

To: Travis Bridewell (City of Richmond)  
From: Thomas Ruff, PE, PTOE  
RE: Bliley Road Multimodal Study  
Date: September 23, 2019  
Copy: Scott Dunn, AICP, PTP (TG)

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Timmons Group has prepared an assessment of Bliley Road and Westover Drive to best determine the location for potential bicycle and pedestrian improvements along the corridors and identify potential solutions for a safer, more accessible neighborhood. Along Bliley Road, the investigation focuses on the section between Jahnke Road and Blakemore Road. On Westover Drive the investigation focuses on the section between Blakemore Road to Forrest Hill Drive, as shown on Figure 1.

### **Background & Site Visit Information**

#### **Bliley Road**

Bliley Road (Route 7533) is a 2-lane, urban major collector facility with a posted speed limit of 35 mph that carries approximately 2,700 vehicles per day (VDOT 2017 traffic data). Bliley Road is an east-west route that includes a number of residential developments, including single-family homes, apartments, and townhomes. The roadway provides a connection between Jahnke Road and Forest Hill Avenue and is used as a cut-through to avoid the at-grade railroad crossing on Jahnke Road and traffic on Forest Hill Avenue. The study section is approximately 0.75 miles in length.

Timmons Group performed a site field visit in March 2019 to inventory the Bliley Road corridor, collect pictures of the study area, and observe existing conditions/operations. Photographs from the site field visit can be found in Figures 2 through 20.

There is one signalized intersection within the study area, Bliley Road at Forest Hill Avenue. All other intersections along Bliley Road are stop-controlled, with Bliley Road maintaining the right-of-way; the sole exception is at the Blakemore Road intersection, which is a 4-way yield/roundabout intersection. The following nine (9) intersections with Bliley Road are located within the study area:

1. Blakemore Road/Haguman Drive;
2. Netherwood Road;
3. Whitlone Drive;
4. Cedarhurst Drive;
5. Briardcliff Road;
6. Old Willow Court;
7. Willow Creek Ln/Willow Oaks Dr;
8. Riverside Heights Way; and
9. Forest Hill Avenue.

On-street parking is prohibited along the entirety of Bliley Road; however, on-street parking is permitted and was observed on some side streets. There is one (1) bus stop located within the study area at the Forest Hill Avenue intersection. There is also a bus route along Jahnke Road, approximately 1/4 mile south of the Bliley Road/Blakemore Road intersection.

The majority of Bliley Road within the study area has a typical section width of 20', with two (2) 10' travel lanes. The only section that has a slightly larger width of 22' is the 400' section from Blakemore Road east. This change in typical section does not impact operations. Two (2) splitter islands are installed at the intersection of Riverside Heights Way, which widens that roadway for approximately 100'. The roadway widths meet the minimum standards outlined in the City of Richmond's *2018 Better Streets Guidelines*.

The majority of the Bliley Road corridor utilizes shoulder and ditch; however, some newer intersections/entrances have constructed curb for short lengths along Bliley Road. The VDOT *Road Design Manual* standard for shoulder on an urban collector facility is a minimum of 8'. The shoulder width along the corridor is approximately 6" on both sides; this translates to a deficit of 7.5'. In addition, there are deep paved ditches on many portions of the roadway that are within 1' of the travel way.

Right-of-way along Bliley Road varies between 30' and 60', with a majority of the corridor between 30' and 40'.

### Westower Drive

Westower Drive is a 2-lane, urban local facility with a posted speed limit of 25 mph that carries approximately 1,800 vehicles per day (VDOT 2017 traffic data). Bliley Road is an east-west route that includes a number of residential developments, including single-family homes, apartments, and townhomes. Similar to Bliley Road, Westower Drive provides a connection between Jahnke Road and Forest Hill Avenue and is used as a cut-through for some traffic. The roadway parallels the Bliley Road area and the study area is approximately 1.0 mile in length.

The portion of Westower Drive between Huntland Road and Irby Drive has curb and gutter along the south side of the roadway and on-street parking is allowed. A traffic signal is currently under construction at the intersection of Forest Hill Avenue and Westower Drive. All other intersections are stop-controlled with Westower Drive maintaining the right-of-way; the two exceptions are the Merrifield Drive intersection where eastbound Westower Drive is stop-controlled and the Whitlone Drive intersection where westbound Westower Drive is yield controlled.

The following 13 intersections with Westower Drive are located within the study area:

1. Blakemore Road;
2. Merrifield Drive;
3. Whitlone Drive;
4. Huntland Road;
5. Westower Court (West);
6. Westower Court (East);
7. Newell Road (West);
8. Newell Road (East);
9. Brannock Drive/Oakhurst Lane;
10. Irby Drive;
11. Limerick Drive;
12. Yeardley Drive; and
13. Forest Hill Avenue.

## Sight Distance

The VDOT *Road Design Manual* requires a minimum of 390' of intersection sight distance for a roadway with a 35 mph design speed (Bliley Road) and 280' for a roadway with a 25 mph design speed (Westtower Drive). The following intersections do not meet the minimum sight distance requirements:

- Bliley Road
  - Netherwood Road – Sight Distance Right
  - Whitlone Drive – Sight Distance Right
  - Cedarhurst Drive – Sight Distance Left
  - Briarcliff Road – Sight Distance Right
  - Riverside Heights Way – Sight Distance Right
  
- Westtower Drive
  - Westtower Drive EB at Merrifield Drive – Sight Distance Left
  - Irby Drive – Sight Distance Right & Left
  - Limerick Drive – Sight Distance Left
  - Yeardley Drive – Sight Distance Left

The signalized intersection of Forest Hill Avenue/Bliley Road technically meets stopping sight distance (250') in the eastbound direction of Bliley Road, however, the vertical curvature, heavy vegetation, and skew of the roadway all limit approaching driver's ability to identify stopped vehicles at the intersection. In addition, the southbound right turn movement from Forest Hill Avenue onto westbound Bliley Road has a large turning radius due to the skew of the intersection which allows vehicles to make the right turn at above average speeds. The concrete retaining wall on the radius impairs the line of sight for right turning traffic.

There are no sidewalks, crosswalks, or bike lanes along the Bliley Road corridor. During the field visit, there were three (3) pedestrians traveling along the corridor, using the ditches and shoulder of the roadway. No bicyclists were observed.

Right-of-way on Westtower Drive varies between 40' and 70', with a majority of the corridor between 50' and 70'. The section east of Newell Road is consistently more than 60' in width.

## **Crash Analysis**

Timmons Group reviewed the six-year crash history of the Bliley Road study area between Blakemore Road and Forest Hill Avenue. From January 1, 2013 to November 30, 2018, there were 17 crashes within the study area. Four (4) crashes occurred at the Forest Hill Avenue intersection, six (6) crashes occurred at the Willow Creek Lane/Willow Oaks Drive intersection, three (3) crashes occurred at the Cedarhurst Drive intersection, three (3) crashes occurred at the Whitlone Drive intersection, and one (1) crash occurred at the Blakemore Road intersection.

It should be noted that only 5% (1 of 17) were attributed to speeding and 0% (0 of 17) were attributed to alcohol. The crash review found that approximately 70% (12 of 17) of the crashes occurred when the weather was clear. The remaining five (5) crashes were noted to have occurred during rain or snow events.

There were no noted pedestrian or bicycle crashes reported along Bliley Road.

Table 1 shows the number of crashes per year by collision type. The 17 crashes were spread evenly between five different categories: rear end, angle, sideswipe, and fixed object off road. Each category accounted for three (3) crashes. In general, it appeared that a majority of the crashes were created by either a vehicle entering the intersection at an unsafe time or vehicles leaving the travel way.

