purpose lanes.

4.2.1 Reasonable Alternative(s) Carried Forward

One reasonable alternative of the I-26 Corridor Improvements was carried forward, which included extension of the existing CD facilities north of the System Interchange to connect to and distribute/receive traffic directly from the System Interchange. This CD widening and extension to the north of the System Interchange includes the elimination of the Aviation Avenue eastbound diagonal on-ramp with traffic redirected to the existing eastbound loop on-ramp. This proposed geometry is shown in **Figure 43**.

Additionally, a westbound CD facility south of the System Interchange is included in this reasonable alternative which carries traffic from I-26 westbound to I-526 and to Remount Road and Aviation Avenue. This proposed geometry is shown in **Figure 44.**

Figure 43 – I-26 North of System Interchange Reasonable Alternative

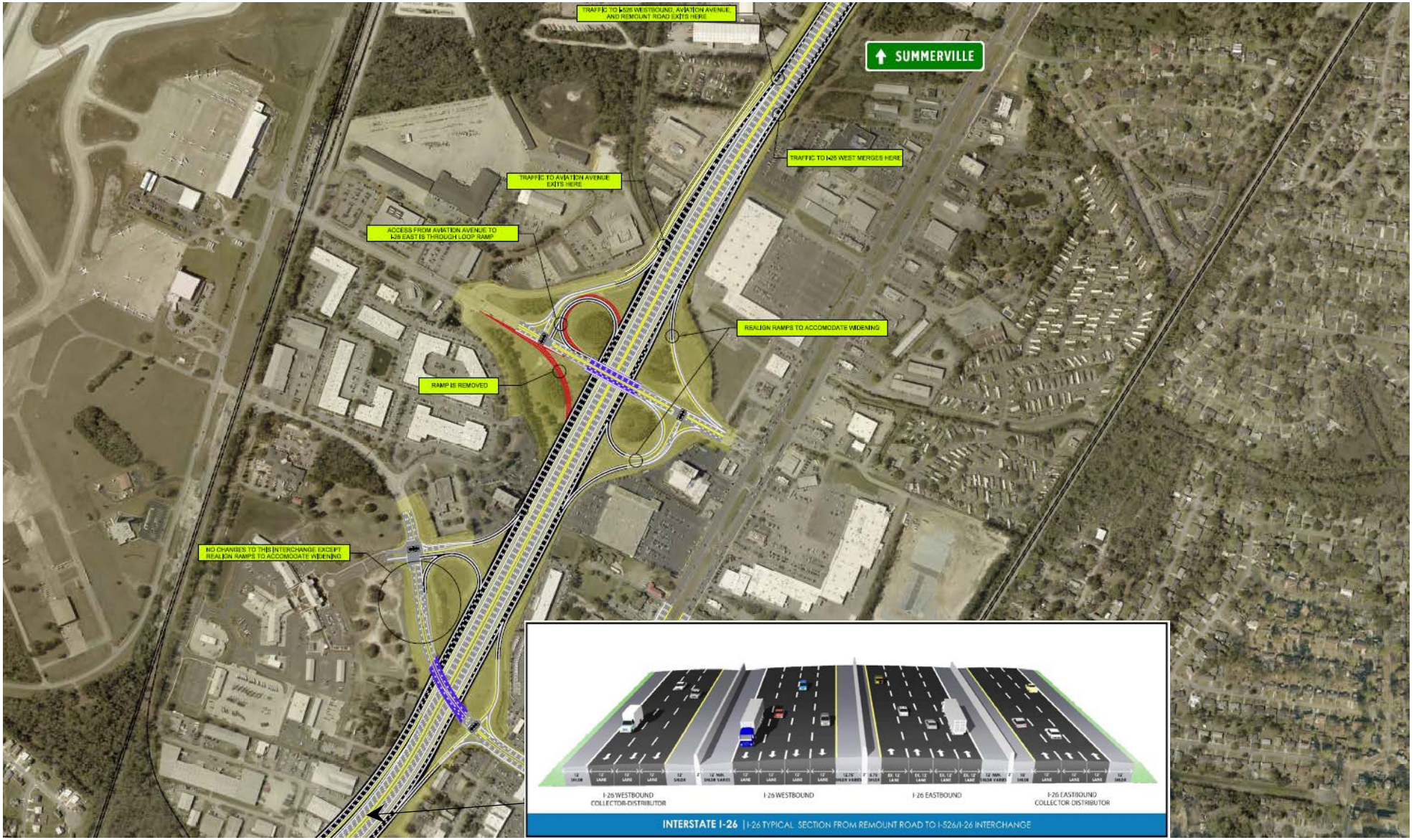
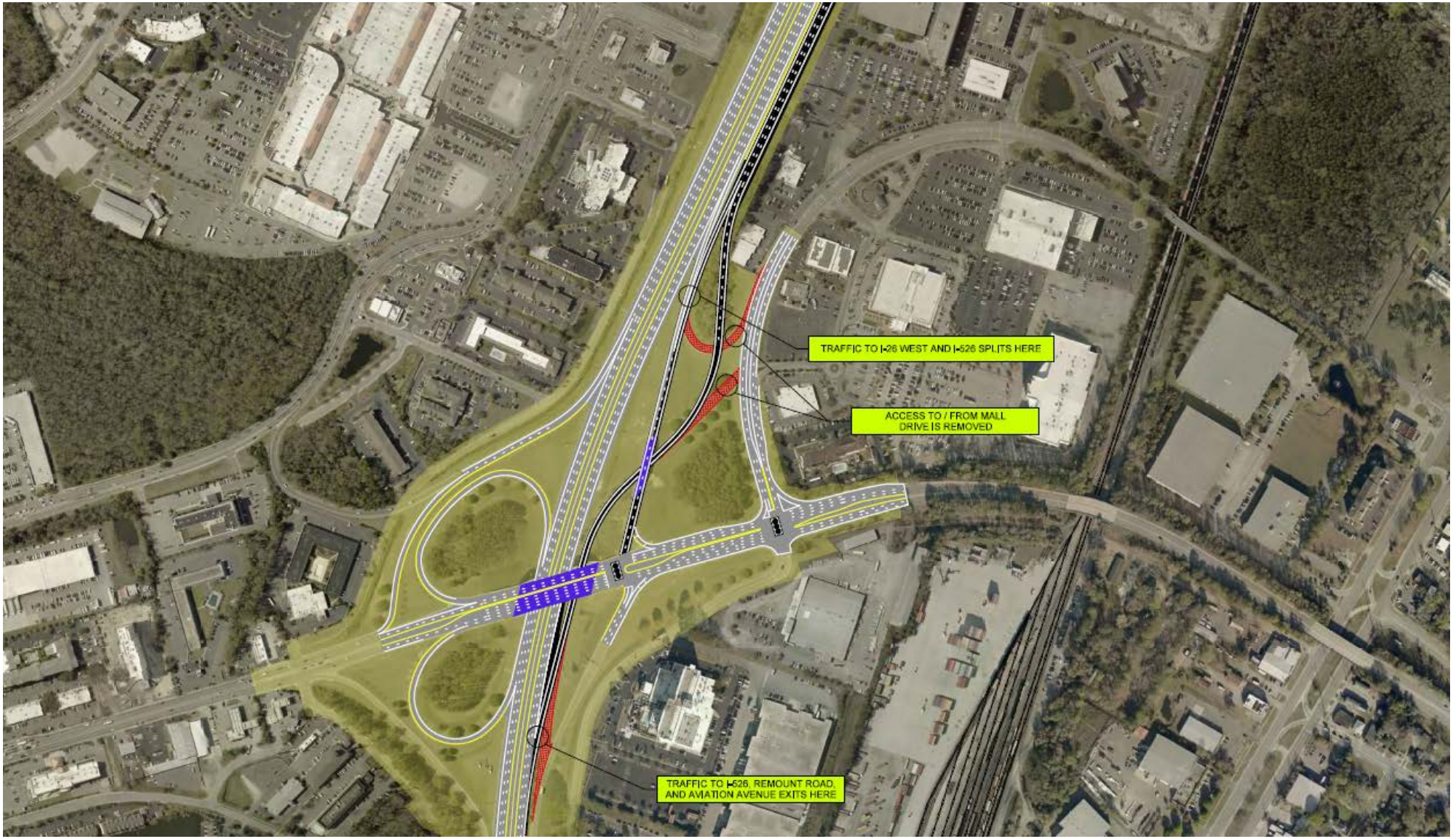


Figure 44 – I-26 South of System Interchange Reasonable Alternative



4.3 I-526 & I-26 System Interchange

Fifteen (15) deficiencies were identified at the System Interchange, as shown in **Table 29**.

Table 29 – System Interchange Existing Deficiencies

Area	No.	Deficiency
I-26 & I-526	1	Congestion along I-26 WB, I-526 EB, and I-526 WB in the afternoon
	2	Weave along I-26 WB from I-526 EB/I-526 WB to Remount Road/Aviation Avenue C-D road
	3	Weave along I-26 EB from Remount Road/Aviation Avenue C-D road to I-526 EB/I-526 WB
	4	Weave along I-26 WB from Montague Avenue to I-526
	5	Short weave distance along I-526 WB between Rivers Avenue and I-26
	6	Short weave distance along I-526 EB between I-26 and Rivers Avenue
	7	Deceleration lane length and weave from I-526 WB to I-26 EB loop ramp
	8	Acceleration lane length from I-26 EB to I-526 EB loop ramp
	9	Deceleration/acceleration lane length and weave along I-26 EB C-D road
	10	Vertical curve along I-526 west of I-26
I-526 & Rivers Avenue	11	Congestion along I-526 WB and I-526 EB in the afternoon
	12	Deceleration lane length from I-526 WB to Rivers Avenue EB loop ramp
	13	Deceleration lane length from I-526 EB to Rivers Avenue WB loop ramp
	14	Vertical curve along I-526 west of Rivers Avenue
I-526	15	Future capacity projections show need for potential widening from the Don Holt Bridge to I-26

In order to address these deficiencies, four System Interchange alternatives were developed for preliminary screening based on separating movements that create congestion caused by closely spaced ramps and inadequate lengths of merges and weaves.

The traffic analysis was conducted using a VISSIM microsimulation subarea model, which included the System Interchange as well as the I-526 & Rivers Avenue interchange.

Alternative 1 was created by replacing a large two-lane flyover ramp from eastbound I-526 to westbound I-26 with relocated crossover and two smaller bridges. The loop ramp has been improved from 20 to 30 mph design speed in the westbound direction. C-D roads leading to loops and System Interchange ramps will be barrier separated. Alternative 1 is illustrated in **Figure 45.**

To develop ***Alternative 2***, two of the turbine ramps from Alternative 1 were removed and the existing flyover ramp from eastbound I-526 to westbound I-26 was retained and incorporated into this design. This existing ramp would carry two lanes to the westbound I-26 mainline, rather than tapering down to one.

This alternative also retains the 25-mph loop ramp from westbound I-26 to westbound I-526, since it is projected to carry relatively low traffic volumes in the AM and PM peak hours, respectively. Traffic to this loop will be barrier separated from mainline I-26 traffic on C-D road. This layout could also be upgraded to a full turbine in the future as volumes dictate. Alternative 2 is illustrated in **Figure 46.**

Alternative 3 consists of circular directional ramps which deliver traffic to and from a collector-distributor road system along I-26 and I-526 east of the interchange. Full access is provided between Rivers Avenue and I-26, via I-526. Alternative 3 is illustrated in **Figure 47**. This alternative was analyzed as a VISSIM sub area model using projected design year traffic volumes. The interchange was analyzed assuming four lanes in each direction on I-26 mainline through the interchange.

Alternative 4 incorporates the existing ramp from eastbound I-526 to westbound I-26 into a semi directional 3 level flyover ramp interchange. Semi directional ramps deliver traffic to and from barrier separated C-D roads along I-26 and I-526 east of the interchange. Alternative 4 is illustrated in **Figure 48.**

Each of these four System interchange alternatives will function with either full or partial access to/from Rivers Avenue; full access meaning a vehicle can reach I-26 east or west via I-526 from Rivers Avenue and partial access meaning that I-526 is accessible from the I-526 & Rivers Avenue interchange, but I-26 is not. If partial access is constructed, access to I-26 from Rivers Avenue would be via the Remount Road, Montague Avenue, Aviation Avenue interchange, and/or other nearby interchanges.

Full and partial access plans for Rivers Avenue are illustrated on **Figure 49** and **Figure 50**, respectively. The analyses for full and partial access at Rivers Avenue was conducted based upon Design Year projected peak hour volumes and assessed the impact of diverting the volumes of the associated origin-destination pairs, to other access points on I-26. Alternative concepts at this location were integrated into the overall network for microsimulation analysis, on the basis of highest level of service and least impact.

Figure 45 – System Interchange Preliminary Alternative 1: Semi-Directional Interchange

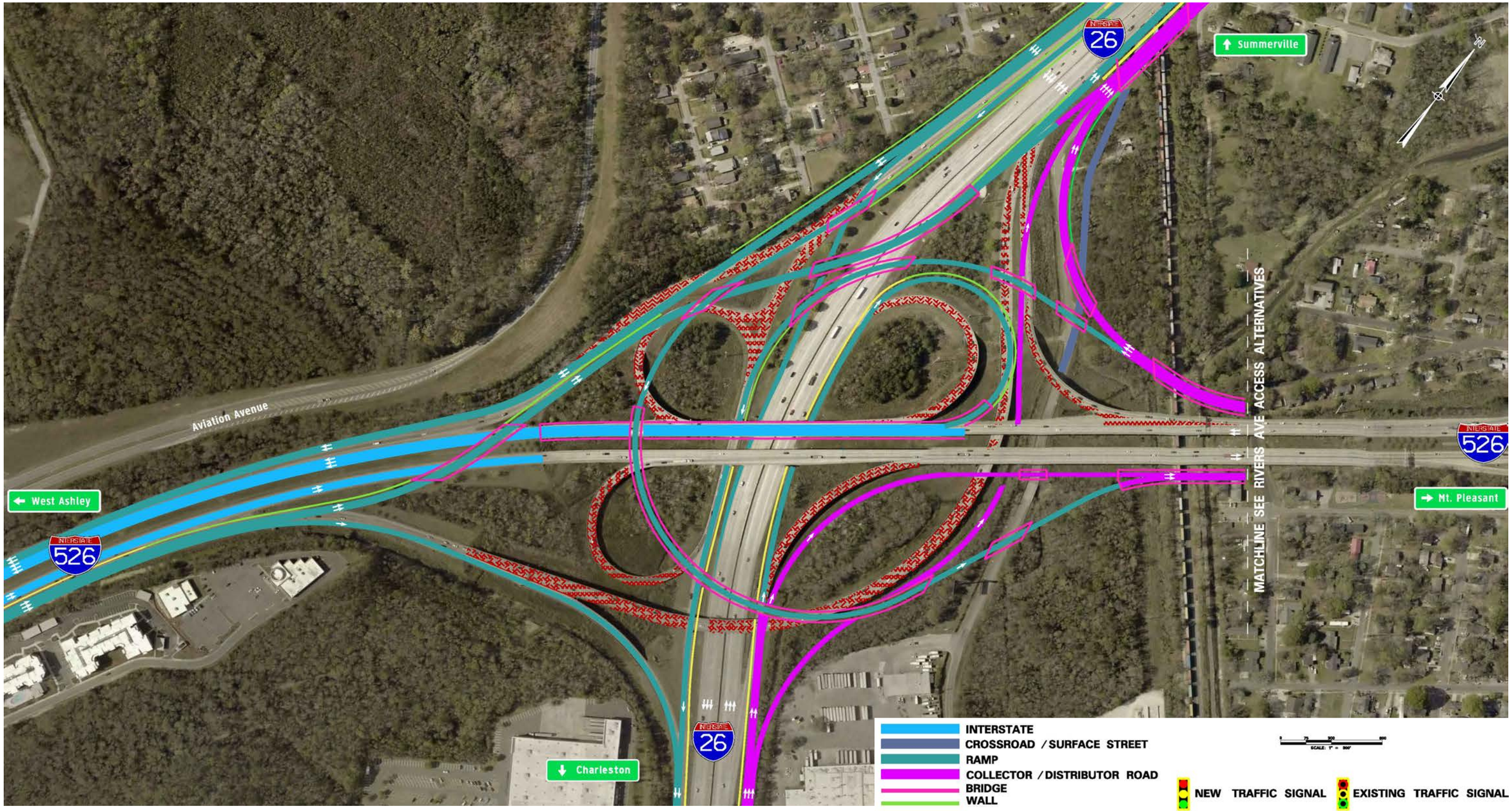


Figure 46 – System Interchange Preliminary Alternative 2: Semi-Directional Interchange w/ 1 Loop Ramp

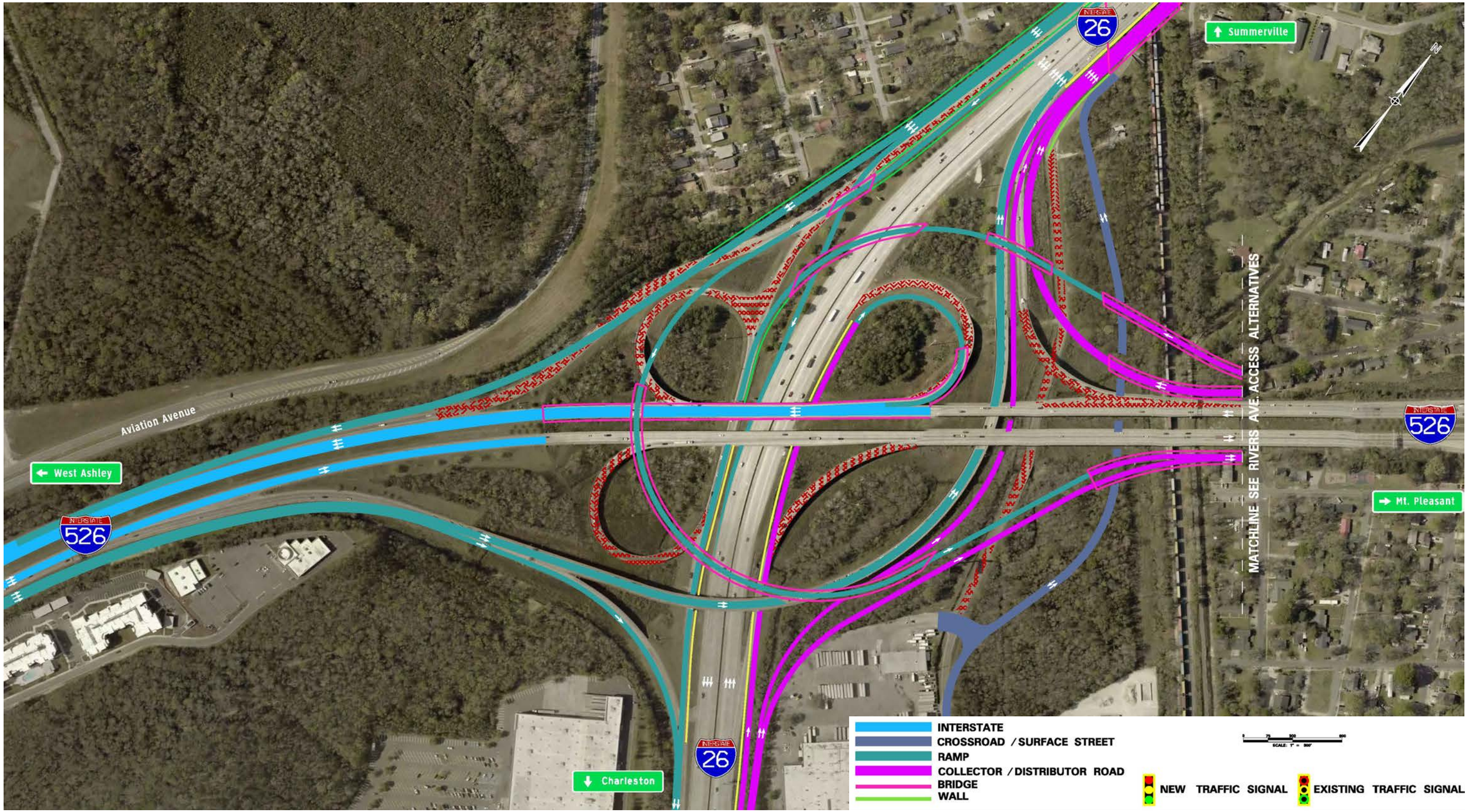


Figure 47 – System Interchange Preliminary Alernative 3: Semi-Directional Turbine Interchange

