VDOT

SKIFFES CREEK
CONNECTOR STUDY
ALTERNATIVES ANALYSIS
TECHNICAL REPORT

JUNE 2018

SKIFFES CREEK CONNECTOR STUDY

Alternatives Analysis Technical Report

James City County
Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

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List of Acronyms

AASHTO	American Association of State Highway Transportation Officials
CIM	Citizen Information Meeting
CSXT	CSX Transportation
EA	Environmental Assessment
FWHA	Federal Highway Administration
FY	Fiscal Year
HRTPO	Hampton Roads Transportation Planning Organization
I-64	Interstate 64
LOD	Limits of Disturbance
LRTP	Long Range Transportation Plan
NEPA	National Environmental Policy Act
O/D	Origin/Destination
SCC	Skiffes Creek Connector
SYIP	Six-Year Improvement Program
TDM	Transportation Demand Management
TSM	Transportation System Management
US 60	US Route 60 (Pocahontas Trail)
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VA 143	State Route 143 (Merrimac Trail)
VDOT	Virginia Department of Transportation

1. INTRODUCTION

The Virginia Department of Transportation (VDOT), in coordination with the Federal Highway Administration (FHWA) as the lead federal agency, has initiated an Environmental Assessment (EA) for the Skiffes Creek Connector (SCC) Study in James City County, Virginia. This study evaluates potential transportation improvements between Pocahontas Trail (US Route 60 (US 60)) and Merrimac Trail (State Route 143 (VA 143)). The purpose of the SCC is to create efficient local connectivity between US 60 and VA 143, in the area between VA 199 and VA 238, in a manner that improves safety, emergency evacuation, and the movement of goods along the two primary roadways.

To support the analysis in the EA, this Alternative Analysis Technical Report has been prepared to document the following:

- **Section 1** provides an overview of the study and the Purpose and Need of the project;
- **Section 2** describes the No Build Alternative and Build Alternative Options and the factors that were considered in the evaluation and selection of the Alternative Options not retained for evaluation and the alternatives retained for evaluation; and,
- **Section 3** provides the references used within this Technical Report.

The EA has been prepared in accordance with the National Environmental Policy Act of 1969, as amended, (NEPA) and in accordance with FHWA regulations[1]. The environmental review process as part of the EA was carried out following the *National Environmental Policy Act and Clean Water Act (Section 404) Merged Process for Highway Projects in Virginia* (merged process)[2] between VDOT, the FHWA, the U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (USEPA), and the U.S. Fish and Wildlife Service (USFWS).

1.1 DESCRIPTION OF SKIFFES CREEK STUDY AREA

The SCC study area is bordered to the north by the southern edge of the Interstate 64 (I-64) right-of-way and to the south by the southern edge of the US 60 right-of-way. The eastern border is Skiffes Creek Reservoir and the western border is just west of the intersection of the inactive rail spur that lines up with BASF Drive, as shown on **Figure 1-1** and **Figure 1-2**. The SCC study area is comprised mainly of undeveloped, residential, institutional/public land, and industrial land. The southwest portion of the study area contains two residential areas bisected north to south by the inactive rail spur that lines up with BASF Drive, west of Green Mount Parkway. A second rail line, the CSX Transportation (CSXT) railroad, runs west to east, separating the northern third of the study area from the southern portion. This area contains three institutional properties – the Virginia Peninsula Regional Jail, Merrimac Juvenile Detention Center, and a VDOT maintenance center, as well as an industrial use, the asphalt processing plant.

[1]NEPA and FHWA's regulations for Environmental Impact and Related Procedures can be found at 42 USC §4332(c), as amended, and 23 CFR §771, respectively.

[2]The process is intended to facilitate an environmental review process and development of documentation that comply with the requirements of NEPA and provide sufficient information to support FHWA approval or Federal regulatory decision-making, including permits issued by other Federal agencies.

Figure 1-1
Skiffes Creek Connector Initial Study Area

Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

0 0.25 0.5 1 Mile

N W E S

Source: Esri OpenStreetMap

Study Area

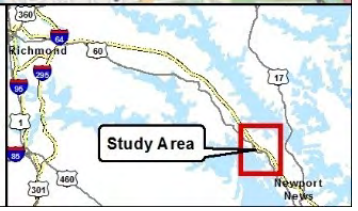


Figure 1-2
Skiffes Creek Connector Study Area

1.2 PURPOSE AND NEED

The purpose of the SCC is to create efficient local connectivity between US 60 and VA 143, in the area between VA 199 and VA 238, in a manner that improves safety, emergency evacuation, and the movement of goods along the two primary roadways. The SCC would address the following needs:

- ***Improved local connectivity*** – there is inadequate and or inefficient connectivity points between these two primary routes;
- ***Provide efficient connectivity for local truck movement*** – there are known truck destinations along the corridors; and
- ***Emergency evacuation capability*** – connectivity between identified evacuation routes should be enhanced to support connectivity and efficiency.

1.3 EXISTING CONDITIONS

Between the Exit 243 Busch Gardens interchange at I-64 and the Exit 250 Fort Eustis Boulevard (VA 105) interchange at I-64, US 60 is a two-lane roadway. West of the Exit 243 Busch Gardens interchange, traveling towards the VA 199 interchange, US 60 widens to four lanes. VA 143 is a four-lane roadway between the VA 199 interchange and the VA 105 interchange. US 60 and VA 143 are the two main east-west primary routes along the entirety of the Hampton Roads Peninsula and serve local and regional traffic. US 60 and VA 143 are separated by the CSX Transportation (CSXT) rail line along the peninsula creating a barrier between the two roadways. Since there is not a direct connection between US 60 and VA 143 within the project area, in order to reach the industrial facilities/parks in this area, existing traffic utilizes the VA 199 (Exit 242), Busch Gardens (Exit 243), Yorktown (Exit 247), and Fort Eustis Boulevard (Exit 250) exits from I-64 and travels through the residential communities along US 60.

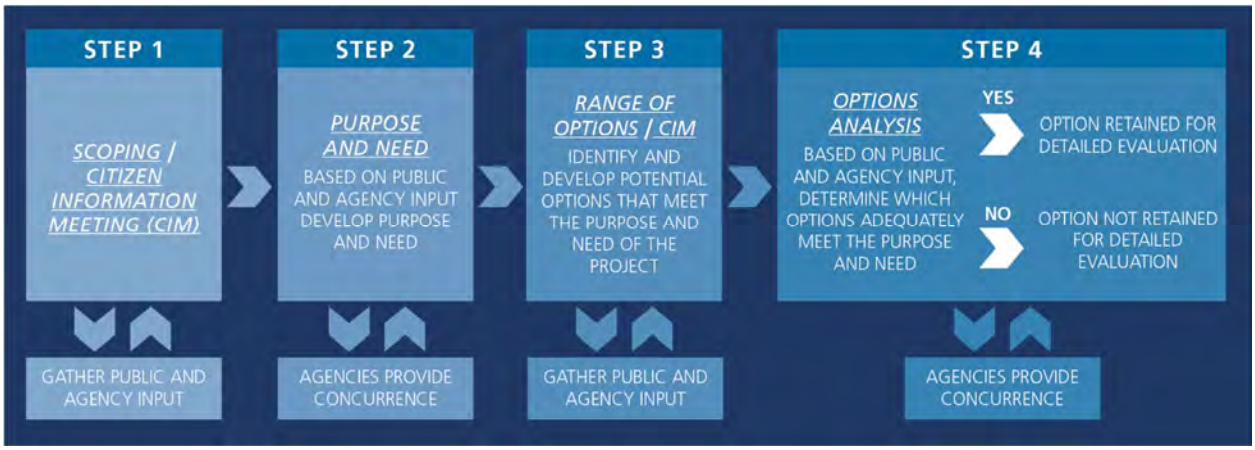
2. ALTERNATIVE OPTIONS CONSIDERED

2.1 ALTERNATIVE OPTIONS DEVELOPMENT AND EVALUATION PROCESS

In order to improve local connectivity, provide efficient connectivity for local truck movement, and enhance emergency evacuation capability, VDOT, in coordination with FHWA, considered a range of options to determine which would effectively meet the established purpose and need of the project. While the development and evaluation of these options does not represent a formal, detailed engineering analysis of all potential engineering solutions, the preliminary analysis contained herein was developed for the options identified and to evaluate their anticipated impacts. Should one of these options be advanced to the detailed design phase, further traffic and engineering analysis would be required.

Through the merged process, VDOT has worked extensively with the Concurring, Cooperating, and Participating Agencies for the SCC Study (resource agencies), as well as the public to develop the purpose and need of the project and evaluate potential options to meet the needs. VDOT held several meetings with the resource agencies as well as the public to evaluate how well each option met the purpose and need of the project. The presentation material from the March 14, 2018 meeting with the resource agencies documenting this discussion is included in **Appendix A**. As required by the merged process, concurrence was received by the Concurring Agencies upon the alternatives to be retained for detailed study. **Figure 2-1** shows the VDOT alternative options development and evaluation process.

Figure 2-1: Alternative Options Development and Evaluation Process



The alignments proposed in the different options were developed using current design guidelines including American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets, 2011* (Green Book) and the VDOT Road Design Manual (AASHTO, 2011 and VDOT, 2017). Detailed tables showing the design criteria that were used for this study are included in **Appendix B**. Overall, the design criteria are based on the functional classification of the new roadway as an Urban Minor Arterial Street (GS-6).

2.1.1 2012 Alternatives

Upon initiation of the SCC Study in 2012, VDOT sent scoping letters to project stakeholders to obtain pertinent information and to identify key issues regarding the potential environmental impacts for this study. Six alternatives were initially identified, the No Build Alternative, Option 1 (formerly identified as Alternative A), Option 3 (formerly identified as Alternative B), Option 4 (formerly identified as Alternative C), a Transportation System Management (TSM) Alternative, and a Mass Transit Alternative. During resource agency coordination, a seventh option was developed to provide a perpendicular crossing of Skiffes Creek that would minimize impacts, identified as Option 2 (formerly Alternative A1). Options 1, 2, 3, and 4 utilized a design speed of 50 miles per hour (mph), were classified as Urban Minor Arterial Streets (GS-6), and were designed as four-lane divided freeway facilities, with wide medians and bicycle/pedestrian facilities, with 225-foot wide planning level Limits of Disturbance (LODs)[3]. These alternative options are discussed in detail in **Section 2.2: Alternative Options Not Retained for Detailed Evaluation** and **Section 2.3: Alternative Options Retained for Detailed Evaluation**. Options 1 through 4 are shown on **Figure 2-2**.

[3] The LOD is the boundary that includes all of the construction, materials storage, grading, landscaping and any other construction activities needed for this project excluding stormwater management. The width of the LOD is centered on the proposed centerline line of the corridor.

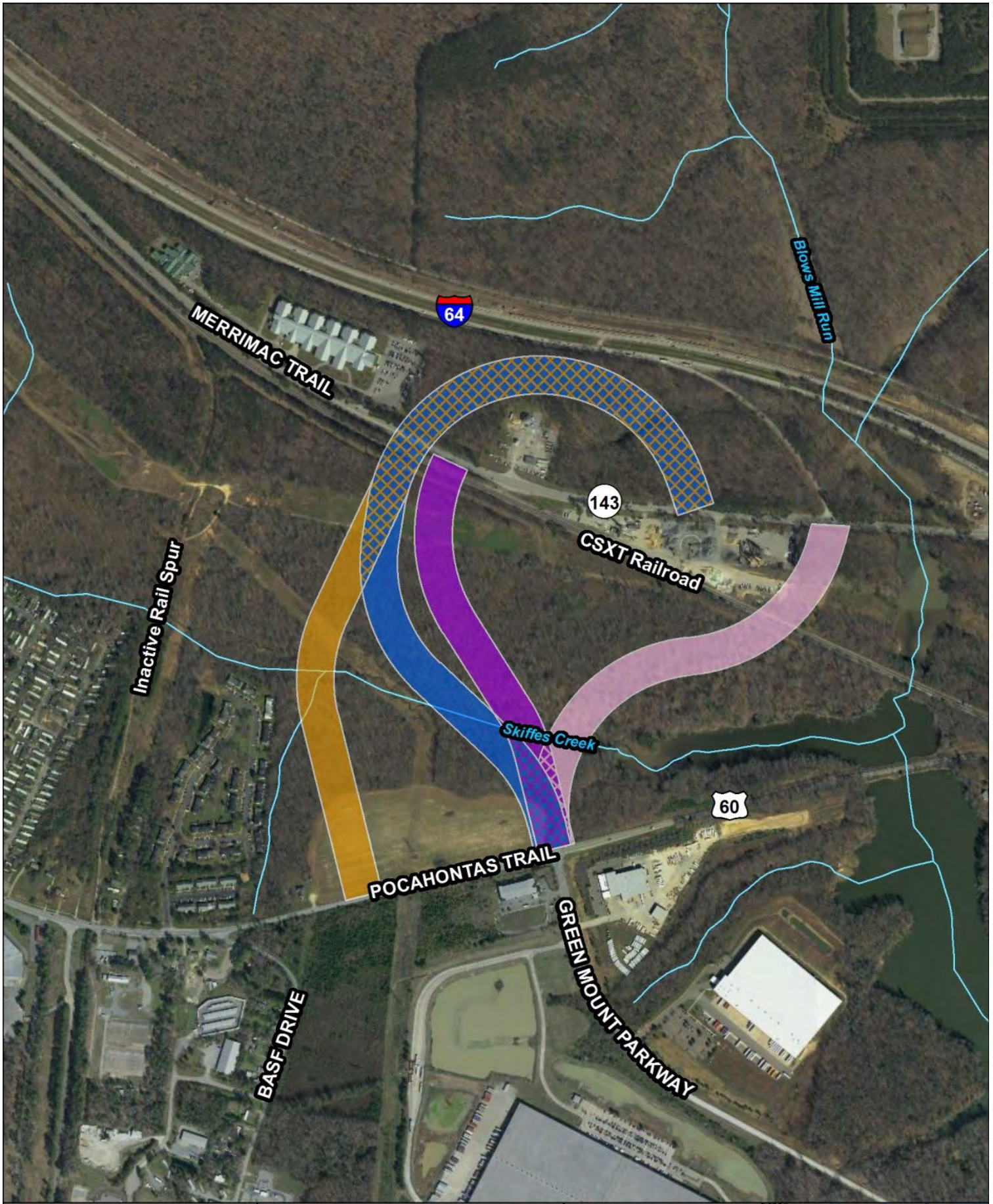


Figure 2-2
Options 1 through 4
(225 Feet LOD)

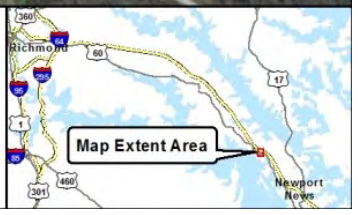
VDOT Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501;
UPC: 100200

0 200 400 800 Feet

N W E S

Source: VGIN VBMP Imagery, Esri World Transportation, NHD

Option 1
Option 2
Option 3
Option 4



2.1.2 Refinement of 2012 Alternatives

In the original study, VDOT considered two projects that would eventually connect – the widening and relocation of US Route 60 and the SCC. The US Route 60 project was conceived as a four-lane road with a wide median, as well as bicycle/pedestrian facilities. Similarly, the SCC was conceived to be a four-lane road with bicycle/pedestrian facilities. Both projects were put on hold in 2013 due to resource agency concerns about independent utility. In 2017, VDOT reinitiated the SCC Study and abandoned the US Route 60 project, removing it from the VDOT Six-Year Plan. As a stand-alone project, the SCC did not require as large of a cross-section and was reduced to a simple two-lane undivided freeway facility with no wide median or designated bicycle/pedestrian facilities, reducing the planning level LODs from 225 feet to 140 feet (see **Figure 2-3**).

Once the alignment was reduced to two lanes, it was further determined that the 50 mph design was also no longer necessary. Given the short length of the roadway and the elevation required to cross over the railroad tracks, trucks would not be able to accelerate in time to reach the 50 mph design speed; therefore, a design speed of 35 mph would be sufficient (AASHTO, 2011). The refined Options 1 and 2 are shown in **Figure 2-4**. As part of the merged process, these revisions were discussed with FHWA, the resource agencies, and the public. The revisions received positive response from the resource agencies and the public due to the reduction in resource impacts and project costs.

2.1.3 2017 Options

During meetings with the resource agencies and the public, additional alternative options, Options 5, 6, 7, 8, and 9 were identified (see **Figure 2-5**). These additional options either included a new alignment or improvements to existing roadways. Additionally, the TSM Alternative was revised to be a TSM/Transportation Demand Management (TDM) Alternative, and a stand-alone Bicycle/Pedestrian Alternative also was included. These alternatives are discussed in detail in **Section 2.2: Alternative Options Not Retained for Detailed Evaluation.**

2.1.4 Evaluation of Options

Options 1 through 9, the TSM/TDM Alternative (referenced as Option 10), the Mass Transit Alternative (referenced as Option 11), and the Bicycle/Pedestrian Alternative (referenced as Option 12) were evaluated based upon how they met the purpose and need and whether there were engineering issues with any of the options. The results of the evaluation were presented at the February 15, 2018 Citizen Information Meeting (CIM), and discussed at the January 10, 2018, February 14, 2018, and March 14, 2018 agency meetings. VDOT recommended at these meetings that Options 1 and 2 be retained for detailed evaluation, and Options 3 through 12 not be retained. Following the March 2018 agency meeting, the Concurring Agencies, informed by public comment, concurred with VDOT's recommendations (refer to **Appendix A**). Descriptions of options not retained for detailed evaluation and reasons for their elimination are included in **Section 2.2**. Descriptions of Options 1 and 2 (now referred to as Build Alternatives 1 and 2) and why they were retained for detailed evaluation are included in **Section 2.3**.

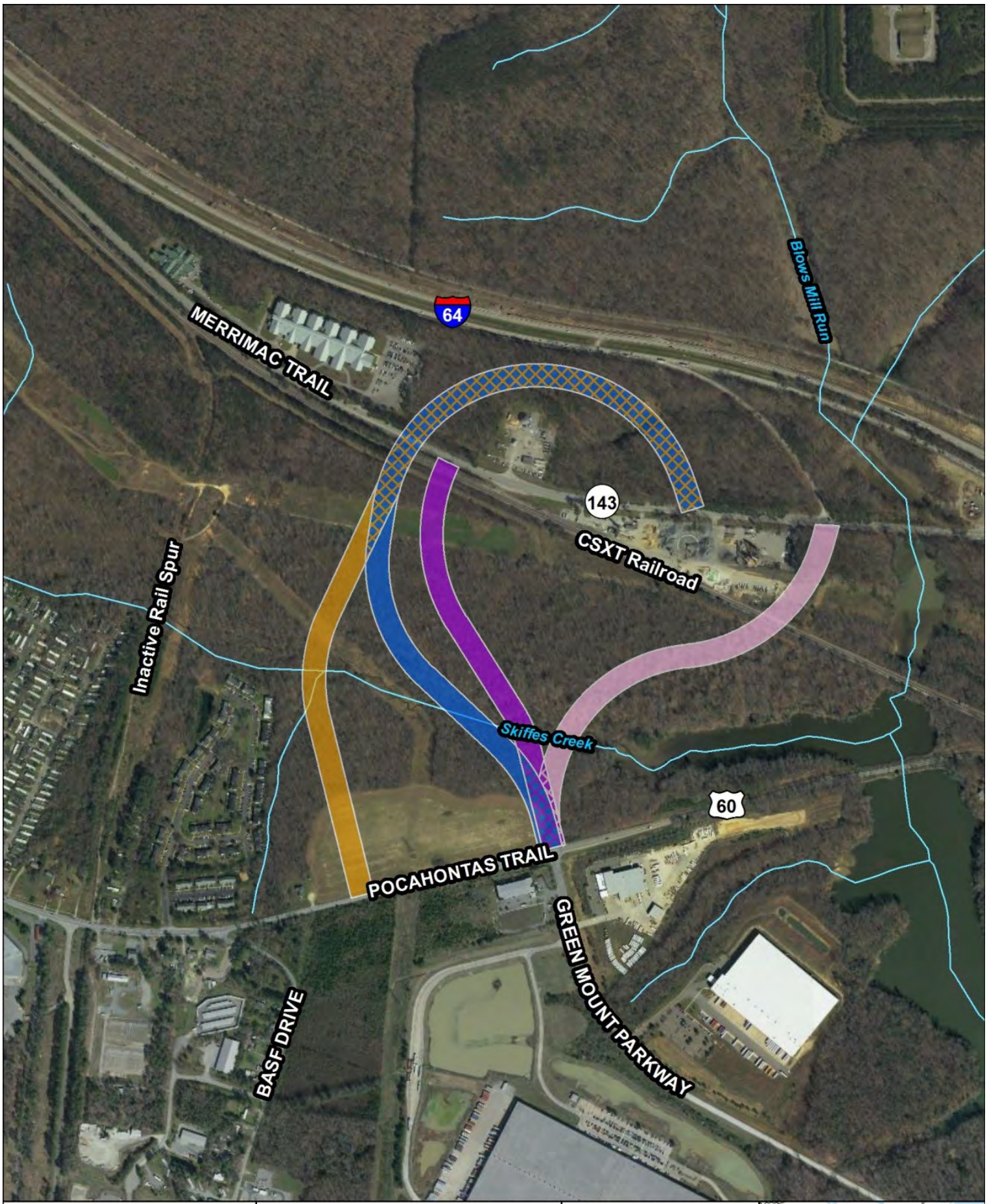


Figure 2-3
Refined Options 1 through 4 (140 Feet LOD)

VDOT Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

0 200 400 800 Feet

N
W E
S

Source: VGIN VBMP Imagery, NHD

Option 1
Option 2
Option 3
Option 4

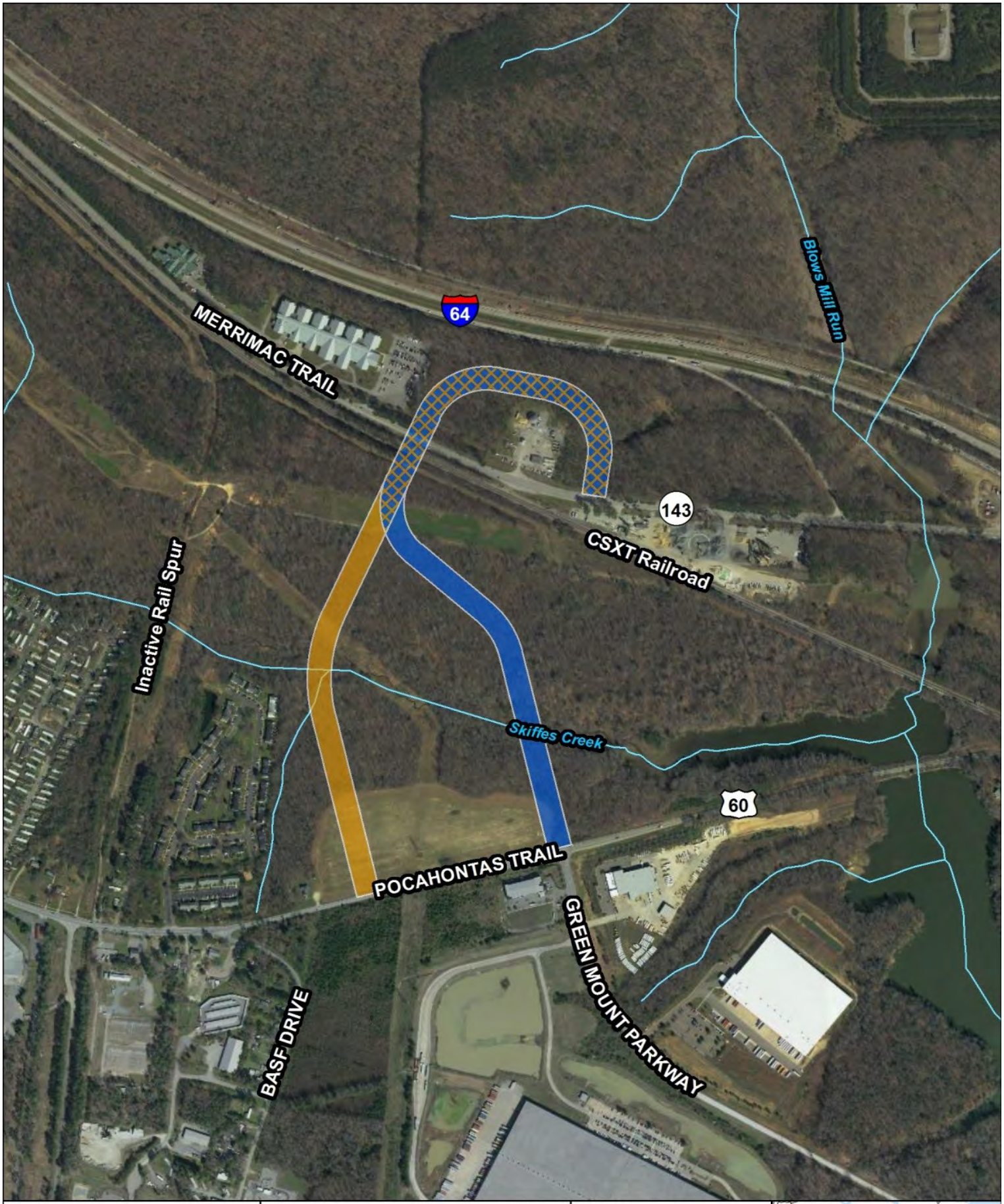


Figure 2-4
Refined Options 1 and 2

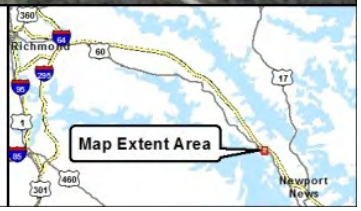
VDOT Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

0 200 400 800 Feet

N W E S

Source: VGIN VBMP Imagery, NHD

Option 1
Option 2



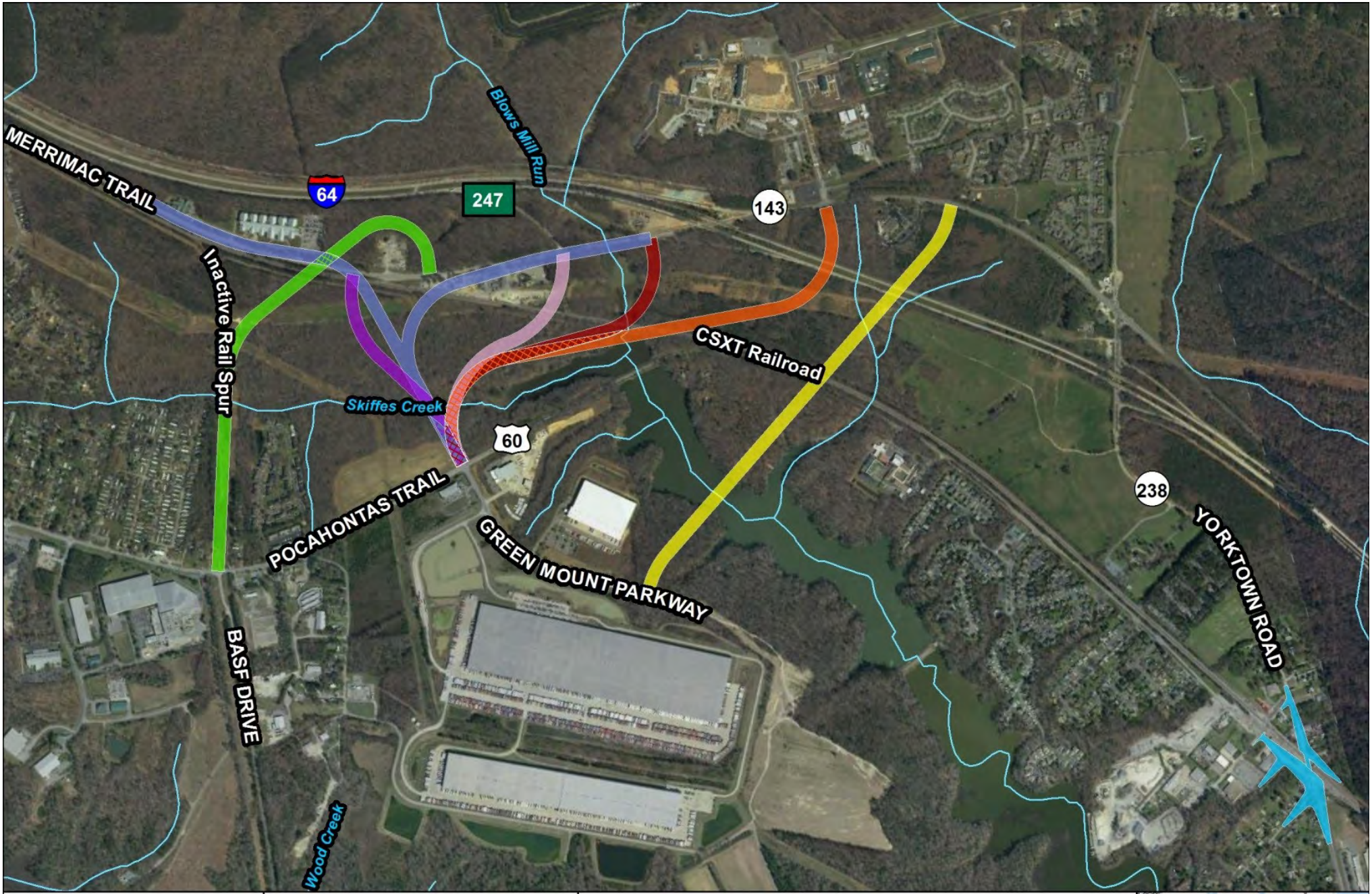


Figure 2-5
Options 3 through 9

VDOT Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

0 375 750 1,500 Feet

N E S W

Source: VGIN VBMP Imagery, NHD

2.2 ALTERNATIVE OPTIONS NOT RETAINED FOR DETAILED EVALUATION

As discussed above, ten options (Options 3 through 12) were developed but not retained for detailed evaluation. Below is a discussion of each option and the reason(s) each was eliminated from further evaluation. **Appendix A** contains a matrix noting how each option addresses the need elements of the purpose statement that was used as the basis for discussion with the resource agencies at the February 14, 2018 and March 14, 2018 agency meetings.

