

## MEMORANDUM

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**Date:** February 27, 2020 **VDOT Contract ID #: 46267**

**To:** Charles Proctor  
Planning Manager – Culpeper District  
1601 Orange Road, Culpeper VA 22701

**From:** Chris Tiesler, PE; Alexandra Jahnle, PE

**Task Order:** Task Order 241 – Route 20 Shared Use Path (Albemarle County)

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Kittelison & Associates, Inc. (Kittelison) developed a concept plan and cost estimate for a shared use path (SUP) along Route 20, from the southern Charlottesville city limits to the Piedmont Virginia Community College (PVCC) and the Saunders-Monticello Trailhead in Albemarle County, Virginia. The SUP would connect the city residential neighborhood to PVCC and the existing multi-use trail via Route 20 where no existing bicycle or pedestrian facilities exist today. As a part of the project, Kittelison also documented possible operations impacts, stormwater impacts, and right of way and utility impacts. The concept plan is in **Attachment A**, the cost estimate is in **Attachment B**, and the summarized signal operation results at the College Drive intersection are in **Attachment C**.

### Alignment

Kittelison conducted a site visit in November 2019 to document existing conditions. A CAD base map was developed using aerials and available GIS parcel data. Two sketch-level layouts for the proposed SUP alignment were developed and discussed with the stakeholder group (Virginia Department of Transportation [VDOT], Albemarle County, and Thomas Jefferson Planning District Commission). One alignment was chosen, modified, and further developed based on the data collected in the site visit and feedback from the stakeholder group meeting on December 12, 2019.

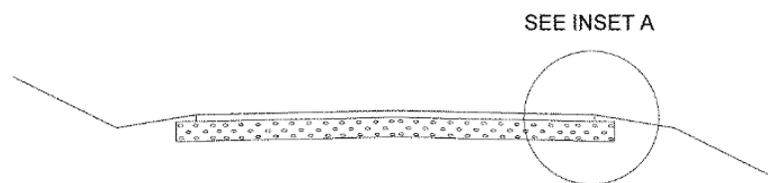
The alignments focused on locating the SUP in the median due to the proximity of the I-64/Route 20 Interchange. It was undesirable to provide an alignment where the SUP would cross multiple uncontrolled ramps at grade for safety concerns and number of conflict areas and the alternative to incorporate below/above grade crossings was eliminated due to the high cost. The location of existing trees and fiber utility in the median was considered with the development of the SUP alignment. All existing trees in conflict with the proposed alignment will be relocated or replaced to the extent possible.

## Design Summary and Considerations

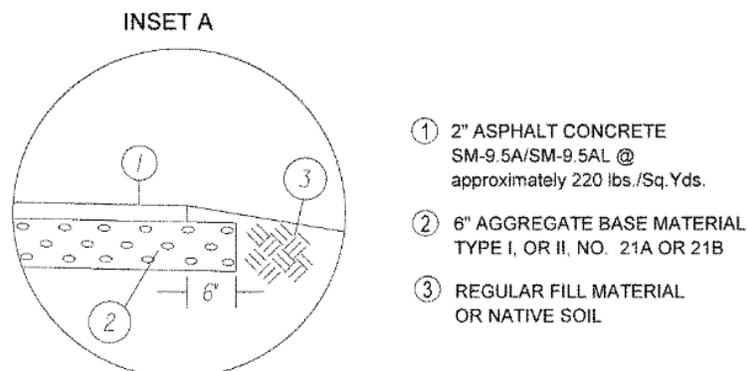
The chosen alignment was developed further and shared at another stakeholder group meeting on February 13, 2020. The design presented in this Memorandum incorporates comments and feedback discussed at this meeting. **Attachment D** includes the meeting minutes from the stakeholder meeting for reference, as some elements of the shared use path will be further investigated in future design phases.

In the project area, Scottsville Road (Route 20) is classified as a minor arterial and identified as an urbanized area from the VDOT 2014 Approved Functional Classification map. The roadway has a 45 mile per hour posted speed limit as identified by the VDOT Posted Speed Limits ArcGIS Webmap (updated as of Dec 23, 2019). VDOT Geometric Road Design Standards were used in the development of the two-directional SUP where feasible. The proposed shared use path is assumed to be a ten-foot-wide minimum, asphalt concrete path along the length of the project as shown in **Exhibit 1** and **Exhibit 2**. An eight-foot clearance was maintained between the shared use path and the face of curb where feasible and guardrail or barrier is proposed where the clearance is less than eight feet. This occurs primarily along the west side of the median where the SUP is closer to Route 20 and in locations where there are median breaks or other obstructions (sign poles, bridge piers) within the median. The minimum standard clearance of three feet is maintained from the path to obstructions such as trees, signs, etc. Further comments from the stakeholders included a desire for a “creative” barrier along both sides of the SUP for those portions within the median in order to create a more “inviting feel” for pedestrians and bicyclists and still meet safety requirements and standards. This type of treatment and cost implications should be investigated in future design phases of the project.

