

BROOKE DRIVE SIDEWALK GAP REPORT

Brooke Drive from Lewis Drive to Rockland Avenue

Twinbrook Safe Routes to School and Transit Access Feasibility Studies
City of Rockville Contract No. BCS 2017-01H

December 2024

Prepared For:

City of Rockville
111 Maryland Ave,
Rockville, Maryland 20850

Prepared By:

Mercado Consultants, Inc.
17830 New Hampshire Avenue
Suite 200
Ashton, Maryland 20861

AECOM
4 North Park Drive, Suite 300
Hunt Valley, Maryland 21030

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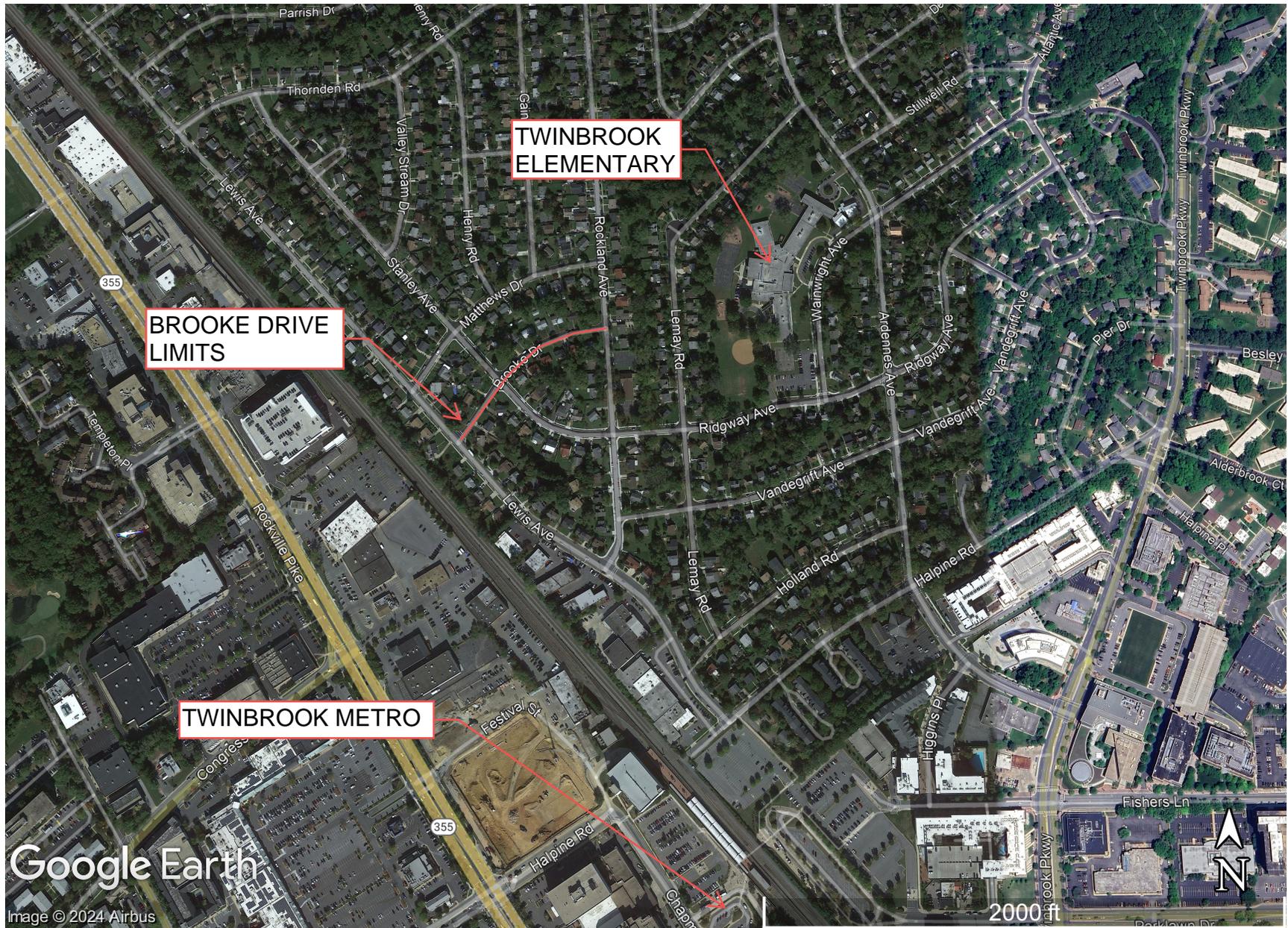
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BROOKE DRIVE
FIGURE 1: LOCATION MAP

I. PROJECT INTRODUCTION

This report has been prepared for the City of Rockville as one of their Vision Zero Projects. Vision Zero is a priority initiative of the Mayor and Council to create safe and livable neighborhoods. The Twinbrook Safe Routes to School and Transit Access feasibility study focuses on improving multimodal access and mobility in the Twinbrook neighborhood in Rockville. The goal of this project is to evaluate the feasibility of constructing new sidewalks along roads and identify opportunities to improve intersection safety for all modes of transportation, especially for trips to and from Twinbrook Elementary School and the Twinbrook Metro Station.

The following sidewalk segments were studied:

1. Brooke Drive between Lewis Avenue and Rockland Avenue
2. Crawford Drive between Rockcrest Circle and Hillcrest Park
3. Crawford Drive between Atlantic Avenue and Ardennes Avenue
4. Halsey Road between Henry Road and Ardennes Avenue
5. Lemay Road between Vandegrift Avenue and Ardennes Avenue
6. Midway Avenue between Crawford Drive and Stillwell Road
7. Wade Avenue between Edmonston Drive and Crawford Drive

The intersections studied included:

1. Ardennes Avenue and Crawford Drive
2. Ardennes Avenue and Halsey Road
3. Ardennes Avenue and Halpine Road
4. Ardennes Avenue and Ridgway Avenue
5. Ardennes Avenue and Wainwright Avenue
6. Chapman Avenue and Bouic Avenue
7. Chapman Avenue and Twinbrook Parkway
8. Lemay Road and Ridgway Avenue

This project was funded by a Maryland Department of Transportation (MDOT) Transportation Alternatives (TA) Program grant, and the improvements and cost estimate are proposed by the project team consisting of Mercado Consultants and AECOM.

II. PROJECT DESCRIPTION

This report discusses the feasibility of sidewalk improvements along both sides of Brooke Drive between Lewis Avenue and Rockland Avenue. Please see Appendix A for the sidewalk options and cost estimate.

III. DESIGN CRITERIA AND ASSUMPTIONS

The design criteria used for the proposed sidewalks comes from the ADA Standards for Accessible Design and the recently adopted Public Right-of-Way Accessibility Guidelines. A 5-foot minimum width sidewalk is proposed to meet this standard. The running slopes on the ramps are 12:1 maximum, and the proposed landing pads are a minimum of 5-foot x 5-foot with a 48:1 maximum cross-slope. The depressed landing pads located at crossings contain a 2-foot wide minimum detectable warning surface.

The buffer between the proposed sidewalk and back of curb is a minimum 2-foot but may vary to avoid impacts with utilities or trees. Proposed sidewalks must also tie into adjacent existing sidewalk where applicable.

It is assumed the sidewalk is also proposed entirely within the City of Rockville's right-of-way. Temporary construction easements will only be necessary for driveway reconstruction to tie-in to existing driveway grades. Driveways will be reconstructed in-kind. Impacted fences, mailboxes, and other resident belongings located within the City of Rockville's right-of-way are to be relocated. Impacted steps or resident walkways are to be reconstructed to tie into the proposed sidewalk. The study looked at shifting sidewalk to avoid moving utilities such as inlets, fire hydrants, and utility poles. At a time of more detailed design, the City of Rockville should coordinate with Pepco about moving utility poles.

Retaining walls or knee walls are to be proposed at locations with steep slope adjacent to the proposed sidewalk.

