

#### **MEMORANDUM**

Jack Kelsey, PE

To: FES – Facilities Planning and Construction

Albemarle County

From: Matt Harrell, PE

Kimley-Horn and Associates, Inc.

Date: Tuesday, September 22<sup>nd</sup>, 2020

Subject: Eastern Avenue Alternative Alignment Development Summary

#### **Executive Summary**

Under contract to Albemarle County, Kimley-Horn and Associates, Inc. (Kimley-Horn) identified and evaluated potential alignments for the extension of Eastern Avenue from Westhall Drive to Route 250 (Rockfish Gap Turnpike). On the north side of Lickinghole Creek, Eastern Avenue is an existing road extending from Park Ridge Drive toward Westhall Drive. As residential developments (i.e., Westlake at Foothill Crossing) are expected to continue North of Lickinghole Creek, the County planned for the extension of Eastern Avenue to provide connectivity for the Crozet development area to Route 250 (Rockfish Gap Turnpike).

Kimley-Horn identified and analyzed three (3) conceptual alignments for the extension of Eastern Avenue to Route 250 (Rockfish Gap Turnpike). Constraints studied include wetland impacts, tree clearing, property impacts, and construction cost. Kimley-Horn analyzed these constraints to help to guide the County in selection of a preferred alignment. Based on Kimley-Horn's analysis of these constraints, Alignment B is the recommended alignment as it presents a balance of impacts to the identified constraints. Alignment B also matches the needs identified within the Downtown Crozet Master Plan with the lowest construction cost.

### **Background**

Eastern Avenue is an existing road extending from Park Ridge Drive toward Westhall Drive, as shown in **Figure 1**. Eastern Avenue provides access to residential properties including Westlake at Foothill Crossing. As additional residential developments (i.e., Westlake at Foothill Crossing) are expected to continue North of Lickinghole Creek, an extension of Eastern Avenue is needed to improve connectivity to the Crozet development area and Route 250 (Rockfish Gap Turnpike). Currently there is no crossing of Lickinghole Creek within Crozet besides Route 240 (Crozet Avenue) and Route 250 (Three Notched Road). Therefore, the approximately 5.5-mile detour required to cross Lickinghole Creek is not a viable option for existing residents within the County and as future development continues in Crozet.



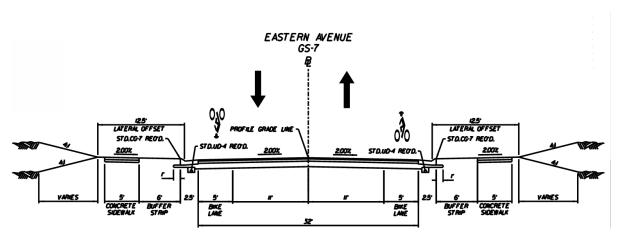
Analysis of resolving the extensive detour and consequent congestion along Route 250, Route 240, and the downtown Crozet area. As employment and development increases within Crozet, Eastern Avenue is needed to link the neighborhoods and mitigate the congestion that is expected on Route 240 (Crozet Avenue and Three Notch'd Road) and Route 250 (Rockfish Gap Turnpike). This extension is consistent with the Downtown Crozet Master Plan, adopted in 2004.

#### **Conceptual Alignment Analysis**

Kimley-Horn developed three (3) conceptual alignments for the extension of Eastern Avenue from Westhall Drive to Route 250 (Rockfish Gap Turnpike). While developing these alignments, Kimley-Horn identified several constraints to guide the selection of a preferred alignment. Constraints included wetland impacts, tree clearing, property impacts, and construction cost. Based on a limited field visit Kimley-Horn identified potential wetlands on Cory Farm HOA (056F0-01-00-000A0), County of Albemarle (056H0-01-00-000A4), and Coble Living Trust (05600-00-09700). Figure 2 illustrates the three (3) analyzed alignments. Findings for each alignment based on the identified constraints is provided in the subsequent paragraphs and Attachment A: Alignment Alternatives Matrix.

Kimley-Horn evaluated the proposed intersection of Alignment B and Route 250 (Rockfish Gap Turnpike) against Virginia Department of Transportation (VDOT) access management standards and AASHTO intersection sight distance requirements. Kimley-Horn determined that each Alignment would likely comply with known and applicable VDOT and AASHTO requirements.