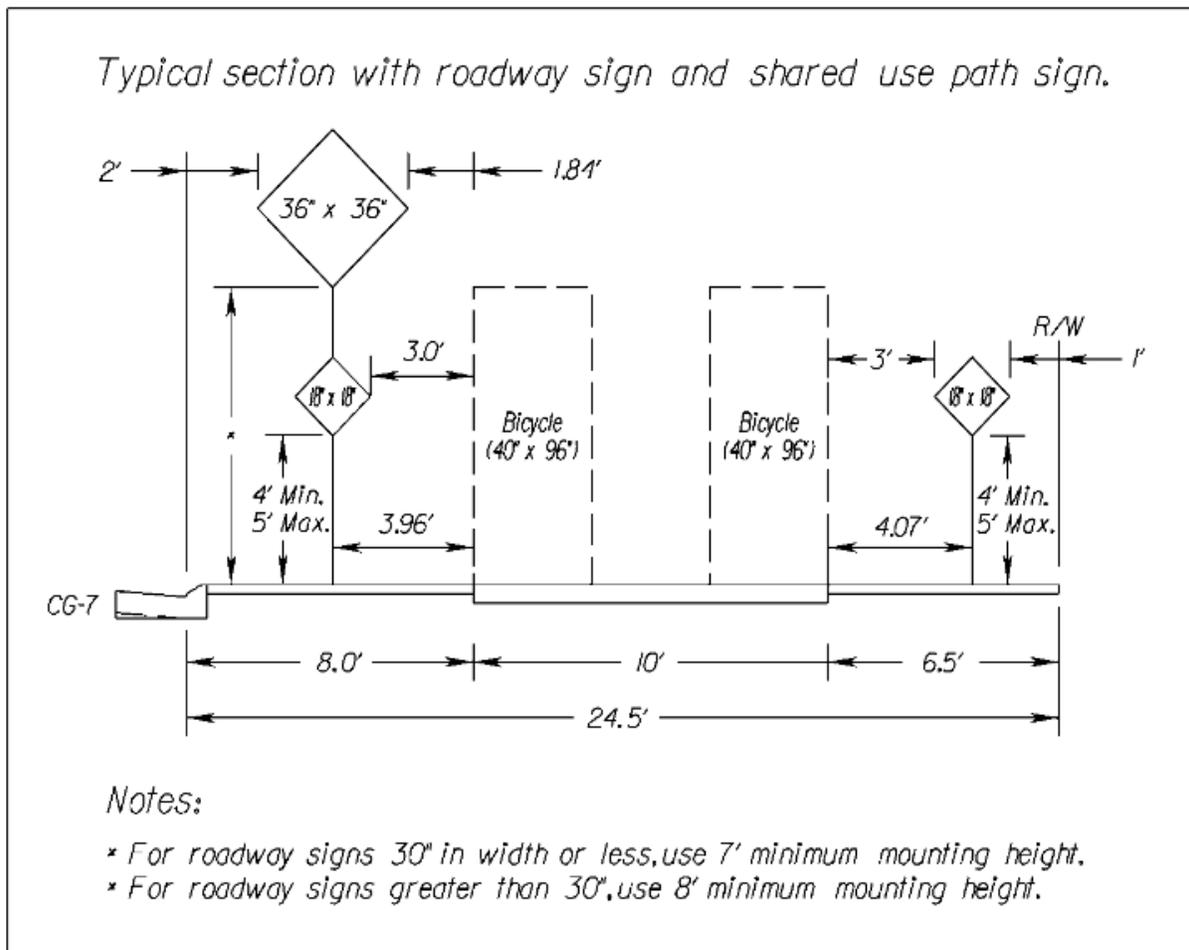
**Exhibit 1.** Shared Use Path Pavement Structure (Source: *Figure A(1)-1-10 of Appendix A(1) VDOT Complete Streets: Bicycle and Pedestrian Facility Guidelines*)



Note: For dimensions, slopes and offsets, see Appendix A, Figure A-5-5



**Exhibit 2.** Typical Section of Shared Use Path (Source: Figure A(1)-1-4 of Appendix A(1) VDOT Complete Streets: Bicycle and Pedestrian Facility Guidelines)



The proposed SUP concept design alignment connects and meets existing sidewalks near Druid Avenue. Transitions from the proposed city bike lanes to the SUP in the median will be provided at Quarry Road where the bike lanes currently end. Additional configurations could be considered in future projects. A full crossing of Route 20 on the south side of the Quarry Road intersection will provide access to the median for pedestrians and bicyclists from the west and east sides of Route 20. Rectangular Rapid Flashing Beacons (RRFB) or HAWK signals (if warranted) are proposed at this crossing. Passive detection treatments for pedestrian and bicyclists could enhance the visibility of this crossing. Upstream signage and pavement markings for vehicles should be evaluated and provided to further enhance the visibility and safety of this crossing.

South of Quarry Road and north of the bridge, the SUP continues in the median and a curb extension will be constructed in the inside lane of the bridge where a lane is removed with yellow pavement markings today, shown in **Image 1**.

**Image 1.** Current Pavement Markings on Route 20 North of Bridge



Guardrail is proposed to be flush with the curb and then transition to a railing/barrier across the bridge in accordance with VDOT Standards. Guardrail will also be provided between the SUP and the bridge abutment/slope. The existing five foot wide sidewalk on the west side of the bridge provides a connection to the existing Rivanna Trail along Moore’s Creek and a connection to Piedmont House is proposed with an extension of the sidewalk along the west side of Route 20 to match the existing sidewalk across the bridge. Future connection upgrades may be explored in future phases of design.

The SUP extends south in the median and crosses several median breaks (I-64 Westbound Off-Ramp, I-64 Eastbound On-Ramp, and Hart Road). In the stakeholder meeting, there was a discussion about the opportunity to close the median at Hart Road. Due to the uncertainty of timing and the ability to close the median, the concept design assumes the median break is retained. Signage and pavement markings are provided to alert drivers in advance of the SUP crossing locations. Additional opportunities to include passive detection or other crossing treatments should be further evaluated in future phases of design to enhance the visibility and safety of SUP users and alert drivers of the crossing locations.

Where the SUP passes obstructions such as bridge piers (shown on **Figure 04** in **Attachment A**) or overhead sign poles (shown on **Figure 02** in **Attachment A**) the SUP will transition to a wider width in order to enable comfortable two-way travel. Guardrail will be installed in accordance with VDOT standards to protect obstructions from vehicular travel as well as SUP users.

At the south end of the trail a signal modification is proposed at the College Drive (Route 338)/ Scottsville Road (Route 20) intersection to provide pedestrian signal timing to allow for a single stage crossing of Route 20. A summary of the operation analysis results is displayed in **Table 1** in **Attachment C**. Pedestrian signal equipment (signal heads/pushbuttons) will be provided within the median for pedestrians/bicyclists that arrive at the signal in the median on the SUP. An additional sidewalk connection between Route 20 and the PVCC parking lot on College Drive is illustrated in the design and recommended for inclusion in this project. This additional sidewalk segment provides a connection from PVCC on the west side of the intersection and Dairy Barn Road to connect to the Saunders-Monticello trailhead on the east side of the Route 20 intersection.

### Stormwater Impacts

No roadway plans or roadway cross-sections were available to review as a part of this project. The project assumes the open drainage system will be converted to a closed drainage system and the entire median will include construction of curb and gutter where we are proposing the SUP.

### Right of Way and Utility Impacts

There will be right-of-way impacts at the Saunders-Monticello trailhead where the sidewalk will connect the SUP to the trailhead at Dairy Barn Road. There will be also be some minor right-of-way impacts to the property east of Route 20 between Druid Avenue and Quarry Road where the sidewalk is proposed to connect the existing sidewalks north of Druid Avenue to the proposed SUP in the median.

The SUP is located closer to the west side of the median to minimize/avoid impacts to the known fiber utility running in the median. No detailed utility plans were available to help inform the conceptual design, and will need to be investigated further in future phases of design.