**Table 1: Crash Summary by Collision Type**

<b>Collision Type</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>Total</b>	<b>%</b>
Rear End	0	1	0	1	1	0	3	18%
Angle	1	2	1	0	0	0	4	24%
Head On	0	0	1	0	2	0	3	18%
Sideswipe - Same Direction	0	0	0	0	0	0	0	0%
Sideswipe - Opposite Direction	0	0	1	0	0	2	3	18%
Fixed Object - In Road	0	0	1	0	0	0	1	6%
Fixed Object - Off Road	0	0	1	0	0	2	3	18%
<b>Total Crashes</b>	<b>1</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>17</b>	<b>100%</b>

Table 2 shows the number of crashes per year by crash severity. During the 2013 to 2018 study period, there were no fatalities and five (5) injury-only crashes; a total of nine (9) individuals were injured. A majority of the crashes, approximately 70%, were property damage only crashes.

**Table 2: Crash Summary by Severity**

Crash Severity	2013	2014	2015	2016	2017	2018	Total	%
Fatal Crashes	0	0	0	0	0	0	0	0%
Injury Only Crashes	1	0	3	1	0	0	5	29%
Prop. Damage Only Crashes	0	3	2	0	3	4	12	71%
<b>Total Crashes</b>	<b>1</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>17</b>	<b>100%</b>
Persons Killed	0	0	0	0	0	0	0	-
Persons Injured	1	0	7	1	0	0	9	-
Pedestrians Killed	0	0	0	0	0	0	0	-
Pedestrians Injured	0	0	0	0	0	0	0	-

Table 3 shows the number of crashes per year by time of day. During the 2013 to 2018 study period, a plurality of crashes (29%) occurred between the hours of noon and 3:00 PM.

**Table 3: Crash Summary by Time of Day**

Hour of Day	2013	2014	2015	2016	2017	2018	Total	%
0:00 - 6:00	0	0	0	0	0	2	2	12%
6:00 - 9:00	0	0	1	0	0	0	1	6%
9:00 - 12:00	0	1	0	1	0	1	3	18%
12:00 - 15:00	0	1	1	0	3	0	5	29%
15:00 - 18:00	0	0	1	0	0	0	1	6%
18:00 - 21:00	1	1	1	0	0	1	4	24%
21:00 - 24:00	0	0	1	0	0	0	1	6%
<b>Total Crashes</b>	<b>1</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>17</b>	<b>100%</b>

Table 4 shows the number of crashes per year by lighting conditions during the time of the crash. During the 2013 to 2018 study period, a majority of crashes (60%) occurred during daylight. Bliley Road does have street lights present along a majority of the corridor.

**Table 4: Crash Summary by Lighting Condition**

Lighting Condition	2013	2014	2015	2016	2017	2018	Total	%
Dawn	0	0	0	0	0	0	0	0%
Daylight	0	2	3	1	3	1	10	59%
Dusk	0	0	0	0	0	0	0	0%
Darkness	1	1	2	0	0	3	7	41%
<b>Total Crashes</b>	<b>1</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>17</b>	<b>100%</b>

Table 5 shows the number of crashes per day of the week. There is no noticeable trend concerning which day of the week that crashes occur. A majority of crashes, 82% (14 of 17), occurred during the week, with only three (3) crashes occurring on the weekend.

**Table 5: Crash Summary by Day of Week**

<b>Day of Week</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>Total</b>	<b>%</b>
Monday	0	2	1	0	0	0	3	18%
Tuesday	1	1	0	1	0	1	4	24%
Wednesday	0	0	1	0	1	1	3	18%
Thursday	0	0	1	0	0	0	1	6%
Friday	0	0	1	0	2	0	3	18%
Saturday	0	0	1	0	0	1	2	12%
Sunday	0	0	0	0	0	1	1	6%
<b>Total Crashes</b>	<b>1</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>17</b>	<b>100%</b>

The crash data utilized in this analysis was collected from publicly available VDOT data sources and may not include all crashes in the area. The analyzed crashes can be found in Appendix A.

There were only two (2) crashes along Westover Drive during the 2013-2018 study period. Both occurred in 2018. The first crash occurred in February 2018 and involved a property-damage-only crash where a vehicle struck a utility pole near the intersection of Huntland Road. The second crash occurred in August 2018 and involved an injury crash where a vehicle turning left out of the easternmost apartment entrance (5724 Westover Drive) struck a through vehicle.

There were no noted pedestrian or bicycle crashes reported along Westover Drive.

## **Multimodal Improvement Options**

The following improvement options provide pedestrian and bicycle accommodations along the Bliley Road and Westower Drive corridors. It is assumed the improvements will be installed along one side of the roadway only.

The existing Bliley Road corridor has a 1' or less shoulder provided and typically has less than 1' of space between the edge of pavement and the beginning of the ditch. In addition, the full pavement width is approximately 20', which leaves only 10' for each travel direction. For vehicles, this creates a narrow travel way and leaves no room to share the road with bicycles or pedestrians.

For pedestrians and bicycles, the roadway is too narrow to feel safe within the pavement markings and there is no shoulder to safely traverse the corridor. The transition from shoulder to ditch is severe enough that it is difficult for able-bodied individuals to navigate. There is no safe area between the roadway and the ditch for a pedestrian to safely remove themselves from the roadway.

Due to drainage and grading concerns, there are certain sections of the Bliley Road corridor that may require extensive survey and stormwater management analysis to ensure that the recommended improvements do not negatively impact the area.

The sight distance issues noted at multiple intersections along the corridor will pose significant impacts to crosswalk locations perpendicular to Bliley Road and Westower Drive.

Given the right-of-way, drainage, grading, and utility constraints, the following locations along Bliley Road and Westower Drive were judged to best accommodate widening of the roadway:

- Bliley Road
  - Blakemore Road to Whitlone Drive – North
  - Whitlone Drive to Briarcliff Road – North or South
  - Briarcliff Road to Riverside Heights – North
  - Riverside Heights Way to Forest Hill Avenue – South
  
- Westower Drive
  - Blakemore Road to Whitlone Drive – North
  - Whitlone Drive to Huntland Road/Abbingdon Hills Entrance – North
  - Huntland Road/Abbingdon Hills Entrance to Irby Drive – South
  - Irby Drive to Yeardeley Drive – North or South
  - Yeardeley Drive to Forest Hill Avenue – North

Right-of-way considerations along the length of the corridor will vary between the options. In general, it will be assumed that right-of-way between 15' (curb/gutter/sidewalk) and 30' (shoulder/ditch) will be required. Certain locations will likely require the use of retaining walls to limit the impacts to property along the corridor.

Survey and design costs will add approximately 15% to the construction costs listed in the following section.

There are four (4) options for installation of multimodal improvements within the study area:

*Option 1 – Install Sidewalk Behind Curb & Gutter*

The safest option for improving multimodal travel along the Bliley Road and Westower Drive corridors is providing sidewalk behind curb and gutter. This option provides a safe location for pedestrians and bicycles outside of the roadway and the physical buffer of a curb between the roadway and the sidewalk.

This is also the most expensive option as it involves placing large amounts of concrete curb and gutter along the entire corridor, resulting in the need for extensive storm sewer piping and structures to accommodate the drainage. Advantages to the curb and gutter section include (1) limiting the impacts of grading to properties along the corridor and (2) potentially improving the overall drainage along the corridor.

Recent construction costs in the Richmond region have shown prices of approximately \$750 per linear foot for installing sidewalk behind curb and gutter. This pricing includes earthwork, storm sewer, curb/gutter, sidewalk, and basic utility relocations. Any retaining walls, major utilities, or rights-of-way would be additional costs.

The improvements on Bliley Road are approximately 4,000' in length, resulting in an approximate cost of \$3,000,000. The improvements on Westower Drive are approximately 3,500', excluding the 1,500' of curb/gutter already in place, resulting in an approximate cost of \$2,625,000. The 1,500' section with curb/gutter will only have sidewalk installed behind for a cost of \$200 per linear foot, resulting in an approximate cost of \$300,000. The total cost on Westower Drive is approximately \$2,925,000.