Eastern Avenue is classified as an Urban Collector (GS-7) with a 30mph design speed. For the conceptual alignment analysis, it was assumed that the proposed extension of Eastern Avenue would match the existing typical section of Eastern Drive from Park Ridge Drive to Westhall Lake with approximately 61 feet of right-of-way (ROW) which includes two (2) travel lanes and two (2) bike lanes with standard curb and gutter and 5' of sidewalk on each side, as show below and in **Figure 2**.

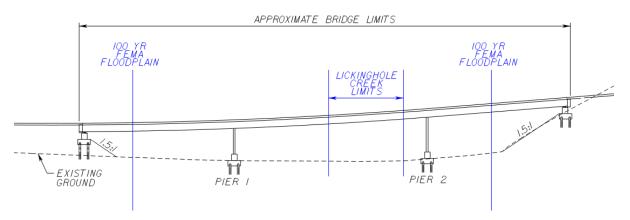


Alignment A takes the shortest route directly across Lickinghole Creek and follows the existing alignment of Route 1260 (Cory Farm Road). Over the 3,010 feet extension, Alignment A impacts 6 property owners, including 1 total acquisition (Shiflett Farm LLC – 056H0-00-00-000B0). Alignment A closely meets the needs of the Albemarle County 2020 Land Use Map by carrying little to no risk of a



total acquisition of the Coble Living Trust (05600-00-00-09700) parcel as the post development acreage of the site is approximately 18 acres. Alignment A has the smallest footprint of impacts to the existing floodplain (0.63 ac.) while impacting 145 ft of Lickinghole Creek. Alignment A consists of 29,217 sf of disturbed slopes (managed & preserved) and 26,925 sf of impacts to the Water Protection Ordinance Stream Buffer. Alignment A crossed the Lickinghole Creek at an S-curve in the alignment of the creek, so Alignment A requires the longest bridge length at 340 ft. The longer bridge length will require a deeper (larger) beam which will require the proposed profile of Eastern Avenue to be higher than Alternative B and C. The higher profile elevation may increase the construction cost due to additional earthwork and/or impacts from steep slopes. Alignment A's crossing location of Lickinghole Creek may also subject the bridge piers nearest the creek to the risk of scour due to their relative location to the creek. Even though Alignment A matches the existing alignment of Route 1260 (Cory Farm Road), Route 1260 (Cory Farm Road) will be reconstructed to accommodate a widened roadway that includes bike lanes, curb and gutter, and sidewalk. While Alignment A provided the lowest right-of-way cost, the larger length of the bridge results in the largest construction cost.

Alignment B crossed Lickinghole Creek to the East of Alignment A and follows the existing alignment of Route 1260 (Cory Farm Road). Over the 3,075 feet extension, Alignment B impacts 6 property owners, including 1 total acquisition (Shiflett Farm LLC – 056H0-00-00-000B0). Alignment B adequately meets the needs of the Albemarle County 2020 Land Use Map by carrying little risk of a total acquisition of the Coble Living Trust (05600-00-00-09700) parcel as the post development acreage of the site is approximately 16 acres. Alignment B has the largest footprint of impacts to the existing floodplain (0.83 ac.) while impacting 145 ft of Lickinghole Creek. Alignment B consists of 28,553 sf of disturbed slopes (managed & preserved) and 36,270 sf of impacts to the Water Protection Ordinance Stream Buffer. Unlike Alignment A, Alignment B crossed Lickinghole Creek at a location where the stream is in tangent, so the bridge length is the second shortest bridge at 270 ft. The smaller bridge length reduced the earthwork, impacts from slopes and lowered the scour risk around the bridge piers. Even though Alignment B matches the existing alignment of Route 1260 (Cory Farm Road), Route 1260 (Cory Farm Road) will be reconstructed to accommodate a widened roadway that includes bike lanes, curb and gutter, and sidewalk. Alignment B provided a similar right-of-way cost to Alignment A, but the shorter bridge length resulted in the lowest construction cost.