### Cost Estimate

A planning level cost estimate is shown in **Attachment B**. The cost estimate includes conservative assumptions using standard VDOT items and the reported VDOT District Averages from August 2017 to October 2019.

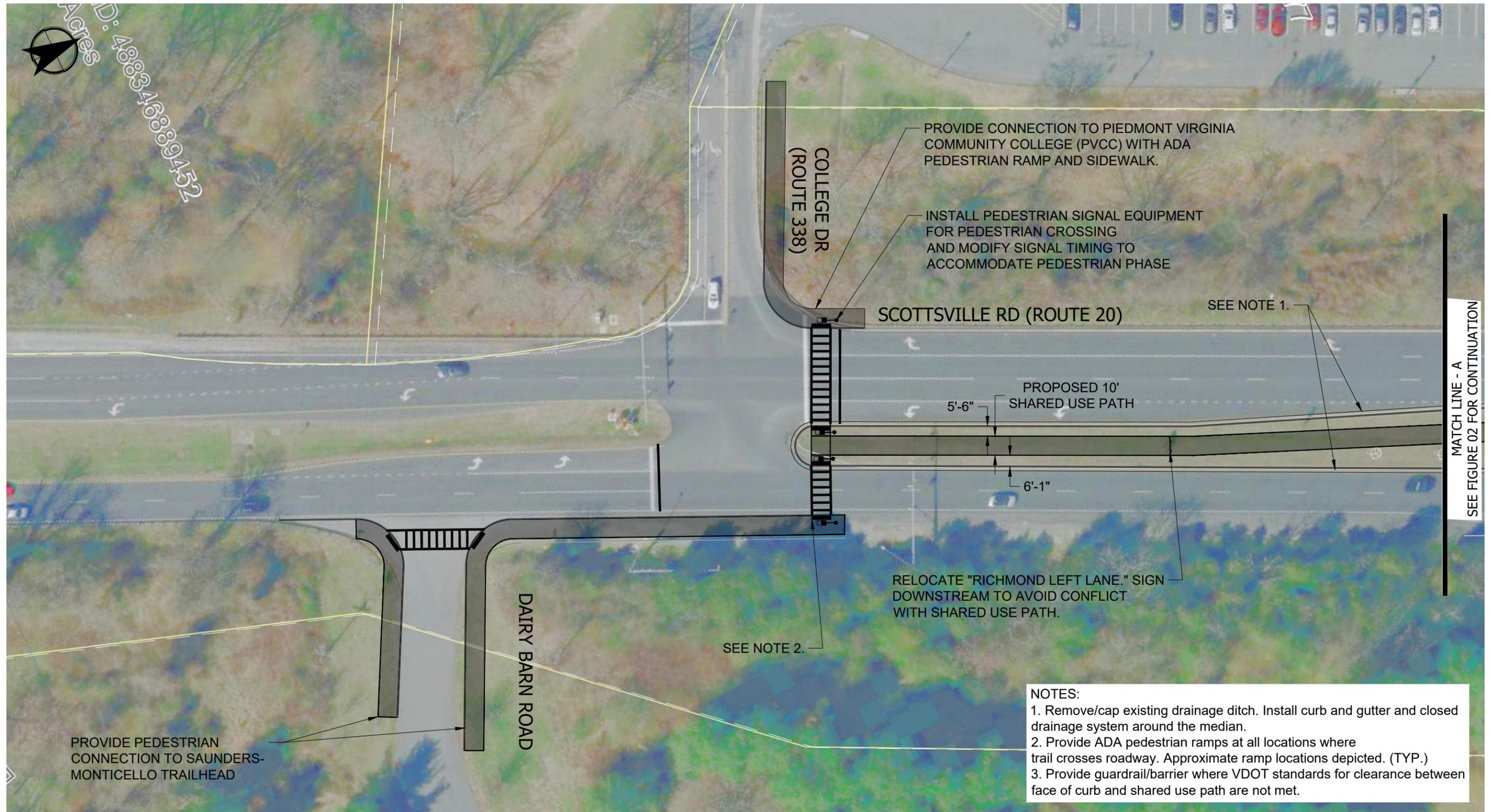
## ATTACHMENTS

**Attachment A** – Shared Use Path Concept Design

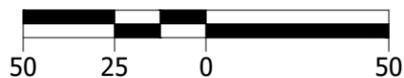
**Attachment B** – Planning Level Cost Estimate