Marked crosswalks are proposed at intersections along the proposed sidewalk. Proposed marked crosswalks are to include advanced warning signage and stop bars at stop-controlled intersections. The MD MUTCD is to be followed for crosswalk placement. Per the MD MUTCD marked crosswalks are to be 6-foot wide minimum.

The Fire Department Access Performance-Based Design Guide also dictates the roadway clear width to be 20-foot minimum for emergency vehicles. The curb radius recommended at intersections is 25-foot minimum and was used to upgrade curb radii throughout the site. Intersections used specific AASHTO design vehicles proposed by the City of Rockville.

IV. EXISTING CONDITIONS

Brooke Drive is an undivided two-way road, classified as a secondary residential street. The southernmost limits of the study, the intersection of Brooke Drive and Lewis Avenue, is located 0.4 miles from the Twinbrook Metro Station. The northernmost limits of the study, the intersection of Brooke Drive and Rockland Avenue, is located 0.4 miles from Twinbrook Elementary School.

The proposed sidewalk gap on Brooke Drive extends from Lewis Avenue to Rockland Avenue and measures approximately 800 linear feet. The limits of Brooke Drive are intersected by three streets, Lewis Avenue, Stanley Avenue, and Rockland Avenue. The intersecting roads of Lewis Avenue, and Stanley Avenue have existing sidewalk on both sides of the road, while Rockland Avenue only has existing sidewalk on the east side of Brooke Drive.

Existing utilities poles begin on the south side of Brooke Drive and transition to the north for most of the site limits. There is also an existing fire hydrant on the north side of Brooke Drive. There are many trees on both sides of Brooke Drive. The roadway clear width is approximately 25-foot along Brooke Drive. Although only two residents along Brooke Drive do not have a driveway, there are multiple cars parking along the street.

Please see Appendix B for existing site photos.

V. CRASH DATA

There were no police-reported crashes at this location during the 2018-2022 study period. During the walk the block meetings, residents reported two crashes within a month from each other between Stanley Avenue and Rockland Avenue.

VI. ALTERNATIVES CONSIDERED

Two alternatives, one per side, were considered for the sidewalk gap along Brooke Drive. The alternative on the south side of Brook Drive, Option 1, was designed using the criteria mentioned in the Design Criteria and Assumptions section. The buffer in Option 1 is a consistent 2-foot buffer throughout the sidewalk gap limits. Option 1 impacts include tree removal (6), bush removal (3), driveway impact (8), and easements required (8).

The alternative on the north side of Brooke Drive, Option 2, was designed with a larger 5-foot buffer across most of the sidewalk gap's limits to try to avoid tree and utility impacts. It is possible that using the larger 5-foot buffer, trees will still be impacted as shown on the plans. The application of flexi-pave would need to be evaluated by the City of Rockville on a case-by-case basis to mitigate tree impacts on the north side. There are three trees located in front of property numbers 1202, 1204, and 1212 that may not require removal if flexi-pavement can be used. Option 2 also requires an approximately 95-linear foot knee wall along property 2102 Stanley Avenue due to the existing grades. Other impacts of Option 2 include tree removal (8), bush removal (1), driveways impact (8), and easements required (7).

Options 1 and 2 both upgrade curb radii to 25-feet at intersections and tie into adjacent existing sidewalk on Lewis Avenue and Stanley Avenue. Both options propose marked crosswalks across Stanley Avenue, and across Brooke Avenue along Lewis Avenue.

VII. PUBLIC INPUT

Residents and the Study Team participated in the walk the block meeting for Brooke Drive sidewalk gap on May 28th. The primary concerns were related to the proximity of the sidewalk to the right-of-way, and if the sidewalk would require property impacts. The residents were shown the sidewalk is proposed on the City of Rockville's right-of-way. Residents also raised concerns about tree removal that would be required to install the proposed sidewalk. There were a few residents that voiced concerns about speeding vehicles on Rockland Avenue and requested traffic calming measures along Rockland Avenue. One resident was opposed to Option 2, as they did not want to lose a tree in front of their property. Another resident voiced concerns about grading behind the sidewalk, toward their property, and what the proposed knee wall would look like. No written resident comments were received for this location.