Alignment C took a route that crossed Lickinghole Creek to the East of Alignment B and follows the existing alignment of Radford Lane. Over the 3,290 feet extension, Alignment C impacts 9 property owners, including 1 total acquisitions (Shiflett Farm LLC – 056H0-00-00-000B0). Alignment C carries

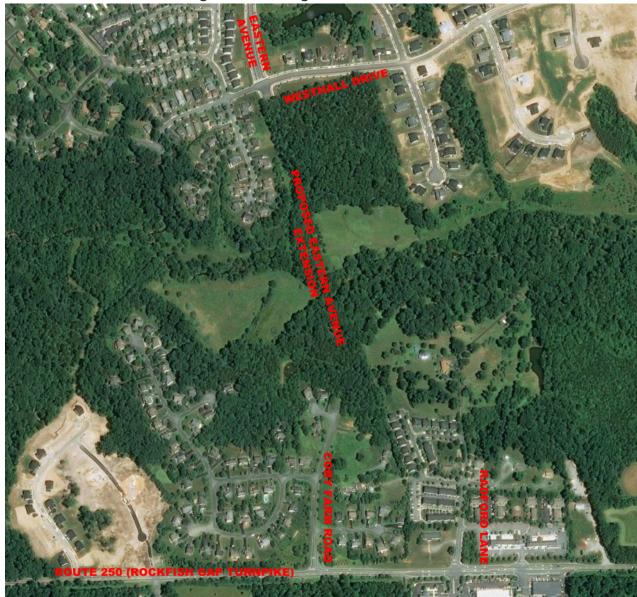


a large risk of impacting the neighborhood development within the Albemarle County 2020 Land Use Map by impacting the Coble Living Trust (05600-00-00-09700) parcel, leaving approximately 12 acres available for development after the proposed extension of Eastern Avenue. Alignment C carries additional risk that the proposed improvement may require a total acquisition of the Coble Living Trust (05600-00-00-09700) parcel. Alignment C has the second largest footprint of impacts to the existing floodplain (0.71 ac.) while impacting 145 ft of Lickinghole Creek. Alignment C consists of 34,076 sf of disturbed slopes (managed & preserved) and 31,993 sf of impacts to the Water Protection Ordinance Stream Buffer. Alignment C crossed Lickinghole Creek at a tangent, so the bridge length is the shortest at 240 ft. The shortest bridge span will reduce the overall earthwork and construction costs. Even though Alignment C matches the existing alignment of Radford Lane, Radford Lane will be reconstructed to accommodate a widened roadway that includes bike lanes, curb and gutter, and sidewalk. As Radford Lane already consists of curb and gutter, sidewalk, and residential entrances, its reconstruction will require additional impacts to existing utilities and private property. Alignment C has the largest right-of-way cost and the shortest bridge length, resulting in the largest construction cost.

#### **Preferred Alignment Location**

It is recommended to pursue the future extension of Eastern Avenue along the proposed Alignment B, as shown in **Figure 3**. This preferred alignment presents a balance of impacts to the identified constraints along with planned and unplanned developments. Alignment B matches the needs identified within the Downtown Crozet Master Plan with the lowest construction cost. Alignment B provides a crossing over Lickinghole Creek that lowers the risk of the bridge construction and future scour. The preferred alignment also minimizes impacts to utilities and private property by matching the alignment along Route 1260 (Cory Farm Road).

In addition to the horizontal evaluation of Alignment B, Kimley-Horn evaluated a possible vertical alignment through a preliminary model. With the use of the preliminary model, Kimley-Horn determined approximate construction limits, as shown by the proposed right-of-way in **Figure 3**.