**Attachment C** – Signalized Pedestrian Crossing Impact Summary

**Attachment D** – Stakeholder Meeting Minutes, February 13, 2020



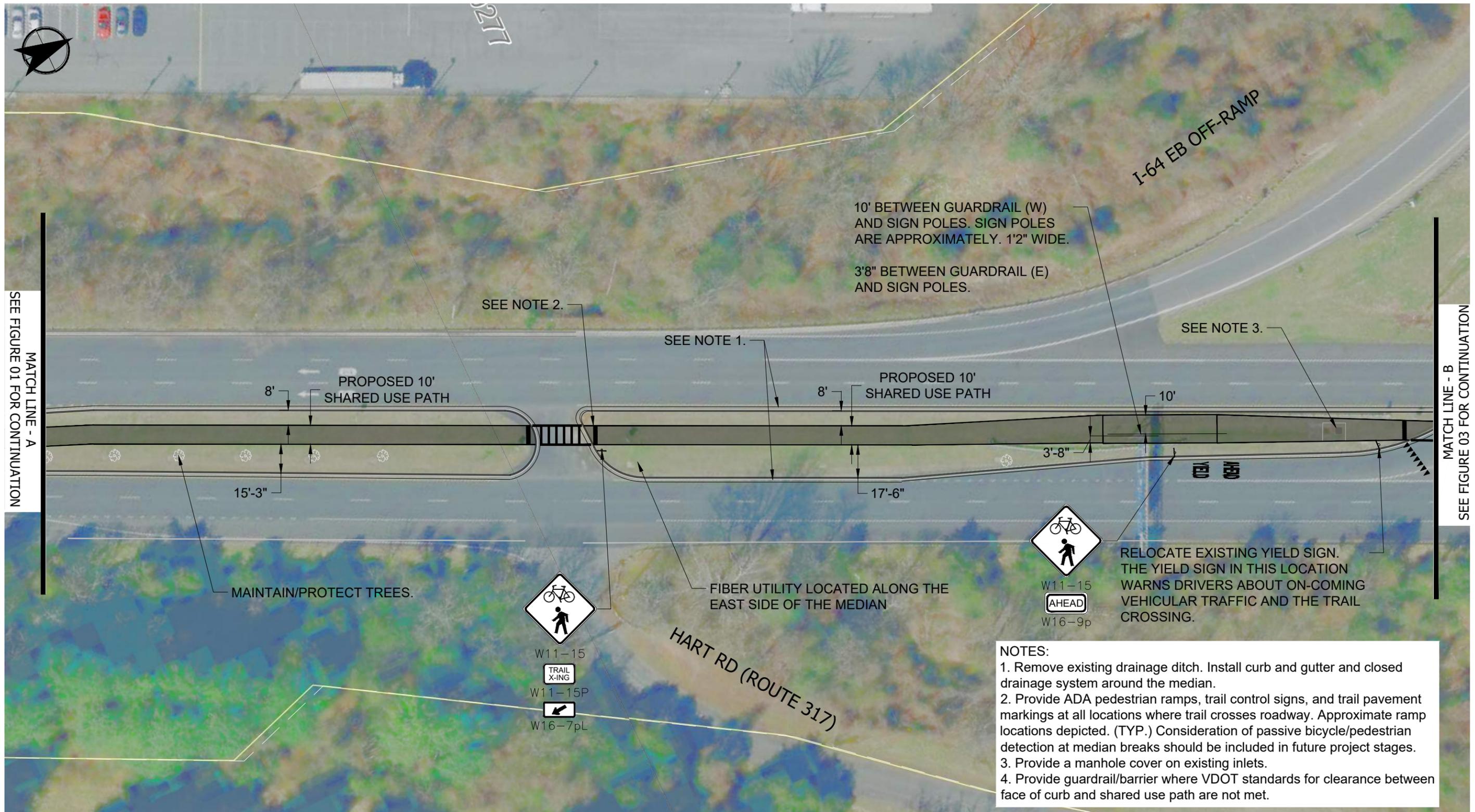
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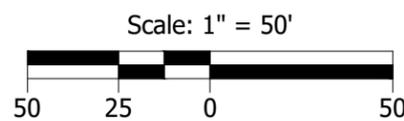
Route 20 Shared Use Path - Concept Design  
Albemarle County, VA

Figure  
01

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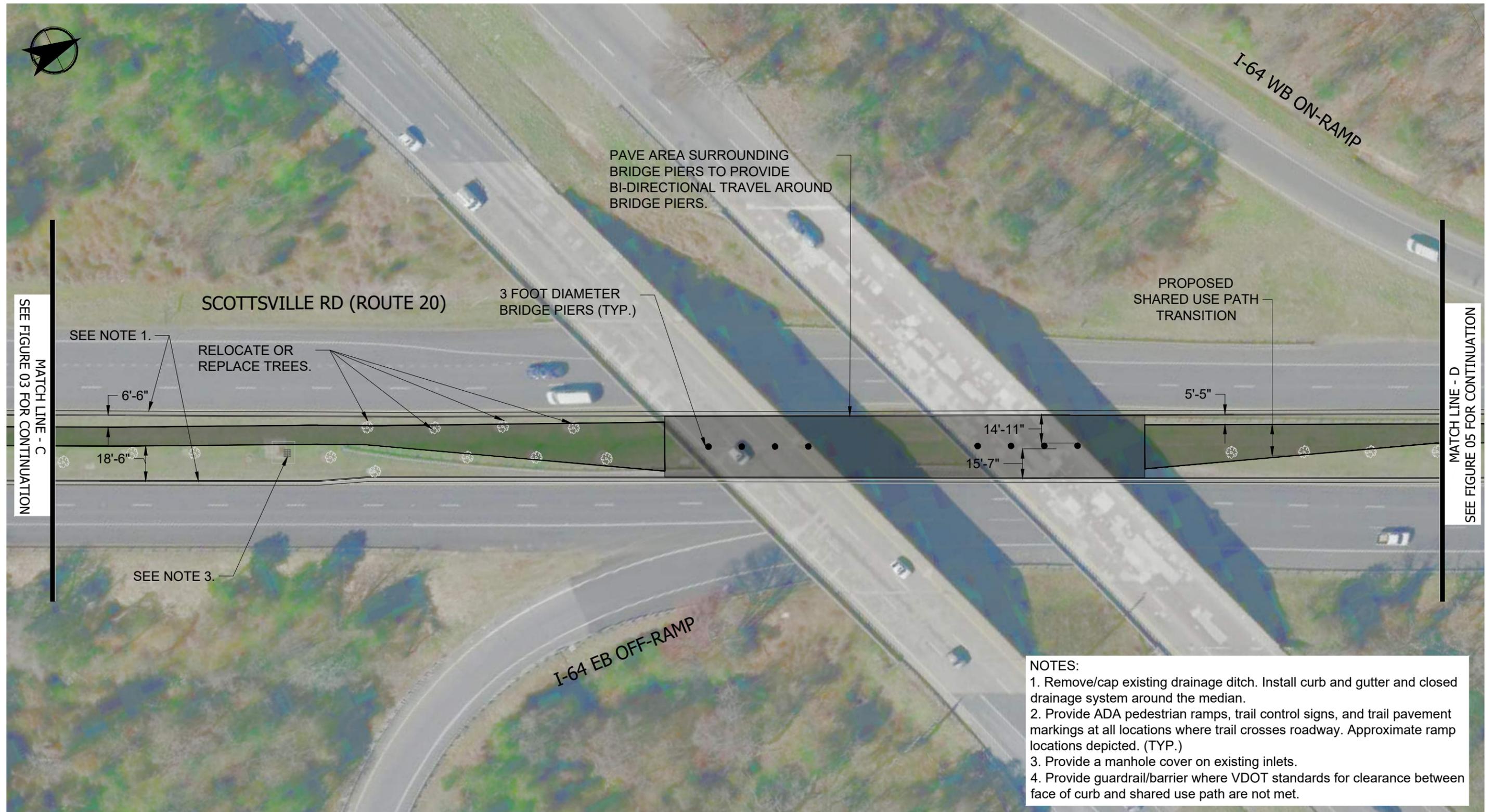
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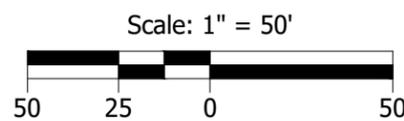
Route 20 Shared Use Path - Concept Design  
 Albemarle County, VA

