



WEST EAST TRAIL FEASIBILITY STUDY

HARFORD ROAD TO PERRY HALL BOULEVARD

April 21, 2023
FINAL REPORT





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EXECUTIVE SUMMARY

Baltimore County enlisted Johnson, Mirmiran, and Thompson (JMT) to conduct a feasibility study evaluating options for a proposed pedestrian and bicycle trail connecting communities and residents on the south / west side of I-695 in the vicinity of Harford Road and Belair Road with the Northeast Trail leading to White Marsh. JMT also sought to identify potential connections with outdoor recreational areas such as Double Rock Park and Linover Park.

The proposed trail is approximately 2.5 miles to 3.5 miles long depending on the potential routes to connect these points. JMT’s task was to evaluate potential alignment options, identify known natural and cultural resources, identify potential stormwater management (SWM) treatment design solutions, conduct an impact analysis, and develop feasibility level cost estimates for the proposed trail alignments.

During the initial phase of the project, JMT completed a desktop analysis, submitted trilogy letters to regulatory agencies, and submitted record requests to utility companies to determine the potential impacts of the project. These analyses identified no significant concerns, however, depending on the desired trail alignment, continued evaluation and analysis will be necessary in future design phases. A portion of the project area is located within FEMA floodplains and some areas are heavily forested. Additionally, Stemmers Run, which is a stream that travels through the project area, is classified as a Use IV Stream, meaning that no instream construction activities will be allowed from March 1st to May 31st of any given year to protect fish spawning.

After the existing conditions analysis was completed, JMT staff conducted a field visit to assess feasible trail options. As part of the concept development phase, JMT created design criteria, typical sections, and horizontal alignments for the proposed trail. Since the proposed trail covered a large area, the project was split into two project segments. Segment 1 is between Harford Road and Belair Road, while Segment 2 is between Belair Road and Lillian Holt Drive. Three alternatives were developed in Segment 1, while four alternatives were developed in Segment 2.

After developing these alignment options, the project team completed a feasibility level stormwater management (SWM) design analysis to identify potential treatment facilities. The team incorporated the footprint of the potential SWM facilities and added a 25-foot offset Limit-of-Disturbance (LOD) for all construction activities to create a feasibility level Impacts Analysis chart. In addition, cost estimates were developed for each of the design options, as shown in the table below.

Finally, after submitting the initial DRAFT report, the County and JMT agreed upon a recommended option for each of the two segments, which combines the best attributes of the original design options. The cost estimate for the recommended option in each segment are also shown in the following table.

SEGMENT 1 – HARFORD ROAD TO BELAIR ROAD		SEGMENT 2 – BELAIR ROAD TO LILLIAN HOLT DRIVE	
DESIGN OPTION	COST ESTIMATE	DESIGN OPTION	COST ESTIMATE
OPTION 1	\$2.5 – \$3.5 Million	OPTION 1	\$2.0 – \$3.0 Million
OPTION 2	\$1.5 – \$2.5 Million	OPTION 2	\$7.0 – \$11.0 Million
OPTION 3	\$3.0 – \$4.5 Million	OPTION 3	\$2 – \$3 Million
		OPTION 4	\$2.5 – \$4.0 Million
RECOMMENDED OPTION	\$1.5 - \$2.5 Million	RECOMMENDED OPTION	\$1.0 - \$1.5 Million

INTRODUCTION

Baltimore County enlisted JMT to provide feasibility-level design for a proposed pedestrian and bicycle facility for connecting communities and residents on Harford Road and Belair Road to the Northeast Trail to White Marsh. The County also asked JMT to evaluate the potential to connect the trail with established recreational areas such as Double Rock Park and Linover Park.

The proposed trail will be approximately 2.5 miles to 3.5 miles long and will be primarily located within County owned right-of-way. Due to the size of the project area, it was split into two segments, Segment 1 is located between Harford Road and Belair Road, while Segment 2 is located between Belair Road and Lillian Holt Drive. Several alternatives were developed for each of the two segments.

Additionally, this feasibility report includes a summary of anticipated stormwater management requirements, an existing conditions analysis, feasibility level cost estimates and impacts analyses, a constructability review, and identification of next steps for the project.



Figure 1: Study Area Map



EXISTING CONDITIONS

Natural Resources

JMT performed a desktop analysis and submitted trilogy letters to regulatory agencies to identify potential natural resources located within the proposed West East Trail project area. These analyses identified no major concerns for the project area, however future design phases should include more detailed field analysis and further coordination with regulatory agencies to confirm these results and to identify potential tree impacts.

DESKTOP ANALYSIS

JMT reviewed several background data sources including topographic maps, soil survey maps, National Wetland Inventory (NWI) and Maryland Department of Natural Resources (MDNR) mapped wetlands, MDE mapped streams, Federal Emergency Management Agency (FEMA) floodplain maps, recent aerial photographs, as well as Maryland's Environmental Resources and Land Information Network (MERLIN).

According to these sources the project area contains one mapped waterway, Stemmers Run, which is classified as a Use IV stream. The project area is partially located within the FEMA 100-year floodplain. In addition, the study area contains areas of forested land that are encumbered by Local Protected Lands.

Environmental mapping based on GIS data can be found in Appendix A.



Figure 2: Stemmers Run Use IV Stream

AGENCY COORDINATION

JMT coordinated with MDNR, US Fish and Wildlife Service (USFWS), and Maryland Historic Trust (MHT) to determine whether any state protected species, federally protected species, and/or known historical or archaeological sites are present within the Study Area.

JMT sent a letter on October 17, 2022, to the MDNR Wildlife and Heritage Service to determine if state-listed rare, threatened, or endangered (RTE) species are present in the Study Area. A response was received on January 25, 2022, stating that there are no official state records for RTE species within the delineation area (see Appendix B).

On October 17, 2022, JMT used the MDNR Environmental Review Program (ERP) Aquatic Resources Pre-Screening Tool to determine the presence of anadromous finfish or other fish in the Study Area. The stream is a cold-water trout stream, and if there are any impacts to this stream, then there would be a



March 1st through May 31st Time of Year Restriction (TOYR) for any instream work. A screenshot of the results can be found in Appendix B.

Through coordination with USFWS, the Northern Long-eared Bat (*Myotis septentrionalis*) could potentially exist within the Study Area. The Northern Long-eared Bat Rangewide Determination Key was filled out and results show that the project may affect, but is not likely to adversely affect the Northern Long-eared bat. A bat habitat assessment may be required for the project. The USFWS Online Certification Letter dated March 31, 2023, documenting these results can be found in Appendix B.

JMT contacted the Maryland Historic Trust (MHT) in a letter dated October 17, 2022, to determine if the proposed project may impact known historical or archeological sites. A response was received on November 7, 2022, stating that the project will have no adverse effect on historic properties. A copy of MHT's response can be found in Appendix B.

Subsurface Utilities

JMT submitted records requests for subsurface utilities within the project area to Baltimore County DPW, Baltimore County Government, Colonial Pipeline, Comcast, BGE, Crownncastle, and Verizon, but did not receive a response from BGE. A summary of the information that was gathered from the responding agencies is below.

VERIZON

Maps provided by Verizon showed the existence of fiber cables, copper cables, and conduit within the project area. The mapping indicates that there is existing fiber cable along the north side of Hiss Avenue near Parkville Middle School and near the intersection of Hiss Avenue and Fowler Avenue. There is existing fiber cable, copper cable, and conduit along Belair Road. There is existing fiber cable along Overton Avenue, Fowler Avenue on the east side of Belair Road, Edro Avenue, Sipple Avenue, and Alberta Avenue. There is also existing fiber cable along the south / west side of Rossville Boulevard. Any locations where proposed construction activities will include digging (i.e., not mill and overlay), should include delineation of these existing underground utilities to ensure they are not impacted by the project.

CROWNCASTLE

Maps provided by Crownncastle did not show any existing utility lines within the project area, however the project should continue to coordinate with them in future design phases to ensure there are no changes.

COMCAST

Maps provided by Comcast showed existing and proposed coaxial and fiber lines within the project area. There are existing coaxial and fiber lines along Hiss Avenue near the intersection with Harford Road and near Parkville Middle School. There are also existing coaxial and fiber lines, as well as a proposed future fiber line, along Fowler Avenue, Putty Hill Avenue, and Belair Road. There are existing coaxial lines and a proposed future fiber line along Rossville Boulevard. There are existing fiber and coaxial lines along Fowler Avenue on the east side of Belair Road, Sipple Avenue, and Alberta Avenue. Any locations where proposed construction activities will include digging (i.e., not mill and overlay), should include delineation of these existing underground utilities to ensure they are not impacted by the project.

COLONIAL PIPELINE

A map provided by Colonial Pipeline indicated the existence of an 8" petroleum pipeline within the existing utility easement adjacent to Lillian Holt Drive. The emailed response stated that the company

maintains a 12-foot easement around the pipeline. The pipeline should be designated during future design phases to ensure it will not be impacted during construction.

BALTIMORE COUNTY GOVERNMENT

Mapping provided by Baltimore County identified a 2" fiber optic conduit adjacent to Lillian Holt Drive and along the north / east side of Rossville Boulevard. If future phases of this project include construction activities along Lillian Holt Drive, these utilities should be designated to ensure they are not impacted by the project.

BALTIMORE COUNTY DPW

Mapping provided by Baltimore County DPW identified existing water, sewer, gas, and storm drain pipes within the project area. The maps showed existing water, sewer, and gas lines on Belair Road, Cardwell Avenue, and Sipple Avenue. Edro Avenue and Hiss Avenue were both identified as having water and sewer lines. Overton Avenue was identified to have water, sewer, and storm drain lines. Alberta Avenue and Kenlea Avenue were both identified to have water lines. Lillian Holt Drive and Rossville Boulevard both had water lines and both roadways crossed the existing 96" water line that provides the water supply for Baltimore City. Finally, there is an existing sewer interceptor that roughly parallels Stemmers Run throughout the project area. Any locations where proposed construction activities will include digging (i.e., not mill and overlay), should include delineation of these existing underground pipes to ensure they are not impacted by the project.



Figure 3: Utility corridor along Lillian Holt Drive



TRAIL CONCEPT DEVELOPMENT

The project team developed design criteria, proposed typical sections, and trail alignment options.

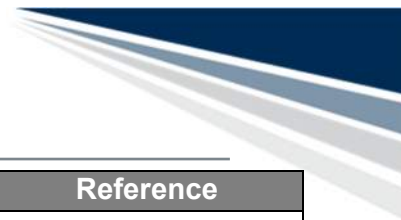
Design Criteria

The project team developed Design Criteria for the proposed West East Trail Feasibility Study. The purpose of these criteria is to identify design elements for the project such as trail widths, offsets, and other constraining factors. These criteria are developed based on guidance provided by international, national, state, and city literature. When conflicting information is present in these guidance documents, the strictest criteria will be used for design.

The Design Criteria for the proposed trail facilities were created using the 2012 AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (AASHTO Bike Book), the 2018 AASHTO Policy on Geometric Design of Highways and Streets the Maryland State Highway Administrations (2018 Green Book), the 2015 Bicycle Policy and Design Guidelines (MSHA Bike Policy) and the NACTO Urban Bikeway Design Guide (NACTO UBDG). While a fifth edition of the AASHTO Bike Book is currently under review it has not yet been released for use. As this project is anticipated to use federal funding, these criteria will follow the Public Rights-of-Way Accessibility Guidelines (PROWAG) to ensure accessibility for all users.

FACILITY TYPE: EXISTING ROADS

Criteria	Existing Design	Reference
Hiss Avenue		
Roadway Classification	Local Road	MDOT SHA Roadway Functional Classification (MDOT SHA)
Posted Speed Limit	25 mph	
Typical Section	36' curb-to-curb width, two 10' travel lanes with 8' parking lanes on each side. 4' sidewalk on each side with grass buffer	
Ownership	Baltimore County	
Belair Road		
Roadway Classification	Principal Arterial	MDOT SHA
Posted Speed Limit	35 mph	
Typical Section	Curb-to-curb width varies – 48 to 68', typically includes two lanes in each direction with right and left turn lanes. 5' sidewalk on each side of the roadway	
Ownership	MDOT SHA	
Overton Avenue		
Roadway Classification	Local Road	MDOT SHA
Posted Speed Limit	N/A (assumed 25 mph)	
Typical Section	Open Section, 21' roadway width, no sidewalks, Transitions to closed section, 30' curb-to-curb width with 4' sidewalk along north side of road separated by a grass buffer near the western end of the roadway.	



Criteria	Existing Design	Reference
Ownership	Baltimore County	
Fowler Avenue		
Roadway Classification	Local Road	MDOT SHA
Posted Speed Limit	N/A (assumed 25 mph)	
Typical Section	Open Section, 18' roadway width, no sidewalks east of Rainville Avenue	
Ownership	Baltimore County	
Cardwell Avenue		
Roadway Classification	Local Road	MDOT SHA
Posted Speed Limit	N/A (assumed 25 mph)	
Typical Section	30' curb-to-curb width. On-street parking on both sides of the roadway. 4' sidewalk on each side with no buffer	
Ownership	Baltimore County	
Edro Avenue		
Roadway Classification	Local Road	MDOT SHA
Posted Speed Limit	N/A (assumed 25 mph)	
Typical Section	30' curb-to-curb width. On-street parking on both sides of the roadway. 4' sidewalk on each side with no buffer	
Ownership	Baltimore County	
Lillian Holt Drive		
Roadway Classification	Minor Arterial	MDOT SHA
Posted Speed Limit	45 mph	
Typical Section	<p><i>South of Lillian Holt Drive bridge over I-95:</i> Open Section, 64' width – two drive lanes in each direction with 9' wide shoulder along southbound side and 11' wide shoulder along northbound side. No existing sidewalks.</p> <p><i>From Lillian Holt Drive bridge over I-95 to Rossville Boulevard:</i> Closed section, width varies 52'-65', includes two lanes in each direction, and a median / turn lanes where applicable. Existing 4' sidewalk along both sides of the road.</p>	
Ownership	Baltimore County	



FACILITY TYPE: OFF-ROAD PEDESTRIAN AND BICYCLE TRAIL

Criteria	Guidance	Proposed	Reference
Bicycle Design Speed	20 MPH max 12 MPH max for urban areas	20 MPH	MSHA Bike Policy (pg. 7.3, 7.5)
Min. Curve Radius	74 ft	-	AASHTO Bike Book (pg. 5-14)
Stopping Sight Distance	200 ft	-	AASHTO Bike Book (pg. 5-17)
Maximum Grade (within Street or Highway ROW)	Not to exceed roadway grade	-	PROWAG Supplemental Notice R302.5.1
Maximum Grade (outside Street or Highway ROW)	5% max, with allowances for: 5% < X < 8.33% for 200' max 8.33% < X < 10% for 30' max 10% < X < 12% for 10' max	-	Forest Service Trail Accessibility Guidelines (FSTAG) (pg. 10)
Cross Slope	2% max.	1.5%	PROWAG Supplemental Notice R302.6
Superelevation	Not Needed	N/A	AASHTO Bike Book (pg. 5-16)
Vertical Clearance above Path	10 ft preferred	-	AASHTO Bike Book (pg. 5-26)
Vertical Clearance above Roadway	15 ft	-	2018 AASHTO Policy on Geometric Design of Highways and Streets (2018 Green Book) (pg. 6-20)
Horizontal Sightline Offset (HSO)	58 ft	-	AASHTO Bike Book (pg. 5-23)
Shared-Use Path (SUP) Width	10 ft preferred 8 ft min for short segments of constrained areas*	12 ft preferred 10 ft minimum	AASHTO Bike Book (pg. 5-3)
Pedestrian Access Route (PAR)	Full Width of SUP	Full Width of SUP	PROWAG Supplemental Notice R302.3.1
Shoulder Clearance Width (Clear area on either side of SUP)	2 ft min. (6:1 slope) Grass shoulders	2 ft min width, Grass shoulders	AASHTO Bike Book (pg. 5-5) NPS Preferred Practice
Safety Grading	Barrier / Fence required if buffer <5' or: 3:1 for 6' vertical drop 2:1 for 4' vertical drop 1:1 for 1' vertical drop		AASHTO Bike Book (pg. 5-6)
Buffer Width (With and without Curbs)	5' min, greater than 5' preferred for high-speed roadways from outside edge of shoulder If the buffer < 5', a vertical barrier should be installed for separation from vehicle lanes		AASHTO Bike Book (pg. 5-11)
Pavement Design	Pervious or impervious depending on soil characteristics. 3" Hot Mix Asphalt (HMA) for Surface, 4" Graded Aggregate Subbase (GASB)		



FACILITY TYPE: ON-ROAD SHARED LANE

Criteria	Guidance	Proposed	Reference
Lane Width	13' < X < 15'	-	AASHTO Bike Book (pg. 4-3)
Road Speed Limit	35 mph	-	AASHTO Bike Book (pg. 4-5)
Roadway Surface Requirements	Must meet requirements for motor vehicle use	-	AASHTO Bike Book (pg. 4-28)
Shoulder Width	Not needed Can be absorbed in retrofit	-	AASHTO Bike Book (pg. 4-29)

FACILITY TYPE: ON-ROAD BIKE LANE

Criteria	Guidance	Proposed	Reference
Bicycle Lane Width	5 ft min	-	AASHTO Bike Book (pg. 4-14, 4-28)
Road Speed Limit	50 mph Recommended that higher speeds have wider bike lanes	-	MSHA Bicycle Policy (pg. 3.1) AASHTO Bike Book (pg.4-7)
Roadway Surface Requirements	Must meet requirements for motor vehicle use	-	AASHTO Bike Book (pg. 4-28)
Shoulder Width	Not needed Can be absorbed in retrofit	-	AASHTO Bike Book (pg. 4-7, 4-29)

FACILITY TYPE: CYCLE TRACK

Criteria	Guidance	Proposed	Reference
Bicycle Lane Width	5 ft – 7ft min 12 ft min if two ways	-	NACTO UDBG One-way Protected Cycle Lane Guide and Two-way Protected Cycle Lane Guide
Roadway Surface Requirements	Must meet requirements for motor vehicle use	-	AASHTO Bike Book (pg. 4-28)
Shoulder Width	Not needed Can be absorbed in retrofit	-	AASHTO Bike Book (pg. 4-7, 4-29)
Buffer Width	2 ft min	-	MSHA Bicycle Policy (pg. 10.3)



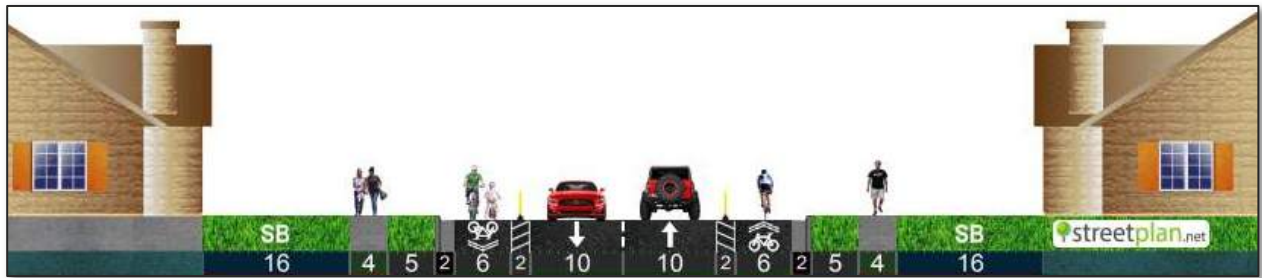
Typical Sections

Hiss Avenue

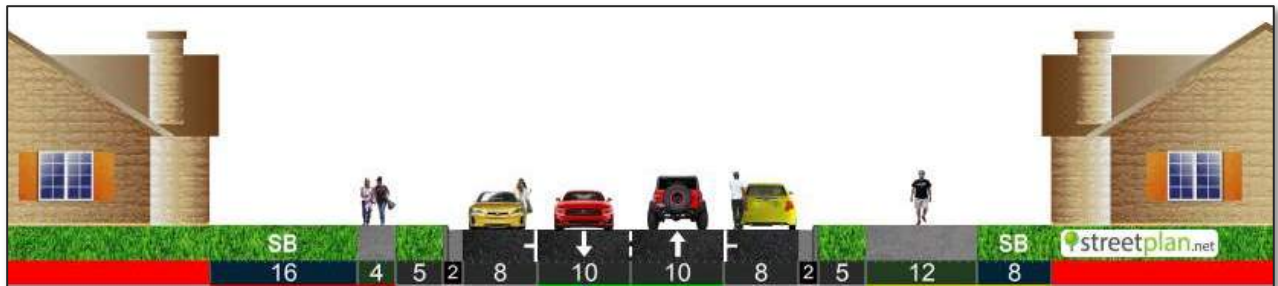
Existing Conditions (looking West)



Proposed Buffered Bike Lanes (Option 1)



Proposed Shared-Use Path (Option 2)

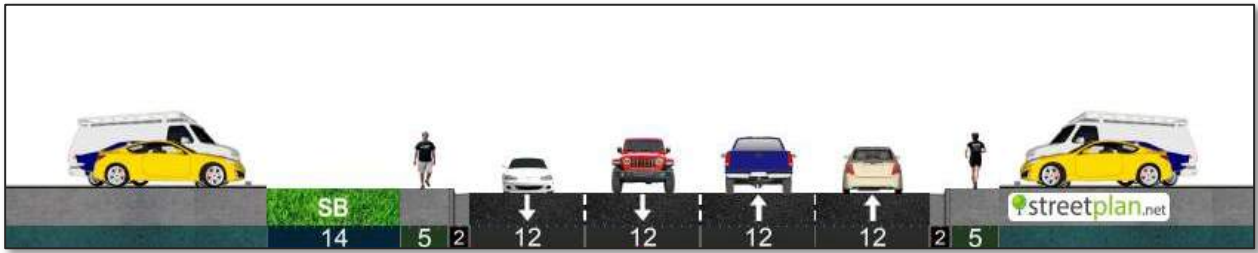


SB: Setback to structure

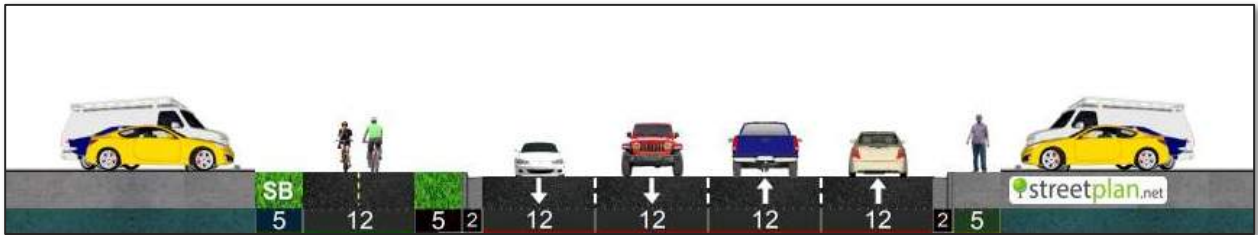


Belair Road

Existing Conditions (looking South)

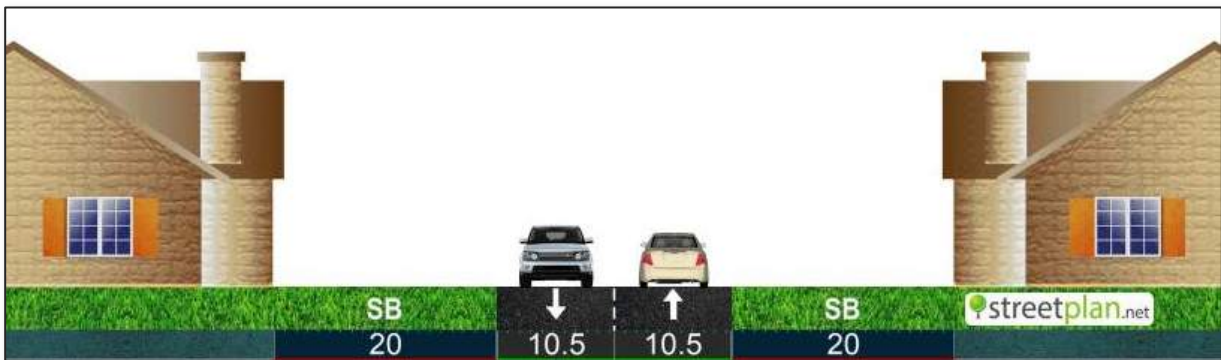


Proposed Shared-Use Path

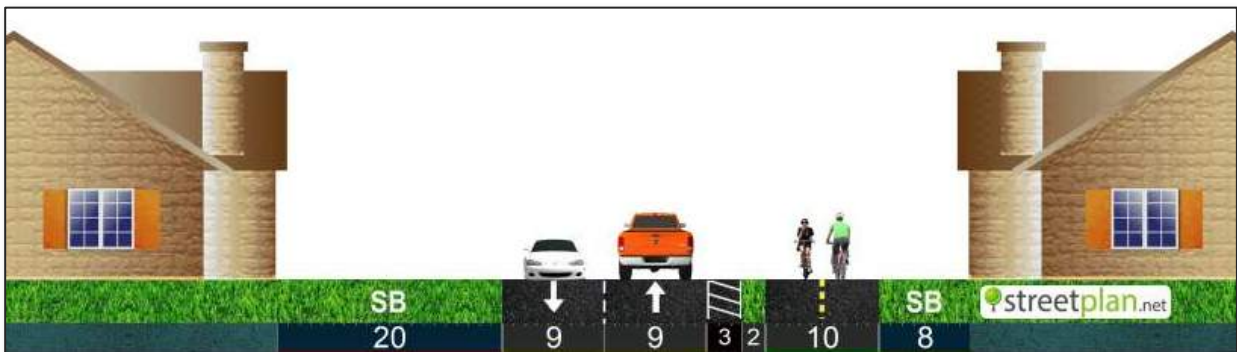


Overton Ave

Existing Conditions – Open Section (looking East)



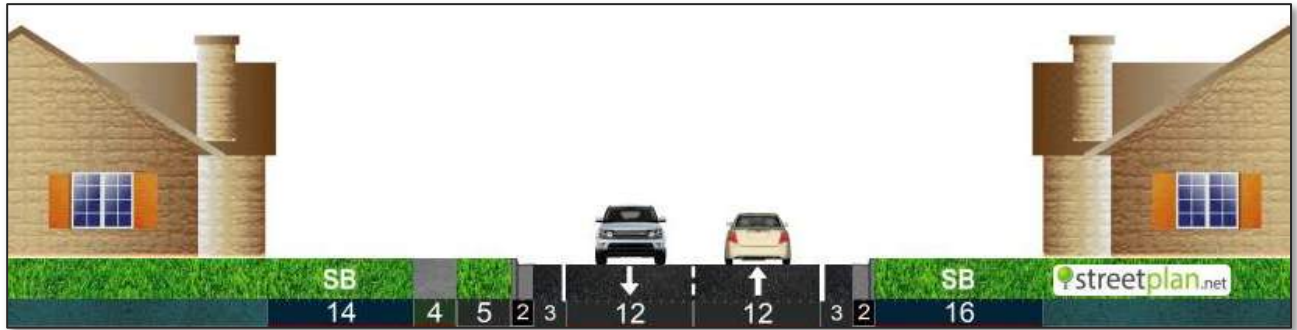
Proposed Shared-Use Path



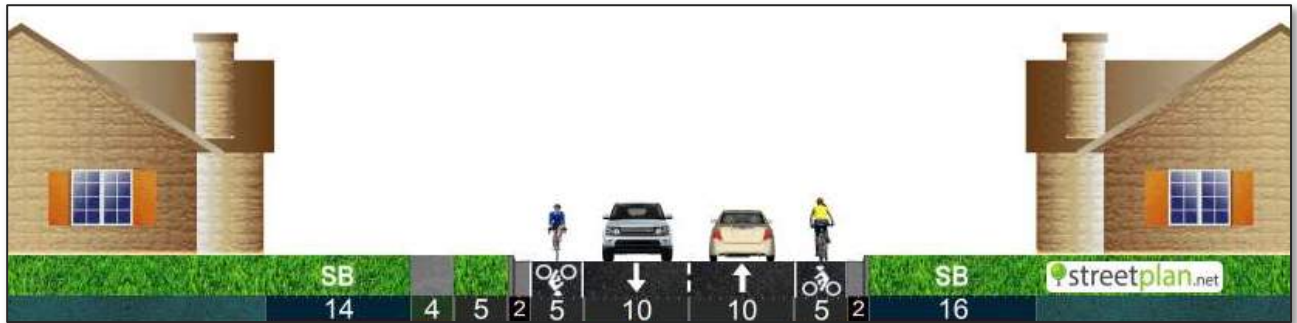
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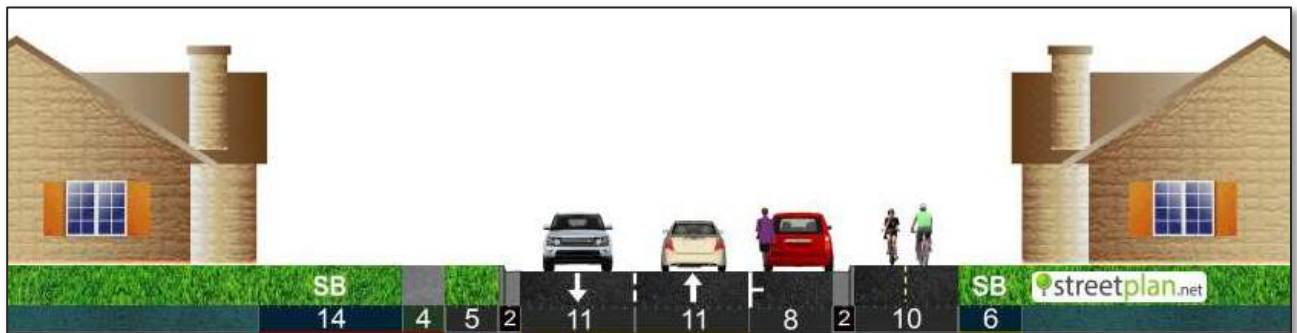
Existing Conditions – Closed Section (looking East)