VIII. RECOMMENDATIONS

The study team recommends proceeding with Option 1 as the most feasible option for construction. The study team came to this conclusion based on several factors. Residents showed more support for Option 1 over Option 2 during the walk the segments. Option 1 also has a significantly lower cost as there is no need to construct a knee wall. Constructability is also simplified as there were no visible utilities on this side. Option 1 also had fewer trees needed to be removed for the installation of the proposed sidewalk. There are also no impacts outside of the City of Rockville's right-of-way.

A. IMPACTS:

Option 1 impacts include:

Tree removal: 6
Bush removal: 3
Driveways impacted: 8
Easements required: 8

Option 2 impacts include:

Tree removal: 8
Bush removal: 1
Driveways impacted: 8
Easements required: 7

B. COST ESTIMATE:

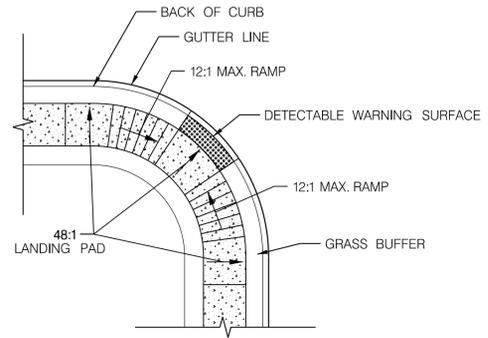
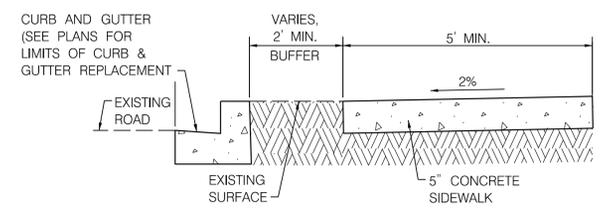
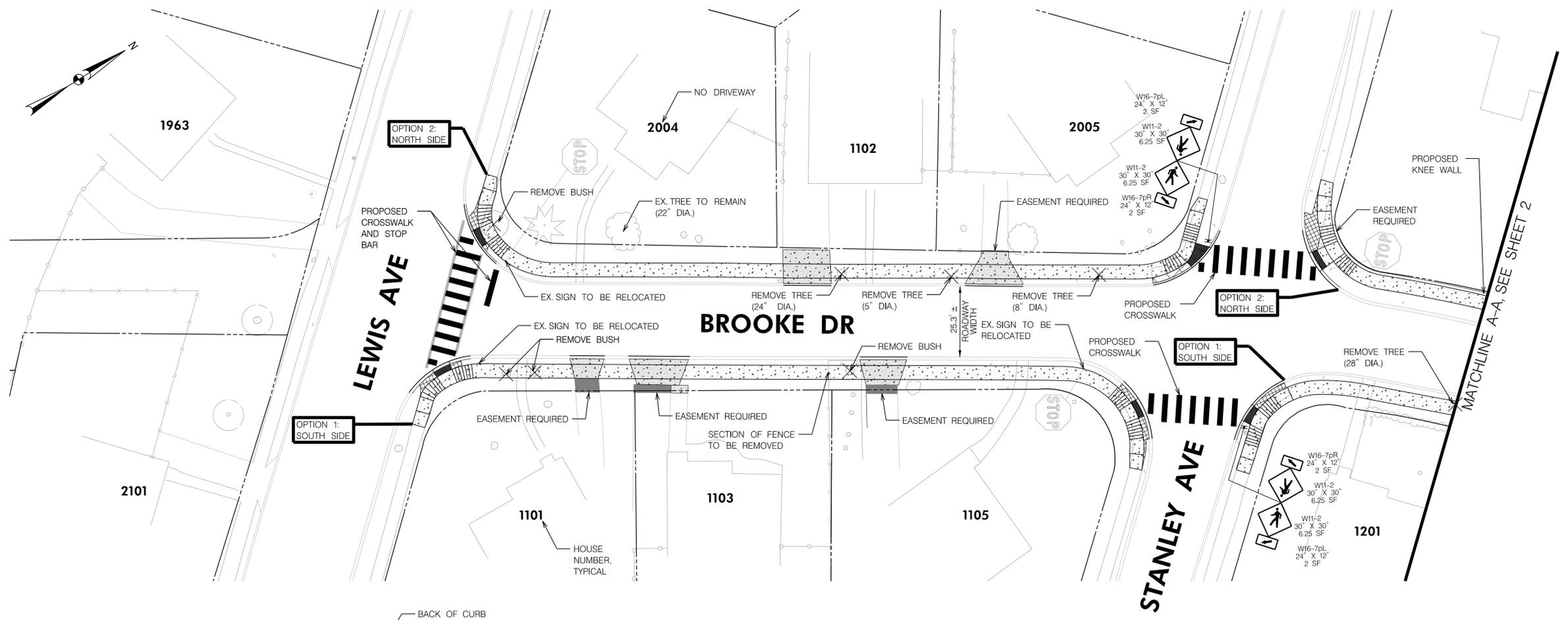
Project cost was estimated using the unit cost method plus an overall 40% contingency to reflect the current level of study. Unit costs were gathered for proposed items in each option and quantities were gathered. The unit costs used were derived from similar projects within Montgomery County. The approximate cost for constructing Option 1 is \$191,000 and for Option 2 is \$257,000. Please see Appendix A for cost estimate breakdown.