Figure 02



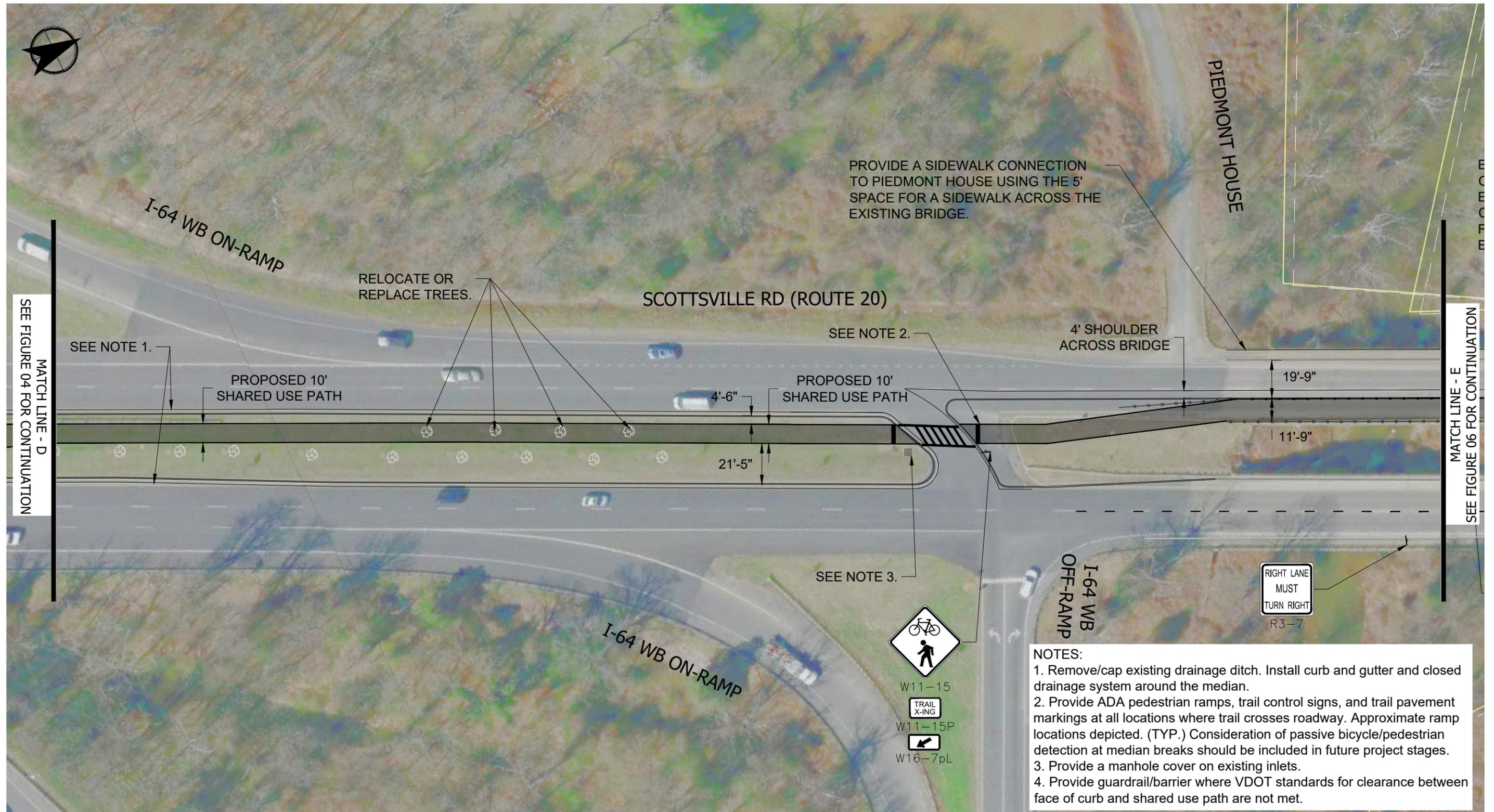


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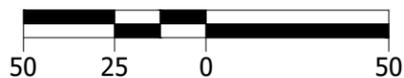


Route 20 Shared Use Path - Concept Design  
Albemarle County, VA

Figure  
04

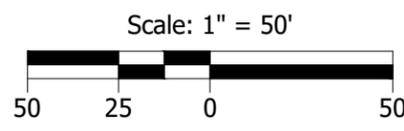
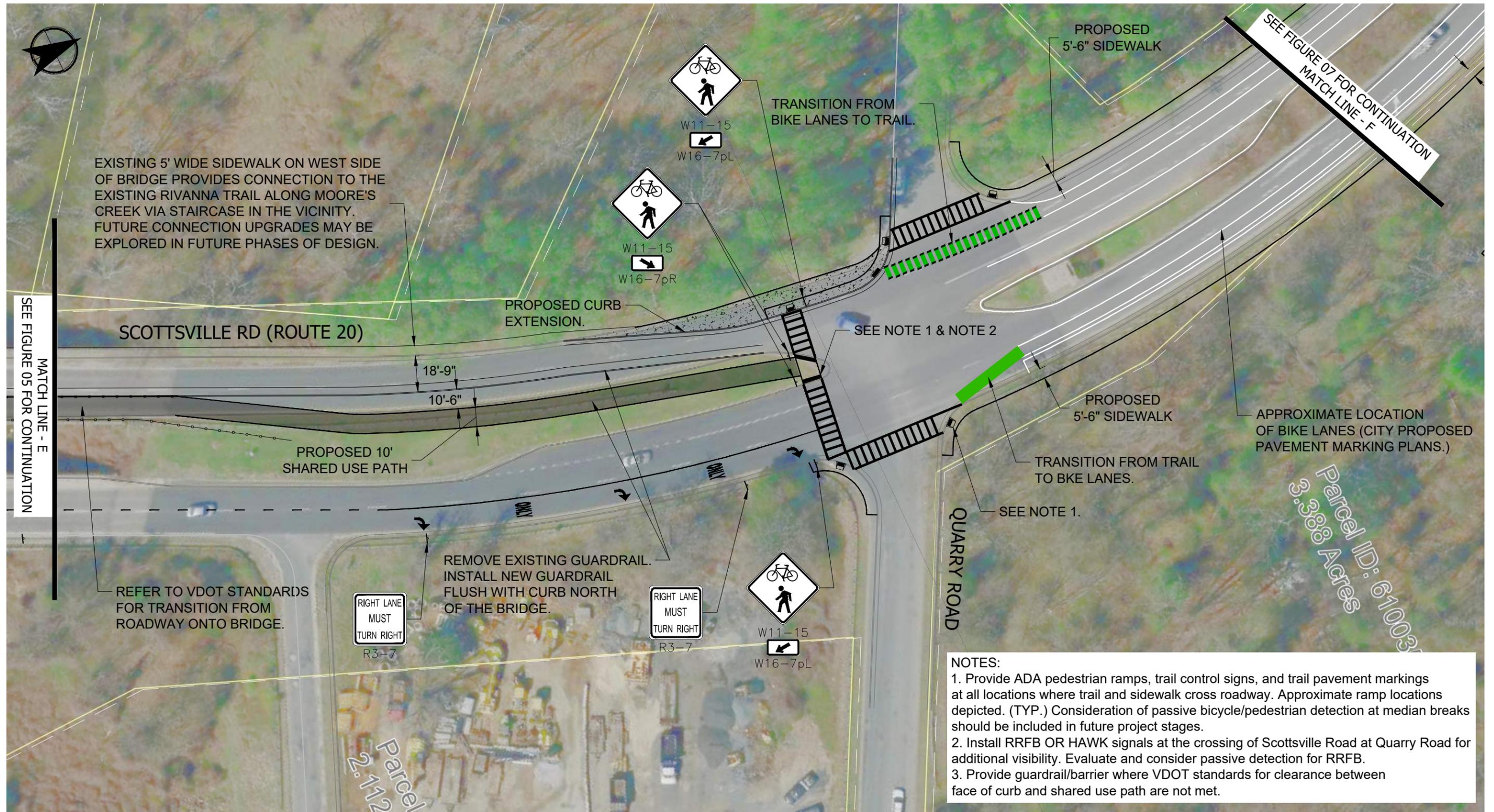


Scale: 1" = 50'



Route 20 Shared Use Path - Concept Design  
Albemarle County, VA

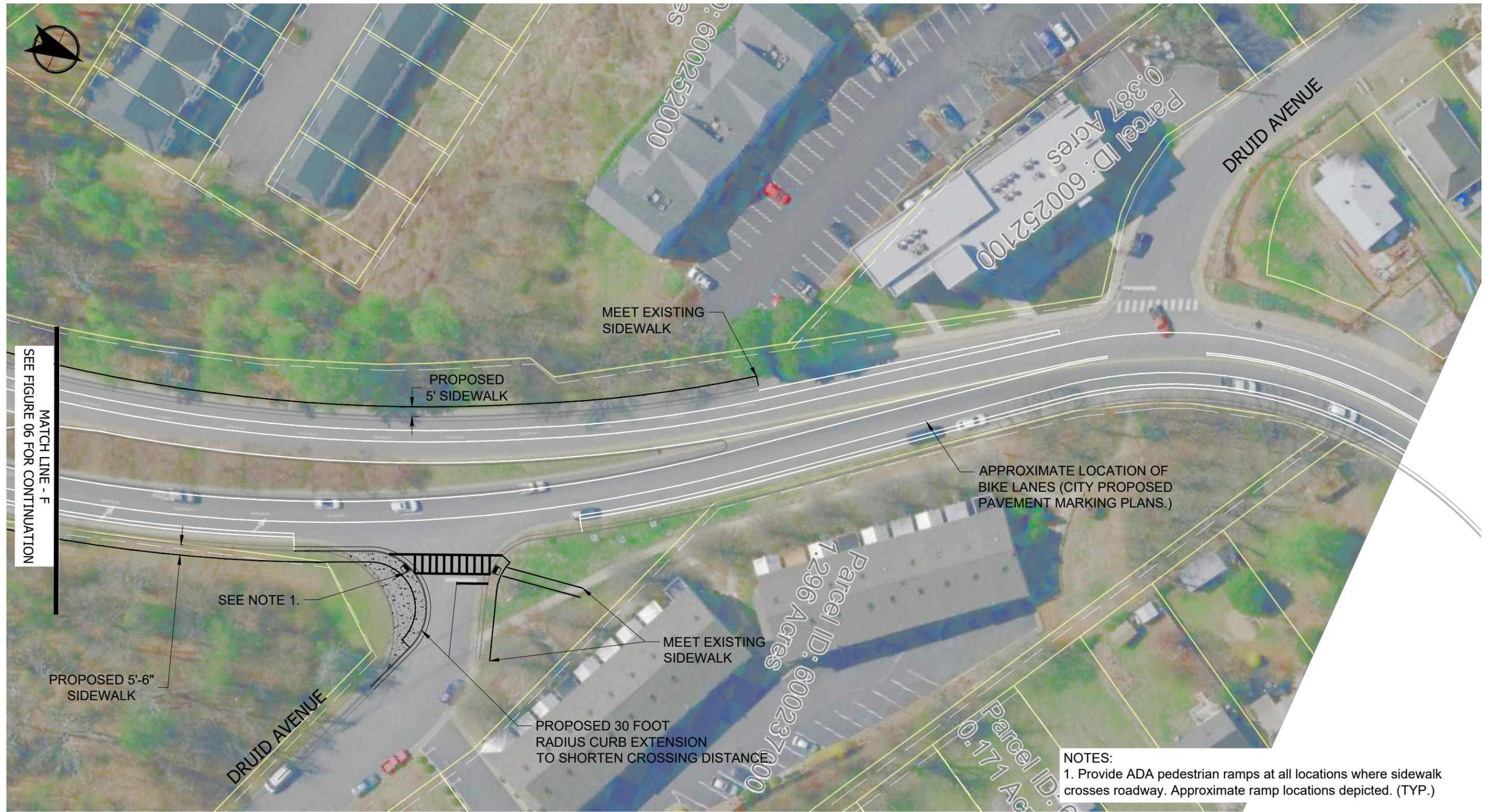
Figure  
05



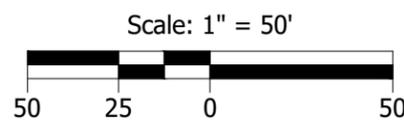
Route 20 Shared Use Path - Concept Design  
Albemarle County, VA

Figure 06

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NOTES:  
 1. Provide ADA pedestrian ramps at all locations where sidewalk crosses roadway. Approximate ramp locations depicted. (TYP.)



Route 20 Shared Use Path - Concept Design  
 Albemarle County, VA

Figure  
 07

# Attachment B

## Route 20 Shared Use Path

Project #: 21605.241

VDOT Contract ID#: 46267



### Engineer's Conceptual Estimate

Prepared by: Kittelson & Associates, Inc.