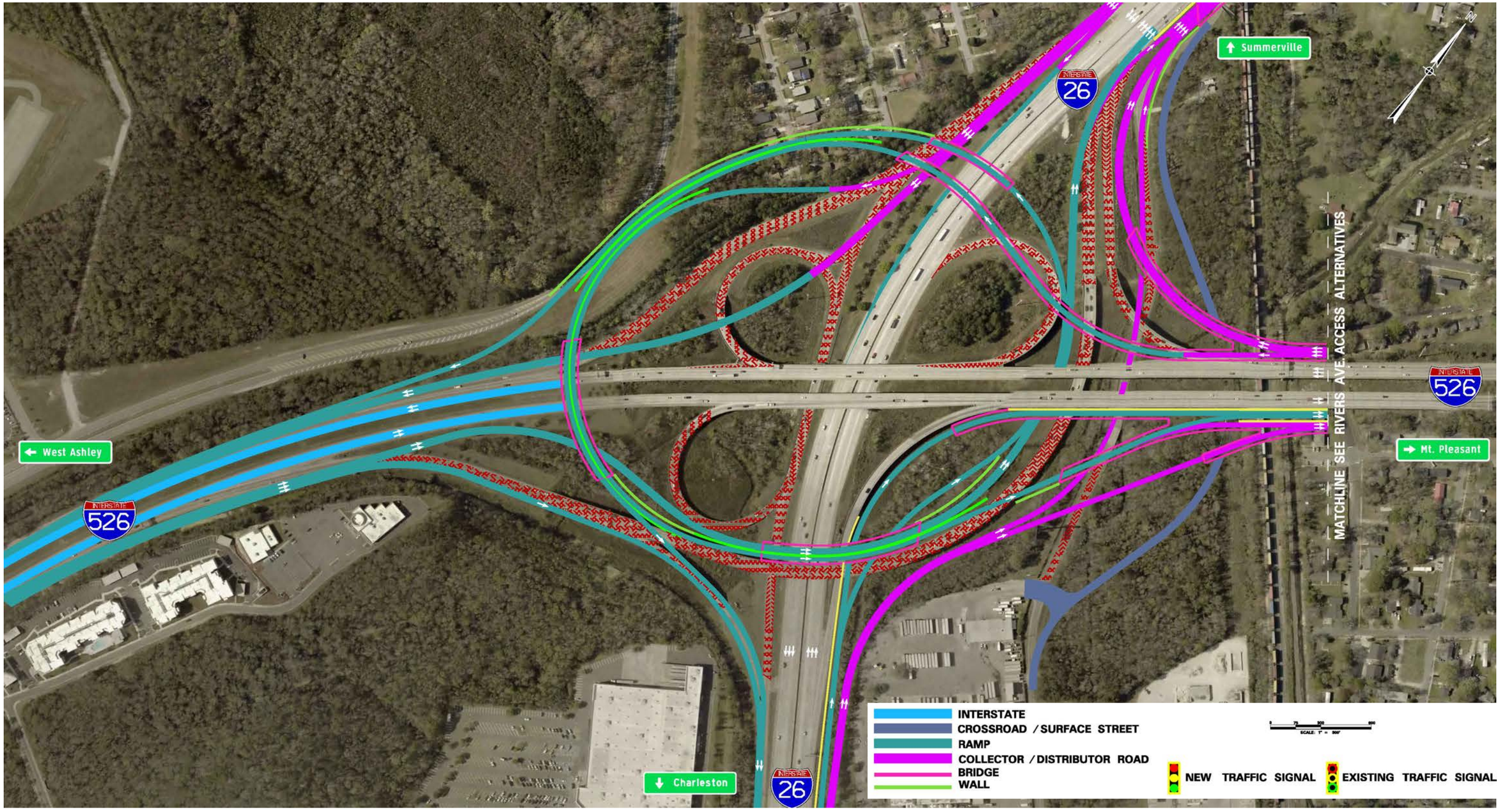


Figure 48 – System Interchange Preliminary Alernative 4: Semi-Directional w/ 3 Levels of Ramping

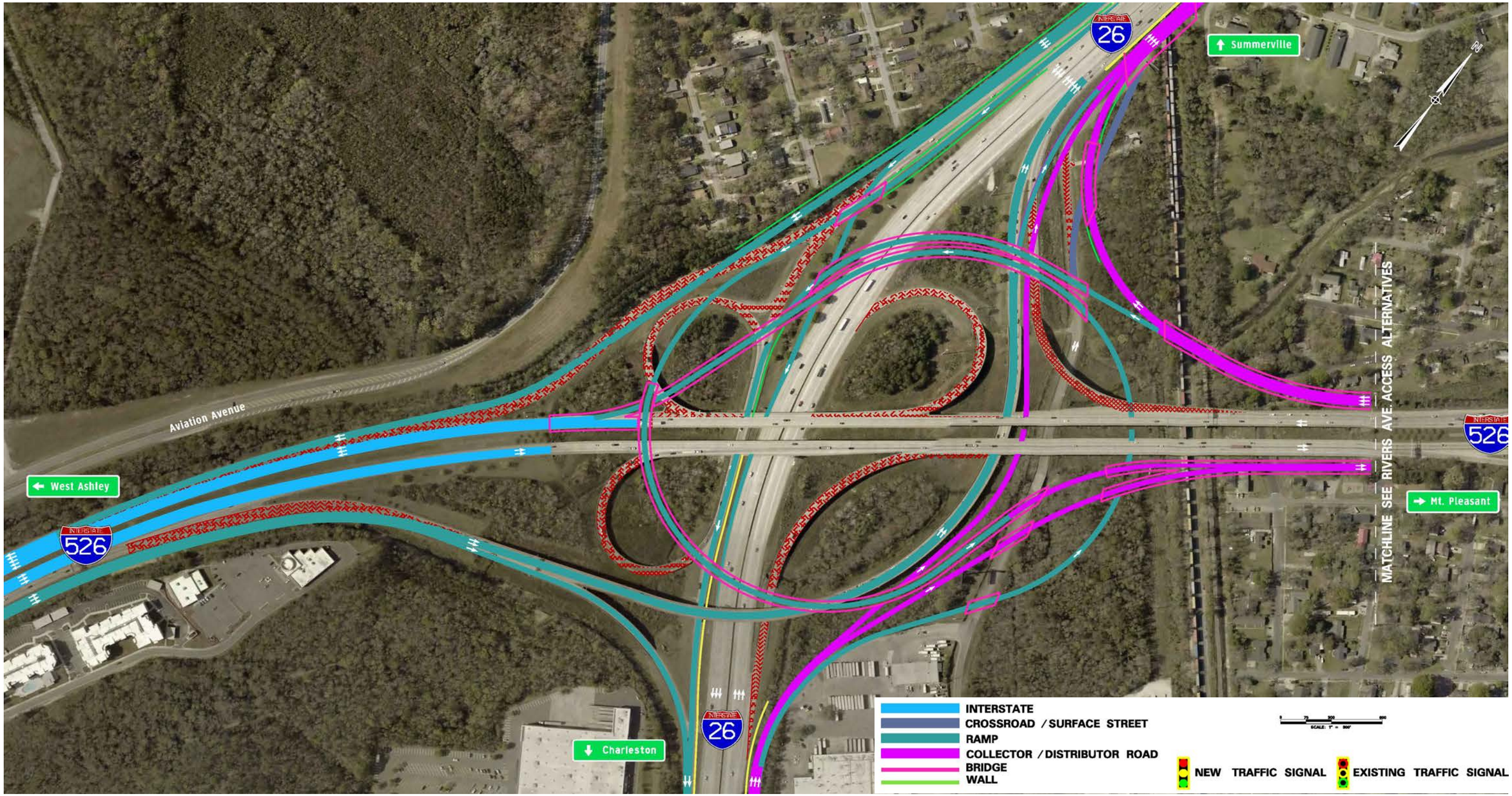


Figure 49 – System Interchange: Full Access at Rivers Avenue

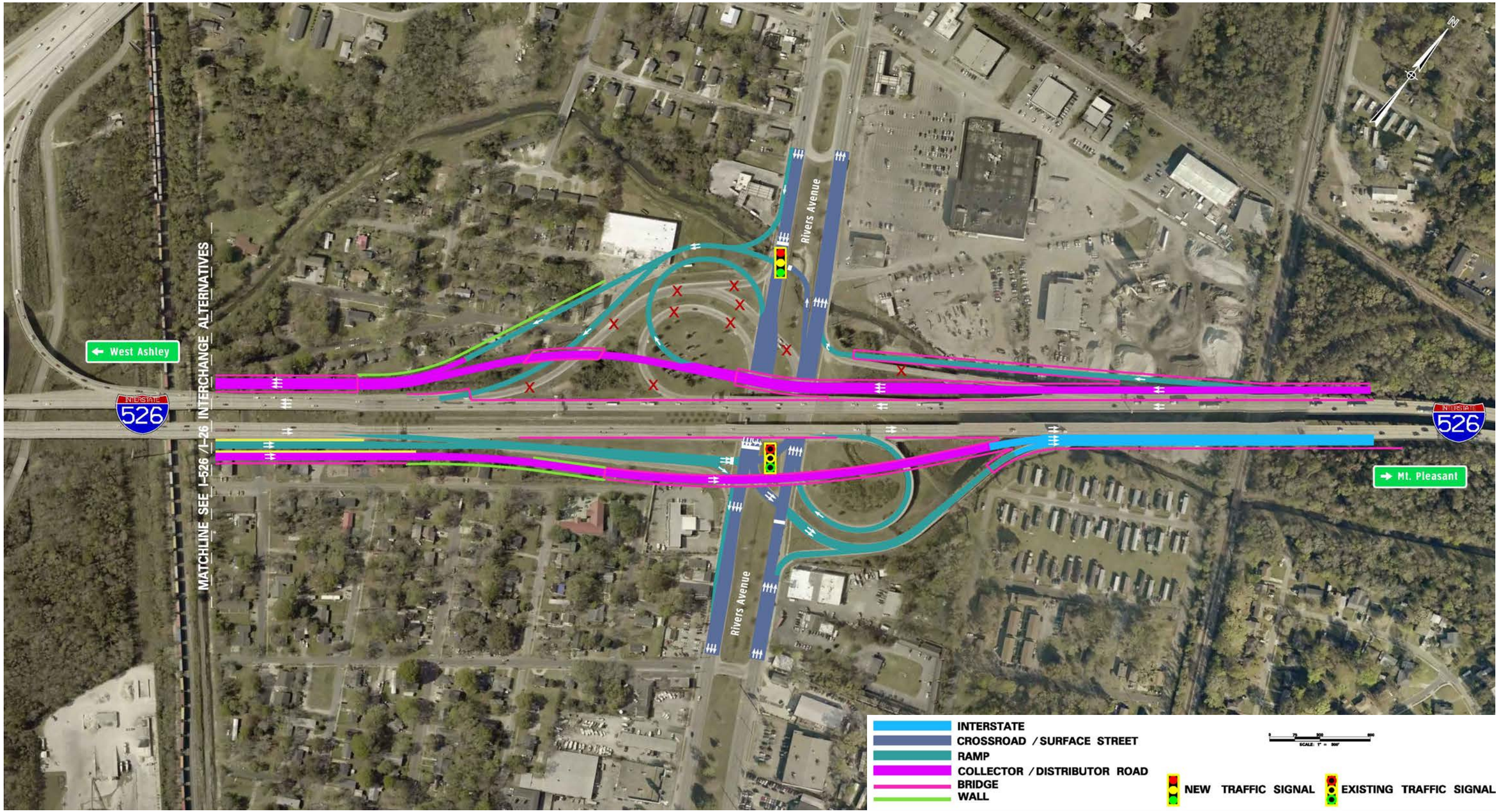
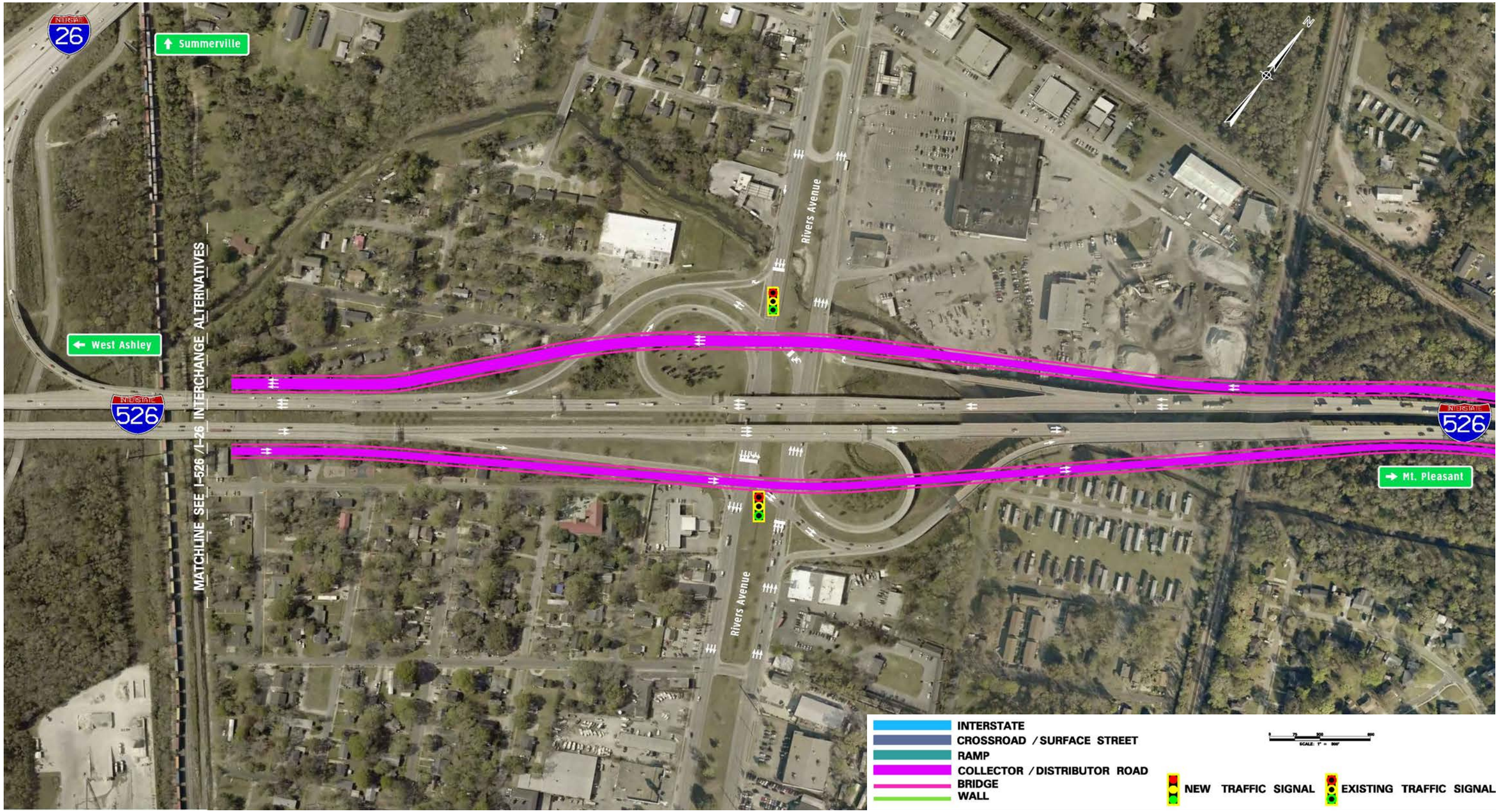


Figure 50 – System Interchange: Partial Access at Rivers Avenue



Sub-area VISSIM Microsimulation models were created and analyzed for each of the four preliminary alternatives. The sub-area models encompass the I-26 and I-526 System interchange and the Rivers and I-526 interchange. Dynamic assignment (DTA) was run with the new network and the origin-destination matrix. It is expected that different zones have different growth patterns due to the local developments and constrained nature of the roadway system. As such, the base year cannot simply be grown by a global factor. A similar OD estimation process was employed to match the future year volume targets, while maintaining the base year traffic pattern. Travel times segments were created at the exact same locations in each of the alternative build models and compared in **Table 30**, with the lowest travel time for each path **bolded in blue text**. In the AM peak hour, Alternative 3 generally had the highest travel times for the 16 paths examined. Alternative 4 showed generally lower travel times considering the 16 paths while Alternative 1 and 2 showed comparable travel time results. In the PM peak hour, results varied more by travel time path; however Alternatives 1, 2, and 4 displayed similar average travel times while Alternative 3 had the highest average travel time considering all 16 segments.

Table 30 – VISSIM Sub Area Model Travel Times

No.	TT Measurement				Average AM Travel Time (s)				Average PM Travel Time (s)			
	From		To		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 1	Alt. 2	Alt. 3	Alt. 4
1	I-526 WB	*E of I-26*	I-526 WB	*W of I-26*	179	179	**178**	179	182	182	**180**	182
2	I-526 WB CD	*E of I-26*	I-26 WB CD	*N of I-526*	**208**	**208**	209	217	212	209	**204**	215
3	I-526 WB CD	*E of I-26*	I-26 EB	*S of I-526*	301	301	292	**272**	**243**	276	273	249
4	I-26 WB	*S of I-526*	I-526 WB	*W of I-26*	246	246	361	**244**	**240**	246	359	244
5	I-26 WB	*S of I-526*	I-26 WB CD	*N of I-526*	**231**	**231**	346	235	239	**227**	346	235
6	I-26 WB	*S of I-526*	I-26 WB	*N of I-526*	**198**	**198**	312	**198**	**203**	**203**	331	**203**
7	I-26 WB	*S of I-526*	I-526 EB CD	*E of I-26*	236	236	354	**226**	241	235	345	**225**
8	I-526 EB	*W of I-26*	I-26 WB CD	*N of I-526*	235	235	282	**212**	**188**	212	215	210
9	I-526 EB	*W of I-26*	I-26 WB	*N of I-526*	220	220	264	**194**	**171**	197	196	195
10	I-526 EB	*W of I-26*	I-26 EB	*S of I-526*	236	236	264	**214**	**185**	192	192	193
11	I-526 EB	*W of I-26*	I-526 WB	*E of I-26*	181	181	187	**179**	178	178	**177**	178
12	I-26 EB CD	*N of I-526*	I-526 WB	*W of I-26*	251	251	252	**232**	**196**	198	199	201
13	I-26 EB CD	*N of I-526*	I-26 EB	*S of I-526*	289	289	287	**268**	247	**226**	**226**	227
14	I-26 EB CD	*N of I-526*	I-26 EB	*S of I-526*	245	245	242	**225**	200	**181**	**181**	182
15	I-26 EB	*N of I-526*	I-526 EB CD	*E of I-26*	322	322	323	**286**	285	273	274	**259**
16	I-26 EB	*N of I-526*	I-26 EB	*S of I-526*	209	209	**207**	209	201	**200**	**200**	**200**
				AVERAGE	**237**	**237**	**273**	**224**	**213**	**215**	**244**	**212**

4.3.1 Reasonable Alternative(s) Carried Forward

Based on this VISSIM travel time analysis, Alternatives 1, 2, and 4 are projected to provide the best travel times throughout the System Interchange. From this subset of the three best performing alternatives, Alternatives 1 and 2 were carried forward as reasonable alternatives. Alternative 3 was not carried forward due to the large footprint and resulting impacts and Alternative 4 was not carried forward due to complex constructability. As mentioned previously, each of the four System interchange alternatives will function with either full or partial access to/from Rivers Avenue. Therefore, of the two preliminary System Interchange alternatives carried forward (Alternatives 1 and 2), two additional alternatives were developed based on full or partial access to/from Rivers Avenue, **leading to four total System Interchange reasonable alternatives:** (1 – partial Rivers Avenue access, 1A – Full Rivers Avenue access, 2 – partial Rivers Avenue access, and 2A – full Rivers Avenue access) as shown in **Figure 51** , **Figure 52 Figure 53 Figure 54** below.

