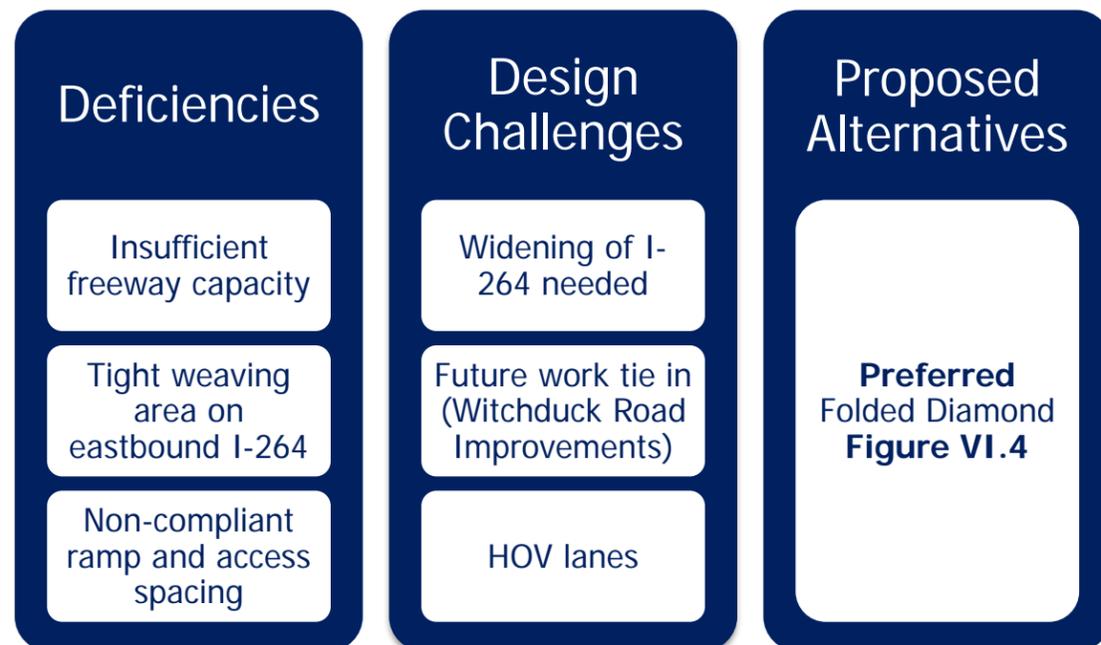


## VI. Witchduck Road Interchange



### VI.1 Existing Conditions

Existing conditions present at the Witchduck Road interchange are described focusing on roadway geometry, volumes, capacity analysis, and crash history.

#### VI.1.1 Geometry, Speeds, Lanes, Traffic Control

Figure VI.1 displays a summary of the existing roadway geometry. The Witchduck Road interchange has a modified diamond configuration: the eastbound direction has a weave segment between two loop ramps and the westbound direction has a single directional off-ramp followed by a single lane on-ramp (the westbound ramps do not line up on Witchduck Road). Concurrent flow HOV lanes are provided in each direction of travel on the lane immediately adjacent to the median through the interchange.

Several geometric deficiencies have been documented, including:

- Ramp spacing is non-compliant at 3 locations
- Access spacing is non-compliant at 4 locations
- Acceleration lane length is non-compliant at 1 location
- Inefficient 5-way signalized intersection at eastbound off-ramp junction with Greenwich Road and Grayson Road

Additional details on the existing conditions geometry can be found in the Technical Appendix.

### VI.1.2 Volumes & Operations

Figure VI.2: Existing Volumes displays the existing volumes for the Witchduck Road interchange for the year 2014. Traffic counts were conducted during early December 2014, with counts conducted on Tuesdays, Wednesdays and/or Thursdays. The peak hour counts document the typical commuter pattern on I-264, with heavier volumes in the westbound direction during the AM peak period and in the eastbound direction during the PM peak period. On Witchduck Road, the heavier volumes are majority in the northbound direction in the AM peak period and in the southbound direction in the PM peak period.

Table 6.1 displays a summary of the results of the capacity analysis of existing conditions using the Highway Capacity Manual software (HCS) package, and as shown in the results, the interchange exhibits a number of deficiencies. Specifically, west of Witchduck Road, eastbound I-264 mainline freeway lanes operates at LOS E in the PM peak hour. Conversely, westbound I-264 mainline freeway lanes east of Witchduck Road operate with LOS E in the AM peak hour. There are two deficiencies involving ramp movement: one is the diverge movement from westbound I-264 mainline to Witchduck Road, which operates at LOS E in the AM peak hour; and the other is the weave section on eastbound I-264, which operates at LOS E in both peak hours. In summary, when focusing only on the interchange ramps, the results indicate that all movements are operating with inadequate capacity.