*Option 2 – Install Sidewalk Behind Improved Shoulder & Ditch*

The second option to provide a safer roadway for all modes of transportation is to improve the shoulders and ditches along the Bliley Road and Westower Drive corridors and install sidewalk behind the proposed typical section. This option would maintain the use of shoulder and ditch drainage along the entire corridor.

This option takes advantage of the existing ditches as a "natural barrier" between the roadway and the pedestrian/bicycle improvements. There would require some lateral movement to avoid existing utilities and utility poles. In addition, this option is the most impactful with respect to rights-of-way requirements due to severe grading issues along the corridor.

The approximate construction cost for improving the shoulders/ditches and installing sidewalk is \$600 per linear foot. Any retaining walls, major utilities, or rights-of-way are not included and would be an additional cost.

The improvements on Bliley Road are approximately 4,000' in length, resulting in an approximate cost of \$2,400,000. The improvements on Westower Drive are approximately 3,500', excluding the 1,500' of curb/gutter already in place, resulting in an approximate cost of \$2,100,000. The 1,500' section with curb/gutter will have sidewalk installed behind for a cost of \$200 per linear foot, resulting in an approximate cost of \$300,000. The total cost on Westower Drive is approximately \$2,400,000.



### *Option 3 – Install Sidewalk Only*

The third option to provide a safer roadway for all modes of transportation is to install sidewalks along the back of existing ditch (or existing curb/gutter) on the Bliley Road and Westower Drive corridors. This option would follow the existing contours of the shoulder and ditch sections along Bliley Road and Westower Drive and place the sidewalk in the most advantageous location along the graded back of ditch.

This option takes advantage of the existing ditches as a natural barrier between the roadway and the pedestrian/bicycle improvement location. In many locations, the sidewalk would need to meander along the back of ditch to utilize the existing grading. There would likely need to be some lateral adjustments to accommodate the existing utilities and utility poles.

The approximate construction cost for installing sidewalk only is \$300 per linear foot. Any retaining walls, major utilities, or rights-of-way would be additional costs.

The improvements on Bliley Road are approximately 4,000' in length, resulting in an approximate cost of \$1,200,000. The improvements on Westower Drive are approximately 3,500', excluding the 1,500' of curb/gutter already in place, resulting in an approximate cost of \$1,050,000. The 1,500' section with curb/gutter will have sidewalk installed behind for a cost of \$200 per linear foot, resulting in an approximate cost of \$300,000. The total cost on Westower Drive is approximately \$1,350,000.

### *Option 4– Widen Shoulders Only*

The fourth option to provide a safer roadway for all modes of transportation is to widen the paved shoulders of the Bliley Road and Westower Drive corridors. This option does not include installing any pedestrian/bicycle centric sidewalk or multi-use path accommodations. One (1) side of the roadway would be widened to a minimum 8' width to allow for a 2' buffer and a 6' pedestrian/bicycle travel area.

This option is not ideal, as there is no physical buffer between vehicles and bicycles/pedestrians. In addition, there would be no designated sidewalk or multi-use path area, only a shoulder.

To install a wider shoulder along one side of the roadway, it will be necessary to relocate the existing ditch a minimum of 8' away from the proposed shoulder. This lateral movement will require additional considerations, such as right-of-way, retaining walls, utilities, and grading, that impact costs.

The approximate construction cost for widening the shoulders is \$400 per linear foot. Any retaining walls, major utilities, or rights-of-way are not included.

The improvements on Bliley Road are approximately 4,000' in length, resulting in an approximate cost of \$1,600,000. The improvements on Westower Drive are approximately 3,500', excluding the 1,500' of curb/gutter already in place, resulting in an approximate cost of \$1,400,000.

## **Public Meeting**

Public outreach and participation added a much-needed component to the evaluation and decision-making process. Since residents typically have first-hand experience with the daily transportation problems, their input is invaluable.

To ensure the study team had the benefit of this information, citizen input was gathered from the residents during the initial assessment and conceptualization of proposed solutions.

City of Richmond Staff and representatives from Timmons Group attended a public meeting held by Councilwoman Larson on Tuesday, April 2, 2019 at Lucille M. Brown Middle School from 5:30 PM to 7:00 PM.

The public meeting focused on the goals and objectives of the pedestrian study along with various improvement alternatives that had been considered by the Timmons Group and the City of Richmond. Citizens were (1) informed about the intent of the meeting, (2) asked to provide feedback on existing issues within the study area, and (3) evaluate alternative concepts for safety improvements along the corridor.

Approximately 25 citizens attended the public meeting, with many expressing a desire for improved access to bus stops and other locations along Forest Hill Avenue. There currently are no pedestrian accommodations to allow access to Forest Hill Avenue, which is the conduit to other commercial and recreational destinations. In addition, it was discovered that Lucille M. Brown Middle School on Blakemore Road is also considered a destination due to the fields and track.

A number of pedestrian/bicycle safety issues were discussed at various intersections within the study area, either due to the limited flat shoulders or the poor sight distance. The depth of ditches along both Bliley Road and Westover Drive creates a hazard, as most shoulders are less than 1' in width.

Citizens expressed a concern about speeding along Bliley Road and the posted speed limit of 35 mph. Westover Road was mentioned as a location for speeding, however, the City of Richmond is currently pursuing traffic calming measures along that corridor.

A major concern was the lack of a safe route to Lucille M. Brown Middle School for school-aged children. Sidewalks along Jahnke Road, Forest Hills Avenue, and Blakemore Road allow access to other schools and destinations. However, there are no sidewalks to allow pedestrians from the residential neighborhoods to safely access the existing pedestrian accommodations.

The feedback from this meeting was incorporated into the pedestrian, bicycle, and safety analysis review areas for proposed improvements.

## **Conclusions**

After a review of the geometric limitations of Bliley Road and Westtower Drive and an assessment of non-vehicular traffic demand in the area, it has been determined that there is a public need for installation of pedestrian accommodations. The existing corridors have narrow travel lanes, limited/no shoulders, and non-traversable ditches, which make bicycle and pedestrian travel unsafe and infrequent.

In addition, there are a number of sight distance concerns along Bliley Road and Westtower Drive which may need to be addressed via changes to the speed limit or geometric curvature of the roadway alignment. The sight distance issues noted at multiple intersections along the corridor pose significant impacts relative to crosswalk locations along Bliley Road and Westtower Drive.

Given the right-of-way, drainage, grading, and utility constraints, the following locations along Bliley Road and Westtower Drive were judged to best accommodate widening of the roadway:

- Bliley Road
  - Blakemore Road to Whitlone Drive – North
  - Whitlone Drive to Briarcliff Road – North or South
  - Briarcliff Road to Riverside Heights – North
  - Riverside Heights Way to Forest Hill Avenue – South
  
- Westtower Drive
  - Blakemore Road to Whitlone Drive – North
  - Whitlone Drive to Huntland Road/Abbingdon Hills Entrance – North
  - Huntland Road/Abbingdon Hills Entrance to Irby Drive – South
  - Irby Drive to Yeardeley Drive – North or South
  - Yeardeley Drive to Forest Hill Avenue – North

Right-of-way considerations along the length of the corridor will vary upon survey of the location. In general, it will be assumed that right-of-way will be required. Certain locations will likely require the use of retaining walls to limit the impacts to property along the corridor.

The recommended improvement option is Option 1, installation of sidewalk behind curb and gutter on one side of the roadway. Although this option is the most expensive, the ultimate advantages of (1) limiting the impacts to individual adjacent properties and (2) improving overall drainage operations within the corridor, offset the anticipated cost.