Date: February 2020

ITEM	UNIT	TOTAL QUANTITY	Average	UNIT PRICE	TOTAL COST	
00110	CLEARING AND GRUBBING	LS	1	\$14,200.00	\$5,000.00	\$5,000.00
12020 or 12030	STD. CURB (CG-2 or CG-3)	LF	1,290	\$27.93	\$27.93	\$36,029.70
12600 or 12700	STD. COMB. CURB & GUTTER (CG-6 or CG-7)	LF	6,000	\$29.00	\$29.00	\$174,000.00
13108	CG-12 DETECTABLE WARNING SURFACE	SY	39	\$247.17	\$247.17	\$9,612.17
13268	REMOVE EXISTING GUARDRAIL TERMINAL	EA	1	\$260.00	\$260.00	\$260.00
13280	INSTALL GUARDRAIL (GR-MGS1)	LF	4,250	\$20.77	\$20.77	\$88,272.50
13286	INSTALL GUARDRAIL TERMINAL SECTION (GR-MGS2)	EA	14	\$2,685.76	\$2,685.76	\$37,600.64
24600	REMOVE EXISTING GUARDRAIL	LF	1,530	\$0.61	\$0.61	\$933.30
	EXCAVATION	CY	1,000	\$20.00	\$20.00	\$20,000.00
	REGULAR FILL MATERIAL	CY	4,088	\$30.00	\$30.00	\$122,653.33
	AGGREGATE BASE MATERIAL TYPE I OR II (6")	TON	1,130	\$45.00	\$45.00	\$50,852.08
	ASPHALT CONCRETE (2")	TON	342	\$146.76	\$146.76	\$50,256.24
	HYDR. CEMENT CONC. SIDEWALK (Sidewalks)	SY	1,576	\$85.00	\$85.00	\$133,922.22
	SAWCUT ASPH. CONC.	LF	7,290	\$7.00	\$7.00	\$51,030.00
50108	SIGN PANEL	SF	136	\$27.28	\$27.28	\$3,710.08
50342	RELOCATE EXISTING 2 POST GROUND MOUNTED SIGN PANEL	EA	1	\$500.00	\$500.00	\$500.00
50430	SIGN POST STP-1, 2", 14 GAUGE	LF	110	\$27.96	\$27.96	\$3,075.60
50485	CONC. SIGN FDN. STP-1, TYPE A	EA	12	\$414.96	\$414.96	\$4,979.52
51198	PEDESTRIAN ACTUATION PA-2	EA	4	\$862.50	\$862.50	\$3,450.00
51210	PEDESTAL POLE, PF-2, 10'	EA	4	\$895.87	\$895.87	\$3,583.48
51240	CONC. FOUNDATION PF-2	EA	4	\$851.36	\$851.36	\$3,405.44
51607	14 AWG/7C CONDUCTOR CABLE	LF	1,840	\$3.72	\$3.72	\$6,844.80
51700	14 AWG/2C CONDUCTOR CABLE	LF	1,840	\$2.77	\$2.77	\$5,096.80
51951	SIGN INSTALLATION	EA	11	\$349.03	\$349.03	\$3,839.33
52403	LED PEDESTRIAN SIGNAL HEAD - SP-8	EA	4	\$390.60	\$390.60	\$1,562.40
54048	24" TYPE B CLASS I PAVEMENT MARKING (STOP BAR + Crosswalk)	LF	2,135	\$27.98	\$27.98	\$59,737.30
	6" WIDE, 2' WHITE LINE SEGMENT 6' GAP PAVEMENT MARKING LINE	LF	305	\$5.00	\$5.00	\$1,525.00
	6" WIDE SOLID WHITE PAVEMENT MARKING LINE	LF	265	\$5.00	\$5.00	\$1,325.00
54393	PAVEMENT MESSAGE MARK. ONLY TY B CL II (Includes "Yield Ahead")	EA	5	\$540.00	\$540.00	\$2,700.00
54575	PAVEMENT SYMBOL SGLTURN ARR. TY B CL II	EA	3	\$291.22	\$291.22	\$873.66
55580	JUNCTION BOX JB-R1	EA	3	\$2,235.02	\$2,235.02	\$6,705.06
56051	BORED CONDUIT 3"	LF	150	\$27.97	\$27.97	\$4,195.50
	SIGNAL MODIFICATION (Planning Level Cost Estimate)	LS	1	\$10,000.00	\$10,000.00	\$10,000.00
	RRFB INSTALL (Planning Level Cost Estimate)	EA	7	\$12,500.00	\$12,500.00	\$87,500.00
	PASSIVE DETECTION (RRFB) (Planning Level Cost Estimate)	EA	7	\$5,000.00	\$5,000.00	\$35,000.00
<b>SUBTOTAL COST</b>					<b>\$ 1,030,031</b>	
00100	MOBILIZATION	LS	1	\$55,626.67	\$25,000.00	\$25,000.00
	MAINTENANCE OF TRAFFIC	PCT	5.0%			\$51,501.56
	STORMWATER/DRAINAGE ESTIMATE	PCT	7.5%			\$77,252.34
	UTILITY ESTIMATE (10% of Project Total)	PCT	10.0%			\$103,003.12
	CONTINGENCY (Planning Level Cost Estimate)	PCT	10.0%			\$103,003.12
<b>TOTAL CONSTRUCTION COST</b>					<b>\$ 1,389,791</b>	

PROPERTY IMPACTS (VDOT STAFF TO EVALUATE ROW AND UTILITIES)			
Potential New Right-of-way Needed	SF	1,468	
Total Number of Lots Impacted	EA	2	
Number of Commercial Properties	EA		
Number of Residential Properties	EA		

Attachment C

**Route 20 Shared Use Path – Signalized Pedestrian Crossing Impact Summary**

**Table 1. Route 20/College Drive Intersection Operations – With- and Without-Pedestrian Crossing**

Intersection Information					AM Peak Hour			PM Peak Hour			
Intersection (#)	Pedestrian Crossing Provided?	Approach	Lane Group	Existing turn-lane lengths	LOS	Back of Queue (feet)	Delay (sec)	LOS	Back of Queue (feet)	Delay (sec)	
Route 20 (Scottsville Road)/ College Drive	No	EB	EBL		D	31	52.1	E	212	57.2	
			EBR		D	14	47.4	D	34	43.4	
						D	-	50.6	D	-	54.3
		NB	NBL		A	9	2.5	A	23	9.0	
			NBT	-	A	356	6.8	A	181	9.0	
		NB Approach				A	-	6.7	A	-	9.0
		SB	SBU	275	D	14	52.4	F	25	97.5	
			SBT	-	A	88	5.0	B	442	15.1	
			SBR	-	A	19	4.5	A	36	9.9	
		SB Approach				A	-	5.2	B	-	14.8
	Overall Intersection				A	-	6.7	B	-	16.9	
	Yes <sup>1</sup>	EB	EBL	465	D	20	41.0	D	182	49.9	
			EBR	-	D	9	40.4	D	29	41.2	
		EB Approach				D	-	40.8	D	-	48.0
		NB	NBL	-	A	26	4.5	B	32	10.3	
			NBT	225	B	#774	11.0	B	226	10.2	
		NB Approach				B	-	10.9	B	-	10.2
		SB	SBU	-	D	14	53.3	F	25	130.5	
			SBT	-	A	179	7.8	B	557	16.9	
			SBR	-	A	39	7.0	B	61	11.2	
SB Approach				A	-	7.9	B	-	16.7		
Overall Intersection				B	-	10.3	B	-	17.8		