Movement (Type)	AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
EB I-264 between Newtown Rd and Witchduck Rd (Freeway)	25.7	C	<b>36.8</b>	<b>E</b>
NB/SB Witchduck Rd & EB I-264 (Weave)	<b>37.6</b>	<b>E</b>	<b>42.3</b>	<b>E</b>
EB I-264 between Witchduck Rd and Independence Blvd (Freeway)	28.5	D	34.6	D
WB I-264 between Witchduck Rd and Independence Blvd (Freeway)	<b>44.2</b>	<b>E</b>	33.4	D
WB I-264 to Witchduck Rd (Diverge)	<b>36.5</b>	<b>E</b>	31.8	D
WB I-264 between Newtown Rd and Witchduck Rd (Freeway)	33.1	D	25.8	C

# I-264 Corridor Evaluation Study

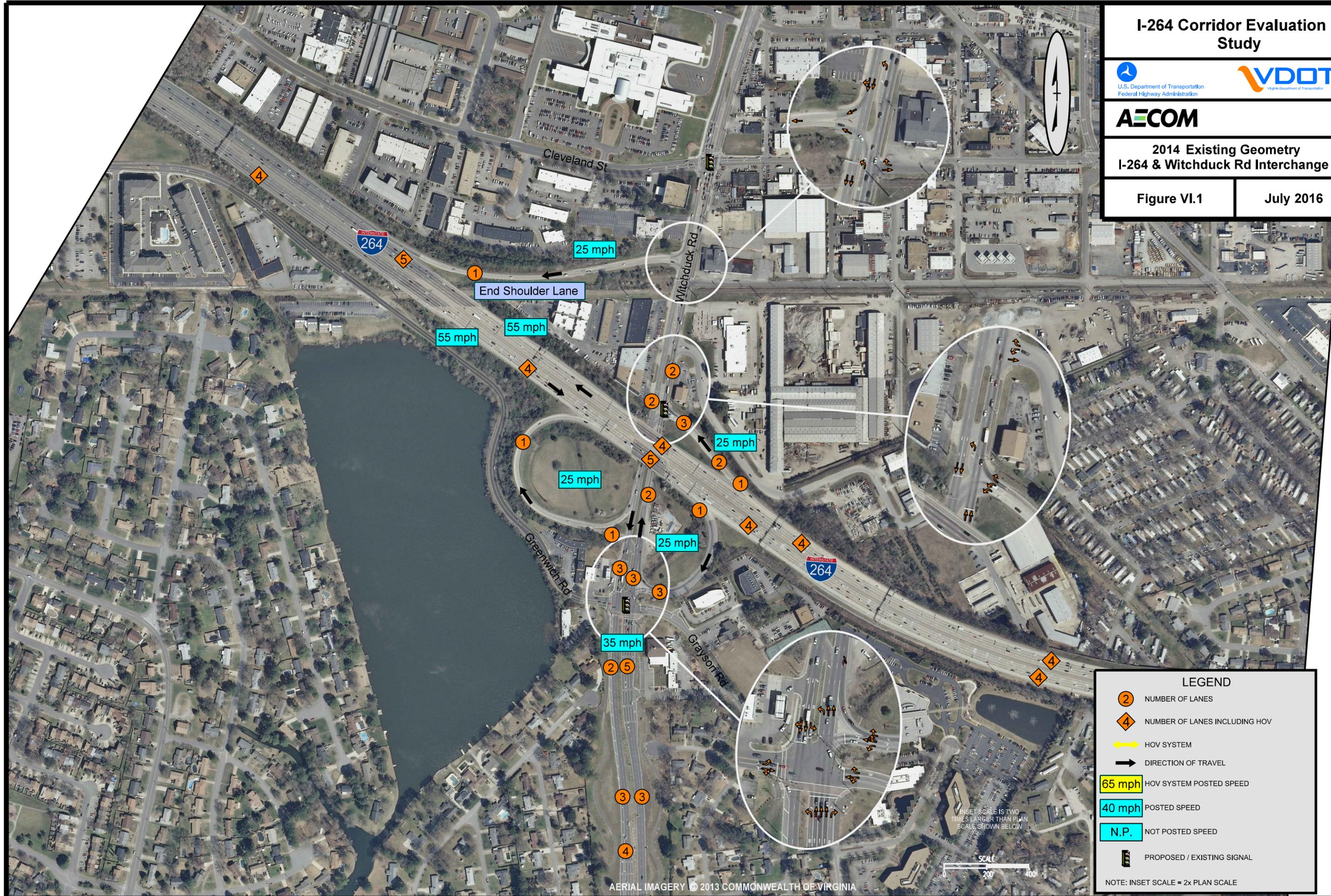


**AECOM**

2014 Existing Geometry  
I-264 & Witchduck Rd Interchange

Figure VI.1

July 2016



**LEGEND**

- 2 NUMBER OF LANES
- 4 NUMBER OF LANES INCLUDING HOV
- HOV SYSTEM
- DIRECTION OF TRAVEL
- 65 mph HOV SYSTEM POSTED SPEED
- 40 mph POSTED SPEED
- N.P. NOT POSTED SPEED
- PROPOSED / EXISTING SIGNAL

NOTE: INSET SCALE = 2x PLAN SCALE

INSET SCALE IS TWO TIMES LARGER THAN PLAN SCALE SHOWN BELOW

SCALE  
0 200 400

# I-264 Corridor Evaluation Study

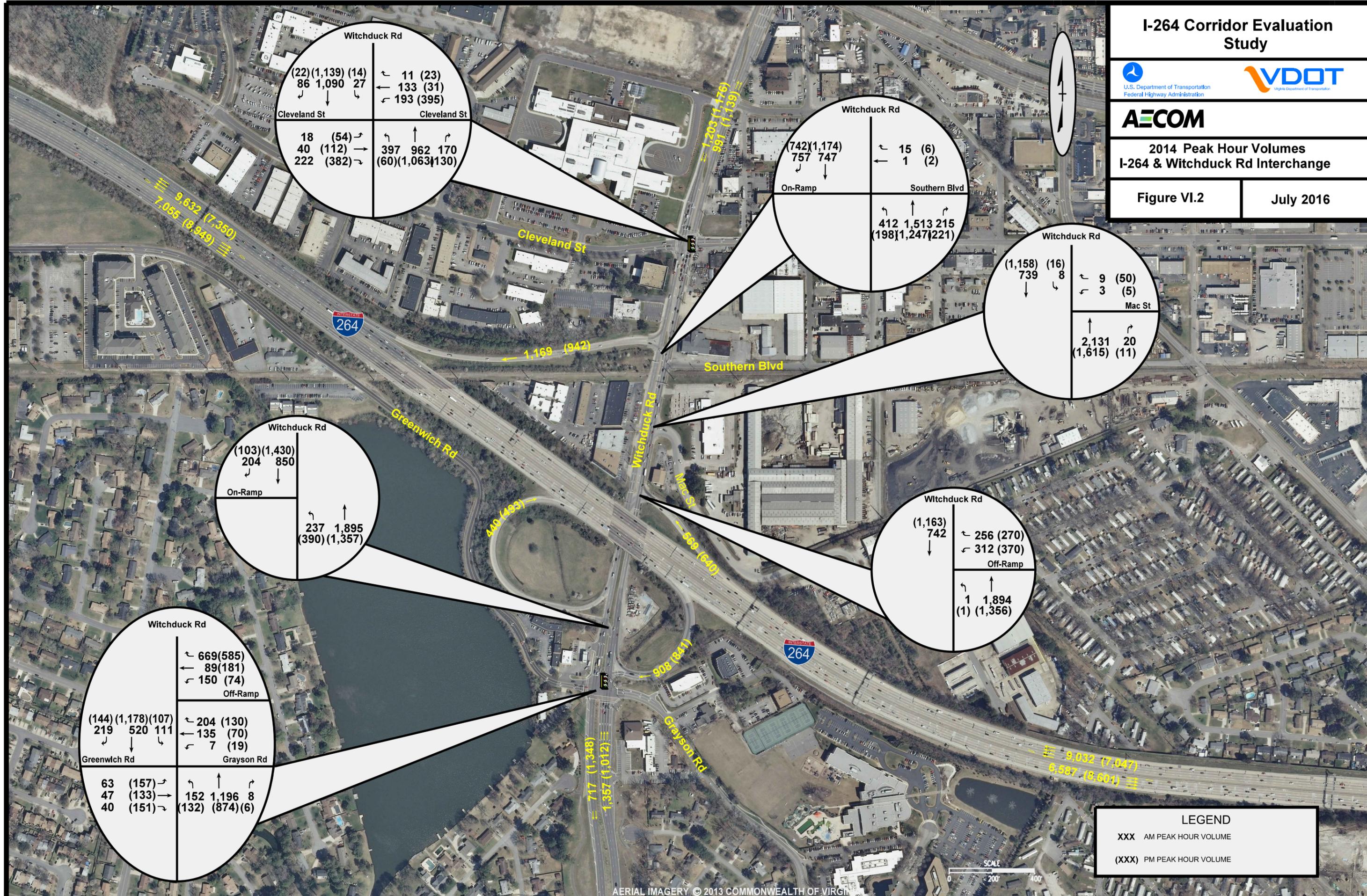


**AECOM**

## 2014 Peak Hour Volumes I-264 & Witchduck Rd Interchange

Figure VI.2

July 2016



LEGEND	
XXX	AM PEAK HOUR VOLUME
(XXX)	PM PEAK HOUR VOLUME

**Table 6.2** displays a summary of the capacity analysis results for the CORSIM analysis of existing conditions. The CORSIM analysis results show most of the movements operating with LOS E or D conditions. More detailed review of CORSIM analysis results (included in the Appendix) shows that combining existing heavy volumes with large numbers of lane changes occurring between Newtown Road and Witchduck Road results in high vehicle densities and poor conditions.

Table 6.2 Summary of 2014 Existing Conditions CORSIM Capacity Analysis I-264 & Witchduck Road Interchange				
Movement (Type)	AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
EB I-264 between Newtown Rd and Witchduck Rd (Freeway)	24.7	C	33.0	D
NB/SB Witchduck Rd & I-264 EB (Weave)	27.0	C	31.0	D
EB I-264 between Witchduck Rd and Independence Blvd (Freeway)	29.5	D	30.2	D
WB I-264 between Witchduck Rd and Independence Blvd (Freeway)	<b>39.4</b>	<b>E</b>	30.2	D
WB I-264 to Witchduck Rd (Diverge)	<b>37.0</b>	<b>E</b>	28.2	D
WB I-264 between Newtown Rd and Witchduck Rd (Freeway)	27.1	D	22.4	C

**HCS Capacity Analysis indicates that all ramps at the Witchduck Road interchange are currently operating with inadequate capacity.**

**Table 6.3** summarizes the existing conditions SimTraffic capacity analysis of the Witchduck Road corridor. The analysis shows adequate service levels of D or better except for the intersection of Cleveland Street and Witchduck Road which exhibits LOS F in the AM peak hour and LOS E in the PM peak hour. Three of the intersections analyzed are unsignalized along the Witchduck Road corridor.

Table 6.3 Summary of 2014 Existing Conditions SimTraffic Capacity Analysis I-264 at Witchduck Road Improvement Alternatives				
Intersection	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Cleveland Street	<b>127.5</b>	<b>F</b>	<b>57.1</b>	<b>E</b>
Southern Boulevard/I-264 WB On-Ramp*	13.8	B	7.3	A
Mac Street*	5.5	A	5.9	A
I-264 WB Off-Ramp	24.9	C	18.7	B
I-264 EB On-Ramp*	7.2	A	9.5	A
Greenwich Road/Grayson Road/I-264 EB Off-Ramp	37.7	D	42.2	D

\* Unsignalized

**Table 6.4** presents a summary of the existing conditions SimTraffic queuing analysis, and the results show that vehicle queues extending from the traffic signals are currently accommodated by the storage available on the respective off-ramps.

Table 6.4 Summary of 2014 Existing Conditions SimTraffic Queue Analysis I-264 at Witchduck Road Improvement Alternatives					
Intersection	Ramp Length (feet)	AM Peak Hour		PM Peak Hour	
		Average (feet)	95th % (feet)	Average (feet)	95th % (feet)
WB I-264 Off-Ramp to NB/SB Witchduck Road	615	185	295	189	286
EB I-264 Off-Ramp to NB/SB Witchduck Road	675	137	214	122	183

VI.1.3 Crashes

Figure VI.3 displays the 4-year crash history at Witchduck Road for the years 2009-2012. It illustrates a large number of crashes throughout the interchange, heavy in both the eastbound and westbound direction. Crashes in both directions of travel appear to be evenly distributed. The off-ramps in both directions of travel show a moderate density of crashes, which are likely related to a combination of moderate congestion and geometric deficiencies. The eastbound I-264 on-ramp shows a high density of rear end and angle crashes at each access area from northbound and southbound Witchduck Road.

Table 6.5 summarizes the crash history by direction and type of freeway facility (Ramp, CD or mainline) at the Witchduck Road interchange for the period 2009-2012. A total of 408 crashes occurred in the interchange vicinity and a majority of the crashes (226) involved rear end crashes that occurred mostly (372) on the mainline of I-264. There were 154 injury crashes and 1 fatal crash. Rear End and Fixed Object Off-Road crashes, the two most frequent types of crashes, made up 73% of the total number of crashes at the

Location	Type of Crash										Severity		
	Rear End	Angle	Head On	Sideswipe - Same Dir.	Fixed Object in Road	Non-Collision	Fixed Object Off Road	Bicyclist	Misc.	Total	Property Damage Only	Injury	Fatal
EB ML	91	22	2	25	0	0	44	0	1	<b>185</b>	110	75	0
WB ML	112	24	1	17	1	4	28	0	0	<b>187</b>	123	63	1
EB Ramp	21	7	0	0	0	1	0	1	0	<b>30</b>	17	13	0
WB Ramp	2	3	0	1	0	0	0	0	0	<b>6</b>	3	3	0
<b>Total</b>	<b>226</b>	<b>56</b>	<b>3</b>	<b>43</b>	<b>1</b>	<b>5</b>	<b>72</b>	<b>1</b>	<b>1</b>	<b>408</b>	<b>253</b>	<b>154</b>	<b>1</b>

VI.2 Forecasted Conditions

The analysis of forecasted conditions includes the development and evaluation of future volumes and operations for the year 2040. The forecasted conditions include the No Build alternative and one improvement alternative. Cost and impacts for the improvement alternative are listed at the end of this section.

VI.2.1 Forecasted Volumes & Operations

Table 6.6 displays the forecasted conditions volumes for the No Build (regular font) and Build (bold font) Alternative at the Witchduck Road interchange for the year 2040. Existing volumes are also listed (in italics) in order to provide for comparison. In general, the volumes show moderate increase entering and exiting the interchange area. The improvements included in the Build Alternative tie in with the future work in place on Witchduck Road both north and south of this interchange.

The roadway geometry for the No Build Alternative for this interchange is different than the geometry found under existing conditions. Improvements are currently funded in the Six-Year Improvement Program for I-264 eastbound improvements from westbound I-64 through Witchduck Road. The I-264 eastbound improvements from Newtown Road through Witchduck Road (UPC 17630) are currently only funded through ROW in the Six-Year Improvement Program, however it is anticipated that construction funding will be allocated to these improvements in the next several years. These improvements have been included in the development of forecasts, and as a result, the additional freeway capacity produces a substantial growth in traffic volumes. The changes in mainline volumes within the interchange reflect increases in traffic volumes from the programmed improvements. The roadway geometry for the No Build and Build Alternative on the arterial network is different for this interchange than that found in the existing conditions. Improvements are currently identified for funding in the Hampton Roads 2034 Long Range Transportation Plan for Phase II of the Witchduck Road widening from I-264 to Virginia Beach Boulevard. These improvements include widening Witchduck Road from a 4-lane divided arterial to a 6-lane divided arterial. Phase I included widening from Bonney Road to Grayson Road 1.

And to reiterate, the preferred alternative improvements along the corridor (including the widening of the mainline freeway west of the Rosemont Road interchange) have been included in the development of forecasts for the 2040 Build Alternative improvements. The improvements to the corridor explain the differences between the volumes forecasted in the No Build and Build alternatives in Table 6.6.

<sup>1</sup> Hampton Roads Transportation Planning Organization. 2034 LRTP: The Regional Transportation Plan Technical Appendices. January 2012. p. 271.



**LEGEND**

**CRASH TYPE**

- Rear End
- Angle
- Head On
- Sideswipe - Same Direction
- Sideswipe - Opposite Direction
- Fixed Object in Road
- Train
- Non-Collision
- Fixed Object - Off Road
- Bicyclist
- Motorcyclist
- Backed Into
- Other

Interstate & Direction	Movement		2014 Existing Volumes		2040 No Build Alternative		2040 Build Alternative	
	From	To	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
I-264 EB	Mainline before Witchduck		7,055	8,949	7,952	10,091	8,571	10,847
	Witchduck Rd	EB I-264	441	493	601	640	678	775
	EB I-264	Witchduck Rd	908	841	1,199	1,141	1,129	1,026
	Mainline after Witchduck		6,587	8,601	7,354	9,590	8,120	10,596
I-264 WB	Mainline before Witchduck		9,032	7,047	10,068	7,852	11,117	8,683
	WB I-264	Witchduck Rd	569	640	754	831	871	962
	Witchduck Rd	WB I-264	1,169	942	1,559	1,265	1,381	1,172
	Mainline after Witchduck		9,632	7,350	10,873	8,286	11,627	8,893

**Table 6.9** displays a summary of the results of the HCS capacity analysis of the No Build Alternative. Since substantial traffic volume growth is forecasted, service levels have deteriorated from what is currently exhibited in the existing conditions in the majority of the westbound movements. In contrast, the eastbound freeway segment between Newtown Road and Witchduck Road improves to LOS C conditions in both peak hours with improvements programmed in the Ramp D-7 (UPC 57048) and I-264/Witchduck Road improvements (UPC 17630) projects. **Table 6.9** also displays a summary of the results of the CORSIM analysis of the No Build Alternative, which show poor service levels for the westbound movements in both peak hours. Again, the ramp D-7 and I-264/Witchduck Road improvements improve the eastbound conditions on I-264 between Newtown Road and Witchduck Road.

The results of the HCS and CORSIM capacity analysis indicate the forecasted year 2040 volumes will be inadequately accommodated on all westbound movements and the eastbound I-264 mainline between Witchduck Road and Independence.

**Table 6.7** summarizes the No Build SimTraffic capacity analysis of the Witchduck Road corridor. The analysis shows poor service levels for the intersections of Cleveland Street and Witchduck Road and Grayson Road/I-264 Ramps and Witchduck Road that exhibit LOS F in both peak hours. The programmed widening of Witchduck Road combined with the ramp D-7/Witchduck Road interchange improvements converted the Witchduck Road corridor into four signalized intersections.

Intersection	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Cleveland Street	85.3	F	96.4	F
Southern Boulevard/I-264 WB On-Ramp	35.8	D	25.8	C
I-264 WB Off-Ramp	34.1	C	28.6	C
Grayson Road/I-264 EB Ramps	140.0	F	81.1	F

**Table 6.8** presents a summary of the No Build SimTraffic queueing analysis, and the results show that vehicle queues extending from the traffic signals spill back to the interstate and impact freeway operations. The westbound off-ramp is beyond capacity and 95<sup>th</sup> percentile queue lengths will overflow the available storage length and queue on the interstate in the AM peak hour. The eastbound off-ramp exhibits average and 95<sup>th</sup> percentile queues spilling onto the interstate in both peak hours. Reported queue lengths were only reported up to a maximum 1,500' in length, modeling demonstrated much longer lengths because the modeled ramps were much longer than the actual ramps. The actual eastbound I-264 off-ramp length with the ramp D-7/Witchduck Road interchange improvements is 1,290'.

Intersection	Ramp Length (feet)	AM Peak Hour		PM Peak Hour	
		Average (feet)	95th % (feet)	Average (feet)	95th % (feet)
WB I-264 Off-Ramp to NB/SB Witchduck Road	615	412	762	245	358
EB I-264 Off-Ramp to NB/SB Witchduck Road	1,290	1,465	+1,500	1,433	+1,500

# I-264 Corridor Evaluation Study

U.S. Department of Transportation  
Federal Highway Administration

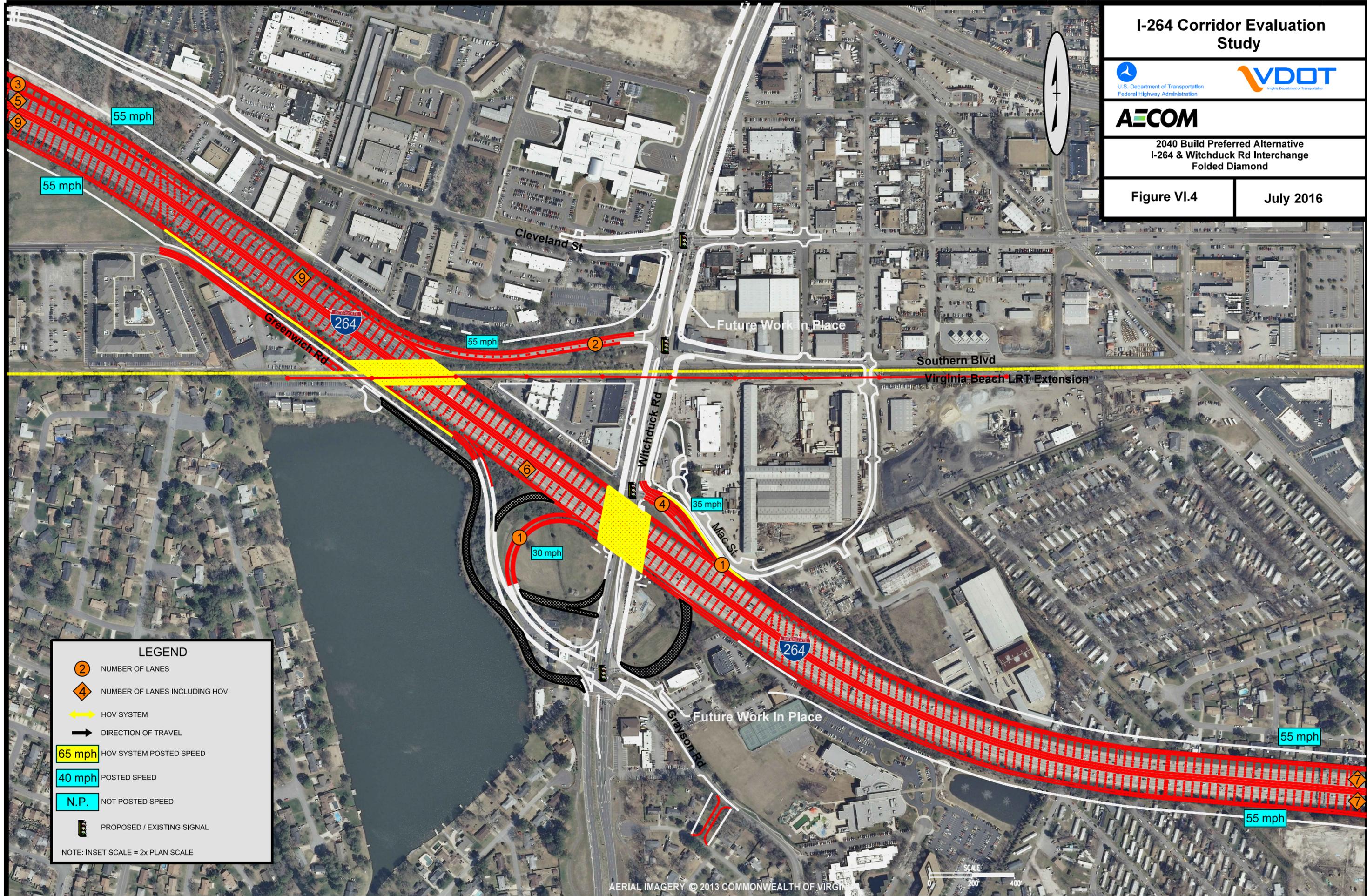
**VDOT**  
Virginia Department of Transportation

**AECOM**

2040 Build Preferred Alternative  
I-264 & Witchduck Rd Interchange  
Folded Diamond

Figure VI.4

July 2016



**LEGEND**

- 2 NUMBER OF LANES
- 4 NUMBER OF LANES INCLUDING HOV
- HOV SYSTEM
- DIRECTION OF TRAVEL
- 65 mph HOV SYSTEM POSTED SPEED
- 40 mph POSTED SPEED
- N.P. NOT POSTED SPEED
- 🚦 PROPOSED / EXISTING SIGNAL

NOTE: INSET SCALE = 2x PLAN SCALE



Table 6.9 Summary of Capacity Analysis Results Year 2040 Alternatives: Witchduck Road & I-264									
Year 2040 Alternative		No Build Alternative				Improvement Alternative			
Time of Day		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
Dir	Movement (Type)	Density	LOS	Density	LOS	Density	LOS	Density	LOS
<b>HCS Analysis Results</b>									
<b>East-bound I-264</b>	EB I-264 between Newtown Rd and Witchduck Rd (Freeway)	20.7	C	25.9	C	19.5	C	23.8	C
	I-264 EB to NB/SB Witchduck Rd (Diverge)	20.7 <sup>+</sup>	C	25.9 <sup>+</sup>	C	19.5 <sup>+</sup>	C	23.8 <sup>+</sup>	C
	NB/SB Witchduck Rd to EB I-264 (Merge)	18.2	B	27.5	C	20.0 <sup>+</sup>	C	27.2 <sup>+</sup>	D
	EB I-264 between Witchduck Rd and Independence Blvd (Freeway)	32.6	D	<b>41.6</b>	<b>E</b>	20.0	C	27.2	D
<b>West-bound I-264</b>	WB I-264 between Witchduck Rd and Independence Blvd (Freeway)	<b>57.9</b>	<b>F</b>	<b>39.6</b>	<b>E</b>	31.9	D	22.7	C
	WB I-264 to Witchduck Rd (Diverge)	<b>41.2</b>	<b>F*</b>	<b>35.8</b>	<b>E</b>	31.9 <sup>+</sup>	D	22.7 <sup>+</sup>	C
	WB I-264 between Newtown Rd and Witchduck Rd (Freeway)	<b>40.2</b>	<b>E</b>	29.3	D	24.2	C	17.0	B
<b>CORSIM Analysis Results</b>									
<b>East-bound I-264</b>	EB I-264 between Newtown Rd and Witchduck Rd (Freeway)	18.9	C	29.9	D	19.8	C	25.3	C
	I-264 EB to NB/SB Witchduck Rd (Diverge)	21.9	C	31.5	D	21.3	C	28.1	D
	NB/SB Witchduck Rd to I-264 EB (Merge)	20.6	C	28.0	C	19.8	B	26.0	C
	NB/SB Witchduck Rd to I-264 EB (Merge)	24.4	C	<b>48.8</b>	<b>F</b>	19.7	C	26.8	D
<b>West-bound I-264</b>	EB I-264 between Witchduck Rd and Independence Blvd (Freeway)	<b>118.8</b>	<b>F</b>	<b>72.2</b>	<b>F</b>	27.8	D	20.7	C
	WB I-264 between Witchduck Rd and Independence Blvd (Freeway)	<b>111.7</b>	<b>F</b>	<b>69.7</b>	<b>F</b>	26.5	C	21.3	C
	WB I-264 to Witchduck Rd (Diverge)	<b>80.6</b>	<b>F</b>	<b>57.1</b>	<b>F</b>	25.3	C	18.8	C

\*VFI, V12 + VFO > MAX

## VI.2.2 Improvement Alternatives

Capacity analysis indicates that ramp and mainline deficiencies are forecasted to occur specifically on the westbound side of I-264. The interchange also exhibits geometric deficiencies. Consequently, any major maintenance activities (such as bridge replacement) should be designed to incorporate consideration of a plan for future improvements. To that end, one improvement alternative has been developed and analyzed, shown in **Figure VI.4**. Geometric compliance has been intentionally provided with the proposed improvement.

The improvement alternative in **Figure VI.4** - consists of widening eastbound I-264 to six lanes and westbound I-264 to seven lanes through the interchange. The improvement alternative work will be tied in with any existing improvements completed in the *Six-Year Improvement Program* at the Witchduck Road interchange. It should also be noted that forecasted deficiencies associated with eastbound I-264 traffic movements are being addressed by the improvements associated with the widening of I-64 to I-264 Ramp D-7 widening, which terminate at the Witchduck Road interchange. Consequently, for this study development of improvement alternatives focused only on westbound traffic movements.

After considering recent and imminent major improvements in the interchange vicinity (including the proposed Greenwich Road flyover and the widening of Witchduck Road from I-264 north to Virginia Beach Boulevard to six lanes), the extension of light rail transit from the Newtown Road station east to Town Center, only one alternative was developed.

The improvement alternative has been analyzed using the same procedures – HCS and CORSIM - used in the analysis of existing conditions and No Build Alternative. The results of the capacity analysis for the forecasted year 2040 alternative (including the No Build Alternative) are shown in **Table 6.9**. In **Table 6.9**, a density listed with a (+) was analyzed as a freeway segment due to HCS limitations for considering add lanes (where an on-ramp creates a continuous additional lane to the freeway) and drop lanes (where a continuous freeway lane drops to an off-ramp). The Witchduck Road interchange Build Alternative improvement has locations where the geometry is atypical and is not capable of being appropriately analyzed using HCS 2010 procedures.