**Figure 2: Proposed Alignment Locations** 

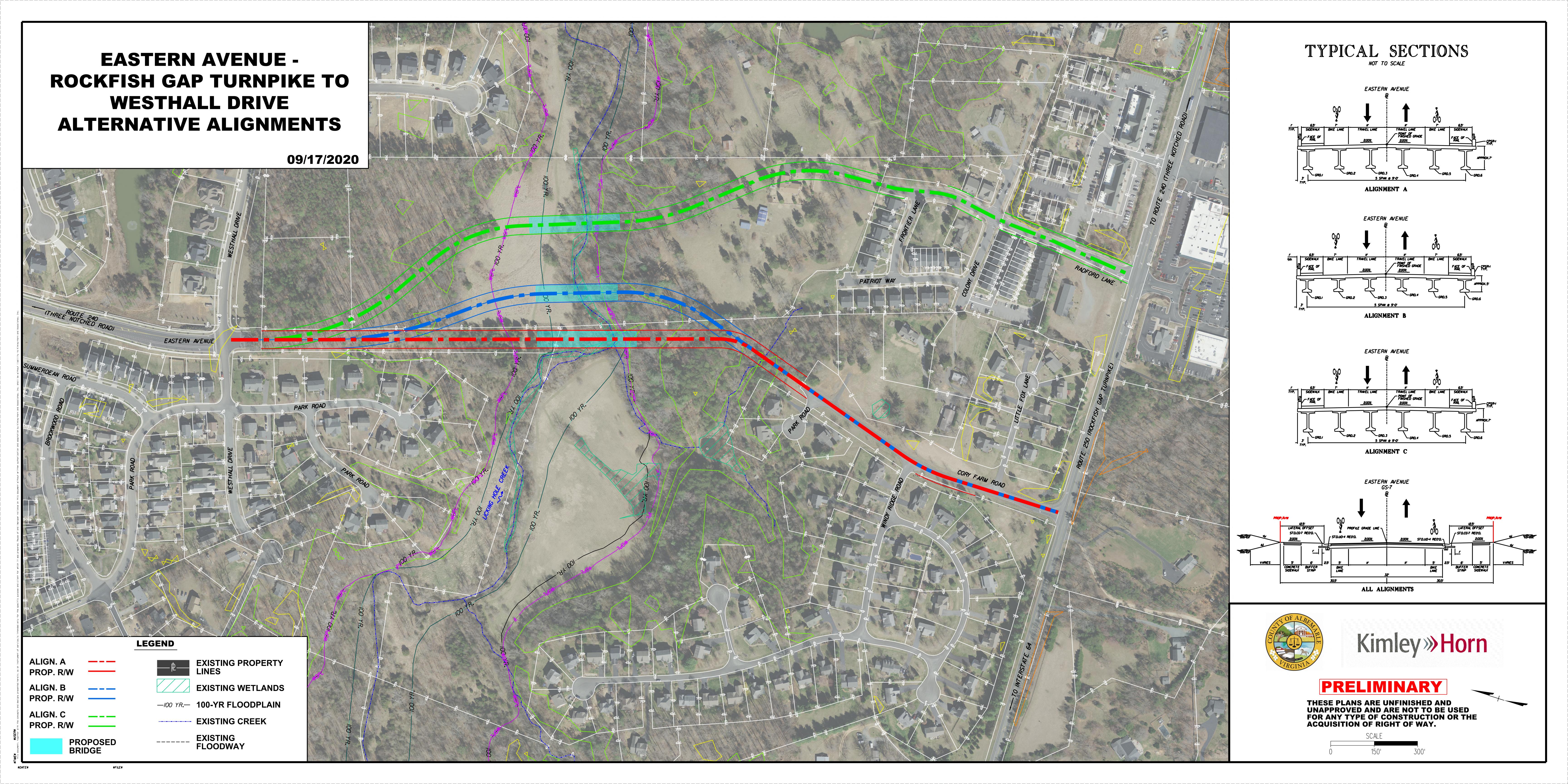
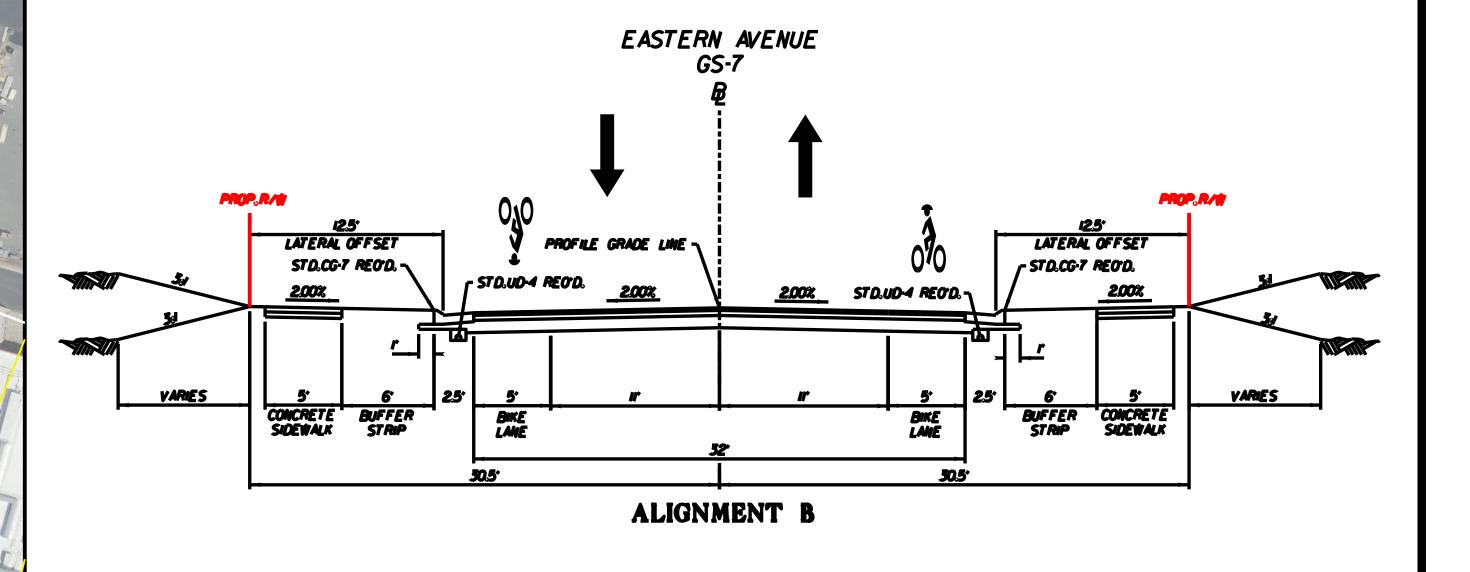