Proposed Condition – Bike Lanes



Proposed Conditions – Street Parking with Shared – Use Path

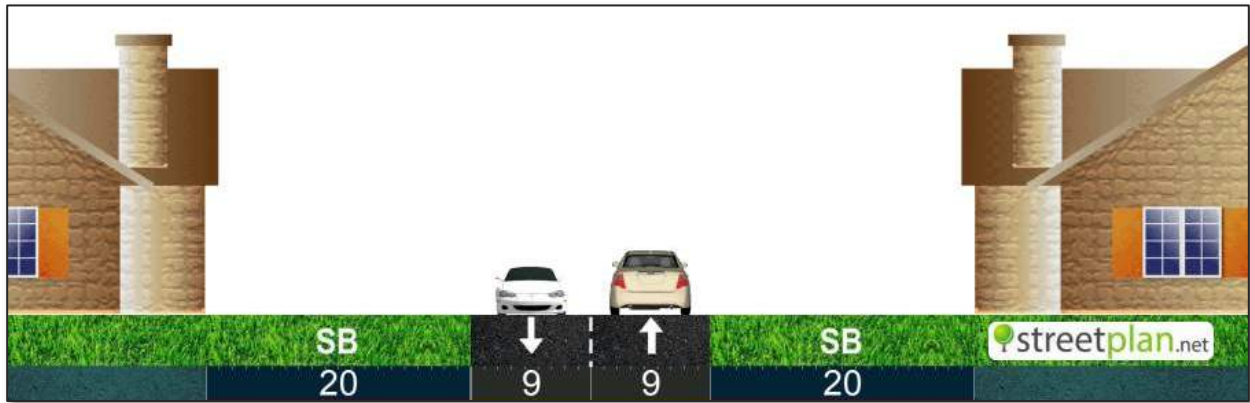


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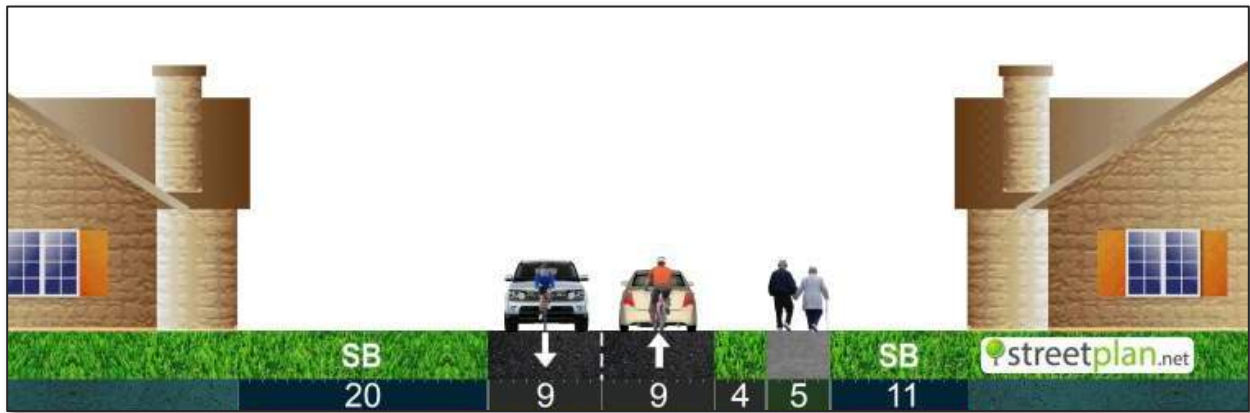


Fowler Avenue

Existing Conditions (looking East)



Proposed Sidewalk and Designated Bike Route



Proposed Shared-Use Path

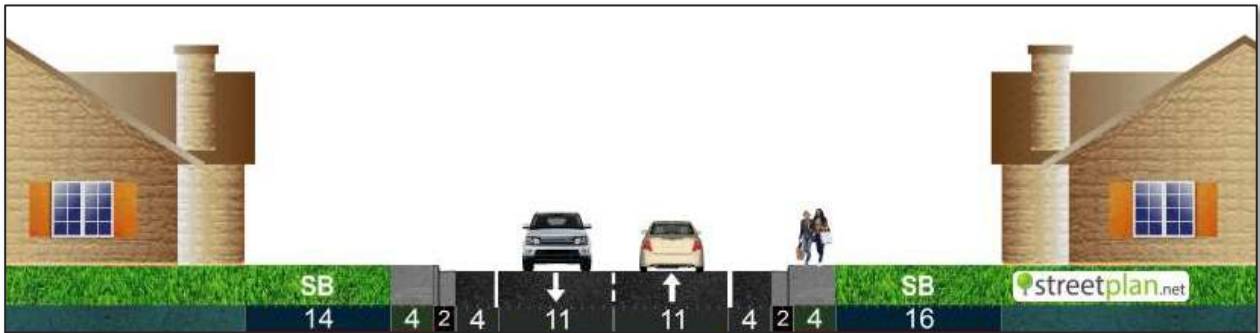


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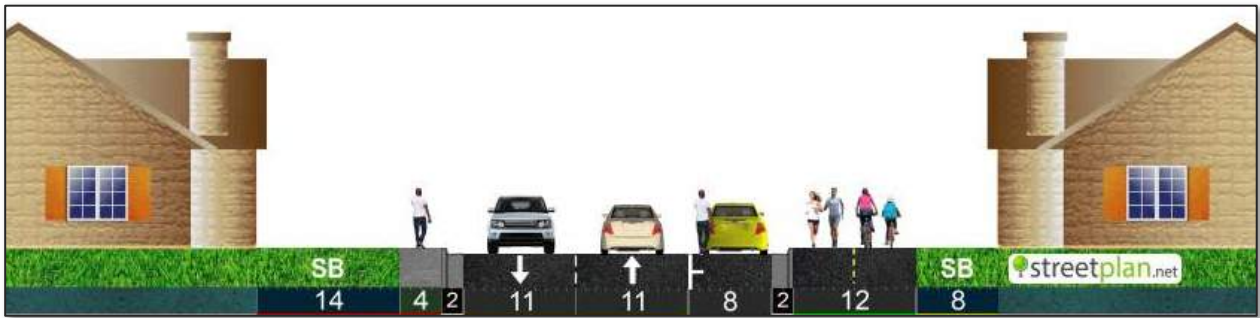


Cardwell Avenue

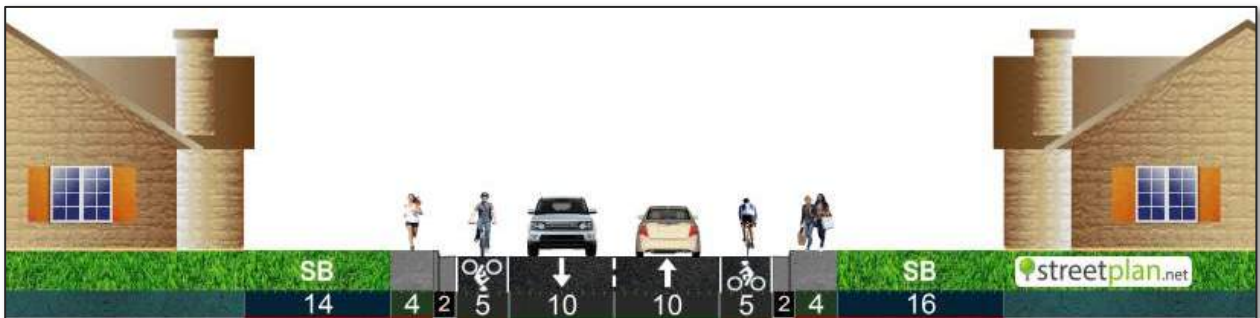
Existing Conditions (looking East)



Proposed Shared-Use Path



Proposed Bike Lanes

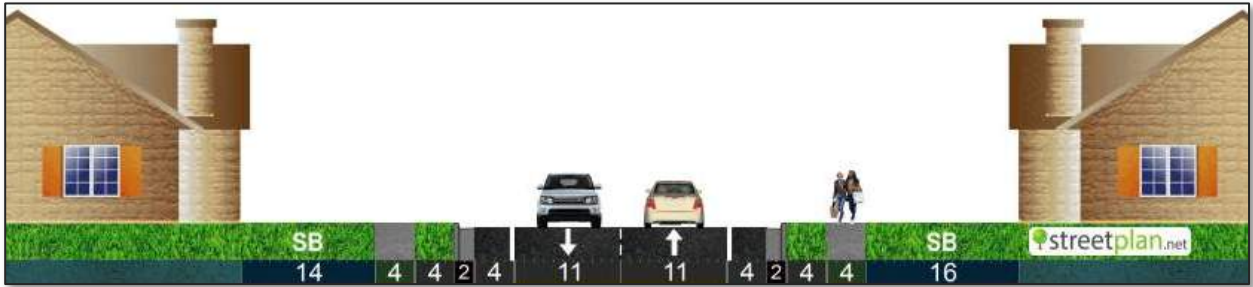


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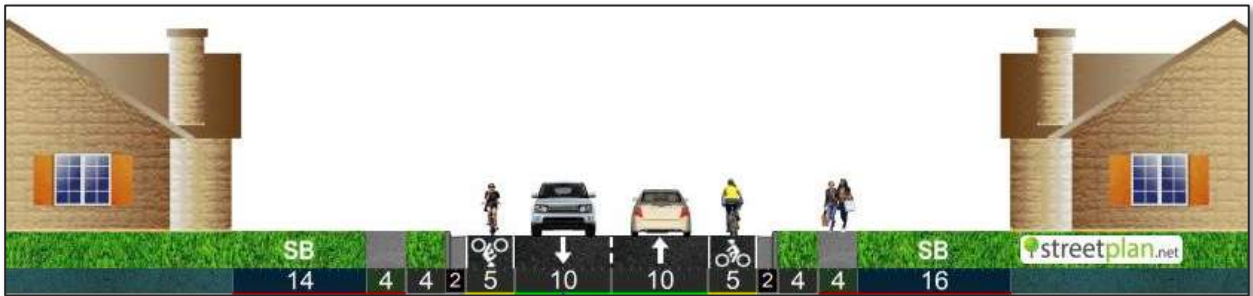


Edro Avenue

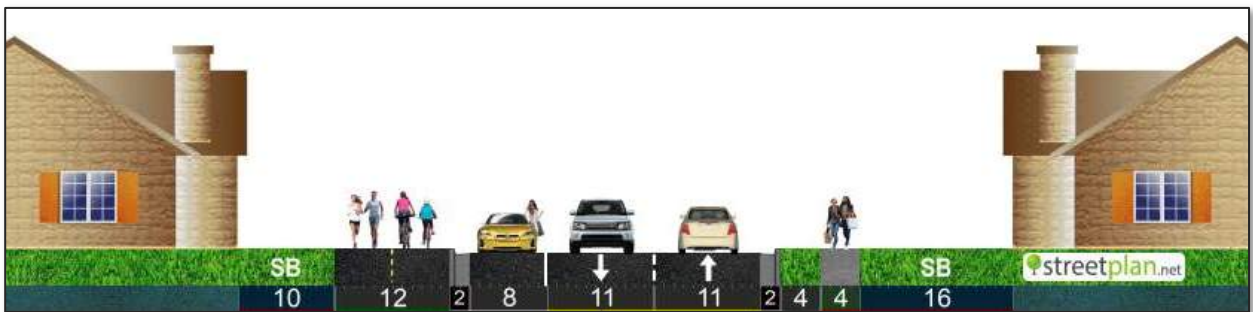
Existing Conditions (looking Northeast)



Proposed Bike Lanes



Proposed Shared-Use Path



SB: Setback to structure



Alignment Options

The project team split this project into two separate segments. Segment 1 is from Harford Road to Bel Air Road, while Segment 2 is from Bel Air Road to Rossville Boulevard. There are three alignment Options within Segment 1, and four alignment options within Segment 2. Some of the alignment options are interchangeable and can be “mixed and matched” to provide the best and most feasible alternative.

SEGMENT 1 – HARFORD ROAD TO BELAIR ROAD

Option 1

Option 1 begins at the intersection of Hiss Avenue and Harford Road and continues east along Hiss Avenue. In this first section of the trail pedestrians will continue to use the existing sidewalk network, while the existing road will be remarked to add buffered bike lanes along each side of the road. The buffered bike lanes will continue for approximately 700 feet before transitioning into standard bike lanes. The alignment is proposed to transition to standard bike lanes due to reduced roadway width in this section, and the bike lanes will continue for approximately 800 feet until reaching Wilson Avenue. The roadway width is reduced again between Wilson Avenue and Avondale Road, and the proposed trail will include transitioning Hiss Avenue into a Bike Boulevard for approximately 850 feet until reaching Avondale Road.

Once the proposed alignment crosses Avondale Road, it will once again transition to buffered bike lanes on each side of the road, with pedestrians continuing to use the existing sidewalk. The bike lanes will take the place of existing on-street parking, and there will be gaps in the marked bike lanes for driveways along both sides of the roadway. The proposed buffered bike lanes will continue east for approximately 2,500 feet until reaching Fowler Avenue. The entire stretch of Hiss Avenue between Harford Road and Fowler Avenue is proposed to be resurfaced using Mill and Overlay.

Once the proposed alignment reaches Fowler Avenue, it will turn south on an existing access road into Double Rock Park. The existing access road is hard packed gravel and is currently only utilized by Park Maintenance Facility staff. As part of this project, the access road will be upgraded to a paved facility that can be used by pedestrians and bicyclists, while also maintaining access to the Park Maintenance Facility. Due to the heavily forested park area around the existing access road and the low volume of vehicular traffic, no additional widening is proposed for new pedestrian / bicycle facilities.

The proposed alignment will continue along the existing access road for approximately 2,200 feet until reaching an existing bridge over Stemmers Run. The existing bridge is closed to vehicular traffic but is currently open to pedestrians and bicyclists. Future design phases should include additional analysis of this bridge to confirm that it will continue to be safe for pedestrians and bicyclists as part of this proposed East-West Trail.

After crossing the bridge, the trail continues on the access road for approximately 150 feet until transitioning into a shared-use path along the north side of the roadway. The proposed shared-use path will run parallel to the existing



Figure 4: Existing bridge over Stemmers Run

access road for approximately 250 feet until turning east and crossing Stemmers Run on a new proposed bridge, then following along the west side of Belair Road for approximately 150 feet until reaching the existing unsignalized intersection of Overton Avenue and Belair Road. The project team proposes to install a new traffic signal at this intersection to allow for safe crossing for pedestrians and bicyclists and to also create safer turning conditions for vehicles turning off of or onto Belair Road. The proposed new traffic signal should only be installed as part of a reconstruction of the interchange between Belair Road and I-695 because the existing interchange ramps are too close to the proposed traffic signal and could create a dangerous weave condition.

This proposed alignment will continue east of Belair Road by utilizing Option 1 of Segment 2.

Option 2

Option 2 begins at the intersection of Hiss Avenue and Harford Road and continues east along Hiss Avenue. In this first section of the trail pedestrians will continue to use the existing sidewalk network, while the existing road will be remarked to add buffered bike lanes along each side of the road. The buffered bike lanes will continue for approximately 700 feet before transitioning into standard bike lanes. The alignment is proposed to transition to standard bike lanes due to reduced roadway width in this section, and the bike lanes will continue for approximately 800 feet until reaching Wilson Avenue. The roadway width is reduced again between Wilson Avenue and Avondale Road, and the proposed trail will include transitioning Hiss Avenue into a Bike Boulevard for approximately 850 feet until reaching Avondale Road.

Once the proposed alignment crosses Avondale Road, it will transition into a shared-use path along the north side of Hiss Avenue. The existing 5-foot sidewalk will be widened to 10 feet and be used by both pedestrians and bicyclists. The shared-use path is proposed on the north side of Hiss Avenue to provide easier access to Parkville Middle School and because there are less driveway crossings on the north side.

The shared use-path will continue along the north side of Hiss Avenue for approximately 2,500 feet until reaching Fowler Avenue. The proposed facility will include two roadway crossings and several driveway crossings in this section. All crossings will be designed to meet ADA Guidelines and roadway crossings will include new crosswalks. When the proposed alignment reaches Fowler Avenue, the trail will cross Fowler Avenue and turn south onto an existing access road into Double Rock Park.

The existing access road is hard packed gravel and is currently only utilized by Park Maintenance Facility staff. As part of this project, the access road will be upgraded to a paved facility that can be used by pedestrians and bicyclists, while also maintaining access to the Park Maintenance Facility. Due to the heavily forested park area around the existing access road and the low volume of vehicular traffic, no additional widening is proposed for new pedestrian / bicycle facilities.



Figure 5: Access road within Double Rock Park



The proposed alignment will continue along the existing access road for approximately 2,200 feet until reaching an existing bridge over Stemmers Run. The existing bridge is closed to vehicular traffic but is currently open to pedestrians and bicyclists. Future design phases should include additional analysis of this bridge to confirm that it will continue to be safe for pedestrians and bicyclists as part of this proposed East-West Trail.

After crossing the bridge, the trail will continue on the access road for approximately 500 feet until reaching Belair Road. The trail will then turn north onto a proposed shared-use path for approximately 150 feet until reaching an existing signalized intersection at Fowler Avenue. The existing intersection will be reconstructed to remove the existing channelized right turn from southbound Belair Road into the Belair-Beltway Plaza. The proposed alignment will cross the entrance to the Belair-Beltway Plaza and then cross Belair Road to reach Fowler Avenue with new crosswalks installed for each crossing.

This proposed alignment will continue east of Belair Road by utilizing either Option 2 or Option 3 within Segment 2.

Option 3

Option 3 begins at the intersection of Hiss Avenue and Harford Road and continues east along Hiss Avenue. In this first section of the trail pedestrians will continue to use the existing sidewalk network, while the existing road will be remarked to add buffered bike lanes along each side of the road. The buffered bike lanes will continue for approximately 700 feet before transitioning into standard bike lanes. The alignment is proposed to transition to standard bike lanes due to reduced roadway width in this section, and the bike lanes will continue for approximately 800 feet until reaching Wilson Avenue. The roadway width is reduced again between Wilson Avenue and Avondale Road, and the proposed trail will include transitioning Hiss Avenue into a Bike Boulevard for approximately 850 feet until reaching Avondale Road.

Once the proposed alignment crosses Avondale Road, it will transition into a shared-use path along the north side of Hiss Avenue. The existing 5-foot sidewalk will be widened to 10 feet and be used by both pedestrians and bicyclists. The shared-use path is proposed on the north side of Hiss Avenue to provide easier access to Parkville Middle School and because there are less driveway crossings on the north side.

The shared use-path will continue along the north side of Hiss Avenue for approximately 2,500 feet until reaching Fowler Avenue.

The proposed facility will include two roadway crossings and several driveway crossings in this section. All crossings will be designed to meet ADA Guidelines and roadway crossings will include new crosswalks. When the proposed alignment reaches Fowler Avenue, the alignment will then turn north along the west side of Fowler Avenue and continue along Fowler Avenue.

The proposed improvements call for the existing five-foot sidewalk along Fowler Avenue to be widened to 10-feet to become a shared-use path. The proposed alignment along Fowler Avenue will include three



Figure 6: South side of Hiss Avenue looking west



roadway crossings and several driveway crossings, and all roadway crossings will include new crosswalks and be designed to meet ADA Guidelines.

As the alignment continues northward, the existing sidewalk ends approximately 230 feet south of Putty Hill Avenue. From this point north to Putty Hill Avenue, there will be a proposed road diet of Fowler Avenue, with the existing road reduced to a 20-foot width, with new curb and a shared-use path located along the west side of Fowler Avenue. Due to the tight constraints for this short section, the shared-use path may need to be reduced to the absolute minimum eight-foot-wide with no buffer from the roadway.

Once the proposed alignment reaches Putty Hill Avenue, it will turn east along the south side of the roadway. The existing Putty Hill bridge over I-695 is proposed to be reconstructed in the near future, with the project currently in design phases of development. The project team recommends that the County should request for bicycle facilities to be installed along the south side of the new bridge that will be incorporated as part of this alignment.

East of the beltway, the trail will continue as a new shared-use path along the south side of Putty Hill Avenue by widening the existing sidewalk from five feet to ten feet. The alignment will cross several driveways and access roads, as well as two roadways. The intersection with Walther Boulevard is currently signalized and may require modifications to the existing signals as part of this alignment. All roadway crossings will include the installation of new crosswalk and will be designed to meet ADA Guidelines.

The proposed trail will continue along the south side of Putty Hill Avenue / Rossville Boulevard for approximately 4,200 feet until reaching the intersection with Belair Road.

This proposed alignment will continue east of Belair Road by utilizing Option 4 of Segment 2.

SEGMENT 2 – BELAIR ROAD TO LILLIAN HOLT DRIVE

Option 1

Option 1 in Segment 2 is a continuation of Option 1 in Segment 1, as the alignment begins at the proposed new traffic signal at the intersection of Belair Road and Overton Avenue. The proposed alignment will include a short section of shared-use path near the intersection, before transitioning into a bike boulevard with traffic calming on Overton Avenue, and a new five-foot-wide sidewalk along the north side of Overton Avenue. A shared-use path is not recommended along Overton Avenue due to the constricted available right-of-way and the desire to avoid impacts to any houses along the roadway.

The bike boulevard will continue for approximately 1,000 feet until reaching a newer development at Nicole Grace Drive. At this location, Overton Avenue widens out from approximately 20-feet wide to approximately 30-feet-wide, allowing for the installation of bike lanes on the roadway. The bike lanes and sidewalk will continue for approximately 600 feet until reaching the end of Overton Avenue, where they will transition to a new shared-use path.



Figure 7: Overton Avenue near Nicole Grace Drive



The shared-use path will travel east for approximately 150 feet before turning south towards Stemmers Run and Sipple Avenue. A new bridge will be built over Stemmers Run, and the trail will continue south through a county-owned easement until reaching Sipple Avenue.

Once the proposed alignment reaches Sipple Avenue, the shared-use path will transition back to a bike boulevard, with pedestrians using existing sidewalk along Sipple Avenue. The bike boulevard will follow Sipple Avenue for approximately 2,000 feet until reaching Alberta Avenue, where it will turn east and continue as a bike boulevard along Alberta Avenue. There are some small gaps in the existing sidewalk network along both Sipple Avenue and Alberta Avenue that will be filled to complete the pedestrian network for the proposed trail.

The alignment will continue on Alberta Avenue until the existing road ends at an existing corridor near Lillian Holt Drive. There is a separate ongoing project that is seeking to install a new bicycle and pedestrian trail adjacent to Lillian Holt Drive that the proposed alignment will tie-in with at this location. The separate trail project will provide links to Linover Park and Perry Hall Boulevard.

Option 2

Option 2 in Segment 2 is a continuation of Option 2 in Segment 1, as the alignment begins at the existing traffic signal at the intersection of Belair Road and Fowler Avenue. After crossing Belair Road, the proposed alignment will include a bike boulevard with existing sidewalk along Fowler Avenue. The existing sidewalk terminates after approximately 350 feet, and new sidewalk will need to be constructed as part of this alignment for an additional approximately 600 feet. When the proposed alignment reaches the end of Fowler Avenue, the trail will transition to a shared-use path that continues along a County-owned easement for approximately 350 feet. After approximately 350 feet, as the trail nears the Park View at Fullerton senior community, the trail will turn north towards Stemmers Run, with a new bridge over Stemmers Run.

The proposed trail will turn east after crossing Stemmers Run and continue through County-owned property for approximately 1,000 feet until reaching a tributary of Stemmers Run. A new bridge is proposed to be built across this tributary. After crossing the tributary, the proposed trail will leave County-owned land and turn onto privately-owned land. This trail will stay on privately-owned right-of-way for approximately 1,300 feet along the southern edge of I-695, requiring significant right-of-way impacts. As the proposed trail approaches Linover Park, a large boardwalk structure will be required to minimize environmental and right-of-way impacts.



Figure 8: Stemmers Run near Beltway, approximate location of proposed boardwalk structure

At the eastern end of the boardwalk structure, the trail will reenter County-owned property near Linover Park. A new shared-use path will be constructed for approximately 500 feet until approaching Lillian Holt Drive. There is a separate ongoing project that is seeking to install a new bicycle and pedestrian trail adjacent to Lillian Holt Drive that the proposed alignment will tie-in with at this location. The separate trail project will provide a link to Perry Hall Boulevard.



Option 3

Option 2 in Segment 2 is a continuation of Option 2 in Segment 1, as the alignment begins at the existing traffic signal at the intersection of Belair Road and Fowler Avenue. After crossing Belair Road, the proposed alignment will include a bike boulevard with existing sidewalk along Fowler Avenue. Approximately 275 feet southeast of the Fowler Avenue and Belair Road intersection, the proposed alignment will turn first southwest onto Rainville Avenue and then southeast onto Cardwell Avenue, continuing to use a combination of a bike boulevard and existing sidewalk on both roads.



Figure 9: Existing dirt path connection to Leslie Avenue

After approximately 1,100 feet on Cardwell Avenue, as the trail approaches the Park View at Fullerton senior community, the alignment will transition to a shared-use path to provide a connection between Park View at Fullerton and Leslie Avenue. There is an existing informal dirt path forming this connection that will be formalized into a paved shared-use path as part of this project.

The shared-use path will continue for a short distance along the west side of Leslie Avenue before turning east onto Edro

Avenue and transitioning to a bike boulevard with existing sidewalk. The proposed alignment will continue on Edro Avenue until reaching Sipple Avenue, where it will turn southwest to follow Sipple Avenue. The bike boulevard will follow Sipple Avenue for approximately 2,000 feet until reaching Alberta Avenue, where it will turn east and continue as a bike boulevard along Alberta Avenue. There are some small gaps in the existing sidewalk network along both Sipple Avenue and Alberta Avenue that will be filled to complete the pedestrian network for the proposed trail.

The proposed alignment will continue on Alberta Avenue until turning north onto Kenlea Avenue. Kenlea Avenue improvements will include new sidewalk along the west side of the roadway and converting the roadway into a bike boulevard. The proposed alignment will reach the end of Kenlea Avenue after approximately 1,000 feet, where it will transition to a shared-use path within an existing County-owned easement.

The proposed shared-use path will continue north towards Linover Park, including a new bridge over Stemmers Run, then through Linover Park, around the parking lots within the park, and eventually reaching Lillian Holt Drive. There is a separate ongoing project that is seeking to install a new bicycle and pedestrian trail adjacent to Lillian Holt Drive that the proposed alignment will tie-in with at this location. The separate trail project will provide a link to Perry Hall Boulevard.



Figure 10: Stemmers Run near Kenlea Avenue

Option 4

Option 4 in Segment 2 is a continuation of Option 3 in Segment 1, as the alignment begins at the intersection of Belair Road and Rossville Boulevard. The proposed alignment will continue south along the west side of Rossville Boulevard by widening the existing sidewalk from five feet to ten feet to create a new shared-use path.

The proposed shared-use path will include crossing several parking access points and one road at Fitch Avenue. The existing Fitch Avenue and Rossville Boulevard intersection is signalized, and the existing signal may need to be modified due to the new proposed shared-use path. All roadway crossings and parking access points will include new crosswalks and will be designed to meet ADA Guidelines.

The proposed alignment will continue along the west side of Rossville Boulevard for approximately 4,800 feet until reaching the intersection with Lillian Holt Drive and Perry Hall Boulevard. There is a separate ongoing project that is seeking to install a new bicycle and pedestrian trail adjacent to Lillian Holt Drive that the proposed alignment will tie-in with at this location. The separate trail project will provide a link to Linover Park.



Figure 11: Lillian Holt Drive

RECOMMENDATION

After consideration of all the alternatives discussed above, the project team developed two potential recommendations for the proposed trail alignment to be moved forward into future design phases. These two recommendations are independent of each other, and both can be pursued in the future to accomplish different County goals.

1. If the County prefers the “southern route,” in which the proposed alignment stays on the south / west side of the beltway, the project team recommends Option 2 in Segment 1, and a combination of Option 1 and Option 3 in Segment 2.

Option 2 is preferred in Segment 1 to provide a shared-use path along Hiss Avenue instead of bike lanes, which will reduce on-street parking availability, and to eliminate the need for a new pedestrian and bicycle bridge and new traffic signal near Harford Road. Additionally, Option 2 is more constructable in the short term since the proposed Belair Road crossing associated with Option 1 is only recommended as part of a Belair Road / I-695 interchange reconstruction project.

Option 3 is preferred in Segment 2 between Belair Road and Kenlea Avenue because it is the most constructable of the three “southern route” alternatives in Segment 2, with no new bridges and only limited new construction proposed at this time. However, the Option 1 connection to Lillian Holt Drive is preferred between Kenlea Avenue and Lillian Holt Drive due to constructability and cost concerns from the proposed direct new connection between Kenlea Avenue and Linover Park.

2. If the County prefers the “northern route,” in which the proposed alignment crosses to the north / east side of the beltway, the project team recommends Option 3 in Segment 1 and Option 4 in Segment 2.



After submitting the Draft version of this report, JMT and the County discussed these recommendations and decided that the “southern route” is the recommended option to be advanced as part of this project. The “northern route” is an option that is recommended to be considered as a future project.

Cost estimates and impacts analysis for the selected recommendation are included in the “Impacts Analysis” and “Cost Estimates” sections of this report.

Conceptual Stormwater Management Design

METHODOLOGY

Stormwater Management (SWM) is required in accordance with the Baltimore County Code, which was revised to incorporate State-mandated changes resulting from the passing of the Storm Water Management Act of 2007. Environmental Site Design (ESD) to the Maximum Extent Practicable (MEP) must be addressed for all projects, including redevelopment.

The project corridor was analyzed for potential SWM facilities to address water quality and quantity control requirements for each trail option. A desktop review of the available, existing site conditions information (e.g., floodplain mapping, NRCS Soil Mapping, GIS contours, wetland mapping, etc.) was performed, followed by a field visit. The site was evaluated to identify potential locations along the trail alignment where ESD facilities are potentially feasible to provide stormwater water quality treatment in accordance with the Maryland Department of the Environment (MDE) Stormwater Design Manual. Potential locations for stormwater detention facilities to provide quantity control (i.e., mitigating potential increases in peak discharge rates resulting from the proposed impervious area) were also evaluated. Potential ESD facilities treating the proposed impervious area from the trail were considered, as well as ESD facilities to treat existing, untreated impervious area.

The proposed trail consists of a combination of new impervious area and existing, reconstructed impervious area. The percentage of existing, reconstructed impervious area was evaluated to determine if the project could potentially be classified as a redevelopment project, which reduces the water quality treatment requirement. Once the proposed impervious area (new and existing, reconstructed impervious) was quantified, the potential treatment provided by ESD facilities was compared. The drainage area to each potential SWM facility was estimated using GIS topographic contours, which allows for the approximate impervious area draining to the potential SWM facility to be quantified.

SITE INFORMATION

The project area is entirely within the Back River Watershed (MDE 8-Digit Watershed 02130901) which is within the Patapsco River Watershed (MDE 6-Digit Watershed 021309). Runoff from the proposed trail drains to Stemmers Run. The trail is not located within a Federal Emergency Management Administration (FEMA) Floodplain except for a portion of Option 2 (i.e., where the trail alignment crosses and is then proposed alongside Stemmers Run). The applicable FEMA Flood Insurance Rate Maps (FIRM) covering the project area are Map Numbers 2400100270F and 2400100410F.



STORMWATER MANAGEMENT – WATER QUALITY

Water Quality Requirements

Portions of the trail that will be developed by modifying pavement markings on existing impervious area do not result in a stormwater quality treatment requirement (i.e., only sections of the trail that require earth disturbance to construct will have a corresponding water quality treatment requirement). Depending on the selected option, there is potential for the total site impervious area to exceed 40%, which would qualify the project as redevelopment, thus reducing water quality treatment requirements. For the purpose of this feasibility study, potential ESD facility locations were evaluated assuming no reduction in treatment requirements is obtained for redevelopment.

A summary of the impervious area changes for each trail option is provided in the table below.

Table 1: Proposed Impervious Area Summary

PROPOSED IMPERVIOUS AREA SUMMARY					
Option	Total Impervious (acres)	New Impervious (acres)	Reconstructed Impervious (acres)	Impervious Removal (acres)	Net Impervious (acres)
West – Harford Road to Belair Road					
1	0.133	0.133	0	0	0.133
2	0.302	0.302	0	0	0.302
3	1.591	0.932	0.659	0	0.932
Belair Road to Rossville Boulevard					
1	0.412	0.412	0	0	0.412
2	0.978	0.978	0	0	0.978
3	0.406	0.406	0	0	0.406
4	1.088	0.544	0.544	0	0.544

Each trail option is evaluated along the West and East segments, and a summary for each segment is provided below.

Segment 1 – Harford Road to Belair Road

Option 1 adds the least impervious area due to the use of existing roadway and compacted gravel access road (i.e., classified as impervious area) for the trail. Option 2 adds more impervious area due to the sidewalk widening along Parkville Middle School. Option 3 adds considerably more impervious than either option, because of the additional length of sidewalk widening along Fowler Avenue. Due to site constraints, there is insufficient space to provide ESD facilities to treat the additional impervious area along Fowler Avenue, but there is potential to treat a portion of the additional impervious area under Option 2 in front of Parkville Middle School.

Segment 2 – Belair Road to Lillian Holt Drive

Option 2 adds the most new impervious area—approximately double the new impervious from the other options. This is largely due to the section of proposed path extending south from Fowler Avenue, which is proposed alongside Stemmers Run through wooded and grassed areas. Much of this alignment is located within or immediately adjacent to the FEMA 100-year floodplain, which limits the feasibility of SWM along this section of proposed path. Option 1 and 3 result in the least new impervious area, resulting in the smallest SWM treatment requirements.



Water Quality Treatment

The potential SWM facility locations identified did not vary significantly between the trail options considered, since much of the potential treated impervious area is present under existing conditions (i.e., there is greater potential to provide treatment for existing impervious area than to fit ESD facilities treating new impervious area from the proposed sections of trail). The potential SWM facility locations are illustrated in Figure 9 through Figure 11. The table below identifies which trail option each potential SWM facility applies to, as well as the new and existing impervious area draining to each SWM location.

Table 2: Potential SWM Facilities

POTENTIAL SWM FACILITIES				
Potential SWM Facility	Type	Applicable Trail Option	New Impervious Area Treated (ac)¹	Existing Impervious Area Treated (ac)
SWM -1	MBR	ALL	0.03	0.17
SWM-2	Swale	ALL	0.03	0.14
SWM-3	Swale	ALL	0.03	0.20
SWM-4	Swale	ALL	0	0.12
SWM-5	Underground Structural WQv	ALL	0	0.36
SWM-6	Underground Structural WQv	ALL	0	0.34
TOTAL	ESD	ALL	0.09	0.63
	Underground Structural WQv	ALL	0	0.70

*Notes: New impervious area treated only applies if the selected trail option adds impervious area adjacent to the SWM facility. The existing impervious area can be treated by this facility regardless of the selected trail alignment.

A microbioretention (MBR) facility could be located in the large, grassed open space adjacent to the Parkville Middle School entrance. Runoff from the roadway currently flows along the curb and gutter to an inlet located by the parking spaces in front of the school. Runoff could be diverted through a curb-on-



grade (COG) opening to a MBR located behind the sidewalk, thus allowing for water quality treatment prior to discharging to the existing inlet where runoff flows under existing conditions. If the sidewalk is widened to create a shared-use path in this location, the additional impervious area between Avondale Road and the school entrance could be treated by this MBR facility.

Figure 12: Approximate Location of SWM-1



Figure 13: Approximate Location of SWM-2 and SWM-3

runoff around the swale in order to maximize the treatment efficiency of the proposed swale.

A swale is feasible at SWM-4, north of the entrance to Linover Park, to treat existing impervious area from Lilian Holt Drive. The existing drainage ditch can be modified to meet the geometry required to obtain ESD credit. The existing ditch continues to the south of the Linover Park entrance; however, the necessary grading to create an ESD facility in this location would encroach on the utility corridor and impact the foundation of the overhead power lines. As a result, the area south of the Linover Park entrance is considered infeasible for ESD.

The existing parking lot for Linover Park is approximately 0.7 acres of untreated impervious area, which discharges as sheet flow. The western half of the parking lot eventually drains to existing inlets within Linover Park, which discharge directly into Stemmers Run. Runoff from the eastern half of the parking lot travels as sheet flow and eventually drains into Stemmers Run to the east. Steep slopes and the presence of utilities (i.e., overhead power lines, a water valve vault and associated piping, and a petroleum transmission main) prevent the implementation of ESD in the areas surrounding the parking lot; however, underground, structural water quality treatment is feasible. Placement of curbs around the parking lot would allow runoff to be conveyed to proposed inlets, which would direct flow into the proposed, underground facilities. Structural water quality treatment could be provided via an underground sand filter or other MDE-approved Structural Water Quality treatment device (e.g., Jellyfish® Filters, Stormfilter®, etc.). The potential underground structural water quality treatment facilities are shown as SWM-5 and SWM-6.

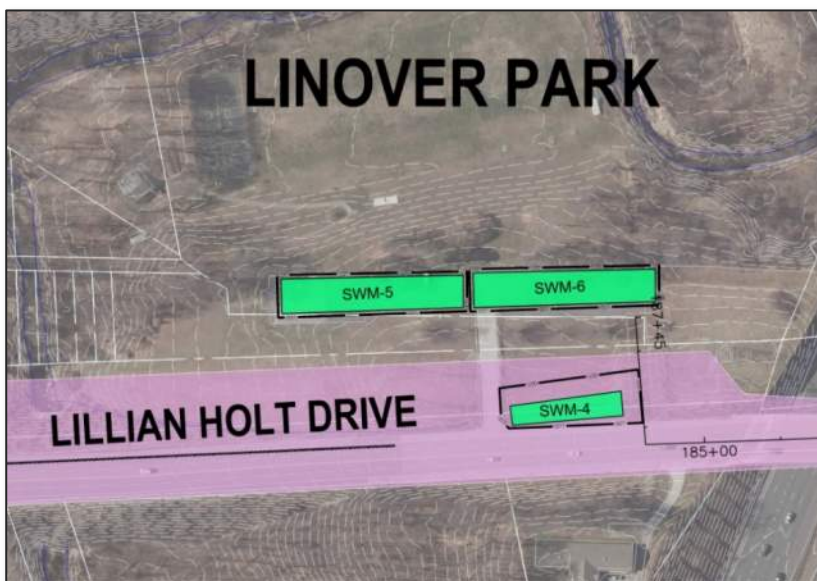


Figure 14: Approximate Location of SWM-4, SWM-5, and SWM-6

A swale (i.e., grass swale, bioswale, or wet swale) is feasible at SWM-2 and SWM-3 along Putty Hill Avenue. There is sufficient space to modify the existing drainage ditch to meet the geometry required to obtain ESD treatment credit for a swale. Runoff from the existing roadway can be conveyed into the swales. An existing inlet at the downstream end of each swale directs stormwater back into the existing storm drain network, where flow is conveyed under existing conditions. A bypass ditch may be required at SWM-2 to convey offsite



Particularly in the case of Option 2, there may be possibilities to claim ESD credit for non-structural practices such as the Disconnection of Non-Rooftop Runoff (NRDC). ESD credit can be claimed in certain areas where sheet flow from the proposed impervious area travels across a sufficient distance of vegetated area at a shallow slope, thus promoting infiltration. Once surveyed topography is obtained, the proposed trail can be evaluated to determine if any sections meet the criteria for NRDC credit.

STORMWATER MANAGEMENT – QUALITY CONTROL

The addition of impervious area has the potential to increase stormwater runoff. The Baltimore County Storm Drainage Design Manual calls for the inlet spacing and drainage design to address the 10-year design storm. At a minimum, management of the 10-year storm will be required.

While the new impervious area proposed is small relative to the overall drainage area to the Stemmers Run, it has the potential to cause a quantifiable increase in peak discharge rates from the site. Along much of the proposed trail alignments, there is insufficient space to provide quantity control facilities (e.g., detention ponds). The proposed design should seek to maintain sheet flow conditions where possible to avoid concentrating runoff, which reduces travel times and can further increase peak discharge rates. Furthermore, the elimination of existing impervious areas to offset new impervious trail areas should be sought wherever possible.

The location of potential SWM facilities SWM-5 and SWM-6 in the parking lot for Linover Park could potentially be used to provide underground detention in addition to water quality treatment. Runoff from the parking lot could be routed through an underground detention facility, thus reducing peak flow discharge rates from this area and offsetting minor increases in peak flow discharge rates elsewhere along the proposed trail (i.e., all of which drains to Stemmers Run). Maintenance of an underground facility located within a parking lot is advantageous compared to a facility within the roadway (e.g., maintenance of traffic is simplified compared to work within a roadway).

PERMITTING REQUIREMENTS

Several permits/approvals will be required due to the limit of disturbance (LOD) and proposed impervious area associated with this project. SWM approval must be obtained from the Baltimore County Department of Environmental Protection and Sustainability (DEPS). This will involve three (3) sequential plan submissions and reviews: Concept SWM Plan; Development SWM Plan; and Final SWM Plan.

Engineered erosion and sediment control (ESC) plans will be required for all areas within the LOD. Review and approval of the ESC Plans will be performed by the Baltimore County Soil Conservation District (BCSCD). The LOD is anticipated to be greater than one (1) acre; therefore, a Notice of Intent (NOI) for coverage under the General Permit No. 20-CP for Discharges from Stormwater Associated with Construction Activity will be required.

A grading permit will be required due to the disturbance of more than 5,000 square feet. The grading permit will be issued by DEPS following final approval of the SWM and ESC plans by the DEPS and BCSCD, respectfully.

If disturbances within the Waters of the United States (WUS) are proposed, the project will be subject to additional permitting requirements. A Joint Federal/State Application (JPA) for the Alteration of Any Floodplain, Waterway, Tidal or Nontidal Wetland in Maryland would be required.



Proposed Structures

SEGMENT 1 – HARFORD ROAD TO BELAIR ROAD

Only one of the three options within Segment 1 includes the construction of a new pedestrian and bicycle bridge along the proposed trail. The approximate size, location, cost, and reason for reconstruction for each of the proposed bridges are shown in the following table.

Option 1

There is one new proposed structure for Option 1, additionally, future design phases should seek to confirm that the existing bridge over Stemmers Run through Double Rock Park is safe for use by pedestrians and bicycles as part of this project.

Table 3: Proposed Structure for Option 1, Segment 1

BRIDGE	SIZE	COST	NOTES
Bridge 1: STA 178+90 to STA 129+20	130' x 14'	\$575,000	Proposed structure to cross Stemmers Run. Existing Belair Road bridge over Stemmers Run does not have available width to use as a pedestrian and bicycle crossing.

Option 2

There are no new proposed structures included in Option 2 of Segment 1 at this time. However, future design phases should seek to confirm that the existing bridge over Stemmers Run through Double Rock Park is safe for use by pedestrians and bicycles as part of this project.

Option 3

There are no new proposed structures included in Option 3 of Segment 1 at this time. However, the existing Puddy Hill Avenue bridge over I-695 is anticipated to be replaced with a new structure as part of an ongoing separate project that is currently in advanced stages of design.

Recommended Option

There are no new proposed structures included for the recommended option in Segment 1 at this time. However, future design phases should seek to confirm that the existing bridge over Stemmers Run through Double Rock Park is safe for use by pedestrians and bicycles as part of this project.

SEGMENT 2 – BELAIR ROAD TO LILLIAN HOLT DRIVE

Three of the four options in Segment 2 include the construction of a new pedestrian and bicycle bridge along the proposed trail. The approximate size, location, cost, and reason for construction for each of the proposed bridges are shown in the following tables.

Option 1

There is one new proposed structure for Option 1.

Table 4: Proposed Structure for Option 1, Segment 2

BRIDGE	SIZE	COST	NOTES
Bridge 1: STA 205+40 to STA 206+00	60' x 14'	\$270,000	Proposed structure to cross Stemmers Run.



Option 2

There are three proposed structures for Option 2.

Table 5: Proposed Structures for Option 2, Segment 2

BRIDGE	SIZE	COST	NOTES
Bridge 1: STA 196+90 to STA 197+60	70' x 14'	\$315,000	Proposed structure to cross Stemmers Run.
Bridge 2: STA 208+35 to STA 209+05	70' x 14'	\$315,000	Proposed structure to cross tributary to Stemmers Run.
Boardwalk bridge: STA 218+90 to STA 223+10	420' x 14'	\$1.6 Million	Large boardwalk structure over Stemmers Run due to lack of available space alongside the beltway.

Option 3

There is one proposed structure for Option 3.

Table 6: Proposed Structure for Option 3, Segment 2

BRIDGE	SIZE	COST	NOTES
Bridge 1: STA 250+10 to STA 250+80	70' x 14'	\$315,000	Proposed structure to cross Stemmers Run.

Option 4

There are no new proposed structures included in Option 4 of Segment 2 at this time.

Recommended Option

There are no new proposed structures included for the recommended option in Segment 2 at this time.

Impacts Analysis

Based on the desktop analysis performed, impacts will occur to forested areas, MDE Streams including Stemmers Run, and the 100-year floodplain associated with Stemmers Run. There are no previously known wetlands identified within the project study area, however this assumption should be confirmed in future design phases. Impacts shown in Table 6 below are conservative estimates based on publicly available GIS Mapping and a 25-foot offset from proposed construction improvements. Confirmation and more detailed quantification of these impacts would result from detailed field investigations.

Table 7: Impacts Analysis for Segment 1

ITEM	OPTION 1	OPTION 2	OPTION 3
<i>Right-of-Way</i>	5 parcels, 1.0 acres	19 parcels, 1.8 acres	63 parcels, 4.7 acres
<i>Forests</i>	0.4 acres	No anticipated impacts	No anticipated impacts
<i>Stream Impacts</i>	130 LF	No anticipated impacts	No anticipated impacts
<i>Potential Wetlands</i>	No known impacts	No known impacts	No known impacts
<i>Utility / Light Poles</i>	1 pole	5 poles	8 poles
<i>Driveways / Entrances</i>	65 driveways / entrances impacted	39 driveways / entrances impacted	71 driveways / entrances impacted
<i>Fire Hydrants</i>	No impacts	1 fire hydrant impacted	7 fire hydrants impacted
<i>Business Signage</i>	1 sign	1 sign	3 signs
<i>Traffic Signal Upgrades</i>	1 new traffic signal	1 signal modification. 4 legs total	2 traffic signal modifications, 4 legs total



<i>Number of New / Reconstructed Structures</i>	1 new bridge	None anticipated	None anticipated
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Table 8: Impacts Analysis for Segment 2

ITEM	OPTION 1	OPTION 2	OPTION 3	OPTION 4
<i>Right-of-Way</i>	22 parcels, 1.0 acres	11 parcels, 1.9 acres	55 parcels 0.8 acres	14 parcels, 2.1 acres
<i>Forests</i>	0.7 acres	2.7 acres	0.6 acres	0.9 acres
<i>Stream Impacts</i>	60 LF	560 LF	70 LF	No anticipated impacts
<i>Potential Wetlands</i>	No known impacts	No known impacts	No known impacts	No known impacts
<i>Utility / Light Poles</i>	3 poles	4 poles	No impacts	8 poles
<i>Driveways / Entrances</i>	21 driveways / entrances impacted	8 driveways / entrances impacted	14 driveways / entrances impacted	7 driveways / entrances impacted
<i>Fire Hydrants</i>	No impacts	No impacts	No impacts	6 fire hydrants impacted
<i>Business Signage</i>	No impacts	No impacts	No impacts	No impacts
<i>Traffic Signal Upgrades*</i>	1 new traffic signal	1 signal modification. 4 legs total	1 signal modification. 4 legs total	2 traffic signal modifications, 4 legs total
<i>Number of New / Reconstructed Structures</i>	1 new bridge	3 new bridges	1 new bridge	None anticipated

Additionally, after submitting the initial report, JMT created an Impacts Analysis Summary for the recommended “southern route” option, as shown in Table 9.

Table 9: Impacts Analysis for Recommended Alternative

ITEM	SEGMENT 1	SEGMENT 2
<i>Right-of-Way</i>	19 parcels, 1.8 acres	10 parcels 0.5 acres
<i>Forests</i>	No anticipated impacts	0.1 acres
<i>Stream Impacts</i>	No anticipated impacts	No anticipated impacts
<i>Potential Wetlands</i>	No known impacts	No known impacts
<i>Utility / Light Poles</i>	5 poles	No impacts
<i>Driveways / Entrances</i>	39 driveways / entrances impacted	14 driveways / entrances impacted
<i>Fire Hydrants</i>	1 fire hydrant impacted	No impacts
<i>Business Signage</i>	1 sign	No impacts
<i>Traffic Signal Upgrades</i>	1 signal modification. 4 legs total	1 signal modification. 4 legs total
<i>Number of New / Reconstructed Structures</i>	None anticipated	None anticipated



Cost Estimates

Cost estimates were developed using the MDOT SHA Cost Estimating Guideline for each of the options described above. The estimates were primarily developed on a Cost Per Mile (CPM) basis, with items such as structures, sidewalks, and utility pole relocations added to the initial CPM estimate. The estimates also include items such as preliminary construction work, drainage, landscaping, and utilities as contingency costs on the initial CPM estimate. Finally, to account for uncertainty at this early stage of design, a 40% design contingency was added to the project cost. These estimates **do not** include the cost of additional right-of-way. Detailed estimates for each of the seven options can be found in **Appendix C**.

SEGMENT 1 – HARFORD ROAD TO BELAIR ROAD

Table 10: Cost Estimates for Segment 1

DESIGN OPTION	COST RANGE
Option 1	\$2.5 Million - \$3.5 Million
Option 2	\$1.5 Million - \$2.5 Million
Option 3	\$3.0 Million – \$4.5 Million

SEGMENT 2 – BELAIR ROAD TO LILIAN HOLT DRIVE

Table 11: Cost Estimates for Segment 2

DESIGN OPTION	COST RANGE
Option 1	\$2 Million - \$3 Million
Option 2	\$7 Million - \$11 Million
Option 3	\$2 Million - \$3 Million
Option 4	\$2.5 Million – \$4.0 Million

RECOMMENDED OPTION

Table 12: Cost Estimates for the Recommended Option

DESIGN OPTION	COST RANGE – SEGMENT 1	COST RANGE – SEGMENT 2
Recommended Option	\$1.5 Million - \$2.5 Million	\$1.0 Million - \$1.5 Million



Constructability

Each of the options discussed above were evaluated for constructability challenges that are discussed below.

SEGMENT 1 – HARFORD ROAD TO BELAIR ROAD

All three options in Segment 1 will involve a loss of on-street parking along Hiss Avenue. Option 1 will have the most significant loss of parking, with approximately 4,000 linear feet of new bike lanes on both sides of the street. Options 2 and 3 will include approximately 1,500 feet of new bike lanes on both sides of the street. Public outreach will be essential to keep the public aware of the potential for lost on-street parking and to receive positive or negative feedback on the proposed improvements.

Option 1 includes a new pedestrian and bicycle bridge over Stemmers Run, which is classified as a Use IV Stream. This means that any in-stream construction activities needed for the proposed bridge construction would not be allowed from March 1st to May 31st of any given year to protect spawning fish. Additionally, Option 1, Option 2, and the recommended option all propose to utilize an existing bridge over Stemmers Run between the Belair Beltway Plaza and Double Rock Park. If future design phases identify that the existing bridge will need to be replaced, any in-stream construction activities involving the removal of the existing bridge and/ or the construction of a new bridge will not be allowed from March 1st to May 31st of any given year.



Figure 15: Existing bridge over Stemmers Run

Option 3 includes the reconstruction of the existing Putty Hill Avenue bridge over I-695, and coordination with that project will be necessary to confirm that the project continues to move forward and that the bridge will include pedestrian and bicycle facilities.

SEGMENT 2 – BELAIR ROAD TO LILLIAN HOLT DRIVE

Options 1, 2, and 3 all include new proposed pedestrian and bicycle bridges over Stemmers Run. As mentioned above, Stemmers Run is classified as a Use IV Stream, and no in-stream construction activities will be allowed between March 1st and May 31st of any given year.

Option 4 includes the existing 96" Susquehanna Water Main at Rossville Boulevard. It is unlikely that this water line will be impacted by the proposed trail, however this should be confirmed during future design phases.



Next Steps

This study was completed to the feasibility level of the project. These Next Steps are items that should be addressed during the next phase of the project.

FULL SURVEYS AND DESIGN REFINEMENT

The proposed alignment should be field surveyed prior to additional design work. The surveys will provide a higher level of accuracy than the GIS-based mapping data that has been used for the feasibility stage of the project. Additionally, this phase of design should include subsurface utility designation to confirm the initial subsurface utilities records requests.

Once these surveys are completed, the proposed design should be reevaluated based on more accurate data, and three-dimensional design should be initiated to further refine the proposed Limit of Disturbance for the project.

AGENCY COORDINATION

Although regulatory agencies have not identified any significant concerns for the project at this time, coordination with agencies should continue into future design phases to ensure that there are no changes or surprises as the project continues to move forward.

CONCEPT STORMWATER MANAGEMENT PLAN

As part of the next phase of design, the design team will take the informal SWM design proposed in this report and utilize soil borings and detailed surveys to create a more formal Concept SWM Plan that will be submitted to DEPS for their review and approval.

COORDINATION WITH MDOT-SHA

All proposed options will require some coordination with MDOT-SHA as the project continues to move forward.



Figure 16: Belair Road

If the “northern route” alternative is considered in the future, coordination with MDOT-SHA will be required about the status of the Putty Hill Avenue bridge over I-695. Coordination should focus on the final bridge design and on the anticipated timeline for completed construction.

For all options in both segments, additional coordination with MDOT-SHA will be necessary for any proposed changes to intersections along Belair Road since Belair Road is a state-maintained roadway.

PERMITTING AND MITIGATION – NATURAL CULTURAL RESOURCES

Field delineations of sensitive natural resources will be performed to quantify impacts and confirm permitting requirements. As part of this process, the team will collect field data including forest and wetland data points, individual specimen trees, wetland boundaries, and streams.

Wetlands will be identified following the procedures detailed in the 1987 US Army Corps of Engineers (USACE) Wetland Delineation Manual and the Eastern Mountain and Piedmont Regional Supplement. This includes identifying areas that satisfy the following three wetland criteria: hydric soils, hydrophytic vegetation, and hydrology. Identified wetlands will be flagged and Waters of the U.S. (WUS) will be flagged at top of bank; all flags will be numbered consecutively and surveyed using a GPS unit capable of sub-meter accuracy. As part of this process, a wetland and waterway delineation memorandum will be prepared, including a description of field survey methods, summary of findings, maps showing sample plot locations, wetland boundaries and their associated buffers, and stream boundaries; and completed datasheets for each sample location.

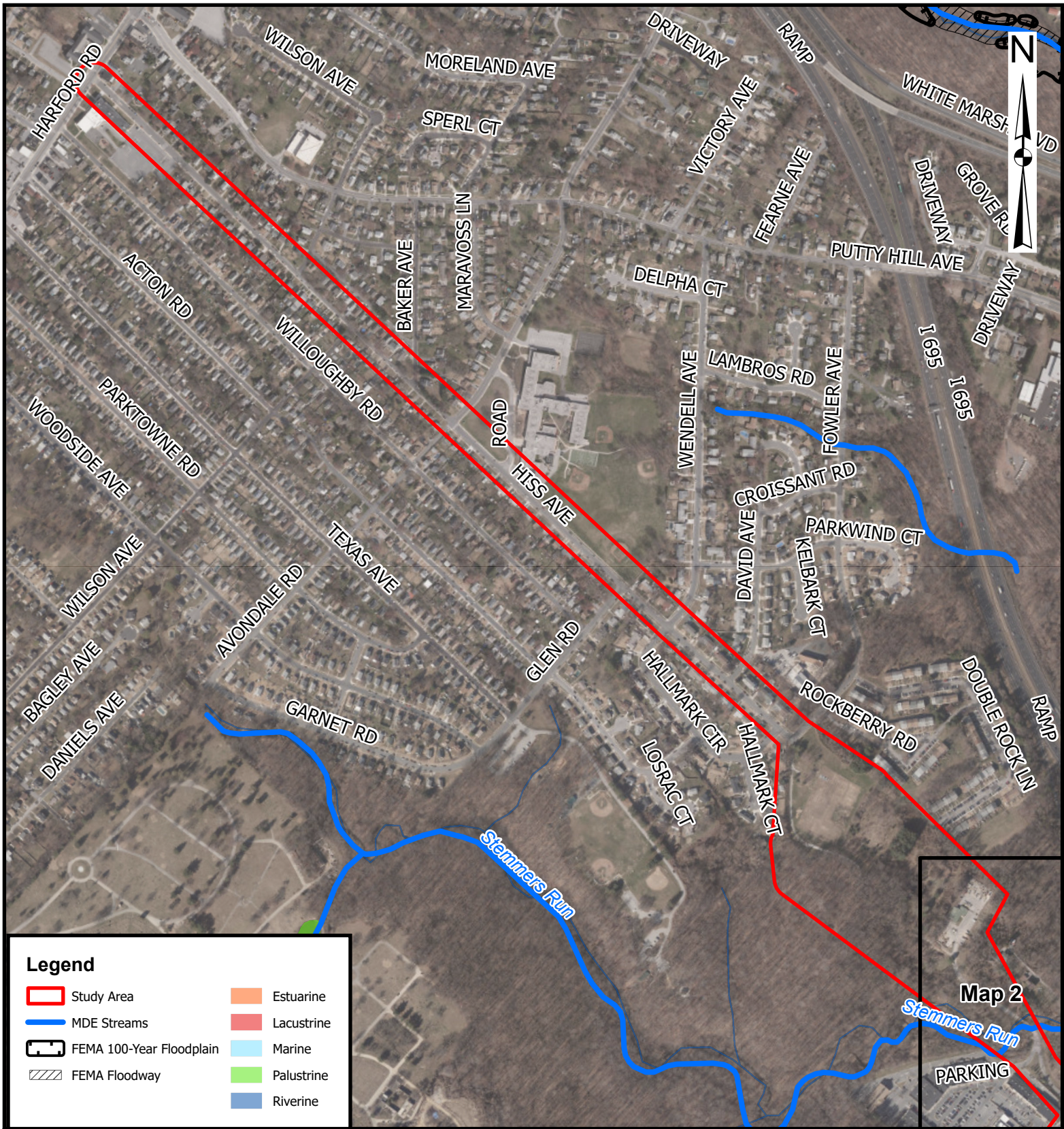
A Forest Stand Delineation (FSD) report and Steep Slopes Analysis (SSA) will need to be prepared for submission to the County's Department of Environmental Protection and Sustainability (DEPS) for review and comment. Upon approval of the FSD and SSA, a Forest Conservation Plan (FCP) and Forest Buffer Protection Plan (FBPP) will need to be prepared and submitted to DEPS for review and approval. Concurrently, a Wetland Investigation Report will need to be prepared and submitted to the Maryland Department of the Environment with a request for a Pre-Application Meeting to be held on-site to accomplish the following: verification of boundaries and classifications of delineated resources; discussion of proposed project elements including design and/or construction constraints; and determination of a path forward and anticipated schedule to obtain permit authorization. A Water Quality Certification would also be required. Mitigation requirements for forest, streams, and wetlands would be determined once unavoidable impacts have been quantified.



Figure 17: Stemmers Run

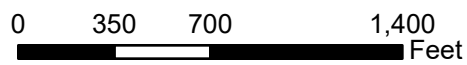


APPENDIX A: ENVIRONMENTAL BASE MAPPING



Legend

- Study Area
- MDE Streams
- FEMA 100-Year Floodplain
- FEMA Floodway
- Estuarine
- Lacustrine
- Marine
- Palustrine
- Riverine



SOURCE: MD IMAP, MDE, DNR, BALTIMORE COUNTY
 CREATED BY: GB



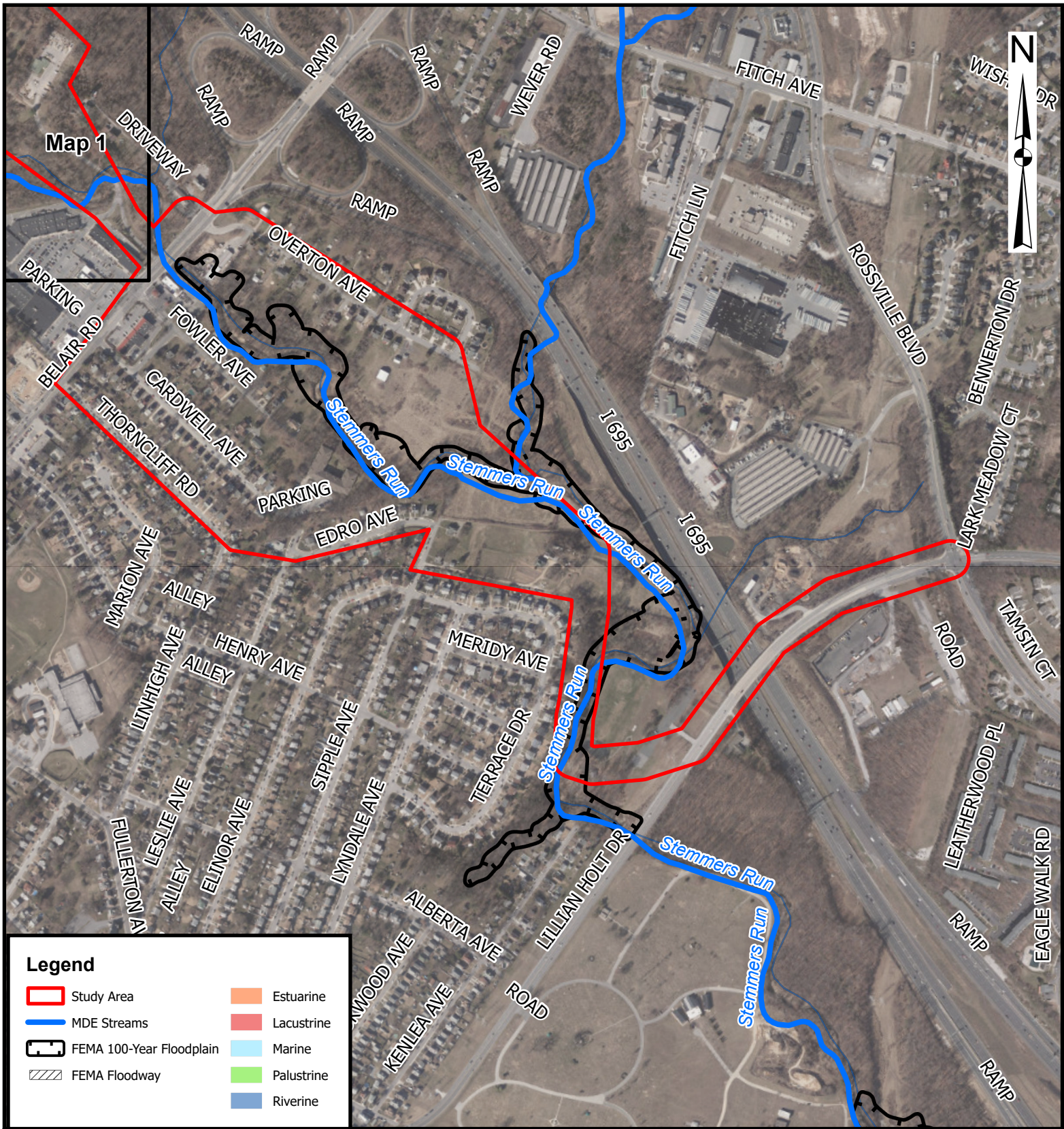
ENVIRONMENTAL FEATURES MAP 1

**WEST EAST TRAIL
 FEASIBILITY STUDY**

BALTIMORE COUNTY, MD







DATE: MARCH 2023

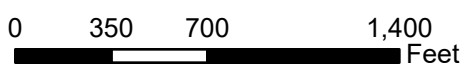
Map 2
 Stemmers Run
 PARKING



Map 1

Legend

	Study Area		Estuarine
	MDE Streams		Lacustrine
	FEMA 100-Year Floodplain		Marine
	FEMA Floodway		Palustrine
			Riverine



SOURCE: MD IMAP, MDE, DNR, BALTIMORE COUNTY
 CREATED BY: GB

ENVIRONMENTAL FEATURES MAP 2

**WEST EAST TRAIL
 FEASIBILITY STUDY**

BALTIMORE COUNTY, MD

DATE: MARCH 2023





APPENDIX B: AGENCY COORDINATION

2020 4763

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RECEIVED
OCT 20 2022

BY: _____

October 17, 2022

Maryland Historical Trust
Division of Historical and Cultural Programs
100 Community Place
Crownsville, MD 21032-2023

Attn: Ms. Beth Cole
Administrator, Review and Compliance

RE: West East Destination Trail Feasibility Study
Baltimore County, Maryland
JMT Job No. 19-03735-004

Dear Ms. Cole,

JMT is completing a feasibility study to evaluate options for connecting communities and residents on Harford Road and Belair Road to the North East Trail to White Marsh in Baltimore County, MD. This trail will also have the potential to connect into different established recreational areas such as the Double Rock Park and Linover Park. Please accept this correspondence as a request for an evaluation of the study area indicated on the attached maps for the presence of any historical sites, archeological sites or unique features. Based on your review, we request an opinion as to whether an archeological investigation is warranted. We look forward to the receipt of your findings and appreciate your assistance with this matter. If additional information is required, please do not hesitate to contact me at (443) 662-4036 or gboone@jmt.com.

Very truly yours,

JOHNSON, MIRMIRAN & THOMPSON, INC.

Ginny Boone
Environmental Scientist

Cc: Jessie Bialek, Baltimore County
Jennifer Ray, JMT
Rob Stratmeyer, JMT

Enclosures

The Maryland Historical Trust has determined that this undertaking will have no adverse effect on historic properties.

Date 11/1/22

DLH
11/1/22
Zua



Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Jeannie Haddaway-Riccio, Secretary
Allan Fisher, Deputy Secretary

January 25, 2023

Ginny Boone
Johnson, Mirmiran & Thompson, Inc.
40 Wight Avenue
Hunt Valley, MD 21030

RE: Environmental Review for West East Destination Trail Feasibility Study, JMT Job No. 19-03735-004, Baltimore County, Maryland

Dear Ms. Boone:

The Wildlife and Heritage Service has no official records for State or Federal listed, candidate, proposed, or rare plant or animal species within the project area shown on the map provided. As a result, we have no specific concerns regarding potential impacts to such species or recommendations for protection measures at this time. If the project changes in the future such that the limits of proposed disturbance or overall site boundaries are modified, please provide us with revised project maps and we will provide you with an updated evaluation.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at lori.byrne@maryland.gov or at (410) 260-8573.

Sincerely,

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2022.1819.BA

Stratmeyer, Rob

From: Christopher Aadland -DNR- <christopher.aadland@maryland.gov>
Sent: Friday, October 21, 2022 5:02 PM
To: Boone, Ginny
Subject: [EXTERNAL] MDDNR Fisheries Scoping Information for the West East Destination Trail Feasibility Study, Baltimore County
Attachments: MDDNR Environmental Review Common Time of Year Restrictions.pdf

Dear Ginny;

I took a quick look at this project location and it looks like the only resources of state concern would be any impacts such as stream crossings to Stemmers Run which is classified as a Use IV (may support adult trout) stream. If any impacts to this stream are anticipated then there would be a March 1st through May 31st TOY restriction for any instream work.

At this time we are no longer providing formal written pre-application screening comments by default due to a staffing shortage. As of November 1st 2022, the Environmental Review Department at MDDNR will no longer be providing pre-application comments on proposed projects. A screenshot of the provided Aquatic Resources Screening Tool results included with any JPA application package will be deemed sufficient to show coordination with MDDNR. We have provided attached to this email a document outlining the most common Time of Year Restrictions associated with stream impacts.

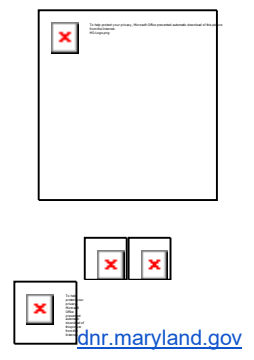
The Aquatic Resources Screening Tool can be found at the following link:

<https://maryland.maps.arcgis.com/apps/webappviewer/index.html?id=1c1095e641c541d8aa6588ef6c1b23c8>

Note: We have included the Department's Sensitive Species Project Review Area data layer (records of rare, threatened or endangered species present) in this tool as a planning aid. However, for detailed information concerning RT&E species the Department's Wildlife & Heritage Program should be contacted. The absence of a Sensitive Species Project Review Area polygon at a given project site is not necessarily proof that no RT&E species are present given delays in updating the data layer with new information. We would recommend continuing to contact the Wildlife & Heritage Program for current information regarding a project location.

If you have any questions, please feel free to contact me.
Chris

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	<p>Christopher Aadland Environmental Planner Environmental Review Department of Natural Resources 580 Taylor Ave., E-2 Annapolis, MD 21401 410-260-8736 (office) 410-710-7413 (cell) christopher.aadland@maryland.gov</p>
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United States Department of the Interior



FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
Phone: (410) 573-4599 Fax: (410) 266-9127

In Reply Refer To:
Project Code: 2023-0063275
Project Name: West/East Trail

March 31, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Chesapeake Bay Ecological Services Field Office

177 Admiral Cochrane Drive

Annapolis, MD 21401-7307

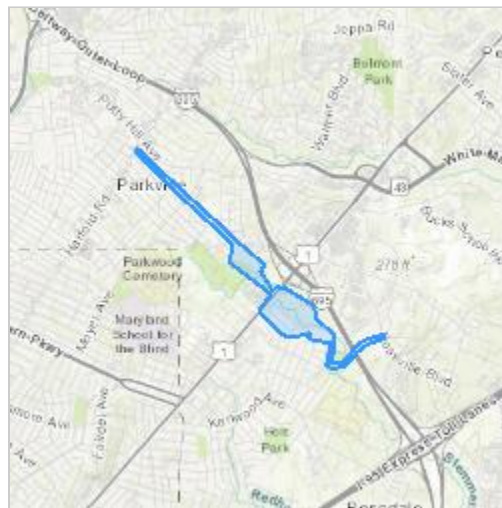
(410) 573-4599

PROJECT SUMMARY

Project Code: 2023-0063275
Project Name: West/East Trail
Project Type: Government / Municipal (Non-Military) Construction
Project Description: Baltimore County enlisted Johnson, Mirmiran, and Thompson (JMT) to conduct a feasibility study evaluating options for a proposed pedestrian and bicycle trail connecting communities and residents on the south / west side of I-695 in the vicinity of Harford Road and Belair Road with the Northeast Trail leading to White Marsh. JMT also sought to identify potential connections with outdoor recreational areas such as Double Rock Park and Linover Park.
The proposed trail is approximately 2.5 miles to 3.5 miles long depending on the potential routes to connect these points. JMT's task was to evaluate potential alignment options, identify known natural and cultural resources, identify potential storm water management (SWM) treatment design solutions, conduct an impact analysis, and develop feasibility level cost estimates for the proposed trail alignments.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@39.37082885,-76.52060120520521,14z>



Counties: Baltimore County, Maryland

ENDANGERED SPECIES ACT SPECIES

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ The monarch is a candidate species and not yet listed or proposed for listing. There are generally no section 7 requirements for candidate species (FAQ found here: https://www.fws.gov/savethemonarch/FAQ-Section7.html). Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPAC USER CONTACT INFORMATION

Agency: Johnson, Mirmiran & Thompson, Inc.

Name: Stacey Gill

Address: 40 Wight Avenue

City: Hunt Valley

State: MD

Zip: 21030

Email: sgill@jmt.com

Phone: 4103162409



APPENDIX C: COST ESTIMATES

West East Trail Feasibility Study
Harford Road to Belair Road - Recommended Option

Roadway Costs						
Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	Notes
	Shared-Use Path	LANE-MI	0.21	\$ 1,000,000.00	\$ 212,436.87	SHA Cost Estimating Guide
	Mill and Overlay Existing Roadway	LANE-MI	1.76	\$ 100,000.00	\$ 176,452.02	SHA Cost Estimating Guide
	Curb and Gutter	LF	200	\$ 60.00	\$ 12,000.00	
	Removal of Existing Roadway	CF	131	\$ 58.00	\$ 7,572.22	Assumed 3' pavement depth
	Utility Pole Impact	EA	5	\$ 13,000.00	\$ 65,000.00	SHA Cost Estimating Guide
	Traffic Signal Modifications	EA	4	\$ 65,000.00	\$ 260,000.00	Price Per Leg of impacted intersection
	Stream Mitigation	LS	1	\$ 35,000.00	\$ 35,000.00	SHA Cost Estimating Guide
Subtotal 1					\$ 768,461.11	
Contingent Categories						
	Category 1: Preliminary, MOT		30%	\$ 768,461.11	\$ 230,538.33	40% of Subtotal 1
	Category 3: Drainage		20%	\$ 768,461.11	\$ 153,692.22	45% of Subtotal 1
	Category 7: Landscaping		12%	\$ 768,461.11	\$ 92,215.33	10% of Subtotal 1
	Category 8: Utilities		10%	\$ 703,461.11	\$ 76,846.11	15% of Subtotal 1
Subtotal 2					\$ 1,321,753.11	
	Contingency		40%		\$ 528,701.24	40% of Subtotal 2
Feasibility Level Cost*					\$ 1,850,454.36	
Rounded Value*					\$ 1,900,000.00	

West East Trail Feasibility Study
Belair Road to Lillian Holt - Recommended Option

Roadway Costs						
Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	Notes
	Shared-Use Path	LANE-MI	0.05	\$ 1,000,000.00	\$ 50,505.05	SHA Cost Estimating Guide
	Mill and Overlay Existing Roadway	LANE-MI	2.79	\$ 100,000.00	\$ 278,882.58	SHA Cost Estimating Guide
	5" Concrete Sidewalk	SF	3,500	\$ 20.00	\$ 70,000.00	January 2023 MDSHA Price Index
	Stream Mitigation	LS	1	\$ 35,000.00	\$ 35,000.00	SHA Cost Estimating Guide
Subtotal 1					\$ 434,387.63	
Contingent Categories						
	Category 1: Preliminary, MOT		30%	\$ 434,387.63	\$ 130,316.29	40% of Subtotal 1
	Category 3: Drainage		25%	\$ 434,387.63	\$ 108,596.91	45% of Subtotal 1
	Category 7: Landscaping		12%	\$ 434,387.63	\$ 52,126.52	10% of Subtotal 1
	Category 8: Utilities		10%	\$ 434,387.63	\$ 43,438.76	15% of Subtotal 1
Subtotal 2					\$ 768,866.10	
	Contingency		40%		\$ 307,546.44	40% of Subtotal 2
Feasibility Level Cost*					\$ 1,076,412.54	
Rounded Value*					\$ 1,100,000.00	

West East Trail Feasibility Study
Harford Road to Belair Road - Option 1

Roadway Costs						
Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	Notes
	Shared-Use Path	LANE-MI	0.06	\$ 1,000,000.00	\$ 62,973.48	SHA Cost Estimating Guide
	Mill and Overlay Existing Roadway	LANE-MI	3.01	\$ 100,000.00	\$ 301,357.32	SHA Cost Estimating Guide
	Removal of Existing Roadway	CF	73	\$ 58.00	\$ 4,253.33	Assumed 3' pavement depth
	Utility Pole Impact	EA	1	\$ 13,000.00	\$ 13,000.00	SHA Cost Estimating Guide
	New Bridge Structures	SF	1,800	\$ 320.00	\$ 576,000.00	SHA Cost Estimating Guide
	New Traffic Signal	EA	1	\$ 250,000.00	\$ 250,000.00	
	Pavement Markings	LF	14,950	\$ 1.50	\$ 22,425.00	
	Stream Mitigation	LS	1	\$ 35,000.00	\$ 35,000.00	SHA Cost Estimating Guide
Subtotal 1					\$ 1,265,009.14	
Contingent Categories						
	Category 1: Preliminary, MOT		30%	\$ 1,265,009.14	\$ 379,502.74	40% of Subtotal 1
	Category 3: Drainage		20%	\$ 1,265,009.14	\$ 253,001.83	45% of Subtotal 1
	Category 7: Landscaping		12%	\$ 1,265,009.14	\$ 151,801.10	10% of Subtotal 1
	Category 8: Utilities		8%	\$ 1,252,009.14	\$ 101,200.73	15% of Subtotal 1
Subtotal 2					\$ 2,150,515.54	
	Contingency		40%		\$ 860,206.22	40% of Subtotal 2
Feasibility Level Cost*					\$ 3,010,721.76	
Rounded Value*					\$ 3,100,000.00	

West East Trail Feasibility Study
Harford Road to Belair Road - Option 2

Roadway Costs						
Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	Notes
	Shared-Use Path	LANE-MI	0.21	\$ 1,000,000.00	\$ 212,436.87	SHA Cost Estimating Guide
	Mill and Overlay Existing Roadway	LANE-MI	1.76	\$ 100,000.00	\$ 176,452.02	SHA Cost Estimating Guide
	Curb and Gutter	LF	200	\$ 60.00	\$ 12,000.00	
	Removal of Existing Roadway	CF	131	\$ 58.00	\$ 7,572.22	Assumed 3' pavement depth
	Utility Pole Impact	EA	5	\$ 13,000.00	\$ 65,000.00	SHA Cost Estimating Guide
	Traffic Signal Modifications	EA	4	\$ 65,000.00	\$ 260,000.00	Price <i>Per Leg</i> of impacted intersection
	Pavement Markings	LF	5,600	\$ 1.50	\$ 8,400.00	
	Stream Mitigation	LS	1	\$ 35,000.00	\$ 35,000.00	SHA Cost Estimating Guide
Subtotal 1					\$ 776,861.11	
Contingent Categories						
	Category 1: Preliminary, MOT		30%	\$ 776,861.11	\$ 233,058.33	40% of Subtotal 1
	Category 3: Drainage		20%	\$ 776,861.11	\$ 155,372.22	45% of Subtotal 1
	Category 7: Landscaping		12%	\$ 776,861.11	\$ 93,223.33	10% of Subtotal 1
	Category 8: Utilities		10%	\$ 711,861.11	\$ 77,686.11	15% of Subtotal 1
Subtotal 2					\$ 1,336,201.11	
	Contingency		40%		\$ 534,480.44	40% of Subtotal 2
Feasibility Level Cost*					\$ 1,870,681.56	
Rounded Value*					\$ 1,900,000.00	

West East Trail Feasibility Study
Harford Road to Belair Road - Option 3

Roadway Costs						
Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	Notes
	Shared-Use Path	LANE-MI	1.10	\$ 1,000,000.00	\$ 1,100,063.13	SHA Cost Estimating Guide
	Mill and Overlay Existing Roadway	LANE-MI	1.13	\$ 100,000.00	\$ 113,005.05	SHA Cost Estimating Guide
	Curb and Gutter	LF	350.00	\$ 60.00	\$ 21,000.00	
	Utility Pole Impact	EA	8	\$ 13,000.00	\$ 104,000.00	SHA Cost Estimating Guide
	Traffic Signal Modifications	EA	2	\$ 65,000.00	\$ 130,000.00	Price Per Leg of impacted intersection
	Pavement Markings	LF	5,600	\$ 1.50	\$ 8,400.00	
	Stream Mitigation	LS	1	\$ 35,000.00	\$ 35,000.00	SHA Cost Estimating Guide
Subtotal 1					\$ 1,511,468.18	
Contingent Categories						
	Category 1: Preliminary, MOT		30%	\$ 1,511,468.18	\$ 453,440.45	40% of Subtotal 1
	Category 3: Drainage		20%	\$ 1,511,468.18	\$ 302,293.64	45% of Subtotal 1
	Category 7: Landscaping		12%	\$ 1,511,468.18	\$ 181,376.18	10% of Subtotal 1
	Category 8: Utilities		10%	\$ 1,407,468.18	\$ 151,146.82	15% of Subtotal 1
Subtotal 2					\$ 2,599,725.27	
	Contingency		40%		\$ 1,039,890.11	40% of Subtotal 2
Feasibility Level Cost*					\$ 3,639,615.38	
Rounded Value*					\$ 3,700,000.00	

West East Trail Feasibility Study
Belair Road to Lillian Holt - Option 1

Roadway Costs						
Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	Notes
	Shared-Use Path	LANE-MI	0.19	\$ 1,000,000.00	\$ 194,128.79	SHA Cost Estimating Guide
	Mill and Overlay Existing Roadway	LANE-MI	2.24	\$ 100,000.00	\$ 223,958.33	SHA Cost Estimating Guide
	5" Concrete Sidewalk	SF	8,155	\$ 12.00	\$ 97,860.00	January 2023 MDSHA Price Index
	Utility Pole Impact	EA	3	\$ 13,000.00	\$ 39,000.00	SHA Cost Estimating Guide
	New Bridge Structures	SF	840	\$ 320.00	\$ 268,800.00	SHA Cost Estimating Guide
	Pavement Markings	LF	1,400	\$ 1.50	\$ 2,100.00	
	Stream Mitigation	LS	1	\$ 35,000.00	\$ 35,000.00	SHA Cost Estimating Guide
Subtotal 1					\$ 860,847.12	
Contingent Categories						
	Category 1: Preliminary, MOT		30%	\$ 860,847.12	\$ 258,254.14	40% of Subtotal 1
	Category 3: Drainage		25%	\$ 860,847.12	\$ 215,211.78	45% of Subtotal 1
	Category 7: Landscaping		12%	\$ 860,847.12	\$ 103,301.65	10% of Subtotal 1
	Category 8: Utilities		10%	\$ 821,847.12	\$ 86,084.71	15% of Subtotal 1
Subtotal 2					\$ 1,523,699.40	
	Contingency		40%		\$ 609,479.76	40% of Subtotal 2
Feasibility Level Cost*					\$ 2,133,179.17	
Rounded Value*					\$ 2,200,000.00	

West East Trail Feasibility Study
Belair Road to Lillian Holt - Option 2

Roadway Costs						
Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	Notes
	Shared-Use Path	LANE-MI	0.5	\$ 1,000,000.00	\$ 496,369.95	SHA Cost Estimating Guide
	Mill and Overlay Existing Roadway	LANE-MI	0.34	\$ 100,000.00	\$ 33,570.08	SHA Cost Estimating Guide
	5" Concrete Sidewalk	SF	2,810	\$ 12.00	\$ 33,720.00	January 2023 MDSHA Price Index
	Utility Pole Impact	EA	4	\$ 13,000.00	\$ 52,000.00	SHA Cost Estimating Guide
	New Bridge Structures	SF	1,960	\$ 320.00	\$ 627,200.00	SHA Cost Estimating Guide
	New Boardwalk Structures	SF	5,880	\$ 274.00	\$ 1,611,120.00	
	Stream Mitigation	LS	1	\$ 700,000.00	\$ 700,000.00	SHA Cost Estimating Guide
Subtotal 1					\$ 3,553,980.03	
Contingent Categories						
	Category 1: Preliminary, MOT		30%	\$ 3,553,980.03	\$ 1,066,194.01	40% of Subtotal 1
	Category 3: Drainage		25%	\$ 3,553,980.03	\$ 888,495.01	45% of Subtotal 1
	Category 7: Landscaping		12%	\$ 3,553,980.03	\$ 426,477.60	10% of Subtotal 1
	Category 8: Utilities		10%	\$ 3,501,980.03	\$ 355,398.00	15% of Subtotal 1
Subtotal 2					\$ 6,290,544.64	
	Contingency		40%		\$ 2,516,217.86	40% of Subtotal 2
Feasibility Level Cost*					\$ 8,806,762.50	
Rounded Value*					\$ 8,900,000.00	

West East Trail Feasibility Study
Belair Road to Lillian Holt - Option 2

Roadway Costs						
Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	Notes
	Shared-Use Path	LANE-MI	0.2	\$ 1,000,000.00	\$ 192,708.33	SHA Cost Estimating Guide
	Mill and Overlay Existing Roadway	LANE-MI	3.07	\$ 100,000.00	\$ 306,628.79	SHA Cost Estimating Guide
	5" Concrete Sidewalk		6,220	\$ 12.00	\$ 74,640.00	January 2023 MDSHA Price Index
	New Bridge Structures	SF	980	\$ 320.00	\$ 313,600.00	SHA Cost Estimating Guide
	Stream Mitigation	LS	1	\$ 35,000.00	\$ 35,000.00	SHA Cost Estimating Guide
Subtotal 1					\$ 922,577.12	
Contingent Categories						
	Category 1: Preliminary, MOT		30%	\$ 922,577.12	\$ 276,773.14	40% of Subtotal 1
	Category 3: Drainage		25%	\$ 922,577.12	\$ 230,644.28	45% of Subtotal 1
	Category 7: Landscaping		12%	\$ 922,577.12	\$ 110,709.25	10% of Subtotal 1
	Category 8: Utilities		10%	\$ 922,577.12	\$ 92,257.71	15% of Subtotal 1
Subtotal 2					\$ 1,632,961.50	
	Contingency		40%		\$ 653,184.60	40% of Subtotal 2
Feasibility Level Cost*					\$ 2,286,146.11	
Rounded Value*					\$ 2,300,000.00	

West East Trail Feasibility Study
Belair Road to Lillian Holt - Option 4

Roadway Costs						
Item No.	Description	Unit	Quantity	Unit Cost	Total Cost	Notes
	Shared-Use Path	LANE-MI	0.72	\$ 1,000,000.00	\$ 715,751.26	SHA Cost Estimating Guide
	Parking Lot Reconstruction for Underground SWM	LANE-MI	0.13	\$ 1,000,000.00	\$ 128,630.05	SHA Cost Estimating Guide
	Utility Pole Impact	EA	8	\$ 13,000.00	\$ 104,000.00	SHA Cost Estimating Guide
	Traffic Signal Modifications	EA	4	\$ 65,000.00	\$ 260,000.00	Price <i>Per Leg</i> of impacted intersection
Subtotal 1					\$ 1,208,381.31	
Contingent Categories						
	Category 1: Preliminary, MOT		30%	\$ 1,208,381.31	\$ 362,514.39	40% of Subtotal 1
	Category 3: Drainage		25%	\$ 1,208,381.31	\$ 302,095.33	45% of Subtotal 1
	Category 7: Landscaping		12%	\$ 1,208,381.31	\$ 145,005.76	10% of Subtotal 1
	Category 8: Utilities		10%	\$ 1,104,381.31	\$ 120,838.13	15% of Subtotal 1
Subtotal 2					\$ 2,138,834.92	
	Contingency		40%		\$ 855,533.97	40% of Subtotal 2
Feasibility Level Cost*					\$ 2,994,368.89	
Rounded Value*					\$ 3,000,000.00	



40 Wight Avenue
Hunt Valley, MD 21030
P. 410-329-3100
www.jmt.com

Submitted to:

