

**IMPACTS ANALYSIS FINDINGS**

Screening Criterion	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Finding
<b>Total Parcels Intersected</b> (Impact value, \$ Millions) <sup>1</sup>	121 (\$26.1 M)	33 (\$2.7 M)	50 (\$8.3 M)	34 (\$5.6 M)	107 (\$21.9 M)	59 (\$8.7 M)	Option 2 impacts the fewest parcels. Dollar value includes Relocations and Partial Acquisitions.
<b>Relocations</b> (Value included in Total Parcels) <sup>1</sup>	77 (\$24.1 M)	3 (\$1.3 M)	15 (\$6.7 M)	10 (\$4.5 M)	68 (\$20.1 M)	15 (\$6.7 M)	Option 2 impacts the fewest dwellings.
<b>Partial Acquisitions</b> (Value included in Total Parcels) <sup>1</sup>	44 (\$1.9 M)	30 (\$1.3 M)	35 (\$1.5 M)	24 (\$1.1 M)	39 (\$1.7 M)	44 (\$1.9 M)	Option 4 requires the fewest partial acquisitions because more of its impacts require relocations.
<b>Environmental Justice</b>	EJ populations are present throughout the entire project area. Parcel, dwelling, noise, access, facilities, and parks impacts represent potential EJ impacts.						Option 2 has the lowest impact.
<b>Noise Receptor Estimate</b> <sup>2</sup>	234	130	143	189	343	219	Option 2 has the lowest impact.
<b>Access</b>	Impacts to Treely Rd/Eves Lane connectivity	-	Impacts to Harrow Drive access and Parkgate Drive connectivity	Major impacts to Carver Middle School (CMS) access, HES access, Harrowgate Park access and Cougar Trail/Sandwave Road connectivity	Major impacts to Broadwater Townhomes access and Treely Road/Eves Lane connectivity	Impacts to Treely Road/Eves Lane connectivity	Option 2 has the lowest impact. Option 4 affects access to CMS and/or the relocated HES which may result in complete relocation of those schools. Costs for those school relocations due to access constraints are not included in this analysis.
<b>Commercial, Public, Non-Profit, and Community Facilities Impacts</b>	-	-	25' from church resulting in potential noise impacts; potential noise impacts to CMS	25' from church resulting in potential noise impacts; major access and potential noise impacts to CMS and HES	-	-	Options 1, 2, and 6 have the lowest impacts. Although mapping shows some options affecting Harrowgate Elementary School, this facility has been slated for relocation.
<b>Public Parks and Recreation Areas</b>	-	-	Major impact to Harrowgate Park and CMS athletic and recreational areas	Minor impact to Harrowgate Park.	-	-	Options 1, 2, 5, and 6 have the lowest impacts.
<b>Historic Resources</b> <sup>3</sup>  Resources common to all options are indicated in italics.	<i>020-5317</i> <i>020-5318</i> <i>020-5320</i> <i>020-5351</i> <i>123-5025</i>	<i>020-5317</i> <i>020-5318</i> <i>020-5320</i> <i>020-5351</i> <i>123-5025</i>	<i>020-5317</i> <i>020-5318</i> <i>020-5320</i> <i>020-5351</i> <i>123-5025</i>	<i>020-5317</i> <i>020-5318</i> <i>020-5320</i> <i>020-5351</i> <i>123-5025</i>	<i>020-5317</i> <i>020-5318</i> <i>020-5320</i> <i>020-5351</i> <i>123-5025</i>	<i>020-5317</i> <i>020-5318</i> <i>020-5320</i> <i>020-5351</i> <i>123-5025</i>	Options 1, 3, and 6 have the lowest impacts.  The resource impacted by Option 2, Pearce House, has been surveyed and recommended "Not Eligible" for listing on the NRHP. This finding has not yet been confirmed by VDHR. If confirmed, Option 2 would be equivalent to Options 1, 3, and 6.
<b>Public Waterfowl/ Wildlife Refuges</b>	None in project area.						No impacts.
<b>Threatened &amp; Endangered Species; Trout; Anadromous Fish; Known Shellfish Grounds; Bald Eagles</b>	No resources were identified in any of the searches apart from potential presence of Northern Long-Eared Bat (NLEB). Further research indicated no known maternity roosts or hibernacula within or in proximity to the project area. Therefore, the project would not affect any known NLEB areas and would rely on the findings of the January 5, 2016 <i>Programmatic Biological Opinion for the Final 4(d) Rule on the Northern Long-Eared Bat and Exemptions from Take Prohibitions</i> to fulfill project-specific Section 7 responsibilities.						No impacts.
<b>Prime Farmland and Farmland of Statewide Importance</b> (nearest acre)	13	14	8	4	11	11	Option 4 has the lowest impacts.
<b>Hydrologic Units</b>	The area is in two Hydrologic Unit Codes (HUCs) of the Appomattox watershed: 020802070904 to the west and 0208071002 to the east.						No unique impacts.
<b>Floodplains</b> (nearest acre)	3	3	3	3	3	4	Options 1 through 5 have the lowest impacts.
<b>USFWS NWI Wetlands</b> (nearest acre) (Impact value, \$ Millions)	3 (\$270 K)	4 (\$360 K)	4 (\$360 K)	4 (\$360 K)	1 (\$90 K)	4 (\$360 K)	Option 5 has the lowest impacts.
<b>USGS NHD Streams</b> (nearest 10 linear feet) (Impact value, \$ Thousands)	790 (\$ 277 K)	930 (\$326 K)	770 (\$270 K)	1800 (\$630 K)	1220 (\$427 K)	770 (\$270 K)	Options 3 and 6 have the lowest impacts.
<b>Wild and Scenic Rivers</b>	None in project area.						No impacts.
<b>Sole Source Aquifers</b>	None in project area.						No impacts.
<b>Coastal Zone Management</b>	Area is in coastal zone. Any option would be expected to undergo Coastal Zone Management Act review by Virginia Department of Environmental Quality during project permitting.						Relatively equal impacts.
<b>Coastal Barrier Resources</b>	None in project area.						No impacts.
<b>Contamination &amp; Toxics</b>	EDR radius report showed no listings of concern in the project area. No naturally occurring asbestos is mapped to the area. PCB contamination site exists near Ruffin Mill Road.						No unique impacts.
<b>Air Quality</b>	Project is in 8-hour Ozone Attainment Area.						No unique impacts.
<b>Interchange Impacts</b>	Severe	Moderate	Moderate	Moderate	Severe	Severe	Options 2, 3, and 4 have the lowest impacts.
<b>Construction Costs</b> (\$ Millions)	\$56.5 M	\$58.1 M	\$60.1 M	\$58.1 M	\$60.6 M	\$58.9 M	Option 1 has the lowest construction cost.
<b>Impact Costs</b> (\$ Millions)	\$26.6 M	\$3.4 M	\$8.9 M	\$6.5 M	\$22.3 M	\$9.3 M	Option 2 has the lowest impact cost.
<b>Construction + Impacts</b> (\$ Millions)	\$83.2 M	\$61.4 M	\$69.0 M	\$64.6 M	\$82.9 M	\$68.1 M	Option 2 has the lowest impact + construction cost.
<b>Note 1:</b> Impact dollar values for Parcels include the total value for Relocations and Partial Acquisitions; although all three line items are displayed in the table for comparative purposes, the Impact Cost Sum does not double count the impacts.				<b>Note 3:</b> Historic Resources and NRHP Eligibility 020-0205: Pearce House; Potentially Eligible; Survey recommended not eligible, awaiting DHR confirmation. 020-5317: Port Walthall Junction Battlefield, Indian Hills Road; Eligible 020-5318: Arrowfield Church, Fort Clifton, Swift Creek Battlefield; Potentially Eligible 020-5320: Drewry's Bluff (2nd) Battlefield, Fort Darling, Fort Drewry, Proctor's Creek Battlefield; Potentially Eligible 020-5351: Richmond & Petersburg Electric Railway; Potentially Eligible 123-5025: Assault on Petersburg/Petersburg Battlefield II; Potentially Eligible 127-6251: Atlantic Coast Railroad (RR) Corridor - Richmond to Petersburg, Richmond & Petersburg RR, Atlantic Coast Line RR Corridor; Potentially Eligible 44CF0533: Native American Archaeological Site; Not Evaluated 44CF0537: Walthall Gun Emplacements; Not Evaluated 44CF0578: Bermuda Hundred Campaign; Potentially Eligible			
<b>Note 2:</b> Noise receptors estimates are based on dwellings within 500' of RW edge. Noise impacts for Options 4 and 5 are approximated lower than actual values as they overlap an area of multifamily housing for which specific numbers of dwelling units were not immediately available.							