Figure 51 – I-526 & I-26 System Interchange Reasonable Alternative 1

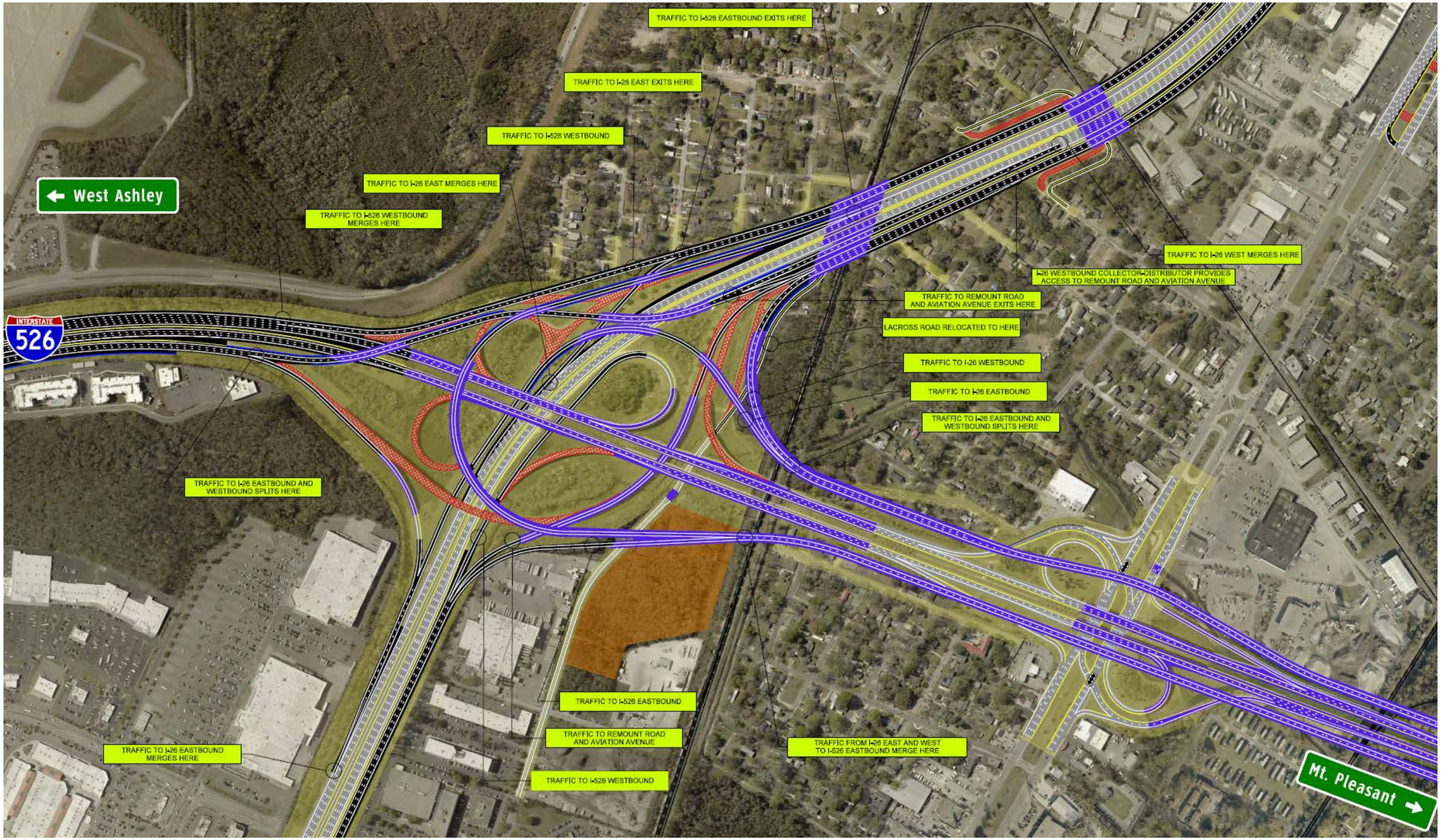


Figure 52 – I-526 & I-26 System Interchange Reasonable Alternative 1A

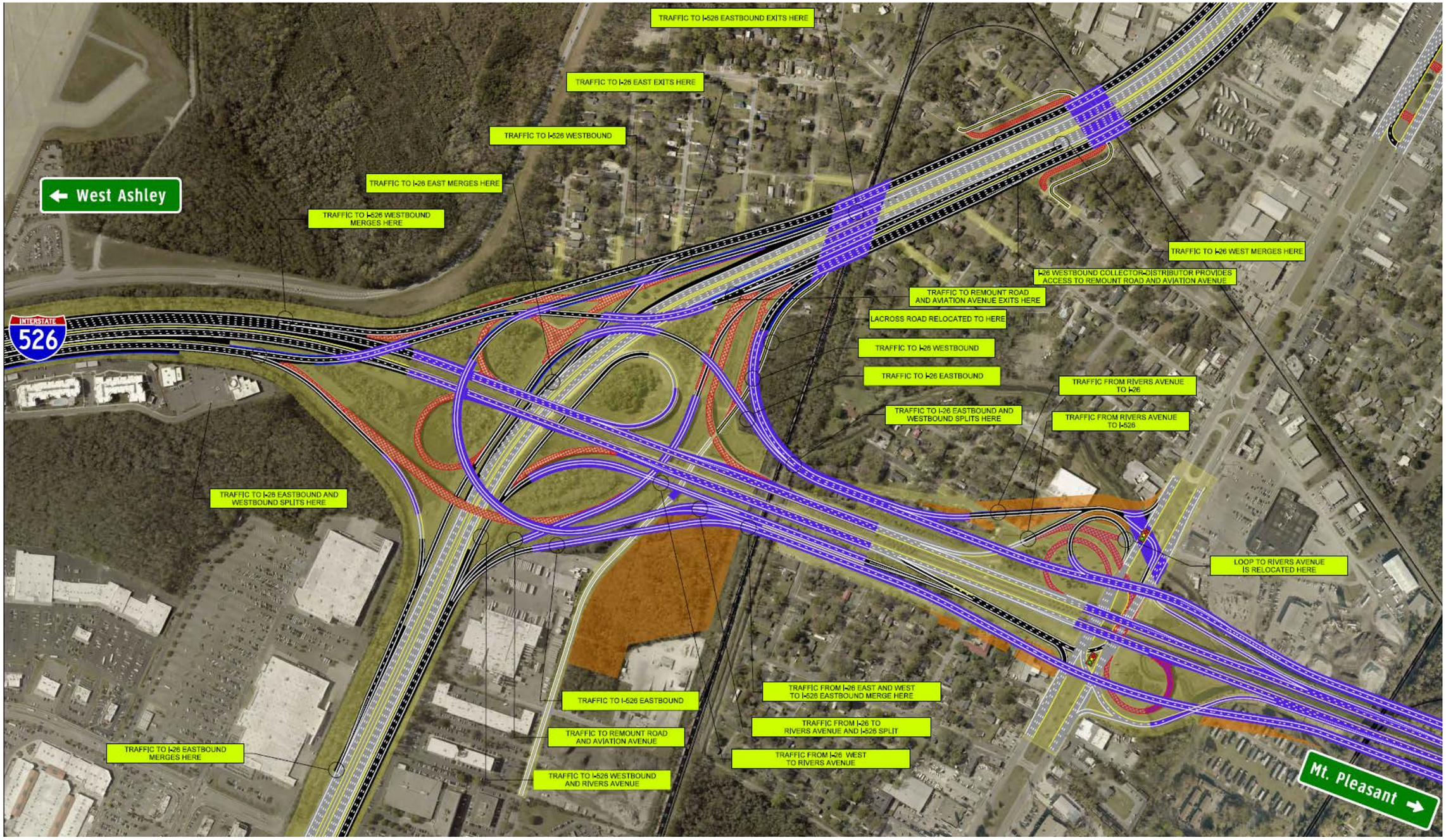


Figure 53 – I-526 & I-26 System Interchange Reasonable Alternative 2

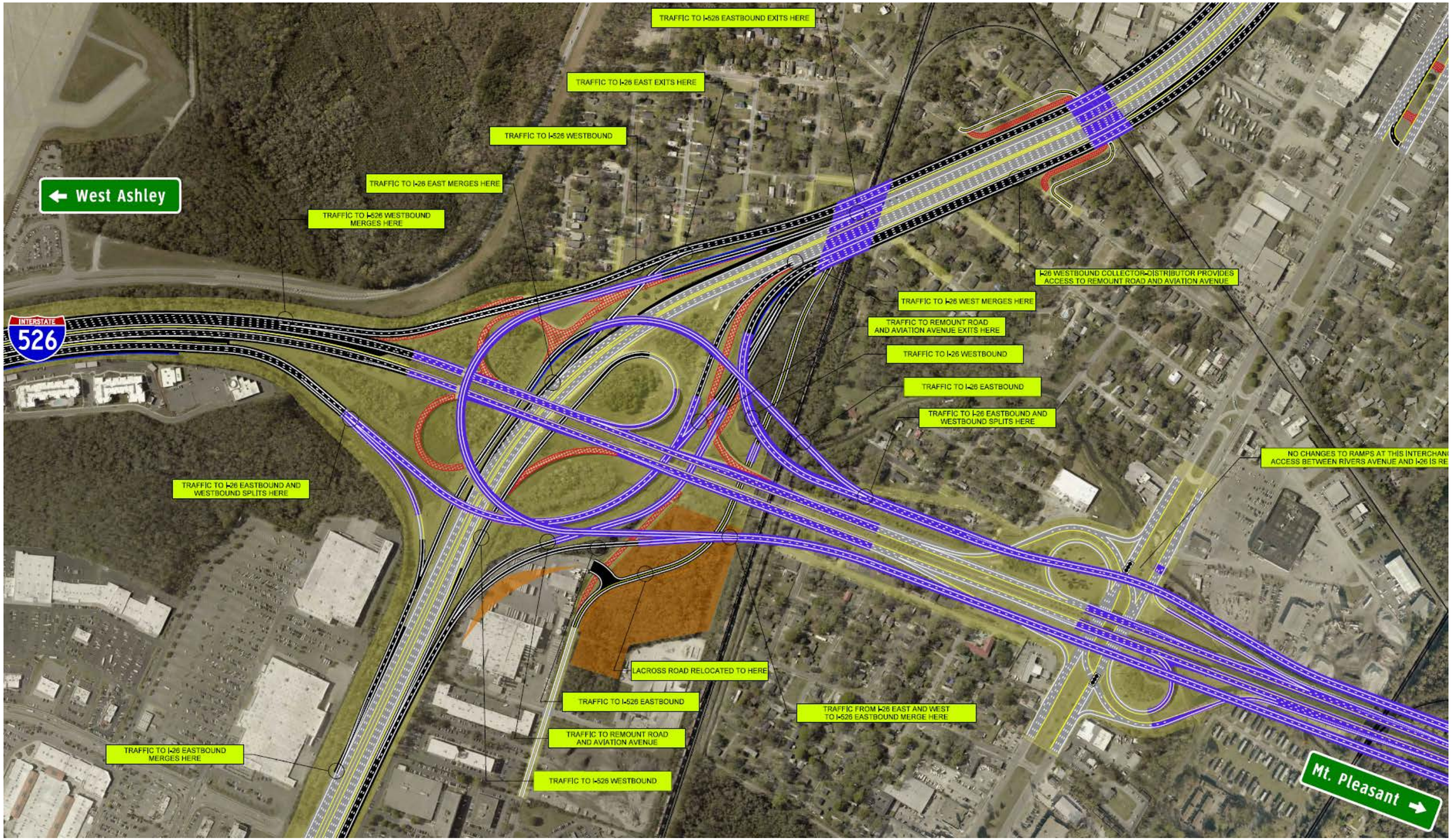
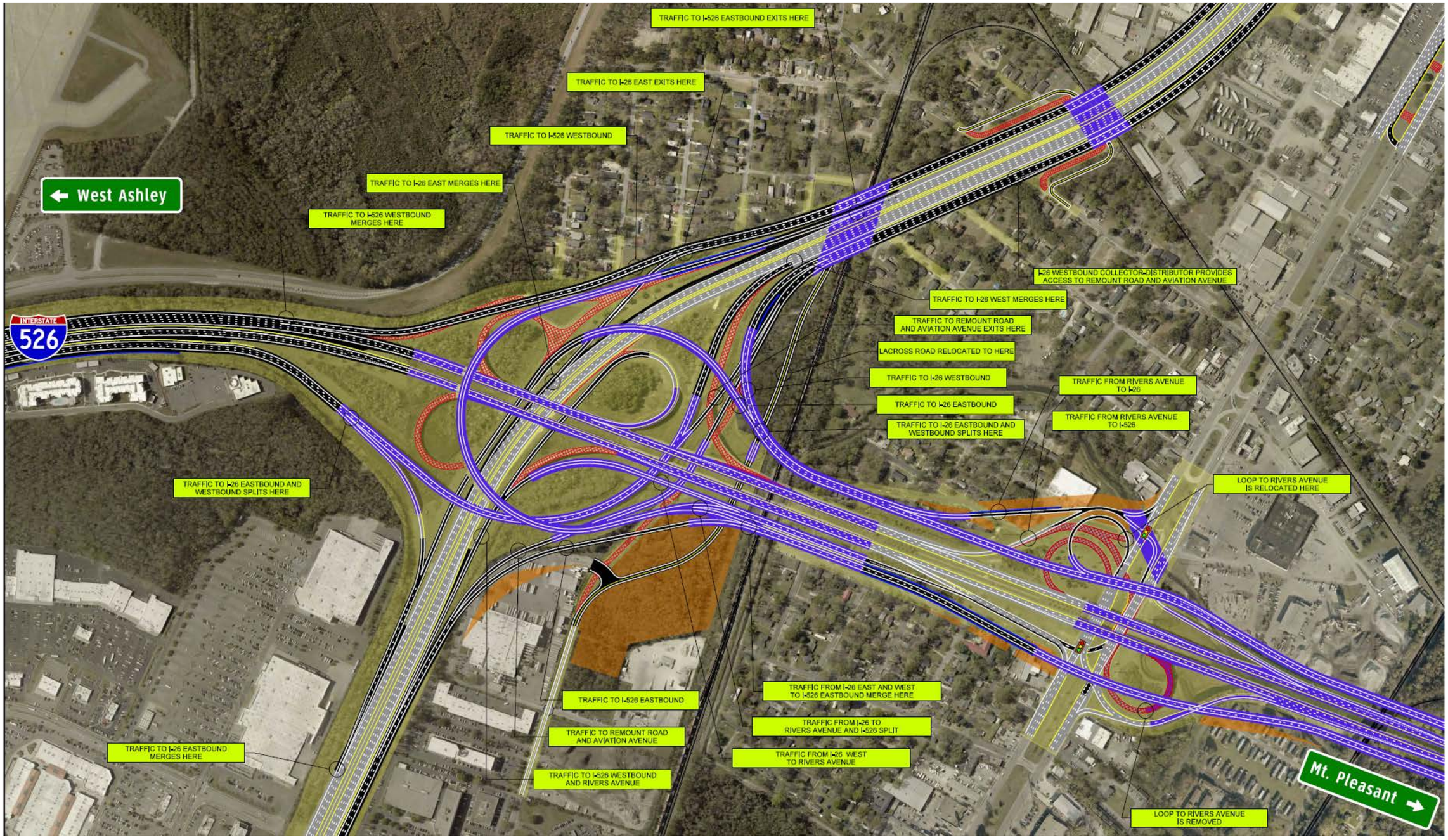


Figure 54 – I-526 & I-26 System Interchange Reasonable Alternative 2A



4.4 SERVICE INTERCHANGE ALTERNATIVES

Recall from **Figure 1** in **Section 1.2 – Study Area** that the following service interchanges are included in the I-526 LCC West Project Study Area:

- I-526 & Paul Cantrell Boulevard (Including Magwood Dr) Exit 11
- I-526 & Leeds Avenue Exit 14
- I-526 & Dorchester Road/Paramount Drive Exit 15
- I-526 & W. Montague Avenue/International Boulevard Exit 16
- I-526 & Rivers Avenue Exit 18
- I-526 & N. Rhett Avenue Exit 19
- I-526 & Virginia Avenue Exit 20
- I-26 & Aviation Avenue Exit 211A
- I-26 & Remount Road Exit 211B
- I-26 & Montague Avenue Exit 213

Also recall from **Section 1.1 – Project Purpose, Need, and Priorities**, the project's goals and priorities:

1. **Replacement/Improvement of the I-526 & I-26 System Interchange.**
    - To significantly improve operations for both interstate corridors.
2. **Improve Mainline Capacity along I-526, defined as:**
    - Eliminate queueing/back up of traffic exiting the freeway by improving auxiliary lanes and ramp termini. This will exclude improvements specifically designed to improve the flow of traffic that is entering the freeway.
    - Provide freeway capacity, excluding cross street improvements, necessary to accommodate forecasted traffic demand. More specifically, assume that improvements will be made by others (local governments, etc.) to fund future improvements allowing additional traffic to enter the freeway. This assumption will be translated into the number of general-purpose lanes, as well as weaving, merging and diverging operations throughout the corridor. This is considered integral to maintaining mainline capacity.

Therefore, service interchange improvements were limited to those required to achieve acceptable mainline interstate operations and were therefore concerned with queueing caused by ramp terminal intersections. If the design year queueing at the ramp terminal intersections of an interchange were not anticipated to cause disruptions to the interstate, the interchange was not considered for improvement, regardless of traffic operations along the cross street. To determine which interchanges were likely to cause disruptions to the interstate without improvements, review of the design year VISSIM microsimulation model was conducted, leading to three interchanges identified for improvements:

- I-526 & Paul Cantrell Boulevard (Including Magwood Dr) Exit 11
- I-526 & N. Rhett Avenue Exit 19
- I-526 & Virginia Avenue Exit 20

The remaining interchanges in the study area were left in their no-build conditions, with the only improvements being realignment of ramps, etc. to attach to the widened interstate. Upon selection of the preferred alternative, the VISSIM microsimulation model was again reviewed with ramp queues collected to verify that, with improvements to the three interchanges listed above, ramp queueing throughout the study area did not cause disruptions to the interstate mainline operations. The sections which follow discuss the preliminary alternatives developed (and reasonable alternatives carried forward) for the interchanges to be improved.

4.4.1 Paul Cantrell Boulevard & Magwood Drive

The at-grade, signalized intersection of Paul Cantrell Boulevard and Magwood Drive is located less than one-half mile from the existing I-526 and Paul Cantrell Boulevard interchange.

The intersection is bordered by development, with restaurants in the northeast and southwest quadrants, and a home improvement store in the northwest quadrant. Driveways access Magwood Drive within 300 feet north of Paul Cantrell Boulevard. Magwood Drive terminates at Henry Tecklenburg Drive 300 feet south of Paul Cantrell Boulevard. St. Francis Hospital is located at the south end of Magwood Drive.

For preliminary screening of alternatives at this location, an assumption was made that the elevation difference between the ground level roadway and the roadway over would be 25 feet. This allows for 17 feet of clearance, and 8 feet of superstructure depth. If Magwood Drive is taken over Paul Cantrell Boulevard, at an assumed design speed of 35 miles per hour and a 4% approach gradient, a distance of nearly 900 feet is required from the edge of Paul Cantrell Boulevard to touch down on Magwood. The business access and proximity of the hospital to the intersection eliminates any interchange alternatives that would take Magwood Drive over Paul Cantrell Boulevard. The design guidance used to determine this distance was taken from Figure 19.4A of the SCDOT Highway Design Manual. The same guidance was used for determining the length to touchdown for Paul Cantrell Boulevard over Magwood Drive. In this case, a 50 mile per hour design speed, and 4% approach gradient was assumed. For this case, the touch down distance would be approximately 1,000 feet from the edge of Magwood Drive. The touch down point will be midway between Magwood Drive and I-526.

Considering the classification and associated traffic volumes of Paul Cantrell Boulevard and Glenn McConnell Parkway relative to Magwood Drive, it would be more appropriate to carry Paul Cantrell Boulevard over Magwood Drive. This option appeared to require less right of way and would affect fewer properties.

In the PM peak hour, westbound traffic on Paul Cantrell Boulevard at this signal currently queues back onto I-526, routinely backing up westbound traffic on I-526 for two to three miles. Forecasted growth in the Paul Cantrell Boulevard corridor (Glenn McConnell Parkway beyond Magwood Drive), is the strongest growth of any surface street in the study area, and the level of service will continue to decline.

The AM peak hour has the reverse conditions. Among the worst performing conditions is a dual left turn from eastbound Paul Cantrell Boulevard to eastbound I-526, and this traffic queues back into the Magwood intersection. These conditions, and the ½ mile of separation between I-526 and Magwood Drive, indicate that any solutions at Magwood Drive will require close coordination with conditions at I-526. Base Year and Design Year No Build, AM and PM peak hour LOS/Delay are shown in **Table 31.**

Table 31 – Paul Cantrell Boulevard & Magwood Drive Intersection LOS/Delay

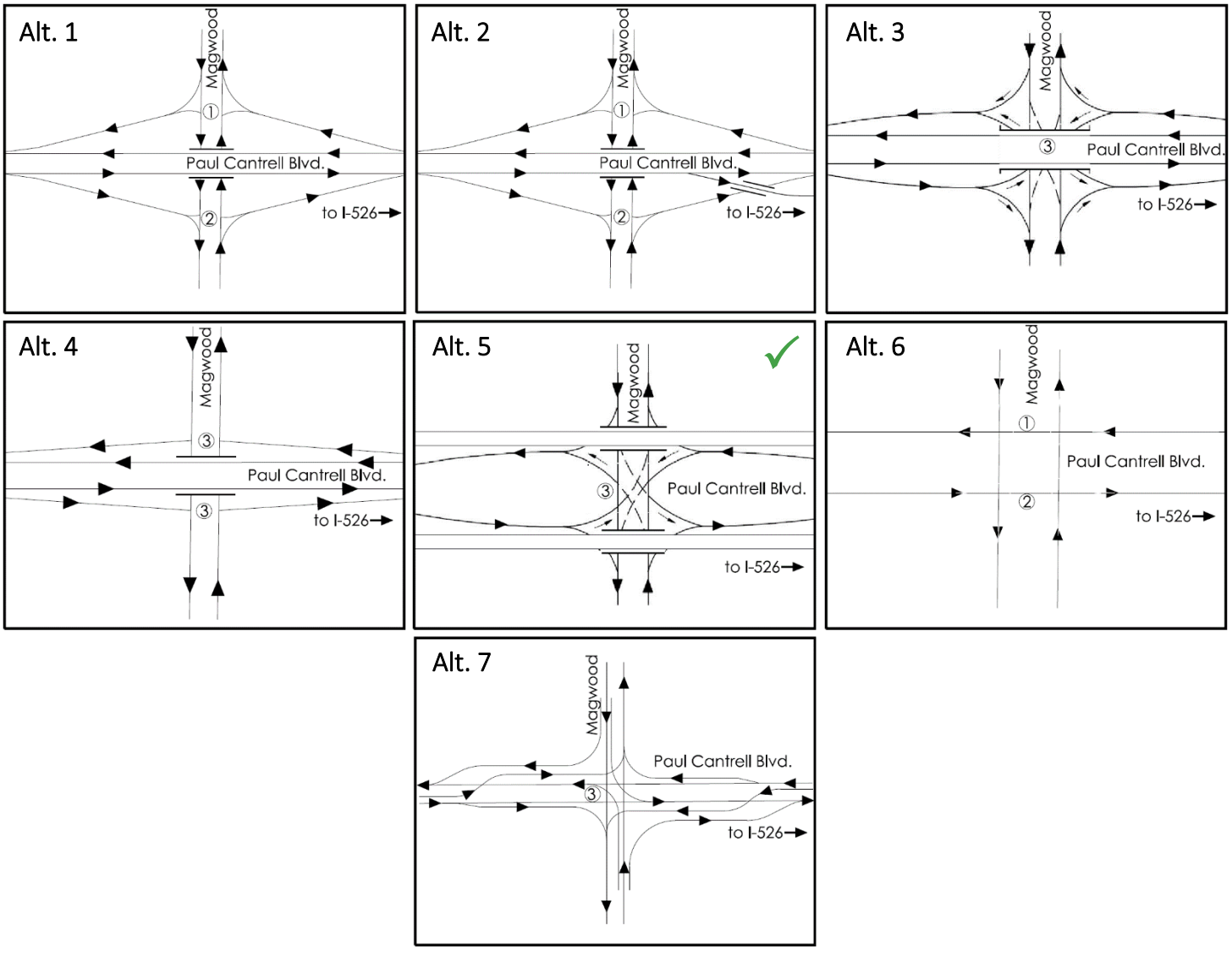
Intersection	Base Year LOS		Design Year No Build LOS	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Paull Cantrell Blvd & Magwood Dr	F	F	F	F

Seven intersection alternatives were included in preliminary screening for the intersection of Paul Cantrell Boulevard & Magwood Drive, as listed in **Table 32** and shown in **Figure 55.** With no geometric deficiencies at this intersection, the decision to carry forward was based on intersection LOS and compatibility with the adjacent interchange.

Table 32 – Paul Cantrell Blvd & Magwood Dr Interchange Alternative Screening

Interchange Alternative		Intersection LOS/Delay (s/veh)						Geometric Deficiencies Resolved	Compatible w/ Adjacent Interchange?	Carried Forward?
		1		2		3				
		AM	PM	AM	PM	AM	PM			
1	Diamond	B	B	C	C	--	--	0/0	NO	✗
2	Diamond w/ semi-directional ramp at I-526	B	B	C	C	--	--	0/0	YES	✗
3	Single point urban interchange (SPUI)	--	--	--	--	C	C	0/0	NO	✗
4	Compressed diamond w/ phase overlap	--	--	--	--	C	B	0/0	YES	✗
5	SPUI w/ separated overpass bridges	--	--	--	--	C	C	0/0	YES	✓
6	Maximized at-grade intersection	--	--	--	--	F	D	0/0	YES	✗
7	Continuous flow intersection	--	--	--	--	F	F	0/0	NO	✗

Figure 55 – Paul Cantrell Blvd & Magwood Dr Interchange Alternative Schematics

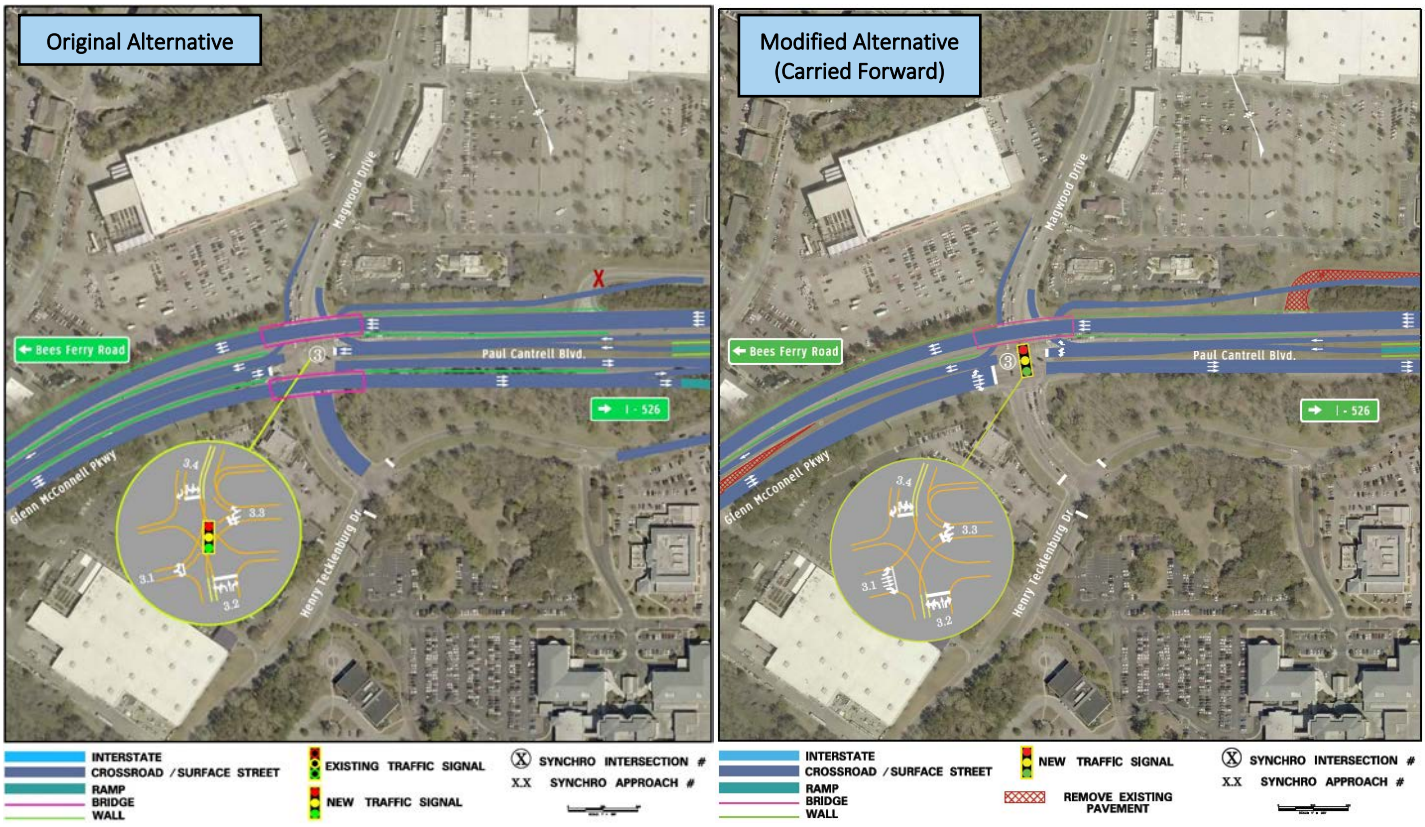


4.4.1.1 Reasonable Alternative(s) Carried Forward

Alternative 5, shown in greater detail in **Figure 56,** was the sole alternative carried forward as a reasonable alternative. In Alternative 5, the major westbound I-526 to westbound Glenn McConnell (beyond Magwood) is carried in the outer lanes of Paul Cantrell Boulevard, and a single lane ramp is carried over the westbound lanes of Paul Cantrell into the median. The eastbound and westbound lanes over Magwood are separated, providing an intersection between the two overpasses. A dual left from eastbound Paul Cantrell to the eastbound I-526 entrance ramp is retained from the current configuration to provide eastbound I-526 access to traffic entering from Magwood Drive. The combination of these two alternates were run with design year peak hour traffic volumes in a VISSIM sub-area model. Visual observation of the model runs indicate effective operations with no queueing onto the freeway. Another feature of this interchange alternative is the inclusion of a "Texas U-turn" for westbound Paul Cantrell traffic to access the frontage road to SC 61. Only one-way access will be permitted.

Prior to carrying forward the original Alternative 5, a modified Alternative 5 was developed to prioritize SCDOT's goals and priorities for the project. This alternative removed the grade separation in the eastbound direction as this separation was not necessary to maintain acceptable queueing on the adjacent I-526 ramps. This modified Alternative 5 was therefore carried forward as the sole reasonable alternative at Paul Cantrell Boulevard & Magwood Drive. Visual observation of the model runs indicate effective operations with no queueing onto the freeway.

Figure 56 – Paul Cantrell Boulevard & Magwood Drive Alternative 5



The reasonable alternative 5, combined with the reasonable alternative at the I-526 & Paul Cantrell Boulevard is shown in **Figure 59.**

4.4.2 I-526 & Paul Cantrell Boulevard

The existing interchange includes two loop ramp exits and two diagonal ramp exits. Vehicles enter I-526 in either direction via diagonal ramps. The close proximity of this interchange with the Paul Cantrell Boulevard & Magwood Drive intersection will require coordination between improvement alternatives at each location.

Based on the traffic demands on the ramps, the most constrained area seems to be the northeast quadrant, where large volumes access the freeway in the AM peak hour, and the combination of a loop and diagonal ramp are pushed up against the residential development.

The *I-526 Corridor Study* recommended improvements in the northeast quadrant of the interchange, including improving the radius of the loop ramp, and providing for a triple left turn operation from eastbound Paul Cantrell boulevard to the eastbound I-526 entrance ramp. This left turning volume is particularly high, and since the traffic forecast was updated for the 526 Lowcountry Corridor Project, that approach fails. Consequently, new alternatives were explored.

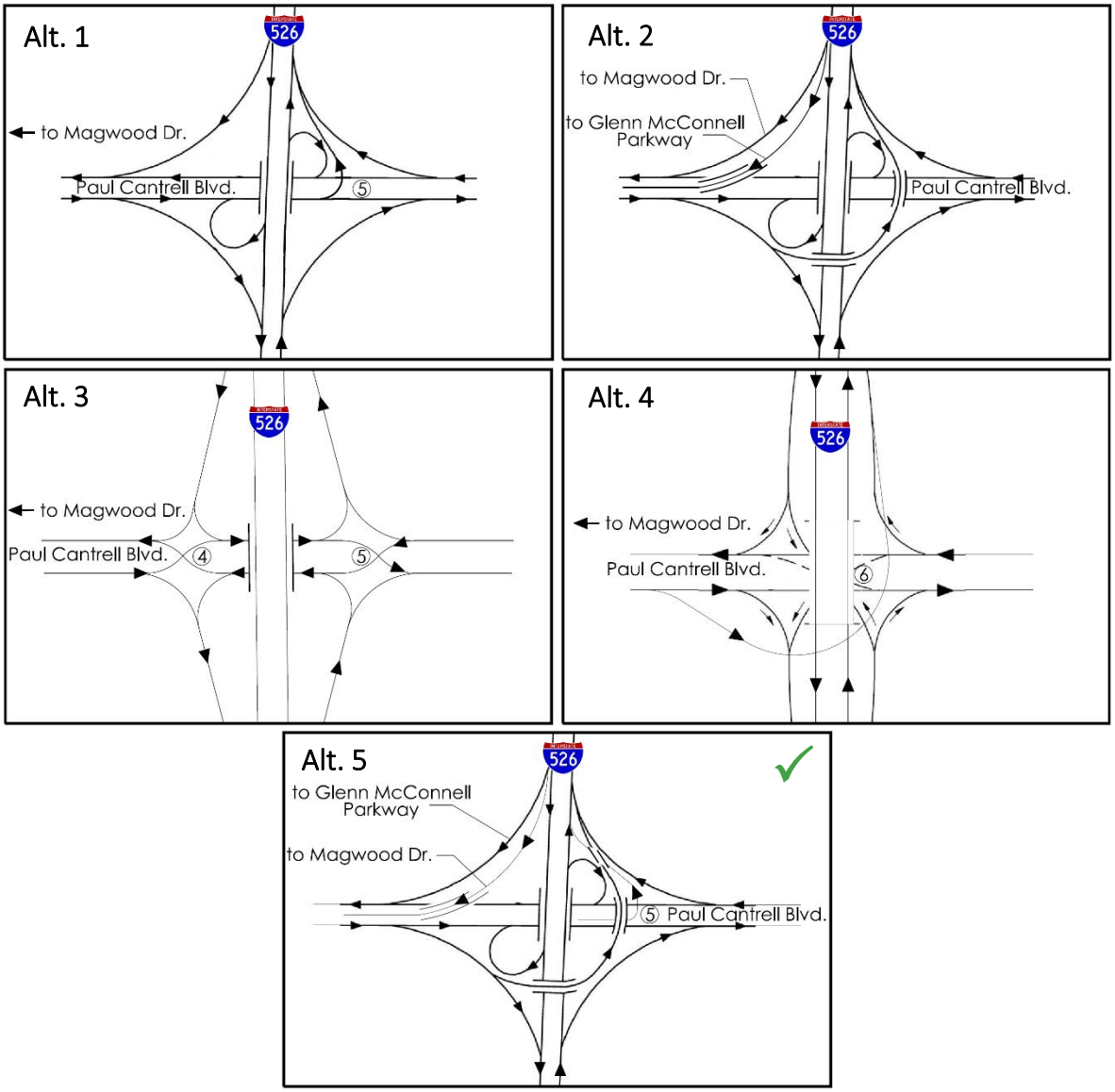
Most the westbound I-526 PM peak hour traffic exits to Paul Cantrell Boulevard. In the westbound direction of I-526, the need for the fourth lane (see mainline discussion) ends at the exit to westbound Paul Cantrell Boulevard. Three lanes may be carried over Paul Cantrell on I-526. In the eastbound direction, only two lanes are required in the design year, until the eastbound traffic enters (AM peak) from Paul Cantrell Boulevard and this pushes the demand to four lanes.

Five interchange alternatives were included in preliminary screening for the interchange of I-526 & Paul Cantrell Boulevard, as listed in **Table 33** and shown in **Figure 57.** With six geometric deficiencies identified at this intersection, the decision to carry forward was based on the number of these geometric deficiencies resolved, intersection LOS, and compatibility with the adjacent interchange.

Table 33 – I-526 & Paul Cantrell Blvd Interchange Alternative Screening

Interchange Alternative		Intersection LOS/Delay (s/veh)						Geometric Deficiencies Resolved	Compatible w/ Adjacent Interchange?	Carried Forward?
		4		5		6				
		AM	PM	AM	PM	AM	PM			
1	Triple lefts to I-526 EB w/ improved loops	--	--	F	E	--	--	6/6	NO	✗
2	Semi-directional ramp to 526 w/ improved loops	--	--	--	--	--	--	6/6	YES	✗
3	Diverge diamond interchange (DDI)	A	B	A	A	--	--	6/6	NO	✗
4	SPUI w/ semi-directional ramp to I-526 EB	--	--	--	--	A	A	6/6	YES	✗
5	Semi-directional ramp *and* left-turn to I-526 EB	--	--	C	C	--	--	6/6	YES	✓

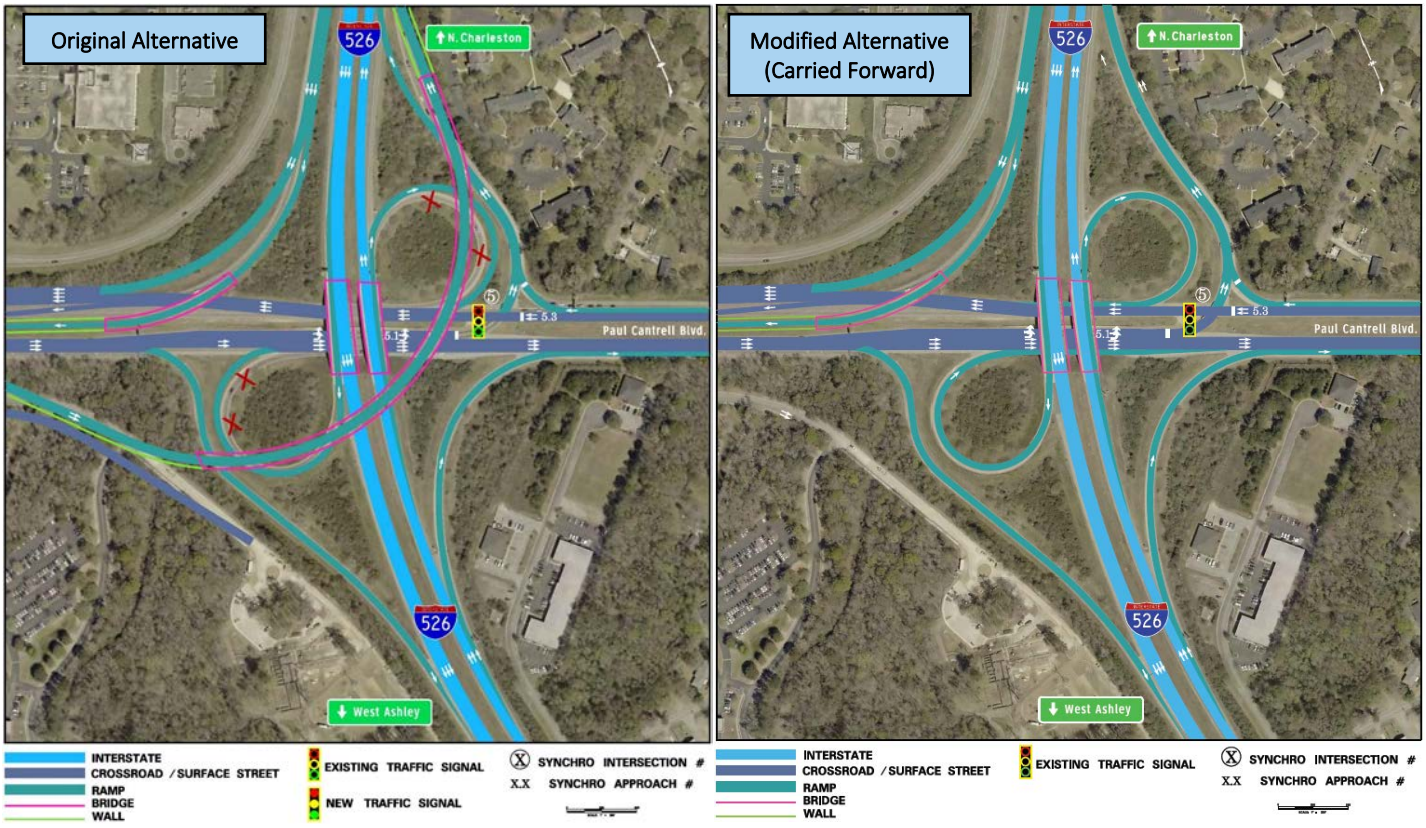
Figure 57 – I-526 & Paul Cantrell Blvd Interchange Alternative Schematics