<sup>1</sup>Pedestrian timing assumes single-stage crossing of Route 20 and 10 pedestrian calls during the peak hours. Timing for two-stage pedestrian crossing (using median refuge) did not show noticeable changes in forecast operations.

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Route 20 Multi-Use Trail - Concept Discussion

February 13, 2020

TJPDC at 10:00 a.m. 401 Water Street E, Charlottesville, VA 22902

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Kittelison & Associates, Inc. discussed the Multi-Use trail concept developed to provide a bicycle and pedestrian connection from the southern Charlottesville city limits along Route 20 to connect to the Saunders-Monticello Trailhead. The trail is assumed to be a concrete trail that is ten feet wide at a minimum along the length of the trail.

The discussion began at the Charlottesville city limits and stepped through the concept elements from the north towards the south. The proposed design will connect and meet existing sidewalks near Druid Avenue. Transitions from the proposed city bike lanes to the concept trail in the median will be provided at Quarry Road where the bike lanes currently end. The sidewalks on the west and east side of Route 20 will cross into the median on the south side of the Quarry Road intersection. It was mentioned that signage will be provided and there is the option to also provide flashing beacons (RRFB) at this crossing.

#### Comments –

1. It was suggested to further evaluate the safety of the crossing location and provide additional signage and downstream pavement markings to enhance the visibility of the crossing. In addition, provide information to validate safety concerns. (It was noted that due to sightlines and speed, an RRFB of HAWK should be required and not just an option at the path entrance.)
2. Comment provided to update the signage with the W11-15 Ped/Bike Crossing Signage instead of the W11-2 Signage throughout the project and Kittelson will update.
3. Refer to and label this “Multi-Use Trail” as a “Shared Use Path” and ensure “Shared Use Path” standards are met and documented in the concept, to the extent feasible. In addition, curb ramps and landings should be designed to shared use path standards with wider landings and truncated domes that extend the width of the shared use path.
4. The city mentioned concerns about the transition from the on-road facility to the shared use path. People riding bikes will be picking up speed going down the hill out of town. Investigate how bicyclists/pedestrians will navigate the curb extension. Consider an on-street pavement marking option to allow people riding in the bike lane to merge directly onto the shared us path in the median.

South of Quarry Road and north of the bridge, the trail will be located in the median and a curb extension will be constructed in the inside lane of the bridge where there are hatched out

pavement markings today. There will be guardrail flush with the curb that will transition to a railing/barrier across the bridge.

### Comments –

1. It was suggested to provide a connection to the existing Riviana Trail along Moore's Creek under the bridge/ connections to Piedmont House. There were a few options discussed. One idea is to extend the sidewalk from Quarry Road south along the west side of Route 20 and connect to the trail on the north side of the creek with a staircase. Alternatively, or additively, the sidewalk could be extended along the bridge on the west side of Route 20. Also, another crossing across Route 20 could be created near the median break.
2. A suggestion was to note the trees can be relocated or replaced (instead of just removed.) In addition, the trail could meander around the trees in some locations.
3. Consider adding additional pavement markings for the I-64 EB Off Ramp to turn into the Left (inside lane) of Route 20 and potentially have a transition lane in advance of the right-turn trap lane if there is adequate spacing.
4. Review traffic volumes at Quarry Road. Is there enough traffic volume turning right onto Quarry Road to warrant a dedicated right turn lane? If not, consider a curb extension on the east side to provide wider waiting area and narrow the crossing distance.
5. Investigate the need for a barrier between the Southbound travel lanes and the pedestrian/bicyclist trail. (It is a curbed median, but the trail is closer to the southbound travel lanes, etc.)
  - a. Follow-up comment on this topic: Future project phases should further expand the investigation to include a creative barrier on both sides of the median, as feasible. For instance, something more inviting for the users of the trail given its location within the median. The SUP will be most successful (in terms of number of users) if it is constructed in a way that not only prioritizes bicyclist and pedestrian safety, but also includes has a welcoming and pleasant feel despite the location in between vehicle traffic.
6. Check Shy distance across Bridge and confirm Shared Use Path Standards are met.
7. Look at transitions and signage needed on trail for users of the trail.

The trail extends south and the crossing at the I-64 Eastbound on-ramp was discussed as a conflict area. The concept design will ensure sight distance is provided for vehicles and for trail users. Signage and pavement markings will be provided to alert drivers in advance of the crossing.

### Comments –

1. Can actuated flashing lights be provided at the trail? Whether its RRFB or flashing lights on the stop signs when users are crossing or approaching the roadway. Kittelson will investigate potential treatments and document.

Where the trail passes obstructions such as bridge piers (shown on Figure 04) or overhead sign poles (shown on Figure 02) the paved trail width will be wider to enable two-way travel. Guardrail will be re-installed as needed. There will be another roadway crossing where the median breaks at Hart Road.

### Comments –

1. The city commented that they wanted to provide a wider/gentler transition between the 10' path and paved area under the bridge. The trail could widen on the bridge approach.
2. There was a discussion about the opportunity to close the median. Timing/ability unsure given uncertainty of future UVA development plans – will assume median break is retained in the design concept.

At the south end of the trail there will need to be a signal modification at the College Drive (Route 338)/ Scottsville Road (Route 20) intersection to provide pedestrian signal timing to allow for a single stage crossing of Route 20. Although, pedestrian signal equipment will be provided within the median for those pedestrians/bicyclists that arrive at the signal in the median. Connections and sidewalks will be provided to connect to the College (sidewalk on College Drive) and the Saunders-Monticello Trail head. The concept will show a sidewalk connection up to the Piedmont Virginia Community College parking lot on the west side of the intersection.