Using recent construction costs in the Richmond Region, the cost for Option 1 is approximately \$750 per linear foot. The recommended improvements on Bliley Road are approximately 4,000' in length, resulting in an approximate cost of \$3,000,000. The improvements on Westtower Drive are approximately 3,500', excluding the 1,500' of curb/gutter already in place, resulting in an approximate cost of \$2,625,000. The 1,500' section with curb/gutter will only have sidewalk installed behind for a cost of \$200 per linear foot, resulting in an approximate cost of \$300,000. The total cost on Westtower Drive is approximately \$2,925,000.

Figures 21 and 22 provide an illustration of the sidewalk behind curb and gutter on both the Bliley Road and Westtower Drive corridors.

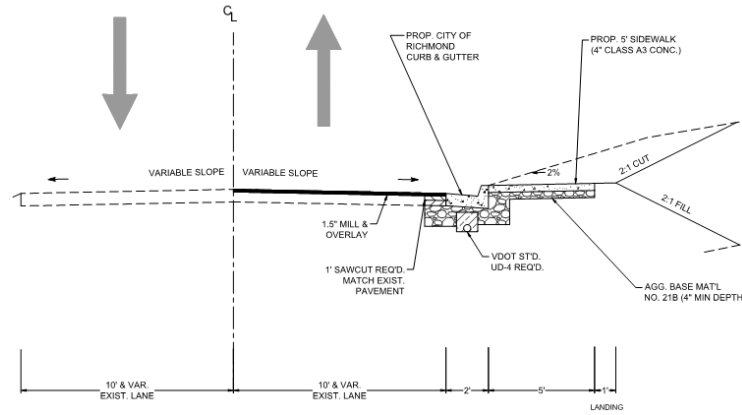
## **APPENDIX A**

Crash Data

Bliley Road - Forest Hill Ave to Blakemore Rd	Date	DOCUMENT_NBR	WEATHER_CONDITION	First Harmful Event of Entire Crash	SPEED_NOTSPEED	ALCOHOL_NOTALCOHOL	COLLISION_TYPE	VEHICLE_BODY_TYPE_CD	DRIVER_ACTION_TYPE_CD	CRASH_SEVERITY	CRASH_MILITARY_TM	K_PEOPLE	A_PEOPLE	B_PEOPLE	C_PEOPLE	TOTAL CRASH
R-VA127UR07533NB3.6427128	11/12/2015	153165373	1. No Adverse Condition (Cle 20, Motor Vehicle In Transport		Not_SPEED	Not_ALCOHOL	3. Head On	1. Passenger car,1. Passenger car	37. Other,1. No Improper Action	B.Visible Injury	1627	0	0	1	2	1
R-VA127UR07533NB3.5344191999999999	2/18/2018	180505003	1. No Adverse Condition (Cle 20, Motor Vehicle In Transport		Not_SPEED	Not_ALCOHOL	5. Sideswipe - Opposite Direction	1. Passenger car,1. Passenger car	40. Fail to Maintain Proper Control,1. No Improper Action	PDO.Property Damage Only	2026	0	0	0	0	1
R-VA127UR07533NB3.8426711999999998	4/7/2018	180975111	5. Rain	20. Motor Vehicle In Transport	Not_SPEED	Not_ALCOHOL	5. Sideswipe - Opposite Direction	1. Passenger car,22. Truck - Sport Utility Vehi	22. Disregarded Stop or Yield Sign,1. No Improper Action	PDO.Property Damage Only	1113	0	0	0	0	1
R-VA127UR07533NB3.8426711999999998	9/13/2017	172575093	1. No Adverse Condition (Cle 20, Motor Vehicle In Transport		Not_SPEED	Not_ALCOHOL	3. Head On	3. Van,22. Truck - Sport Utility Vehicle (SUV)	11. Did Not Have Right-of-Way,1. No Improper Action	PDO.Property Damage Only	1449	0	0	0	0	1
R-VA127UR07533NB4.0475094	4/18/2015	151085051	1. No Adverse Condition (Cle 20, Motor Vehicle In Transport		Not_SPEED	Not_ALCOHOL	2. Angle	22. Truck - Sport Utility Vehicle (SUV),1. Pass	11. Did Not Have Right-of-Way,1. No Improper Action	B.Visible Injury	838	0	0	2	0	1
R-VA127UR07533NB4.0412471999999999	12/15/2014	143505016	1. No Adverse Condition (Cle 20, Motor Vehicle In Transport		Not_SPEED	ALCOHOL	2. Angle	1. Passenger car,1. Passenger car	14. Improper Turn - Wide Right Turn,1. No Improper Action	PDO.Property Damage Only	2005	0	0	0	0	1
R-VA127UR07533NB4.0491222000000002	7/12/2016	161945255	1. No Adverse Condition (Cle 20, Motor Vehicle In Transport		Not_SPEED	Not_ALCOHOL	1. Rear End	1. Passenger car,2. Truck - Pick-up/Passenge	12. Following Too Close,34. Hit and Run	B.Visible Injury	1150	0	0	1	0	1
R-VA127UR07533NB3.3100000000000001	10/15/2013	140370297	1. No Adverse Condition (Cle 20, Motor Vehicle In Transport		Not_SPEED	Not_ALCOHOL	2. Angle	3. Van,1. Passenger car	22. Disregarded Stop or Yield Sign,1. No Improper Action	C.Non-visible Injury	2020	0	0	0	1	1
R-VA127UR07533NB3.4656530000000001	9/5/2018	182485036	1. No Adverse Condition (Cle 3, Utility Pole		Not_SPEED	Not_ALCOHOL	9. Fixed Object - Off Road	1. Passenger car	32. Avoiding Animal	PDO.Property Damage Only	200	0	0	0	0	1
R-VA127UR07533NB3.4907414999999999	5/5/2017	171255324	5. Rain	20. Motor Vehicle In Transport	Not_SPEED	Not_ALCOHOL	1. Rear End	1. Passenger car,2. Truck - Pick-up/Passenge	12. Following Too Close,1. No Improper Action	PDO.Property Damage Only	1225	0	0	0	0	1
R-VA127UR07533NB3.6686936000000001	6/30/2017	171815747	1. No Adverse Condition (Cle 20, Motor Vehicle In Transport		Not_SPEED	Not_ALCOHOL	3. Head On	1. Passenger car,1. Passenger car	15. Improper Turn - Cut Corner on Left Turn,1. No Improper Action	PDO.Property Damage Only	1452	0	0	0	0	1
R-VA127UR07533NB3.6699999999999999	2/16/2015	150475193	6. Snow	14. Ditch	Not_SPEED	Not_ALCOHOL	9. Fixed Object - Off Road	22. Truck - Sport Utility Vehicle (SUV)	3. Exceeded Safe Speed But Not Speed Limit	B.Visible Injury	1500	0	0	1	1	1
R-VA127UR07533NB3.8174904999999999	2/14/2015	150455235	6. Snow	2. Trees	Not_SPEED	Not_ALCOHOL	16. Other	22. Truck - Sport Utility Vehicle (SUV)	40. Fail to Maintain Proper Control	PDO.Property Damage Only	2230	0	0	0	0	1
R-VA127UR07533NB3.8385557000000001	10/7/2014	143035257	1. No Adverse Condition (Cle 20, Motor Vehicle In Transport		Not_SPEED	Not_ALCOHOL	2. Angle	1. Passenger car,2. Truck - Pick-up/Passenge	24. Fail to Stop at Through Highway - No Sign,1. No Improper Acti	PDO.Property Damage Only	1445	0	0	0	0	1
R-VA127UR07533NB3.8433137999999998	7/21/2014	142025111	4. Mist	20. Motor Vehicle In Transport	Not_SPEED	Not_ALCOHOL	1. Rear End	1. Passenger car,1. Passenger car	12. Following Too Close,1. No Improper Action	PDO.Property Damage Only	1115	0	0	0	0	1
R-VA127UR07533NB3.8584106999999999	7/10/2018	181915022	1. No Adverse Condition (Cle 28, Ran Off Road		Not_SPEED	Not_ALCOHOL	9. Fixed Object - Off Road	4. Truck - Single Unit Truck (2-Axles)	40. Fail to Maintain Proper Control	PDO.Property Damage Only	20	0	0	0	0	1
R-VA127UR07533NB4.0499999999999998	3/27/2015	150865294	1. No Adverse Condition (Cle 20, Motor Vehicle In Transport		Not_SPEED	Not_ALCOHOL	5. Sideswipe - Opposite Direction	2. Truck - Pick-up/Passenger Truck,1. Passer	34. Hit and Run,1. No Improper Action	PDO.Property Damage Only	2044	0	0	0	0	1
Grand Total											0	0	5	4	17	