4.4.2.1 Reasonable Alternative(s) Carried Forward

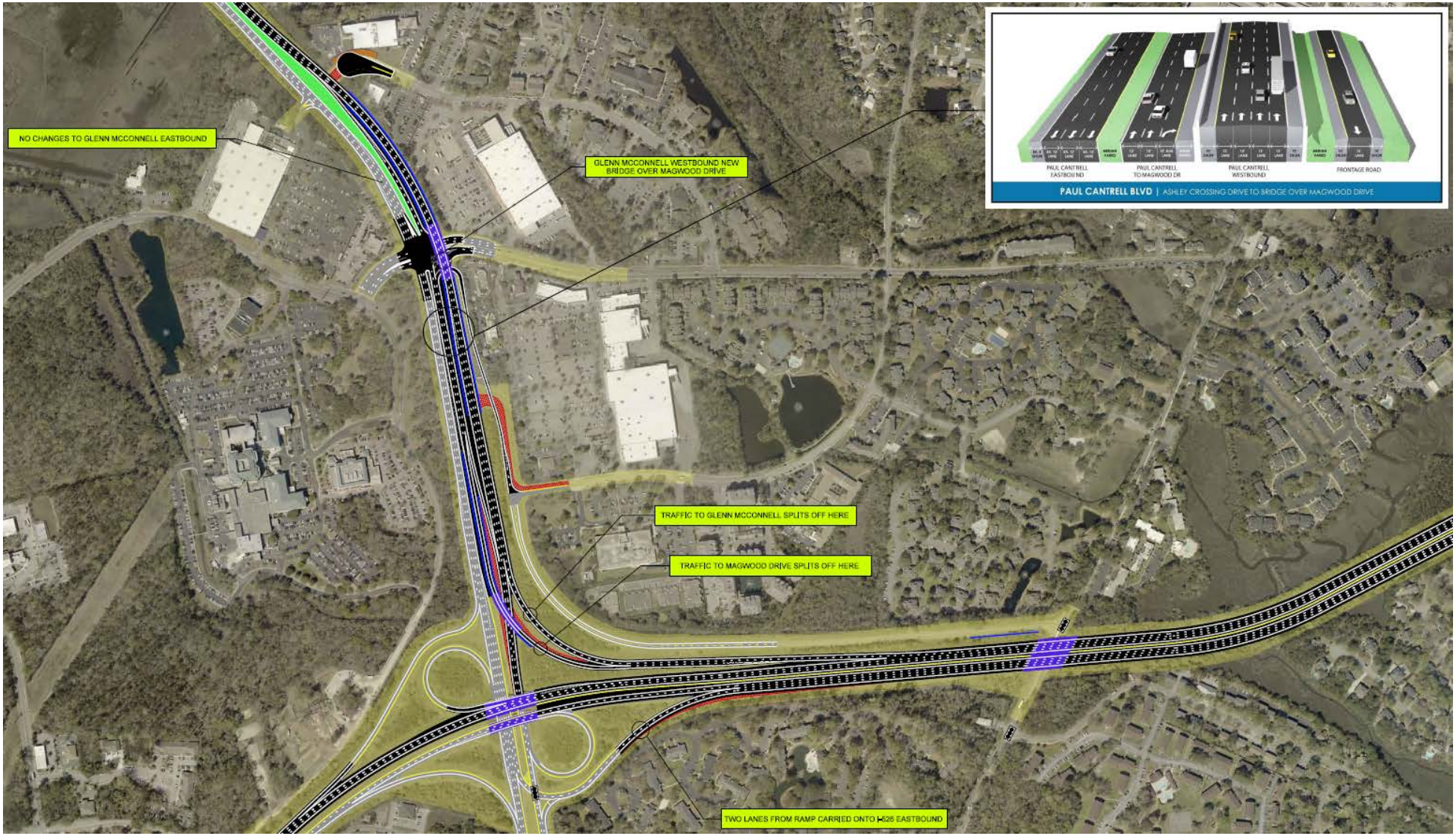
Alternative 5 was the sole alternative carried forward as a reasonable alternative. In Alternative 5, illustrated in greater detail in **Figure 56,** three lanes exit westbound I-526 to proceed west on Paul Cantrell Boulevard. The larger volume is destined for Glenn McConnell Parkway (beyond Magwood Drive). Both alternatives include a two-lane directional flyover from eastbound Paul Cantrell Boulevard to eastbound I-526. Both alternatives retain and improve the two loop ramps that provide exits from I-526 to Paul Cantrell Boulevard. Alternative 5 corresponds with Alternative 5 at Paul Cantrell Boulevard & Magwood Drive, as shown in This merges two of the westbound I-526 exiting traffic into the outside of westbound Paul Cantrell Boulevard. The intersection of Paul Cantrell Boulevard and Magwood Drive will be situated between separate structures carrying westbound traffic over Magwood Drive. This interchange combination (at both the Paul Cantrell Boulevard & Magwood Drive and the I-526 & Paul Cantrell Boulevard interchange) were evaluated in a sub-area model in VISSIM, and each performed well. Prior to carrying forward the original Alternative 5, a modified Alternative 5 was developed to prioritize SCDOT's goals and priorities for the project. This modified alternative retained the westbound off-ramp system but eliminated the eastbound directional flyover on-ramp (as it was not necessary to maintain acceptable queues on I-526, thereby retaining the existing signalized intersection of Paul Cantrell Boulevard & I-526 eastbound on-ramp.

Figure 58 – I-526 & Paul Cantrell Boulevard Alternative 5



The reasonable alternative 5, combined with the reasonable alternative at the Paul Cantrell Boulevard & Magwood Drive interchange is shown in **Figure 59.**

Figure 59 – I-526 & Paul Cantrell & Magwood Reasonable Alternative 5



4.4.3 I-526 & N. Rhett Avenue/Virginia Avenue

The North Rhett Avenue interchange is a significant bottleneck due to high volumes of traffic entering and exiting I-526. Approximately 25% of the traffic crossing the Cooper River on I-526 accesses the freeway at this intersection, and much of this traffic is heavy vehicles. Another factor contributing to this congestion, and to the high frequency of crashes at this location, is the ramp geometry. The westbound exit ramp and eastbound entrance ramp are limited by their 20 to 25 mph design speeds.

The development of alternatives at the I-526 interchanges with North Rhett Avenue and Virginia Avenue begins with an understanding of the traffic patterns between the Don Holt Bridge and I-26. Traffic forecasts indicate that the traffic crossing the Don Holt Bridge can be divided into thirds. Of the westbound traffic, one-third exits at North Rhett and Virginia Avenues, one-third will exit to I-26, and one-third will continue west on I-526 beyond I-26. The proportions are similar for the eastbound traffic over the Don Holt Bridge. One-third originates west of I-526, one-third comes from I-26 and one-third from North Rhett and Virginia Avenues. Entering and exiting traffic at Rivers Avenue comprises a nominal portion of the traffic in each direction.

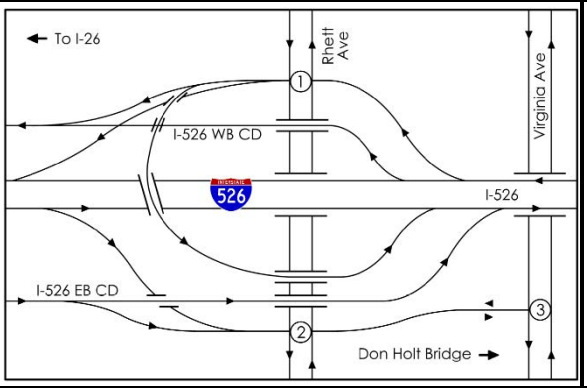
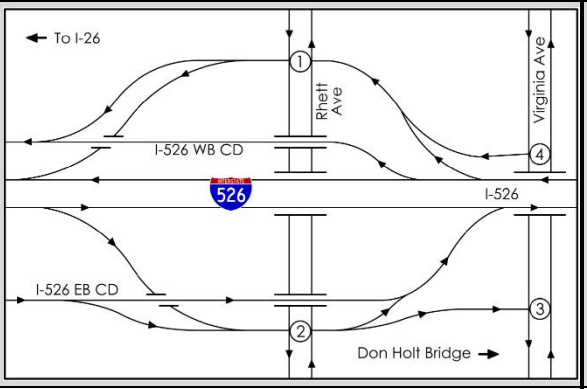
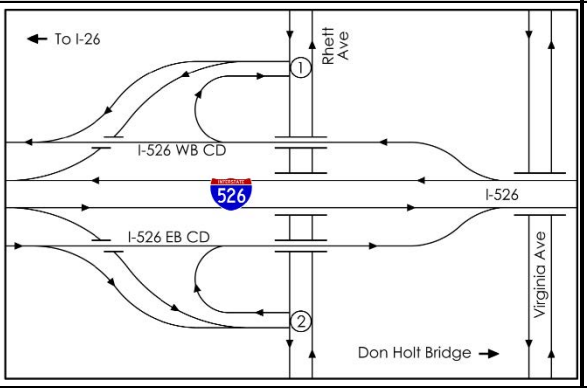
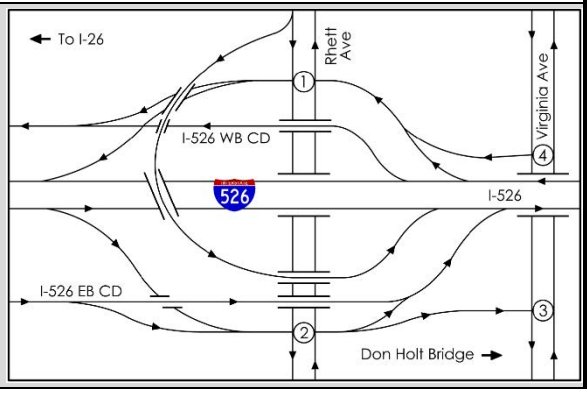
These patterns support the use of collector-distributor, or C-D roads between the System interchange at I-26, and the Don Holt Bridge. The C-D roads will provide the additional capacity between I-26 and the Cooper River while minimizing the amount of widening of the existing elevated roadway in this segment. Connections to these C-D roads in a manner that accommodates these traffic patterns is a fundamental criterion of the North Rhett and Virginia Avenue interchange concepts.

At the existing N. Rhett and Virginia Avenue interchange, there are geometric deficiencies that limit capacity. The most notable deficiencies are the loop ramps which have a 25-mph design speed, and the very short weave distances between N. Rhett Avenue and Virginia Avenue ramps in both eastbound and westbound directions.

To address these deficiencies and respond to future traffic demand, interchange improvement alternatives were developed for this interchange as part of the 526 Lowcountry Corridor West (526 LCC West) project. The major design constraints to consider included the CSX and Norfolk Southern rail lines running adjacent to and underneath the interstate, as well as Filbin Creek – a major tributary to the Cooper River, flowing adjacent to the I-526 mainline within this area crossing under I-526 just west of N. Rhett Avenue.

Four alternatives were developed for the Preliminary Screening. These alternatives were developed to accommodate anticipated traffic demand to a design level of service of D or better. Therefore, level of service was not part of the initial screening process. For each alternative, the initial screening process evaluated compatibility between the Virginia Avenue & N. Rhett Avenue interchanges, distribution of traffic to existing mainline and proposed C-D roads, flexibility to connect to a potential future replacement of the Don Holt Bridge, and the relative level of environmental and community impacts. The results of this screening are shown in **Table 34.**

Table 34 – I-526 & N. Rhett/Virginia Avenue Interchange Preliminary Alternatives

Preliminary Alternative	Compatible w/ Adjacent Interchange?	Flexibility w/ Don Holt Bridge Replacement	Impacts	Carried Forward?
1 On-Ramp from Rhett to I-526 EB and WB through one intersection along Rhett Avenue w/ separate access to Virginia Avenue 	✓	✓	Low	✓
2 Diamond Interchange with access to Virginia Avenue 	✓	✓	Low	✓
3 Improve existing Loop Ramps 	✗	✓	Low	✗
4 Directional ramps for northbound and southbound Rhett Avenue traffic 	✓	✓	High	✗

4.4.3.1 Reasonable Alternative(s) Carried Forward

Alternatives 1 and 2 met each of the screening alternatives considered and were carried forward as reasonable alternatives. Alternative 3 required removing the direct access to/from I-526 and Virginia Avenue, requiring this movement to be made via parallel routes to the north and/or south of the interstate. This was considered unacceptable due to the volume of traffic utilizing Virginia Avenue on and off-ramps, particularly trucks accessing the North Charleston Port Terminal and other industrial land uses in the vicinity of the interstate. Alternative 4 was not carried forward due to the larger footprint of the interchange and the more significant impacts to the surrounding environment, property, and infrastructure.

The Alternative 1 and 2 interchange concepts carried forward were developed to function in two separate conditions. The first condition transitions into the existing geometry east of Virginia Avenue before reaching the main span of the Don Holt Bridge. This is referred to as the Interim Build Condition and defines the eastern terminus of the 526 LCC West project. The second condition adapts the interim interchange geometry to the replacement of the Don Holt Bridge as part of a future 526 Lowcountry Corridor East project (526 LCC East). This is referred to as the Ultimate Build Condition. The Future Build condition considered a range of concepts for the 526 LCC East project, including raising the profile of the Don Holt bridge to accommodate greater navigational clearances for container ships. Studies completed by the 526 LCC East team determined that any new structure built over the Cooper River shipping channel would likely be of a superstructure type that would be prohibitive to widening in the future. As a result, the interim build condition of both concepts in the 526 LCC West project were evaluated for their flexibility to adapt in the future to new four-lane structures in each direction on either side of the existing Don Holt Bridge.

The resulting geometries for Alternative 1 and 2 (interim build) are shown in **Figure 60** and **Figure 61**, respectively.

Figure 60 – I-526 & N. Rhett/Virginia Avenue Interchange Reasonable Alternative 1

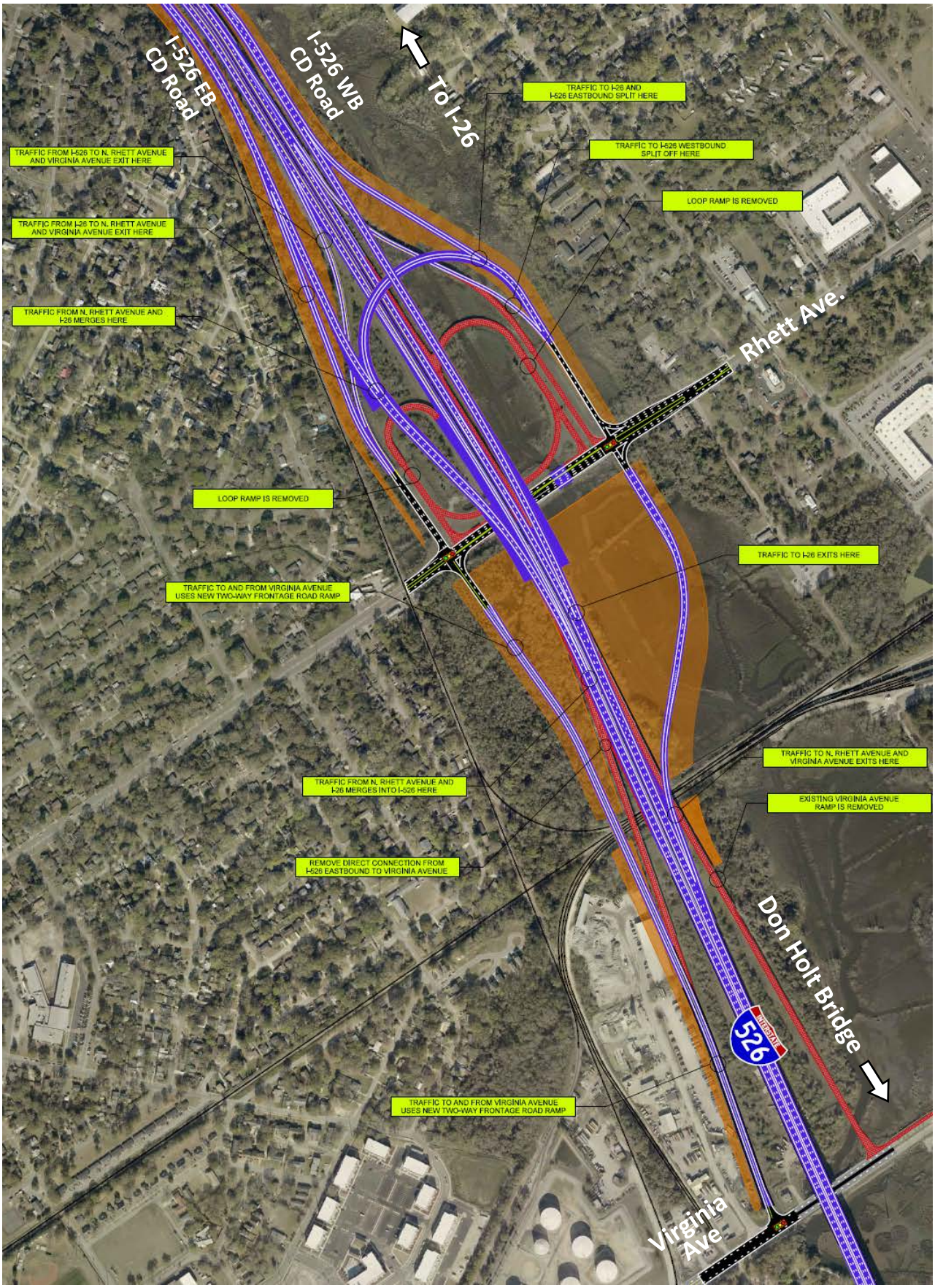
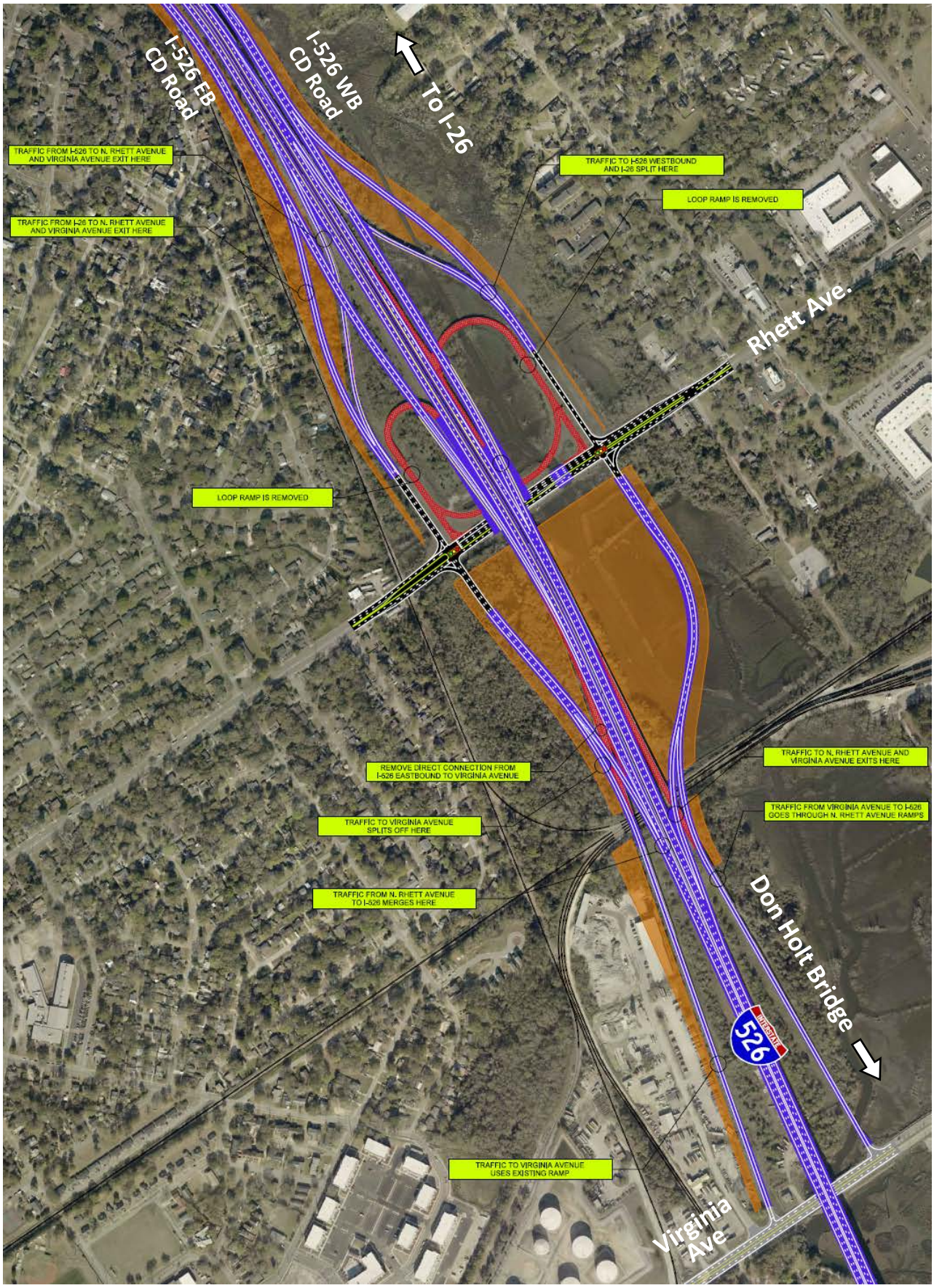
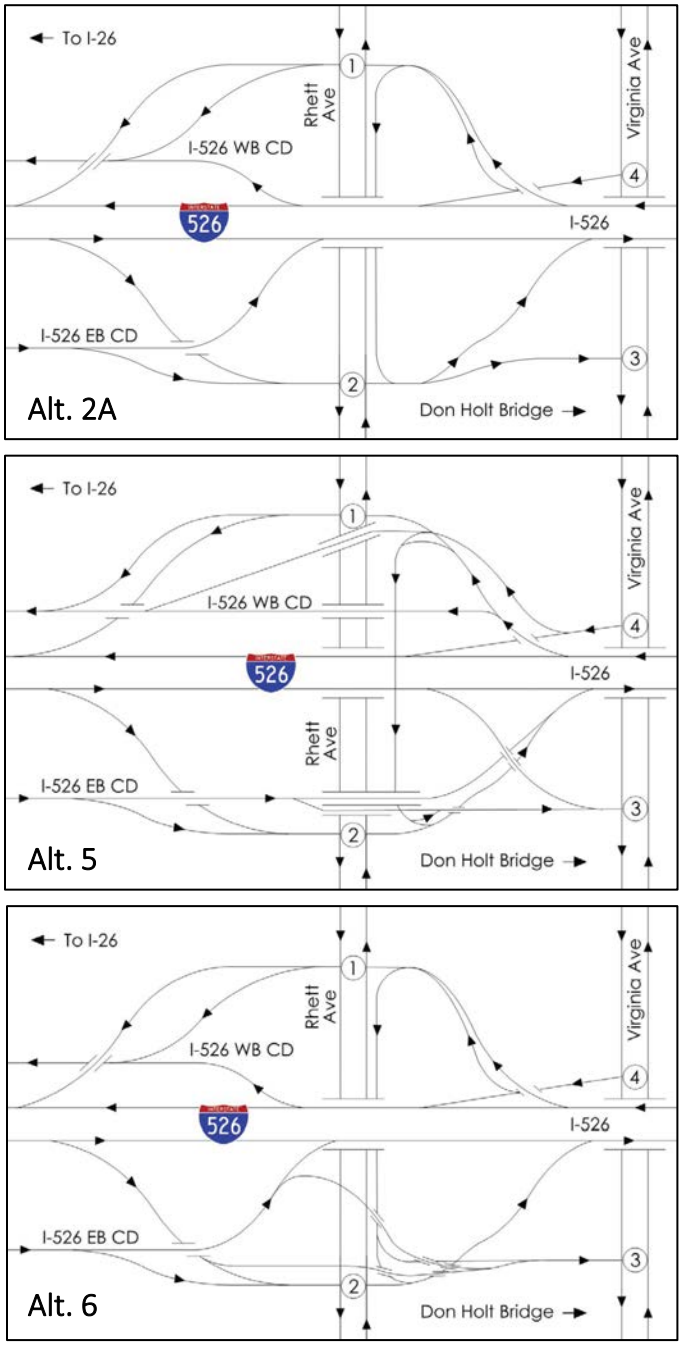


Figure 61 – I-526 & N. Rhett/Virginia Avenue Interchange Reasonable Alternative 2



Alternatives 1 and 2 represent the reasonable alternatives which were carried forward for Public Information. The result of this public information meeting were significant public concerns about the change in access between I-526 and Virginia Avenue. In the existing condition, traffic traveling from Virginia Avenue to I-526 EB and from I-526 WB to Virginia Avenue utilize a series of loop ramps (separate from the at grade signalized intersections along N. Rhett Avenue). However, in both Alternatives 1 and 2 these movements are processed through the signalized intersections along N. Rhett Avenue. Therefore, three additional alternatives were developed, utilizing elements from Alternatives 1 and 2 but providing similar direct access between Virginia Avenue and I-526 as is provided in the existing condition, as shown schematically in and in greater detail in **Figure 63, Figure 64,** and **Figure 65**, for Alternatives 2A, 5, and 6, respectively.

Figure 62 – Additional I-526 & N. Rhett/Virginia Avenue Reasonable Alternatives



Alternatives 2A, 5, and 6 provide access to/from N. Rhett Avenue similarly to Alternative 2. All three also replace the two-loop U-turn system in the existing condition with a "Texas U-Turn" which runs parallel to N. Rhett Avenue under the I-526 bridges.

The primary difference between the alternatives is that in Alternative 5, the westbound CD road facility is begun further in advance of N. Rhett Avenue allowing an additional ramp for direct access from Virginia Avenue to the CD road. Additionally, the "Texas U-Turn" facility has two lanes, one dedicated to traffic from Virginia Avenue and one dedicated to traffic from I-526. In Alternative 2A and 6, this facility has one lane which serves traffic from both destinations via a weave upstream of the U-turn. In the eastbound direction, the primary difference between 2A and 5 and 6 is that in 2A, traffic destined for Virginia Avenue must proceed through the at-grade intersection along N. Rhett Avenue, whereas in 5 and 6, this movement is given direct access. The primary difference between 5 and 6 in the eastbound direction is the sequence in which traffic is mixed back into one facility across the Ashley River over the Don Holt Bridge from the I-526 Mainline, I-526 CD Road, and N. Rhett Avenue and Virginia Avenue ramp facilities.

These alternatives were developed to accommodate projected traffic demands in the study area, again, with the primary impetus behind their conception being providing comparable direct access between Virginia Avenue and I-526. These alternatives were added to Alternatives 1 and 2 as reasonable alternatives to be carried forward.

These additional reasonable alternatives, Alternatives 2A, 5, and 6 are shown in greater detail in **Figure 63, Figure 64,** and **Figure 65**, respectively.

Figure 63 – I-526 & N. Rhett/Virginia Avenue Interchange Reasonable Alternative 2A

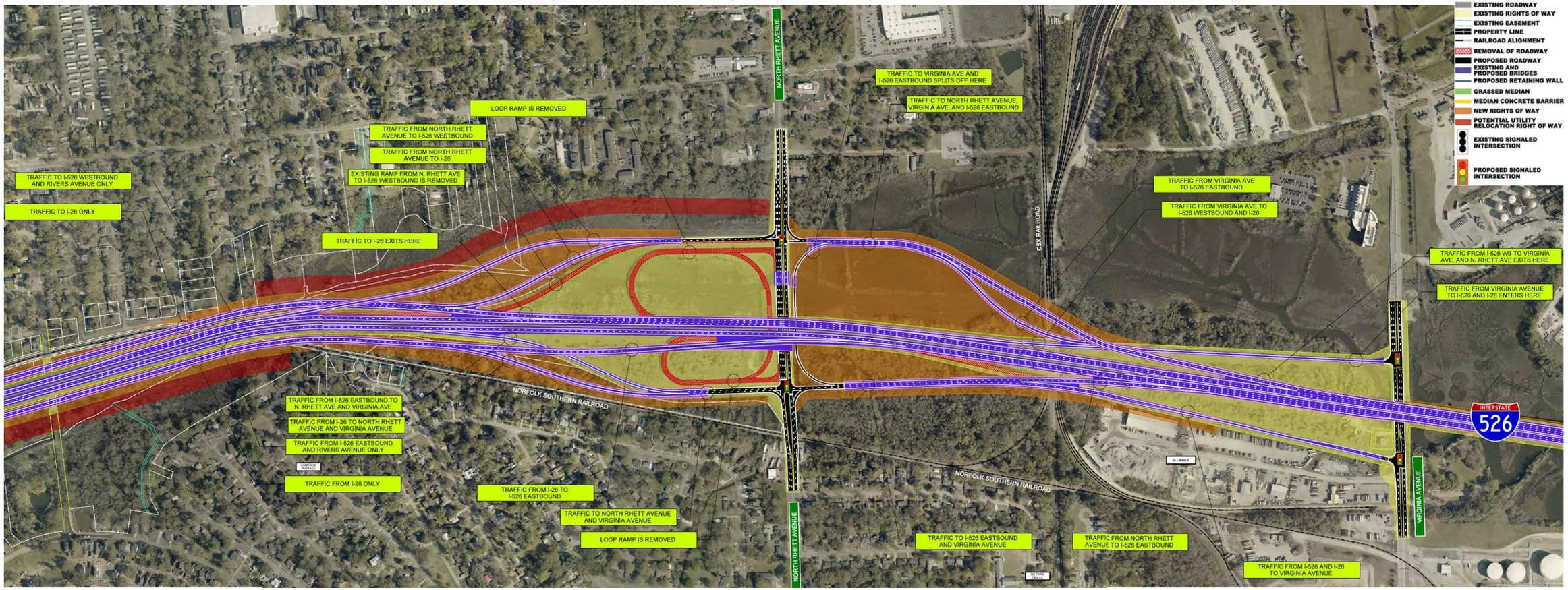


Figure 64 – I-526 & N. Rhett/Virginia Avenue Interchange Reasonable Alternative 5

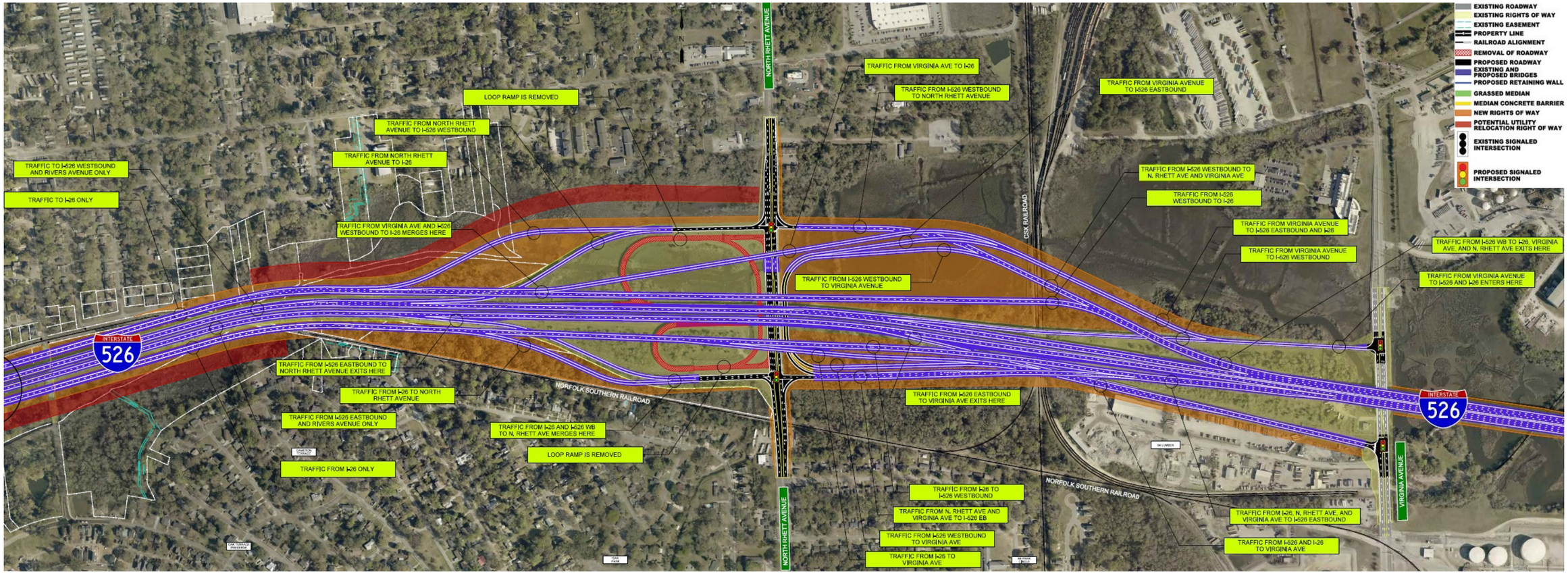
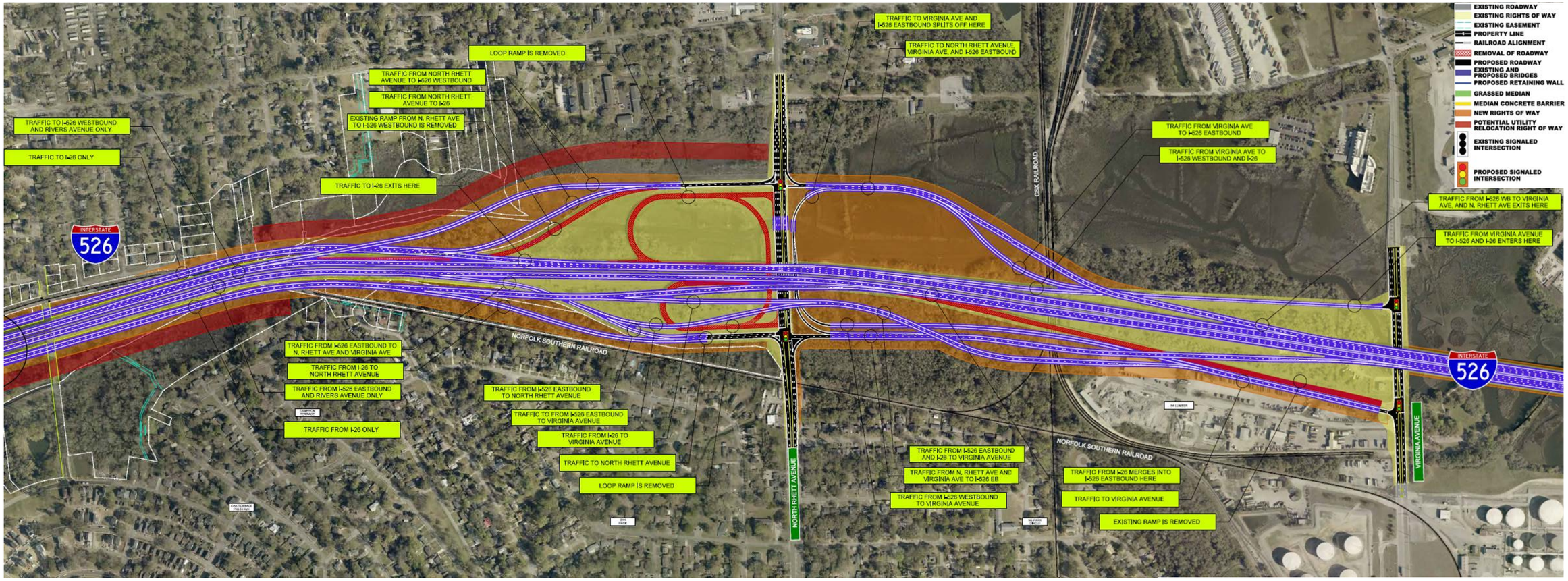


Figure 65 – I-526 & N. Rhett/Virginia Avenue Interchange Reasonable Alternative 6



5.0 REASONABLE ALTERNATIVES SCREENING

As discussed in the previous section, the screening of preliminary alternatives throughout the I-526 LCC West project led to the carrying forward of reasonable alternatives:

No Build

Build:

I-526 Mainline (1 Reasonable Alternative)**:**

- 8-lane widening (additional two general-purpose lanes in each direction)

System Interchange (Including Rivers Avenue) (4 Reasonable Alternatives)

- Alternative 1
- Alternative 1A
- Alternative 2
- Alternative 2A

Service Interchanges:

- **I-526 & Paul Cantrell Boulevard** (1 Reasonable Alternative)
  - Alternative 5
- **Paul Cantrell Boulevard & Magwood Drive** (1 Reasonable Alternative)
  - Alternative 5
- **I-526 & North Rhett Avenue/Virginia Avenue** (5 Reasonable Alternatives)
  - Alternative 1
  - Alternative 2
  - Alternative 2A
  - Alternative 5
  - Alternative 6
- **All other service interchanges same as in No Build** (with ramps aligned to widened I-526)

The following subsections will present the traffic analysis results for the screening of the reasonable alternatives for which there are multiple alternatives:

- I-526 & I-26 System Interchange, and
- I-526 & North Rhett Avenue/Virginia Avenue interchange.

5.1 I-26 & I-526 System Interchange

In order to compare the four alternatives at the I-26 & I-526 System Interchange, a volume/capacity ratio analysis was completed for the major movements of the interchange. These included those movements entering and exiting the interchange in all four directions, as well as those movements through the interchange.

Table 35 on the following page lists the resulting v/c ratios for these corresponding segments for the No Build, Alternative 1, Alternative 2, Alternative 1A, and Alternative 2A for both the AM and PM peak hours. These varying segment v/c ratios could be compared one-by-one between each alternative to determine how each interchange alternative was projected to process the traffic demand for each corresponding movement in each peak hour. While this segment-by-segment comparison for each movement and in each peak hour served as the primary tool for comparing each interchange, a summary metric was also desired to simplify these results numerically for the purposes of ranking the alternatives. This resulted in a "weighted v/c ratio" for each interchange alternative. The "weighted v/c ratio" was calculated by weighting each movement's v/c ratio (in each peak hour) according to the volume experience at that segment.

The results of this v/c ratio comparison indicate that the No Build System interchange is projected to have numerous segments over capacity at each leg of the interchange and at multiple segment through the interchange. Comparing each of the Build alternatives, the results indicate that **Alternative 2 is projected to perform the best**, with only one segment projected to be over capacity (the segment along I-26 eastbound south of the interchange, which is outside the scope of the 526 Lowcountry Corridor West project). However, Alternative 1 is projected to have an over capacity segment along the weaving segment of I-26 westbound between the System interchange and Remount Road. This is a critical movement of the interchange as this movement is one which contributes to significant congestion in the Base Year/No Build Condition. Furthermore, Alternative 1A and 2A are projected to have over capacity segments along the weaving segment of I-526 between Rivers Avenue and the System. Again, this is a critical movement entering the interchange, and one which contributes to significant congestion along the I-526 corridor in the Base Year/No Build Condition. These critical, failing segments in Alternatives 1, 1A, and 2A have cascading impacts on the operations of not only the System interchange but also the I-26 and I-526 corridors up- and down-stream of the interchange. These over-capacity movements are likely to cause congestion and gridlock throughout the network as traffic builds during the peak hours without acceptable processing of the forming queues. This analysis was utilized as part of the metrics to determine a preferred alternative at this interchange, the selection of which is discussed in the subsequent chapter. The output of the results of the HCS analysis can be seen in **Appendix 5.1.**

Table 35 – System Interchange Alternative Volume/Capacity Comparison

2050 Design Year AM Peak Hour																	
Movement		No Build			Alt. 1			Alt. 2			Alt. 1A			Alt. 2A			
		Type	Vol	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	
West Leg	Enter	W	4,160	1.18	M	1,580	0.25	M	1,580	0.25	M	1,580	0.25	M	1,580	0.25	
					W	2,820	0.49	W	2,820	0.49	W	2,820	0.49	W	2,820	0.49	
	Exit	W	6,050	1.18	W	6,860	0.91	W	6,860	0.91	W	6,860	0.91	W	6,860	0.91	
East Leg	Enter	W	5,800	1.59	FS	3,550	0.89	FS	3,550	0.89	W	3,870	1.25	W	3,870	1.25	
					FS	3,200	0.81	FS	3,200	0.81	FS	3,200	0.81	FS	3,200	0.81	
	Exit	W	4,080	0.78	W	1,930	0.34	W	1,930	0.34	W	1,930	0.36	W	1,930	0.36	
					FS	2,840	0.69	FS	2,840	0.69	FS	2,840	0.69	FS	2,840	0.69	
North Leg	Enter	W	11,480	1.44	FS	5,120	0.88	FS	5,120	0.88	FS	5,120	0.88	FS	5,120	0.88	
					D	6,840	0.88	D	6,840	0.88	D	6,890	0.89	D	6,890	0.89	
	Exit	W	6,740	1.22	FS	3,450	0.42	FS	3,450	0.42	FS	3,450	0.42	FS	3,450	0.42	
					W	3,480	1.07	W	3,480	0.63	W	3,660	1.13	W	3,660	0.66	
South Leg	Enter	W	3,770	0.76	FS	1,840	0.32	FS	1,840	0.32	FS	1,840	0.32	FS	1,840	0.32	
					W	1,860	0.42	W	1,860	0.42	W	2,050	0.47	W	2,050	0.47	
	Exit	W	8,340	1.16	W	8,250	1.17	W	8,250	1.17	W	8,390	1.19	W	8,390	1.19	
Through	EB	M	3,350	1.03	FS	1,580	0.38	FS	1,580	0.38	FS	1,580	0.38	FS	1,580	0.38	
	WB	W	4,240	0.87	FS	3,550	0.56	FS	3,550	0.56	FS	3,550	0.56	FS	3,550	0.56	
	NB	FS	3,040	0.53	FS	1,510	0.39	FS	1,510	0.39	FS	1,510	0.39	FS	1,510	0.39	
	SB	FS	6,900	1.11	FS	5,060	0.82	FS	5,060	0.82	FS	5,060	0.82	FS	5,060	0.82	
		W	2,770	1.29													
Weighted v/c		1.16			0.77			0.75			0.80			0.78			

2050 Design Year PM Peak Hour																	
Movement		No Build			Alt. 1			Alt. 2			Alt. 1A			Alt. 2A			
		Type	Vol	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	
West Leg	Enter	W	4,730	1.29	M	2,995	0.49	M	2,995	0.49	M	2,995	0.49	M	2,995	0.49	
					W	3,250	0.58	W	3,250	0.58	W	3,250	0.58	W	3,250	0.58	
	Exit	W	4,700	0.82	W	5,870	0.69	W	5,870	0.69	W	5,870	0.69	W	5,870	0.69	
East Leg	Enter	W	5,070	1.43	FS	3,685	0.91	FS	3,685	0.91	W	4,015	1.34	W	4,015	1.34	
					FS	2,920	0.72	FS	2,920	0.72	FS	2,920	0.72	FS	2,920	0.72	
	Exit	W	4,540	0.82	W	3,315	0.56	W	3,315	0.56	W	3,315	0.62	W	3,315	0.62	
					FS	3,000	0.71	FS	3,000	0.71	FS	3,000	0.71	FS	3,000	0.71	
North Leg	Enter	W	7,440	1.36	FS	3,660	0.63	FS	3,660	0.63	FS	3,660	0.63	FS	3,660	0.63	
					D	4,310	0.69	D	4,310	0.69	D	4,360	0.70	D	4,360	0.70	
	Exit	W	9,620	1.17	FS	6,980	0.84	FS	6,980	0.84	FS	6,980	0.84	FS	6,980	0.84	
					W	3,695	1.12	W	3,695	0.63	W	3,965	1.21	W	3,965	0.68	
South Leg	Enter	W	6,590	0.93	FS	4,620	0.75	FS	4,620	0.75	FS	4,620	0.75	FS	4,620	0.75	
					W	2,310	0.48	W	2,310	0.48	W	2,490	0.53	W	2,490	0.53	
	Exit	W	4,970	0.71	W	4,890	0.81	W	4,890	0.81	W	4,950	0.83	W	4,950	0.83	
Through	EB	M	3,890	0.98	FS	2,995	0.70	FS	2,995	0.70	FS	2,995	0.70	FS	2,995	0.70	
	WB	W	3,490	0.72	FS	3,430	0.55	FS	3,430	0.55	FS	3,430	0.55	FS	3,430	0.55	
	NB	FS	5,940	0.97	FS	1,800	0.44	FS	1,800	0.44	FS	1,800	0.44	FS	1,800	0.44	
	SB	FS	3,700	0.60	FS	2,330	0.38	FS	2,330	0.38	FS	2,330	0.38	FS	2,330	0.38	
		W	2,530	1.18													
Weighted v/c		1.03			0.70			0.67			0.74			0.71			

Volume/Capacity Ratio Color Code

0.00 – 0.60	0.60 – 0.80	0.80 – 1.00	1.00 – 1.20	≥ 1.20

5.2 I-526 & N. Rhett Avenue/Virginia Avenue Interchange

5.2.1 Interstate Facility

Similar to the analysis performed for the System interchange, a volume/capacity ratio analysis was completed for the interchange alternatives at the I-526 & N. Rhett Avenue/Virginia Avenue interchanges. Since the differences between the alternatives at this interchange significantly affected the operations of the ramp terminal intersections along N. Rhett Avenue, these were included in the analysis (including a comparison of the v/c ratio and delay per movement at each of the intersections).

This interchange comparison analysis also included two horizon year scenarios: one in which the Don Holt Bridge is not widened (named the "Interim Build" condition) and one in which the Don Holt Bridge is widened to four lanes in each direction (named the "Ultimate Build" condition). It should be noted that despite the differences in capacity over the Don Holt Bridge along I-526 in both these conditions, the traffic demand volumes were assumed to be equivalent, and were developed utilizing a travel demand model for which the Don Holt Bridge was widened. This is important to this discussion because while the volume used to analyze the "Interim Build" condition are unlikely to be generated in this condition, as congestion due to lack of capacity upstream will prohibit these volumes from being fully realized at the I-526 & N. Rhett and I-526 & Virginia interchanges. The "Ultimate Build" condition is therefore a fairer comparison between how the interstate segments will function for each of the alternatives, as this condition will allow for the demand volumes to actually reach the interchange. Along with the ability for the demand volumes to reach the interchange comes the ability to provide capacity for them with improvements at the interchange which tie into the widened bridge. This distinction is significant because, as the analysis will show, the "Interim Build" condition has several over capacity movements. These, however, are a result of the fact that capacity improvements are included west of this interchange but not to the east. Therefore, the traffic demand which is able to be processed west of the interchange must be 'funneled' to a section of I-526 with insufficient capacity. However, as the results of the "Ultimate Build" show, these over-capacity movements in the interchange are resolved with the widening of the Don Holt Bridge.

The v/c ratio analysis results for the interstate segments for are shown in **Table 36** for the "Interim Build" and in **Table 37** for the "Ultimate Build".

The interstate v/c analysis indicates that the No Build Conditions are projected to have numerous over capacity segments. Each of the five Build Conditions alternatives (Alternative 1, 2, 2A, 5, and 6) show improvements to the No Build Conditions in both the "Interim Build" and Ultimate Build" scenarios. As previously mentioned, several segments in each alternative are projected to be over capacity in the "Interim Build", due to the lack of added capacity across the Don Holt Bridge along I-526. Based on the "Interim Build" scenario results, Alternative 5 is projected to perform the best, followed closely by Alternatives 2A and 6. However, a comparison of the alternatives in the "Ultimate Build" condition indicates that the interstate segments in each of alternatives are projected to perform comparably, as additional capacity is available to process the projected traffic demand. The distinction between Alternatives 1, 2, 2A, 5, and 6, then, is seen more clearly at the operation of the ramp terminal intersections along N. Rhett Avenue, since the main difference between the alternatives is the indirect or direct nature of connection between Virginia Avenue and I-526. The intersection operation analysis will be discussed following the aforementioned interstate v/c ratio tables and diagrams. The output of the results of the HCS analysis can be seen in **Appendix 5.2**.

Table 36 – I-526 & N. Rhett Ave Interchange Alternative Volume/Capacity Comparison (Interim Build)

2050 Design Year AM Peak Hour																							
Movement		No Build			Alt. 1			Alt. 2			Alt. 2A			Alt. 5			Alt. 6						
		Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c				
Between Rivers & N. Rhett	EB	D	5,250	1.22	D	3,075	0.76	D	3,075	0.76	D	3,075	0.76	D	3,075	0.76	D	3,075	0.76				
					D	2,840	0.67	D	2,840	0.67	D	2,840	0.65	D	2,840	0.65	D	2,840	0.65				
	WB	M	5,240	1.19	M	3,550	0.83	M	3,550	0.83	M	3,550	0.84	M	3,550	0.84	M	3,550	0.84				
					M	2,920	0.69	M	2,920	0.69	M	2,920	0.70	M	2,920	0.70	M	2,920	0.70				
Between N. Rhett & Va.	EB	W	7,330	1.43	FS	6,775	1.16	FS	6,775	1.16	FS	6,775	1.16	FS	6,775	1.16	FS	6,775	1.16				
	WB	W	6,120	1.16	D	7,300	1.16	D	7,300	1.16	FS	7,300	0.92	FS	7,300	0.92	FS	7,300	0.92				
Through Interchange	EB	FS	4,660	1.13	FS	3,005	1.45	FS	4,925	1.19	FS	3,005	0.73	FS	2,865	0.69	FS	3,005	0.73				
					FS	3,770	0.97				FS	1,850	0.90	FS	3,910	0.95	FS	1,850	0.90				
								FS	1,850	0.90	FS	1,920	0.93				FS	1,920	0.93				
	WB	FS	4,190	1.05	FS	5,550	0.93	FS	5,550	0.93	W	5,720	1.04	FS	3,090	0.77	W	5,720	1.04				
														FS	2,630	0.66							
Weighed v/c		1.22			1.00			0.99			0.91			0.86			0.91						

2050 Design Year PM Peak Hour																							
Movement		No Build			Alt. 1			Alt. 2			Alt. 2A			Alt. 5			Alt. 6						
		Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c				
Between Rivers & N. Rhett	EB	D	4,330	0.96	D	2,975	0.72	D	2,975	0.72	D	2,975	0.72	D	2,975	0.72	D	2,975	0.72				
					D	3,000	0.68	D	3,000	0.68	D	3,000	0.68	D	3,000	0.68	D	3,000	0.68				
	WB	M	5,260	1.19	M	3,685	0.84	M	3,685	0.84	M	3,685	0.86	M	3,685	0.86	M	3,685	0.86				
					M	3,430	0.78	M	3,430	0.78	M	3,430	0.79	M	3,430	0.79	M	3,430	0.79				
Between N. Rhett & Va.	EB	W	5,130	0.98	FS	6,775	1.13	FS	6,775	1.13	FS	6,775	1.13	FS	6,775	1.13	FS	6,775	1.13				
	WB	W	6,030	1.17	D	7,675	1.21	D	7,675	1.21	FS	7,675	0.95	FS	7,675	0.95	FS	7,675	0.95				
Through Interchange	EB	FS	3,550	0.83	FS	2,925	1.38	FS	5,035	1.18	FS	2,925	0.69	FS	2,885	0.68	FS	2,925	0.69				
					FS	3,850	0.96				FS	1,740	0.82	FS	3,890	0.91	FS	1,740	0.82				
								FS	1,740	0.82	FS	2,110	0.99				FS	2,110	0.99				
	WB	FS	4,380	1.08	FS	5,875	0.96	FS	5,875	0.96	W	6,225	1.05	FS	3,225	0.81	W	6,225	1.05				
														FS	3,000	0.74							
Weighted v/c		1.05			1.00			0.99			0.91			0.87			0.91						

Volume/Capacity Ratio Color Code

0.00 – 0.60	0.60 – 0.80	0.80 – 1.00	1.00 – 1.20	≥ 1.20

Table 37 – I-526 & N. Rhett Ave Interchange Alternative Volume/Capacity Comparison (Ultimate Build)

2050 Design Year AM Peak Hour																				
Movement		No Build			Alt. 1			Alt. 2			Alt. 2A			Alt. 5			Alt. 6		
		Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c
Between Rivers & N. Rhett	EB	D	5,250	1.22	D	3,075	0.76	D	3,075	0.76	D	3,075	0.76	D	3,075	0.76	D	3,075	0.76
					D	2,840	0.67	D	2,840	0.67	D	2,840	0.65	D	2,840	0.65	D	2,840	0.65
	WB	M	5,240	1.19	M	3,550	0.83	M	3,550	0.83	M	3,550	0.84	M	3,550	0.84	M	3,550	0.84
					M	2,920	0.69	M	2,920	0.69	M	2,920	0.70	M	2,920	0.70	M	2,920	0.70
Between N. Rhett & Va.	EB	W	7,330	1.43	FS	6,775	0.82	FS	6,775	0.82	FS	6,775	0.82	FS	6,775	0.82	FS	6,775	0.82
	WB	W	6,120	1.16	D	7,300	0.92	D	7,300	0.92	FS	7,300	0.92	FS	7,300	0.92	FS	7,300	0.92
Through Interchange	EB	FS	4,660	1.13	FS	4,855	0.78	FS	4,925	0.79	FS	3,005	0.73	FS	1,855	0.46	FS	3,005	0.73
											FS	1,850	0.46	FS	4,920	0.79	FS	1,850	0.46
					FS	1,920	0.49	FS	1,850	0.45	FS	1,920	0.93				FS	1,920	0.93
	WB	FS	4,190	1.05	FS	3,020	0.76	FS	3,020	0.76	FS	3,090	0.77	FS	3,090	0.77	FS	3,090	0.77
					FS	2,530	0.63	FS	2,530	0.63	FS	2,630	0.66	FS	2,630	0.66	FS	2,630	0.66
Weighed v/c		1.22			0.78			0.78			0.78			0.78			0.78		

2050 Design Year PM Peak Hour																				
Movement		No Build			Alt. 1			Alt. 2			Alt. 2A			Alt. 5			Alt. 6		
		Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c	Type	Vol.	v/c
Between Rivers & N. Rhett	EB	D	4,330	0.96	D	2,975	0.72	D	2,975	0.72	D	2,975	0.72	D	2,975	0.72	D	2,975	0.72
					D	3,000	0.68	D	3,000	0.68	D	3,000	0.68	D	3,000	0.68	D	3,000	0.68
	WB	M	5,260	1.19	M	3,685	0.84	M	3,685	0.84	M	3,685	0.86	M	3,685	0.86	M	3,685	0.86
					M	3,430	0.78	M	3,430	0.78	M	3,430	0.79	M	3,430	0.79	M	3,430	0.79
Between N. Rhett & Va.	EB	W	5,130	0.98	FS	6,775	0.83	FS	6,775	0.83	FS	6,775	0.83	FS	6,775	0.83	FS	6,775	0.83
	WB	W	6,030	1.17	FS	7,675	0.95	FS	7,675	0.95	FS	7,675	0.95	FS	7,675	0.95	FS	7,675	0.95
Through Interchange	EB	FS	3,550	0.83	FS	4,665	0.73	FS	5,035	0.79	FS	2,925	0.69	FS	1,740	0.41	FS	2,925	0.69
											FS	1,740	0.41				FS	1,740	0.41
					FS	2,110	0.53	FS	1,740	0.41	FS	2,110	0.99	FS	5,035	0.79	FS	2,110	0.99
	WB	FS	4,380	1.08	FS	3,055	0.75	FS	3,055	0.75	FS	3,225	0.81	FS	3,225	0.81	FS	3,225	0.81
					FS	2,820	0.69	FS	2,820	0.69	FS	3,000	0.74	FS	3,000	0.74	FS	3,000	0.74
Weighed v/c		1.05			0.79			0.79			0.80			0.80			0.80		

Volume/Capacity Ratio Color Code

0.00 – 0.60	0.60 – 0.80	0.80 – 1.00	1.00 – 1.20	≥ 1.20

5.2.2 Ramp Terminal Intersections

A significant difference between the I-526 & N. Rhett Avenue interchange alternatives are the volumes at the two ramp terminal intersections along N. Rhett Avenue (with I-526 EB and I-526 WB ramps). In Alternatives 1 and 2, traffic to/from Virginia Avenue and I-526 must be processed through the ramp terminal intersections. In Alternatives 2A, 5 and 6, however, this traffic is provided dedicated movements separated from the intersections. In Alternative 1, all traffic bound for I-526 from N. Rhett Avenue is processed through the N. Rhett Avenue & I-526 WB ramp intersection. In Alternative 2, this traffic is dispersed between the two ramp terminal intersections. In Alternatives 2A, 5, and 6, this traffic is likewise dispersed between the two ramp terminal intersections. The intersection geometries are the same in Alternatives 2A, 5, and 6.

The primary comparison between the ramp terminal intersection operation between the alternatives was a comparison of the approach and overall intersection LOS/delay for each of the two intersections along N. Rhett Avenue (with I-526 WB and EB ramps, respectively) for each of the five alternatives, the results of which are shown in **Table 38.**

The results of this analysis indicate that the No Build, Alternative 1, and Alternative 2 *have* failing approaches and failing intersections along N. Rhett Avenue at the I-526 ramp terminals, while Alternative 2A, Alternative 5, and Alternative 6 *do not have* failing approaches or intersections along N. Rhett Avenue. Rather, for these latter three alternatives, each approach and intersection overall is projected to experience acceptable level of service in the design year.

In order to compare the intersection operation further, the v/c ratios and delays for each movement were analyzed, the results of which are shown diagrammatically in **Figure 66** and **Figure 67.**

The results of the analysis, which are shown in greater detail in **Appendix 5.2**, indicate that with no improvements, the intersections are projected to experience numerous over capacity movements with undesirable delay. Of the Build alternatives, Alternatives 1 and 2 are projected to have numerous over-capacity movements with undesirable delay, whereas Alternatives 2A, 5, and 6 are projected to have no over-capacity movements. Alternative 2A is projected to have one movement with undesirable LOS E, however the delay at this movement of 56.5 sec/veh is just over the LOS E threshold of 55.0 sec/veh, and the v/c ratio of this movement is 0.93, indicating the movement is projected to clear without leading to ever-increasing queues throughout the peak hour.

This analysis was utilized as one of the metrics to determine a preferred alternative at this interchange, the selection of which is discussed in the subsequent section.

Table 38 – I-526 & N. Rhett Ave Intersection Delay Comparison

Intersection		2050 Design Year AM Peak Hour						2050 Design Year PM Peak Hour					
		No Build	Alt. 1	Alt. 2	Alt. 2A	Alt. 5	Alt. 6	No Build	Alt. 1	Alt. 2	Alt. 2A	Alt. 5	Alt. 6
N. Rhett Ave & I-526 WB	EB	F/87.4	NA	NA	NA	NA	NA	E/67.9	NA	NA	NA	NA	NA
	WB	NA	F/137.6	E/77.6	D/47.3	D/47.3	D/47.3	NA	F/150.5	D/49.1	D/35.1	D/35.1	D/35.1
	NB	C/32.0	C/31.6	C/32.5	A/6.2	A/5.6	A/5.6	A/9.3	D/49.3	D/39.9	A/1.6	A/1.6	A/1.6
	SB	F/220.7	F/253.9	D/35.6	C/22.4	C/22.4	C/22.4	F/114.6	F/360.2	C/28.1	B/17.5	B/17.5	B/17.5
	OVERALL	F/152.6	F/155.8	D/43.8	B/18.6	B/18.4	B/18.4	E/70.1	F/195.3	D/37.8	B/11.6	B/11.6	B/11.6
N. Rhett Ave & I-526 EB	EB	F/241.8	D/51.7	F/124.8	D/53.2	D/52.8	D/52.8	F/87.3	F/91.9	E/79.1	D/43.1	D/45.3	D/45.3
	WB	NA	E/74.1	NA	NA	NA	NA	NA	F/112.3	NA	NA	NA	NA
	NB	F/220.4	B/19.8	D/37.7	D/46.4	D/53.0	D/53.0	E/60.5	B/15.5	E/74.4	D/45.1	D/45.1	D/45.1
	SB	F/278.2	A/2.5	F/109.3	B/16.8	B/18.3	B/18.3	F/123.2	A/0.7	E/60.3	B/18.9	B/19.4	B/19.4
	OVERALL	F/258.3	C/22.7	F/102.9	C/30.1	C/30.3	C/30.3	F/94.8	D/37.3	E/67.1	C/30.7	C/31.1	C/31.1
No. of Unacceptable Approaches (LOS E or F):		5 of 8	3 of 8	3 of 8	0 of 8	0 of 8	0 of 8	5 of 8	4 of 8	3 of 8	0 of 8	0 of 8	0 of 8
No. of Unacceptable Intersections (LOS E or F):		2 of 2	1 of 2	1 of 2	0 of 2	0 of 2	0 of 2	2 of 2	1 of 2	1 of 2	0 of 2	0 of 2	0 of 2

Figure 66 – I-526 & N. Rhett Avenue Intersection Operation Alternative Comparison – AM Peak Hour

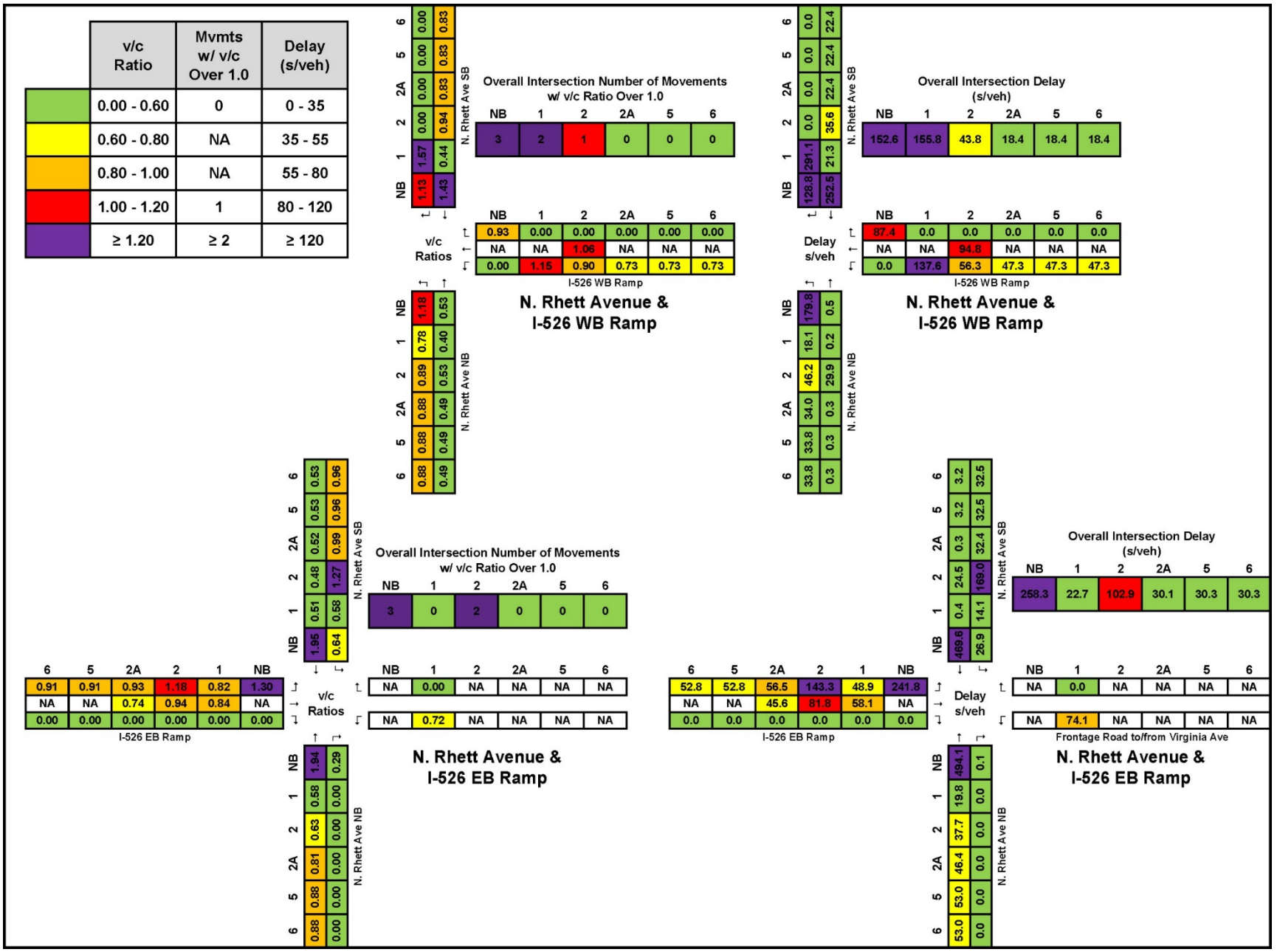
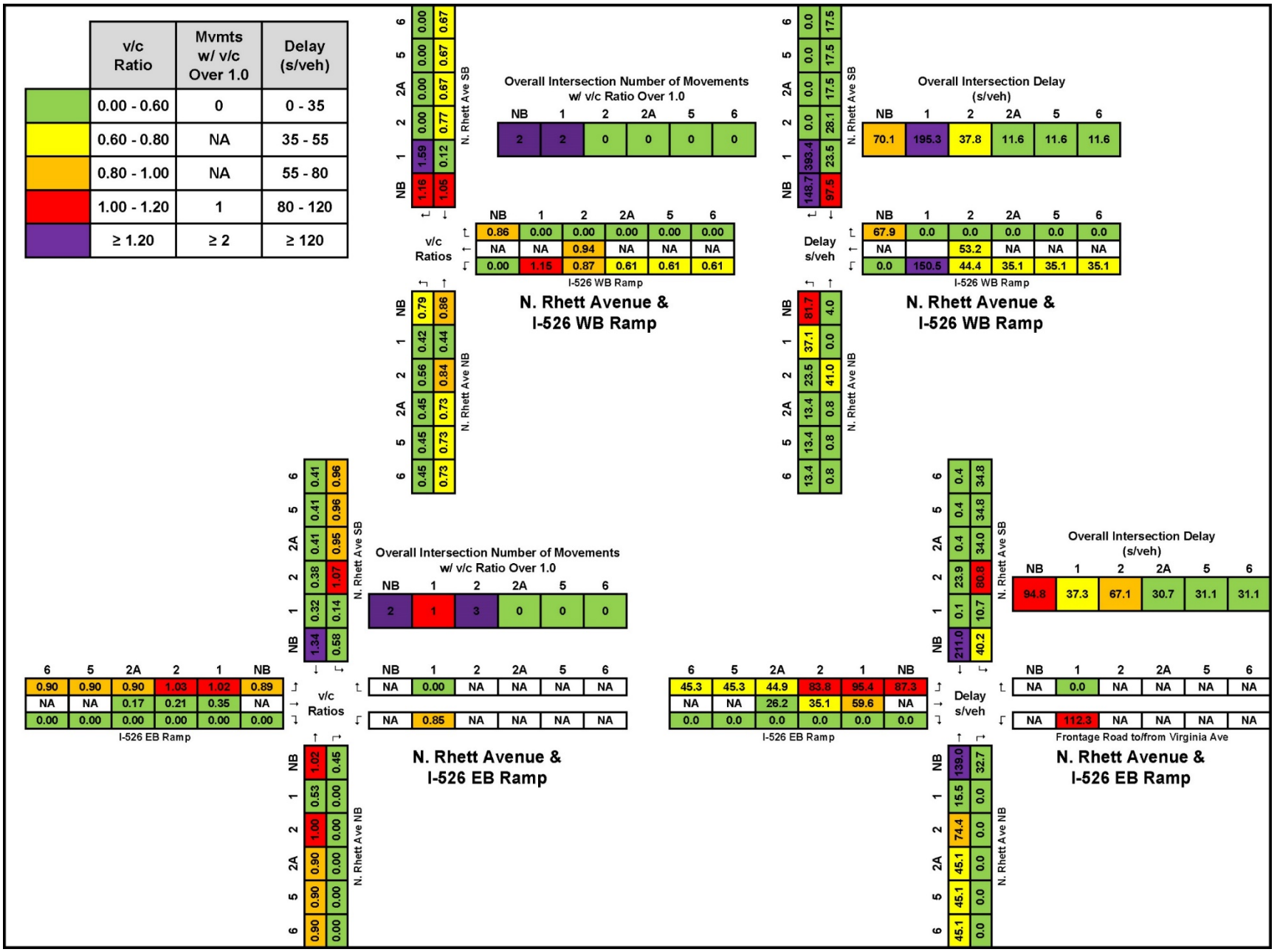


Figure 67 – I-526 & N. Rhett Avenue Intersection Operation Alternative Comparison – PM Peak Hour



5.3 PREFERRED ALTERNATIVE

5.3.1 I-26 & I-526 System Interchange

Based on the results of the capacity screening analysis for the four System interchange alternatives discussed in **Section 5.1** Alternative 2 is projected to provide acceptable volume/capacity ratios throughout the project limits of the System interchange. This, in addition to other screening factors considered (including wetlands impacts, relocations, environmental justice, threatened and endangered species, essential fish habitats, hazardous materials, cultural resources, noise, utilities impacts, cost, Section 4(f) and 6(f), reduction/elimination of geometric deficiencies to improve safety, and hurricane route compatibility) led to the selection of **Alternative 2 as the preferred alternative**. It was therefore carried forward for inclusion in the Preferred Priority Network Capacity Analysis.

5.3.2 I-526 & N. Rhett Avenue/Virginia Avenue Interchange

Based on the results of the capacity analysis discussed in **Section 5.2** Alternatives 2A, 5, and 6 are projected to provide acceptable interstate and intersection operation in the ultimate build condition of the design year. While Alternative 5 is projected to provide slightly better interstate operation, the impacts associated with this performance are considerably greater than those of Alternative 6, which are greater than those of Alternative 2A. Therefore, given the lower impacts associated with Alternative 2A, coupled with the projected acceptable traffic operation while providing direct access between Virginia Avenue and I-526, **Alternative 2A was selected as the preferred alternative**. It was therefore carried forward for inclusion in the Priority Network Capacity Analysis.

5.4 ALTERNATIVES DEVELOPMENT PROCESS SUMMARY

5.4.1 I-526 Mainline Widening Alternatives

Two widening alternatives along I-526 between Paul Cantrell Boulevard and Virginia Avenue were evaluated:

- Six General-Purpose Lanes (1 additional general-purpose lane in each direction)
- Eight General Purpose Lanes (2 additional general-purpose lanes in each direction)

Based on the static capacity analysis, it was determined that eight general purpose lanes are required to provide acceptable levels of service along the corridor in the design year.

5.4.2 I-526 & I-26 System Interchange Alternatives

In addition to widening improvements along the I-526 corridor, improvement alternatives at the I-526 & I-26 System Interchange were evaluated (including the Rivers Avenue interchange due to its proximity). Four (4) preliminary alternatives were evaluated as part of I-526 LCCW Project (each alternative designed to be compatible with both full and partial access alternatives at Rivers Avenue):

1. Semi-Directional Interchange
2. Semi-Directional Interchange with 1 Loop Ramp Retained
3. Semi-Directional Turbine Interchange
4. Semi-Directional with 3-Levels of Ramping

In response to the SCDOT directive to develop a Priority Network (prioritizing the I-526 Mainline and System Interchange operations), the development of four reasonable alternatives were developed, relying on increases in capacity of the existing CD roads on I-26 in order to achieve desired capacity and LOS on both intersecting interstates:

1. Semi-Directional Interchange w/ partial access at Rivers
2. **Semi-Directional Interchange with 1 Loop Ramp Retained w/ partial access at Rivers (Recommended)**

1A. Semi-Directional Interchange w/ full access at Rivers

2A. Semi-Directional Interchange with 1 Loop Ramp Retained w/ full access at Rivers

Of the reasonable alternatives evaluated, Alternative 2 at the System Interchange was recommended and selected as the preferred alternative to be included in the Preferred Build Network.

5.4.3 I-526 and I-26 Service Interchanges

Along with the improvements to the I-526 Mainline and the System Interchange, improvements to service changes in the project limits were also evaluated. In response to the SCDOT directive to develop a Priority Network, only improvements at service interchanges required to maintain operations of the interstate were retained. This led to a revision of improvements to be proposed at the following interchanges in the Priority Network (with only I-526 & N. Rhett Avenue/ Virginia Avenue having multiple alternatives to be further evaluated):

❖ Paul Cantrell Boulevard & Magwood Drive	Adjacent to Exit 11	1 Reasonable Alternative
❖ I-526 & Paul Cantrell Boulevard	Exit 11	1 Reasonable Alternative
❖ I-526 & International Boulevard	Exit 16	1 Reasonable Alternative
❖ I-526 & N. Rhett Avenue/Virginia Avenue	Exit 19/Exit 20	5 Reasonable Alternatives
❖ I-26 & Aviation Avenue	Exit 211A	1 Reasonable Alternative
❖ I-26 & Montague Avenue	Exit 213	1 Reasonable Alternative

The five reasonable alternatives at the I-526 & N. Rhett Avenue/Virginia Avenue interchange were further evaluated based on intersection and interstate traffic analysis as well as other impacts to the study area:

1. Single access from Rhett Avenue to I-526 EB and WB with separate Virginia Avenue access
2. Diamond Interchange with access to Virginia Avenue

2A. Removed loop-ramps w/ "Texas U-Turn" for movements to/from Virginia (Recommended)

5. Removed loop-ramps w/ "Texas U-Turn" and direct access ramps between Virginia and I-526/I-526 CD
6. Removed loop-ramps w/ "Texas U-Turn" and direct access ramps between Virginia and I-526

Of the reasonable alternatives evaluated, Alternative 2A at I-526 & N. Rhett Avenue/Virginia Avenue was recommended and selected as the preferred alternative to be included in the Preferred Build Network.

With all Preferred Alternatives selected at the service interchanges, the following interchanges, in addition to the previously noted I-526 mainline and I-526 & I-26 System Interchange improvements, are proposed to be improved in association with the 526 LCCW project, the improvements of which are included in the Preferred Build Network:

❖ **Paul Cantrell Boulevard & Magwood Drive**	**Adjacent to Exit 11**
❖ **I-526 & Paul Cantrell Boulevard**	**Exit 11**
❖ **I-526 & International Boulevard**	**Exit 16**
❖ **I-526 & N. Rhett Avenue/Virginia Avenue**	**Exit 19/Exit 20**
❖ **I-26 & Aviation Avenue**	**Exit 211A**
❖ **I-26 & Montague Avenue**	**Exit 213**

Based on the selection of the preferred alternatives at the System Interchange (Alternative 2) and at the I-526 & N. Rhett Avenue and Virginia Avenue interchanges (Alternative 2A), a Preferred Priority Network was developed, which also incorporated the reasonable alternative for the mainline widening (8-lane widening) and of the other interchanges evaluated (I-526 & Paul Cantrell Boulevard and Paul Cantrell Boulevard & Magwood Drive).

This resulting Preferred Alternative Network is described below and shown schematically in **Figure 68** (with the description letters matching those in the figure). It is also illustrated in detail in **Figure 69** through **Figure 73.** The analysis of this Preferred Alternative network compared to the No Build alternative network is included in the *I-526 Lowcountry Corridor West Preferred Alternative Traffic Analysis Report*.

A. I-526 Widening from Paul Cantrell Boulevard to I-26

- Interstate 526 will be widened to four lanes in each direction as part of this project.

B. System Interchange Improvements at the junction of I-26 & I-526.

- The improved interchange will incorporate an expanded use of CD roads along I-26 and I-526 to provide better distribution of traffic and reduce congestion caused by weaving of conflicting high-volume movements through and between the two freeways.

C. I-526 Eastbound Collector-Distributor

- A collector-distributor will be constructed parallel and to the outside of the existing eastbound lanes of I-526 between I-26 and North Rhett Avenue. This CD road will carry traffic from the I-26 eastbound and westbound CDs to North Rhett Avenue, Virginia Avenue, and I-526 eastbound towards Mount Pleasant. There will be no connections from this CD to Rivers Avenue, which will retain full access from the existing lanes of I-526 eastbound.

D. I-526 Westbound Collector-Distributor

- A collector-distributor will be constructed parallel and to the outside of the existing westbound lanes of I-526 between North Rhett Avenue and I-26. This CD road will carry traffic from I-526 westbound crossing the Cooper River, as well as traffic from North Rhett Avenue and Virginia Avenue to the I-26 westbound CD and to I-26 eastbound. There will be no connections from this CD to Rivers Avenue, which will retain full access from the existing lanes of I-526 westbound.

E. North Rhett Avenue and Virginia Avenue Interchange Improvements

- The loop ramps at North Rhett Avenue will be replaced with higher speed diagonal ramps North Rhett Avenue will have direct access to the I-526 eastbound and westbound mainline, as well as direct access to and from the I-526 eastbound and westbound CD system. Virginia Avenue will also have direct access, except for I-526 eastbound exiting traffic, which will pass through the eastbound exit ramp terminal intersection before continuing to Virginia Avenue.

F. I-26 Eastbound Collector-Distributor Extension and Widening

- The existing CD road providing access to the Aviation Avenue and Remount Road interchanges will be extended to the system interchange at I-526 and will carry traffic from I-26 eastbound to I-526 westbound. Traffic travelling to and from Aviation Avenue and Remount Road will also utilize this CD to access I-526 eastbound and westbound. One lane will be added to the existing CD road to accommodate the addition of the I-26 eastbound to I-526 westbound traffic.

G. I-26 Westbound Collector-Distributor Extension and Widening

- The existing CD road providing access to the Aviation Avenue and Remount Road interchanges will be extended to begin at the system interchange at I-526 and will carry traffic from I-526 eastbound and I-526 westbound to I-26 westbound in addition to traffic travelling to and from Aviation Avenue and Remount Road. One lane will be added to the existing CD road to accommodate the addition of the I-526 westbound to I-26 westbound traffic.

H. Aviation Avenue Northbound Entrance Ramp to I-26 Eastbound Collector-Distributor

- The ramp currently connecting northbound Aviation Avenue to the I-26 eastbound CD will be removed and traffic will be rerouted to the existing loop making this connection with the southbound traffic.

I. Collector-Distributor between Montague Avenue and I-526 on I-26 Westbound

- A short CD road will be constructed between Montague Avenue and the system interchange with I-526 on I-26 westbound to carry traffic from Montague Avenue and I-26 westbound to the I-526 eastbound collector-distributor, I-526 westbound, and the I-26 westbound CD to Remount Road and Aviation Avenue.

J. Braided Ramps between International Boulevard and I-26 on I-526 Eastbound

- Braided ramps will be constructed between International Boulevard and the System Interchange with I-26 on I-526 eastbound to carry traffic from Montague Avenue, International Boulevard, and I-526 eastbound to I-26 eastbound and westbound.

K. Braided Ramps between Montague Avenue and International Boulevard on I-526 Eastbound and I-526 Westbound (*by Others*)

- Braided ramps will be constructed between these closely spaced interchanges while maintaining the existing one-way frontage road connections between Montague Avenue and International Boulevard.
- The braided ramps between Montague Avenue and International Boulevard are to be constructed by Charleston County as part of another project. While these improvements are not included in the 526 LCCW Project, they were developed in conjunction with the other components of the 526 LCCW Project. These ramps are being advanced with the County's project, the Airport Connector Road (ACR), because they are necessary to maintain access when that project is constructed. More details on the ACR project as well as other committed projects that are relevant to the 526 LCCW Project will be provided in **Section 3.1.1.2.1 – Project Descriptions.**

L. Paul Cantrell Boulevard/Glenn McConnell Parkway at Magwood Drive Improvements

- SC 461, named Paul Cantrell Boulevard east of Magwood Drive, becomes Glenn McConnell Parkway west of Magwood Drive. The I-526 westbound exit ramp to westbound Paul Cantrell Boulevard will be widened and then will split, with the two outer lanes being grade separated over Magwood Drive, connecting to Glenn McConnell Parkway westbound. The inside lane of this ramp will be grade separated over the westbound lanes of Paul Cantrell Boulevard, then intersect at grade with Magwood Drive.

Figure 68 – I-526 Lowcountry Corridor Project Overview