IX. SUMMARY

Construction of the sidewalk on Brooke Drive is deemed feasible. Sidewalks may be constructed on either side (north or south) with similar impacts. Option 1, the South side, is the recommended option for construction. Unlike Option 2, Option 1 does not require a 95-foot long knee wall adding to construction costs. Option 1 also has less impact to trees, residents' steps, and has overall more resident support.

APPENDIX A:

PLAN SHEET(S) AND ESTIMATE

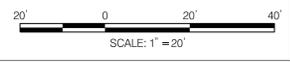


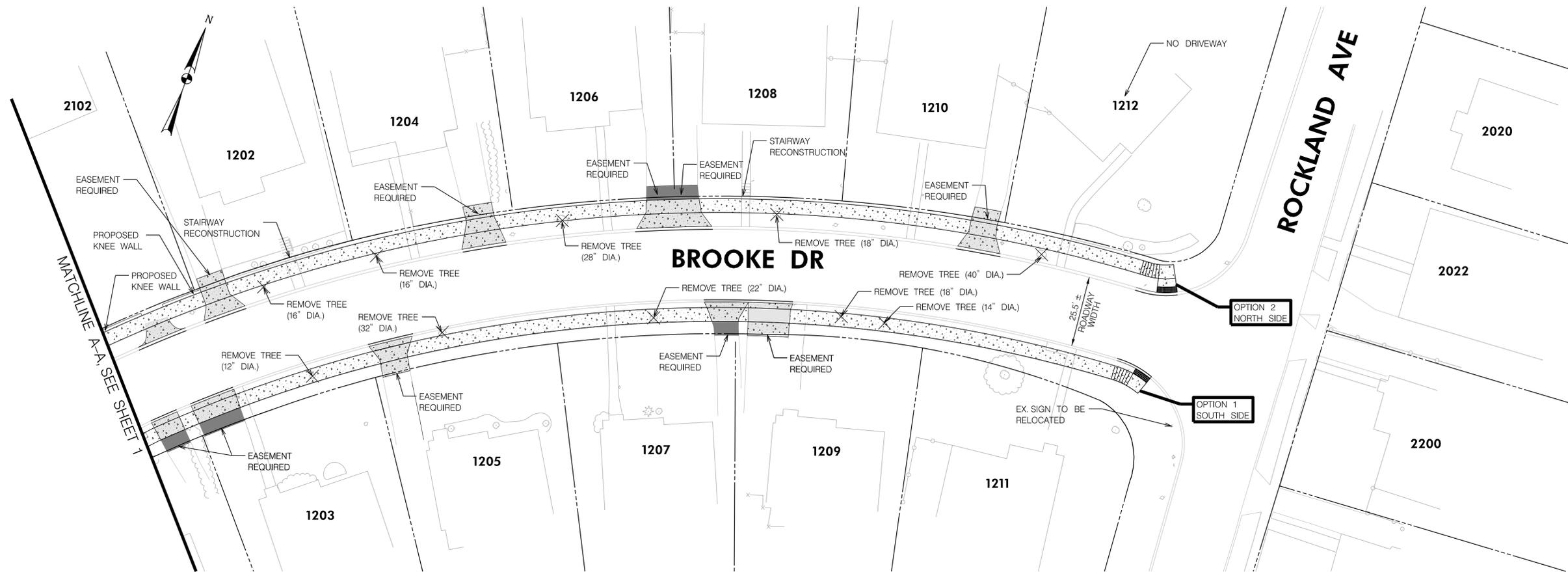
- NOTES:**
1. DIRECTION OF 2% CROSS SLOPE WILL BE CONSISTENT WITH EXISTING DRAINAGE CONDITIONS.
 2. A CURB SHALL BE ADDED TO THE BACK OF THE SIDEWALK WHERE NEEDED TO PROTECT EXISTING LANDSCAPE AND WHERE THE SLOPE BEHIND THE SIDEWALK IS GREATER THAN 10 PERCENT.
 3. EXISTING MULCH BEDS SHALL RETURN TO MULCH BEDS IF DISTURBED.

- LEGEND**
- 5 INCH CONCRETE SIDEWALK
 - CONCRETE REMOVAL
 - 8 INCH PORTLAND CEMENT CONCRETE DRIVEWAY
 - 8 INCH ASPHALT DRIVEWAY
 - DETECTABLE WARNING SURFACE
 - NEW CURB
 - APPROX. RIGHT OF WAY
 - ADA RAMP

- OPTION 1 NOTES:**
1. TREES TO BE REMOVED: 6
 2. BUSHES/HEDGES TO BE REMOVED: 3
 3. KNEE WALL LENGTH (LF): 0
 4. EASEMENTS REQUIRED: 10

- OPTION 2 NOTES:**
1. TREES TO BE REMOVED: 9
 2. BUSHES/HEDGES TO BE REMOVED: 1
 3. KNEE WALL LENGTH (LF): 95
 4. EASEMENTS REQUIRED: 7





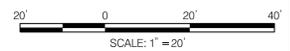
LEGEND

-  5 INCH CONCRETE SIDEWALK
-  CONCRETE REMOVAL
-  8 INCH PORTLAND CEMENT CONCRETE DRIVEWAY
-  8 INCH ASPHALT DRIVEWAY
-  DETECTABLE WARNING SURFACE
-  NEW CURB
-  APPROX. RIGHT OF WAY
-  ADA RAMP



DEPARTMENT OF PUBLIC WORKS
CITY OF
ROCKVILLE
111 MARYLAND AVE. ROCKVILLE, MARYLAND

NOTE: TOPOGRAPHY BASED ON MOBILE LIDAR SCAN



SIDEWALK GAP PLANS
BROOKE DR FROM LEWIS DR TO
ROCKLAND AVE - OPTIONS 1 AND 2

TWINBROOK SAFE ROUTES TO SCHOOL AND TRANSIT
ACCESS FEASIBILITY STUDIES

DATE SUBMITTED:
10/07/2024
CONTRACT NO.
BCS 2017-01H

SCALE
1"=20'

DRAFT
SHEET
NO. 2
OF 2



Engineer's Cost Estimate

Contract No. BCS 2017-01H
 Twinbrook Safe Routes to School and
 Transit Access Feasibility Studies
 Brooke Drive - Option 1
 December 30, 2024

ITEM NO.	CATEGORY CODE	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CATEGORY 1						
		TREE REMOVAL	EA	6	\$1,000.00	6,000.00
		BUSH REMOVAL	EA	3	\$250.00	750.00
CATEGORY 1 TOTAL						\$6,750.00
CATEGORY 2						
		CLASS 1 EXCAVATION	CY	82	\$60.00	\$4,920.00
CATEGORY 2 TOTAL						\$4,920.00
CATEGORY 3						
		STEPS OR PATH RELOCATION (SET)	EA	6	\$500.00	\$3,000.00
CATEGORY 3 TOTAL						\$3,000.00
CATEGORY 4						
CATEGORY 4 TOTAL						\$0.00
CATEGORY 5						
		HOT ASPHALT MIX FOR DRIVEWAY	TON	5	\$175.00	\$875.00
		PAVEMENT MARKINGS FOR CROSSWALK	LF	148	\$5.00	\$740.00
		PAVEMENT MARKINGS FOR STOP BAR	LF	14	\$5.00	\$70.00
CATEGORY 5 TOTAL						\$1,685.00
CATEGORY 6						
		5 INCH CONCRETE FOR SIDEWALK	CY	53	\$1,000.00	\$53,000.00
		7 INCH CONCRETE FOR DRIVEWAY	CY	22	\$1,500.00	\$33,000.00
		TYPE A COMBINATION CURB AND GUTTER ANY HEIGHT OR DEPTH	LF	222	\$150.00	\$33,300.00
CATEGORY 6 TOTAL						\$119,300.00
CATEGORY 7						
CATEGORY 7 TOTAL						\$0.00
CATEGORY 8						
		SHEET ALUMINUM SIGN	SF	17	\$45.00	765.00
CATEGORY 8 TOTAL						\$765.00
SUBTOTAL						\$136,420.00
40% CONTINGENCY						\$54,568.00
TOTAL						\$190,988.00



Engineer's Cost Estimate

Contract No. BCS 2017-01H
 Twinbrook Safe Routes to School and
 Transit Access Feasibility Studies
 Brooke Drive - Option 2
 December 30, 2024

ITEM NO.	CATEGORY CODE	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CATEGORY 1						
		TREE REMOVAL	EA	9	\$1,000.00	9,000.00
		BUSH REMOVAL	EA	1	\$250.00	250.00
CATEGORY 1 TOTAL						\$9,250.00
CATEGORY 2						
		CLASS 1 EXCAVATION	CY	85	\$60.00	\$5,100.00
CATEGORY 2 TOTAL						\$5,100.00
CATEGORY 3						
		STEPS OR PATH RELOCATION (SET)	EA	7	\$500.00	\$3,500.00
		KNEE WALL	LF	95	\$350.00	\$33,250.00
CATEGORY 3 TOTAL						\$36,750.00
CATEGORY 4						
CATEGORY 4 TOTAL						\$0.00
CATEGORY 5						
		HOT ASPHALT MIX FOR DRIVEWAY	TON	2	\$175.00	\$350.00
		PAVEMENT MARKINGS FOR CROSSWALK	LF	158	\$5.00	\$790.00
		PAVEMENT MARKINGS FOR STOP BAR	LF	14	\$5.00	\$70.00
CATEGORY 5 TOTAL						\$1,210.00
CATEGORY 6						
		5 INCH CONCRETE FOR SIDEWALK	CY	56	\$1,000.00	\$56,000.00
		7 INCH CONCRETE FOR DRIVEWAY	CY	26	\$1,500.00	\$39,000.00
		TYPE A COMBINATION CURB AND GUTTER ANY HEIGHT OR DEPTH	LF	233	\$150.00	\$34,950.00
CATEGORY 6 TOTAL						\$129,950.00
CATEGORY 7						
CATEGORY 7 TOTAL						\$0.00
CATEGORY 8						
		SHEET ALUMINUM SIGN	SF	17	\$45.00	765.00
CATEGORY 8 TOTAL						\$765.00
SUBTOTAL						\$183,025.00
40% CONTINGENCY						\$73,210.00
TOTAL						\$256,235.00

APPENDIX B:

SITE PHOTOS



Brooke Drive – Looking West toward Lewis Avenue



Brooke Drive – Looking East toward Stanley Avenue



Brooke Drive – Looking Northeast toward Proposed Knee Wall



Brooke Drive – Looking East toward Rockland Avenue



Brooke Drive – Looking East toward Proposed Rockland Avenue Midblock Crossing