The results show that all of the movements associated with the Witchduck Road interchange exhibit adequate service levels of D or better.

In addition, SimTraffic simulation software capacity and queue analysis was conducted for the improvement alternative at signalized intersections and the results for the year 2040 improvement alternative are shown in **Table 6.10** and **Table 6.11**. The results show that three of the signalized intersections along the Witchduck Road study area exhibit LOS D or better. The intersection at the eastbound I-264 ramps and Grayson Road is forecasted to operate at LOS E. **Table 6.11** presents a summary of the SimTraffic queueing analysis, and the results show that vehicle queues extending from the traffic signals will be easily accommodated by the storage available on the westbound I-264 off-ramp. The eastbound I-264 off-ramp queues in the PM

peak hour exhibit significant lengths; however the 95<sup>th</sup> percentile queue lengths are adequately accommodated by the storage provided on the off-ramp.

Table 6.10 Summary of 2040 Build SimTraffic Capacity Analysis I-264 at Witchduck Road Improvement Alternatives				
Intersection	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
<b>Witchduck Road Alternative Improvement (Figure VI.4)</b>				
Cleveland Street	42.2	D	39.4	D
Southern Boulevard/I-264 WB On-Ramp	21.8	C	23.5	C
I-264 WB Off-Ramp	25.7	C	15.4	B
Grayson Road/I-264 EB Ramps	<b>56.5</b>	<b>E</b>	<b>61.4</b>	<b>E</b>

Table 6.11 Summary of 2040 Build SimTraffic Queue Analysis I-264 at Witchduck Road Improvement Alternatives					
Intersection	Ramp Length (feet)	AM Peak Hour		PM Peak Hour	
		Average (feet)	95th % (feet)	Average (feet)	95th % (feet)
<b>Witchduck Road Alternative Improvement (Figure VI.4)</b>					
WB I-264 Off-Ramp to NB/SB Witchduck Road	615	228	332	188	266
EB I-264 Off-Ramp to NB/SB Witchduck Road	1,290	284	496	398	623

**VI.2.3 Alternative: Cost**

Planning level cost estimates were developed for the improvement alternative for the Witchduck Road Interchange. The vast majority of the costs associated with the preferred Witchduck alternative consist of adding interstate lanes and replacing the bridges over the rail line and Witchduck Road. Detailed calculations have been included in the Technical Appendix. It should be noted that the estimates do not include costs associated with complete removal of existing I-264 through lanes and inflation/escalation. A 4" overlay was assumed over portions of I-264 that are not being completely removed. The cost estimates in year 2015 dollars are:

<u>Alternative</u>	<u>Cost (in \$million)</u>
<b>Witchduck Road Improvement</b>	<b>\$361.4</b>

The Witchduck Road interchange cost estimate does not include the committed Cleveland/Greenwich flyover project.

**VI.2.4 Stakeholder Coordination**

A series of coordination meetings were held with staff from the City of Virginia Beach. Representatives from the City were supportive of the evaluation process and the selection of the preferred alternative.

**VI.2.5 Impacts**

Identification of potential impacts on key resources from construction of the improvement alternative was evaluated using desktop GIS mapping analysis. Detailed exhibits are in the Technical Appendix. Summarized in **Table 6.12**, the results show that the alternative would not impact water resources (wetlands, for example) and would not potentially impact Section 4(f) properties (public parks, for example). However, this improvement alternative would impact two adjacent buildings.

**VI.3 Recommendation**

Only one improvement alternative was developed for the Witchduck Road interchange. Recent and imminent improvements around the Witchduck Road interchange severely limit possible improvement alternatives. The geometry of eastbound I-264 will be established with the programmed improvements included in the widening of the westbound I-64 to eastbound I-264 Ramp D-7 project improvements, which include widening eastbound I-264 from Newtown Road through Witchduck Road as well as reconfiguring the Witchduck interchange on eastbound I-264. The existing weave on eastbound I-264 is removed and it is replaced by a single off-ramp and a single on-ramp. The westbound configuration of the Witchduck Road interchange was generally fixed by the programmed widening of Witchduck Road from I-264 to Virginia Beach Boulevard, this design assumed the westbound configuration of ramps would remain as they currently exist.

The preferred alternative provides for additional lanes on eastbound I-264 east of Witchduck Road and it provides for additional lanes on westbound I-264 both east and west of Witchduck Road. The westbound on-ramp is improved from a single lane on-ramp to a two-lane on-ramp.

The preferred alternative provides adequate service levels for all interstate movements in the design year 2040. Additionally, none of the off-ramps are forecast to have queues that will impact mainline interstate freeway operations.

<b>Table 6.12</b>				
<b>Witchduck Road Interchange Improvement Alternative Impacts</b>				
<b>Improvement Alternative</b>	<b>WATER</b>	<b>BUILDINGS</b>	<b>RESIDENTIAL</b>	<b>POTENTIAL SECTION 4F</b>
Witchduck Road Improvement Alternative	N	2	0	N