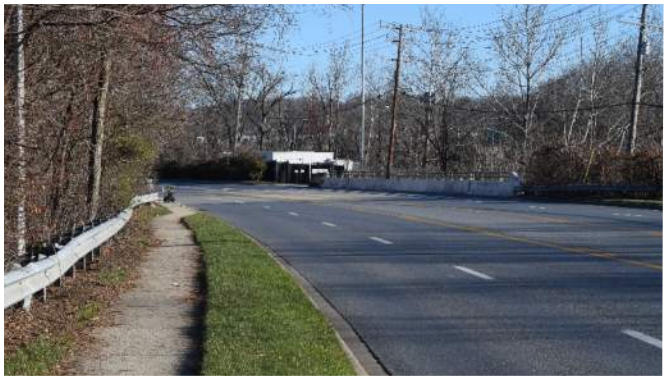

RED RUN TRAIL EXTENSION FEASIBILITY STUDY

GRAND CENTRAL AVENUE TO RED RUN STREAM VALLEY TRAIL

March 3, 2023

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EXECUTIVE SUMMARY

Baltimore County enlisted Johnson, Mirmiran, and Thompson Inc. (JMT) to conduct a feasibility study to evaluate options for a pedestrian and bicycle trail between the Owings Mills Metro Center and the existing Red Run Stream Valley Trail near Owings Mills, MD. The proposed alignments primarily utilize property that is already owned by the County, including a long unmaintained section of County roadway.

The proposed trail is approximately two miles long along the Red Run stream valley and includes several proposed stream crossings. JMT's task was to evaluate potential trail alignment options, identify known natural and cultural resources, identify potential stormwater management (SWM) treatment design solutions, conduct an impacts analysis, and develop feasibility level cost estimates for the proposed trail alignment.

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 several challenges that will require continuing evaluation and coordination through future design phases. There is one known wetland within the project area, and the majority of the project is within FEMA floodplains. Future design phases should include wetland delineations to more precisely locate the known wetland and to confirm that no other wetlands will be impacted by the project. The project area includes forested area for Forest Interior Dwelling Bird species, and Red Run is known to contain anadromous fish. To help protect these species, regulatory agencies will likely require time of year restrictions to prohibit construction activities within the streambed from October 1 through April 30 and to prohibit the removal or disturbance of forested habitat from April through August. Additionally, there is a National Register listed historic site within the project area that will require the coordination with and approval by the Maryland Historic Trust Easement Committee for any work to be completed within the historic site easement.

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. JMT created two feasibility level trail alignment options connecting the Owings Mills Metro Center and the Red Run Stream Valley Trail.

After developing these alignment options, the project team completed a feasibility level stormwater management (SWM) design to identify potential treatment facilities for the project. Incorporating the footprint for the potential SWM facilities, the project team developed a feasibility-level Impacts Analysis based on a 25-foot offset of all proposed construction improvements. In addition, feasibility level cost estimates were developed for each of the two design options as shown in Table 1.

Table 1: Cost Estimate Comparison

DESIGN OPTION	COST RANGE
Option 1	$8 Million - $12 Million
Option 2	$10 Million - $15 Million

INTRODUCTION

Baltimore County enlisted Johnson, Mirmiran, and Thompson Inc. (JMT) to conduct a feasibility study evaluating options for a pedestrian and bicycle trail near Owings Mills, MD that would connect the Metro Center with the existing Red Run Stream Valley Trail. The study evaluated two options for a proposed trail alignment identified by the County.

The trail is approximately two miles long along the Red Run stream valley and includes several proposed stream crossings. The proposed alignments primarily use County-owned right-of-way within the stream valley, including an old, unmaintained access roadway named Meadow Road. JMT evaluated the feasibility of using Meadow Road to minimize new construction costs and impacts from the project.

Additionally, this feasibility report includes a general summary of the anticipated stormwater management requirements, an evaluation of existing utilities, development of feasibility level cost estimates and impacts analyses for each of the proposed options, a constructability review, and identification of next steps for the project.

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 Red Run 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, Red Run, which is classified as a Use III stream. The project area is partially located within the FEMA 100-year floodplain and is also located within a Tier II catchment with no assimilative capacity remaining. In addition, the study area contains areas of forested land that are encumbered by Transfer of Development Rights and Purchase Development Rights (PDRs) and Forest Conservation Easements (FCEs).

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

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 December 16, 2022, stating that there are no official state records for RTE species within the delineation area (see Appendix B). The response also stated that the forested area on this property provides habitat for Forest Interior Dwelling Bird species (FIDS).

To help maintain existing FIDS habitat on the project site, MDNR WHS suggests incorporating these guidelines into the project plan (as applicable):

1. Do not remove or disturb forest habitat during April-August, the breeding season for most FIDS (this seasonal restriction may be expanded to February-August if certain early nesting FIDS (e.g., Barred Owl) are present), and
2. Avoid creating canopy openings and maintain canopy closure over any trails.

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 tool returned records of brown or rainbow trout within the Study Area. If any impacts to this stream are anticipated, then there would be a October 1st through April 30th Time of Year Restriction (TOYR) for any instream work. A screenshot of the results can be found in Appendix B.

Through coordination with USFWS, no federally listed threatened or endangered species are known to exist in the Study Area, other than occasional transient individuals. The USFWS Online Certification Letter dated October 25, 2022 documenting these results can be found in Appendix B.

JMT contacted the Maryland Historic Trust (MHT) in a letter dated October 25, 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 study area is located within the boundaries of the historic preservation easement that MHT holds on The Meadows - a National Register-listed 18th c. farm that was built by the Owings family and served as the residential nucleus of the extensive Owings milling operations. MHT advised that given the presence of the easement property, *all* work that is to be conducted within the easement boundaries must be reviewed by MHT's Easement Committee. If the proposed trail extension will be crossing The Meadows Property (located just north of Red Run - between Red Run and the Hilton Garden Inn), an "Application for Change/Alteration to Easement Property" form will need to be completed by the property owner and submitted to the Easement Committee for review. The southern (buffer) portion of the easement property is owned by Baltimore County, while the northern portion that contains the farm complex appears to be owned by Painters Mill Venture LLP. A copy of MHT's response can be found in Appendix B.

Figure 1: View of The Meadows Historic Site from Meadow Road

Subsurface Utilities

The project team submitted utility requests to Baltimore County DPW, Century Link Lumen, Lightower-Crowncastle, Zayo, and Transco to identify existing utilities within the project area.

BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS

Baltimore County provided as-built drawings of a series of different water and sewer projects that have been completed within the project area. The as-built drawings range in age from 1962 to 2007. In general, the utilities shown appear to have at least five feet of cover, and are thus unlikely to be impacted by a trail project.

CENTURY LINK LUMEN

Maps provided by Century Link Lumen show underground cables along Painters Mill Road and Red Run Boulevard, and a long-haul underground cable located within the existing utility corridor between Meadows Road and Painters Mill Road.

LIGHTOWER-CROWNCASTLE

Maps provided by Lightower-Crowncastle 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.

ZAYO

Maps provided by Zayo identified additional underground cables along Painters Mill Road and Red Run Boulevard, including both Metro Network and Longhaul Network Cables. These cables should be delineated in future design phases to identify whether they will be impacted by this project.

TRANSCO

Transco owns and operates a large gas line that runs from Texas to New York. Within the project area, the gas line is split into three separate pipes running through the existing utility corridor between Meadow Road and Painters Mill Road. The project team believes that it is unlikely that the pipelines are located close enough to ground level to be impacted by this project, however the gas pipelines should still be field designated and surveyed to ensure that they will not impacted.

TRAIL CONCEPT DEVELOPMENT

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

Design Criteria

The project team developed Design Criteria for the proposed Red Run 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 5th 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
Painters Mill Road		
Roadway Classification	Minor Arterial	MDOT SHA Roadway Functional Classification (MDOT SHA)
Posted Speed Limit	40 mph	
Typical Section	60’ curb-to-curb width, two lanes in each direction with a Two-Way Center Turn Lane (TWCTL), 4’ sidewalk on each side of the road separated by a grass buffer. Sidewalk on east side terminates at bridge over Red Run	
Ownership	Baltimore County	
Red Run Boulevard		
Roadway Classification	Minor Arterial	MDOT SHA
Posted Speed Limit	40 mph	
Typical Section	Two lanes in each direction with a median, median varies between 0 – 16 feet wide. 5’ sidewalk along south edge	
Ownership	Baltimore County	
Meadows Road		
Roadway Classification	Local Road	MDOT SHA
Posted Speed Limit	N/A	
Typical Section	Open Section, 22’ width, majority of the roadway is currently unmaintained	

Criteria	Existing Design	Reference
Ownership	Baltimore County	
Lakeside Boulevard		
Roadway Classification	Major Collector	MDOT SHA
Posted Speed Limit	35 mph	
Typical Section	Two lanes in each direction with 16' median. 4' sidewalk along both sides of the roadway, separated by grass buffer	
Ownership	Baltimore County	

FACILITY TYPE: OFF-ROAD SHARED-USE PATH

Criteria	Guidance	Reference
Bicycle Design Speed	20 MPH max Recommended 12 MPH max for urban areas 8 MPH max speed at intersections	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.	PROWAG Supplemental Notice R302.6
Vertical Clearance above Path	8 ft min 10 ft preferred	MSHA Bicycle Policy (pg. 7.1) 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	12 ft to 14 ft preferred If under 10 ft, need design waiver from state; 8 ft min for short segments if constrained areas	MSHA Bicycle Policy (pg. 7.1)
Pedestrian Access Route (PAR)	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	AASHTO Bike Book (pg. 5-5) NPS Preferred Practice

Criteria	Guidance	Reference
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	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)

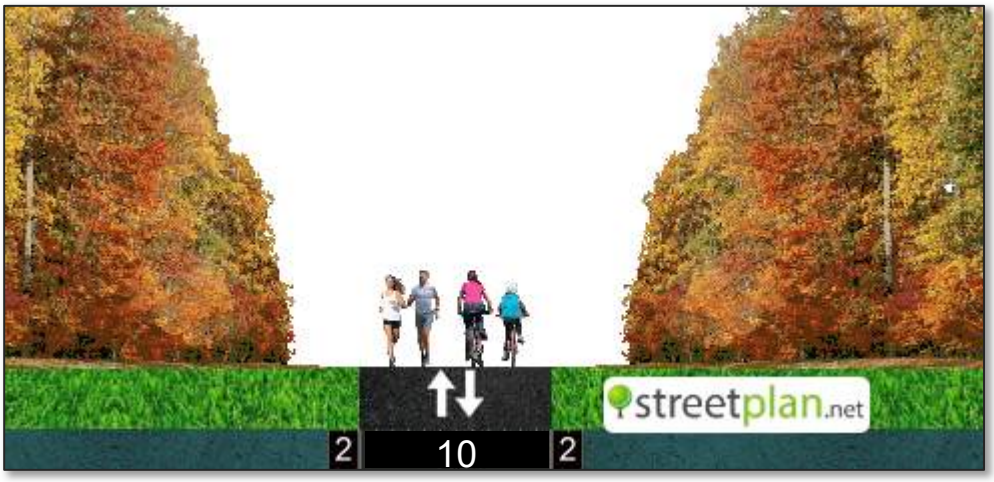
FACILITY TYPE: ON-ROAD BIKE LANE

Criteria	Guidance	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)

Typical Sections

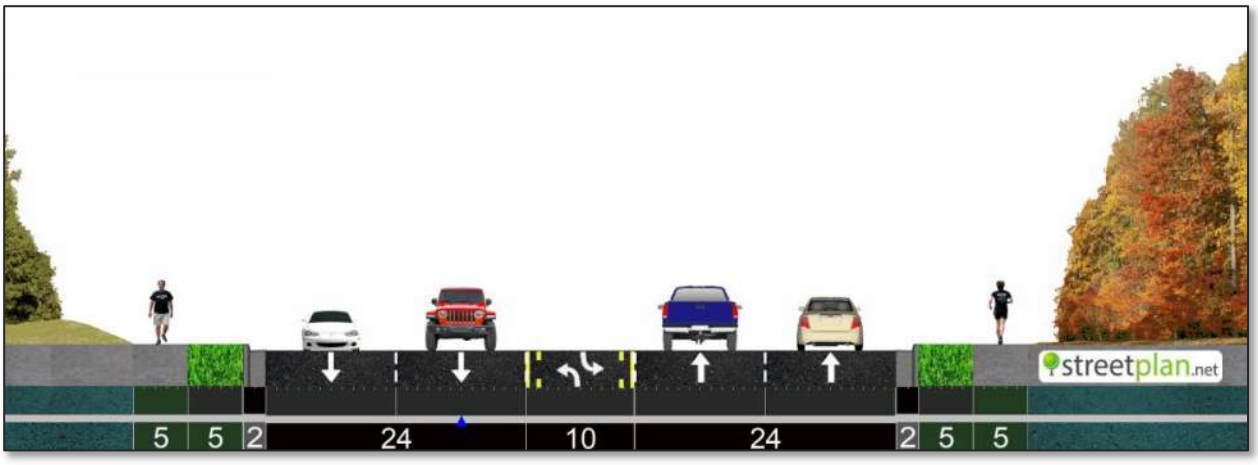
PROPOSED BRIDGE – AS NECESSARY

PROPOSED TRAIL - GENERAL

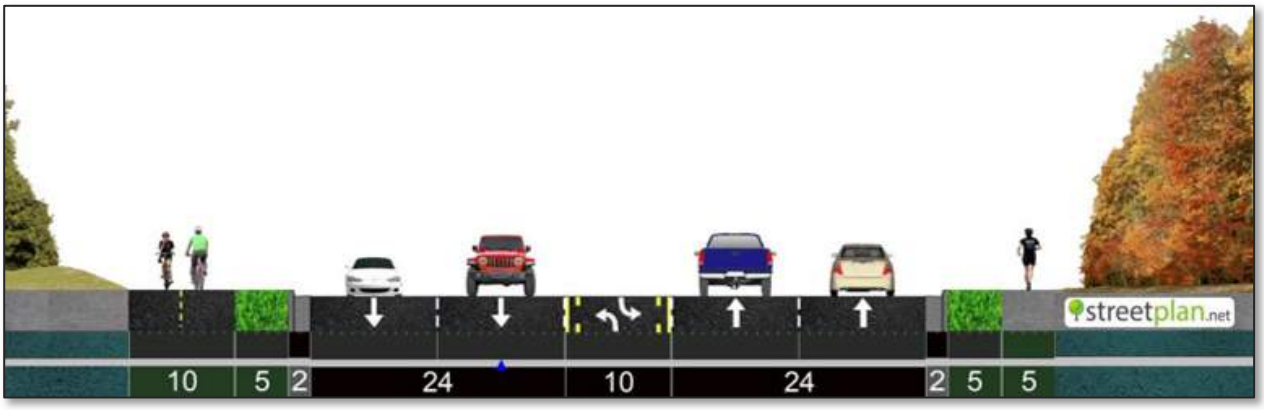


PAINTERS MILL ROAD

Existing Conditions (looking North)



Proposed Shared-Use Path (looking North)



Proposed Trail Alignment Options

Two proposed trail alignment options were developed to ensure feasible options for the trail extension. Both options begin at the Owings Mills Metro Center and connect to the existing Red Run Stream Valley Trail.

OPTION 1

Option 1 will begin at the Owings Mills Metro Center and follow Grand Central Avenue out to Painters Mill Road. The proposed trail will turn southwest along Painters Mill Road and become a new 10-foot-wide shared-use trail with a five-foot buffer along the west side of Painters Mill Road. When the proposed trail reaches the existing Painters Mill Road bridge over Red Run, a new pedestrian and bicycle bridge over Red Run will be constructed at the same elevation as the Painters Mill Road bridge. The new proposed bridge will be approximately 90-feet-long by 14-feet-wide.

After crossing Red Run, the proposed trail will continue along the west side of Painters Mill Road until reaching Red Run Boulevard. The trail will cross Red Run Boulevard, and then turn northwest towards Meadow Road along the south side of Red Run Boulevard. The trail will then turn onto Meadow Road and run alongside Meadow Road for approximately 400 feet before merging onto Meadow Road to become an on-road pedestrian and bicycle facility. The trail will remain an on-road facility for approximately 800 feet until passing an existing residence at 101 Meadow Road. After passing this residence, Meadow Road will be closed to vehicular traffic and will become a shared-use path along the existing Meadow Road alignment. The stretch of Meadow Road that will remain open for vehicles will receive mill and overlay pavement resurfacing.

Figure 2: Existing Meadow Road

After passing the residential driveway, the existing condition of Meadow Road deteriorates and becomes heavily overgrown and eroded. Due to this, the project team is recommending new full-depth pavement for the trail throughout this section of Meadow Road.

The existing Meadow Road alignment exits County-owned right-of-way approximately 500 feet past the point where vehicle access will be restricted along the proposed trail. The Meadow Road alignment remains outside of County-owned right-of-way for approximately 1,000 feet until approaching Owings Mills Boulevard. For this section, the County will need to coordinate with the owners of the Groveton Green Apartment Complex for an easement or acquisition for construction and use by the public. As part of this coordination, the County may be asked to provide direct access from the trail to the apartment complex for easier use by residents.

The proposed trail will return to County-owned property approximately 500 feet east of Owings Mills Boulevard and continue west towards Owings Mills Boulevard. The trail will go under the existing Owings Mills Boulevard bridge over Red Run, continuing to use the Meadow Road alignment, and cross to the west side of Owings Mill Boulevard.

The trail will continue along the Meadow Road alignment for approximately 600 additional feet before finally exiting the Meadow Road alignment and continuing west towards Lakeside Boulevard. Additionally, an approximately 25-foot-long by 14-foot-wide bridge will be constructed to cross a tributary to Red Run approximately 350 feet west of Owings Mills Boulevard.

As the trail approaches Lakeside Boulevard, the alignment will turn northwest to run parallel to the roadway for approximately 400 feet. As part of this segment that is parallel to Lakeside Boulevard, a 70-foot-long by 14-foot-wide pedestrian and bicycle bridge is proposed to cross a tributary of Red Run.

The proposed trail will then turn north into an existing utility corridor for approximately 1,000 feet until eventually reaching the existing Red Run trail approximately 500 feet north of Lakeside Boulevard. There is a proposed 25-foot-long by 14-foot-wide pedestrian and bicycle bridge along this section of the trail.

The proposed trail will then include making upgrades to the existing Red Run trail to create a more accessible facility for all trail users. The existing Red Run trail is approximately 0.6 miles long, is unpaved, and features large six-inch plus vertical discontinuities in some locations. The proposed upgrades will include a paved trail, removing vertical discontinuities, and some changes to the existing trail alignment to reduce steep existing grades in some locations.

The proposed trail will generally follow the existing trail, constructing four new pedestrian and bicycle bridges, including two new crossings of Red Run, until eventually turning east towards the existing Red Run Stream Valley Trail. The existing Red Run Stream Valley Trail is an accessible paved trail and will serve as the endpoint of this project.

OPTION 2

Option 2 will begin at the Owings Mills Metro Center and travel southwest through the existing Owings Mill Metro Station Parking Lots towards Red Run. The proposed trail will cross Red Run and the surrounding floodplains using a new proposed 290-foot-long by 14-foot-wide boardwalk structure heading towards the existing utility corridor between Painters Mill Road and Red Run Boulevard. The proposed trail will turn west after reaching the utility corridor and continue within the utility corridor until approaching Red Run Boulevard.

As the proposed trail reaches Red Run Boulevard, the alignment will turn northwest towards the Red Run Boulevard bridge over Red Run, then crossing underneath the bridge to reach the west side of Red Run Boulevard. As discussed in the design criteria section, the AASHTO Bike Book recommends a minimum vertical clearance of ten feet with an absolute minimum vertical clearance of eight feet. However, an eight foot vertical clearance is unlikely to be maintained for this structure, and the clearance is more likely to be between seven and eight feet high. To account for this clearance discrepancy, the proposed trail would need a design waiver approved by the County, and advanced “Warning – Low Clearance” signage should

Figure 3: Red Run Boulevard Bridge Clearance

be installed for trail users approaching from both sides of the bridge.

After crossing Red Run Boulevard, the proposed trail will return into the existing utility corridor for approximately 400 feet until the corridor reaches Meadow Road. The proposed trail will then merge onto Meadow Road to become an on-road pedestrian and bicycle facility. The trail will remain an on-road facility for approximately 800 feet until passing an existing residence at 101 Meadow Road. After passing this residence, Meadow Road will be closed to vehicular traffic and will become a shared-use path along the existing Meadow Road alignment. The stretch of Meadow Road that will remain open for vehicles will receive mill and overlay pavement resurfacing.

After passing the residential driveway, the existing condition of Meadow Road deteriorates and becomes heavily overgrown and eroded. Due to this, the project team is recommending new full-depth pavement for the trail throughout this section of Meadow Road.

The existing Meadow Road alignment exits County-owned right-of-way approximately 500 feet past the point where vehicle access will be restricted along the proposed trail. The Meadow Road alignment remains outside of County-owned right-of-way for approximately 1,000 feet until approaching Owings Mills Boulevard. For this section, the County will need to coordinate with the owners of the Groveton Green Apartment Complex for an easement or acquisition for construction and use by the public. As part of this coordination, the County may be asked to provide direct access from the trail to the apartment complex for easier use by residents.

The proposed trail will return to County-owned property approximately 500 feet east of Owings Mills Boulevard and continue west towards Owings Mills Boulevard. The trail will go under the existing Owings Mills Boulevard bridge over Red Run, continuing to use the Meadow Road alignment, and cross to the west side of Owings Mill Boulevard.

The trail will continue along the Meadow Road alignment for approximately 600 additional feet before finally exiting the Meadow Road alignment and continuing west towards Lakeside Boulevard. Additionally, an approximately 25-foot-long by 14-foot-wide bridge will be constructed to cross a tributary to Red Run approximately 350 feet west of Owings Mills Boulevard.

As the trail approaches Lakeside Boulevard, the alignment will turn northwest to run parallel to the roadway for approximately 400 feet. As part of this segment that is parallel to Lakeside Boulevard, a 70-foot-long by 14-foot-wide pedestrian and bicycle bridge is proposed to cross a tributary of Red Run.

The proposed trail will then turn north into an existing utility corridor for approximately 1,000 feet until eventually reaching the existing Red Run trail approximately 500 feet north of Lakeside Boulevard. There is a proposed 25-foot-long by 14-foot-wide pedestrian and bicycle bridge along this section of the trail.

The proposed trail will then include making upgrades to the existing Red Run trail to create a more accessible facility for all trail users. The existing Red Run trail is approximately 0.6 miles long, is unpaved, and

Figure 4: Existing Red Run Trail

features large six-inch plus vertical discontinuities in some locations. The proposed upgrades will include a paved trail, removing vertical discontinuities, and some changes to the existing trail alignment to reduce steep existing grades in some locations.

The proposed trail will generally follow the existing trail, constructing four new pedestrian and bicycle bridges, including three new crossings of Red Run, until eventually turning east towards the existing Red Run Stream Valley Trail, creating a new connection with the trail approximately 200 feet northeast of the existing Red Run trail connection. The existing Red Run Stream Valley Trail is an accessible paved trail and will serve as the endpoint of this project.

Feasibility Level 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 team analyzed the project corridor for potential SWM facilities to address water quality and quantity control requirements for each trail option. The team performed a desktop review of the available existing site conditions information (e.g., floodplain mapping, NRCS Soil Mapping, GIS contours, wetland mapping, etc.), 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. The team also evaluated 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). 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 primarily of new impervious area, with limited sections of the path involving existing, reconstructed impervious area. The team evaluated the percentage of existing, reconstructed impervious area to determine if the project could potentially be classified as a redevelopment project, which reduces the water quality treatment requirement; however, the project is classified as New Development. Once the proposed impervious area (new and existing, reconstructed impervious) was quantified, potential ESD facilities were evaluated.

SITE INFORMATION

The project area is entirely within the Patapsco River Watershed (MD 6-Digit Watershed 021309). Runoff from the proposed trail drains to Red Run. Most of the proposed trail is located within the Federal Emergency Management Administration (FEMA) 100-yr Floodplain for both trail alignments evaluated. The applicable FEMA Flood Insurance Rate Map (FIRM) covering the project area is Map Number 2400100220D. The MDE SWM manual indicates that SWM measures should not be located within the 100-year floodplain, which limits potential areas for SWM facilities along the project corridor. The FEMA 100-yr Floodplain boundaries are depicted on the Environmental Features Map in **Appendix A**.

According to the National Resource Conservation Service (NRCS) Soil Survey, the proposed trail alignments are underlain by Codorus Silt Loams, which are classified as hydrologic soil group (HSG) C

soils. Due to the proximity to the stream and results of the NCRS Soil Survey, shallow groundwater is anticipated along much of the trail alignment, which limits the types of feasible ESD facilities.

STORMWATER MANAGEMENT – WATER QUALITY

Water Quality Requirements

The section of the trail along Meadow Road involves mill and overlay of existing pavement, which does not require water quality treatment; however, most of the proposed path includes new impervious area. There are existing sections of existing impervious area (i.e., heavily damaged sections of asphalt and concrete) along the proposed trail alignment extending West of Owings Mills Boulevard up to the point where the trail runs parallel to Lakeside Boulevard. Potions of the path along Old Meadow Road (i.e., extending from the Owings Mills Boulevard underpass to the east to Meadow Road) consists of compacted aggregate or broken pavement. A topographic survey would be required to precisely quantify the existing impervious area; however, the existing impervious area across the project is significantly less than the 40% impervious required to classify the project as redevelopment.

The approximate impervious area for each trail alignment option is summarized in the table below.

Proposed Impervious Area Summary

Option	Total Impervious Area[1] (acres)	Net Impervious Increase[1] (acres)	Existing Impervious Removed / Reconstructed[3] (acres)	New Boardwalk[2] (acres)	Existing Boardwalk (acres)
1	2.2 – 2.5	2.0 – 2.3	0.3 – 0.6	0.1	0.4
2	2.4 – 2.6	2.1 – 2.4	0.3 – 0.6	0.1	0.4

Notes:

1. Proposed boardwalk areas are included as impervious area. Existing impervious area is approximate (see note 3).
2. While boardwalk is considered as impervious area, the areas have been broken down separately because boardwalk is hydrologically distinct from impervious asphalt or concrete pavement (i.e., water flows through boardwalk and can infiltrate into the underlying soil).
3. Topographic survey is required to accurately delineate the limits of existing, impervious area. Along Old Meadow Road, much of the trail follows compacted gravel or heavily deteriorated pavement, with significant portions overgrown with weeds.

Both options propose similar total amounts of impervious areas, and the reconstruction or removal of existing impervious area is consistent between the two options. The actual quantity of existing impervious area removed or reconstructed will need to be refined at the Concept design stage utilizing more detailed survey results.

Limiting Factors

First and foremost, the location within the 100-year floodplain limits available space for SWM facilities, as the MDE SWM Manual states SWM facilities should not be located within the floodplain. Furthermore, much of the trail runs through wooded areas, which limits the potential for ESD treatment—the removal of woods to install an ESD facility is discouraged.

In areas with suitable infiltration rates, which would need to be confirmed by in situ infiltration tests, permeable pavement could potentially be utilized; however, the potential for clogging of the permeable pavement increases in areas where leaves and dirt are easily tracked or washed onto the trail. Furthermore, shallow groundwater is anticipated due to the proximity to Red Run, which would render permeable pavement infeasible. As a result, permeable pavement is not recommended in the wooded areas, and offsetting water quality treatment should be sought elsewhere.

Two large, grassed areas within a utility corridor on either side of the Red Run Boulevard underpass, were considered for potential SWM facilities (i.e., while these areas are located within the floodplain, no tree clearing would be required); however, due to the density of utility markers throughout this area, these areas are most likely infeasible for SWM unless existing utilities were relocated.

Water Quality Treatment

There may be possibilities to claim ESD credit for non-structural practices such as the Disconnection of Non-Rooftop Runoff (NRDC), but it won't be possible for most of the project area due to large upslope areas contributing runoff across the trail. 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; however, any credit would address only a small percentage of the ESD requirement for the project.

Due to the challenges implementing SWM along the path, offsetting treatment of existing, untreated impervious area within the watershed may be required to meet the water quality requirements. For example, west of the intersection with Owings Mills Boulevard, Red Run Boulevard has two lanes each direction with a continuous turning lane. There is the potential to replace impervious area with pervious medians, and possibly incorporating ESD facilities.

Sections of Red Run adjacent to the proposed trail show signs of erosion along the stream banks. Incorporating stream restoration into the proposed Red Run Trail project would provide improvements to water quality by preventing continuing erosion and transport of sediment downstream. While stream restoration is not a typical ESD practice, given the limitations to implementing ESD along the proposed trail, incorporating stream restoration would provide significant water quality improvements and could potentially support the justification of a variance from meeting the ESD treatment requirements resulting from impervious area added for the trail project.

Proposed Structures

Each of the two options includes the construction of new pedestrian and bicycle bridges along the proposed trail. The approximate size, location, cost, and reason for reconstruction for each of the proposed bridges are shown in the following tables.

Table 2: Proposed Structures for Option 1

BRIDGE	SIZE	COST	NOTES
Bridge 1: STA 104+90 to STA 105+60	70' x 14'	$350,000	Proposed structure to cross Red Run. Existing Painters Mill Road bridge over Red Run does not have available width to use as a pedestrian and bicycle crossing.
Bridge 2: STA 158+40 to STA 158+65	25' x 14'	$125,000	Proposed structure (potentially a culvert in future design phases) to replace failed culvert at a tributary of Red Run
Bridge 3: STA 167+10 to STA 168+80	70' x 14'	$275,000	Proposed boardwalk structure crossing a tributary of Red Run
Bridge 4: STA 173+80 to STA 173+95	25' x 14'	$125,000	Proposed structure (potentially a culvert in future design phases) crossing a tributary of Red Run
Bridge 5: STA 181+80 to STA 182+50	70' x 14'	$275,000	Proposed boardwalk structure crossing a tributary of Red Run
Bridge 6: STA 186+40 to STA 187+10	70' x 14'	$350,000	Proposed crossing of Red Run to avoid steep grades and to avoid potential ROW impacts
Bridge 7: STA 189+50 to STA 190+15	65' x 14'	$310,000	Proposed crossing of Red Run to avoid steep grades and to avoid potential ROW impacts
Bridge 8: STA 194+60 to STA 194+80	20' x 14'	$100,000	Proposed structure (potentially a culvert in future design phases) crossing a tributary of Red Run

In total, Option 1 is anticipated to have eight new bridges with a total cost of approximately $2 million.

Table 3: Proposed Structures for Option 2

BRIDGE	SIZE	COST	NOTES
Bridge 1: STA 103+40 to STA 106+30	290' x 14'	$1,1150,000	Proposed boardwalk structure to cross Red Run and wetlands / floodplains at crossing.
Bridge 2: STA 153+80 to STA 153+95	25' x 14'	$125,000	Proposed structure (potentially a culvert in future design phases) to replace failed culvert at a tributary of Red Run
Bridge 3: STA 163+40 to STA 164+10	70' x 14'	$275,000	Proposed boardwalk structure crossing a tributary of Red Run
Bridge 4: STA 169+05 to STA 169+30	25' x 14'	$125,000	Proposed structure (potentially a culvert in future design phases) crossing a tributary of Red Run
Bridge 5: STA 177+15 to STA 177+85	70' x 14'	$275,000	Proposed boardwalk structure crossing a tributary of Red Run
Bridge 6: STA 181+80 to STA 182+50	70' x 14'	$350,000	Proposed crossing of Red Run to avoid steep grades and to avoid potential ROW impacts
Bridge 7: STA 184+95 to STA 185+60	65' x 14'	$310,000	Proposed crossing of Red Run to avoid steep grades and to avoid potential ROW impacts
Bridge 8: STA 189+95 to STA 190+15	20' x 14'	$100,000	Proposed structure (potentially a culvert in future design phases) crossing a tributary of Red Run
Bridge 9: STA 202+40 to STA 204+10	170' x 14'	$650,000	Proposed boardwalk structure to avoid steep grades along existing trail

In total, Option 2 is anticipated to have nine new bridges with a total cost of approximately $3.3 million.

Impacts Analysis

Based on the desktop analysis performed, impacts will occur to forest areas (potentially including an existing Forest Conservation Area) and the 100-year floodplain associated with Red Run. It is uncertain at this time as to whether direct impacts would occur to Red Run or adjacent wetlands, wetland buffers or tributaries. Impacts shown in Table 3 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 4: Impacts Analysis

ITEM	OPTION 1	OPTION 2
Right-of-Way	12 parcels 2.9 acres	11 parcels 2.6 acres
Forests	8.8 acres	8.7 acres
Stream Impacts	1,2000 LF	1,560 LF
Potential Wetlands	0.2 acres	0.2 acres
Utility / Light Poles	9 poles	No impacts
Driveways / Entrances	3 entrances impacted	1 entrance impacted
Fire Hydrants	1 fire hydrant	No impacts
Business Signage	No impacts	No impacts
Traffic Signal Upgrades	No impacts	No impacts
Number of New / Reconstructed Structures	8 new bridges	9 new bridges

Cost Estimate

Cost estimates were developed using the MDOT SHA Cost Estimating Guideline for each of the three 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, however, much of the project will be constructed on county-owned land and any right-of-way costs are anticipated to be minimal. Detailed estimates for each of the three options can be found in **Appendix C**.

Table 5: Cost Estimate Comparison

DESIGN OPTION	COST RANGE
Option 1	$8 Million - $12 Million
Option 2	$10 Million - $15 Million

Constructability

The project team evaluated the constructability of both options.

FOREST INTERIOR DWELLING BIRD SPECIES (FIDS)

As discussed in the Natural Resources section above, the forested areas of this project are known to include FIDS. To maintain the habitat for these species, construction activities within the forested areas may be restricted during breeding season (April-August or February-August depending on what species are identified). Additionally, construction activities should seek to ensure that no new gaps in the forest canopy are created by construction work. Since this is a trail project with a reduced footprint, the project team anticipates that forest canopy impacts can be avoided.

Figure 5: Forest within Project Area

ANADROMOUS FISH

Similarly, Red Run has been previously identified as containing specimens of brown trout and rainbow trout within the project area. To prevent impacts to these species, construction activities that will impact the stream (primarily including new bridge structures) will be restricted between October 1st and April 30th of any given year.

TRANSCO GAS LINE

There is a large TRANSCO Gas Line running within a utility easement within the project area. Careful research, coordination, and delineation will be required to ensure that the gas line will not be impacted by this project.

SWM DESIGN

Since most of the project is located in areas of shallow groundwater, forested areas, and / or within the FEMA 100-year floodplain, it will be difficult to provide the necessary SWM facilities to address the increased impervious area. Water treatment will most likely be completed through offsite and / or non-standard methods such as stream restorations or treating existing off-site untreated impervious areas.

Next Steps

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 utilities 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.

Figure 6: Subsurface Utility Corridor

STORMWATER MANAGEMENT DESIGN

Several permits/approvals will be required due to the 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 limit of disturbance (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. Baltimore County stream restoration projects must adhere to the same permitting process as all other waterway construction projects. Projects are reviewed by and permits obtained from the Department of Environmental Protection and Sustainability.

PERMITTING AND MITIGATION – NATURAL AND CULTURAL RESOURCES

Figure 7: Red Run Stream Valley

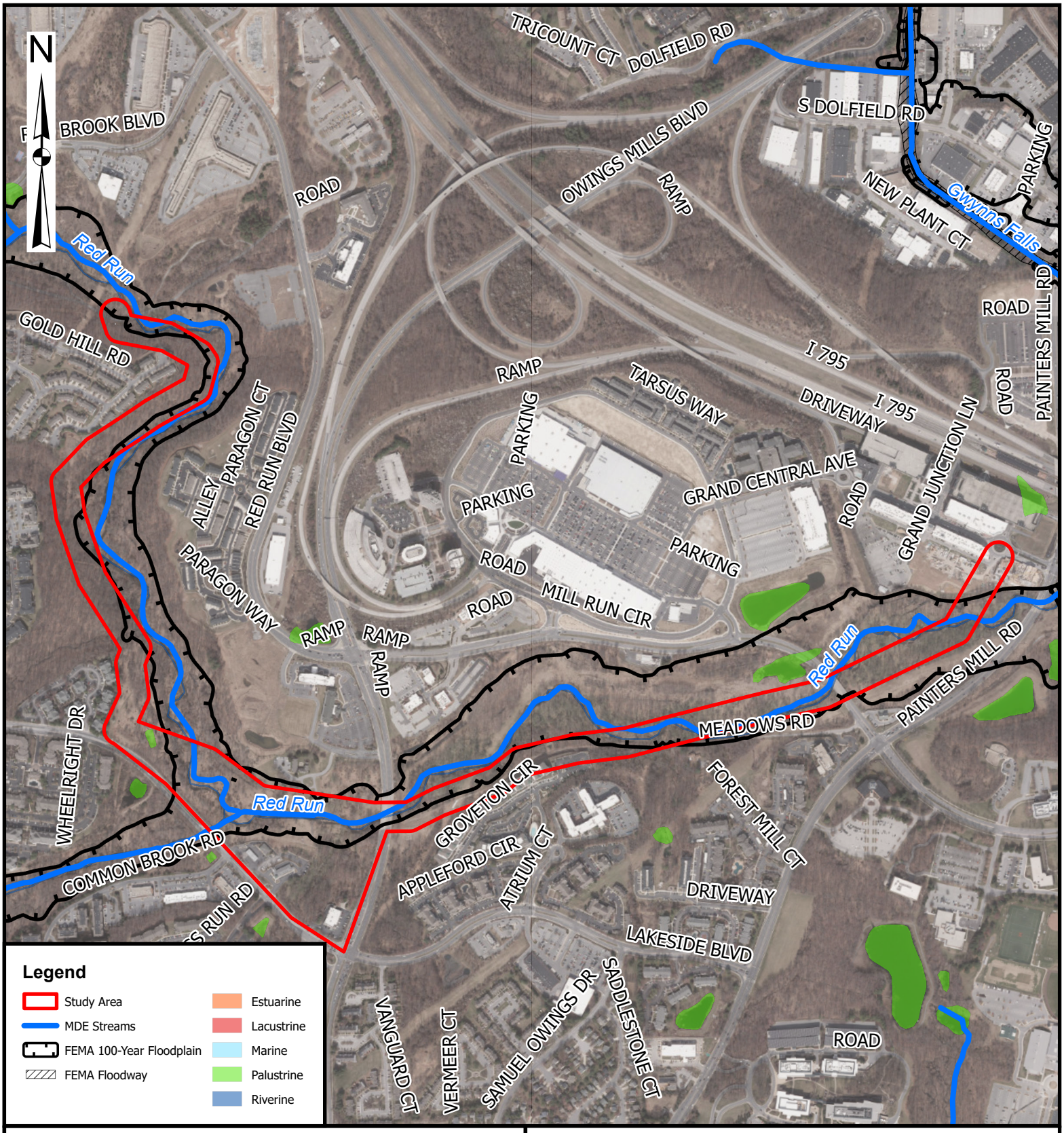
Field delineations of sensitive natural resources will be performed to quantify impacts and confirm permitting requirements. As part of this process, the team will collect field data including forest and wetland data points, individual specimen trees, wetland boundaries, and streams.

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 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.

Should impacts occur to the historic preservation easement associated with The Meadows, which is listed on the National Register of Historic Places, an "Application for Change/Alteration to Easement Property" form will need to be completed by the property owner and submitted to the Maryland Historic Trust Easement Committee for review.

APPENDIX A
ENVIRONMENTAL BASE MAPPING



0 450 900 1,800 Feet

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

VICINITY MAP

RED RUN TRAIL FEASIBILITY STUDY

BALTIMORE COUNTY, MD

DATE: OCTOBER 2022

APPENDIX B:
AGENCY COORDINATION

United States Department of the Interior
U.S. Fish & Wildlife Service
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573 4575

Online Certification Letter

Today's date: October 25, 2022

Project: Red Run Trail Feasibility Study
Baltimore County, Maryland

Dear Applicant for online certification:

Thank you for using the U.S. Fish and Wildlife Service (Service) Chesapeake Bay Field Office online project review process. By printing this letter in conjunction with your project review package, you are certifying that you have completed the online project review process for the referenced project in accordance with all instructions provided, using the best available information to reach your conclusions. This letter, and the enclosed project review package, completes the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA).This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this certification to be valid. This letter and the project review package will be maintained in our records.

Based on this information and in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), we certify that except for occasional transient individuals, no federally listed endangered or threatened species are known to exist within the project area. Therefore, no Biological Assessment or further section 7 consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For additional information on threatened or endangered species in Maryland, you should contact the Maryland Wildlife and Heritage Division at (410) 260-8573. For information in Delaware you should contact the Delaware Division of Fish and Wildlife, Wildlife Species Conservation and Research Program at (302) 735-8658. For information in the District of Columbia, you should contact the National Park Service at (202) 339-8309.

The U.S. Fish and Wildlife Service also works with other Federal agencies and states to minimize loss of wetlands, reduce impacts to fish and migratory birds, including bald eagles, and restore habitat for wildlife. Information on these conservation issues and how development projects can avoid affecting these resources can be found on our website (www.fws.gov/chesapeakebay)

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interest in these resources. If you have any questions or need further assistance, please contact Chesapeake Bay Field Office Threatened and Endangered Species program at (410) 573-4527.

Sincerely,

Genevieve LaRouche
Field Supervisor

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

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

December 16, 2022

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

RE: Environmental Review for Red Run Trail Feasibility Study, Owings Mills, JMT Job No. 19-03735-003, Baltimore County, Maryland.

Dear Ms. Boone:

The Wildlife and Heritage Service has determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. However, our remote analysis suggests that the forested area on this property provides habitat for Forest Interior Dwelling Birds. Many species of forest interior breeding birds are declining in Maryland. This group of bird species requires large, contiguous blocks of forest to successfully breed. Most FIDS are neotropical migrants; these long distance migratory birds breed in North America and winter in Central and South America. The declines in FIDS have been attributed largely to the loss and fragmentation of forests in the eastern United States due to urbanization, agriculture and some forest management practices. The key to maintaining suitable breeding habitat for FIDS, and halting or reversing their declines, is the protection of extensive, unbroken forested areas throughout the region. To help maintain existing FIDS habitat on the project site, we suggest incorporating the following guidelines into the project plan (as applicable): 1) Do not remove or disturb forest habitat during April-August, the breeding season for most FIDS; This seasonal restriction may be expanded to February-August if certain early nesting FIDS (e.g., Barred Owl) are present, 2) Avoid creating canopy openings, and maintain canopy closure over any trails.

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

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

ER# 2022.1552.ba

Boone, Ginny

From: Dixie Henry -MDP- <dixie.henry@maryland.gov>
Sent: Monday, November 7, 2022 11:58 AM
To: Boone, Ginny
Cc: Kate Jaffe -MDP-
Subject: [EXTERNAL] MHT review of Red Run Trail Feasibility Study, Baltimore County, 202204764

Ginny --

Thank you for providing the Maryland Historical Trust (MHT) with preliminary information regarding the above-referenced project in Baltimore County, Maryland. MHT is reviewing the project to assess potential effects on historic properties in accordance with Section 106 of the National Historic Preservation Act and the Maryland Historical Trust Act, §§ 5A-325 and 5A-326 of the State Finance and Procurement Article. It is our understanding that JMT is completing a feasibility study for the proposed extension of the existing Red Run Trail near the Metro Center in Owings Mills, and that this project may require a permit from the Corps and MDE. Below are our preliminary comments and recommendations regarding potential effects on historic properties.

MHT files indicate that a portion of the study area is located within the boundaries of the historic preservation easement that MHT holds on The Meadows - a National Register-listed 18th c. farm that was built by the Owings family and served as the residential nucleus of the extensive Owings milling operations. Given the presence of the easement property, *all* work that is to be conducted within the easement boundaries must be reviewed by MHT's Easement Committee and approved by Elizabeth Hughes, Director. If the proposed trail extension will be crossing The Meadows property (located just north of Red Run - between Red Run and the Hilton Garden Inn), the property owner will need to complete an "Application for Change/Alteration to Easement Property" form to submit to the Easement Committee for review. Please note that the southern (buffer) portion of the easement property is owned by Baltimore County, while the northern portion that contains the farm complex appears to be owned by Painters Mill Venture LLP. The application form can be found on our website at http://mht.maryland.gov. If you have any questions, please do not hesitate to submit your inquiries to the Easement Committee at mht.easement@maryland.gov.

Review by the Easement Committee will, in fact, satisfy all historic preservation requirements for this particular undertaking.

Let me know if you have any questions or need further information -

- Dixie Henry

$

Stratmeyer, Rob

From: Christopher Aadland -DNR- <christopher.aadland@maryland.gov>
Sent: Friday, October 21, 2022 5:10 PM
To: Boone, Ginny
Subject: [EXTERNAL] MDDNR Fisheries Scoping Information for the Red Run 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 Red Run which is classified as a Use III (with records of brown or rainbow trout) stream. If any impacts to this stream are anticipated then there would be a October 1st through April 30th 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

--

CHANGING Maryland for the Better
dnr.maryland.gov

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

MDDNR Environmental Review Common Time of Year Restrictions

Stream Use I and Use II (Where records of anadromous fish are indicated in close proximity)

Generally, no in-stream work is permitted from March 1st through June 15th of any given year to protect spawning fish.

Stream Use I and II (With records of yellow perch)

Generally, no in-stream work is permitted from February 15th through June 15th of any given year to protect spawning fish.

Stream Use III (Cold water trout stream)

Generally, no in-stream work is permitted from October 1st through April 30th of any given year to protect spawning fish.

Stream Use IV (Recreational trout stream)

Generally, no in-stream work is permitted from March 1st through May 31st of any given year to protect spawning fish.

Dredging Within Natural Oyster Bar (NOB) or leased Shellfish Bottom

No mechanical dredging or hydraulic dredging is permitted from June 1st through September 30th and December 16th through March 14th of any given year to protect oyster beds.

Dredging Outside Natural Oyster Bar (NOB) but Within 500 Yards of the NOB Leased Shellfish Bottom

For hydraulic dredging, no dredging is permitted from June 1st through September 30th of any given year to protect oyster beds.

For, mechanical dredging no dredging is permitted from June 1st through September 30th and December 16th through March 14th of any given year to protect oyster beds.

Dredging Within 500 Yards of SAV Beds

Where SAV has been present within the past 5 years, no dredging is permitted from April 15th through October 15th of any given years to protect SAV beds.

Other SAV Impacts

In general, the Department does not support the construction of piers over 6 foot wide or platforms built over existing SAV beds.

Waterfowl Concentration Area Impacts

No instream construction activity with the boundaries of a Historic Waterfowl Concentration Area should occur from November 15th through March 1st of any given year to protect overwintering waterfowl, except for pier construction less than or equal to150 feet in length, revetments less than or equal to 375 feet in length, bulkheads less than or equal to 350 feet in length, and marsh restorations less than or equal to 375 feet in length.

APPENDIX C:
COST ESTIMATES

Red Run Trail Feasibility Study

Option 1

Roadway Costs						
Item No.	**Description**	**Unit**	**Quantity**	**Unit Cost**	**Total Cost**	**Notes**
	Shared-Use Path	LANE-MI	1.58	$ 1,000,000.00	$ 1,578,282.83	SHA Cost Estimating Guide
	Mill and Overlay Existing Roadway	LANE-MI	0.29	$ 100,000.00	$ 28,748.42	SHA Cost Estimating Guide
	Utility Pole Impact	EA	9	$ 13,000.00	$ 117,000.00	SHA Cost Estimating Guide
	New Bridge Structures	SF	4,160	$ 320.00	$ 1,331,200.00	SHA Cost Estimating Guide
	New Boardwalk Structures	SF	1,950	$ 274.00	$ 534,300.00	
	Stream Mitigation**	LS	1	$ 700,000.00	$ 700,000.00	SHA Cost Estimating Guide
Subtotal 1					$ 4,289,531.25	
Contingent Categories						
	Category 1: Preliminary, MOT		30%	$ 4,289,531.25	$ 1,286,859.38	40% of Subtotal 1
	Category 3: Drainage		20%	$ 4,289,531.25	$ 857,906.25	45% of Subtotal 1
	Category 7: Landscaping		12%	$ 4,289,531.25	$ 514,743.75	10% of Subtotal 1
	Category 8: Utilities		11%	$ 4,172,531.25	$ 471,848.44	15% of Subtotal 1
Subtotal 2					$ 7,420,889.06	
	Contingency		40%		$ 2,968,355.63	40% of Subtotal 2
Feasibility Level Cost*					$ 10,389,244.69	
Rounded Value*					$ 10,400,000.00	

Red Run Trail Feasibility Study

Option 2

Roadway Costs						
Item No.	**Description**	**Unit**	**Quantity**	**Unit Cost**	**Total Cost**	**Notes**
	Shared-Use Path	LANE-MI	1.45	$ 1,000,000.00	$ 1,452,888.26	SHA Cost Estimating Guide
	Mill and Overlay Existing Roadway	LANE-MI	0.29	$ 100,000.00	$ 28,748.42	SHA Cost Estimating Guide
	New Bridge Structures	SF	2,915	$ 320.00	$ 932,800.00	SHA Cost Estimating Guide
	New Boardwalk Structures	SF	8,450	$ 274.00	$ 2,315,300.00	
	Stream Mitigation**	LS	1	$ 700,000.00	$ 700,000.00	SHA Cost Estimating Guide
Subtotal 1					$ 5,429,736.68	
Contingent Categories						
	Category 1: Preliminary, MOT		30%	$ 5,429,736.68	$ 1,628,921.00	40% of Subtotal 1
	Category 3: Drainage		20%	$ 5,429,736.68	$ 1,085,947.34	45% of Subtotal 1
	Category 7: Landscaping		12%	$ 5,429,736.68	$ 651,568.40	10% of Subtotal 1
	Category 8: Utilities		11%	$ 5,429,736.68	$ 597,271.03	15% of Subtotal 1
Subtotal 2					$ 9,393,444.46	
	Contingency		40%		$ 3,757,377.78	40% of Subtotal 2
Feasibility Level Cost*					$ 13,150,822.24	
Rounded Value*					$ 13,200,000.00	

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

Submitted to: