

## 9.0 I-26 & I-526 Interchange Improvements

The I-26 & I-526 System-to-System interchange currently consists of a combination of directional and loop ramps providing for all movements from one Interstate to another. There is a two-lane directional fly-over ramp from I-526 eastbound to I-26 westbound, loop ramps in the other three quadrants of the interchange, and a CD road in the two western quadrants of the interchange. The interchange provides access to/from downtown Charleston, Summerville/Columbia, West Ashley/Savannah, and Mount Pleasant

A CD system along I-26 east of the interchange with I-526 has recently been constructed through the interchanges with Remount Road and West Aviation Avenue. I-526 travels over I-26, generally consisting of a four-lane cross section separated by a grass median and a cable median barrier.

### 9.1 Strategies

A total of fifteen deficiencies, summarized in Table 9-1, were identified for the I-26 & I-526 system-to-system interchange, and seven improvement alternates were developed to address these deficiencies. Initial alternates were developed for input from the project team members, which helped ensure that all feasible design were considered. Based upon the feedback from the project team, additional alternates were developed for consideration. Maps summarizing the location of the deficiencies identified around the I-26 & I-526 interchange area are provided in Appendix B.

It should be noted that development of interchange alternates considered structure height limitations due to restrictions of the Charleston International Airport flight path generally located on the western side of the system to system interchange.

The viable alternates were then modeled with the *VISSIM* analysis program, which simulated potential problem areas with the respective alternates. The alternates were then modified for the final concept designs.

Table 9-1: Existing I-26 & I-526 Interchange Area Deficiencies

AREA	#	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

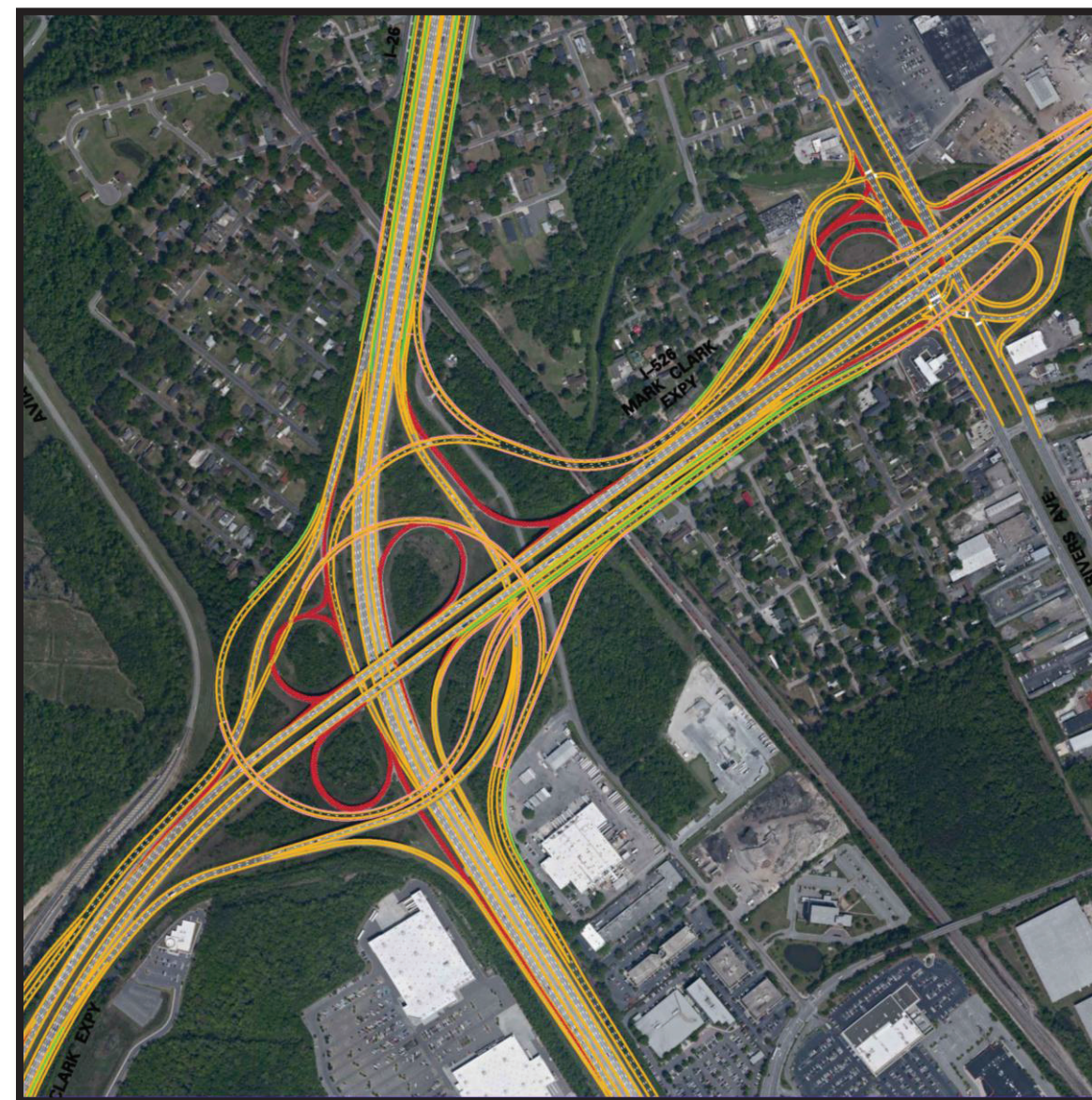
### 9.2 Alternate 1

This alternate, illustrated in Exhibit 9-1, removed the three low speed loops and replaced them with semi-directional ramps. The existing CD system for I-26 eastbound from Remount Road was extended to tie with the I-26 & I-526 interchange. A new CD system begins at Montague Avenue for I-26 westbound and ties with the existing CD system at Remount Road. There are also two new CD systems on the north and south sides of I-526 between I-26 and Rivers Avenue, with the westbound CD continuing through the International Boulevard interchange. The interchange at Rivers Avenue is replaced with a DDI.

Exhibit 9-1: I-26 & I-526 Alternate 1



Exhibit 9-2: I-26 & I-526 Alternate 2



### 9.3 Alternate 2

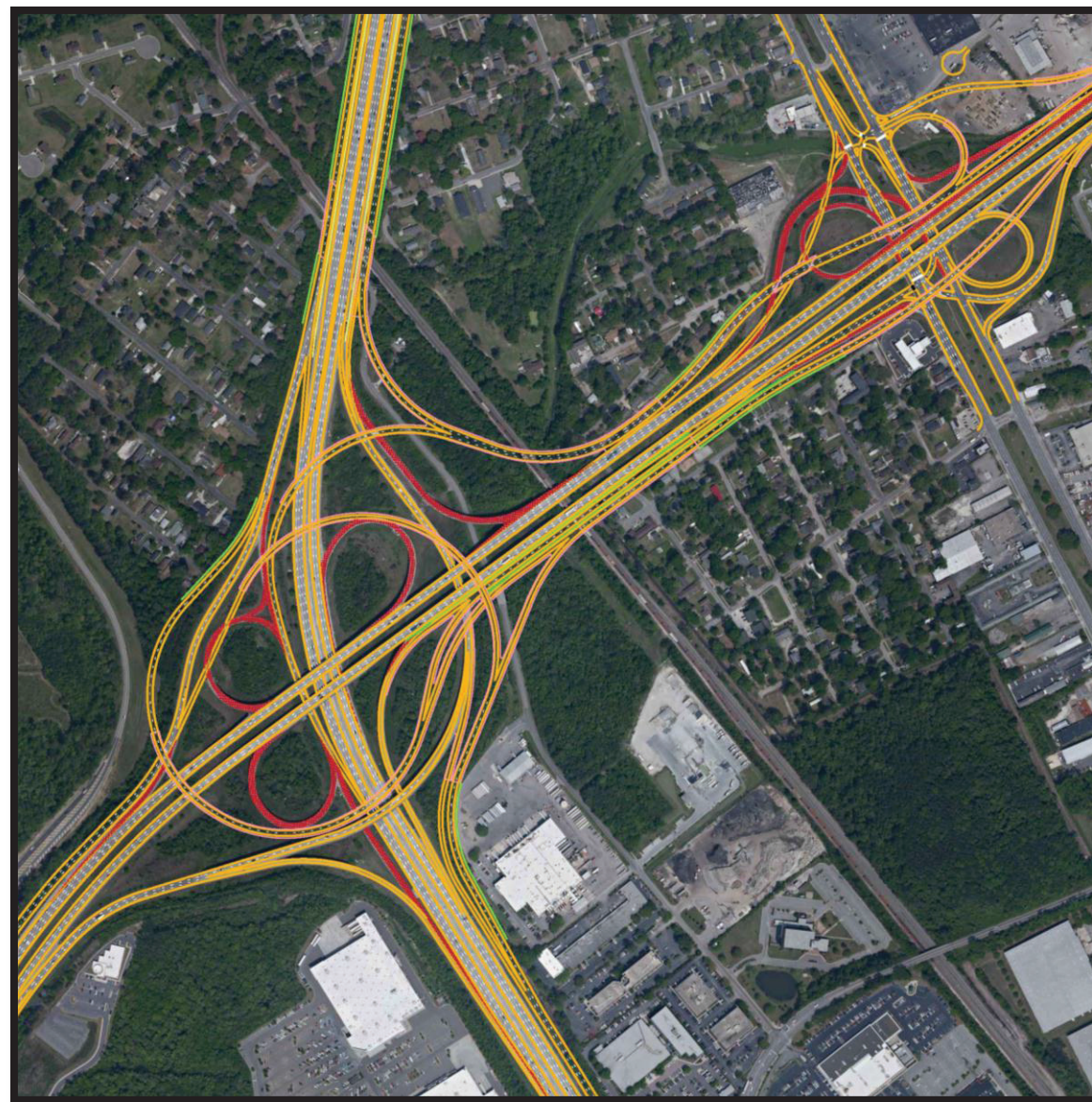
This alternate, illustrated in Exhibit 9-2, generally includes the same ramp configuration for the I-26 & I-526 interchange as Alternate 1. The difference is the configuration at Rivers Avenue and how the ramp system in the westbound direction of I-526 ties to International Boulevard. At Rivers Avenue the configuration of the interchange is similar to existing conditions with a few minor modifications.

The loop and ramps to and from I-526 westbound have been moved out (to the north) to accommodate the new CD with the radius of the loop increased for a 30 mph design speed. The I-526 eastbound ramp to Rivers Avenue enables movements to eastbound and westbound Rivers Avenue as walls are proposed to prevent weaving of I-26 traffic destined for Rivers Avenue westbound with the I-526 mainline. The I-526 westbound traffic between I-26 and International Boulevard uses braided ramps in lieu of a CD system. The existing CD system to and from Remount Road will be extended to the new I-26 & I-526 interchange.

#### 9.4 Alternate 3

This alternate, illustrated in Exhibit 9-3, is similar to Alternate 2 with the difference being the ramp configuration at Rivers Avenue. The loop in the northwest quadrant of Rivers Avenue is removed and a new loop is installed in the northeast quadrant, which would potentially reduce impacts to residences and businesses. This alternate would also increase the weaving length on the CD system for traffic destined to I-26.

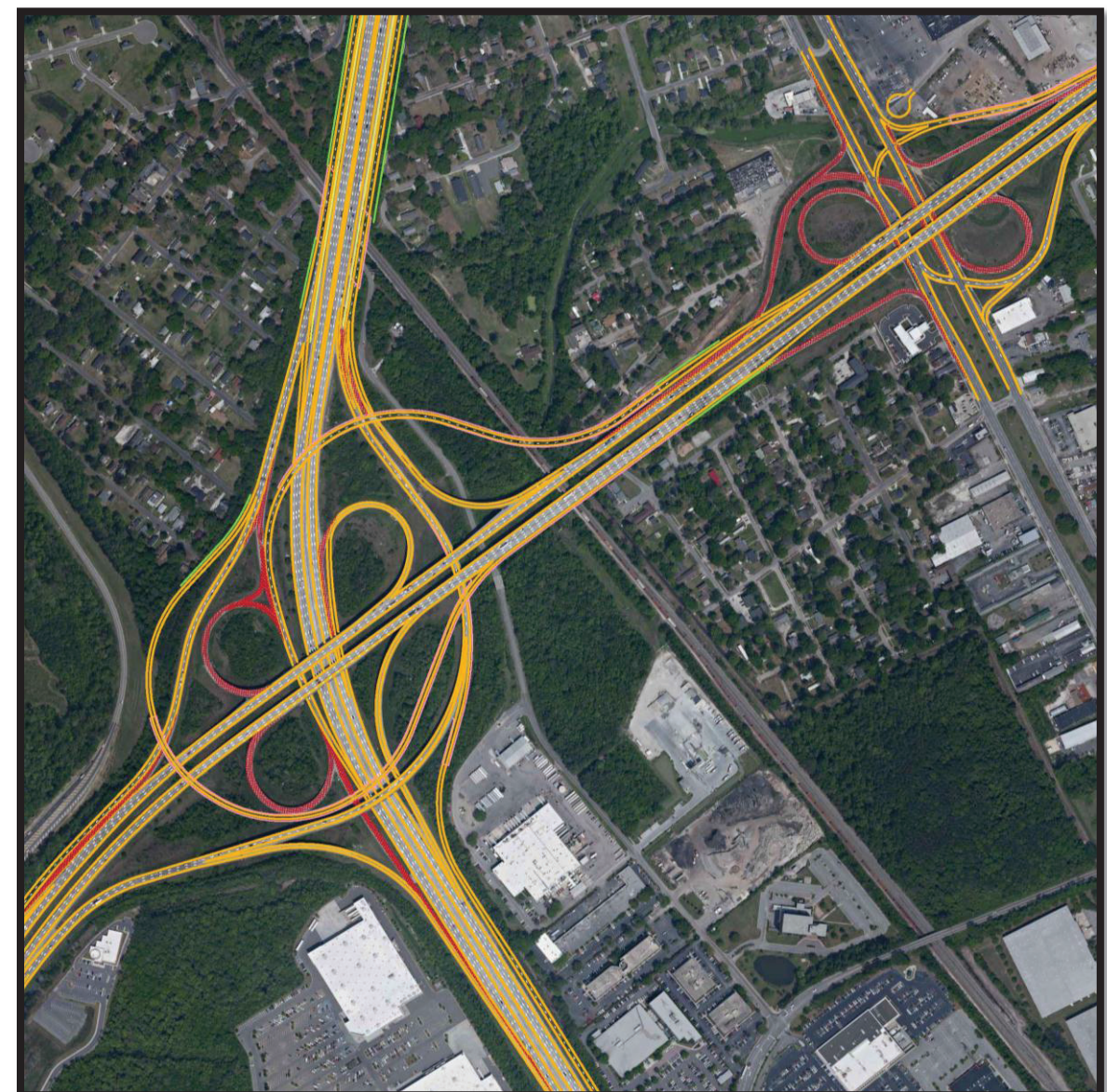
**Exhibit 9-3: I-26 & I-526 Alternate 3**



#### 9.5 Alternate 4

This alternate, illustrated in Exhibit 9-4, is related to the Partial Interchange alternate for Rivers Avenue. This alternate also considers elimination of the loops for the I-26 eastbound to I-526 eastbound traffic and for the I-526 westbound to I-26 eastbound traffic, which are replaced with semi-directional ramps. The I-26 westbound to I-526 westbound loop is left in due to the lower volume of traffic.

**Exhibit 9-4: I-26 & I-526 Alternate 4**



The major design issue with this interchange is the elimination of the ramps at Rivers Avenue from I-526 eastbound and to I-526 westbound. The removal of these ramps eliminated all the deficiencies associated with the close proximity of the I-526 interchanges with I-26 and Rivers Avenue. The traffic from I-26 and I-526 west of Rivers Avenue would likely be accommodated by Remount Road or Montague Avenue. The movements to and from Rivers Avenue in the direction of Mount Pleasant would be left in place.

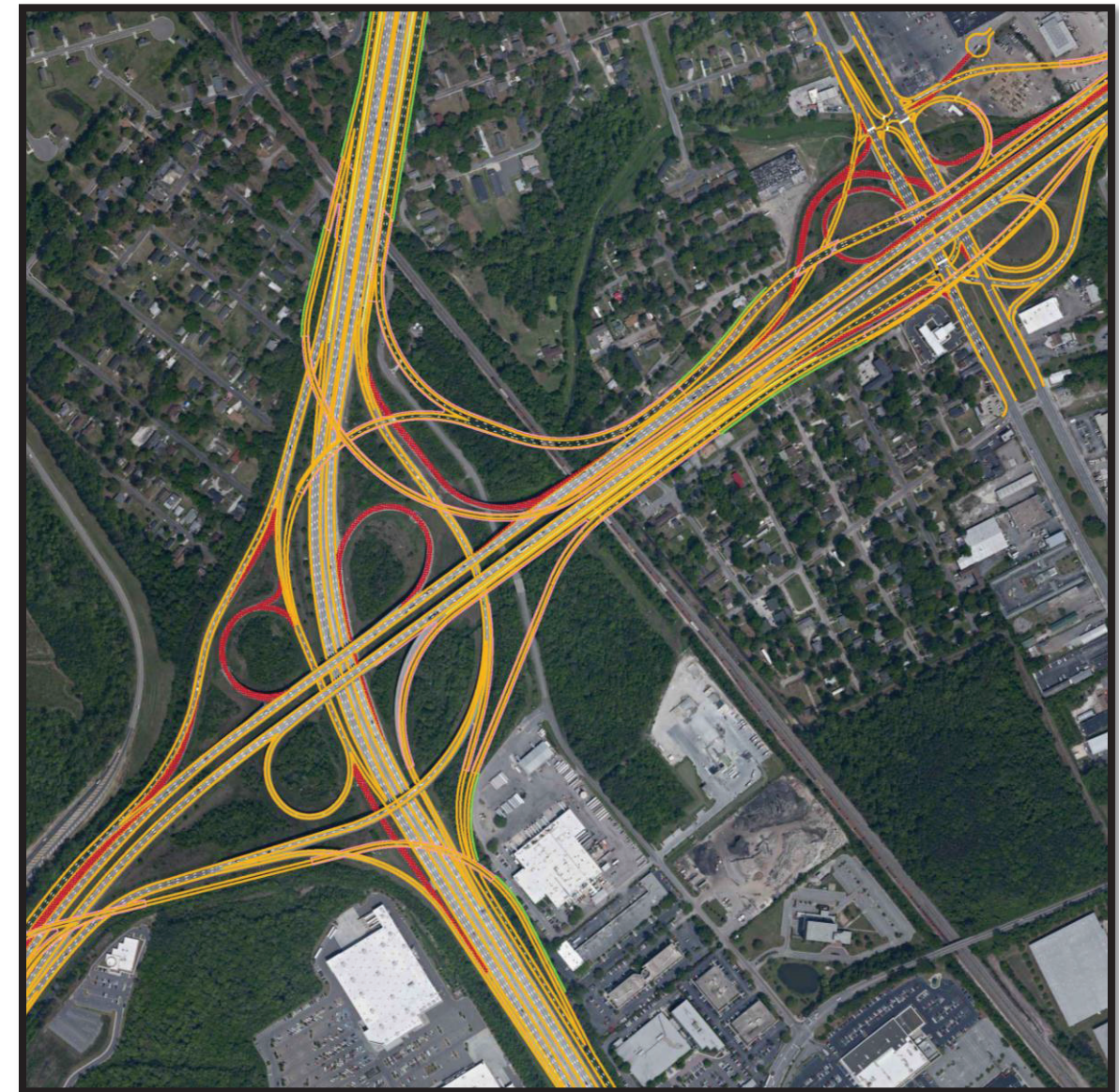
The removal of the movements to/from the west would resolve many of the deficiencies along I-526 between I-26 and Rivers Avenue and would present a significant cost savings; however, it was determined that the recommended alternate needed to provide for all existing movements, therefore this alternate was not considered for further study.

#### 9.6 Alternate 5

This alternate, illustrated in Exhibit 9-5, puts the I-26 eastbound to I-526 eastbound on a directional flyover to the median of I-526 to keep the heavy traffic volumes movement out of the weave between the I-526 interchanges with I-26 and Rivers Avenue. The I-26 eastbound to Rivers Avenue traffic would continue to use the existing loop for this movement.

The I-26 westbound to I-526 westbound loop would be removed and replaced with a directional flyover to the median of I-526 in the westbound direction. The I-526 westbound to I-26 eastbound traffic would be put on a semi-directional ramp and the existing loop removed. The I-26 and I-526 westbound traffic toward International Boulevard would be put on a CD system. There will also be a new CD system on both sides of I-526 between I-26 and Rivers Avenue. The I-526 & Rivers Avenue interchange would be the same as Alternate 3. The CD system to and from Remount Road would be extended to the new I-26 & I-526 interchange.

Exhibit 9-5: I-26 & I-526 Alternate 5



#### 9.7 Alternate 6

This alternate, illustrated in Exhibit 9-6, replaces all the loops at the I-26 & I-526 interchange with semi-directional flyover ramps. The I-526 & Rivers Avenue interchange is similar to Alternate 3 with CD systems on both sides of I-526 between the I-26 and Rivers Avenue interchanges.

The traffic traveling from I-26 to I-526 westbound toward International Boulevard would be placed on a CD system. The traffic from I-26 westbound to I-526 will be placed on a CD system beginning at Montague Avenue and the existing CD system to and from Remount Road would be extended to the new I-26 & I-526 interchange.

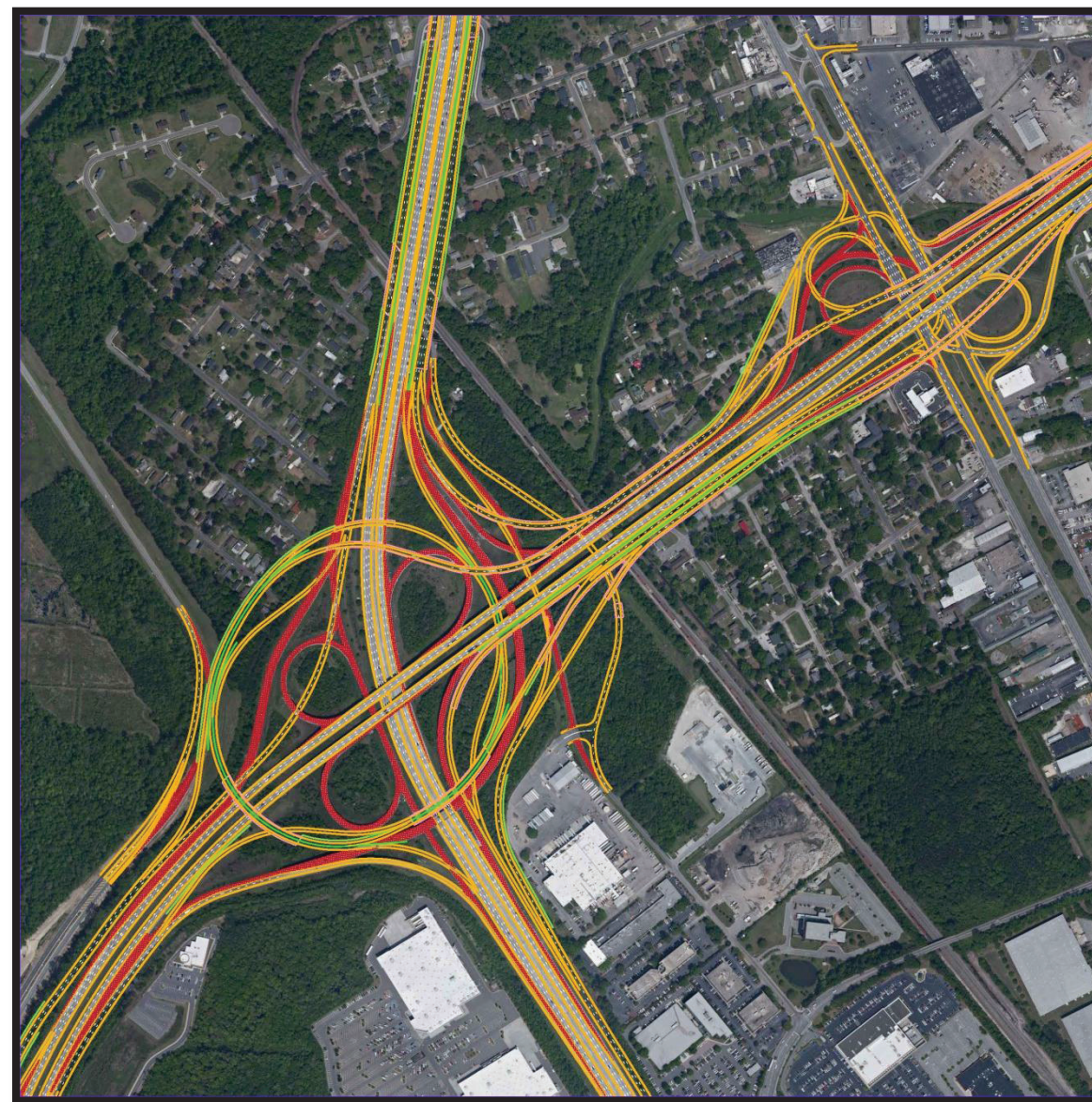
Exhibit 9-6: I-26 & I-526 Alternate 6



## 9.8 Alternate 7

The interchange alternate, illustrated in Exhibit 9-7, replaces the existing interchange with a semi-directional turbine interchange. The key component of this design is that there is no weaving within the interchange. All weaving occurs on the lower-speed CD systems.

Exhibit 9-7: I-26 & I-526 Alternate 7



The traffic from I-26 westbound to I-526 is placed on a CD system beginning at Montague Avenue. There are CD systems on both sides of I-526 between the I-26 and Rivers Avenue interchanges. The interchange at Rivers Avenue is the same as alternate 2. The traffic from I-26 to I-526 westbound is on a braided-ramp system and the existing CD systems to and from Remount Road are extended to the new interchange at I-26 & I-526.

### 9.9 I-26 & I-526 Interchange Improvements Summary

Conceptual plans illustrating the proposed improvement alternates for the I-26 & I-526 interchange area are provided in Appendix B.

The seven alternates developed were reviewed to determine a recommended concept for the I-26 & I-526 interchange. This review considered a ranking against the following criteria: number of deficiencies addressed, utility impacts, right-of-way impacts, environmental impacts, compatibility with widening to the I-526 median, and cost. A summary of the review criteria for each alternate of the I-26 & I-526 System-to-System interchange is provided in Table 9-2.

**Table 9-2: I-26 & I-526 Interchange Alternate Evaluation Summary**

SUMMARY OF CRITERIA	ALTERNATE						
	1	2	3	4	5	6	7*
Number of Deficiencies Addressed	13 of 15	13 of 15	13 of 15	13 of 15	12 of 15	13 of 15	13 of 15
Utility Impacts (Ranked High to Low)	4	3	1	7	2	5	6
Right-of-Way Impacts (Ranked High to Low)	6	3	4	7	5	2	1
Compatible with Median Widening of I-526	Yes	Yes	Yes	No	Yes	Yes	Yes
Environmental Impact (Ranked High to Low)	6	4	5	7	2	3	1
Estimated Construction Cost	\$172 million	\$175 million	\$173 million	\$91 million	\$173 million	\$169 million	\$169 million

\*Recommended Alternate

Note: Ranking in Comparison Table run from (1) Highest to (7) Lowest Impacts

Based upon the review criteria, it was determined that Alternate 7 ranked highest for the recommended concept of the I-26 & I-526 interchange. It should be noted that Alternate 2 ranked closely to the recommended Alternate 7; however, there is a lack of weaving within the interchange area with Alternate 7 as compared to Alternate 2.

### 9.10 VISSIM Build Analyses

As outlined in Chapter 8, significant roadway improvements were identified along the I-526 corridor to mitigate the project future traffic congestion. As part of the development of the VISSIM build models for 2035 conditions, Alternate 7 was considered for the I-26 & I-526 interchange. The results of VISSIM analyses indicated that this alternate would mitigate the congestion deficiencies at the I-26 & I-526 interchange as summarized in Chapter 10.

It should be noted that, a VISSIM model was developed for Alternate 2 of the I-26 & I-526 interchange, and the results of the model indicated that this alternate would also mitigate the future congestion deficiencies.

### 9.11 Project Phasing

As part of the I-26 & I-526 interchange analyses, a constructability review was conducted of the recommended Alternate 7 to determine the sequence of construction and to determine if the most severe deficiencies could be constructed first. The deficiencies were broken down into three categories, with congestion being the most important, followed by weaving issues and then ramp deceleration/acceleration lengths. The final phasing of the interchange improvements will depend on constructability and available funding. A conceptual phasing plan is provided in Appendix B.

Based upon the constructability review, the first priority is the congestion and weaving along I-526 westbound between Rivers Avenue and the I-26 & I-526 interchange. This deficiency would be resolved by building the new interchange at Rivers Avenue and the braided CD system from I-526 westbound to I-26 westbound with a temporary tie to I-26 westbound.

The next phase of the I-26 & I-526 interchange to be constructed would be the I-26 eastbound to I-526 eastbound directional ramp and the I-526 eastbound CD system to address the congestion and eliminate the weave in the I-526 eastbound direction. Next would be the I-26 westbound to I-526 westbound CD system to address congestion and weaving, which will require a temporary tie-in to I-526.

Then, the directional ramp from I-526 westbound to I-26 eastbound should be constructed next, including the tie-ins from I-26 westbound to I-526 eastbound and Remount Road and Aviation Avenue. Finally, the last phase the interchange improvement project would be the completion of the CD systems along I-26 eastbound and westbound to tie-in to the existing CD systems at Remount Road and Aviation Avenue. The ramp from I-26 eastbound to I-526 westbound would also be tied into the new CD system.

### 9.12 Hurricane Evacuation Review

If a hurricane threatens to impact the Charleston area, SCDOT has an evacuation plan that would reverse all lanes of I-26 to outbound beginning at the I-26 & I-526 interchange and ending at the I-26 & I-77 interchange in Columbia, South Carolina. Under the existing plan, traffic from the Mount Pleasant area traveling I-526 westbound is split into two lanes with one lane exiting to the existing ramp to I-26 westbound as normal and the other lane utilizing a temporary connection in the loop ramp in the northwest quadrant of the interchange to access the I-26 eastbound lanes in the reverse-flow direction. Traffic originating from the West Ashley area traveling I-526 eastbound is directed to take a temporary connection in the ramp to I-26 eastbound to access the I-26 eastbound lanes in a reverse-flow direction.

Considering the recommended Alternate 7 for the I-26 & I-526 interchange, a similar all-lane reversal plan for I-26 can be implemented. Traffic traveling on I-526 westbound from the Mount Pleasant area would be split into two paths, one directed to take the new two-lane ramp to I-26 westbound as normal and the other utilizing a temporary connection in the southwest quadrant of the interchange from the directional ramp to I-26 eastbound to access the I-26 eastbound lanes in the reverse-flow direction. Traffic traveling I-526 eastbound from the West Ashley area would be directed to take a new temporary connection in the ramp to I-26 eastbound to access the I-26 eastbound lanes in a reverse-flow direction, similar to the existing reversal plan.

### 9.13 Environmental Review

Using the recommend conceptual improvements for the I-26 & I-526 interchange, the interchange was reviewed to determine if the human and natural environments would be impacted. As noted in Chapter 8, the project corridor was subdivided into 11 segments that were evaluated in detail. This section describes four of the project segments that impact the I-26 & I-526 interchange area. As previously noted, information on the corridor's human and natural environments was obtained from:

- Current and historical aerial photography,
- US Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI) mapping,
- Threatened and endangered species list for Charleston County,
- Federal Emergency Management Agency (FEMA) Floodplain Insurance Rate Maps (FIRM),
- South Carolina Department of Archives and History (SCDAH) records,
- South Carolina Department of Health and Environmental Control (SCDHEC) records, and
- Limited investigations during site visits.

Table 9-3 provides a brief summary of the potential impacts of the recommended conceptual improvements for the I-26 & I-526 interchange on the adjacent human and natural environments. Additional detailed studies within the project corridor will be required to determine the presence and/or likely impact to wetlands, threatened and endangered species, and cultural/historic resources. Detailed summaries for each of the four project segments that impact the I-26 & I-526 interchange area are provided herein.

**Table 9-3: Environmental Impact Summary**

LOCATION	ROUTE	POTENTIAL WETLAND IMPACTS	POTENTIAL FLOODPLAIN IMPACTS	POTENTIAL RELOCATIONS		POTENTIAL NOISE RECEPTORS	THREATENED & ENDANGERED SPECIES IMPACTS	POTENTIAL CULTURAL RESOURCE IMPACTS
				RESID.	COMM.			
6) I-26 & I-526 Interchange	I-26/I-526	Yes	No	4	0	12	Unlikely	Unlikely
7) I-26 East of I-526	I-26	No	No	0	0	6	Unlikely	Unlikely
8) I-26 West of I-526	I-26	No	No	0	0	42	Unlikely	Unlikely
9) I-26 Between Remount Road and W. Aviation Avenue	I-26	Yes	No	0	0	4	Unlikely	Unlikely

#### **9.13.1 Segment 6 – I-26 & I-526 Interchange**

This segment includes the I-26 & I-526 interchange and its approaches from each of the four cardinal directions extending approximately 1,950 feet east (north) of the interchange to approximately 1,000 feet west (south) of the interchange along I-26 and approximately 1,550 feet east and 2,000 feet west of the interchange along I-526. The adjacent land uses include the Charleston International Airport and Joint Base Charleston, a residential neighborhood, commercial areas, undeveloped forest land and a rail line.

The USFWS NWI maps indicate that freshwater wetland communities exist in the southeast and southwest interchange quadrants and will likely be impacted due to new ramp construction. However, a review of the FEMA FIRMs for this section indicates that no floodplains exist within the project section. The proposed improvements would likely result in four potential relocations due to the installation of new ramps in the northeast and southeast quadrants of the interchange. A review of this section of the project corridor indicated that approximately 12 noise receptors exist within 300 feet of the I-526 mainline.

#### **9.13.2 Segment 7 – I-26 East of I-526**

This segment includes the I-26 mainline east of the I-26 & I-526 interchange and extends approximately 2,600 feet to the east (north). The adjacent land uses are commercial and industrial as this portion of the project is completely developed.

The USFWS NWI maps indicate that there are no wetland communities adjacent to the I-26 mainline, and a review of the FEMA FIRMs for this section indicates that no floodplains exist within or adjacent to the project corridor. The proposed improvements would not likely result in any potential relocations. A review of this section of the project corridor indicated that approximately six noise receptors exist within 300 feet of the I-26 mainline.

#### **9.13.3 Segment 8 – I-26 West of I-526**

This segment includes the I-26 mainline west of the I-26 & I-526 interchange extending approximately 2,000 feet west (south) of the I-526/I-26 interchange. The adjacent land uses are residential in the south and commercial/industrial/warehousing in the northern portion of the section. Historic aerial photos show that the entire length of the section appears to have been developed for at least 20 years.

The USFWS NWI maps indicate that there are no wetland communities adjacent to the I-26 mainline, and a review of the FEMA FIRMs for this section indicates that no floodplains exist within or adjacent to the project corridor. The recommended improvements would not likely result in any potential relocations. A

review of this section of the project corridor indicated that approximately 42 noise receptors exist within 300 feet of the I-26 mainline.

#### **9.13.4 Segment 9 – I-26 Between Remount Road and West Aviation Avenue**

This segment includes the I-26 mainline between the interchange of Remount Road and West Aviation Avenue for a length of approximately 2,300 feet. This area has also been developed for at least the last 20 years and its adjacent land uses are commercial, industrial and warehousing.

The USFWS NWI maps indicate that there was previously a freshwater wetland located east of the mainline; however recent aerial photographs indicate that this area has been heavily disturbed. A review of the FEMA FIRMs for this section indicates that no floodplains exist within or adjacent to the project corridor. The proposed improvements would not likely result in any potential relocations. A review of this section of the project corridor indicated that approximately four noise receptors exist within 300 feet of the I-26 mainline.