2.2.1 Option 3

Option 3 would tie into US 60 at the existing US 60/Green Mount Parkway intersection, continue in a northwest direction to the proposed bridge over Skiffes Creek, cross the CSXT railroad at-grade, then connect directly with VA 143 approximately 2,300 feet from the I-64 Exit 247 eastbound off ramp. Option 3 would be located approximately halfway between the existing connections from US 60 to VA 143 at VA 199 and VA 238, providing an efficient connection for local traffic, trucks, and emergency evacuation within the study area. Utilizing the existing Green Mount Parkway intersection would provide a safe and efficient connection for all traffic and would allow trucks direct access to the SCC from their origin and destination (O/D) locations. Relying on an at-grade crossing of an active rail line; however, would not provide a safe or reliable option. Due to the short distance between VA 143 and the grade crossing, approximately 500 feet, traffic using the SCC would likely backup onto VA 143 when the grade crossing is closed during train movements, reducing the efficiency of the traveling public on this road. Additionally, there are known safety concerns with at-grade crossings, with the state code (*Code of Virginia § 56-363*) discouraging at-grade crossings. Furthermore, previous coordination with CSXT when the project was initiated in 2012 suggested that adding an at-grade crossing could require removing three existing at-grade crossings, which cannot be accomplished through the scope of a single project. Successful federal approvals for such changes are unknown/unlikely. Furthermore, the distance between the new intersection at VA 143 would not meet VDOT's identified minimum desired spacing of 750 feet between an intersection and an interchange ramp (VDOT, 2017a). This would require a design exception which may or may not be approved. With the safety concerns of the at-grade railroad crossing and the potential for interruptions in local connectivity and truck access due to the train stoppages, this option would not adequately meet the purpose and need. This option is illustrated in **Figure 2-6**.

2.2.2 Option 4

Option 4 would tie into the existing US 60/Green Mount Parkway intersection; turn northeast to bridge over Skiffes Creek and the CSXT railroad; then connect directly with VA 143 at the I-64 Exit 247 eastbound off ramp. Option 4 would have steep vertical grades to provide appropriate clearance over the CSXT railroad and then descend to the VA 143 intersection. Option 4 would be located approximately halfway between the existing connections from US 60 to VA 143 at VA 199 and VA 238. The location, however, would not provide the same efficiency as the other options as the required grade would be steep (approximately 8% to 9.5%) due to the close proximity of the existing railroad and existing VA 143, and would likely be avoided by trucks and some personal vehicles. The design criteria for this classification of roadway has a maximum vertical grade of 7% (see **Appendix B**); Option 4's required grade would not meet the current VDOT design standards and guidelines.

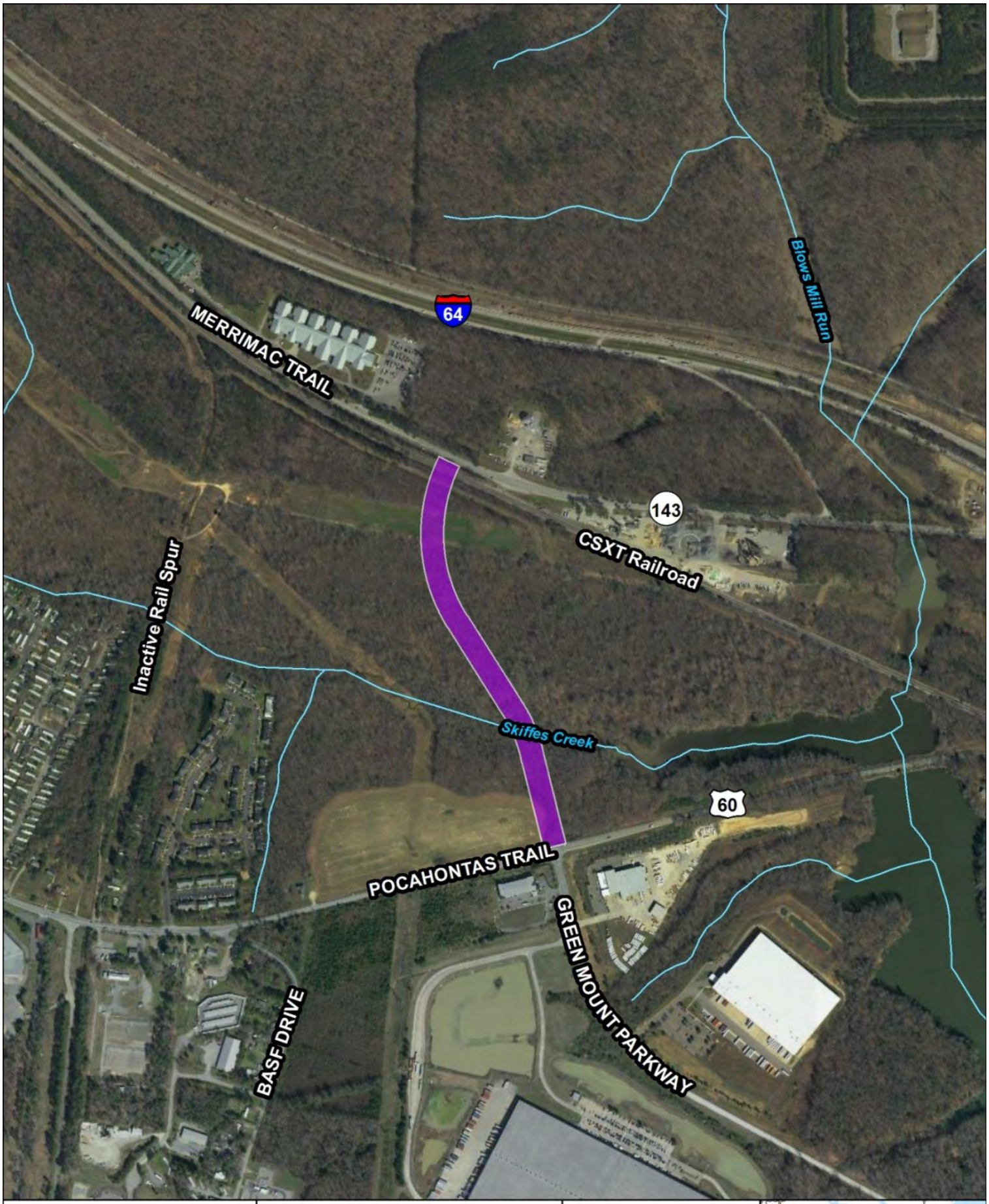


Figure 2-6
Option 3

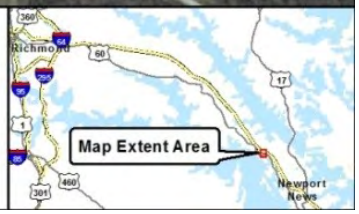
VDOT Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

0 200 400 800 Feet

N W E S

Source: VGIN VBMP Imagery, NHD

Option 3



Per the AASHTO Green Book, a truck needs approximately 1,500 feet to accelerate from zero to 30 mph on a 3% vertical grade. If a truck attempted to travel on the proposed grades (8% to 9.5%), it would slow any traffic down behind it, further reducing the efficiency of the connection, and would be undesirable for trucks and local traffic.

If Option 4 was constructed, the facility could serve as a connection in an evacuation. The previous iteration of Option 4 would have required design exceptions to account for slope and sight distances, as well as a substandard sag curve (sag curves are the curves that connect descending vertical grades and when it is substandard, it reduces the sight distance for traveling vehicles). The design exception process would allow for design exceptions; however, the design must still meet a safety standard which is not likely to be provided or mitigated with this option due to the sight distance and steep grade. Additionally, due to the steep grade, trucks would not be able to get up to speed or maintain a speed. The delay that this reduction in speed causes would be compounded during periods of heavy truck traffic, causing delays on the SCC, as well as the approach lanes to the SCC. While this option would improve local connectivity, the improvement would be limited to periods where there are fewer large trucks on the road. Given the higher percentage of trucks accessing the study area (see **Section 1.3: Skiffes Creek Connector Background**) and the hours of operations of the O/D locations of the trucks, there are only small windows of time when trucks are not accessing the roadways. Therefore, since this option would not consistently improve local connectivity or provide efficient connectivity for local truck movement, it would not adequately meet the purpose and need. See **Figure 2-7** for an illustration of this option.

2.2.3 Option 5

Option 5 would begin at the southern end of Green Mount Parkway, proceed in a northeasterly direction, bridge over the Skiffes Creek Reservoir, US 60, the CSXT railroad, and I-64, and then connect to VA 143, approximately 1,400 feet from Yorktown Naval Weapons Station Gate 3 at Longfellow Road. Utilizing the existing Green Mount Parkway intersection would provide a safe and efficient connection to US 60. However, by utilizing a portion of the existing Green Mount Parkway to make the connection, it would force local and regional travelers to use what is, in practice, an industrial access road. Green Mount Parkway does not have a posted speed limit; therefore, due to the location within a county and not within city limits, the statutory speed limit is 55 mph for vehicular traffic and 45 mph for trucks (Code of Virginia§ 46.2-870). Due to the length and nature of the industrial road, it is unlikely that traffic would be able to obtain 55 mph or 45 mph. This traffic would mix with trucks entering/exiting O/D locations along the road. When accessing Green Mount Parkway, trucks would start from a stopped condition and would need approximately 1,500 feet to obtain 30 mph (AASHTO, 2011). The introduction of local trucks would reduce the efficiency of local traffic that interacts with the trucks entering and exiting the existing facilities. This interaction would not support the efficient movement of traffic and, in some instances, could create safety concerns. In addition to the potential inefficiencies, the connection made at VA 143 is east of the study area. Since this option would direct local traffic to travel in an easterly direction, it is likely that traffic and local trucks heading west would not utilize this option.

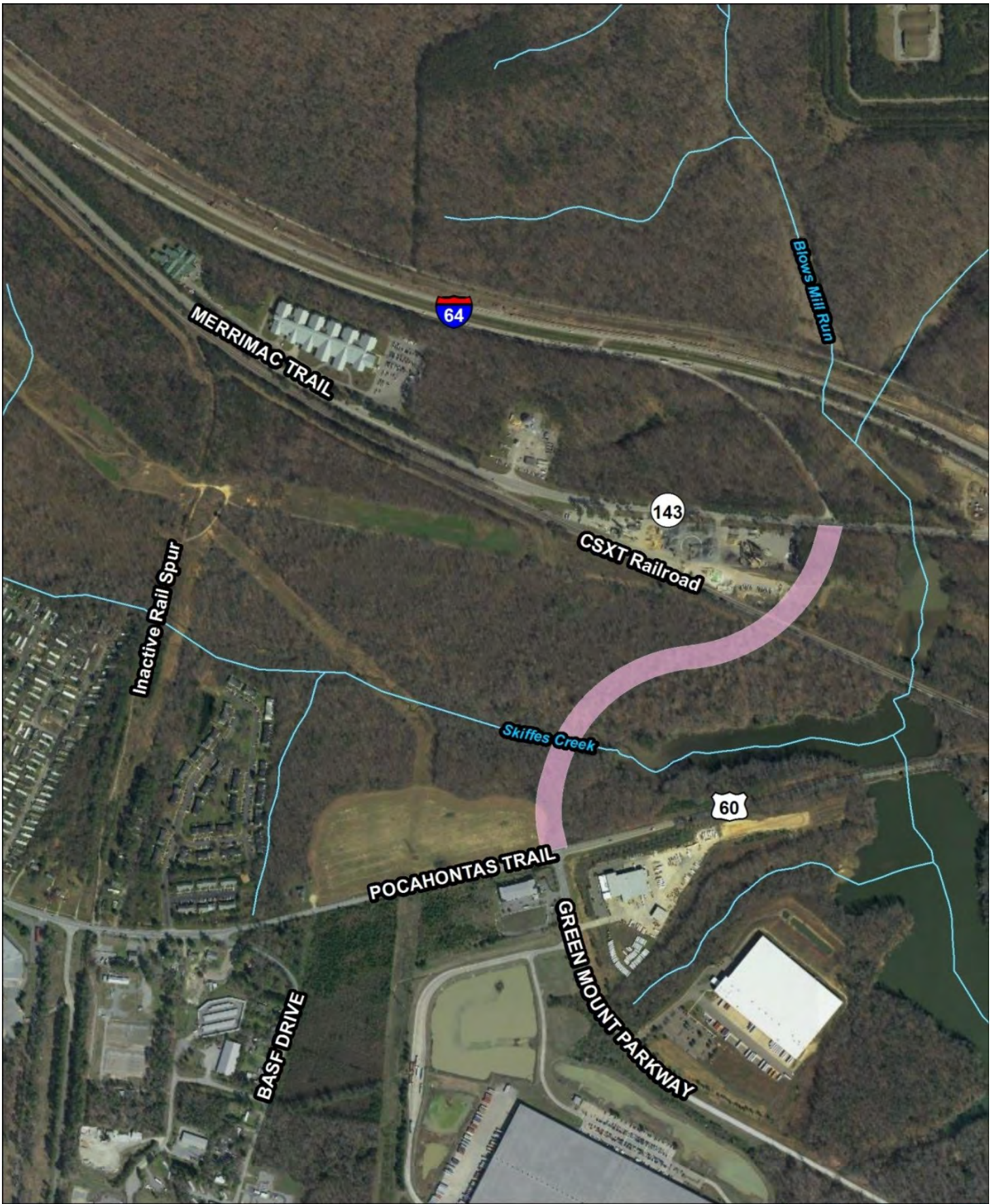


Figure 2-7
Option 4

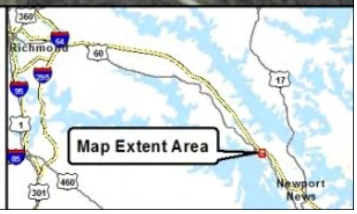
VDOT Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

0 200 400 800 Feet

N
W E
S

Source: VGIN VBMP Imagery, NHD

Option 4



Additionally, the intersection on VA 143 considered for this option is located on the inside of an existing horizontal curve which produces sight distance issues at the intersection for local and truck traffic entering VA 143. In order to mitigate this sight distance, additional right-of-way would be required at the intersection for clearing of any obstructions, such as trees or shrubs, to optimize the sight lines of the driver. Alignments that would impact the U.S. Navy property were not considered. While Option 5 is feasible, it would not improve local connectivity or provide efficient connectivity for local trucks, therefore, it would not adequately meet the purpose and need of the project. **Figure 2-8** illustrates this option.

2.2.4 Option 6

Option 6 is the "improve existing" option. Option 6 would focus on the US 60 / VA 238 intersection, as no improvements are warranted at the VA 199 or I-64 ramps which connect VA 143 to US 60, to the west of the study area. The existing US 60 / VA 238 intersection is a signalized skewed T-intersection with an at-grade crossing with the existing CSXT railroad located to the north. To improve this intersection, Option 6 would create a grade separated intersection, elevating US 60 and VA 238 and bridging VA 238 over the CSXT railroad. Due to the close proximity of the existing CSXT railroad, and in order to make it a grade separated crossing, both VA 238 and US 60 would be required to be raised approximately 30 feet, impacting several businesses and properties located at the existing intersection. Even with the increased elevation, the intersection would remain skewed due to the close proximity of the railroad and the historical properties, which would lessen the efficiency of turning vehicles, especially trucks, and would not improve the existing geometrics of the intersection.

Existing VA 238 is approximately 20 feet wide with minimal shoulders and may require improvements if additional trucks and local traffic are directed to utilize this route. This option would improve existing connectivity but not in the "efficient" manner specified in the Purpose Statement. Located approximately two miles east of the study area, Option 6 would not provide an efficient connection for vehicles traveling west or seeking to travel within the study area. Since this option would direct local traffic to travel to the east, it is likely that traffic and local trucks heading west would not utilize this option. Therefore, Option 6 would not provide efficient connectivity for local trucks within the study area and connectivity between evacuation routes would not be improved.

Additionally, the preliminary layout, as shown in **Figure 2-9** in greater detail, illustrates a number of impacts to properties listed on or eligible for listing on the National Register of Historic Places. These impacts would require the preparation of an alternatives analysis under Section 106 of the National Historic Preservation Act to consider options that cause fewer impacts to historical properties (such as Options 1 and 2). In addition to the historical properties, these improvements would impact a public school property and several residences. With the Section 106 impacts, it was determined that other options were more feasible and Option 6 was not considered for advancement.

2.2.5 Option 7

Option 7 responds to comments asking how Option 1 would function if it was split in a "Y" to provide east- and west-bound based connections to VA 143, eliminating the intersection along VA 143. Option 7 would be located approximately halfway between the existing connections from US 60 to VA 143 at VA 199 and VA 238, providing an efficient connection for local traffic, trucks, and emergency evacuation.

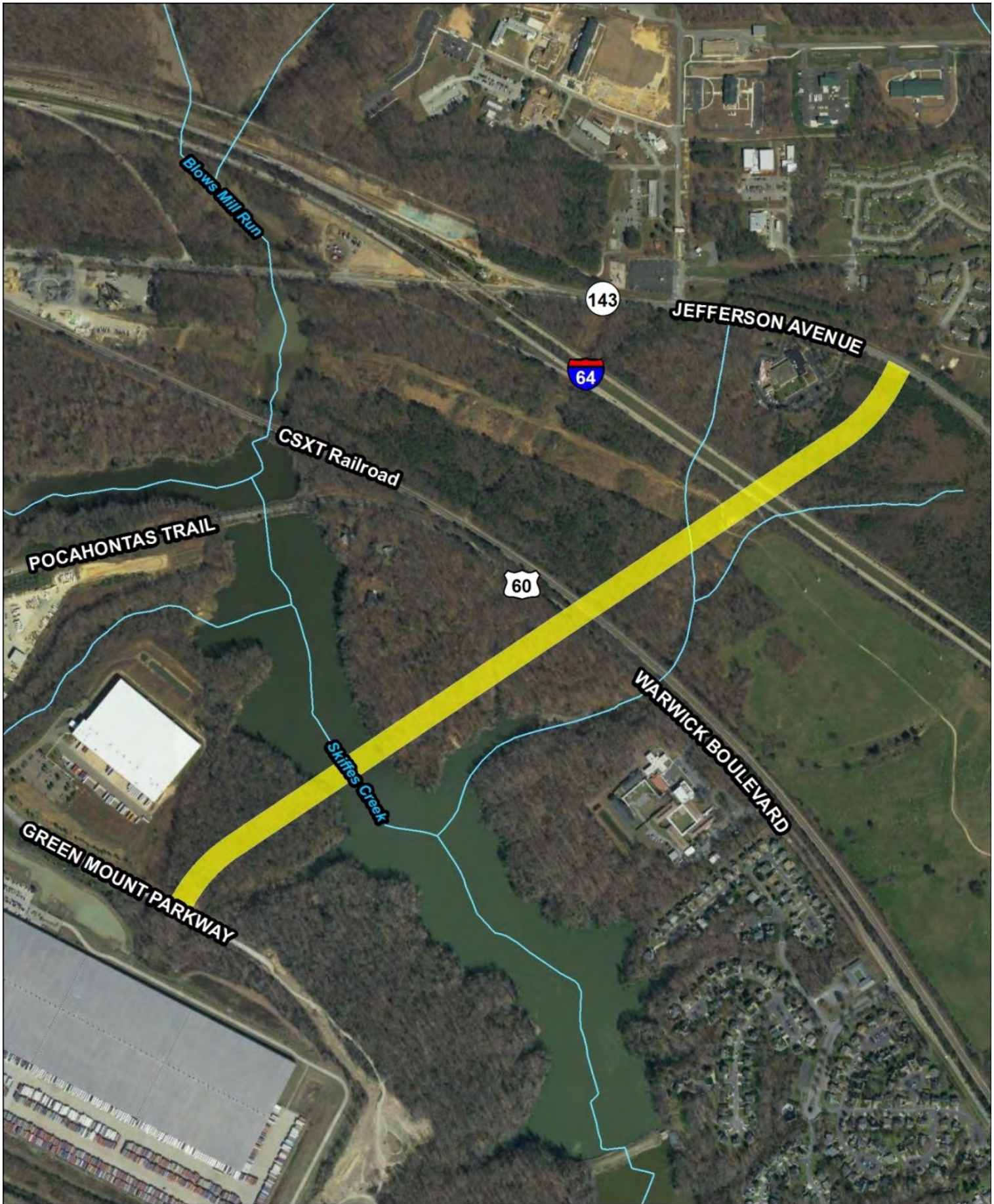


Figure 2-8
Option 5

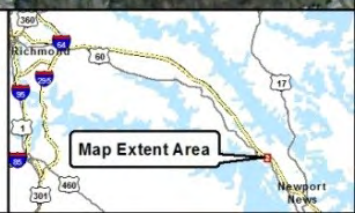
VDOT Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

0 200 400 800 Feet

N W E S

Source: VGIN VBMP Imagery, NHD

Option 5



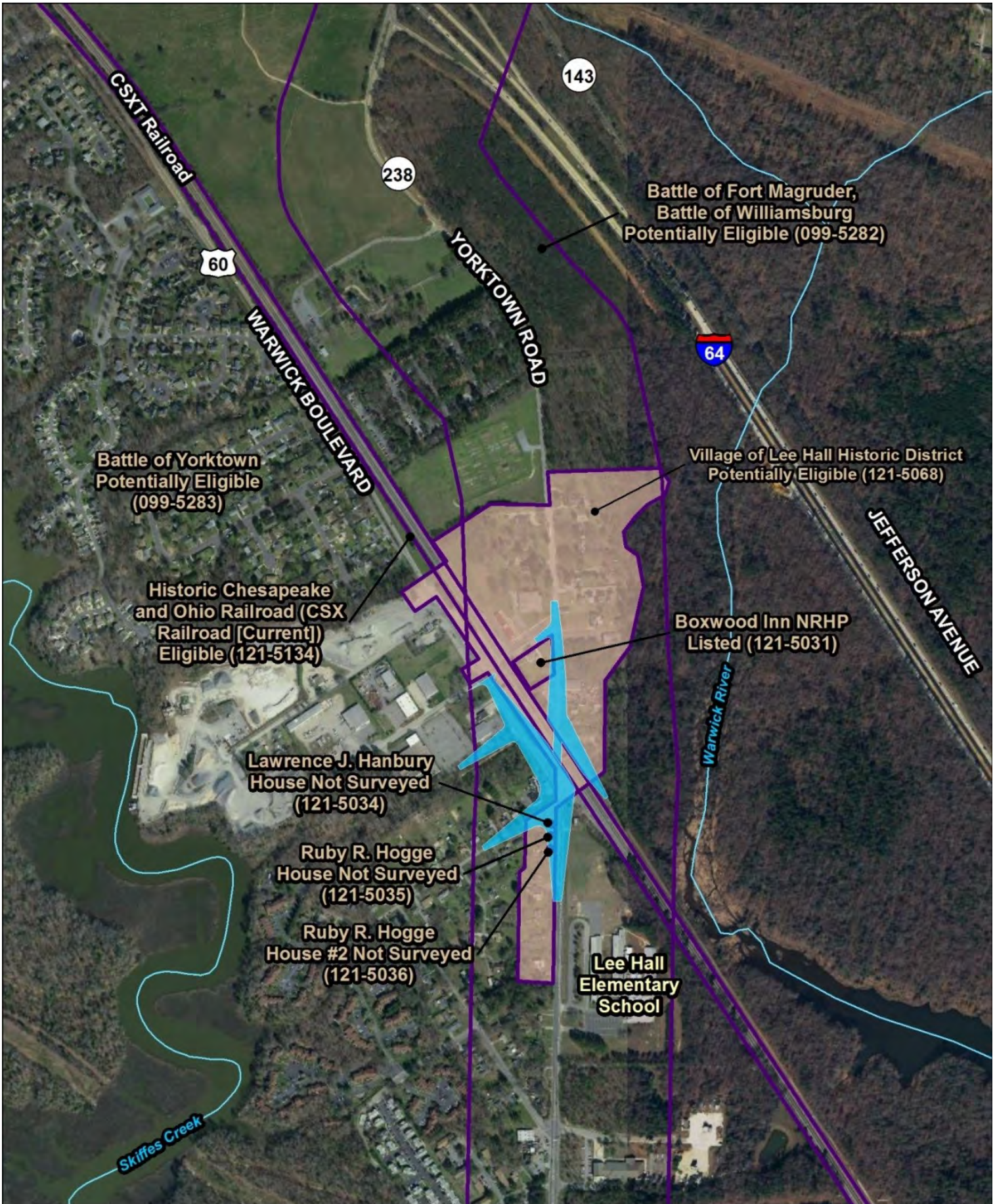


Figure 2-9
Option 6

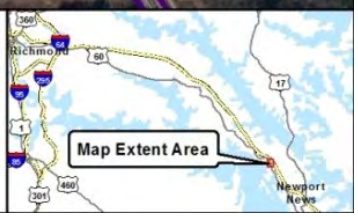
VDOT Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

0 200 400 800 Feet

N W E S

Source: VGIN VBMP Imagery, NHD, CEDAR DHR

Option 6
CEDAR Historic Resources
CEDAR Historic District



Utilizing the existing Green Mount Parkway intersection would provide a safe and efficient connection for all traffic and would allow trucks direct access to the SCC from their O/D locations. This option, however, would not provide the same efficiency as the other options; the road is a proposed two-lane facility, therefore, the merging/diverging of traffic at the "Y" would either create congestion and safety concerns or require a traffic signal. In either case, the connection would occur at the base of the incline to get over the railroad tracks. Forcing trucks to slow down or come to a halt at this location would reduce the efficiency of the connection for large trucks, as well as small vehicles that would be traveling behind them as they attempted to get up to speed and would likely be avoided by trucks and some personal vehicles. These conditions would also create the same concerns if the road was open to two-way traffic during an evacuation, reducing efficiency of evacuation efforts. Therefore, since this option would not provide efficient connectivity for local truck movement or enhance evacuation capabilities, it would not adequately meet the purpose and need.

The westbound leg of this option would impact the access of the Virginia Peninsula Regional Jail onto VA 143, requiring relocation of the driveway to the jail. The eastbound leg would intersect with the eastbound on-ramp to I-64, requiring modification to the ramp, as well as a design exception for not meeting VDOT's identified minimum desired spacing of 750 feet between an intersection and an interchange ramp (VDOT, 2017a). This option would require the widening or replacement of an existing bridge on VA 143 and approach work into the Skiffes Creek Reservoir. Option 7 is similar to Option 1 and Option 2, but with increased cost (two bridges over the railroad and more roadway as well as relocation of the jail driveway and modifications to the on-ramp), increased logistics (coordination with the railroad for two crossings and bridging/fill in the reservoir), and increased safety concerns. Given these shortcomings and the similarity to other options[4], Option 7 was not retained for evaluation. This option is illustrated in **Figure 2-10**.

2.2.6 Option 8

Option 8 would be located approximately halfway between the existing connections from US 60 to VA 143 at VA 199 and VA 238, and was developed to respond to comments questioning if shifting the Option 4 alignment elsewhere in the corridor could avoid associated grade issues discussed above. East of the proposed location/study area, the railroad sits adjacent to US 60. This would not provide enough space to achieve the elevation required to clear the railroad. Likewise, in the western end of the corridor, the railroad sits adjacent to VA 143, creating similar challenges. Options 8A and 8B show the most reasonable ways to stretch out Option 4 to reduce grades. However, even at these locations, the grades would be steep enough to result in issues similar to those discussed under Option 4.

[4] The elimination of similar alternatives is consistent with FHWA's Technical Advisory T 6640.8A *Guidance For Preparing and Processing Environmental and Section 4(f) Documents*, which states "the EA does not need evaluate in detail all reasonable alternatives for the project, and may be prepared for one or more build alternatives."

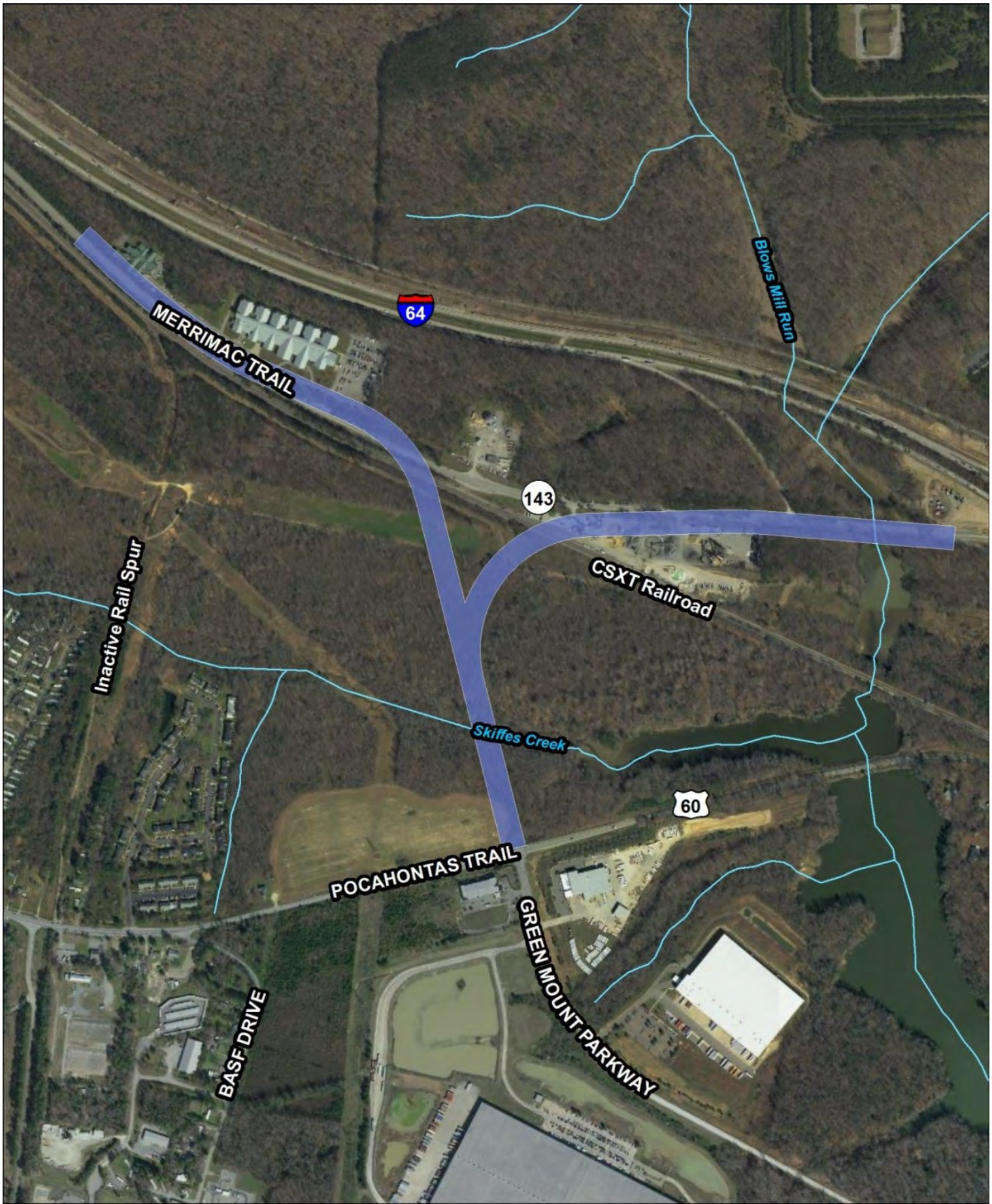


Figure 2-10
Option 7

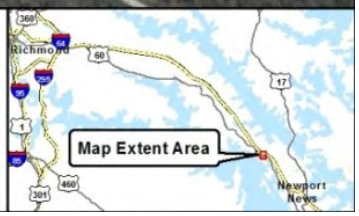
VDOT Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

0 200 400 800 Feet

N W E S

Source: VGIN VBMP Imagery, NHD

Option 7



Option 8A **–** would connect US 60 to VA 143 from the Green Mount Parkway terminus and proceed northeast, bridge over Skiffes Creek, the CSXT railroad, and the Skiffes Creek Reservoir, and would tie to VA 143 in the area of the I-64 on ramp, requiring relocation of the on ramp, as well as a design exception for not meeting VDOT's identified minimum desired spacing of 750 feet between an intersection and an interchange ramp (VDOT, 2017a). As noted above, this design exception is less likely to be approved since there are other options that provide acceptable access and would not require any design exceptions. Additionally, the relocation of the on ramp comes with increased impacts and costs.

Option 8B **-** is similar to Option 8A in connection; however, it would require an additional structure over I-64 and would tie into an existing intersection with Longfellow Road on VA 143 that is close in proximity to the I-64 westbound on ramp. Similar to Option 8A, this option would require a design exception for not meeting the desired spacing of 750 feet between an intersection and an interchange ramp (VDOT, 2017a). As noted above, this design exception is less likely to be approved since there are other options that provide acceptable access and would not require any design exceptions. This option would also have very steep grades in order to have the minimum clearance over I-64 and then tie into existing VA 143. This would have a similar impact on the local traffic as discussed in **Section 2.2.2: Option 4**.

Options 8A and 8B would be located approximately halfway between the existing connections from US 60 to VA 143 at VA 199 and VA 238 and are illustrated in **Figure 2-11**. The location, however, would not provide the same efficiency as the other alternatives as the required grade would be steep and would likely be avoided by trucks and personal vehicles. If a truck attempted to travel on these grades, it would slow any traffic down behind it, further reducing the efficiency of the connection. The facility could serve as a connection in an evacuation. Options 8A and 8B are like Option 4, an option that, if constructed, would be unusable by the large truck volumes that are experienced in the study corridor, and would therefore, not adequately meet the purpose and need.

2.2.7 Option 9

Option 9 attempts to address a public comment received at the February 15, 2018 CIM suggesting, "Why not try to take over old railroad track although more impact?" Based on this input, the layout developed is similar to Option 2 but shifted further west with a wider curve to connect to VA 143. Option 9 would begin at the northern terminus of BASF Drive and continue along the inactive rail spur and proceed in a northeasterly direction. Option 9 would bridge over the CSXT railroad and VA 143 and would tie into VA 143 at a new intersection. The option would have utility conflicts due to the close proximity of the existing Dominion transmission and distribution lines and proposed (and permitted) transmission lines. This proposed route would require the truck traffic to make additional turns on US 60 which would reduce the efficiency of the truck traffic. In a stopped condition at an intersection, signalized or unsignalized, trucks would need approximately 1,500 feet to obtain a speed of 30 mph (AASHTO, 2011).

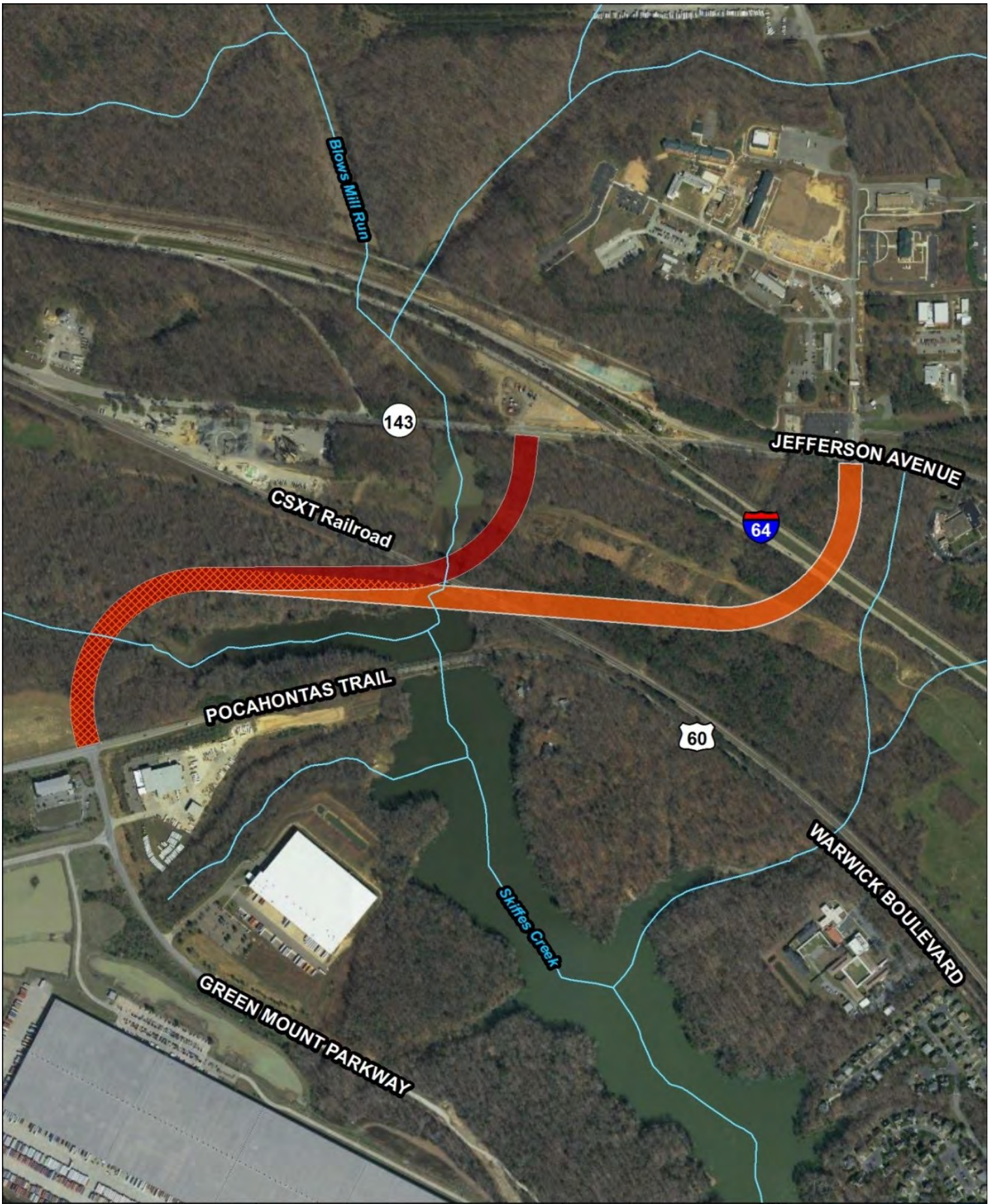


Figure 2-11
Options 8a and 8b

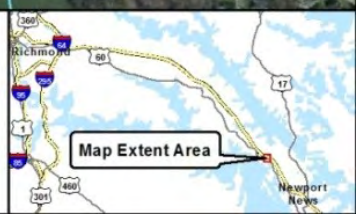
VDOT Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

0 200 400 800 Feet

N W E S

Source: VGIN VBMP Imagery, NHD

Option 8A
Option 8B



Additionally, five pedestrian-related crashes were reported, all of which occurred along US 60; therefore, there are safety concerns with adding additional intersections within close proximity to existing intersections and residential areas. The facility could serve as a connection in an evacuation. Coordination with James City County has determined that the "old" rail line is not currently in use but is not abandoned. The County's land use plans for industrial growth in the area assumes this line would become active in the future. While Option 9 could enhance local connectivity, this option is similar to Options 1 and 2 except with a greater distance between the employment centers and truck O/D locations and the SCC. Additionally, Option 9 would require additional turning movements, decreasing the speed of local traffic and trucks. Therefore, as this is not an abandoned rail line, and since the option does not provide as efficient connectivity for local truck movement as Options 1 and 2 provide, Option 9 would not adequately meet the purpose and need. **Figure 2-12** illustrates this option.

2.2.8 Option 10

Option 10 would consist of TSM/TDM. The possible TSM/TDM opportunities for the Skiffes Creek corridor could include the optimization of traffic signal timing and other signalized arterials in the study area, and/or pursuing strategies to better coordinate traffic signals, such as adaptive signal control. As a stand-alone option, these strategies would not meet the purpose and need. However, the NEPA process does not preclude these strategies from being implemented as part of a preferred alternative or as a separate project in the future.

2.2.9 Option 11

Option 11 would consist of mass transit improvements. Mass transit improvements could include additional bus services, such as new buses, stops or lines to supplement the existing Williamsburg Area Transit Authority (WATA) grey bus line, which has several bus stops within the study area along US 60. As a stand-alone option, these strategies would not meet the purpose and need. However, the NEPA process does not preclude these strategies from being implemented as part of a preferred alternative or as a separate project in the future.

2.2.10 Option 12

Option 12 would consist of bicycle/pedestrian improvements. Bicycle/pedestrian improvements could include sidewalk enhancements, new multi-use paths and trail systems, designated bicycle lanes, and shared roadways with signing as bicycle routes. As discussed in **Section 2.1.2: Refinement of 2012 Alternatives**, the SCC was originally planned as part of a larger regional transportation improvement that proposed a wider typical section and included four lanes, sidewalk, and multi-use paths. Since the larger regional project has not moved forward, James City County has begun to focus on smaller local improvements, the typical section was reduced from a four-lane divided freeway to a two-lane section, the sidewalk and multi-use paths were removed from the typical section. As a stand-alone option, these strategies would not meet the purpose and need. However, the NEPA process does not preclude these strategies from being implemented as a separate project in the future.

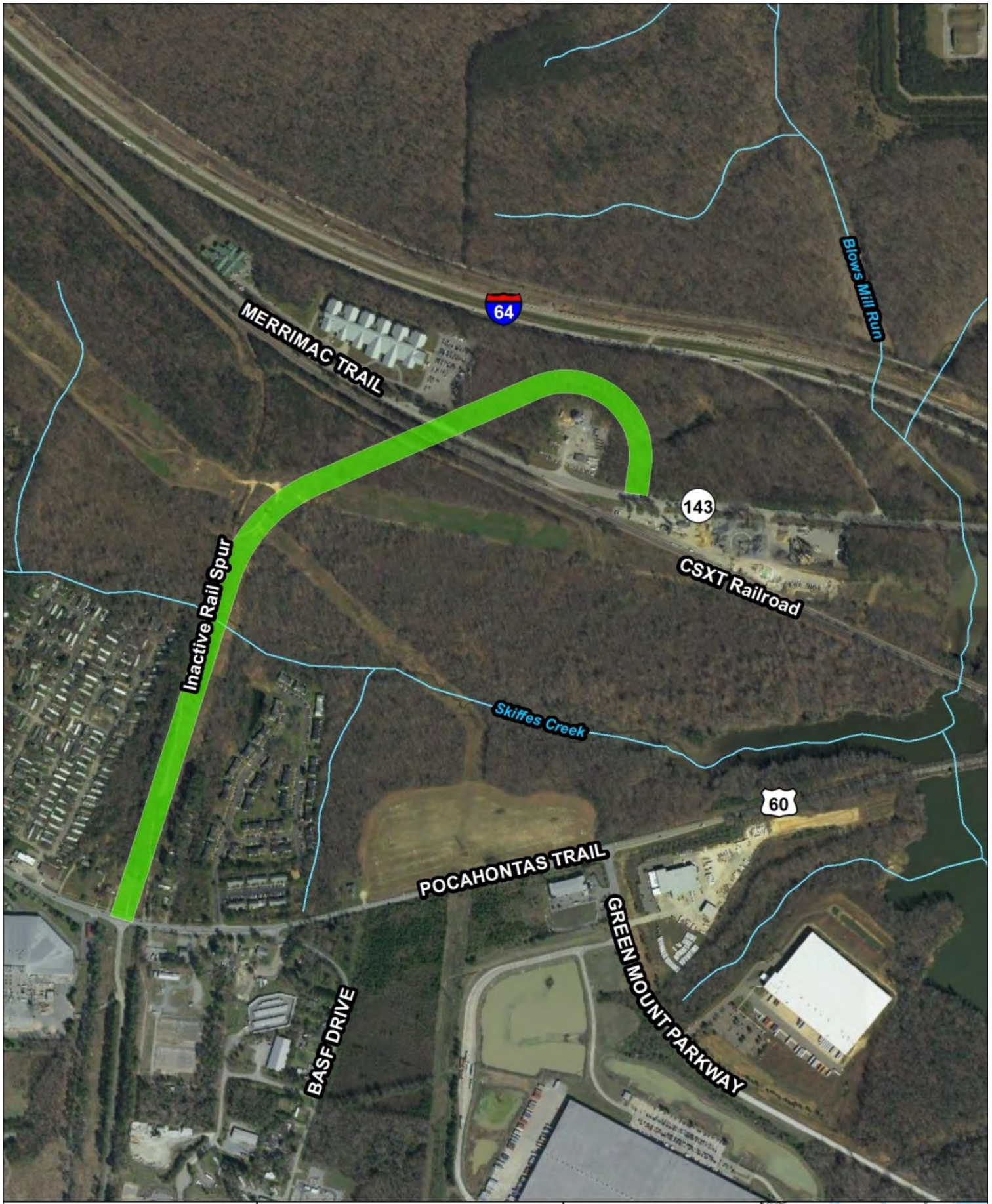


Figure 2-12
Option 9

VDOT Virginia Department of Transportation
Skiffes Creek Connector Study
VDOT Project Number: 0060-047-627, P101, R201, C501; UPC: 100200

0 200 400 800 Feet

N W E S

Source: VGIN VBMP Imagery, NHD

Option 9

2.2.11 Options to Develop Alignments Between the Existing I-64 and VA 199 Ramps and the Study Area

In addition to the options presented above, a general review was conducted to identify additional options between the I-64 and VA 199 ramps and the SCC study area. Moving west of the SCC study area, options to connect US 60 and VA 143 would not provide efficient connections. The location would not efficiently service eastbound travelers. Those travelers who opted to use an option west of the study area would be required to continue to past the residential areas and school along US 60, rather than being diverted before they reach these areas. Due to the close proximity of the existing CSXT rail line to VA 143 (less than 100 feet for the entire length between the existing I-64 and VA 199 Ramps and the study area), there would be similar engineering and safety concerns as those noted in **Section 2.2.1: Option 3** and **Section 2.2.2: Option 4**. Not only would this fail to improve local connectivity and increase safety concerns on the corridor, it would not provide an efficient connection to employment centers and truck O/D locations. Preliminary analysis indicated that a number of the communities that could be impacted by such an alignment may be environmental justice communities. Since options in this area would not provide efficient connection for truck movement and would not improve local connectivity, the options would not adequately meet the purpose and need as stated previously.

2.2.12 Options to Develop Alignments Between VA 238 and the Study Area

Similar to **Section 2.2.11**, a general review was conducted to identify additional options between VA 238 and the SCC study area. Moving east of the SCC study area, options to connect US 60 and VA 143 would not provide an efficient connection. The location would not efficiently service westbound travelers. Due to its close proximity to the existing CSXT rail line, there would be similar engineering and safety concerns as those noted **Section 2.2.1: Option 3** and **Section 2.2.2: Option 4**. Not only would this fail to improve local connectivity, it would not provide an efficient connection to employment centers and truck O/D locations. Options east of the Skiffes Creek Reservoir and Newport News Reservoir would result in Section 106 impacts similar to those described for Option 6. These options would not efficiently connect the local trucks to the O/D locations and would not be efficient for local traffic; therefore, the options would not adequately meet the purpose and need.

2.3 ALTERNATIVES RETAINED FOR EVALUATION

Following is a discussion of the alternatives retained for evaluation, which includes two Build Alternatives, and a No Build Alternative, in order to provide a baseline for comparison. This approach is consistent with FHWA's Technical Advisory *T 6640.8A Guidance For Preparing and Processing Environmental and Section 4(f) Documents* (FHWA, 1987).

2.3.1 No Build Alternative

In accordance with the regulations implementing NEPA (40 CFR § 1502.14(d)), the No Build Alternative has been included for evaluation as a benchmark for the comparison of future conditions and impacts. The No Build Alternative would retain the existing US 60 and VA 143 roadways and associated intersections/interchanges in their present configuration, and allow for routine maintenance and safety upgrades.

This alternative assumes no major improvements to either corridor with the exception of previously committed projects, including projects currently programmed and funded in VDOT Fiscal Year (FY) 2018-2023 Six-Year Improvement Program (SYIP) and the Hampton Roads Transportation Planning Organization (HRTPO)'s 2040 Long-Range Transportation Plan (LRTP). As these other projects are independent of the proposed action, they are not evaluated in this EA.

Traffic Operations

This option would not improve traffic flow or mobility for local traffic and trucks to travel between US 60 and VA 143. Local traffic and trucks traveling west on US 60 would have to travel approximately 4 miles before access to VA 143 would be available; while local traffic and trucks travelling east on US 60 would have to travel approximately 3.5 miles before access to VA 143 would be available. Neither of these routes would provide direct access for the local traffic or the trucks from the O/D locations.

Ability of the No Build Alternative to Address the Purpose and Need

The No Build Alternative would not address the purpose and need elements of the study as identified in **Section 1.2** because routine maintenance and other programmed projects would not provide improved local connectivity, efficient connectivity for local truck movements, or enhanced evacuation routes.

2.3.2 Build Alternative 1

Build Alternative 1 would provide an approximate one-mile two-lane roadway between US 60 and VA 143. This alternative would tie into US 60 at the existing US 60/Green Mount Parkway signalized intersection, bridge[5] over Skiffes Creek, the CSXT railroad, and VA 143, then turn east to connect at a new intersection with VA 143 (see **Figure 2-13**). Utilizing the existing Green Mount Parkway intersection would provide a safe and efficient connection for all traffic and would allow trucks direct access to the SCC from their O/D locations. This alternative would provide consistent vertical grades (approximately 3% to 4%) for the local traffic and trucks. As described in **Section 2.1.2**, Build Alternative 1 has been revised since it was originally developed to provide a reduced planning level LOD from 225 feet to 140 feet, a perpendicular stream crossing, and to accommodate a reduction in design speed from 50 mph to 35 mph; all of which have reduced cost and impacts.

By reducing the design speed to 35 mph for Build Alternative 1, the alignment could be shifted to cross Skiffes Creek perpendicularly, thereby further reducing impacts to wetlands and streams. In addition to a reduction in wetland and stream impacts for Build Alternative 1, the intersection at VA 143 would be able to be located further away from the I-64 Exit 247 westbound off-ramp (which would improve traffic flow through the area). This width of 140 feet includes sufficient area to accommodate the required right-of-way as well as any necessary utility or construction easements[6]. The design of this alternative meets the current VDOT Urban Minor Arterial Street (GS-6) guidelines and standards.

[5] The type and length of bridge-like structure over Skiffes Creek would be determined during final design/permitting.

[6] Stormwater management facilities have not been included within the LOD to determine the associated environmental impacts or the specific parcels that would be impacted. Additional signing and maintenance of traffic

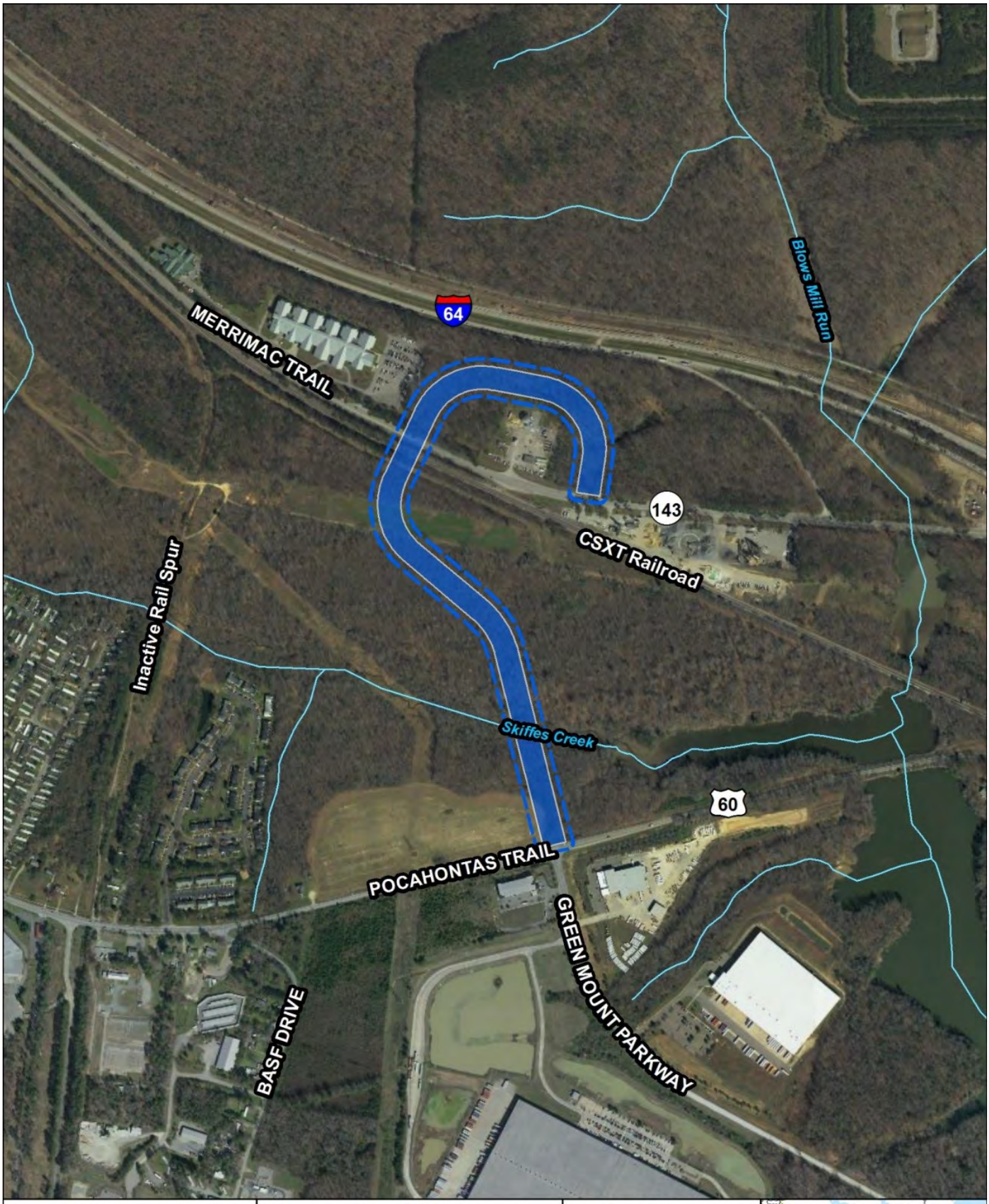


Figure 2-13
Build Alternative 1

VDOT Virginia Department of Transportation
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0 200 400 800 Feet

N W E S

Source: VGIN VBMP Imagery, NHD

Build Alternative 1 (140-foot LOD)

Build Alternative 1 (225-foot Inventory Corridor)

Traffic Operations

This option would improve traffic flow by providing an efficient connection for local traffic and trucks to travel between US 60 and VA 143. US 60 is designated as a Corridor of Statewide Significance (CoSS) and is part of VDOT's Arterial Preservation Network (VDOT, 2017b). According to VDOT's policy, "the Commonwealth Transportation Board has expressed concern that the proliferation of new signals on the Arterial Preservation Network, whether due to land use development or installed via VDOT construction project, collectively degrade the travel time and travel experience within and between urban centers, adversely impacting the Commonwealth's economy" (VDOT, 2017b). By tying into the existing Green Mount Parkway signalized intersection along US 60, Build Alternative 1 would not add an additional intersection and would be in accordance with VDOT's policy. In addition, this alternative allows for direct access from the employment centers and truck O/D locations for improved efficiency and improved mobility by eliminating turning movements of the trucks unlike other options that would increase the turning movements.

Ability of Build Alternative 1 to Address the Purpose and Need

Build Alternative 1 would be located approximately halfway between the existing connections from US 60 to VA 143 at VA 199 and VA 238, and was retained for detailed study because it would provide an efficient connection for local traffic, trucks, and emergency evacuation. This alternative utilizes the existing signalized Green Mount Parkway intersection at US 60, which minimizes turning movement conflicts which can be associated with additional access points. Utilizing an existing intersection provides a safe and efficient connection for all traffic, in addition to providing an efficient connection to the primary truck origins and destinations in the study area. By having a direct connection between the SCC and Green Mount Parkway, Build Alternative 1 minimizes the number of conflict points and turns required by trucks traveling between Green Mount Parkway and VA 143, thereby resulting in improved safety and by reducing the turning movements of the trucks, there would be fewer delays related to trucks stopping and starting. By being located midway between the existing connections from US 60 and VA 143 (VA 199 and VA 238), Build Alternative 1 results in greater connectivity to both local traffic and truck traffic. Additionally, by providing a consistent vertical grade (approximately 3% to 4%), Build Alternative 1 provides an efficient connection for local trucks. Finally, this direct route between US 60 and VA 143 would provide an enhanced emergency evacuation route along the primary routes (US 60 and VA 143). Should an accident or other backup occur on one of the primary routes, traffic could connect to the other route without interfering with traffic trying to get to or from I-64 and its connecting ramps.

Under Build Alternative 1, the SCC is forecasted to carry 7,300 daily trips in 2043 which would provide a more efficient travel route between US 60 and VA 143 for employment centers and primary truck O/D locations in the SCC study area. Daily traffic volumes along US 60 from Green Mount Parkway east to VA 238, VA 238 east to VA 105, VA 238 between US 60 and I-64, and VA 105 between US 60 at I-64 are forecasted to decrease as a result of the connectivity provided by the SCC. Based on the 2043 forecasts, the SCC would create a utilized efficient connection for travelers similar to existing connections between VA 143 and US 60. These reductions, as well as the discussion in the above paragraph, show that Build Alternative 1 would address the purpose and need elements of the study by providing improved local connectivity, efficient connectivity for local truck movements, and enhanced

evacuation routes (see the ***Traffic and Transportation Technical Report*** [VDOT, 2018f] for additional details).

2.3.3 Build Alternative 2

Build Alternative 2 would provide an approximate one-mile two-lane roadway between US 60 and VA 143. This alternative would begin at a new intersection with US 60, approximately 1,000 feet west of the existing US 60/Green Mount Parkway intersection. Similar to Build Alternative 1, Build Alternative 2 would then bridge[8] over Skiffes Creek, the CSXT railroad, and VA 143, then turn east to connect at a new intersection with VA 143 (see **Figure 2-14**). This alternative would provide consistent vertical grades (approximately 3% to 4%) for the local traffic and trucks.

As described in **Section 2.1.2**, Build Alternative 2 has been revised since it was originally developed to provide a reduced planning level LOD from 225 feet to 140 feet and to accommodate a reduction in the design speed from 50 mph to 35 mph. This width includes sufficient area to accommodate the required right-of-way as well as any necessary utility or construction easements. The design of this alternative meets the current VDOT Urban Minor Arterial Street (GS-6) guidelines and standards.

Traffic Operations

This option improves traffic flow by providing an efficient connection for local traffic and trucks to travel between US 60 and VA 143. Although US 60 is designated as a CoSS and is part of VDOT's Arterial Preservation Network, about which the CTB has expressed concern about the proliferation of new signals, this alternative introduces a new intersection (VDOT, 2017b). The new intersection would require users of the SCC to perform additional turn movements. For trucks starting at Green Mount Parkway, they would make a left turn from a stop condition, get up to speed to travel along US 60 and then slow down to make a right turn onto the SCC, which would decrease the speed of local traffic and trucks since in a stopped condition at an intersection, signalized or unsignalized, trucks would need approximately 1,500 feet to obtain a speed of 30 mph (AASHTO, 2011).

Ability of Build Alternative 2 to Address the Purpose and Need

Build Alternative 2 would be located approximately halfway between the existing connections from US 60 to VA 143 at VA 199 and VA 238, and was retained for detailed study because it would provide an efficient connection for local traffic, trucks, and emergency evacuation. This alternative would provide new intersections at US 60 and VA 143. Although this alternative would create an additional new access point along US 60, the connection would still provide a link between the two routes in close proximity to the employment centers and primary truck O/D locations in the study area. By being located midway between VA 199 and VA 238, Build Alternative 2 would result in greater connectivity to both local traffic and truck traffic. Additionally, by providing a consistent vertical grade (approximately 3% to 4%), Build Alternative 2 would provide an efficient connection for local trucks. Finally, this direct route between US 60 and VA 143 would provide an enhanced emergency evacuation route along the primary routes (US 60 and VA 143).

[8] The type and length of bridge-like structure over Skiffes Creek would be determined during final design/permitting.

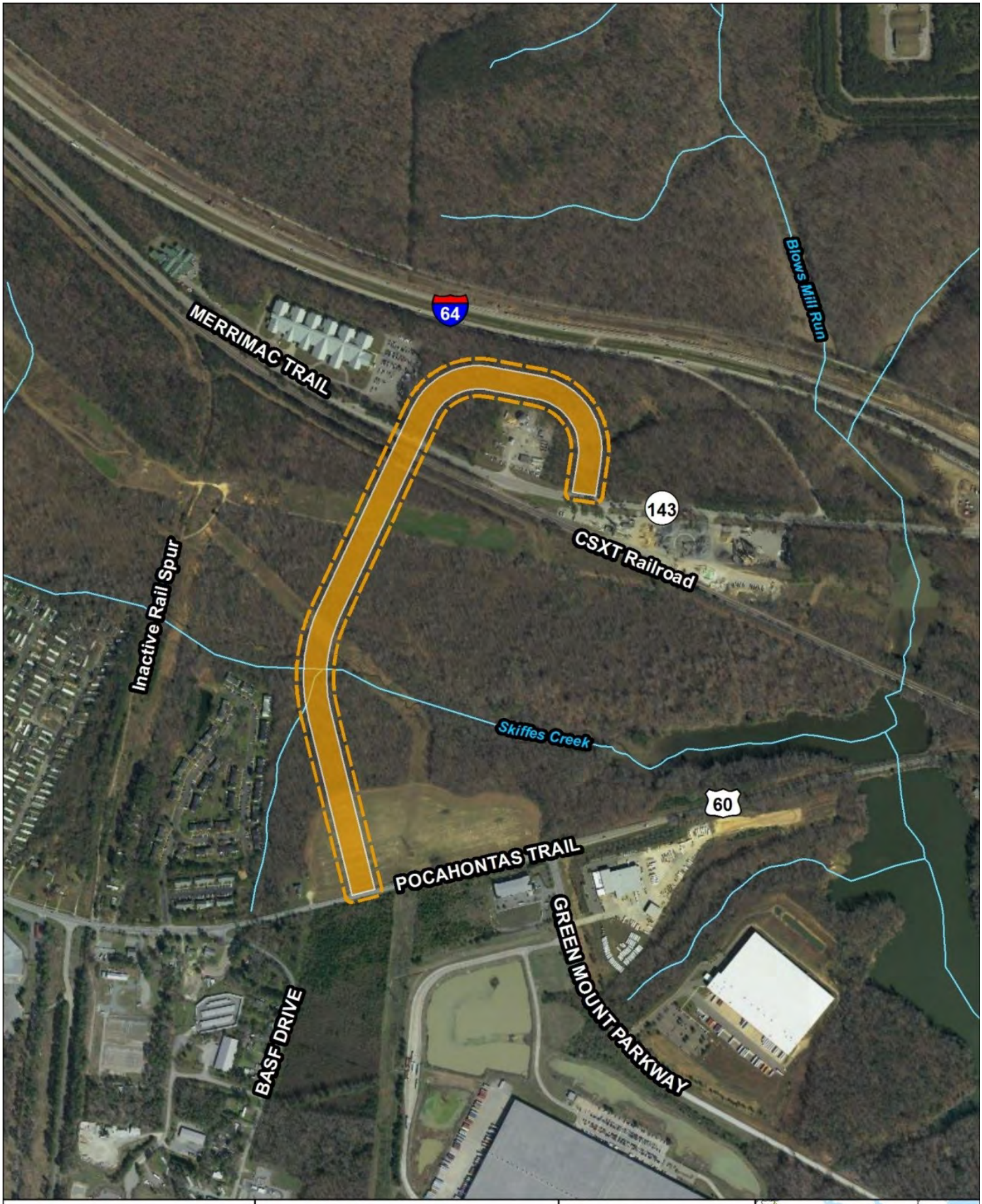

Figure 2-14
Build Alternative 2

VDOT Virginia Department of Transportation
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Source: VGIN VBMP Imagery, NHD

Build Alternative 2 (140-foot LOD)

Build Alternative 2 (225-foot Inventory Corridor)

Should an accident or other backup occur on one of the primary routes, traffic could connect to the other route without interfering with traffic trying to get to or from I-64 and its connecting ramps.

The traffic forecasts for Build Alternative 2 would be the same as those described above for Build Alternative 1. Based on the 2043 forecasts, the SCC would create a utilized efficient connection for travelers similar to existing connections between VA 143 and US 60. These reductions, as well as the discussion in the above paragraph, show that Build Alternative 2 would address the purpose and need elements of the study by providing improved local connectivity, efficient connectivity for local truck movements, and enhanced evacuation routes (see the ***Traffic and Transportation Technical Report*** [VDOT, 2018f] for additional details).

2.3.4 Typical Section of Build Alternatives

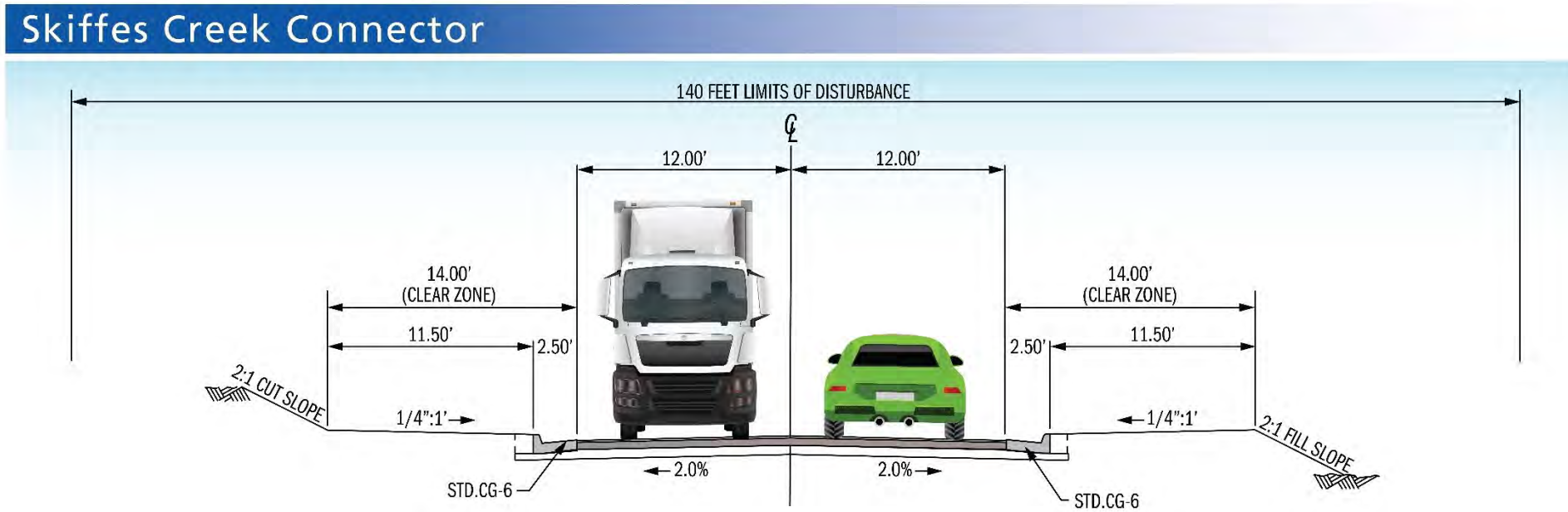
The proposed typical section for the Build Alternatives is shown in **Figure 2-15**. The typical section was developed for planning purposes only and would be refined during detailed design and permitting. The typical section is based on the Urban Minor Arterial (GS-6) design criteria as shown in **Appendix B**. The proposed typical section utilizes two lanes of 12 feet (one in each direction) with curb and gutter on both sides. In addition, there is a buffer space provided behind the curb and gutter for the acceptable clear zone for the design speed of 35 mph. For this type of roadway classification, a 2:1 sideslope was utilized. The bridge over the railroad would be constructed outside of the railroad right-of-way. As noted above, for the purposes of the study, a planning level LOD (140 feet) was utilized to estimate impacts. In order to illustrate a worst-case scenario, impacts to Waters of the U.S. (WOUS) were estimated assuming the proposed roadway would cross Skiffes Creek on a fill causeway with culverts and would not be bridged. Through design and permitting, it is assumed bridging would be applied to avoid and minimize these impacts. This width includes sufficient area to accommodate the required right-of-way as well as any necessary utility or construction easements.

2.3.5 Cost Estimate

A preliminary construction cost estimate and anticipated right-of-way and utility costs for the entire project were developed using the VDOT Project Cost Estimating System (PCES), version 7.10. Construction costs were calculated using the VDOT PCES spreadsheet (see **Appendix C**). The following is a list of assumptions used in developing these costs:

- The project is in the Hampton Roads District
- Advertisement Year 2021 was used with construction completion in Year 2023
- The SCC is assumed to be a two-lane urban typical section with 24 feet of pavement
- Bridges were assumed to be 48 feet wide and the lengths of each bridge was measured in Microstation files
    - For Build Alternative 1, the bridge over Skiffes Creek is approximately 275 feet in length and the bridge over the CSXT railroad and VA 143 is approximately 270 feet
    - For Build Alternative 2, the bridge over Skiffes Creek is approximately 650 feet in length and the bridge over the CSXT railroad and VA 143 is approximately 270 feet
- The estimate assumed signals for the intersections (either revisions to existing signals or new signals where none currently exist) and the estimate assumed lighting along the proposed roadway.

Figure 2-15: Typical Section



Typical Section develop for planning purposes only.

In addition to construction costs, costs were estimated for the anticipated right-of-way and utilities needed along the proposed corridors for the SCC for each of the proposed alternatives using the VDOT PCES spreadsheet. The current VDOT PCES bridge spreadsheet (version 1.2) is independent of the roadway construction cost and was utilized for the bridge construction cost.

The preliminary construction cost estimate and anticipated right-of-way costs assumed that the parcels would fall in the Rural density category. Assumptions also included that property access would not be affected and therefore right-of-way negotiations would be limited to partial acquisitions rather than complete acquisitions. The right-of-way cost estimate assumes partial takes of the 7 parcels within the LOD of each build alternative.

The utility cost is based on current aerial photography and GIS information. Assumptions were made to include cost for certain utilities such as power poles and lines, communications, water line, sewer line, and gas line. A summary of the estimated construction and right-of-way/utility costs is provided in **Table 2-1**. The detailed information for the cost for each alternative are located in **Appendix C**.

Table 2-1: Total Estimated Costs

Alternative	Cost Estimate	Total
Build Alternative 1	Construction and Preliminary Engineering	$30,767,079
	Right-of-way and Utilities	$10,949,164
	Total Cost Estimates	$41,716,243
Build Alternative 2	Construction and Preliminary Engineering	$38,595,562
	Right-of-way and Utilities	$10,864,170
	Total Cost Estimates	$49,459,732

3. REFERENCES

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Appendix A: March 14, 2018 Agency Meeting Material and Agency Concurrence

NEPA PROGRAMS COORDINATION MEETING
MEETING SUMMARY

Patrick Henry Building
Reading Room East
1111 East Broad Street
Richmond, Virginia 23219

Dial in: (866) 842-5779
Conference Code: 804-371-6756#

Join WebEx meeting
Meeting number: 590 479 511
Meeting password: NEPA1969

ATTENDANCE LIST

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Jenny Salyers	VDOT	(804) 371-6706	Jennifer.Salyers@vdot.virginia.gov	In Person
Nicholas Nies	WR&A	(804) 314-4068	NNies@wrallp.com	In Person

SUMMARY OF PRESENTATIONS AND DISCUSSIONS

Skiffes Creek Connector Environmental Assessment

Summary: Jennifer Salyers (presenting for Scott Smizik), VDOT Location Studies Project Manager, provided an overview of the input received during the February 14, 2018 Citizen Information Meeting (CIM) and reviewed the recommended range of preliminary alternatives, including two new options suggested by agency representatives and one new option suggested by the public during the CIM for the Skiffes Creek Connector (SCC). CIM comments along with an updated table describing whether each option met the elements of the purpose and need was presented, as well as figures showing the location of each option. Twelve options were discussed, in addition to the No Build Alternative, and reasoning was given for why additional alternatives were not developed further east or west. Ms. Salyers noted to date that no agency had provided concurrence on the recommended options to be retained for analysis. VDOT requested concurrence from the USACE and USEPA on the recommended options to be retained for analysis.

Discussion: Ms. Salyers summarized the input received during the CIM. Discussion included the following points:

- Identification of a new option (option 9 in presentation);
- CIM attendees and comment forms indicated support for the project – citing gridlock and lack of access options for residents and emergency vehicles;
- Preference for Option 1;
- Supported VDOT's options recommended to be retained;
- Some confusion over comment form questions – specifically as it related to option preferences verses VDOT's recommendations (options not retained/retained);
- Interest in other projects; and
- Suggestions for operational improvements.

Lee Fuerst, USACE - noted that two CIM comments asked if there would ever be a connection to I-64. Ms. Salyers indicated the I-64 is outside of our study area and that the scope of this project focuses on connecting US 60 to VA 143.

Ms. Salyers then reviewed the No Build Alternative and each option, briefly summarizing each option as outlined on the presentation slides, whether it met the purpose and need elements, and whether it was being recommended to be retained.

VDOT recommended retaining Options 1 and 2, and not retaining Options 3 through 12. Options 7 and 8 were recommended by agencies during the February 14th NEPA Agency Coordination Meeting. Option 9 was recommended at the CIM.

Barbara Okorn, USEPA – thanked VDOT for looking at Option 8, which was developed as a variation on Option 4.

Barbara Okorn, USEPA – questioned whether Option 9, using the CSXT rail spur alignment, would affect industrial growth, and would they (James City County) be able to work a road into their plans. Ms. Salyers, noted that growth is not planned for the area along Option 9; however, the County does not support constructing a road in this location because they do not want to lose the potential for future rail. Ms. Salyers also discussed the new power lines that are proposed for the rail spur location and that the area is zoned for industrial use.

Rob Case, HRTPO – Curious why the study area didn't stop at Exit 243 (Bush Gardens) since there is full access between US 60 and VA 243 (for clarification – US 60 and VA 243 do not connect at this location) instead of Exit 242. Nick Nies, WRA – noted that the larger study area was developed for the traffic analysis. Caleb Parks, VDOT – noted that there are many truck origin and destinations (O/D) points within the US 60 corridor. Mr. Case asked about which exits trucks use. David Joyner, VDOT – noted that through coordination with Walmart (one of the largest employers in the area), most of their trucks utilize Exit 250 moving eastbound while westbound trucks use Exit 242. Mr. Nies noted the high percent of trucks on US 60, relating it back to dominant O/D's that are located along US 60 within the industrial area and that trucks traveling westbound on US 60 must travel through residential areas. Mr. Case questioned whether this project would remove traffic from Exit 242 or 243? Mr. Nies noted that the traffic analysis currently being completed would be able to answer this question.

Barbara Okorn, USEPA – asked about NWI numbers. Angel Deem, VDOT Environmental Division Director, noted that neither VDOT nor the regulatory agencies with purview over the resource are not comfortable relying on the NWI numbers. Field work is being completed to obtain this data.

Ms. Salyers requested concurrence on the alternatives to be retained for analysis in the Environmental Assessment from USACE and USEPA.

USACE and USEPA both agreed with alternatives to be retained but requested an additional week to consider information before providing official concurrence.

Note: Following the meeting the EPA and USACE provided their concurrence on March 19 and March 21, respectively.

NEXT STEPS: Receive official concurrence from USACE and USEPA, begin preparations for field work, and technical report preparation. Mr. Parks noted that VDOT is reviewing the methodology documents to ensure proper coordination is being conducted as agreed upon.

STUDY CONCURRENCE TRACKING

Skiffes Creek Connector				
U.S. Army Corps of Engineers	Environmental Analysis Methodologies	1	YES	8-Nov-17
	Purpose and Need Statement	2	YES	10-Jan-18
	Alternatives to Be Carried Forward	3	YES	21-Mar-18
U.S. Environmental Protection Agency	Environmental Analysis Methodologies	1	YES	8-Nov-17
	Purpose and Need Statement	2	YES	10-Jan-18
	Alternatives to Be Carried Forward	3	YES	19-Mar-18

SKIFFES CREEK CONNECTOR ENVIRONMENTAL ASSESSMENT

Request Concurrence on Range of Alternatives

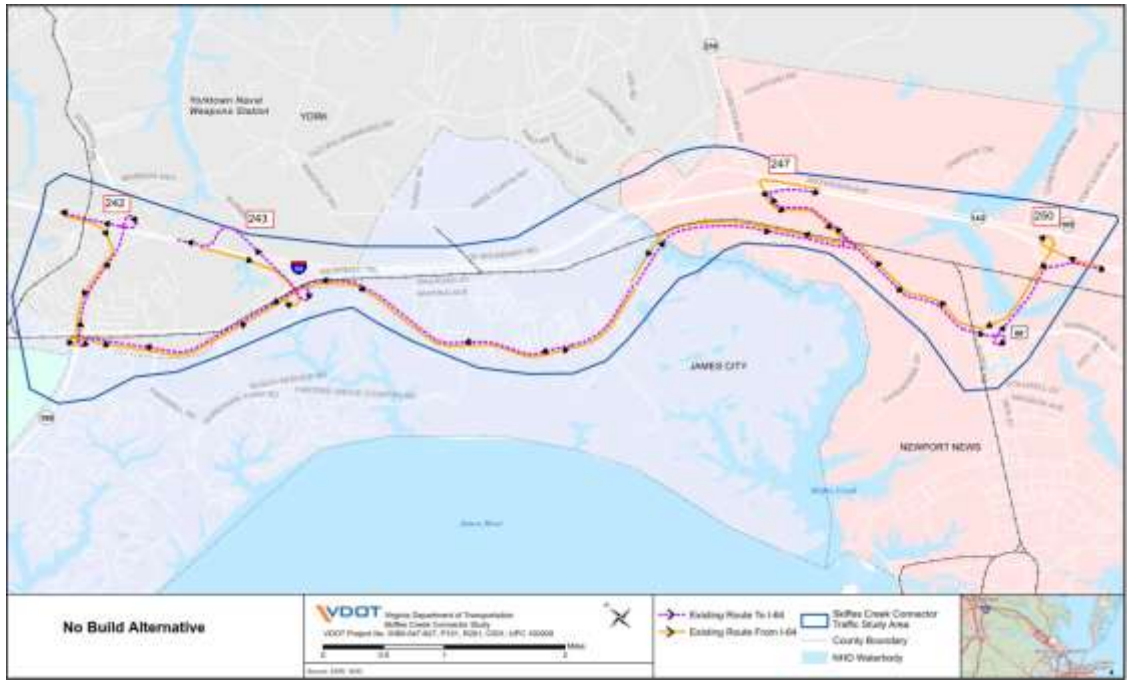
March 14, 2018 Agency Meeting

Input Received During Citizen Information Meeting

- Identification of a potential new option that is reviewed in this presentation
- Support for the project – citing gridlock and lack of access options for residents and emergency vehicles
- Preference for Option 1 – citing truck operations under Option 2
- Support for the options recommended to be retained
- Confusion over the process – individuals who were opposed to some of the options marked “disagree” thinking they were disagreeing with the project and not our recommendation
- Interest in other projects
- Suggestions of operational improvements

(comments are appended to this presentation)

NO BUILD ALTERNATIVE



Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
●	●	●

Does not meet the identified purpose and need elements but is retained to provide a benchmark for comparison of future conditions and impacts.

Recommendation: Retain

OPTION 1

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
●	●	●

Option 1 is located approximately halfway between the existing connections from US 60 to VA 143, providing an efficient connection for local traffic, trucks, and emergency evacuation. Utilizing the existing Green Mount Parkway intersection provides a safe and efficient connection for all traffic. It also provides an efficient connection to the primary truck origin/destination (O/D) points in the study area.

Recommendation: Retain

OPTION 2

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
●	●	●

Option 2 is located approximately halfway between the existing connections from US 60 to VA 143, providing an efficient connection for local traffic, trucks, and emergency evacuation. New intersections at US 60 and VA 143 would provide a connection between the two routes in close proximity to the primary truck O/D points in the study area.

Recommendation: Retain

OPTION 3

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
🔴	🔴	🟢

Option 3 is located approximately halfway between the existing connections from US 60 to VA 143, providing an efficient connection for local traffic, trucks, and emergency evacuation. Relying on an at-grade railroad crossing, however, does not provide a safe or reliable option. There are known safety concerns with such crossings and routine stoppages for trains does not provide an efficient connection for local traffic or trucks.

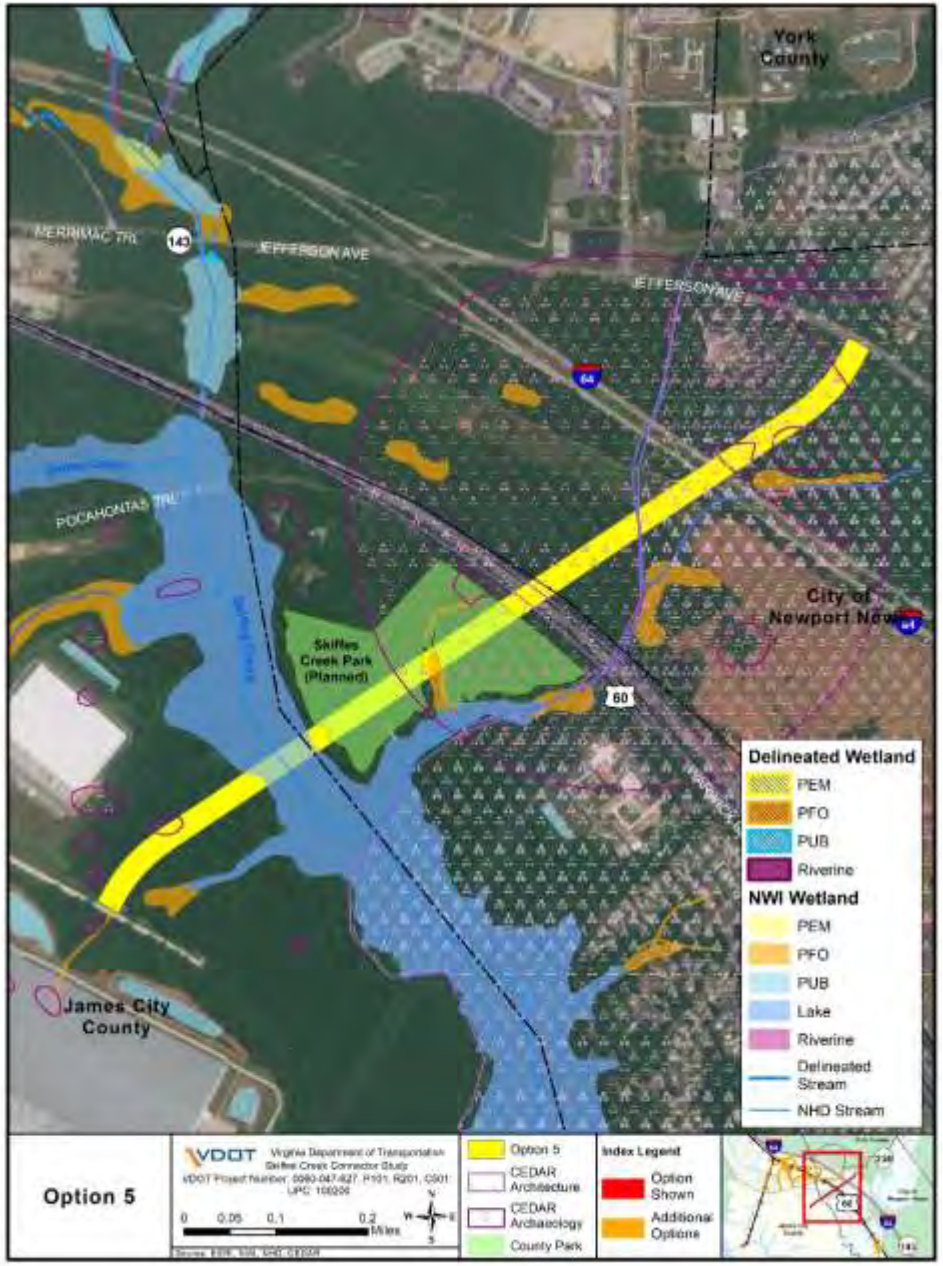
Recommendation: Do Not Retain

OPTION 4

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
🔴	🔴	🟢

Option 4 does not provide the same efficiency as the other alternatives as the required grade would be so steep it would most likely be avoided by trucks and some personal vehicles. If a truck attempted to travel on these grades, it would slow any traffic down behind it, further reducing the efficiency of the connection. While not ideal, if it was able to be constructed, the facility could serve as a connection in an evacuation.

Recommendation: Do Not Retain

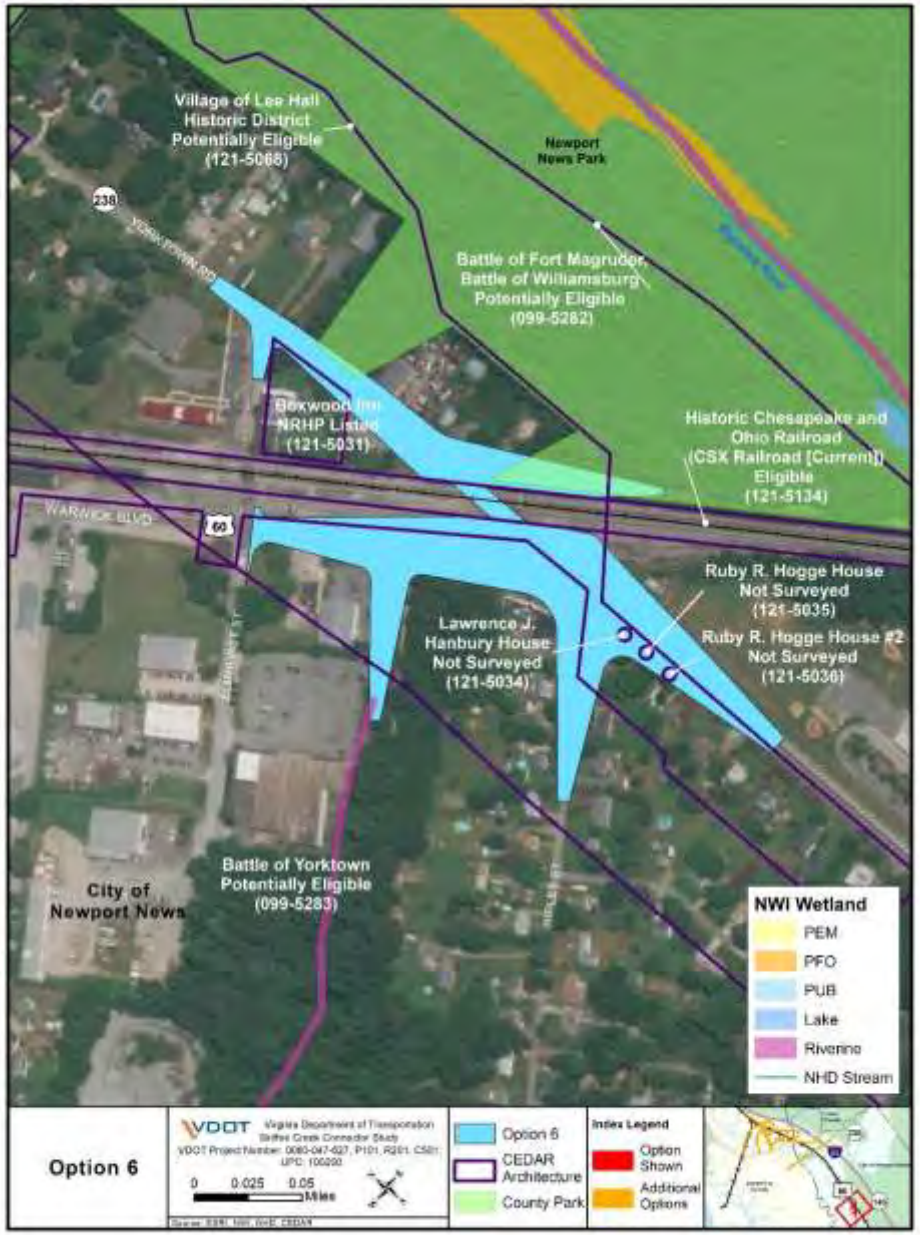


OPTION 5

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
🔴	🔴	🟢

Option 5 forces local and regional travelers to use what is, in practice, an industrial access road. This would not support the efficient movement of traffic and, in some instances, could create safety concerns. The connection made at VA 143 is east of the primary study area. This location is not efficient for travelers attempting to move within the primary study area and/or traveling directly between US 60 and VA 143.

Recommendation: Do Not Retain

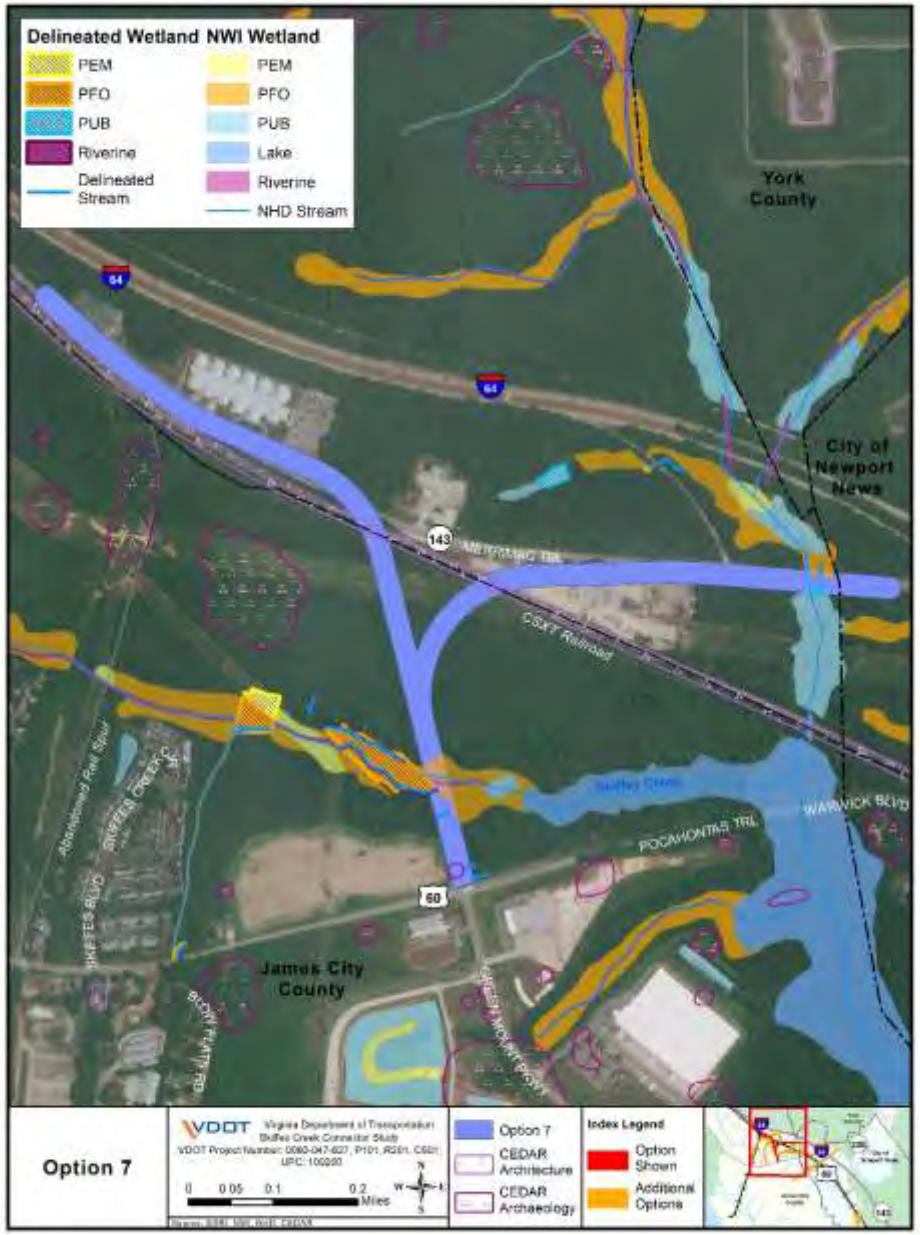


OPTION 6

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
●	●	●

The "improve existing" option is focused on the US 60/VA 238 intersection, as no improvements are warranted at the VA 199 or I-64 ramps. This option would not provide an efficient connection for vehicles traveling west or seeking to travel within the preliminary study area. It also would not provide efficient connectivity for local trucks. Connectivity between evacuation routes would not be improved.

Recommendation: Do Not Retain

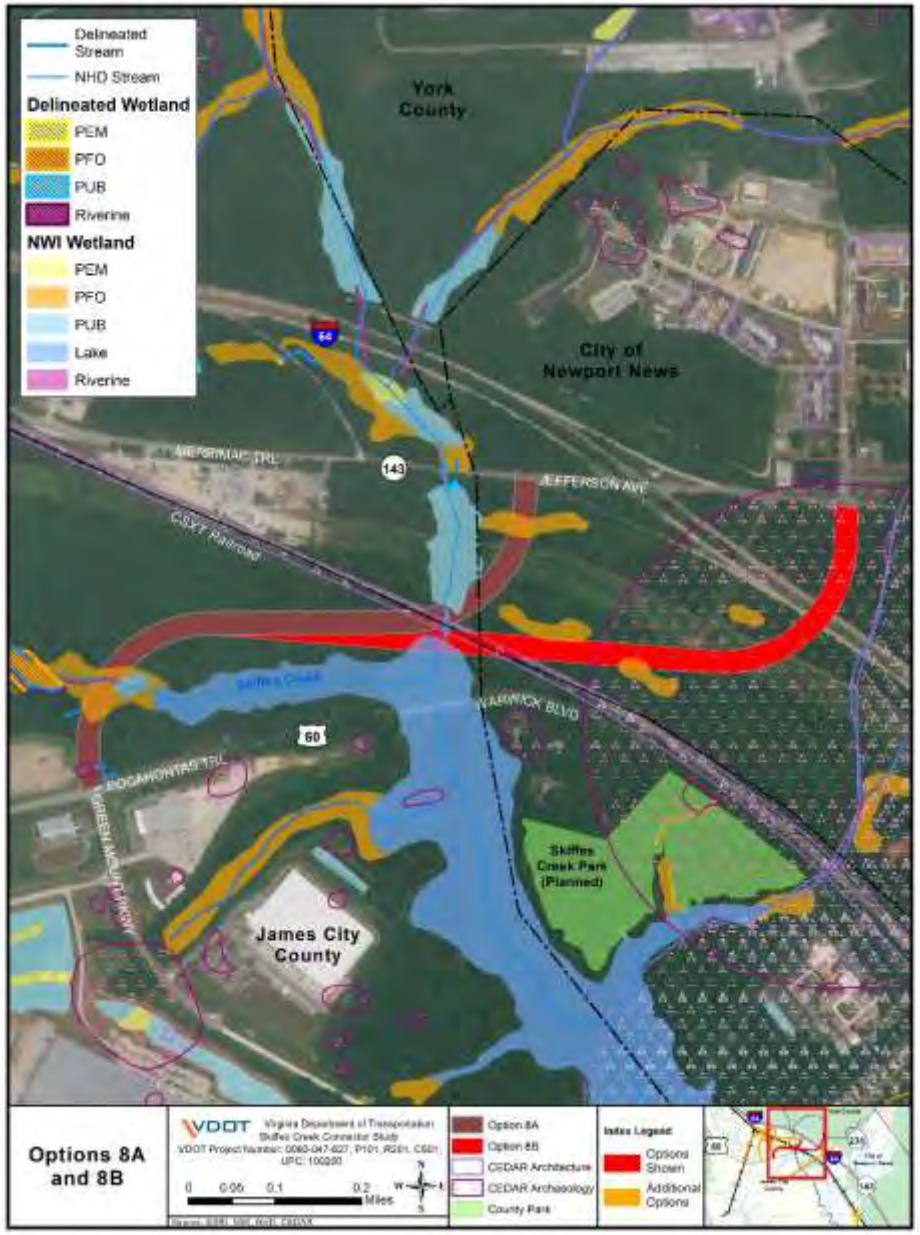


OPTION 7

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
●	●	●

As the road is a proposed two-lane facility, the merging/diverging of traffic at the "Y" would either create congestion and safety concerns or require a traffic signal. Forcing trucks to slow down or come to a halt at this location would reduce the efficiency of the connection for large trucks, as well as small vehicles that would be traveling behind them as they attempted to get up to speed. These conditions would also create the same concerns during an evacuation.

Recommendation: Do Not Retain



OPTION 8

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
🔴	🔴	🟢

Option 8 responds to comments asking if shifting the Option 4 alignment elsewhere in the corridor could avoid grade issues. East and west of the proposed location, the railroad sits adjacent to the existing roadways and does not provide enough space to achieve the elevation required to clear the railroad. Even at the two illustrated locations, the grades would be steep enough to result in issues similar to those anticipated in Option 4.

Recommendation: Do Not Retain

OPTION 9

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
●	●	●

Option 9 attempts to document a public comment suggesting, "Why not try to take over old railroad track although more impact." The "old" rail line is currently not in use but is not abandoned. The County's land use plans for industrial growth in the area assume this line would become active in the future and are not in favor of impacting/losing this rail line. As this is not an abandoned rail line, the suggestion was found to be infeasible.

Recommendation: Do Not Retain

OPTION 10

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
●	●	●

Transportation System Management (TSM) /Transportation Demand Management (TDM) opportunities could include the optimization of traffic signal timing and other signalized arterials in the study area, and or pursuing strategies to better coordinate traffic signals. As stand-alone options, these strategies would not meet the Purpose and Need for the study but are not preclude from being implemented in the future.

Recommendation: Do Not Retain

OPTION 11

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
●	●	●

Mass Transit improvements could include additional bus services (new buses, stops, and lines). As stand-alone options, these strategies would not meet the Purpose and Need for the study but are not preclude from being implemented in the future.

Recommendation: Do Not Retain

OPTION 12

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
●	●	●

Bicycle/Pedestrian improvements could include sidewalk enhancements, new multi-use paths and trail systems, designated bicycle lanes, and shared roadways signed as bicycle routes. As stand-alone options, these strategies would not meet the Purpose and Need for the study but are not preclude from being implemented in the future.

Recommendation: Do Not Retain

OPTIONS WEST OF THE PRELIMINARY STUDY AREA

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
🔴	🔴	🟢

Moving west of the preliminary study area, options to connect US 60 and VA 143 would not provide an efficient or safe connection. The location would not efficiently service eastbound travelers and would draw additional truck traffic into the residential community. Not only would this fail to improve local connectivity and increase safety concerns on the corridor, it would not provide an efficient connection to truck O/Ds.

Recommendation: Do Not Retain

OPTIONS EAST OF THE PRELIMINARY STUDY AREA

Improve Local Connectivity	Provide Efficient Connectivity for Local Truck Movement	Emergency Evacuation
🔴	🔴	🟢

Moving east of the preliminary study area, options to connect US 60 and VA 143 would not provide an efficient connection. Not only would this fail to improve local connectivity, it would not provide an efficient connection to truck O/Ds. Options east of the reservoirs would result in Section 106 impacts similar to those described for Option 6.

Recommendation: Do Not Retain

Questions/Discussion/Concurrence

- Input from participating and cooperating agencies
- Input from concurring agencies
- Request concurrence
  - USACE
  - EPA
- Next Steps

Skiffes Creek Connector Study EA – Reviewing a Range of Alternatives

(Updates since 2/14/18 are highlighted in green)

Option #	Description	Recommendation	Purpose and Need Statement:	How the Option Addresses Need Elements of Purpose:			Notes
			…to create efficient local connectivity between US 60 and VA 143, in the area between VA-199 and VA 238, in a manner that improves safety, emergency evacuation, and the movement of goods along the two primary roadways.	*Improve local connectivity*	*Provide efficient connectivity for local truck movement*	*Emergency evacuation*	
No Build	No changes to the existing roadways, intersections, or interchanges within the Skiffes Creek Connector (SCC) study area.	Retain	Does not meet the identified purpose and need elements but is retained to provide a benchmark for comparison of future conditions and impacts.	X	X	X	
1	Option 1 ties into US 60 at the existing US 60/Green Mount Parkway intersection, bridges over Skiffes Creek (perpendicularly), the CSXT railroad, and VA 143, then turns east to connect with VA 143.	Retain	Option 1 is located approximately halfway between the existing connections from US 60 to VA 143, providing an efficient connection for local traffic, trucks, and emergency evacuation. Utilizing the existing Green Mount Parkway intersection provides a safe and efficient connection for all traffic. It also provides an efficient connection to the primary truck origin/destination (O/D) points in the study area.	✓	✓	✓	• Option 1 has been re-engineered since previous iterations to provide a perpendicular water crossing similar to what was originally considered in Option 2. • Additionally, the design speed was reduced from 50 mph to 35 mph which has further reduced impacts.
2	Option 2 would begin at a new intersection with US 60, approximately 1,000 feet west of the existing US 60/Green Mount Parkway intersection. Option 2 then bridges over Skiffes Creek (perpendicularly), the CSXT railroad, and VA 143, then turns east to connect with VA 143.	Retain	Option 2 is located approximately halfway between the existing connections from US 60 to VA 143, providing an efficient connection for local traffic, trucks, and emergency evacuation. New intersections at US 60 and VA 143 would provide a connection between the two routes in close proximity to the primary truck O/D points in the study area.	✓	✓	✓	As discussed on February 14, 2018, this alternative has been re-engineered to a 35 mph design speed.
3	Option 3 ties into US 60 at the existing US 60/Green Mount Parkway intersection, bridges over Skiffes Creek, crosses the CSXT railroad at grade, then connects directly with VA 143.	Do Not Retain	Option 3 is located approximately halfway between the existing connections from US 60 to VA 143, providing an efficient connection for local traffic, trucks, and emergency evacuation. Utilizing the existing Green Mount Parkway intersection provides a safe and efficient connection for all traffic. Relying on an at-grade railroad crossing, however, does not provide a safe or reliable option. There are known safety concerns with such crossings and routine stoppages for trains does not provide an efficient connection for local traffic or trucks.	X	X	✓	• State code discourages at-grade crossings. • Previous coordination with CSXT suggested that adding an at-grade crossing would require removal of three existing crossings; something that cannot be accomplished through the scope of a single project. • Successful federal approvals are unknown/ unlikely, making Option 3 infeasible.
4	Option 4 ties into the existing US 60/Green Mount Parkway intersection; turns northeast to bridge over Skiffes Creek and the CSXT railroad; then connects directly with VA 143. Option 4 would have steeper vertical grades due to the proximity of the CSXT railroad crossing and the VA 143 intersection.	Do Not Retain	Option 4 is located approximately halfway between the existing connections from US 60 to VA 143. The location, however, does not provide the same efficiency as the other alternatives as the required grade would be so steep it would most likely be avoided by trucks and some personal vehicles. If a truck attempted to travel on these grades, it would slow any traffic down behind it, further reducing the efficiency of the connection. While not ideal, if it was able to be constructed, the facility could serve as a connection in an evacuation.	X	X	✓	• Previous iteration would have required design exceptions to account for slope and sight distances. • Recent review of the previous iterations has concluded that, even with design exceptions, it cannot be engineered as previously presented and any option that seeks to cross the rail line and Skiffes Creek and tie directly into the two roads is considered infeasible.

Skiffes Creek Connector Study EA – Reviewing a Range of Alternatives

(Updates since 2/14/18 are highlighted in green)

Option #	Description	Recommendation	Purpose and Need Statement:	How the Option Addresses Need Elements of Purpose:			Notes
			…to create efficient local connectivity between US 60 and VA 143, in the area between VA-199 and VA 238, in a manner that improves safety, emergency evacuation, and the movement of goods along the two primary roadways.	*Improve local connectivity*	*Provide efficient connectivity for local truck movement*	*Emergency evacuation*	
5	Option 5 begins at the southern terminus of Green Mount Parkway, proceeds in a northeasterly direction, bridges over Skiffes Creek Reservoir, US 60, the CSXT railroad, and I-64, then connects with VA 143 across from the Yorktown Naval Weapons Station, approximately 1,400 feet from Gate 3 at Longfellow Road.	Do Not Retain	The connection at US 60 provides a safe and efficient connection at the existing Green Mount Parkway intersection. By utilizing a portion of existing Green Mount Parkway to make the connection, it forces local and regional travelers to use what is, in practice, an industrial access road. This traffic would mix with trucks entering/exiting O/D locations along the road. This would not support the efficient movement of traffic and, in some instances, could create safety concerns. The connection made at VA 143 is east of the primary study area. This location is not efficient for travelers attempting to move within the primary study area and/or traveling west from the primary study area.	X	X	✓	• Variations of this alignment that could impact U.S. Navy property were not considered.
6	Option 6 improves the existing intersection of US 60 and VA 238 by creating a grade separation, elevating (bridging) VA 238 over the CSXT railroad.	Do Not Retain	The option would improve existing connectivity but not in the "efficient" manner specified in the Purpose Statement. Located at the far eastern end of the study area, it would not provide an efficient connection for vehicles traveling west or seeking to travel within the preliminary study area. It also would not provide efficient connectivity for local trucks. Connectivity between evacuation routes would not be improved.	X	X	X	• The preliminary layout illustrates a number of impacts to properties listed on or eligible for listing on the National Register of Historic Places. • Impacts to these properties would require an alternatives analysis under Section 106 of the National Historic Preservation Act. • The other options recommended to be retained represent this analysis.
7	Option 7 responds to comments received during the 2/14/18 meeting asking how Option 1 would function if it was split in a "Y" to provide east- and west-bound based connections to VA 143	Do Not Retain	Option 7 is located approximately halfway between the existing connections from US 60 to VA 143, providing an efficient connection for local traffic, trucks, and emergency evacuation. As the road is a proposed two-lane facility, the merging/diverging of traffic at the "Y" would either create congestion and safety concerns or require a traffic signal. In either case, the connection would occur at the base of the incline to get over the railroad tracks. Forcing trucks to slow down or come to a halt at this location would reduce the efficiency of the connection for large trucks, as well as small vehicles that would be traveling behind them as they attempted to get up to speed. These conditions would also create the same concerns if the road was open to two-way traffic during an evacuation.	✓	X	X	• The option is similar to Option 1 and Option 2, but with o increased cost (two bridges over the railroad and more roadway), o increased logistics (coordination with the railroad for two crossings and bridging/fill in the reservoir), and o increased safety concerns • Given these shortcomings and the similarity to other alternatives, it is not recommended to be retained

Skiffes Creek Connector Study EA – Reviewing a Range of Alternatives

(Updates since 2/14/18 are highlighted in green)

Option #	Description	Recommendation	Purpose and Need Statement:	How the Option Addresses Need Elements of Purpose:			Notes
			…to create efficient local connectivity between US 60 and VA 143, in the area between VA-199 and VA 238, in a manner that improves safety, emergency evacuation, and the movement of goods along the two primary roadways.	*Improve local connectivity*	*Provide efficient connectivity for local truck movement*	*Emergency evacuation*	
8	Option 8 responds to comments received during the 2/14/18 meeting asking if shifting the alignment elsewhere in the corridor could avoid the grade issues associated with Option 4. East of the proposed location, the railroad sits adjacent to US 60. This does not provide enough space to achieve the elevation required to clear the railroad. Likewise, in the western end of the corridor, the railroad sits adjacent to VA 143, creating similar challenges. The proposed configurations show the most reasonable way to stretch out Option 4 to reduce grades. Even at this location, the grades would be steep enough to result in issues similar to those anticipated in Option 4.	Do Not Retain	Option 8 is located approximately halfway between the existing connections from US 60 to VA 143. The location, however, does not provide the same efficiency as the other alternatives as the required grade would be so steep it would most likely be avoided by trucks and some personal vehicles. If a truck attempted to travel on these grades, it would slow any traffic down behind it, further reducing the efficiency of the connection. The facility could serve as a connection in an evacuation.	X	X	✓	• Like Option 4, VDOT does not recommend retaining/analyzing an option that, if constructed, would be unusable by the large truck volumes that are experienced in the study corridor.
9	Option 9 attempts to document a public comment suggesting, "Why not try to take over old railroad track although more impact." Based on this input the layout developed is similar to Option 2 but shifted slightly further west with a wider curve to connect to VA 143	Do Not Retain	The proposed location is west of the preliminary study area, encountering some of the issues discussed on Page 4 of this document. As it is not too far west, it could still enhance local connectivity. The distance from the truck O/D locations does not provide efficient connectivity for local truck movement, as eastbound trucks would have to travel west, through the neighborhoods, before making the new connection. As previously discussed, there are safety issues with trucks traveling through these neighborhood areas. The facility could serve as a connection in an evacuation.	✓	X	✓	• Coordination with James City County has determined that the "old" rail line is currently not in use but is not abandoned. The County's land use plans for industrial growth in the area assume this line would become active in the future and are not in favor of impacting/losing this rail line. • **As this is not an abandoned rail line, the suggestion was found to be infeasible.**
10	Transportation System Management (TSM) / Transportation Demand Management (TDM). Possible TSM/TDM opportunities for the Skiffes Creek corridor could include the optimization of traffic signal timing and other signalized arterials in the study area, and or pursuing strategies to better coordinate traffic signals such as adaptive signal control.	Do Not Retain	As stand-alone options, these strategies would not meet the Purpose and Need for the study.	X	X	X	• The NEPA process does not preclude this from being implemented as part of a preferred alternative or as a separate project in the future.
11	Mass Transit Improvements. Mass Transit improvements could include additional bus services (new buses, stops, and lines).	Do Not Retain	As stand-alone options, these strategies would not meet the Purpose and Need for the study.	X	X	X	• The NEPA process does not preclude this from being implemented as part of a preferred alternative or as a separate project in the future.
12	Bicycle/Pedestrian Improvements. Bicycle/Pedestrian improvements could include sidewalk enhancements, new multi-use paths and trail systems, designated bicycle lanes, and shared roadways signed as bicycle routes.	Do Not Retain	As stand-alone options, these strategies would not meet the Purpose and Need for the study.	X	X	X	• The NEPA process does not preclude this from being implemented as part of a preferred alternative or as a separate project in the future.