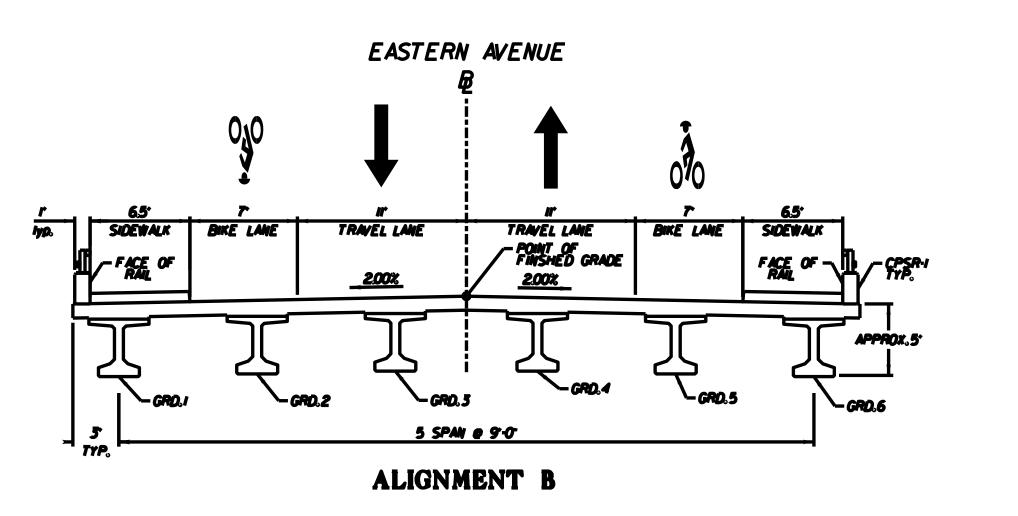


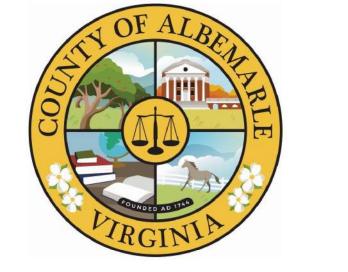
Figure 3: Proposed Alignment B



# TYPICAL SECTIONS NOT TO SCALE



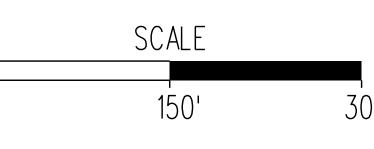


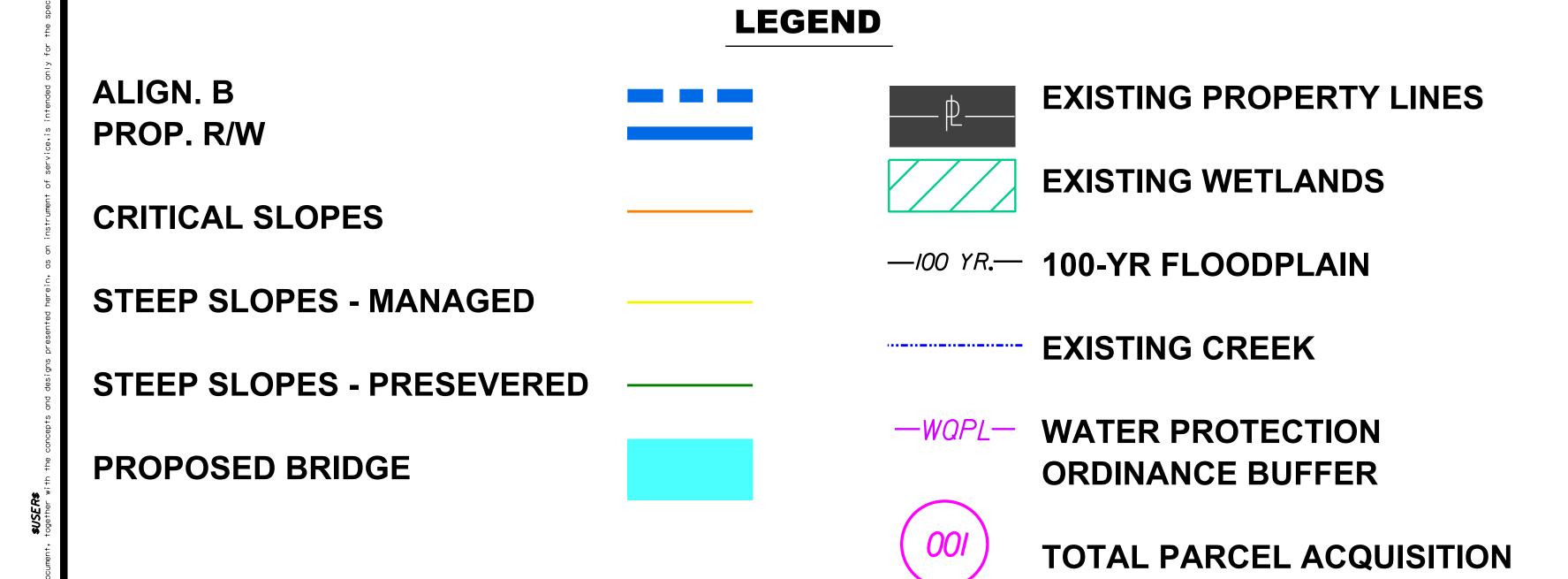


Kimley» Horn

## PRELIMINARY

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY.