Westower Drive - Forest Hill Ave to Blakemore Rd	Date	DOCUMENT_NBR	WEATHER_CONDITION	CRASH_DSC	First Harmful Event of Entire Crash	SPEED_NOTSPEED	BELTED_UNBELTED	ALCOHOL_NOTALCOH	COLLISION_TYPE	VEHICLE_BODY_TYPE_CD	DRIVER_ACTION_TYPE_CD	CRASH_SEVERITY	CRASH_MILITARY_TM	K_PEOPLE	A_PEOPLE	B_PEOPLE	C_PEOPLE	TOTAL CRASH	
S-VA127NP WESTOWER DR0.42723109999999997	8/18/2018	182305211	1. No Adverse Condition (Cles V1	WAS TURNING WEST FROM A20. Motor Vehicle In Transport		Not_SPEED	UNBELTED	Not_ALCOHOL	2. Angle	1. Passenger car,1. Passenger ca 24. Fail to Stop at Through Highway - N.B. Visible Injury		1548		0	0	1	1	1	
S-VA127NP WESTOWER DR0.84709721999999998	2/13/2018	180445024	1. No Adverse Condition (Cles UPON MY ARRIVAL ON SCENE I (3. Utility Pole			Not_SPEED	BELTED	Not_ALCOHOL	9. Fixed Object - Off Road	1. Passenger car	34. Hit and Run	PDO.Property Damage C		145	0	0	0	0	1
Grand Total														0	0	1	1	2	

## Option #1 – Install Sidewalk Behind Curb



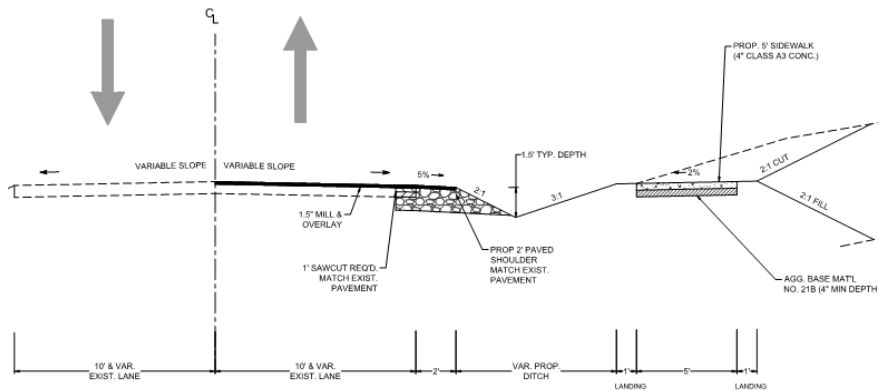
- \$750 per LF
- Biiley – \$3,000,000
- Westower – \$2,925,000

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## Option #2 – Install Sidewalk Behind Improved Ditch



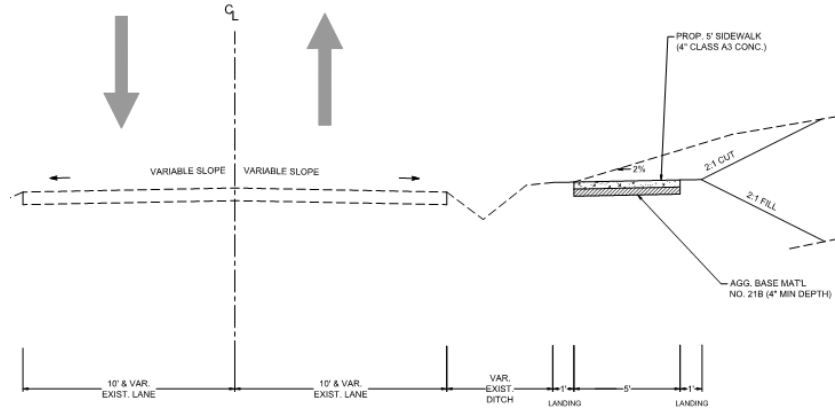
- \$600 per LF
- Biiley – \$2,400,000
- Westower – \$2,400,000

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### Option #3 – Install Sidewalk Only



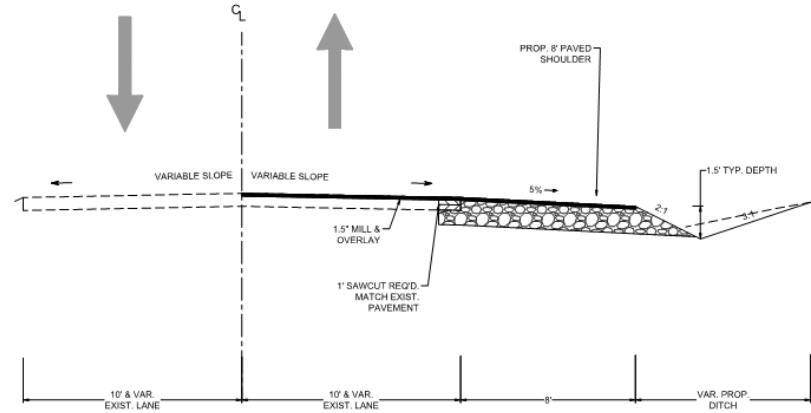
- \$300 per LF
- Biiley – \$1,200,000
- Westower – \$1,350,000

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### Option #4 – Widen Shoulders Only



- \$400 per LF
- Biiley – \$1,600,000
- Westower – \$1,400,000

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# BLILEY ROAD & WESTOWER DRIVE MULTIMODAL STUDY

City of Richmond, VA

July 30, 2019

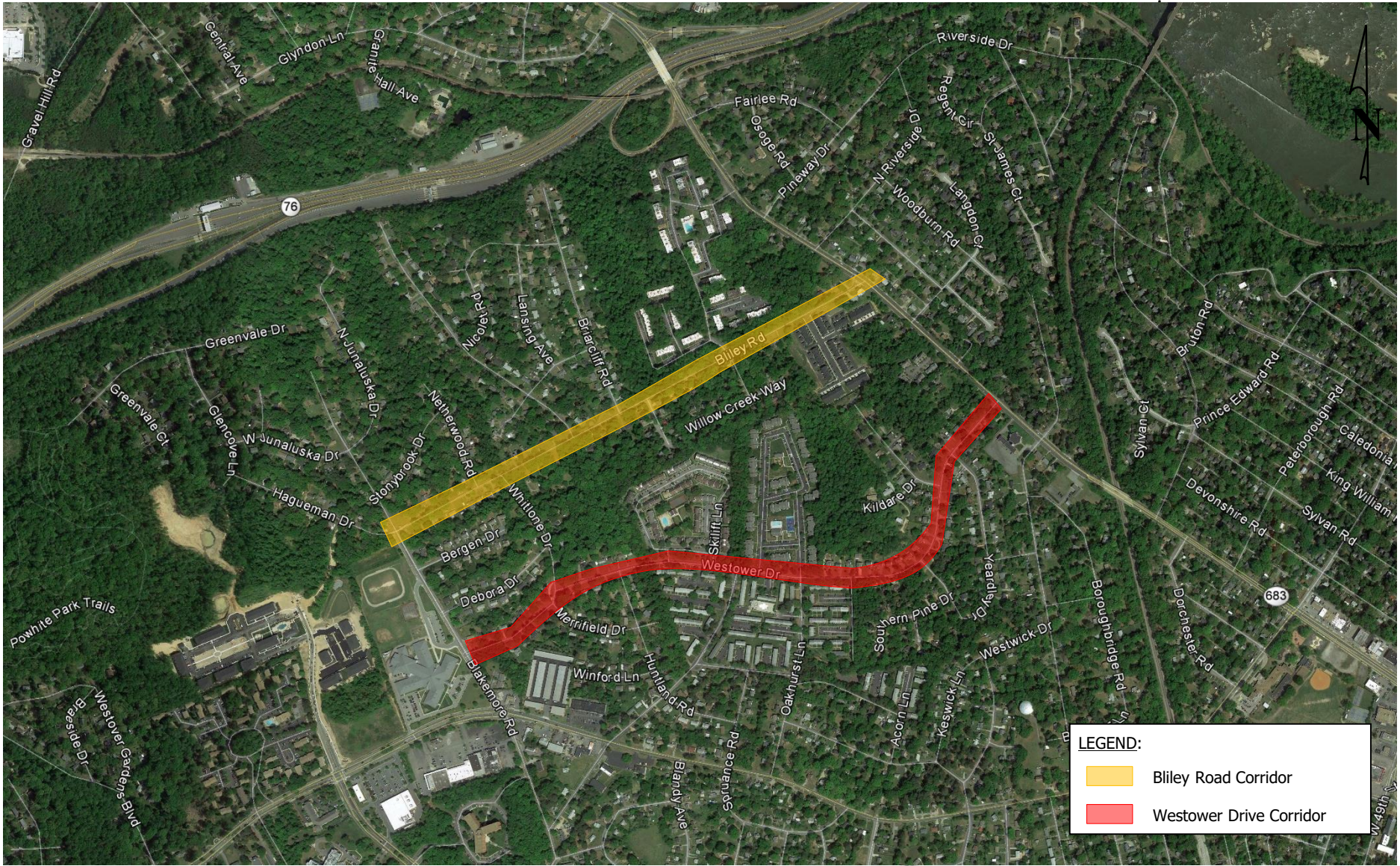
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# Scope of Work

- Study Area and Purpose
- Site Visit & Existing Conditions Review
- Conceptual Sidewalk Location
- Stakeholder Meeting
- Technical Memo





NOT TO SCALE



# Existing Corridor Conditions

Netherwood Road  
Facing East



Netherwood Road  
Facing West



# Existing Corridor Conditions



Old Willow Court  
Facing East

Forest Hill Avenue  
Facing West



# Existing Corridor Conditions



Between Irby Drive/Oakhurst Lane  
Facing West



Newell Road  
Facing West



# Existing Corridor Conditions

- Approximately 20' of pavement with 1' or less of shoulder
- Sight distance issues at multiple intersections pose significant impacts for crossing Bliley Road and Westover Drive
- Grade of roadway and surrounding area present major issues for drainage, stormwater management, and safety



# Crash History Review (2013 – 2018)

- Bliley Road
  - 17 Crashes within Study Area
- Westtower Drive
  - 2 Crashes within Study Area
- Review of crash reports shows that speed was recorded as a factor in only 1 of 19 crashes.
- No pedestrian or bicycle crashes reported.



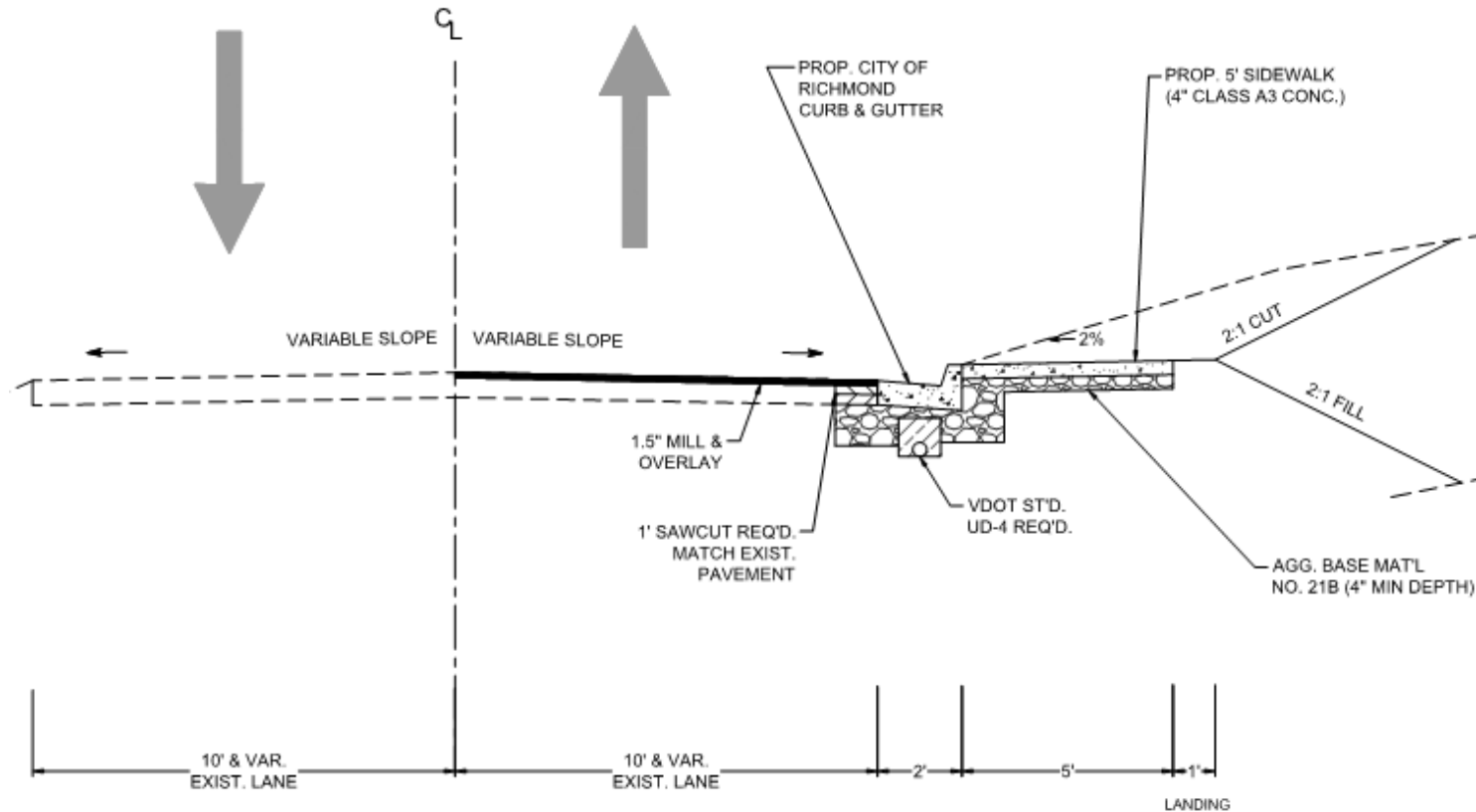


# Improvement Criteria

- Bliley Road
  - 4,000' between Blakemore Road and Forest Hill Avenue
- Westtower Drive
  - 5,000' between Blakemore Road and Forest Hill Avenue
  - 1,500' of that distance has existing curb/gutter
- Improvements will be limited to one (1) side of the road only



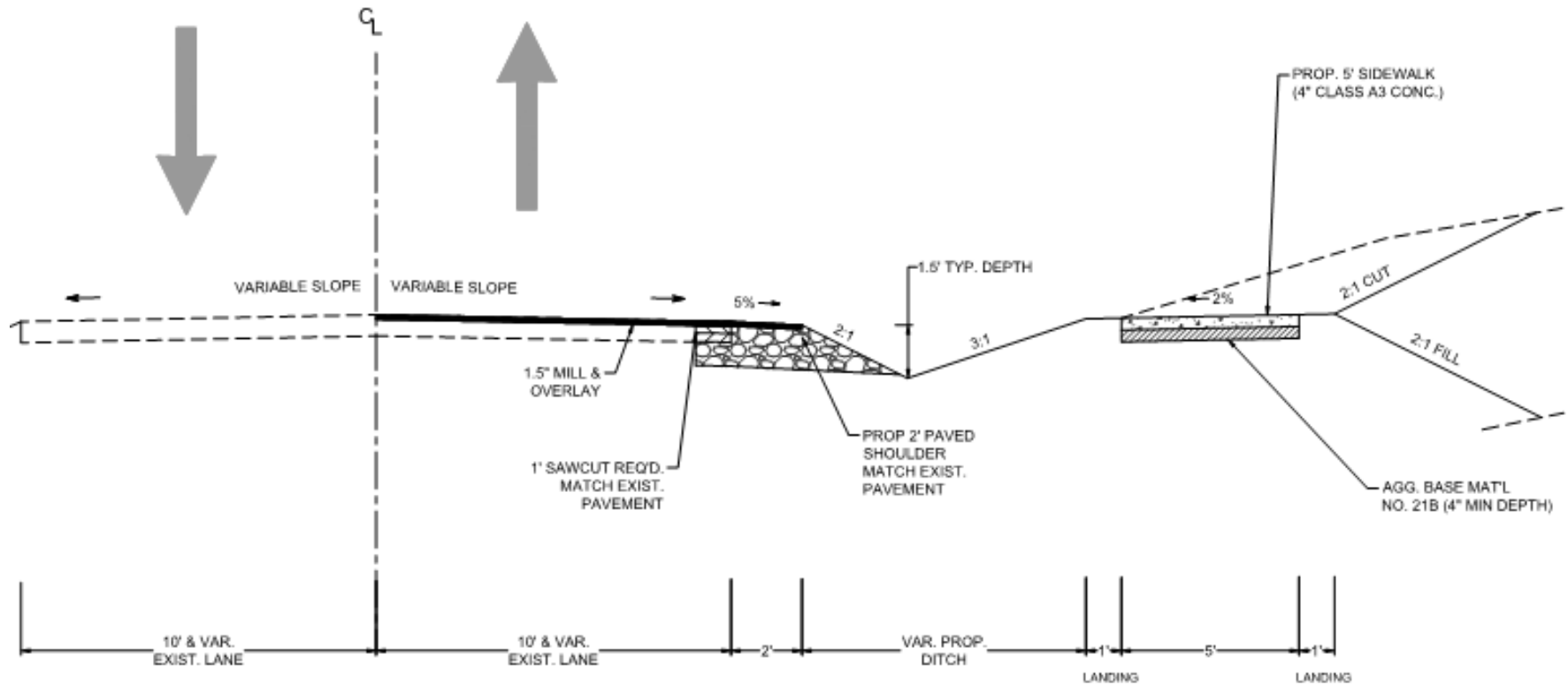
# Option #1 – Install Sidewalk Behind Curb



- \$750 per LF
- Bliley – \$3,000,000
- Westtower – \$2,925,000



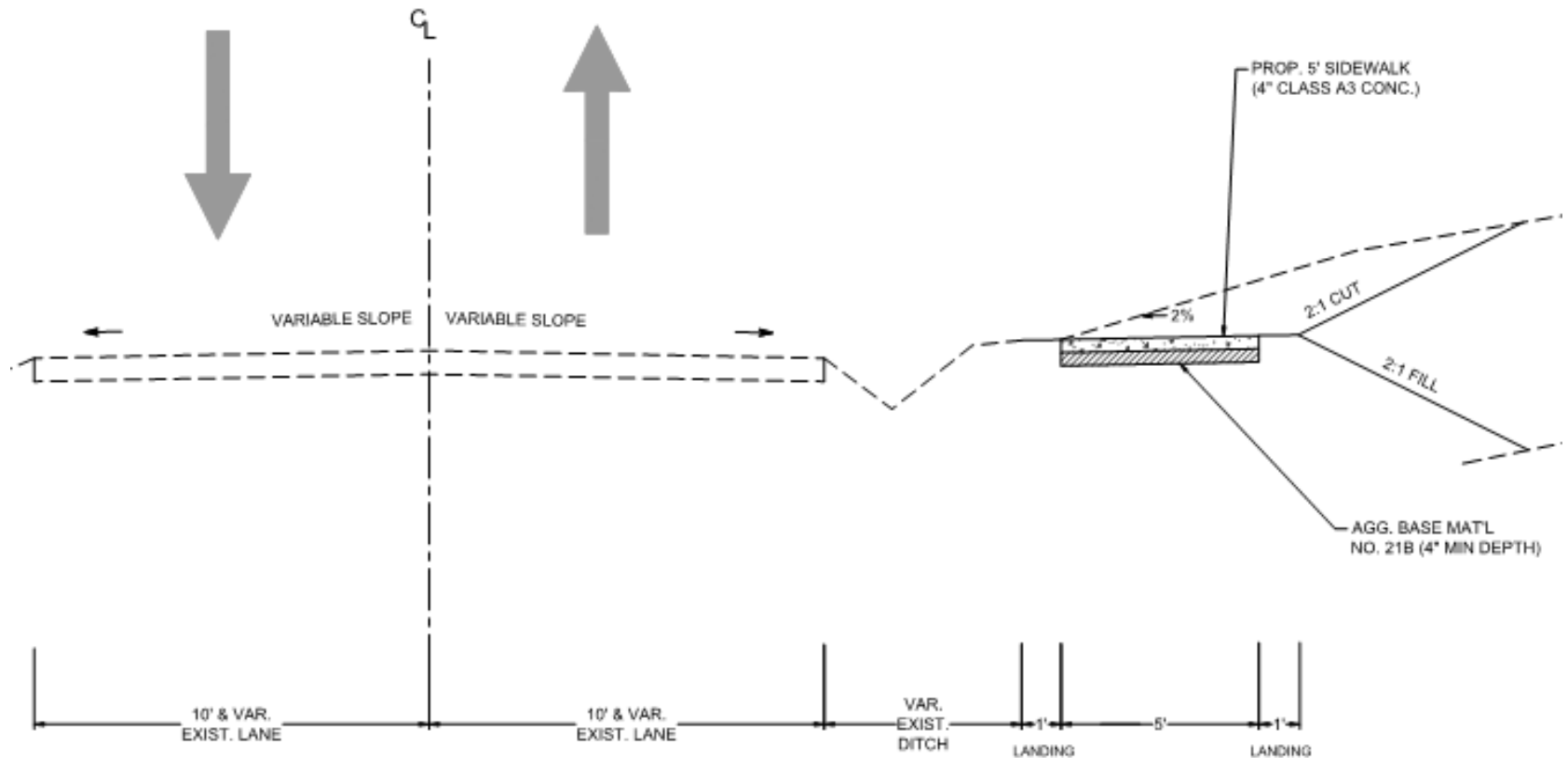
# Option #2 – Install Sidewalk Behind Improved Ditch



- \$600 per LF
- Bliley – \$2,400,000
- Westower – \$2,400,000



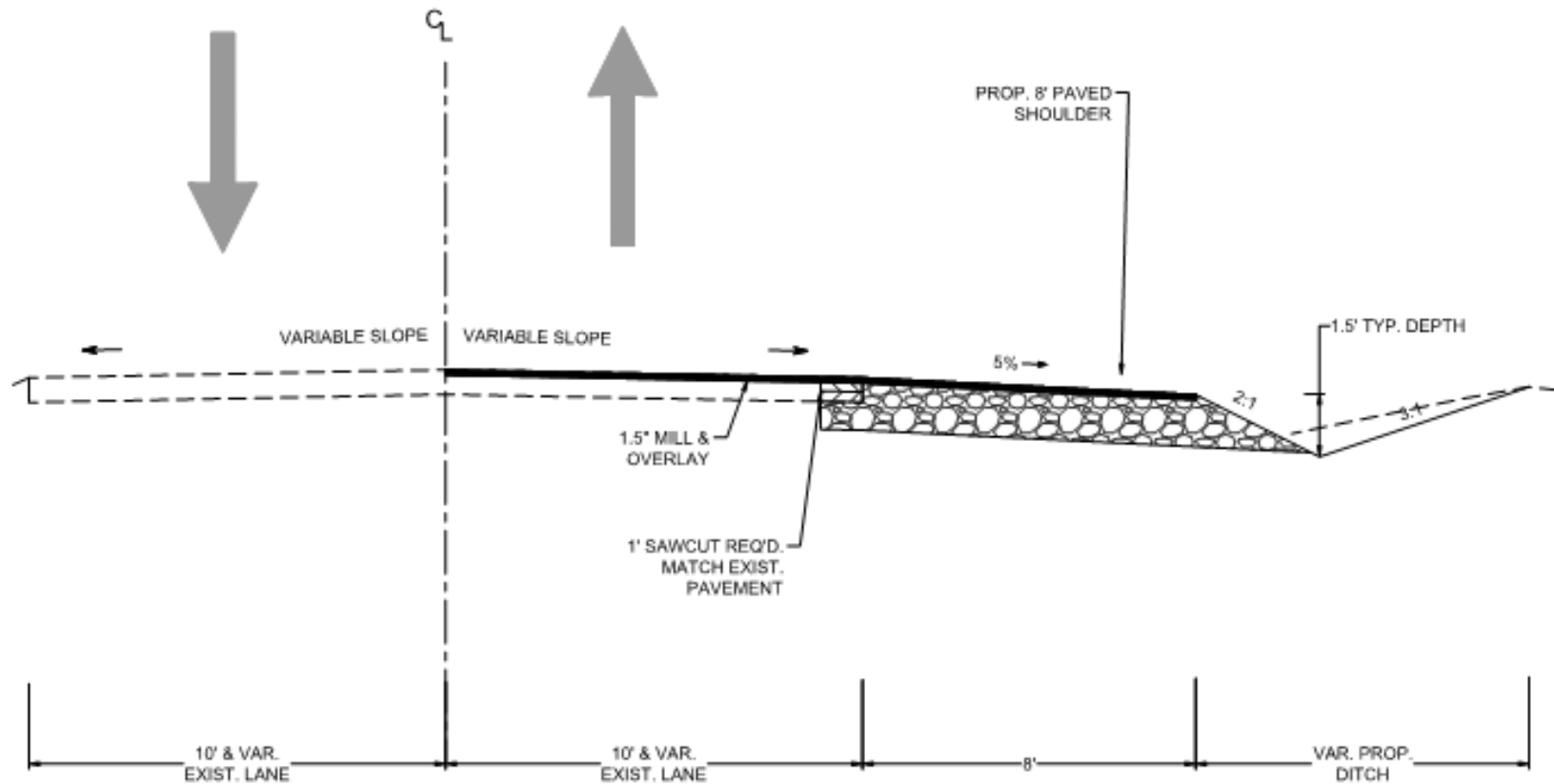
# Option #3 – Install Sidewalk Only



- \$300 per LF
- Bliley – \$1,200,000
- Westower – \$1,350,000



# Option #4 – Widen Shoulders Only



- \$400 per LF
- Bliley – \$1,600,000
- Westover – \$1,400,000



# Recommended Improvement – Option #1

- Option #1 – Install Sidewalk Behind Curb and Gutter
  - Limits impacts to adjacent properties
  - Improves overall drainage operations on the corridor
  - Safe option providing physical buffer between cars and pedestrians
  - Matches similar urban roadway sections within the City



# Questions?

- City of Richmond
  - Travis Bridewell
  - 804-646-5745
  - Travis.Bridewell@Richmondgov.com
  
- Timmons Group
  - Scott Dunn, AICP, PTP
  - 804-200-6955
  - Scott.Dunn@Timmons.com



# Westtower Drive Improvements – Bliley Road Improvements

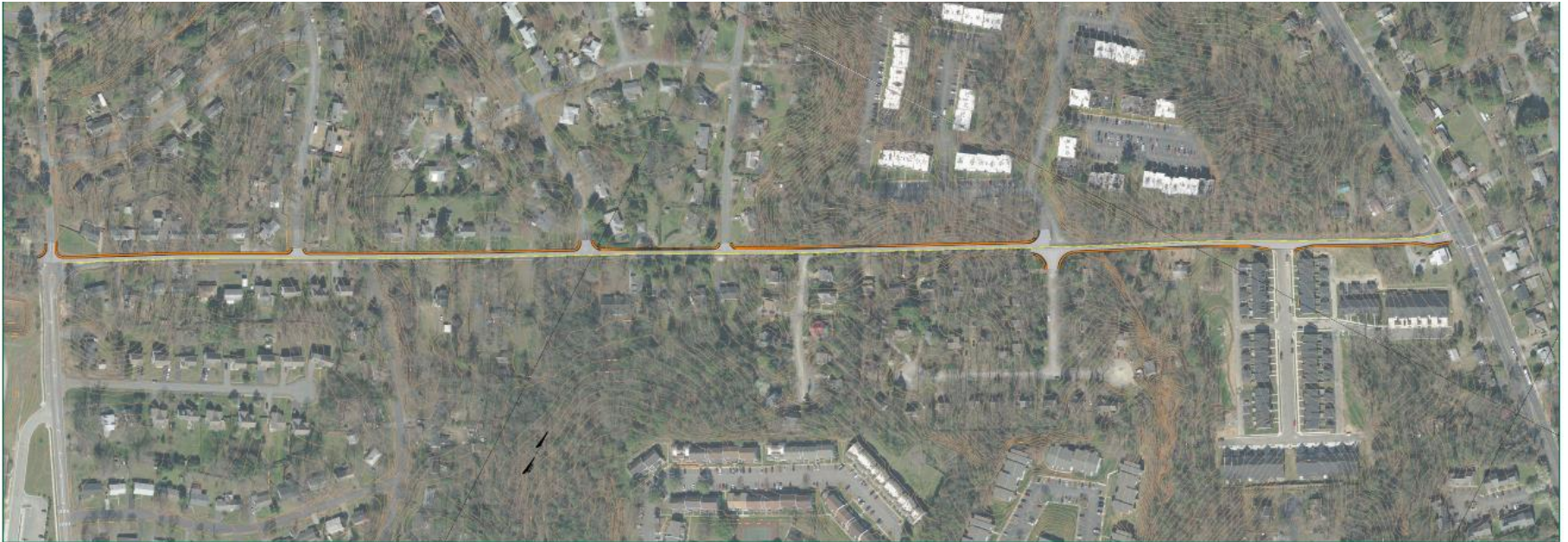


**WESTTOWER DRIVE IMPROVEMENTS**

0' 50' 100'



# Westtower Drive Improvements – Bliley Road Improvements



## BLILEY ROAD IMPROVEMENTS

0' 50' 100'