Skiffes Creek Connector Study EA – Reviewing a Range of Alternatives

(Updates since 2/14/18 are highlighted in green)

Other Considerations							
NA	Options to develop alignments between the existing I-64 and VA 199 ramps and the preliminary study area.	Do Not Retain	Moving west of the preliminary study area, options to connect US 60 and VA 143 would not provide an efficient or safe connection. The location would not efficiently service eastbound travelers and would draw additional truck traffic into the residential community. Not only would this fail to improve local connectivity and increase safety concerns on the corridor, it would not provide an efficient connection to truck O/Ds.	X	X	✓	• Preliminary analysis indicates that a number of the communities that could be impacted by such an alignment may be environmental justice communities. • Costs for such an alignment would increase exponentially as increased relocations and sound wall requirements would be expected.
NA	Options to develop alignments between VA 238 (Yorktown Road) and the preliminary study area.	Do Not Retain	Moving east of the preliminary study area, options to connect US 60 and VA 143 would not provide an efficient connection. The location would not efficiently service westbound travelers. Not only would this fail to improve local connectivity, it would not provide an efficient connection to truck O/Ds.	X	X	✓	• Options east of the reservoirs would result in Section 106 impacts similar to those described for Option 6.

Appendix B: Design Criteria

Skiffes Creek
Design Criteria (DRAFT)
Urban Minor Arterial Street System (GS-6)

ROADWAY DESIGN	LEVEL OF SERVICE (LOS) GOAL	**TBD**
	DESIGN SPEED	35 MPH
	LANE WIDTHS[1]	12'-0" Travel Lanes
	CURB & GUTTER[1]	CG-6
	BUFFER STRIP[2]	4' Minimum
	SIDEWALK	5'Concrete
	TRAVEL WAY CROSS SLOPES (NORMAL CROWN OR SUPERELEVATED) [1]	Minimum
		2.0%
		Maximum
		4.0%
	BRIDGE WIDTHS	Match Approach Lanes
	VERTICAL GRADES (Minimum)	0.50%
	VERTICAL GRADES (Maximum)[3]	7.0%
	VERTICAL CLEARANCE[4]	Minimum
		16'-6"
	HORIZONTAL CURVATURE[1]	Minimum Radius = 373'
	VERTICAL CURVATURE[5]	Crest:
		K_{min} = 29
		Sag:
		K_{min}=49
	SIGHT DISTANCE[1]	Stopping Sight Distance
		250'
	CLEAR ZONE WIDTHS[6]	Minimum = 14'
	SIDE SLOPES (Desired)	1V:6H or Flatter
	SIDE SLOPES (Minimum) [1]	1V:2H

1. VDOT Road Design Manual Standard Appendix A, GS-6
2. VDOT Road Design Manual Standard Appendix A, Section A-5, pg. A-168.
3. Based on Level Terrain. AASHTO Table 7-4, pg. 7-29.
4. VDOT Manuals of the Structure and Bridge Division, Geometrics Road Classifications Freeways (Rural or Urban), File No. 06.02-1.
5. 2011 AASHTO Green Book, Table 3-34, pg. 3-155 and 3-36, pg. 3-161
6. VDOT Road Design Manual Standard Appendix A Table A-2-1

Appendix C: VDOT Project Cost Estimating System

Hampton Roads
Skiffes Creek Connector
Build Alternative 1

	Cost
Preliminary Engineering	$1,816,220
Construction (excluding bridges)	$17,237,443
Right of Way	$2,200,164
Utilities x 30%	$8,749,000
Bridges	$5,560,000
Contingency for PE and CN (25%)	$6,153,416
Total	$41,716,243

SAY $41,700,000

Project Cost Estimating System

SUMMARY PAGE

DISTRICT	HAMPTON ROADS		
PROJECT NUMBER	60047627		
CONSTRUCTION END YEAR	FY2023	UPC	100200
AD YEAR	FY2021	RATE OF INFLATION TO AD	7.79%
ESTIMATE YEAR	FY2018	INFLATION RATE DURING CN	N/A
Date of previous estimate	04/11/18		
PROJECT MANAGER / DESIGNER	Wali.Zaman		
Preliminary Engineering Estimate:	PCES		
Construction Estimate:	PCES		
Right-of-Way Estimate:	PCES		
Utilities Estimate:	PCES		
DATE	*5/24/2018*		

THE FOLLOWING DATA WILL BE PROVIDED UPON COMPLETION OF THE REMAINDER OF THE WORKBOOK, WHICH IS ACCESSED BY SELECTING THE CONST, RW, & UTIL TABS BELOW

Bridge PE ESTIMATE	*$0*
Bridge CN ESTIMATE	*$0*
Bridge RW ESTIMATE	*$0*
PRELIMINARY ENGINEERING ESTIMATE (excluding Bridge PE)	*$1,816,220*
CONSTRUCTION ESTIMATE (excluding Bridge CN)	*$22,702,748*
RIGHT-OF-WAY & UTILITIES ESTIMATE(excluding Bridge RW)	*$2,200,164*
TOTAL PROJECT ESTIMATE (excluding Bridge estimate)	*$26,719,132*

Revised 01/10/18

Estimate Class: Blank

Version 7.10

UPC: 100200

Project Cost Estimating System
CONSTRUCTION / BRIDGE / PE

Project No. 60047627

Interstate Project ?	No	No	
Route Number	SCC	143/60	Urban or Other

	CONST-1	CONST-2	Total
Geometric Standard	GS-6	GS-2	
Construction Base	$18,285,986	$435,090	$18,721,076
Bridge Removal			$0
CE	$2,340,135		$2,340,135
Construction Estimate (2018)	$21,061,211		$21,061,211
To AdYear Inflation			$1,641,537
Mid-point construction Inflation			$0
Total Construction Estimate			$22,702,748
Preliminary Engineering Cost	$1,816,220		$1,816,220

CONSTRUCTION & PE TOTALS

Total Construction Estimate (Roadway plus Bridge)	*$22,702,748*	***PCES***
Total Preliminary Engineering Estimate (Roadway plus Bridge)	*$1,816,220*	***PCES***

Virginia Department of Transportation 2005

Today's Date: **05/24/18**

Version 7.10

UPC: 100200

Project Cost Estimating System
CONSTRUCTION / BRIDGE / PE

Project No.	60047627			
Interstate Project ?	No	*		
Maintenance Project ?	No	*		
Route Number	SCC	*	Urban or Other	
Geometric Standard	GS-6	*	Urban Minor Arterial Street System	
Ad Date	2021		Design Year =	2043
Design Year ADT		*	Project Terrain	Level
OR				
Current (Recent) ADT		*		
Enter Design Speed (MPH) (30, 40, 45, 50 or 60)	40	*	Minimum Design Speed =	
Box Must Be Empty				
Box Must Be Empty				
Project Length (mi.)	0.86	*	*Number of Additional Lanes:*	*Length of Add'l. Lanes (mi.):*
Total Length -Adding or Building Two Lanes (mi.)	0.86	*	*None*	
Total Length - Adding or Building Four Lanes (mi.)		*	*None*	
Total Length - Building Ramps and Loops (mi.)		*	*None*	
Shoulder or Curb & Gutter ? (Select S or C&G)	C&G	*	Enter Lane Width (ft) >	12
Median Type - Graded, Raised, or None ?	N	*	Normal Lane Width(ft)	11
Number of Crossovers (Divided Highways ONLY)		*		
Length - Curb & Gutter - Left PLUS Right Side (ft.)	8,260			
Length - Sidewalk - Left PLUS Right Side (ft.)		*		
Bike / Pedestrian Type	None			
Total Length - Raised Median (ft.)				
Number of Right Turn Lanes - Left PLUS Right Side	2	*		
Number of Left Turn Lanes - (Undivided Only)	2	*		

HAMPTON ROADS Cost Factor used

110%

Construction Costs

Signals, ITS, Signs and Lighting Costs*	$945,910	Base #1 (PCES)	*$18,285,986*
Cost of Large Drainage Structures	*$4,000,000*	Base #2	*$435,090*
In-Plan Utility Costs*	*$7,403,000*	Enter Const CE Cost >	*$0*
Adjustment for Unusual Construction Costs	*$0*	CE (12.5%)	*$2,340,135*
** Totals include district factor calculations*		Estimate (2018)	*$21,061,211*

Additional (or Unusual) P. E. Costs			
Select % of PE to be performed by Consultants		PE Cost (PCES)	***$1,816,220***

Note: Do Not Include Bridge P. E. Costs Here

Roadway P. E. / Roadway Const. = 8.0%

Revised 01/10/18

Today's Date: **05/24/18**

Version 7.10

UPC: 100200

Project Cost Estimating System
CONSTRUCTION / BRIDGE / PE

Project No.	60047627			
Interstate Project ?	No	*		
Route Number	143/60	*	Urban or Other	
Geometric Standard	GS-2	*	Rural Minor Arterial System	
Ad Date	2021		Design Year =	2043
Design Year ADT		*	Project Terrain	Level
OR				
Current (Recent) ADT		*		
			Minimum	
Enter Design Speed (MPH) (Enter 50 or 60)	50	*	Design Speed =	
Box Must Be Empty				
Box Must Be Empty				
Project Length (mi.)	0.38	*	*Number of Additional Lanes:*	*Length of Add'l. Lanes (mi.):*
Total Length -Adding or Building Two Lanes (mi.)		*	*+ One Add'l. Lane*	*0.38*
Total Length - Adding or Building Four Lanes (mi.)		*	*None*	
Total Length - Building Ramps and Loops (mi.)		*	*None*	
Shoulder or Curb & Gutter ? (Select S or C&G)	S	*	Enter Lane Width (ft.)	*12.00*
Median Type - Graded, Raised, or None ?	R	*	Normal Lane Width (ft.)	12
Number of Crossovers(Divided Highways ONLY)		*		
Length - Curb & Gutter - Left PLUS Right Side (ft.)				
Length - Sidewalk - Left PLUS Right Side (ft.)		*		
Bike / Pedestrian Type	None			
Total Length - Raised Median (ft.)	800			
Number of Right Turn Lanes - Left PLUS Right Side		*		
Number of Left Turn Lanes - (Undivided Only)		*		

Construction Costs

Base #2	*$435,090*

Revised 01/10/18

Today's Date: **05/24/18**

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Project Cost Estimating System
Miscellaneous Cost Estimates

COST OF LARGE DRAINAGE STRUCTURES

Job#	Description	Cost ()
	Large Drainage Structures for Wetlands	$1,000,000
	SWM	$3,000,000
		$4,000,000

ADJUSTMENT FOR UNUSUAL CONSTRUCTION COSTS

Type	Description	Cost ()
		$0

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SIGNALS, ITS, SIGNS and LIGHTING COST WORKSHEET

Stand Alone Traffic Project:	No

UPC: 100200

SIGNALS

Permanent Signals

	Location/Description	New/ Mod.	Intersection Type	Major Direction	Major Lanes	Major Direction	Major Lanes	Cross Direction	Cross Lanes	Cross Direction	Cross Lanes	Poles	Detection	Pre-emption	Cost
1	Intersection US60	Mod.	Four-way	East	1	West	1	North	1	South	1	Mast Arm	Video	Yes	$100,756
2	Intersection VA143	New	Tee	East	1	West	1	North	1	South	1	Mast Arm	Video	Yes	$160,619
3															$0
4															$0
5															$0
6															$0
7															$0
8															$0
9															$0
10															$0

	Quantity	Cost
Temporary Signals - New Equipment		$0
Temporary Signals - Modified Equipment		$0

		Location/Description	Cost
MISCELLANEOUS	1		
SIGNAL WORK	2		

Signals Construction Subtotal $261,375

ITS

		Location/Description	Cost
ITS WORK	1		
	2		

ITS Construction Subtotal $0

MAJOR SIGN STRUCTURES

	Type of Sign	Comment	Quantity	Unit	Lighted Y/N	Cost/Sign	Extended Cost
1	Cantilever		1	Ea.	No	59,961	$59,961
2				Ea.			
3				Ea.			
4				Ea.			
5				Ea.			
6				Ea.			
7				Ea.			

		Location/Description	Cost
MISCELLANEOUS	1		
SIGN WORK	2		

Signs Construction Subtotal $59,961

LIGHTING

Continuous Roadway

	Urban Type of Lighting	Comments	No. Lanes	Number of Miles	Cost
1	Conventional		2	0.86	$538,582

	Freeway Type of Lighting	Comments	No. Lanes	Number of Miles	Cost
1					$0

Interchange

	Interchange Type	Type of Lighting	Number of Interchanges	Cost
1				$0
2				$0
3				$0

Miscellaneous

	Location/Description	Cost
1		
2		

Lighting Construction Subtotal $538,582

CONSTRUCTION TOTAL $859,918

District factor will be applied when the total cost is passed to the const-1 worksheet

PROJECT COMMENTS

Prepared by: Date Prepared/Modified:

Version 7.10

UPC: 100200

Project Cost Estimating System
RIGHT-OF-WAY ESTIMATE

Project No.: *60047627*

VDOT Construction District : *HAMPTON ROADS* *# 5*

Select Project Area Real Estate Costs : Well Below Average

Define Project Land Use Characteristics :

Agricultural :	20%
Residential :	20%
Industrial :	20%
Commercial :	40%
	100%

Instructions: Please fill-in all applicable White Boxes or make a choice from the Drop-down Lists

Enter the Approximate Number of Parcels on the Project : 7

1. LAND VALUE

Prop. Right-of-Way

Total Right-of-Way Project Length (ML + Connections)	6,560	ft	*Computed RW Cost per sq ft =*	*$1.27*
Average width of Existing RW	0	ft	Enter Right-of-Way Estimator's Right-of-Way Cost per sq ft :	
Average width of Proposed RW	140	ft		
Total area of all additional Prop. Right-of-Way	10,000	sf	Enter total sq ft (override calculation):	
			928,400 sq ft = 21.313 Ac.	
Approx. % of Prop. CL within	70	ft	of Exist. CL	0%
Approx. % of Prop. CL between	70	ft	& 70 ft of Exist. CL	0%
Approx. % of Prop. CL greater than	70	ft	from Exist. CL	100%

Temp. Ease.

Average Width of parallel Temporary Easements Left	10	ft	*Comp. Temp. Ease. Cost / sq ft =*	*$0.32*
Total Length of parallel Temporary Easements Left	6,560	ft	Enter Right-of-Way Estimator's Temp. Ease. Cost per sq ft :	
Average Width of parallel Temporary Easements Right	10	ft		
Total Length of parallel Temporary Easements Right	6,560	ft	Enter total sq ft (override calculation):	
			131,200 sq ft = 3.012 Ac.	

Perm. & Util. Ease.

Total Area of All Replacement Utility Easements	10,000	sf	*Comp. Utility Ease. Cost / sq ft =*	*$0.51*
AND Select % of RW Cost for Util. Ease.	40%		RW Est's. Utility Ease. Cost per sq ft :	
			10,000 sq ft = 0.230 Ac.	
This Box Must Be Empty >		ea	*Comp. Perm. Ease. Cost / sq ft =*	*$1.02*
			RW Est's. Perm. Ease. Cost per sq ft :	
Total area of All Permanent Easements	10,000	sf	10,000 sq ft = 0.230 Ac.	

COST OF LAND (Item # 1) ***$1,235,021***

2. BUILDING VALUE

Based upon comparison to similar, occupied **Residential Dwellings** in the Project Area, enter the Number of:

		Computed:
A. Low Cost Residential Dwellings :		*$0*
B. Moderately Low Cost Dwellings :		*$0*
C. Average Cost Residential Dwellings :		*$0*
D. Moderately High Cost Dwellings :		*$0*
E. High Cost Residential Dwellings :		*$0*
Computed Total Residential Dwelling Costs :		***$0***
Estimator's Total Residential Dwelling Costs :		

Enter the total estimated cost of ALL **COMMERCIAL & INDUSTRIAL BUILDINGS** to be taken:

Note: No Computed Costs Available. Use User Defined Costs Below:

Estimator's Total Commercial / Industrial Buildings Costs : **$0**

3. OTHER IMPROVEMENTS

Enter the estimated cost of ALL OTHER IMPROVEMENTS on the Project:

Computed Total Other Improvements Costs :	***$123,502***
Estimator's Total Other Improvements Costs :	

4. DAMAGES

Anticipated % of Parcels Affected by Damages to Remainder :	100%
Anticipated Relative Cost Impact of Damages to Remainder :	Moderate
Approximate Number of Parcels Affected :	7
Computed Cost of Damages to Remainder :	***$182,525***
Estimator's Total Cost of Damages to Remainder :	

TOTAL ACQUISITIONS (Items # 1 - 4) ***$1,541,048***

5. ADMINISTRATIVE SETTLEMENTS

Anticipated % of Parcels Affected by Administrative Settlements :	80%
Anticipated Relative Cost Impact of Administrative Settlements :	Moderately Low
Approximate Number of Parcels Affected :	6
Computed Cost of Administrative Settlements :	*$78,225*
Estimator's Total Cost of Administrative Settlements :	

6. CONDEMNATION INCREASES

Anticipated % of Parcels Affected by Condemnation Increases :	20%
Anticipated Relative Cost Impact of Condemnation Increases :	Moderate
Approximate Number of Parcels Affected :	2
Computed Cost of Condemnation Increases :	*$70,403*
Estimator's Total Cost of Condemnation Increases :	

7. ADMINISTRATIVE COSTS & INCIDENTAL EXPENSES

Anticipated Relative Cost Impact of Admin. Costs & Incidental Expenses :	Moderate
Computed Administrative Costs & Incidental Expenses :	*$20,991*
Estimator's Total Administrative Costs & Incidental Expenses :	

8. DEMOLITION CONTRACTS

Anticipated Relative Cost Impact of Demolition Contracts :	Moderately Low
Computed Costs of Demolition Contracts :	*$1,827*
Estimator's Total Cost of Demolition Contracts :	

9. HAZARDOUS MATERIALS REMOVAL

Anticipated Number of Demolished Buildings Requiring Asbestos Removal :	
Anticipated Relative Cost of Asbestos Removal from Demolished Buildings :	
Anticipated Number of Other Hazardous Materials Removal Sites :	2
Anticipated Relative Cost Impact of Other Hazardous Materials Removal :	Moderate
Computed Cost of Hazardous Materials Removal :	*$187,740*
Estimator's Total Costs of Hazardous Materials Removal :	

10. PROPERTY MANAGEMENT

Anticipated Relative Cost Impact of Property Management :	Moderate
Computed Costs of Property Management :	*$350*
Estimator's Total Cost of Property Management :	

TOTAL OTHER ITEMS (Items # 5 - 10) ***$359,536***

11. RELOCATION ASSISTANCE

Residential Relocation Costs:

Anticipated Relative Cost Impact of Residential Relocation Expenses :	Very Low
Computed Residential Relocation Costs :	*$0*
Estimator's Total Residential Relocation Costs :	

Commercial Relocation Costs:

Note: No Computed Costs Available. Use User Defined Costs Below:	
Estimator's Total Comm/Indust Relocation Costs :	

Total Displacements:	0	Farms:	0
Families:	0	Non-Profit:	0
Businesses:	0	Personal Property Only:	0

TOTAL RELOCATION ASSISTANCE (Item # 11) ***$0***

12. YEAR OF RIGHT-OF-WAY AUTHORIZATION	FY2021	FY2021
13. MANUAL INFLATION RATE		5.00%

		Today's Cost	Factor	Inflated Cost
SUB-TOTAL RIGHT-OF-WAY COSTS		$1,900,584	15.76%	$2,200,164
UTILITY COSTS TO RIGHT-OF-WAY PROJECT *	(PCES)	$0	7.79%	$0
TOTAL RIGHT-OF-WAY COSTS	(PCES)	$1,900,584		$2,200,164

* Utility Data display requires completion of Utilities Estimate Worksheet (tab below)

COMMENTS:

RW-238 Data :

Right-of-Way Estimate Date :

Based on Approved / Unapproved Plans ? :

Participating Cost / Non-Participating Cost ? :

Today's Date : **05/24/18**

Revised 01/10/18

Version 7.10

UPC: 100200

Project Cost Estimating System
UTILITIES ESTIMATE

Project No.: *60047627*

A. ELECTRICAL

Transmission

	Computed or User	RW or Const	Type of Pole	No Entry Required	Number of Poles	Rural or Urban	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	Const	Wood		0	Rural	100%	$0	$0	$0
B	Computed	RW				Rural	100%	$0	$0	$0
C	Computed	RW				Rural	100%	$0	$0	$0
D	Computed	RW				Rural	100%	$0	$0	$0
								$0	$0	$0

Distribution - Aerial

	Computed or User	RW or Const	Type of Pole	No Entry Required	Number of Poles	Rural or Urban	Percent VDOT	Total Cost	to RW Project	to Const Project
E	Computed	RW				Rural	100%	$0	$0	$0
F	Computed	RW				Rural	100%	$0	$0	$0
G	Computed	RW				Rural	100%	$0	$0	$0
H	Computed	RW				Rural	100%	$0	$0	$0
I	Computed	RW				Rural	100%	$0	$0	$0
J	Computed	RW				Rural	100%	$0	$0	$0
								$0	$0	$0

Distribution - Underground - by Linear Foot

	Computed or User	RW or Const	Type of Service	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
K	Computed	RW				100%	$0	$0	$0
L	Computed	RW				100%	$0	$0	$0
M	Computed	RW				100%	$0	$0	$0
N	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Distribution - Underground - by Pole Equivalent

	Computed or User	RW or Const	Equivalent Type of Pole	No Entry Required	Equiv. # of Poles	Percent VDOT	Total Cost	to RW Project	to Const Project
O	Computed	RW				100%	$0	$0	$0
P	Computed	RW				100%	$0	$0	$0
Q	Computed	RW				100%	$0	$0	$0
R	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Distribution - Conduit for Underground Electrical

	Computed or User	RW or Const	Type of Service	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
S	Computed	RW				100%	$0	$0	$0
T	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Distribution - Underground - Manholes

	Computed or User	RW or Const	Size / Price Range of Manhole	No Entry Required	Number of MH's	Percent VDOT	Total Cost	to RW Project	to Const Project
U	Computed	RW				100%	$0	$0	$0
V	Computed	RW				100%	$0	$0	$0
W	Computed	RW				100%	$0	$0	$0
X	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Misc. Electrical Costs

Y	Misc. Electrical Costs Charged to RW Project:	
Z	Misc. Electrical Costs Charged to Const. Project:	$6,140,000

TOTAL ELECTRICAL	Total to RW Proj	Total to Const Proj
$6,140,000	$0	$6,140,000

B. TELEPHONE

Aerial - Copper Wire

	Computed or User	RW or Const	Type of Cable (Pair Cable)	No Entry Required	Number of Poles	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	RW				100%	$0	$0	$0
B	Computed	RW				100%	$0	$0	$0
C	Computed	RW				100%	$0	$0	$0
D	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Aerial - Fiber Optic

	Computed or User	RW or Const	Type of Cable (Optical Fiber)	No Entry Required	Number of Poles	Percent VDOT	Total Cost	to RW Project	to Const Project
E	Computed	RW				100%	$0	$0	$0
F	Computed	RW				100%	$0	$0	$0
G	Computed	RW				100%	$0	$0	$0
H	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Underground - Copper Wire

	Computed or User	RW or Const	Type of Cable (Pair Cable)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
I	Computed	Const	200		0	100%	$0	$0	$0
J	Computed	RW				100%	$0	$0	$0
K	Computed	RW				100%	$0	$0	$0
L	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Underground - Fiber Optic

	Computed or User	RW or Const	Type of Cable (Optical Fiber)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
M	Computed	Const	144		0	100%	$0	$0	$0
N	Computed	RW				100%	$0	$0	$0
O	Computed	RW				100%	$0	$0	$0
P	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Underground - Copper Wire - In Conduit

	Computed or User	RW or Const	Type of Cable (Pair Cable)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
Q	Computed	RW				100%	$0	$0	$0
R	Computed	RW				100%	$0	$0	$0
S	Computed	RW				100%	$0	$0	$0
T	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Underground - Fiber Optic - In Conduit

	Computed or User	RW or Const	Type of Cable (Optical Fiber)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
U	Computed	RW				100%	$0	$0	$0
V	Computed	RW				100%	$0	$0	$0
W	Computed	RW				100%	$0	$0	$0
X	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Manholes for UG Telephone Service

	Computed or User	RW or Const	Item	No Entry Required	Quantity	Percent VDOT	Total Cost	to RW Project	to Const Project
Y	Computed	RW	Telephone Manhole			100%	$0	$0	$0
Z	Computed	RW	Telephone Manhole			100%	$0	$0	$0

Misc. Telephone Costs

AA	Misc. Telephone Costs Charged to RW Project:	
BB	Misc. Telephone Costs Charged to Const. Project:	$140,000

TOTAL TELEPHONE	Total to RW Proj	Total to Const Proj
$140,000	$0	$140,000

C. CATV

Aerial CATV

	Computed or User	RW or Const	Type of Service	No Entry Required	Number of Pole Att'mnts	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	RW				100%	$0	$0	$0
B	Computed	RW				100%	$0	$0	$0
C	Computed	RW				100%	$0	$0	$0
D	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Underground CATV

	Computed or User	RW or Const	Type of Service	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
E	Computed	Const	1.00 Coax		0	100%	$0	$0	$0
F	Computed	Const	18 Fiber		0	100%	$0	$0	$0
G	Computed	RW				100%	$0	$0	$0
H	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Power Units

	Computed or User	RW or Const	Item	No Entry Required	Quantity	Percent VDOT	Total Cost	to RW Project	to Const Project
I	Computed	RW	CATV Power Supply			100%	$0	$0	$0
J	Computed	RW	CATV Power Supply			100%	$0	$0	$0

Misc. CATV Costs

Misc. CATV Costs Charged to RW Project:

Misc. CATV Costs Charged to Const. Project: **$20,000**

TOTAL CATV	Total to RW Proj	Total to Const Proj
$20,000	$0	$20,000

D. WATER

Water Line

	Computed or User	RW or Const	Diameter of Water Pipe (in)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	Const	4		0	100%	$0	$0	$0
B	Computed	Const				100%	$0	$0	$0
C	Computed	Const				100%	$0	$0	$0
D	Computed	Const				100%	$0	$0	$0
							$0	$0	$0

Misc. Water Costs

E Misc. Water Costs Charged to Const. Project: **$180,000**

F Misc. Water Costs Charged to RW Project:

TOTAL WATER	Total to RW Proj	Total to Const Proj
$180,000	$0	$180,000

E. SANITARY SEWER

Sewer Line

	Computed or User	RW or Const	Diameter of Sewer Pipe (in)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	Const	12		0	100%	$0	$0	$0
B	Computed	Const				100%	$0	$0	$0
C	Computed	Const				100%	$0	$0	$0
D	Computed	Const				100%	$0	$0	$0
							$0	$0	$0

Misc. Sewer Costs

E Misc. Sewer Costs Charged to Const. Project: **$60,000**

F Misc. Sewer Costs Charged to RW Project:

TOTAL SEWER	Total to RW Proj	Total to Const Proj
$60,000	$0	$60,000

F. NATURAL GAS / PROPANE

Distribution

	Computed or User	RW or Const	Diameter of Gas Line (in)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	Const	4		0	100%	$0	$0	$0
B	Computed	RW				100%	$0	$0	$0
C	Computed	RW				100%	$0	$0	$0
D	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Transmission

	Computed or User	RW or Const	Diameter of Gas Line (in)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
E	Computed	Const	10		0	100%	$0	$0	$0
F	Computed	RW				100%	$0	$0	$0
G	Computed	RW				100%	$0	$0	$0
H	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Misc. Natural Gas / Propane Costs

			TOTAL GAS / PROPANE	Total to RW Proj	Total to Const Proj
I	Misc. Gas / Pro Costs Charged to RW Project:		$190,000	$0	$190,000
J	Misc. Gas / Pro Costs Charged to Const. Project:	$190,000			

G. PETROLEUM

Transmission

	Computed or User	RW or Const	Diameter of Gas Line (in)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	RW				100%	$0	$0	$0
B	Computed	RW				100%	$0	$0	$0
C	Computed	RW				100%	$0	$0	$0
D	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Misc. Petroleum Costs

			TOTAL PETROLEUM	Total to RW Proj	Total to Const Proj
E	Misc. Petroleum Costs Charged to RW Project:		$0	$0	$0
F	Misc. Petroleum Costs Charged to Const. Project:				

H. CELLULAR

Cellular Telephone Costs

			TOTAL CELLULAR	Total to RW Proj	Total to Const Proj
A	Total Cellular Costs Charged to RW Project:		$0	$0	$0
B	Total Cellular Costs Charged to Const. Project:				

I. ADDITIONAL COSTS

Additional Utility Costs to Right-of-Way Project :

Comments:

Additional Utility Costs to Construction Project :

Comments:

Additional Utility Costs to Utility Owners/Others :

Comments:

TOTAL UTILITY COST - RIGHT-OF-WAY PROJECT	$0
TOTAL UTILITY COST - CONSTRUCTION PROJECT	$6,730,000
TOTAL UTILITY COST - UTILITY OWNER / OTHERS	$0
GRAND TOTAL UTILITY COSTS (PCES)	$6,730,000

Version 7.10

PCES

BRIDGE MODULE

v 1.2 release date 1/16

INSTRUCTIONS

START PCES

V 1.1 release date 7/16

Project No =

Project =

Project Manager =

UPC =

District = Hampton Roads

No. Bridges = 2 *Maximum 15 bridges*

RUN

CLEAR ALL

RESET

ease date 1/16

Bridge No. 1

Bridge No.: | Fed. Str. ID: | Proj. No.:

Description: New Bridge over Skiffes Creek

Length = 260 ft. | Width = 48 ft. | 0 0 deg

BRIDGE CONSTRUCTION AND PRELIMINARY ENGINEERING COSTS SUMMARY

Estimate Created =		5/24/2018	
Ad Date =		10/15/2017	
Base Bridge Estimate =	$	2,156,000	
Sub-total Modifiers =	$	903,000	
Sub-total Base + Modifiers =	$	3,059,000	(A)
Base + Mod. (Adj'd District Modifier) =	$	3,059,000	
Aesthetics =	$	-	(B)
Bridge Construction Est. (PCES) =	$	3,059,000	(A +B)
Dismantle & Remove =	$	-	(C)
Mobilization =	$	183,000	(D)
Total Bridge Estimate (2018) =	$	3,242,000	(A + B + C + D)

USE

Legend:

xxxx	Denotes Input
xxx	Denotes Calculation
xxx	Denotes Explanatory Notes
xxx	Denotes Output
xxx	Denotes calculated value not included in total estimate

NEXT

SUMMARY

CLEAR SHEET

☑

PCES BRIDGE ESTIMATE
BRIDGE NO 1

		CALCULATED	OVER-RIDE	
denotes "YES"	**BASE BRIDGE EST.** =	$ 2,156,000	☐	
	SUB-TOTAL MODIFIERS (EXCLUDING Aesthetic Treatment) =	$ 903,000	+ $ -	
	SUB-TOTAL BASE + MODIFIERS =	$ 3,059,000		(A)
☐	**DISTRICT MODIFIER** =	1.00		
	SUB-TOTAL BASE + MODIFIERS (ADJUSTED FOR DISTRICT) =	$ 3,059,000		
	AESTHETICS: DO YOU ANTICIPATE THE USE OF AESTHETIC TREATMENTS?	$ -	$ -	(B)
	BRIDGE CONSTRUCTION ESTIMATE =	$ 3,059,000		(A + B)
	DISMANTLE & REMOVE: (adj'd for Dist. Mod.) DO YOU NEED TO DISMANTLE & REMOVE AN EXISTING STRUCTURE? L= 0 ft W= 0 ft	$ -	$ -	(C)
☐ ☑	**MOBILIZATION** based upon (A + B + C) =	$ 183,000	$ -	(D)
	TOTAL BRIDGE ESTIMATE =	$ 3,242,000		(A + B+ C + D)

BRIDGE MODIFIERS

		CALCULATED	OVER-RIDE
☐	**FOUNDATIONS**: DO YOU ANTICIPATE ANY OF THE FOLLOWING:	$ 699,000	$ -
	Are pre-boring or rock excavation anticipated?	$ -	
	Are drilled shafts or micropiles anticipated?	$ 699,000	
☐	**UTILITIES** DO YOU ANTICIPATE ANY OF THE FOLLOWING ATTACHMENTS TO THE BRIDGE?	$ -	$ -
	Gas lines	$ -	
	Water lines or Sewer lines	$ -	
☑	*Telephone conduits*	$ -	

Please note: this does not include conduits located in the deck or parapet.

REINFORCING: *(refer to Structure & Bridge II&M 81.5)*

☐ DO YOU ANTICIPATE THE USE OF CLASS III CRR IN THE DECK? — $ - | $ -

TEMPORARY SHEETING/SHORING:

☐ DO YOU ANTICIPATE ANY OF THE FOLLOWING: — $ - | $ -

The use of temporary sheet piles?
The use of temporary retaining structures?
The use of temporary shoring?

☑ **COFFERDAMS:**
DO YOU ANTICIPATE THE USE OF COFFERDAMS? — $ - | $ -

☐ *If anticipated, how many?* 0

CONSTRUCTION ACCESS:

DO YOU ANTICIPATE ANY OF THE FOLLOWING? — $ 144,000 | $ -

The use of a causeway?
A Construction Access bid item?
A temporary work bridge?

TOOTH EXPANSION JOINTS: *(refer to Vol. V Part 3; BEJ 6-10)*

☐ DO YOU ANTICIPATE THE USE OF A TOOTH EXPANSION JOINT? (Such as with a Virginia Abutment). — $ - | $ -

☐ *If anticipated, how many?* 0

VIRGINIA ABUTMENTS: *(refer to Vol. V Part 2; File 17-01.9)*

☐ DO YOU ANTICIPATE THE USE OF A VIRGINIA ABUTMENT? — $ - | $ -

If anticipated, how many? 0

☐ **APPROACH SLABS:** *(refer to Vol. V Part 3; BAS)*

DO YOU ANTICIPATE THE USE OF AN APPROACH SLAB? — $ 60,000 | $ -

☐ **RAISED SIDEWALKS/MEDIANS:**
DO YOU ANTICIPATE ANY OF THE FOLLOWING: — $ - | $ -

☐ *Sidewalks on the bridge?*
Raised median on the bridge?

If yes, enter:

TOTAL width ALL SIDEWALKS & MEDIANS (in feet) 0

☐ *AVG. HEIGHT of sidewalk/medians (in inches)* 0

☐ **DETOUR BRIDGE:**

☐ DO YOU ANTICIPATE THE USE OF A TEMPORARY DETOUR BRIDGE? — $ - | $ -

☐ **STAGED BRIDGE CONSTRUCTION:**
DO YOU ANTICIPATE STAGED BRIDGE CONSTRUCTION? — $ - | $ -

PEDESTRIAN FENCE: *(refer to Vol. V Part 3; BPF-3)*

PCES BRIDGE ESTIMATE
BRIDGE NO 1

DO YOU ANTICIPATE PEDESTRIAN FENCE?	$ -	$ -
Anticipated Length =	0	

CURVED BRIDGE:

DO YOU ANTICIPATE CURVED GIRDERS?	$ -	$ -

PREFABRICATED TRUSS:

DO YOU ANTICIPATE THE USE OF PREFABRICATED TRUSS(ES)?	$ -	$ -

ASPECT RATIO > 1.5:

MODIFIER NOT REQUIRED. YOUR CALCULATED ASPECT RATIO (W/L) OF THE BRIDGE <= 1.5	$ -

OTHER ITEMS NOT LISTED ABOVE:

DO YOU ANTICIPATE OTHER NON-STANDARD ITEMS, NOT LISTED ABOVE?

Description:	Roadway Approaches (Bridge only projects)		
Description:			
Description:			
Description:			
	SUB-TOTAL MODIFIERS	= $ 903,000	$ -

NOTE: *The following items and considerations are not considered:*

Special Structures (e.g. pump stations)
Culverts
Roadway lighting
Navigation lighting
Use of non-standard items not listed above
Fender System
Historic Structures
Environmental Factors
Difficult site access
Accelerated Bridge Construction Methods
Crash Walls
Pier Protection Systems

This list is not meant to be all-inclusive. If you anticipate an item not listed here-in, the PCES estimate should be adjusted accordingly with use of the OTHER ITEMS below.

ease date 1/16

Bridge No. 2

Bridge No.: | Fed. Str. ID: | Proj. No.:

Description: New Bridge over VA143

Length = 170 ft. | Width = 48 ft. | 0 deg

BRIDGE CONSTRUCTION AND PRELIMINARY ENGINEERING COSTS SUMMARY

Estimate Created =		5/24/2018	
Ad Date =		5/15/2016	
Base Bridge Estimate =	$	1,523,000	
Sub-total Modifiers =	$	656,000	
Sub-total Base + Modifiers =	$	2,179,000	(A)
Base + Mod. (Adj'd District Modifier) =	$	2,179,000	
Aesthetics =	$	-	(B)
Bridge Construction Est. (PCES) =	$	2,179,000	(A +B)
Dismantle & Remove =	$	-	(C)
Mobilization =	$	139,000	(D)
Total Bridge Estimate (2018) =	$	2,318,000	(A + B + C + D)

USE

Legend:

xxxx	Denotes Input
xxx	Denotes Calculation
xxx	Denotes Explanatory Notes
xxx	Denotes Output
xxx	Denotes calculated value not included in total estimate

NEXT

SUMMARY

CLEAR SHEET

☑

PCES BRIDGE ESTIMATE
BRIDGE NO 2

		CALCULATED	OVER-RIDE	
denotes "YES"	**BASE BRIDGE EST.** =	$ 1,523,000	☐	
	SUB-TOTAL MODIFIERS (EXCLUDING Aesthetic Treatment) =	$ 656,000	+ $ -	
	SUB-TOTAL BASE + MODIFIERS =	$ 2,179,000		(A)
☐	**DISTRICT MODIFIER** =	1.00		
	SUB-TOTAL BASE + MODIFIERS (ADJUSTED FOR DISTRICT) =	$ 2,179,000		
	AESTHETICS: DO YOU ANTICIPATE THE USE OF AESTHETIC TREATMENTS?	$ -	$ -	(B)
	BRIDGE CONSTRUCTION ESTIMATE =	$ 2,179,000		(A + B)
	DISMANTLE & REMOVE: (adj'd for Dist. Mod.) DO YOU NEED TO DISMANTLE & REMOVE AN EXISTING STRUCTURE? L= 0 ft W= 0 ft	$ -	$ -	(C)
☐ ☑	**MOBILIZATION** based upon (A + B + C) =	$ 139,000	$ -	(D)
	TOTAL BRIDGE ESTIMATE =	$ 2,318,000		(A + B+ C + D)

BRIDGE MODIFIERS

		CALCULATED	OVER-RIDE
☐	**FOUNDATIONS**: DO YOU ANTICIPATE ANY OF THE FOLLOWING:	$ 494,000	$ -
	Are pre-boring or rock excavation anticipated?	$ -	
	Are drilled shafts or micropiles anticipated?	$ 494,000	
☐	**UTILITIES** DO YOU ANTICIPATE ANY OF THE FOLLOWING ATTACHMENTS TO THE BRIDGE?	$ -	$ -
	Gas lines	$ -	
	Water lines or Sewer lines	$ -	
☑	*Telephone conduits*	$ -	

Please note: this does not include conduits located in the deck or parapet.

REINFORCING: *(refer to Structure & Bridge II&M 81.5)*

☐ DO YOU ANTICIPATE THE USE OF CLASS III CRR IN THE DECK? — $ - | $ -

TEMPORARY SHEETING/SHORING:

☐ DO YOU ANTICIPATE ANY OF THE FOLLOWING: — $ - | $ -

The use of temporary sheet piles?
The use of temporary retaining structures?
The use of temporary shoring?

☑ **COFFERDAMS:**
DO YOU ANTICIPATE THE USE OF COFFERDAMS? — $ - | $ -

☐ *If anticipated, how many?* 0

CONSTRUCTION ACCESS:

DO YOU ANTICIPATE ANY OF THE FOLLOWING? — $ 102,000 | $ -

The use of a causeway?
A Construction Access bid item?
A temporary work bridge?

TOOTH EXPANSION JOINTS: *(refer to Vol. V Part 3; BEJ 6-10)*

☐ DO YOU ANTICIPATE THE USE OF A TOOTH EXPANSION JOINT? (Such as with a Virginia Abutment). — $ - | $ -

☐ *If anticipated, how many?* 0

VIRGINIA ABUTMENTS: *(refer to Vol. V Part 2; File 17-01.9)*

☐ DO YOU ANTICIPATE THE USE OF A VIRGINIA ABUTMENT? — $ - | $ -

If anticipated, how many? 0

☐ **APPROACH SLABS:** *(refer to Vol. V Part 3; BAS)*

DO YOU ANTICIPATE THE USE OF AN APPROACH SLAB? — $ 60,000 | $ -

☐ **RAISED SIDEWALKS/MEDIANS:**

DO YOU ANTICIPATE ANY OF THE FOLLOWING: — $ - | $ -

☐ *Sidewalks on the bridge?*
Raised median on the bridge?

If yes, enter:

TOTAL width ALL SIDEWALKS & MEDIANS (in feet) 0

☐ *AVG. HEIGHT of sidewalk/medians (in inches)* 0

☐ **DETOUR BRIDGE:**

☐ DO YOU ANTICIPATE THE USE OF A TEMPORARY DETOUR BRIDGE? — $ - | $ -

☐ **STAGED BRIDGE CONSTRUCTION:**

DO YOU ANTICIPATE STAGED BRIDGE CONSTRUCTION? — $ - | $ -

PEDESTRIAN FENCE: *(refer to Vol. V Part 3; BPF-3)*

PCES BRIDGE ESTIMATE
BRIDGE NO 2

DO YOU ANTICIPATE PEDESTRIAN FENCE?	$ -	$ -
Anticipated Length =	0	

CURVED BRIDGE:

DO YOU ANTICIPATE CURVED GIRDERS?	$ -	$ -

PREFABRICATED TRUSS:

DO YOU ANTICIPATE THE USE OF PREFABRICATED TRUSS(ES)?	$ -	$ -

ASPECT RATIO > 1.5:

MODIFIER NOT REQUIRED. YOUR CALCULATED ASPECT RATIO (W/L) OF THE BRIDGE <= 1.5	$ -

OTHER ITEMS NOT LISTED ABOVE:

DO YOU ANTICIPATE OTHER NON-STANDARD ITEMS, NOT LISTED ABOVE?

Description:	Roadway Approaches (Bridge only projects)		
Description:			
Description:			
Description:			
	SUB-TOTAL MODIFIERS	= $ 656,000	$ -

NOTE: *The following items and considerations are not considered:*

Special Structures (e.g. pump stations)
Culverts
Roadway lighting
Navigation lighting
Use of non-standard items not listed above
Fender System
Historic Structures
Environmental Factors
Difficult site access
Accelerated Bridge Construction Methods
Crash Walls
Pier Protection System

This list is not meant to be all-inclusive. If you anticipate an item not listed here-in, the PCES estimate should be adjusted accordingly with use of the OTHER ITEMS below.

Proj. =

District = Hampton Roads UPC = Proj. Mgr. =

BRIDGE CONSTRUCTION COSTS SUMMARY

	Bridge Constr. Est. (PCES)	Unit Cost				
=	$ 3,242,000	$ 259.78	/SF	Fed. Str. ID =		Descr. = New Bridge over Skiffes Creek
=	$ 2,318,000	$ 284.07	/SF	Fed. Str. ID =		Descr. = New Bridge over VA143

Hampton Roads
Skiffes Creek Connector
Build Alternative 2

	Cost
Preliminary Engineering	$1,930,508
Construction (excluding bridges)	$18,660,942
Right of Way	$2,115,170
Utilities x 30%	$8,749,000
Bridges	$10,285,000
Contingency (25% for PE and CN)	$7,719,112.45
Total	$49,459,732

SAY $49,500,000

Project Cost Estimating System

SUMMARY PAGE

DISTRICT	HAMPTON ROADS		
PROJECT NUMBER	60047627		
CONSTRUCTION END YEAR	FY2023	UPC	100200
AD YEAR	FY2021	RATE OF INFLATION TO AD	7.79%
ESTIMATE YEAR	FY2018	INFLATION RATE DURING CN	N/A
Date of previous estimate	04/11/18		
PROJECT MANAGER / DESIGNER	Wali.Zaman		
Preliminary Engineering Estimate:	PCES		
Construction Estimate:	PCES		
Right-of-Way Estimate:	PCES		
Utilities Estimate:	PCES		
DATE	*5/24/2018*		

THE FOLLOWING DATA WILL BE PROVIDED UPON COMPLETION OF THE REMAINDER OF THE WORKBOOK, WHICH IS ACCESSED BY SELECTING THE CONST, RW, & UTIL TABS BELOW

Bridge PE ESTIMATE	*$0*
Bridge CN ESTIMATE	*$0*
Bridge RW ESTIMATE	*$0*
PRELIMINARY ENGINEERING ESTIMATE (excluding Bridge PE)	*$1,930,508*
CONSTRUCTION ESTIMATE (excluding Bridge CN)	*$24,131,347*
RIGHT-OF-WAY & UTILITIES ESTIMATE(excluding Bridge RW)	*$2,115,170*
TOTAL PROJECT ESTIMATE (excluding Bridge estimate)	*$28,177,025*

Revised 01/10/18

Estimate Class: Blank

Version 7.10

UPC: 100200

Project Cost Estimating System
CONSTRUCTION / BRIDGE / PE

Project No. 60047627

Interstate Project ?	No	No	
Route Number	143	143/60	Primary Highway

	CONST-1	CONST-2	Total
Geometric Standard	GS-6	GS-2	
Construction Base	$19,498,995	$400,129	$19,899,124
Bridge Removal			$0
CE	$2,487,390		$2,487,390
Construction Estimate (2018)	$22,386,514		$22,386,514
To AdYear Inflation			$1,744,833
Mid-point construction Inflation			$0
Total Construction Estimate			$24,131,347
Preliminary Engineering Cost	$1,930,508		$1,930,508

CONSTRUCTION & PE TOTALS

Total Construction Estimate (Roadway plus Bridge)	*$24,131,347*	***PCES***
Total Preliminary Engineering Estimate (Roadway plus Bridge)	*$1,930,508*	***PCES***

Virginia Department of Transportation 2005

Today's Date: **05/24/18**

Version 7.10

UPC: 100200

Project Cost Estimating System
CONSTRUCTION / BRIDGE / PE

Project No.	60047627			
Interstate Project ?	No	*		
Maintenance Project ?	No	*		
Route Number	143	*	Primary Highway	
Geometric Standard	GS-6	*	Urban Minor Arterial Street System	
Ad Date	2021		Design Year =	2043
Design Year ADT		*	Project Terrain	Level
OR				
Current (Recent) ADT		*		
Enter Design Speed (MPH) (30, 40, 45, 50 or 60)	40	*	Minimum Design Speed =	
Box Must Be Empty				
Box Must Be Empty				
Project Length (mi.)		*	*Number of Additional Lanes:*	*Length of Add'l. Lanes (mi.):*
Total Length -Adding or Building Two Lanes (mi.)	0.88	*	*None*	
Total Length - Adding or Building Four Lanes (mi.)		*	*None*	
Total Length - Building Ramps and Loops (mi.)		*	*None*	
Shoulder or Curb & Gutter ? (Select S or C&G)	C&G	*	Enter Lane Width (ft) >	12
Median Type - Graded, Raised, or None ?	N	*	Normal Lane Width(ft)	11
Number of Crossovers (Divided Highways ONLY)		*		
Length - Curb & Gutter - Left PLUS Right Side (ft.)	8,414			
Length - Sidewalk - Left PLUS Right Side (ft.)		*		
Bike / Pedestrian Type	None			
Total Length - Raised Median (ft.)				
Number of Right Turn Lanes - Left PLUS Right Side	2	*		
Number of Left Turn Lanes - (Undivided Only)	2	*		

HAMPTON ROADS Cost Factor used

110%

Construction Costs

Signals, ITS, Signs and Lighting Costs*	$1,037,570	Base #1 (PCES)	*$19,498,995*
Cost of Large Drainage Structures	*$5,000,000*	Base #2	*$400,129*
In-Plan Utility Costs*	*$7,403,000*	Enter Const CE Cost >	*$0*
Adjustment for Unusual Construction Costs	*$0*	CE (12.5%)	*$2,487,390*
** Totals include district factor calculations*		Estimate (2018)	*$22,386,514*

Additional (or Unusual) P. E. Costs			
Select % of PE to be performed by Consultants		PE Cost (PCES)	***$1,930,508***

Note: Do Not Include Bridge P. E. Costs Here

Roadway P. E. / Roadway Const. = 8.0%

Revised 01/10/18

Today's Date: **05/24/18**

Version 7.10

UPC: 100200

Project Cost Estimating System
CONSTRUCTION / BRIDGE / PE

Project No.	60047627			
Interstate Project ?	No	*		
Route Number	143/60	*	Urban or Other	
Geometric Standard	GS-2	*	Rural Minor Arterial System	
Ad Date	2021		Design Year =	2043
Design Year ADT		*	Project Terrain	
OR				
Current (Recent) ADT		*		
			Minimum	
Enter Design Speed (MPH) (Enter 50 or 60)	50	*	Design Speed =	
Box Must Be Empty				
Box Must Be Empty				

			Number of Additional Lanes:	*Length of Add'l. Lanes (mi.):*
Project Length (mi.)	0.38	*		
Total Length -Adding or Building Two Lanes (mi.)		*	*+ One Add'l. Lane*	*0.38*
Total Length - Adding or Building Four Lanes (mi.)		*	*None*	
Total Length - Building Ramps and Loops (mi.)		*	*None*	
Shoulder or Curb & Gutter ? (Select S or C&G)	S	*	Enter Lane Width (ft.)	*12.00*
Median Type - Graded, Raised, or None ?	R	*	Normal Lane Width (ft.)	12
Number of Crossovers(Divided Highways ONLY)		*		
Length - Curb & Gutter - Left PLUS Right Side (ft.)				
Length - Sidewalk - Left PLUS Right Side (ft.)		*		
Bike / Pedestrian Type	None			

Total Length - Raised Median (ft.)	800		
Number of Right Turn Lanes - Left PLUS Right Side		*	
Number of Left Turn Lanes - (Undivided Only)		*	

Construction Costs

Base #2 *$400,129*

Revised 01/10/18

Today's Date: **05/24/18**

Version 7.10

Project Cost Estimating System
Miscellaneous Cost Estimates

COST OF LARGE DRAINAGE STRUCTURES

Job#	Description	Cost ()
	Drainage structures for Wetlands	$2,000,000
	SWM	$3,000,000
		$5,000,000

ADJUSTMENT FOR UNUSUAL CONSTRUCTION COSTS

Type	Description	Cost ()
		$0

Version 7.10

SIGNALS, ITS, SIGNS and LIGHTING COST WORKSHEET

Stand Alone Traffic Project:	No

UPC: 100200

SIGNALS

Permanent Signals

	Location/Description	New/ Mod.	Intersection Type	Major Direction	Major Lanes	Major Direction	Major Lanes	Cross Direction	Cross Lanes	Cross Direction	Cross Lanes	Poles	Detection	Pre-emption	Cost
1	Intersection US60	New	Four-way	East	1	West	1	North	1	South	1	Mast Arm	Video	Yes	$171,558
2	Intersection VA143	New	Tee	East	1	West	1	North	1	South	1	Mast Arm	Video	Yes	$160,619
3															$0
4															$0
5															$0
6															$0
7															$0
8															$0
9															$0
10															$0

	Quantity	Cost
Temporary Signals - New Equipment		$0
Temporary Signals - Modified Equipment		$0

		Location/Description	Cost
MISCELLANEOUS	1		
SIGNAL WORK	2		

Signals Construction Subtotal $332,177

ITS

		Location/Description	Cost
ITS WORK	1		
	2		

ITS Construction Subtotal $0

MAJOR SIGN STRUCTURES

	Type of Sign	Comment	Quantity	Unit	Lighted Y/N	Cost/Sign	Extended Cost
1	Cantilever		1	Ea.		59,961	$59,961
2				Ea.			
3				Ea.			
4				Ea.			
5				Ea.			
6				Ea.			
7				Ea.			

		Location/Description	Cost
MISCELLANEOUS	1		
SIGN WORK	2		

Signs Construction Subtotal $59,961

LIGHTING

Continuous Roadway

	Urban Type of Lighting	Comments	No. Lanes	Number of Miles	Cost
1	Conventional		2	0.88	$551,107

	Freeway Type of Lighting	Comments	No. Lanes	Number of Miles	Cost
1					$0

Interchange

	Interchange Type	Type of Lighting	Number of Interchanges	Cost
1				$0
2				$0
3				$0

Miscellaneous

	Location/Description	Cost
1		
2		

Lighting Construction Subtotal $551,107

CONSTRUCTION TOTAL $943,246

District factor will be applied when the total cost is passed to the const-1 worksheet

PROJECT COMMENTS

Prepared by: Date Prepared/Modified:

Version 7.10

UPC: 100200

Project Cost Estimating System
RIGHT-OF-WAY ESTIMATE

Project No.:	*60047627*
VDOT Construction District :	*HAMPTON ROADS* # *5*
Select Project Area Real Estate Costs :	**Well Below Average**

Define Project Land Use Characteristics :

Agricultural :	**20%**
Residential :	**20%**
Industrial :	**20%**
Commercial :	**40%**
	100%

Instructions: Please fill-in all applicable White Boxes or make a choice from the Drop-down Lists

Enter the Approximate Number of Parcels on the Project : 7

1. LAND VALUE

Prop. Right-of-Way

Total Right-of-Way Project Length (ML + Connections)	6,652	ft	*Computed RW Cost per sq ft =*	*$1.27*
Average width of Existing RW	0	ft	Enter Right-of-Way Estimator's Right-of-Way Cost per sq ft :	
Average width of Proposed RW	140	ft		
Total area of all additional Prop. Right-of-Way	10,000	sf	Enter total sq ft (override calculation):	
			941,280 sq ft = 21.609 Ac.	
Approx. % of Prop. CL within	70	ft	of Exist. CL	0%
Approx. % of Prop. CL between	70	ft	& 70 ft of Exist. CL	0%
Approx. % of Prop. CL greater than	70	ft	from Exist. CL	100%

Temp. Ease.

Average Width of parallel Temporary Easements Left	10	ft	*Comp. Temp. Ease. Cost / sq ft =*	*$0.32*
Total Length of parallel Temporary Easements Left	6,652	ft	Enter Right-of-Way Estimator's Temp. Ease. Cost per sq ft :	
Average Width of parallel Temporary Easements Right	10	ft		
Total Length of parallel Temporary Easements Right	6,652	ft	Enter total sq ft (override calculation):	
			133,040 sq ft = 3.054 Ac.	

Perm. & Util. Ease.

Total Area of All Replacement Utility Easements	10,000	sf	*Comp. Utility Ease. Cost / sq ft =*	*$0.51*
AND Select % of RW Cost for Util. Ease.	40%		RW Est's. Utility Ease. Cost per sq ft :	
			10,000 sq ft = 0.230 Ac.	
This Box Must Be Empty >		ea	*Comp. Perm. Ease. Cost / sq ft =*	*$1.02*
			RW Est's. Perm. Ease. Cost per sq ft :	
Total area of All Permanent Easements	10,000	sf	10,000 sq ft = 0.230 Ac.	

COST OF LAND (Item # 1) ***$1,251,950***

2. BUILDING VALUE

Based upon comparison to similar, occupied **Residential Dwellings** in the Project Area, enter the Number of:

		Computed:
A. Low Cost Residential Dwellings :		*$0*
B. Moderately Low Cost Dwellings :		*$0*
C. Average Cost Residential Dwellings :		*$0*
D. Moderately High Cost Dwellings :		*$0*
E. High Cost Residential Dwellings :		*$0*
Computed Total Residential Dwelling Costs :		***$0***
Estimator's Total Residential Dwelling Costs :		

Enter the total estimated cost of ALL **COMMERCIAL & INDUSTRIAL BUILDINGS** to be taken:

Note: No Computed Costs Available. Use User Defined Costs Below:

Estimator's Total Commercial / Industrial Buildings Costs :

3. OTHER IMPROVEMENTS

Enter the estimated cost of ALL OTHER IMPROVEMENTS on the Project:

Computed Total Other Improvements Costs :	***$125,195***
Estimator's Total Other Improvements Costs :	

4. DAMAGES

Anticipated % of Parcels Affected by Damages to Remainder :	**100%**
Anticipated Relative Cost Impact of Damages to Remainder :	**Moderate**
Approximate Number of Parcels Affected :	**7**
Computed Cost of Damages to Remainder :	***$182,525***
Estimator's Total Cost of Damages to Remainder :	

TOTAL ACQUISITIONS (Items # 1 - 4) ***$1,559,670***

5. ADMINISTRATIVE SETTLEMENTS

Anticipated % of Parcels Affected by Administrative Settlements :	80%
Anticipated Relative Cost Impact of Administrative Settlements :	Moderately Low
Approximate Number of Parcels Affected :	6
Computed Cost of Administrative Settlements :	*$78,225*
Estimator's Total Cost of Administrative Settlements :	

6. CONDEMNATION INCREASES

Anticipated % of Parcels Affected by Condemnation Increases :	20%
Anticipated Relative Cost Impact of Condemnation Increases :	Moderate
Approximate Number of Parcels Affected :	2
Computed Cost of Condemnation Increases :	*$70,403*
Estimator's Total Cost of Condemnation Increases :	

7. ADMINISTRATIVE COSTS & INCIDENTAL EXPENSES

Anticipated Relative Cost Impact of Admin. Costs & Incidental Expenses :	Moderate
Computed Administrative Costs & Incidental Expenses :	*$20,991*
Estimator's Total Administrative Costs & Incidental Expenses :	

8. DEMOLITION CONTRACTS

Anticipated Relative Cost Impact of Demolition Contracts :	Moderate
Computed Costs of Demolition Contracts :	*$3,654*
Estimator's Total Cost of Demolition Contracts :	

9. HAZARDOUS MATERIALS REMOVAL

Anticipated Number of Demolished Buildings Requiring Asbestos Removal :	
Anticipated Relative Cost of Asbestos Removal from Demolished Buildings :	
Anticipated Number of Other Hazardous Materials Removal Sites :	1
Anticipated Relative Cost Impact of Other Hazardous Materials Removal :	Moderate
Computed Cost of Hazardous Materials Removal :	*$93,870*
Estimator's Total Costs of Hazardous Materials Removal :	

10. PROPERTY MANAGEMENT

Anticipated Relative Cost Impact of Property Management :	Moderate
Computed Costs of Property Management :	*$350*
Estimator's Total Cost of Property Management :	

TOTAL OTHER ITEMS (Items # 5 - 10) ***$267,493***

11. RELOCATION ASSISTANCE

Residential Relocation Costs:

Anticipated Relative Cost Impact of Residential Relocation Expenses :	
Computed Residential Relocation Costs :	*$0*
Estimator's Total Residential Relocation Costs :	

Commercial Relocation Costs:

Note: No Computed Costs Available. Use User Defined Costs Below:	
Estimator's Total Comm/Indust Relocation Costs :	

Total Displacements:		Farms:	
Families:		Non-Profit:	
Businesses:		Personal Property Only:	

TOTAL RELOCATION ASSISTANCE (Item # 11) ***$0***

12. YEAR OF RIGHT-OF-WAY AUTHORIZATION	FY2021	FY2021
13. MANUAL INFLATION RATE		5.00%

		Today's Cost	Factor	Inflated Cost
SUB-TOTAL RIGHT-OF-WAY COSTS		$1,827,163	15.76%	$2,115,170
UTILITY COSTS TO RIGHT-OF-WAY PROJECT *	(PCES)	$0	7.79%	$0
TOTAL RIGHT-OF-WAY COSTS	(PCES)	$1,827,163		$2,115,170

*** Utility Data display requires completion of Utilities Estimate Worksheet (tab below)**

COMMENTS:

RW-238 Data :

Right-of-Way Estimate Date :

Based on Approved / Unapproved Plans ? :

Participating Cost / Non-Participating Cost ? :

Today's Date : **05/24/18**

Revised 01/10/18

Version 7.10

UPC: 100200

Project Cost Estimating System
UTILITIES ESTIMATE

Project No.: *60047627*

A. ELECTRICAL

Transmission

	Computed or User	RW or Const	Type of Pole	No Entry Required	Number of Poles	Rural or Urban	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	Const	Wood		0	Rural	100%	$0	$0	$0
B	Computed	RW				Rural	100%	$0	$0	$0
C	Computed	RW				Rural	100%	$0	$0	$0
D	Computed	RW				Rural	100%	$0	$0	$0
								$0	$0	$0

Distribution - Aerial

	Computed or User	RW or Const	Type of Pole	No Entry Required	Number of Poles	Rural or Urban	Percent VDOT	Total Cost	to RW Project	to Const Project
E	Computed	Const	Three Phase		0	Rural	100%	$0	$0	$0
F	Computed	RW				Rural	100%	$0	$0	$0
G	Computed	RW				Rural	100%	$0	$0	$0
H	Computed	RW				Rural	100%	$0	$0	$0
I	Computed	RW				Rural	100%	$0	$0	$0
J	Computed	RW				Rural	100%	$0	$0	$0
								$0	$0	$0

Distribution - Underground - by Linear Foot

	Computed or User	RW or Const	Type of Service	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
K	Computed	RW				100%	$0	$0	$0
L	Computed	RW				100%	$0	$0	$0
M	Computed	RW				100%	$0	$0	$0
N	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Distribution - Underground - by Pole Equivalent

	Computed or User	RW or Const	Equivalent Type of Pole	No Entry Required	Equiv. # of Poles	Percent VDOT	Total Cost	to RW Project	to Const Project
O	Computed	RW				100%	$0	$0	$0
P	Computed	RW				100%	$0	$0	$0
Q	Computed	RW				100%	$0	$0	$0
R	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Distribution - Conduit for Underground Electrical

	Computed or User	RW or Const	Type of Service	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
S	Computed	RW				100%	$0	$0	$0
T	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Distribution - Underground - Manholes

	Computed or User	RW or Const	Size / Price Range of Manhole	No Entry Required	Number of MH's	Percent VDOT	Total Cost	to RW Project	to Const Project
U	Computed	RW				100%	$0	$0	$0
V	Computed	RW				100%	$0	$0	$0
W	Computed	RW				100%	$0	$0	$0
X	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Misc. Electrical Costs

Y	Misc. Electrical Costs Charged to RW Project:	
Z	Misc. Electrical Costs Charged to Const. Project:	$6,140,000

TOTAL ELECTRICAL	Total to RW Proj	Total to Const Proj
$6,140,000	$0	$6,140,000

B. TELEPHONE

Aerial - Copper Wire

	Computed or User	RW or Const	Type of Cable (Pair Cable)	No Entry Required	Number of Poles	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	RW				100%	$0	$0	$0
B	Computed	RW				100%	$0	$0	$0
C	Computed	RW				100%	$0	$0	$0
D	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Aerial - Fiber Optic

	Computed or User	RW or Const	Type of Cable (Optical Fiber)	No Entry Required	Number of Poles	Percent VDOT	Total Cost	to RW Project	to Const Project
E	Computed	RW				100%	$0	$0	$0
F	Computed	RW				100%	$0	$0	$0
G	Computed	RW				100%	$0	$0	$0
H	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Underground - Copper Wire

	Computed or User	RW or Const	Type of Cable (Pair Cable)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
I	Computed	Const	200			100%	$0	$0	$0
J	Computed	RW				100%	$0	$0	$0
K	Computed	RW				100%	$0	$0	$0
L	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Underground - Fiber Optic

	Computed or User	RW or Const	Type of Cable (Optical Fiber)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
M	Computed	Const	144			100%	$0	$0	$0
N	Computed	RW				100%	$0	$0	$0
O	Computed	RW				100%	$0	$0	$0
P	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Underground - Copper Wire - In Conduit

	Computed or User	RW or Const	Type of Cable (Pair Cable)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
Q	Computed	RW				100%	$0	$0	$0
R	Computed	RW				100%	$0	$0	$0
S	Computed	RW				100%	$0	$0	$0
T	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Underground - Fiber Optic - In Conduit

	Computed or User	RW or Const	Type of Cable (Optical Fiber)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
U	Computed	RW				100%	$0	$0	$0
V	Computed	RW				100%	$0	$0	$0
W	Computed	RW				100%	$0	$0	$0
X	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Manholes for UG Telephone Service

	Computed or User	RW or Const	Item	No Entry Required	Quantity	Percent VDOT	Total Cost	to RW Project	to Const Project
Y	Computed	RW	Telephone Manhole			100%	$0	$0	$0
Z	Computed	RW	Telephone Manhole			100%	$0	$0	$0

Misc. Telephone Costs

AA	Misc. Telephone Costs Charged to RW Project:	
BB	Misc. Telephone Costs Charged to Const. Project:	$140,000

TOTAL TELEPHONE	Total to RW Proj	Total to Const Proj
$140,000	$0	$140,000

C. CATV

Aerial CATV

	Computed or User	RW or Const	Type of Service	No Entry Required	Number of Pole Att'mnts	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	RW				100%	$0	$0	$0
B	Computed	RW				100%	$0	$0	$0
C	Computed	RW				100%	$0	$0	$0
D	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Underground CATV

	Computed or User	RW or Const	Type of Service	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
E	Computed	Const	1.00 Coax			100%	$0	$0	$0
F	Computed	Const	18 Fiber			100%	$0	$0	$0
G	Computed	RW				100%	$0	$0	$0
H	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Power Units

	Computed or User	RW or Const	Item	No Entry Required	Quantity	Percent VDOT	Total Cost	to RW Project	to Const Project
I	Computed	RW	CATV Power Supply			100%	$0	$0	$0
J	Computed	RW	CATV Power Supply			100%	$0	$0	$0

Misc. CATV Costs

Misc. CATV Costs Charged to RW Project:

Misc. CATV Costs Charged to Const. Project: **$20,000**

TOTAL CATV	Total to RW Proj	Total to Const Proj
$20,000	$0	$20,000

D. WATER

Water Line

	Computed or User	RW or Const	Diameter of Water Pipe (in)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	Const	4			100%	$0	$0	$0
B	Computed	Const				100%	$0	$0	$0
C	Computed	Const				100%	$0	$0	$0
D	Computed	Const				100%	$0	$0	$0
							$0	$0	$0

Misc. Water Costs

E Misc. Water Costs Charged to Const. Project: **$180,000**

F Misc. Water Costs Charged to RW Project:

TOTAL WATER	Total to RW Proj	Total to Const Proj
$180,000	$0	$180,000

E. SANITARY SEWER

Sewer Line

	Computed or User	RW or Const	Diameter of Sewer Pipe (in)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	Const	10			100%	$0	$0	$0
B	Computed	Const				100%	$0	$0	$0
C	Computed	Const				100%	$0	$0	$0
D	Computed	Const				100%	$0	$0	$0
							$0	$0	$0

Misc. Sewer Costs

E Misc. Sewer Costs Charged to Const. Project: **$60,000**

F Misc. Sewer Costs Charged to RW Project:

TOTAL SEWER	Total to RW Proj	Total to Const Proj
$60,000	$0	$60,000

F. NATURAL GAS / PROPANE

Distribution

	Computed or User	RW or Const	Diameter of Gas Line (in)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	Const	4			100%	$0	$0	$0
B	Computed	RW				100%	$0	$0	$0
C	Computed	RW				100%	$0	$0	$0
D	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Transmission

	Computed or User	RW or Const	Diameter of Gas Line (in)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
E	Computed	Const	10			100%	$0	$0	$0
F	Computed	RW				100%	$0	$0	$0
G	Computed	RW				100%	$0	$0	$0
H	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Misc. Natural Gas / Propane Costs

			TOTAL GAS / PROPANE	Total to RW Proj	Total to Const Proj
I	Misc. Gas / Pro Costs Charged to RW Project:		$190,000	$0	$190,000
J	Misc. Gas / Pro Costs Charged to Const. Project:	$190,000			

G. PETROLEUM

Transmission

	Computed or User	RW or Const	Diameter of Gas Line (in)	No Entry Required	Total Length(ft)	Percent VDOT	Total Cost	to RW Project	to Const Project
A	Computed	RW				100%	$0	$0	$0
B	Computed	RW				100%	$0	$0	$0
C	Computed	RW				100%	$0	$0	$0
D	Computed	RW				100%	$0	$0	$0
							$0	$0	$0

Misc. Petroleum Costs

			TOTAL PETROLEUM	Total to RW Proj	Total to Const Proj
E	Misc. Petroleum Costs Charged to RW Project:		$0	$0	$0
F	Misc. Petroleum Costs Charged to Const. Project:				

H. CELLULAR

Cellular Telephone Costs

			TOTAL CELLULAR	Total to RW Proj	Total to Const Proj
A	Total Cellular Costs Charged to RW Project:		$0	$0	$0
B	Total Cellular Costs Charged to Const. Project:				

I. ADDITIONAL COSTS

Additional Utility Costs to Right-of-Way Project :

Comments:

Additional Utility Costs to Construction Project :

Comments:

Additional Utility Costs to Utility Owners/Others :

Comments:

TOTAL UTILITY COST - RIGHT-OF-WAY PROJECT	$0
TOTAL UTILITY COST - CONSTRUCTION PROJECT	$6,730,000
TOTAL UTILITY COST - UTILITY OWNER / OTHERS	$0
GRAND TOTAL UTILITY COSTS (PCES)	$6,730,000

Version 7.10

PCES

BRIDGE MODULE

v 1.2 release date 1/16

INSTRUCTIONS

START PCES

V 1.1 release date 7/16

Project No =

Project =

Project Manager =

UPC =

District = Hampton Roads

No. Bridges = 2 *Maximum 15 bridges*

RUN

CLEAR ALL

RESET

ease date 1/16

Bridge No. 1

Bridge No.: | Fed. Str. ID: | Proj. No.:

Description: New Bridge over Skiffes Creek

Length = 650 ft. | Width = 48 ft. | 0 0 deg

BRIDGE CONSTRUCTION AND PRELIMINARY ENGINEERING COSTS SUMMARY

Estimate Created =		5/24/2018	
Ad Date =		10/15/2017	
Base Bridge Estimate =	$	4,563,000	
Sub-total Modifiers =	$	2,996,000	
Sub-total Base + Modifiers =	$	7,559,000	(A)
Base + Mod. (Adj'd District Modifier) =	$	7,559,000	
Aesthetics =	$	-	(B)
Bridge Construction Est. (PCES) =	$	7,559,000	(A +B)
Dismantle & Remove =	$	-	(C)
Mobilization =	$	408,000	(D)
Total Bridge Estimate (2018) =	$	7,967,000	(A + B + C + D)

USE

Legend:

xxxx	Denotes Input
xxx	Denotes Calculation
xxx	Denotes Explanatory Notes
xxx	Denotes Output
xxx	Denotes calculated value not included in total estimate

NEXT

SUMMARY

CLEAR SHEET

PCES BRIDGE ESTIMATE
BRIDGE NO 1

		CALCULATED	OVER-RIDE	
denotes "YES"	**BASE BRIDGE EST.** =	$ 4,563,000	☐	
	SUB-TOTAL MODIFIERS (EXCLUDING Aesthetic Treatment) =	$ 2,996,000 +	$ -	
☐	**SUB-TOTAL BASE + MODIFIERS** =	$ 7,559,000		(A)
☐	**DISTRICT MODIFIER** =	1.00		
	SUB-TOTAL BASE + MODIFIERS (ADJUSTED FOR DISTRICT) =	$ 7,559,000		
	AESTHETICS: DO YOU ANTICIPATE THE USE OF AESTHETIC TREATMENTS?	$ -	$ -	(B)
	BRIDGE CONSTRUCTION ESTIMATE =	$ 7,559,000		(A + B)
	DISMANTLE & REMOVE: (adj'd for Dist. Mod.) DO YOU NEED TO DISMANTLE & REMOVE AN EXISTING STRUCTURE? L= 0 ft W= 0 ft	$ -	$ -	(C)
☐ ☑	**MOBILIZATION** based upon (A + B + C) =	$ 408,000	$ -	(D)
	TOTAL BRIDGE ESTIMATE =	$ 7,967,000		(A + B+ C + D)

BRIDGE MODIFIERS

		CALCULATED	OVER-RIDE
☐	**FOUNDATIONS**: DO YOU ANTICIPATE ANY OF THE FOLLOWING:	$ 1,479,000	$ -
	Are pre-boring or rock excavation anticipated?	$ -	
	Are drilled shafts or micropiles anticipated?	$ 1,479,000	
☐	**UTILITIES** DO YOU ANTICIPATE ANY OF THE FOLLOWING ATTACHMENTS TO THE BRIDGE?	$ -	$ -
	Gas lines	$ -	
☑	*Water lines or Sewer lines*	$ -	
	Telephone conduits	$ -	

Please note: this does not include conduits located in the deck or parapet.

REINFORCING: *(refer to Structure & Bridge II&M 81.5)*

☐ DO YOU ANTICIPATE THE USE OF CLASS III CRR IN THE DECK? — $ - | $ -

TEMPORARY SHEETING/SHORING:

☐ DO YOU ANTICIPATE ANY OF THE FOLLOWING: — $ - | $ -

The use of temporary sheet piles?
The use of temporary retaining structures?
The use of temporary shoring?

☑ **COFFERDAMS:**
DO YOU ANTICIPATE THE USE OF COFFERDAMS? — $ - | $ -

☐ *If anticipated, how many?* 0

CONSTRUCTION ACCESS:

DO YOU ANTICIPATE ANY OF THE FOLLOWING? — $ 305,000 | $ -

The use of a causeway?
A Construction Access bid item?
A temporary work bridge?

TOOTH EXPANSION JOINTS: *(refer to Vol. V Part 3; BEJ 6-10)*

☐ DO YOU ANTICIPATE THE USE OF A TOOTH EXPANSION JOINT? (Such as with a Virginia Abutment). — $ - | $ -

☐ *If anticipated, how many?* 0

VIRGINIA ABUTMENTS: *(refer to Vol. V Part 2; File 17-01.9)*

☐ DO YOU ANTICIPATE THE USE OF A VIRGINIA ABUTMENT? — $ - | $ -

If anticipated, how many? 0

☑ **APPROACH SLABS:** *(refer to Vol. V Part 3; BAS)*

DO YOU ANTICIPATE THE USE OF AN APPROACH SLAB? — $ 60,000 | $ -

☐ **RAISED SIDEWALKS/MEDIANS:**
DO YOU ANTICIPATE ANY OF THE FOLLOWING: — $ - | $ -

☐ *Sidewalks on the bridge?*
Raised median on the bridge?

If yes, enter:

TOTAL width ALL SIDEWALKS & MEDIANS (in feet) 0

☐ *AVG. HEIGHT of sidewalk/medians (in inches)* 0

☐ **DETOUR BRIDGE:**

☐ DO YOU ANTICIPATE THE USE OF A TEMPORARY DETOUR BRIDGE? — $ - | $ -

☐ **STAGED BRIDGE CONSTRUCTION:**
DO YOU ANTICIPATE STAGED BRIDGE CONSTRUCTION? — $ - | $ -

PEDESTRIAN FENCE: *(refer to Vol. V Part 3; BPF-3)*

PCES BRIDGE ESTIMATE
BRIDGE NO 1

DO YOU ANTICIPATE PEDESTRIAN FENCE?	$ -	$ -
Anticipated Length =	0	

CURVED BRIDGE:

DO YOU ANTICIPATE CURVED GIRDERS?	$ 1,152,000	$ -

PREFABRICATED TRUSS:

DO YOU ANTICIPATE THE USE OF PREFABRICATED TRUSS(ES)?	$ -	$ -

ASPECT RATIO > 1.5:

MODIFIER NOT REQUIRED. YOUR CALCULATED ASPECT RATIO (W/L) OF THE BRIDGE <= 1.5	$ -

OTHER ITEMS NOT LISTED ABOVE:

DO YOU ANTICIPATE OTHER NON-STANDARD ITEMS, NOT LISTED ABOVE?

Description:	Roadway Approaches (Bridge only projects)	
Description:		
Description:		
Description:		

SUB-TOTAL MODIFIERS	=	$ 2,996,000	$ -

NOTE: *The following items and considerations are not considered:*

Special Structures (e.g. pump stations)
Culverts
Roadway lighting
Navigation lighting
Use of non-standard items not listed above
Fender System
Historic Structures
Environmental Factors
Difficult site access
Accelerated Bridge Construction Methods
Crash Walls
Pier Protection Systems

This list is not meant to be all-inclusive. If you anticipate an item not listed here-in, the PCES estimate should be adjusted accordingly with use of the OTHER ITEMS below.

ease date 1/16

Bridge No. 2

Bridge No.: | Fed. Str. ID: | Proj. No.:

Description: New Bridge over VA143

Length = 170 ft. | Width = 48 ft. | 0 deg

BRIDGE CONSTRUCTION AND PRELIMINARY ENGINEERING COSTS SUMMARY

Estimate Created =		5/24/2018	
Ad Date =		5/15/2016	
Base Bridge Estimate =	$	1,523,000	
Sub-total Modifiers =	$	656,000	
Sub-total Base + Modifiers =	$	2,179,000	(A)
Base + Mod. (Adj'd District Modifier) =	$	2,179,000	
Aesthetics =	$	-	(B)
Bridge Construction Est. (PCES) =	$	2,179,000	(A +B)
Dismantle & Remove =	$	-	(C)
Mobilization =	$	139,000	(D)
Total Bridge Estimate (2018) =	$	2,318,000	(A + B + C + D)

USE

Legend:

xxxx	Denotes Input
xxx	Denotes Calculation
xxx	Denotes Explanatory Notes
xxx	Denotes Output
xxx	Denotes calculated value not included in total estimate

NEXT

SUMMARY

CLEAR SHEET

☑

PCES BRIDGE ESTIMATE
BRIDGE NO 2

	CALCULATED	OVER-RIDE	
BASE BRIDGE EST. =	$ 1,523,000	☐	
SUB-TOTAL MODIFIERS (EXCLUDING Aesthetic Treatment) =	$ 656,000 +	$ -	
SUB-TOTAL BASE + MODIFIERS =	$ 2,179,000		(A)
DISTRICT MODIFIER =	1.00		
SUB-TOTAL BASE + MODIFIERS (ADJUSTED FOR DISTRICT) =	$ 2,179,000		
AESTHETICS: DO YOU ANTICIPATE THE USE OF AESTHETIC TREATMENTS?	$ -	$ -	(B)
BRIDGE CONSTRUCTION ESTIMATE =	$ 2,179,000		(A + B)
DISMANTLE & REMOVE: (adj'd for Dist. Mod.) DO YOU NEED TO DISMANTLE & REMOVE AN EXISTING STRUCTURE? L= 0 ft W= 0 ft	$ -	$ -	(C)
☑ MOBILIZATION based upon (A + B + C) =	$ 139,000	$ -	(D)
TOTAL BRIDGE ESTIMATE =	$ 2,318,000		(A + B+ C + D)

denotes "YES"

BRIDGE MODIFIERS

	CALCULATED	OVER-RIDE
FOUNDATIONS: DO YOU ANTICIPATE ANY OF THE FOLLOWING:	$ 494,000	$ -
Are pre-boring or rock excavation anticipated?	$ -	
Are drilled shafts or micropiles anticipated?	$ 494,000	
UTILITIES DO YOU ANTICIPATE ANY OF THE FOLLOWING ATTACHMENTS TO THE BRIDGE?	$ -	$ -
Gas lines	$ -	
Water lines or Sewer lines	$ -	
☑ *Telephone conduits*	$ -	

Please note: this does not include conduits located in the deck or parapet.

REINFORCING: *(refer to Structure & Bridge II&M 81.5)*

☐ DO YOU ANTICIPATE THE USE OF CLASS III CRR IN THE DECK? — $ - | $ -

TEMPORARY SHEETING/SHORING:

☐ DO YOU ANTICIPATE ANY OF THE FOLLOWING: — $ - | $ -

The use of temporary sheet piles?
The use of temporary retaining structures?
The use of temporary shoring?

☑ **COFFERDAMS:**
DO YOU ANTICIPATE THE USE OF COFFERDAMS? — $ - | $ -

☐ *If anticipated, how many?* 0

CONSTRUCTION ACCESS:

DO YOU ANTICIPATE ANY OF THE FOLLOWING? — $ 102,000 | $ -

The use of a causeway?
A Construction Access bid item?
A temporary work bridge?

TOOTH EXPANSION JOINTS: *(refer to Vol. V Part 3; BEJ 6-10)*

☐ DO YOU ANTICIPATE THE USE OF A TOOTH EXPANSION JOINT? (Such as with a Virginia Abutment). — $ - | $ -

☐ *If anticipated, how many?* 0

VIRGINIA ABUTMENTS: *(refer to Vol. V Part 2; File 17-01.9)*

☐ DO YOU ANTICIPATE THE USE OF A VIRGINIA ABUTMENT? — $ - | $ -

If anticipated, how many? 0

☐ **APPROACH SLABS:** *(refer to Vol. V Part 3; BAS)*

DO YOU ANTICIPATE THE USE OF AN APPROACH SLAB? — $ 60,000 | $ -

☐ **RAISED SIDEWALKS/MEDIANS:**

DO YOU ANTICIPATE ANY OF THE FOLLOWING: — $ - | $ -

☐ *Sidewalks on the bridge?*
Raised median on the bridge?

If yes, enter:

TOTAL width ALL SIDEWALKS & MEDIANS (in feet) 0

☐ *AVG. HEIGHT of sidewalk/medians (in inches)* 0

☐ **DETOUR BRIDGE:**

☐ DO YOU ANTICIPATE THE USE OF A TEMPORARY DETOUR BRIDGE? — $ - | $ -

☐ **STAGED BRIDGE CONSTRUCTION:**

DO YOU ANTICIPATE STAGED BRIDGE CONSTRUCTION? — $ - | $ -

PEDESTRIAN FENCE: *(refer to Vol. V Part 3; BPF-3)*

PCES BRIDGE ESTIMATE
BRIDGE NO 2

DO YOU ANTICIPATE PEDESTRIAN FENCE?	$ -	$ -
Anticipated Length =	0	

CURVED BRIDGE:

DO YOU ANTICIPATE CURVED GIRDERS?	$ -	$ -

PREFABRICATED TRUSS:

DO YOU ANTICIPATE THE USE OF PREFABRICATED TRUSS(ES)?	$ -	$ -

ASPECT RATIO > 1.5:

MODIFIER NOT REQUIRED. YOUR CALCULATED ASPECT RATIO (W/L) OF THE BRIDGE <= 1.5	$ -

OTHER ITEMS NOT LISTED ABOVE:

DO YOU ANTICIPATE OTHER NON-STANDARD ITEMS, NOT LISTED ABOVE?

Description:	Roadway Approaches (Bridge only projects)		
Description:			
Description:			
Description:			
	SUB-TOTAL MODIFIERS	= $ 656,000	$ -

NOTE: *The following items and considerations are not considered:*

Special Structures (e.g. pump stations)
Culverts
Roadway lighting
Navigation lighting
Use of non-standard items not listed above
Fender System
Historic Structures
Environmental Factors
Difficult site access
Accelerated Bridge Construction Methods
Crash Walls
Pier Protection System

This list is not meant to be all-inclusive. If you anticipate an item not listed here-in, the PCES estimate should be adjusted accordingly with use of the OTHER ITEMS below.

Proj. =

District = Hampton Roads **UPC =** **Proj. Mgr. =**

BRIDGE CONSTRUCTION COSTS SUMMARY

	Bridge Constr. Est. (PCES)	Unit Cost				
=	$ 7,967,000	$ 255.35	/SF	Fed. Str. ID =		Descr. = New Bridge over Skiffes Creek
=	$ 2,318,000	$ 284.07	/SF	Fed. Str. ID =		Descr. = New Bridge over VA143