#### ATTACHMENT A: ALIGNMENT ALTERNATIVES MATRIX

EASTERN AVENUE: ROUTE 250 (ROCKFISH GAP TURNPIKE) TO WESTHALL DRIVE - EVALUATION OF ALTERNATIVES MATRIX				
Criterion Total Alignment Length	Alignment A 3,010 feet	Alignment B - Preferred 3,075 feet	Alignment C 3,290 feet	Findings: Alignment A has the shortest alignment length.
Total Alignment Length Total Parcels Intersected	6 6	5,075 leet 6	3,290 feet 9	Alignment A and B have comparable impacts to properties.
Potential Relocations (Total Acquisitions)	1	1	1*	Alignment A and B have comparable impacts to properties.  *Alignment C does carry additional risk for the potential of one (1) more total acquistion.
Partial Acquisitions	5	5	7	Alignment A and B have comparable impacts to properties.
Access Management and Signal Spacing	Approx. 3,825 feet from adjacent signal (Intersection of Miller School Road at Route 250)	Approx. 3,825 feet from adjacent signal (Intersection of Miller School Road at Route 250)	Road at Route 250)	Alignment C has greatest signalized intersection spacing.
Hydrologic Unit Code (HUC)	020802	ot is within two HUC12 of the Rivanna 040101 - Mechums River - Stockton C 2040102 - Mechums River - Beaver Cr	reek	No unique impacts.
Phosphorous Removal Required (lb) Number of SWM Facilities Required	6 lb/yr 2	6 lb/yr 2	7 lb/yr 2	Alignment A and B have comparable requirements for SWM Quality.  Comparable Impacts.
Environmental Justice	Preliminary population demographics from the U.S. Census Bureua for Albemarle County, VA from 2010 Census data were reviewed. The EJ study area traverses Census Tract 111.00, Block Group 2.			The minority population of the environmental justice study area does not exceed 50%. Additionally, the percentage of the minority population is below the EJ evaluator factor for the Census Tract and Block Group. No Tract or Block Group is below \$53.482 so there are no economically disadvantaged populations in the study area. Based on data, both Census Tracts exceed the 2019 Health and Human Services Guidelines. The 2019 guidelines state the a family of four is considered at poverty level if the median household income is \$55.75 oor below. As lited above the project Census Tract exceeds that number; therefore, no-low income population is considered to be present. All alignments have comparable impacts.
Sensitive Noise Receptor Estimate	The Federal Highway Administration (FHWA) noise regulation requires noise studies for Type 1 projects including: roadway widening to provide additional through travel lanes, the construction of a highway on new location, or the physical alteration of an existing highway that significantly changes either the horizonal or vertical alignment or increases capacity. Based on the preliminary conceptual design, this project fits one or more of these descriptions. Therefore, a traffic noise study is anticipated to be required.			Comparable Impacts.
Public Park and Recreation Areas	Based on preliminary review of Albemarle County GIS, National Park Service database information, and the Virginia Outdoors Foundation, no public parks or recreation area are located within the project area. However, Crozet Park is located less than one-mile west of the project area.			No Impacts.
Historic Resources	Based on a preliminary review of the Virginia Department of Historic Resources (VDHR) Virginia Cultural Resources Information System (V-CRIS), no architectural or archaeological resources were identified within the project area. However, a single architectural resource (VDHR 8002-1184) is located in the vicinity of Radford Lane, east of the project area.			No Impacts.
Public Waterfowl/Wildlife Refuges	Based on a preliminary review of the U.S. Fish and Wildlife Service (USFWS) National Wildlife Refuge System and Geospatial Services, there are no public waterfowl or wildlife refuges located within or in the proximity of the project area.			Additional coordination with the USFWS to determine that the proposed project will have no affect on waterfowl species or wildlife refuges is recommended.
Threatened & Endangered Species	Based on a preliminary review of the USFWS Information for Planning and Conservation (IPAC), the Department of Game and Inland Fisheries (DGIF) Virginia Fish and Wildlife Information System (VaFWIS), the Department of Conservation and Recreation (DCR) Virginia Natural Heritage Data Explorer, and the Center for Conservation Biology (CCB) Eagle Nest Locator, the following federal and State threatened and endangered species were identified within the proximity of the project area: Northern Long-aerad Bal (USFWS-Federally Threatened) - James Spinymussel (USFWS/DGIF/DCR - Federally Endangered/ State Endangered)			Additional coordination with the USFWS, DGIF, and DCR to determine that the proposed project will have no affect on federally or state threatened or endangered species is recommended.
Tree Clearing (nearest hundredth of an acre)	5.91	7.35	7.93	Alignment A requires the fewest acres for tree clearing.
Prime Farmland - Farmland of Statewide Importance (nearest acre)	Based on a preliminary review of Natural Resources Conservation Service (NRCS) Web Soil Survey, prime farmland is identified within the project area as well as farmland of statewide importance.			Additional coordination with Albemarle County to determine that the proposed project will have no affect on prime farmland is recommended.
Floodplains (nearest hundreth of an acre)	Floodway: 0.30 100-Year: 0.33 500-Year: 0.00 Total: <b>0.63</b>	Floodway: 0.23 100-Year: 0.60 500-Year: 0.00 Total: <b>0.83</b>	Floodway: 0.22 100-Year: 0.51 500-Year: 0.00 Total: <b>0.73</b>	Alignment A has the smallest footprint in existing floodplains.
National Wetland Inventory Wetlands (nearest hundredth of an acre) - Mitigation Requirements - S Mitigation Cost	Based on a review of the USFWS National Wetland Inventory (NWI), no wetlands have been identified within the project area.			Additional field review of the project area is recommended to determine the location and extent of wetlands.
Nation Wetland Inventory Streams (nearest linear foot)  - Mitigation Requirements  - S Mitigation Cost	145 LF 145 LF <b>\$72,500</b>	145 LF 145 LF <b>\$72,500</b>	145 LF 145 LF <b>\$72,500</b>	The compensation amount for impacts to stream features is based on a field assessment of the quality of the stream (Jufined Stream Methodology). Having not completed a field review of the stream prior to cost estimate, it is recommended to assume cost for all impacts as part of the proposed improvements. The Virginia Aquatic Resources Trust Fund provides mitigation credits at \$500 per credit. All alignments have comparable impacts.
Preliminary Wetland Delineation (field review)	A preliminary wetland delineation was conducted on June 24, 2020 and identified four (4) stream systems and three (3) wetland systems within the project area.			The wetland delineation is preliminary and is subject to confirmation by the USACE. The submittal of Preliminary Jurisdictional Determination (PJD) package for confirmation by the USACE is recommended to determine the location, extent, and anticipated impacts to wetlands and streams.
Wild and Scenic Rivers Sole Source Aquifers	Based on a review of the DCR's Virginia Outdoors Plan Mapper, there are no wild or scenic rivers located within the project area or the immediate vicinity.  The project is not located within a soul source aquifier.			No Impacts.
Coastal Zone Management	Based on a review of the Department of Environmental Quality's (DEQ) Coastal Zone Management, there are no Coastal Zone Management Areas located within the project area or the immediate vicinity.			No Impacts.
Coastal Barrier Resources	Based on a review of the USFWS Coastal Barrier Resource System there are no coastal barrier resources within the project area or the immediate vicinity.			No Impacts.
Contamination and Toxics	Based on a preliminary review of the DEQs VEGIS online database, one petroleum release was identified within the wicinity of the project area. No solid waste facilities or impaired waters were identified within the vicinity of the project area.			Additional coordination on the proposed activities within the vicinity of these identified sites as well as any sites proposed for acquisition is recommended.
Air Quality	Chapter 15-Section 7 of the VDOT LAP Manual states that each federally-funded transportation project be evaluated for its potential impact on air quality in the immediatery vicinity of the project. Each applicable project must demonstrate that sensitive populations will not be exposed to pollutant concentrations above an applicable air quality standard.			If federal dollars are applied to this project, it is recommended that an air quality analysis be conducted.
Steep Slopes Assessment (SF)	Critical Slopes: 0.00 Steep Slopes - Managed: 4,494 Steep Slopes - Preserved: 24,723 Total: 29,217 SF	Critical Slopes: 0.00 Steep Slopes - Managed: 4,598 Steep Slopes - Preserved: 23,955 Total: 28,553 SF	Critical Slopes: 0.00 Steep Slopes - Managed: 2,706 Steep Slopes - Preserved: 31,370 Total: <b>34,076 SF</b>	Alignment B has the lowest impact to "Steep Slopes" within the project limits.
Total Bridge Length	340 LF	280 LF	310 LF	Alignment B has the shortest total bridge length.  The planning level bridge lengths were developed using 1.5:1 sloping abutments that do not impact the FEMA Floodway.
Water Protection Ordinance Stream Buffer Impacts (SF)	26,925 SF	36,270 SF	31,993 SF	Alignment A has the smallest footprint in existing Water Protection Ordinance Stream Buffer Area.
Potential Development Opportunity Area - Post Improvements (Ac.)	18	16	12	Alignment A allows for the greatest space available for potential development post roadway
Parcel ID: 05600-00-00-09700 Construction Roadway Costs (\$ Millions)	13M-15M	13M-15M	14M-16M	improvements. Alignment B has lowest roadway cost.
Construction Bridge Costs (\$ Millions)	10M-12M	8M - 10M	7M - 9M	Alignment C has the lowest bridge cost.

Footnotes: