

National Park Service  
US Department of the Interior

George Washington Memorial Parkway  
Arlington and Fairfax Counties, Virginia



# George Washington Memorial Parkway North Section Rehabilitation Environmental Assessment

June 2018



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## PROJECT SUMMARY

The National Park Service (NPS), in cooperation with the Federal Highway Administration (FHWA) – Eastern Federal Lands Highway Division (EFLHD) and National Capital Planning Commission (NCPC), proposes to rehabilitate the north section of the George Washington Memorial Parkway (GWMP) from Spout Run to Interstate 495 (I-495)/Capital Beltway (the proposed action). This project is being undertaken to repair and rehabilitate deteriorating aspects of the roadway and implement safety improvements in a balance with preserving the cultural and historical characteristics of the GWMP. The rehabilitation of the north section of the GWMP includes: 1) reconstructing the asphalt pavement and constructing new concrete curbs; 2) replacing and adding drainage inlets and culverts; 3) stabilizing erosion at drainage outfalls; 4) improving safety along the Parkway; 5) improving safety with options for crashworthy roadside barriers; 6) reconfiguring and improving safety at the Route 123/GWMP interchange; and 7) other project elements including construction of emergency turnarounds, minor rehabilitation of the two scenic overlooks, short extensions of acceleration and deceleration lanes, installation of conduits and manholes for future Intelligent Transportation Systems (ITS), and installation of stormwater management (SWM) facilities consistent with Virginia Department of Environmental Quality (VDEQ) requirements.

This environmental assessment (EA) analyzes the potential environmental impacts that would result from the implementation of these actions. This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the regulations of the Council on Environmental Quality (CEQ) for implementing the Act (40 Code of Federal Regulations [CFR] 1500-1508), the NPS Director's Order (DO)-12 (*Conservation Planning, Environmental Impact Analysis, and Decision-making*) (NPS 2001) and the NPS NEPA Handbook (NPS 2015a). Additionally, in accordance with the requirements of Section 106 of the National Historic Preservation Act (54 United States Code [U.S.C.] 306108) of 1966 and implementing regulations (36 CFR 800), the NPS will consider the impacts of this undertaking to historic properties in a separate, but parallel process.

### NOTE TO REVIEWERS AND RESPONDENTS

Comments on this EA may be submitted electronically at the NPS Planning, Environment and Public Comment (PEPC) website (<http://parkplanning.nps.gov/gwmp>) or you may mail written comments by July 14, 2018 to the address listed below.

Before including personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Attn: Superintendent  
George Washington Memorial Parkway  
c/o Turkey Run Park  
McLean, Virginia 22101

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- Appendix A – Wall Safety Risk Assessment (2018)
- Appendix B – Draft Programmatic Agreement (2018)
- Appendix C – Locations of the Outfalls

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## ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Properties
AASHTO	American Association of State Highway Transportation Officials
ARPP	Archeological Resource Protection Plan
CIA	Central Intelligence Agency
CCC	Civil Conservation Corps
CFR	Code of Federal Regulations
CEQ	Council on Environmental Quality
CLI	Cultural Landscape Inventory
DOI	Department of the Interior
dbh	diameter at breast height
DO	Director's Order
DC	District of Columbia
DC HPO	District of Columbia Historic Preservation Office
DDOT	District Department of Transportation
EA	environmental assessment
EPA	Environmental Protection Agency
EFLHD	Eastern Federal Lands Highway Division
FCAS	Fairfax County Archaeological Services
FCPA	Fairfax County Parks Authority
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GIS	geographic information systems
GWMP	George Washington Memorial Parkway
GHG	greenhouse gas
ITS	Intelligent Transportation Systems
I-495	Interstate 495
LOD	limits of disturbance
MASH	Manual for Assessing Safety Hardware
MHT	Maryland Historical Trust
MSHA	Maryland State Highway Administration
MVMH	Mount Vernon Memorial Highway

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ACHP	Advisory Council on Historic Properties
NCPC	National Capital Planning Commission
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
Parkway	George Washington Memorial Parkway
PEPC	Planning, Environment and Public Comment
PHT	Potomac Heritage Trail
PA	Programmatic Agreement
STP	shovel test pit
SWM	stormwater management
TL	Test Level
TMP	transportation management plan
US	United States
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
U.S.C.	United States Code
USPP	United States Park Police
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation
VMRC	Virginia Marine Resources Commission
VRA	Visual Resource Assessment
VRI&A	Visual Resource Inventory and Assessment
WMATA	Washington Metropolitan Area Transit Authority

## CHAPTER 1: PURPOSE AND NEED

The National Park Service (NPS), in cooperation with the Federal Highway Administration (FHWA) – Eastern Federal Lands Highway Division (EFLHD) and National Capital Planning Commission (NCPC), proposes to rehabilitate the north section of the George Washington Memorial Parkway (GWMP or “Parkway”<sup>1</sup>) from Spout Run to Interstate 495 (I-495)/Capital Beltway. **Figure 1** shows the project limits and general vicinity of the study area.

This project is being undertaken to repair and rehabilitate deteriorating aspects of the roadway and implement safety improvements in a balance with preserving the cultural and historical characteristics of the GWMP. The rehabilitation of the north section of the GWMP (the proposed action) includes: 1) reconstructing the asphalt pavement and constructing new concrete curbs; 2) replacing and adding drainage inlets and culverts; 3) stabilizing erosion at drainage outfalls; 4) improving safety along the Parkway; 5) improving safety with options for crashworthy roadside barriers; 6) reconfiguring and improving safety at the Route 123/GWMP interchange; and 7) other project elements including construction of emergency turnarounds, minor rehabilitation of the two scenic overlooks, short extensions of acceleration and deceleration lanes, installation of conduits and manholes for future Intelligent Transportation Systems (ITS), and installation of stormwater management (SWM) facilities consistent with Virginia Department of Environmental Quality (VDEQ) requirements.

This environmental assessment (EA) analyzes the potential environmental impacts that would result from the implementation of these actions. This EA considers the public and agency comments received on the EA released for public review in 2008 prior to the project being placed on hold for additional study. Furthermore, the NPS and FHWA are also working with the Virginia Department of Transportation (VDOT), Maryland State Highway Administration (MSHA), District Department of Transportation (DDOT), Montgomery County, Maryland, Fairfax County, Virginia, and Arlington County, Virginia to evaluate maintenance of traffic and how to best minimize impacts on public transportation resulting from construction activities.

This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the regulations of the Council on Environmental Quality (CEQ) for implementing the Act (40 Code of Federal Regulations [CFR] 1500-1508), the NPS Director’s Order (DO)-12 (*Conservation Planning, Environmental Impact Analysis, and Decision-making*) (NPS 2001) and the NPS NEPA Handbook (NPS 2015a). Additionally, in accordance with the requirements of Section 106 of the National Historic Preservation Act (54 United States Code [U.S.C.] 306108) of 1966 and implementing regulations (36 CFR 800), the NPS will consider the impacts of this undertaking to historic properties in a separate, but parallel process.

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<sup>1</sup> GWMP refers to the National Park unit. The term Parkway refers to the scenic roadway.

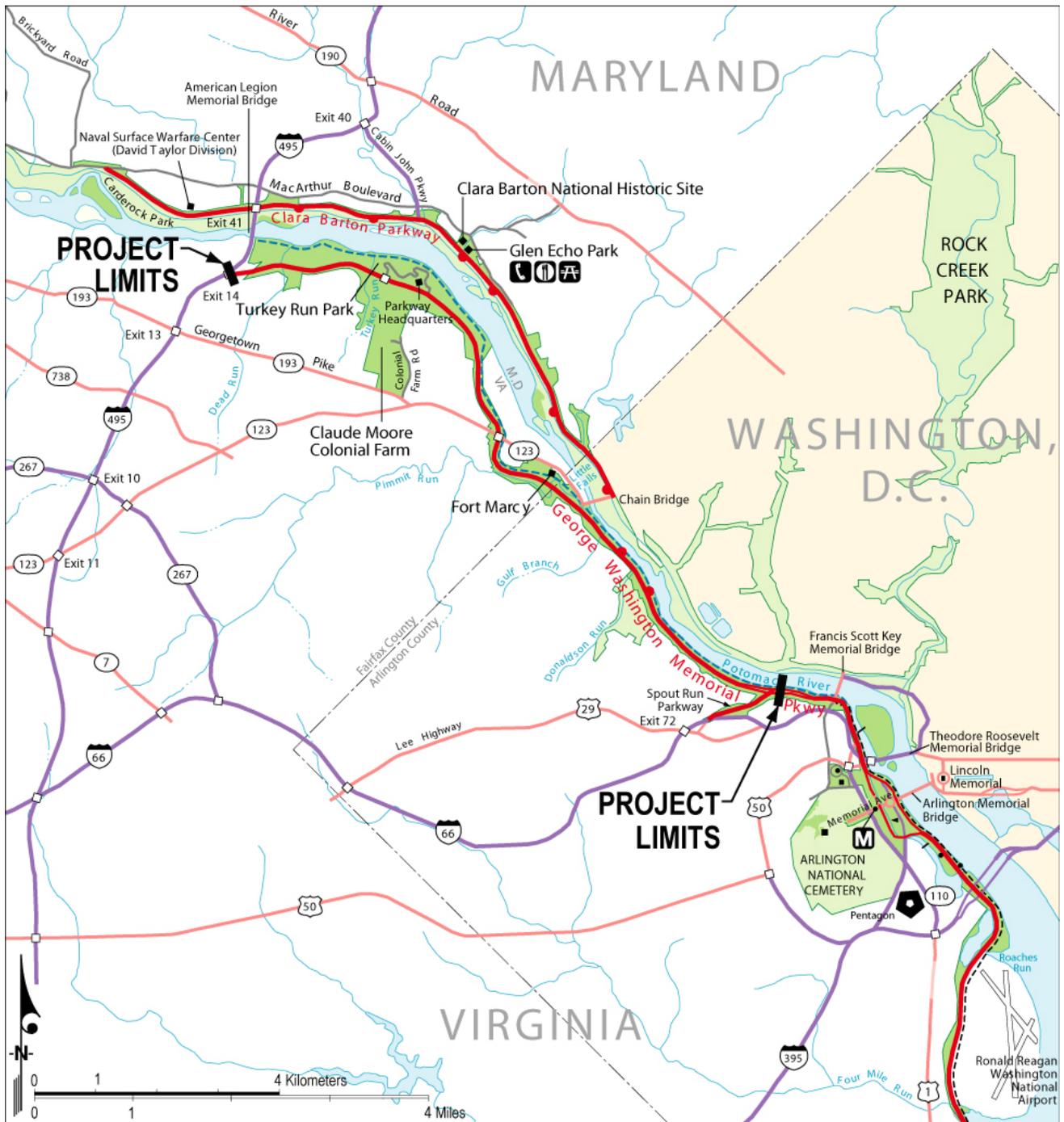


Figure 1. General Vicinity Map including Project Limits

## PURPOSE OF THE ACTION

The purpose of this proposal is to 1) rehabilitate and repair the roadway and related transportation assets and implement safety improvements along the 7.6 miles of the Parkway between Spout Run and I-495/Capital Beltway, and 2) improve existing roadway geometry and safety features along the entire roadway within the project limits, including at the Route 123/GWMP interchange, Central Intelligence Agency (CIA) interchange, and GWMP Headquarters/United States Park Police (USPP) entrance. This rehabilitation project would not increase the existing Parkway traffic capacity, and would be a multi-year, phased construction project implemented based on available funding.

## NEED FOR THE ACTION

The rehabilitation of the north section of the Parkway is needed to help preserve the historic parkway for future generations, improve the visitor experience, enhance maintenance/enforcement operations, address erosion and safety concerns at drainage outfalls, and facilitate safe driving conditions. The project need stems from the age and heavy use of GWMP infrastructure that has resulted in deterioration of the roadway and drainage system (**Figure 2**).



**Figure 2. Examples of the project need (left photo – drop inlet in roadway, middle photo – stone wall in need of repair, and right photo – collapsed drainage pipe)**

The following conditions contribute to the need for a comprehensive rehabilitation:

- The pavement within the project area contains potholes, cracks, and settlement. The curb along the Parkway has deteriorated.
- Existing soil shoulders have been damaged because of improper drainage, plowing, and frequent pull-off by cars.
- The existing drainage system does not drain the road surface effectively, which causes hazardous driving conditions due to stormwater ponding on the road surface. Also, some of the existing drop inlets are deteriorating.
- The historic stone masonry guardwalls do not meet current safety requirements.
- Acceleration and deceleration lanes are inadequate at certain locations along the Parkway, such as the GWMP Headquarters/USPP entrance. These conditions make entering and exiting these areas difficult during peak travel periods.
- Erosion is occurring at most of the drainage outfalls and has caused deep gullies along steep slopes that present a safety concern and have resulted in resource-related impacts.

- The existing configuration of the Route 123/GWMP interchange presents a safety concern. There are three clover-leaf ramps from the Parkway to Route 123 that have tight geometry and the deceleration lane length is inadequate.
- Other needs include emergency turnarounds to improve maintenance and USPP response to incidents on the north end of the GWMP and installation of conduits and manholes to accommodate future ITS infrastructure.

## PURPOSE AND SIGNIFICANCE OF THE PARKWAY

The GWMP was developed as a scenic parkway to help preserve the Potomac River Gorge and shoreline while serving as a memorial to the first president of the United States (US), George Washington. The GWMP was designated a National Park Unit in 1933. The first section, called the Mount Vernon Memorial Highway (MVMH), was completed between the City of Alexandria and the Mount Vernon estate in 1932 to commemorate the bicentennial of George Washington's birth. As the MVMH was being completed, on May 29, 1930, President Herbert Hoover signed what became known as the Capper-Cramton Act, authorizing funds for the GWMP "to include the shores of the Potomac, and adjacent lands, from Mount



**Figure 3. 1959 photograph of the Parkway with views to the Key Bridge and Washington Monument (courtesy of the NPS Museum Resource Center)**

Vernon to a point above the Great Falls on the Virginia side, including the protection and preservation of the natural scenery of the Gorge and the Great Falls of the Potomac, the preservation of the historic Patowmack Canal, and the acquisition of that portion of the Chesapeake and Ohio Canal below Point of Rocks" (Public Law 71-284, as found in Mackintosh 1996). This Act subsumed MVMH as a part of the GWMP and proposed the protection of the northern and southern shores of the Potomac River. **Figure 3** is a representative photograph of the views that still exist today.

Today, the GWMP extends from I-495/Capital Beltway at the northern end to Mount Vernon in Virginia, at the southern end. The Parkway is a key transportation artery in northern Virginia, providing access to Washington, District of Columbia (DC), Arlington County, Fairfax County, and the City of Alexandria. Thus, many residents consider the Parkway a commuter route; however, the Parkway offers travelers much more than convenience. The GWMP is a scenic, historic, and recreational setting away from the nearby urban pressures of metropolitan Washington, DC. Set parallel to the scenic Potomac River Gorge and across from Washington, DC, the Parkway has remarkable vistas of the Potomac River Gorge, Washington Monument, and the Lincoln Memorial. The Parkway links a group of parks and sites that provide a variety of experiences to more than 10 million people per year supporting recreational, educational, and celebratory events.

The Parkway was designed as both a transportation route and a means to preserve and enhance the natural scenic qualities and cultural attributes along the Potomac River (Mackintosh 1996). The Parkway idea came about as several influences that combined in the early-20th century, including the rising use of the automobile, the suburbanization of the Washington metropolitan area, the City Beautiful movement, and the popularity of outdoor recreation and ideals of conservation (Leach 1990).

Following the passage of the Capper-Cramton Act, progress on the Parkway proceeded slowly for the first two decades, partly due to the Great Depression and then World War II. During this time, Frederick Law Olmsted, Jr. worked on the design of the Parkway with other landscape architects, including those from the National Capital Parks and Planning Commission and the US Commission of Fine Arts, as land acquisition continued. It was not until the mid-1950s that notable progress began on the Parkway resulting in part because of the plans to move the CIA to Fairfax County. By 1959, the road was completed north to the CIA interchange (Mackintosh 1996). By the end of 1962, the Parkway opened to traffic from the recently completed section of the new Capital Beltway. Although originally envisioned as extending to Great Falls, the Parkway never reached beyond the Capital Beltway.

The original section of the GWMP, the MVMH, was listed in the National Register of Historic Places (NRHP) in 1981 under criterion B for its commemoration of George Washington and under criterion C for landscape architecture (NPS 1981). The north section of the GWMP was listed in the NRHP in 1995 under the same criteria, and the NPS has prepared a draft for an updated NRHP nomination including Criterion A for national planning and memorialization significance (Draft NR Nomination: George Washington Memorial Parkway Historic District, August 2017). **Figure 4** is a photograph of a notable scenic view from the Parkway.



**Figure 4. A significant feature of the GWMP are the views to the Potomac River Gorge, Georgetown waterfront, and Washington, DC monumental core.**

## PROJECT BACKGROUND AND PLANNING

The greater part of the south section of the GWMP, including the MVMH and a section of the Parkway between Theodore Roosevelt Bridge and Spout Run, has been upgraded in a series of projects over the last 30 years. Past rehabilitation included pavement rehabilitation or reconstruction, reconstruction of concrete curb and gutter, and various other drainage and safety enhancements. The rehabilitation of the north section of the GWMP would upgrade this section using a more context sensitive approach than the previously rehabilitated south section of the Parkway. Furthermore, the NPS has identified ways to minimize the potential changes to the historic stone masonry guardwalls.

A proposal for the rehabilitation of the north section of the Parkway was previously analyzed in an EA released in 2008 (NPS 2008). The 2008 EA analyzed a no-action and a preferred alternative with different options for the reconfiguration of the Route 123/GWMP interchange and roadside barriers to

meet FHWA safety requirements. Due to public and agency concerns, the NEPA and Section 106 processes were not finalized as the NPS and FHWA found it necessary to gather more data on vehicular safety, cultural landscapes, and scenic resources prior to making any further decisions regarding the project. Since 2008, the NPS and FHWA have worked together to complete several studies including a Wall Safety Risk Assessment (FHWA 2018), Visual Resource Inventory and Assessment (VRI&A) (NPS 2014a), and two Cultural Landscape Inventory (CLI) reports (NPS 2009, 2015b).

In 2009, and subsequently updated in 2015, the NPS completed a CLI for the north section of the GWMP. The CLI identifies and documents each landscape's location, size, physical development, condition, landscape characteristics, character-defining features, and other valuable information useful to park management. The CLI is a resource for assessing the potential project impacts, and more information is provided in the *Cultural Landscapes* section of this EA.

In 2010, the FHWA conducted a Wall Safety Risk Assessment to facilitate addressing the need to improve safety and infrastructure conditions on the GWMP while preserving the scenic, aesthetic, and historic resources. The Wall Safety Risk Assessment takes into consideration various criteria, or risk factors, associated with each of the historic stone masonry walls. For the purposes of this EA, a "wall" evaluated as part of the safety risk assessment is defined as the 69 existing stone structures on the north section that range in height from 9 to 18 inches, with the average height between 16 to 18 inches, and length from 40 feet to 740 feet. This assessment presented an evaluation of the overall safety risk of the north section of the Parkway as well as how prone a given wall location is to risk. This information allowed the study team to understand a relative ranking and priority of the walls that present the highest risk to public safety. To support this EA, FHWA updated the Wall Safety Risk Assessment using the crash data from 2006-2012 (2013-2015 data were not available).

In 2014, a detailed VRI&A was conducted that primarily assessed views south of Glebe Road. The purpose of the VRI&A was to identify scenic vistas along the north section of the Parkway and to assess the relative rank and scenic value of the vistas. Assessments were completed using the Visual Resource Assessment (VRA) framework developed by the NPS and implemented for other NPS units, such as Blue Ridge Parkway and Yosemite's front country roads and trails. The VRA framework is transparent and a replicable means of ranking relative scenic qualities of numerous vistas. More detailed information on NPS methods and GWMP visual resources can be found in the *Visual Resources* section of this EA.

In October 2017, the FHWA and NPS re-evaluated the data in the Wall Safety Risk Assessment and how the walls were categorized based on their safety risk. In November 2017, the NPS met with FHWA in a small working group format to discuss opportunities to reduce impacts to the walls associated with superior and high value views/vistas as identified through the VRI&A process, as well as through the CLI. The goal of this working group was to re-evaluate the data and risk categories, identify additional safety countermeasures that could supplement the option of wall alteration as a safety improvement strategy, create a decision tree to guide the evaluation process, and collaboratively work through decisions addressing safety concerns at those walls under specific rankings. During December 2017 and January 2018, additional field work and two meetings were held to review new design visualizations and the findings from the working group. These joint efforts allowed the working group to determine a path forward for a more defined barrier modification approach for this project. The 2018 Wall Safety Risk Assessment is included in **Appendix A**.

Some of the proposed project elements presented in the 2008 EA remain similar; however, as discussed previously, the NPS and FHWA have completed a risk-based wall-by-wall evaluation to repair and/or replace the historic stone masonry guardwalls with crashworthy roadside barriers, where needed, based on the potential safety risk, significance of the viewsheds, and historic character of the walls as a contributing feature to the Parkway. Another change from the 2008 EA is the Parkway requires full pavement reconstruction instead of mill and overlay. Due to changes in regulations since 2008, the NPS will also consider installation of SWM facilities consistent with VDEQ requirements.

In the early 1990s, as planning was underway for rehabilitation of the north-central section of the Parkway, and prior to the current proposed undertaking, a Programmatic Agreement (PA) between the NPS, the Advisory Council on Historic Preservation (ACHP), the Virginia Department of Historic Resources (VDHR), the DC State Historic Preservation Office (DC HPO), and the Maryland Historical Trust (MHT) was executed on August 25, 1993. The 1993 PA described in detail the terms that the NPS must comply with to fulfill its responsibilities under Section 106 of the National Historic Preservation Act of 1966 (NHPA) and the ACHP's regulations for undertakings that occur within the GWMP related to roadway rehabilitation for the north section of the Parkway.

Subsequently, a temporary amendment to the PA was developed in 1997 as part of the mitigation required for impacts associated with emergency installation of temporary median barriers (W-beam guardrail on certain sections of the roadway and F-shaped [Jersey] barriers on the bridges) and other safety improvements on the Parkway. This PA has expired and the NPS has reinitiated the Section 106 process and a new project PA is under development. In this 2018 PA, the NPS outlines the approach to continued consultation under Section 106. The 2018 Draft PA is included in **Appendix B**.

As a part of the NEPA process, and to comply with the requirements of Section 106 of the NHPA, the NPS involved the public in project planning by holding a formal scoping period to give the community a chance to learn about the project and provide feedback. The scoping newsletter, press release, and the NPS Planning, Environment and Public Comment (PEPC) website included notification of the public scoping period, which was held between June 3, 2016 and July 8, 2016. A public scoping meeting was held on June 15, 2016 at the Turkey Run Park Headquarters at 700 George Washington Memorial Parkway in McLean, Virginia.

## **ISSUES IDENTIFIED DURING SCOPING AND RESOURCE TOPICS RETAINED FOR DETAILED ANALYSIS**

The NPS, participating agencies and stakeholders, and members of the public identified issues and concerns during scoping. In the context of NEPA, "issues" or "environmental issues" can be problems, concerns, conflicts, obstacles, or benefits that would result if the proposed action or alternatives, including the no-action alternative, are implemented (NPS 2015a). Substantive issues were retained for detailed analysis and are organized by "resource topic," which represent resources that would be affected if the alternatives under consideration are implemented and are discussed in chapter 3, Affected Environment and chapter 4, Environmental Consequences of the EA. Other issues were considered by the NPS but were ultimately dismissed from detailed analysis because they were determined not central to the proposal or not of critical importance to the decision.

## Issues Retained for Detailed Analysis

During scoping, the following project issues were determined by the NPS to warrant a more detailed analysis. Relevant laws and policies are also briefly discussed for each issue when applicable. After the description of each issue, the reader will be provided with the “resource topic” where the issue will be addressed in the EA.

**Balancing roadway design requirements to enhance safety with impacts to GWMP’s cultural resources.** To implement safety enhancements, certain changes to the Parkway’s original design are needed, such as potential changes to the stone masonry guardwalls. The issue lies with how to best accomplish safety enhancements on the Parkway while avoiding or minimizing impacts to park resources to the extent possible. The NPS seeks to achieve an acceptable balance between safety improvements in accordance with the American Association of State Highway Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets (Greenbook)* and the AASHTO *Roadside Design Guide* and adverse impacts to the Parkway’s historic character, natural resources, and scenic vistas. Therefore, the potential impacts to park resources from safety enhancements are analyzed under the *Cultural Landscapes, Archeological Resources, Aesthetics and Visual Resources*, and *Visitor Use and Experience* resource topics.

**Construction activities and access to implement drainage improvements and outfall repairs could impact natural and cultural resources.** The Parkway runs parallel to the Potomac River, but is separated from the river by steep bluffs. Drainage of the Parkway is collected by drop inlets, diverted through pipe culverts, and discharged at the culvert outfalls. In some cases, these pipe culverts are 40 to 50 feet below the roadway grade. Access for repairs will require clearing of vegetation and potential soil grading that may disturb the rare plant species eastern buttercup phacelia (*Phacelia covillei*), which is a Virginia critically imperiled and globally vulnerable species (G3, S1), as well as archeological resources (NatureServe 2016). In addition, with the construction of access routes, ground disturbance could allow for the introduction of invasive plant species, such as Japanese stiltgrass (*Microstegium vimineum*). Therefore, potential impacts resulting from drainage improvements, including construction access for outfall repairs, are analyzed under the *Archeological Resources, Surface Waters*, and *Vegetation including Rare Plants* resource topics.

**Reconstruction of the Parkway pavement and implementation of other improvements could cause traffic delays and changes in traffic patterns.** Full reconstruction of the Parkway pavement is needed to repair the roadway surface. During pavement reconstruction, curbs would be replaced and additional drop inlets added. This construction would require that the NPS maintain traffic to the maximum extent practicable using lane closures. Detours, shifts in traffic patterns, and temporary roadway closures of the Parkway would be necessary and would cause delays for Parkway visitors and commuters who use GWMP to gain access into Washington, DC, as well as parts of Maryland and northern Virginia. In addition, numerous commenters expressed traffic congestion concerns regarding the timing of construction with other regional projects such as the Metrorail capital improvements. Therefore, potential traffic impacts resulting from construction are analyzed under the *Transportation* and *Visitor Use and Experience* resource topics.

**Implementation of new stormwater regulations could result in changes to the landscape.** Recently approved stormwater regulations require the installation of SWM facilities consistent with VDEQ requirements, such as grass bioswales. These new SWM facilities would require earth disturbance and slight changes to topography to improve drainage. These actions have the potential to disturb areas of high archeological potential and add new elements to the cultural landscape. Therefore, potential impacts resulting from implementation of stormwater practices are analyzed under the *Archeological Resources* and *Cultural Landscapes* resource topics.

**Construction activities associated with the project have the potential to impact sensitive wildlife species on the Parkway.** The reconstruction of the pavement and outfall repairs will result in temporary and localized disturbance for extended periods of time that could affect wildlife along the Parkway. At the time of this EA, it is known that an active bald eagle nest exists in the median of the Parkway. Bald eagles (*Haliaeetus leucocephalus*) are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Several species of migratory birds are also prevalent in the study area and are protected under the Migratory Bird Treaty Act of 1918. Lastly, the US Fish and Wildlife Service (USFWS) identified that the federally threatened northern long-eared bat (*Myotis septentrionalis*) and the federally endangered Indiana bat (*Myotis sodalis*) have the potential to occur in the project area. Therefore, potential impact to these species are analyzed under the *Wildlife* resource topic.

## ISSUES DISMISSED FROM FURTHER ANALYSIS

NPS considered the following issues and concerns identified during scoping. These issues were determined to not warrant further consideration. A brief justification for the dismissal of each issue is provided. In addition, several resource topics were evaluated in detail in the 2008 EA. The “Using Existing NEPA Analysis” section presented in the NPS NEPA Handbook (2015) states that CEQ and Department of the Interior (DOI) NEPA regulations encourages the use of existing NEPA analysis to the extent possible and appropriate to reduce unnecessary analysis and paperwork (1502.20; 1502.21; 46120). As a result, certain resource topics such as *Soils*, *Geological Hazards*, *Water Quality*, and *Park Operations* were determined to not be issues that are central to the proposal or of critical importance to the decision based on past public review and analysis in the 2008 EA. Existing conditions for these resources have not substantially changed from the past analysis presented in the 2008 EA. Rationale for dismissal of other resource topics such as *Wetlands*, *Air Quality*, and *Noise* is also described previously in the 2008 EA.

### Issues and Concerns Dismissed from Further Analysis

**The proposed action would generate air emissions above ambient levels.** In the previous 2008 EA, commenters expressed concern with the potential impacts of traffic on air quality. The proposed action would not increase the roadway capacity. Traffic circulation would be improved by correcting inadequate geometric conditions in several locations. Thus, the proposed action would not have a measurable change in emissions or noticeable long-term impacts on ambient air quality at a local or regional level; therefore, *Air Quality* was dismissed from detailed analysis in this EA.

**The proposed action would have the potential to disproportionately impact minority or low-income populations.** Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental impacts of their programs and policies on minorities and low-income populations and communities. The DOI implements this executive order by requiring its bureaus to explicitly discuss environmental justice in their environmental documents (DOI 1995). According to the Environmental Protection Agency (EPA), environmental justice is the

*“...fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies” (EPA 2015).*

The goal of ‘fair treatment’ is not to shift risks among populations, but to identify potentially disproportionately high and adverse impacts and identify alternatives that may mitigate these impacts. There are no to very few minority and low-income populations near the study area and furthermore, concerns related to environmental justice have been dismissed from further study in this EA because:

- The planning team actively solicited public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- Implementation of the proposed alternative would not result in any identifiable adverse human health impacts. Therefore, there would be no direct or indirect adverse impacts on any minority or low-income population.
- The impacts associated with implementation of the proposed alternative would not disproportionately affect any minority or low-income population or community.
- Implementation of the proposed alternative would not result in any identified impacts that would be specific to any minority or low-income community.

**The proposed action could impact lands held in trust by the Secretary of the Interior for the benefit of Indians.** No lands held in trust for the benefit of Indians have been identified within the study area for the GWMP North Section Rehabilitation project.

## CHAPTER 2: ALTERNATIVES

This chapter describes the NPS's alternatives for the GWMP North Section Rehabilitation project. Alternatives for this project were developed to resolve potential issues associated with safety, drainage, cultural resources, natural resources, traffic, and the aesthetic quality of the viewsheds. In addition, those alternatives that were considered, but dismissed are presented.

### ALTERNATIVE A: NO-ACTION

The no-action alternative describes the action of continuing the present management operations and conditions. It does not imply or direct discontinuing the present action or removing existing uses, development, or facilities. The no-action alternative provides a basis for comparing the management direction and environmental consequences of the action alternative. Should the no-action alternative be selected for implementation, the NPS would respond to future needs and conditions associated with the roadway, guardwalls and guardrails, and the Route 123/GWMP interchange without significant actions or changes in present course.

Under the no-action alternative, the NPS would continue management actions that would include minimum rehabilitation of the Parkway to maintain its existing condition and character. In general, it is anticipated that the level of maintenance (e.g., patching), as well as the recurrence rate of maintenance, would be expected to increase. Existing drainage inlets would remain, and ponding would continue to occur. Curbs would continue to deteriorate. The existing roadside walls would continue to not meet current FHWA safety standards for crashworthiness. In some instances, the existing stone masonry walls are in poor condition, but recent repair and rehabilitation has taken place over the past few years improving wall conditions. Increased maintenance would be needed to repair road potholes and damaged stone masonry walls. The Route 123/GWMP interchange would remain below-recommended stopping time and area to merge when exiting the Parkway southbound onto Route 123. At many of the outfall structure locations, repairs would be minimal to correct erosion that present future safety concerns. Erosion would continue to impact park resources. Acceleration and deceleration lanes at the CIA interchange and GWMP Headquarters/USPP entrance would remain below-recommended lengths given the Parkway design speed. Inadequate stopping and merging distances would persist. The pavement on the Parkway including the overlooks would remain in poor condition. During emergency incidents, such as significant snow events or automobile crashes, designated turnaround areas would not be available to support USPP or GWMP maintenance personnel with incident management. No new conduit and manholes for future ITS would be available. No additional SWM facilities would be needed.

### ALTERNATIVE B (PROPOSED ACTION AND NPS PREFERRED ALTERNATIVE)

Alternative B represents the NPS's preferred alternative and defines the rationale for the action in terms of resource protection and management, visitor and operational use, costs, and other applicable factors. Under alternative B, the NPS in cooperation with the EFLHD, would implement a series of roadway, drainage, and ramp improvements on the Parkway from Spout Run to I-495/Capital Beltway. The

rehabilitation of the north section of the GWMP includes: 1) reconstructing the asphalt pavement and constructing new concrete curbs; 2) replacing and adding drainage inlets and culverts; 3) stabilizing erosion at drainage outfalls; 4) improving safety along the Parkway; 5) improving safety with options for crashworthy roadside barriers; 6) reconfiguring and improving safety at the Route 123/GWMP interchange; and 7) other project elements including construction of emergency turnarounds, minor rehabilitation of the two scenic overlooks, short extensions of acceleration and deceleration lanes, installation of conduits and manholes for future ITS, and installation of SWM facilities consistent with VDEQ requirements. The NPS would phase the proposed action over an extended period as funding is appropriated and would implement transportation management plans (TMPs) for each section.

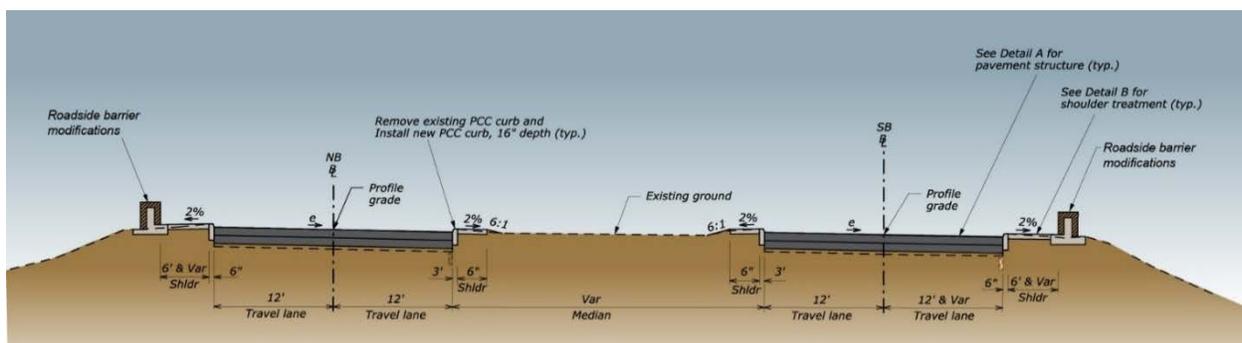
The components of alternative B are generally described throughout this EA in the following order: roadway rehabilitation; acceleration/deceleration lane extensions; roadside barrier modifications; outfall structure repairs; Route 123/GWMP interchange reconfiguration, which includes two build options; and other project elements, including ITS infrastructure, SWM facilities consistent with VDEQ requirements, emergency turnarounds, etc. In addition, construction activities are described separately when applicable because they generally refer to all project components and have similar short-term impacts.

## Roadway Rehabilitation

**Pavement Reconstruction.** Alternative B would include full pavement reconstruction on the northbound and southbound sides of the Parkway from Spout Run to I-495/Capital Beltway.

**Shoulder Stabilization.** Alternative B would include reconstruction of existing unpaved shoulders (6 to 10 feet on outside and 6 to 8 feet on median side) on the Parkway with an aggregate-topsoil mixture and either seeded or laid with sod. In areas of sensitive resources and steep slopes, the width may be reduced to 3 feet. The current estimate for stabilization includes approximately 95,000 square yards of unpaved shoulders on both the inside and outside lanes over the entire length of the project.

**Figure 5** displays key elements of the roadway reconstruction, shoulder stabilization, and replacement of the curb and inlets, which is described below under *Roadway Drainage Improvements*.



e 5. Typical Cross Section

**Roadway Drainage Improvements.** The road surface is drained by a combination of small curb openings and grate inlets, which feed into pipe culvert systems. The culvert systems then outlet into drainage channels that convey the stormwater to the Potomac River. The inlet grates extend into the travel lanes and the roadside and median ditches are drained by field inlets that tie into the same storm drain system. Alternative B would replace the curb and existing inlets as well as add inlets and curb cuts. The design spread criterion for this project is 3 feet maximum spread for the 10-year storm event. Exceptions to this criterion are being considered. Additional inlets would be installed to reduce spread to meet the design criteria. The need for additional curb inlets would be investigated during more detailed design to meet current hydraulic design standards. **Figure 6** shows a typical existing inlet on the Parkway.



**Figure 6. Current drainage grate inlet and curb opening**

### **Roadside Barriers Modification**

Stone masonry guardwalls along the shoulders and the median are the predominant type of barrier along the GWMP. These historic guardwalls are a contributing feature to the GMWP listing in the NRHP, and many walls occur in locations that give Parkway users significant views of the Potomac River, Potomac Palisades, Georgetown, and Washington, DC. These guardwalls do not have a reinforced concrete core, are lower than the FHWA recommended height of 27 inches, and have uneven or jagged sides that exceed the recommended 1-inch variation in surface; therefore, the walls do not meet current FHWA safety standards for crashworthiness. Thus, the NPS, in cooperation with the EFLHD, has completed several studies (Wall Safety Risk Assessment, VRI&A, and CLI) to assist in developing the roadside barrier modifications for consideration in this EA. The construction of new stone masonry guardwalls must also meet the Manual for Assessing Safety Hardware (MASH) requirements to prevent snagging of an impacting vehicle; so, in some cases, the walls would be flared, extended, or connected.

#### ***Selective Replacement of Historic Guardwalls with 27-inch Stone Masonry Guardwalls***

The approach to the roadside barriers modification would be to evaluate each historic stone masonry guardwall using a case-by-case design approach consistent with the 2018 PA between the NPS, FHWA, VDHR, ACHP, and other consulting parties. A draft of the 2018 PA currently under development is included in **Appendix B**. During the compliance process, the NPS examined each wall with the goal of determining the best method to minimize impacts on the GWMP while accomplishing safety objectives. For the purposes of this EA, the NPS and FHWA developed a revised Wall Safety Risk Assessment to evaluate and quantify the risk for each wall. The safety risk assessment employs a case-by-case approach that follows the guidelines established in the *NPS Barrier Inventory Program Business Practices* document for guardwall inventory and condition assessment. The assessment uses a spreadsheet to facilitate the evaluation of risk for each of the 69 walls, of which 59 walls are historic stone masonry guardwalls, in the study area. As originally presented in the 2010 Wall Safety Risk Assessment, there were three categories (high, medium, and low), and all walls, including those non-contributing (or “non-historic” walls) constructed after 1962, were lumped into these categories. A total risk score was

determined for each wall by adding the values of seven risk contributing factors: weighted crashes, speed, average daily traffic, horizontal curvature, hazard severity, length, and grade. However, based on the efforts to update the Wall Safety Risk Assessment in 2017 and 2018, several adjustments were made. FHWA reconsidered the three categories and, in response to NPS concerns, divided the medium risk category into three sub-categories (medium-high, medium-medium, medium-low) based on the three most critical safety risk factors (hazard severity, horizontal curves, and weighted crashes). The results of the 2018 Wall Safety Risk Assessment by wall and location of each wall is presented in **Appendix A**.

In addition, the NPS and FHWA collaboratively addressed safety concerns at walls under specific rankings and created a decision tree to guide the entire evaluation process. The NPS also proposed several safety countermeasures that could be implemented to further reduce the number of walls that would be altered:

- Maintenance of identified clear zone and unobstructed views of signage
- Enhanced Delineation: (a) Alert drivers in advance of high risk guardwalls with pavement markings, chevron signs, and/or dynamic signage; (b) At areas that drivers are typically in excess of advisory speed, add high friction surface treatment
- Longitudinal Rumble Strips: (a) Add rumble strips alerting drivers of lane departure (introduce a continuous groove instead of separate milled elements); (b) Add rumble strips-edgeline pavement marking to increase visibility
- Dynamic Signing: (a) Speed activated speed limit signs; (b) Speed feedback signs; and/or (c) Speed feedback signs with action message (i.e. "Your Speed XX" + "Slow Down").
- Speed Limit Reduction: Reducing the speed limit in select areas (specifically going northbound between Spout Run and Windy Run) in conjunction with other safety countermeasures.
- Temporary Automated Speed Enforcement during the Project: Mounted on law enforcement vehicles deployed at select Parkway locations in order to change driver behavior and promote awareness of speed related safety issues.

From this evaluation process, 15 walls were determined to present low risk. These walls would be repaired with no changes to height and include safety countermeasures. For walls that were identified with superior and/or high views and fell under the high, medium-high, or medium-medium risk categories (wall # 1N, 5N, 7N, 8N, 9N, 10N, 12N, and 29S), FHWA performed additional visual analyses. In addition, the team reviewed walls that were identified with superior and/or high views and fell under the medium-low risk category (wall # 2N and 3N) as part of this exercise. As a result of these analyses, and utilizing the decision tree developed as part of the aforementioned evaluation process, the following walls that were identified with superior and/or high views under the high and medium-high/medium-medium risk category would be addressed accordingly:

- 1N (high) – Repair and safety counter measures
- 5N (medium-high) – Repair and safety counter measures
- 7N (medium-high) – Raised to 27 inches
- 8N (high) – Raised to 27 inches
- 9N (high) – Repair and safety counter measures
- 10N (high) – Raised to 27 inches
- 12N (high) – Raised to 27 inches (with additional review during design at transition point)

- 29S (medium-medium) – Repair and safety counter measures

The remaining walls under the high, medium-high, and medium-medium risk categories would be raised to 27 inches (**Figure 7**). The walls under the medium-low risk category (including wall # 2N and 3N) would be repaired and include safety countermeasures. Overall, the total percentage of cumulative length of historic walls to be altered would be approximately 38%. The total percentage of cumulative length of historic walls to be preserved and repaired would be 62%.

The new 27-inch walls would be crafted in accordance with the National Cooperative Highway Research Program (NCHRP) Report 554 for Aesthetic Concrete Barrier Design and the Secretary of the Interior's Standards for Rehabilitation, using as much of the historic fabric (existing stone) as possible, with sensitivity in design by matching the rough-cut stone shape, color, size, and spatial relationship of the stones to the mortar. The design speed for the Parkway, as well as the posted speed for most of its length, is 50 miles per hour. This design speed requires the



**Figure 7. Photo rendering of 27-inch high stone masonry concrete-core guardwall**

installation of barriers that meet Test Level 3 (TL-3) safety performance standards. Barrier height is one of the primary parameters for barrier crashworthiness, and the minimum barrier height for rigid barriers that meets TL-3 criteria is 27 inches. In addition to barrier height, structural capacity is another parameter for rigid barrier crashworthiness. For structural capacity, the new stone walls along the Parkway must be constructed with a concrete core inside the walls. However, to minimize impacts to viewsheds and cultural resources, some walls would be repaired to the original pattern without the use of concrete core and include safety countermeasures, which were determined through the FHWA-NPS risk assessment as discussed previously in this section.

### ***Other Barrier Modifications***

In addition to the options being considered for the existing stone masonry guardwalls, another type of barrier found along the Parkway is the corten steel W-beam guardrail that separates the northbound and southbound roadways where the median width is 20 feet or less. This barrier type is functional and effective for highway use, but was installed on an emergency basis, is not of the typical historic barrier style of parkway architecture and is classified as temporary by the NPS. The proposed action would include replacement of the existing W-beam guardrails with 27-inch steel-backed timber guardrails (**Figure 8**). The existing Jersey barriers on the Glebe Road, Gulf Branch, Donaldson Run, and Windy Run bridges would be replaced with stone masonry guardwalls.



**Figure 8. Two photos illustrating the placement of steel backed timber guardrail on the Parkway that would replace W-beam guardrails and Jersey barriers**

### **Acceleration/Deceleration Lanes Extension**

Alternative B would include constructing or extending acceleration/deceleration lanes at different locations along the north section of the Parkway. Plans would include extending acceleration/deceleration lanes at the GWMP Headquarters/USPP entrance. The GWMP Headquarters/USPP entrance currently provides a short deceleration lane/taper combination of approximately 150 feet on the northbound side of the Parkway for ingress right turns. In the southbound direction, a 175-foot deceleration lane/taper combination serves left turns to the GWMP Headquarters/USPP entrance. Vehicles making a right turn out of the entrance do not have an acceleration lane to allow for a safe merge onto the northbound side of the Parkway. The deceleration lane for the northbound off-ramp at Turkey Run begins 450 feet west of the GWMP entrance. To address the issue of access at this location, a continuous auxiliary lane of 570 feet between the entrance roadway and the ramp terminal at Turkey Run would be constructed.

Alternative B would also include improvements to the CIA/GWMP interchange. For the northbound deceleration lane, the start of the taper (lane reduction) would be shifted further away from the gore area (point at which the ramp meets the mainline of the roadway) and widened to a full lane's width of 12 feet. This deceleration lane would also be lengthened to 285 feet. These improvements would require a short retaining structure and encroach into the fringe of the existing forest. The existing stone walls would be retained in place and repaired on the ramps of the CIA/GWMP interchange with the potential for elimination or replacement of nonconforming stone walls in the median. The alignment for the southbound CIA/GWMP interchange acceleration lane would be adjusted to provide a longer distance for vehicles to merge into the mainline Parkway traffic. This would include shifting this lane a few feet closer to the Parkway, connecting it in advance (upstream) of the existing merge point. This improvement would result in a longer parallel distance of the ramp with the Parkway and a better opportunity for motorists to accelerate and merge. There would be no changes to the southbound deceleration lane. All lengths noted are approximate and actual lengths will be refined during detailed design.

## Outfall Structure Repairs

The outfall structures throughout the GWMP are in poor condition, and many of these structures would be rehabilitated as part of alternative B. Possible measures to repair the outfalls would include pipe resetting and installation of a concrete cradle to prevent undermining. For the erosion of outfall channels, repairs could include use of compacted soils and partial vegetative stabilization techniques, riprap, or other products. Some outfall locations would be consolidated, use existing or new pipes, or would be abandoned altogether. Each outfall structure would be evaluated on a case-by-case basis and access for repairs would consider ways to minimize impacts to natural and cultural resources. For this EA, a detailed *Outfall Access and Repair Investigation* was completed in April 2007, which identified repair recommendations and proposed access routes considering GWMP's known archeological and rare plant species locations (Earth Tech 2007). A total of 80 outfalls were identified for repairs. The FHWA conducted additional inspection of outfalls in January 2016 and verified the recommendations in the 2007 report remain valid.

Construction routes and limits of disturbance (LOD) to access outfall repair locations are dependent upon topography, natural and cultural resources, and magnitude/type of repair. Throughout the project limits, the topography is predominately rolling to very steep. The topography at the southern end of the project area is very steep, with very dense vegetation and undergrowth. Potential access routes were identified based on field observations and GIS information on cultural and natural resources and then mapped for use in the impact analysis included in this EA. The type of construction equipment will play an important role in finalizing the access routes. Access to the outfalls will range from direct access from the roadway to protracted routes that will need to overcome difficult terrain. To rehabilitate these outfalls, the use of cranes, small backhoes, and other motorized equipment, or with laborers hand-carrying materials and equipment on foot, may have to be used to access each outfall location. Stabilization matting and other soil stabilization techniques will be used to minimize impacts during construction.

## Route 123/GWMP Interchange Reconfiguration

The Route 123/GWMP interchange crosses the GWMP approximately halfway between I-495/Capital Beltway and the Spout Run Parkway. The interchange is a partial cloverleaf with loop ramps and directional ramps in three out of the four quadrants of the interchange. Alternative B would include implementing a series of improvements at the Route 123/GWMP interchange. Work would include reconfiguration of the ramps on the west side of the interchange to improve safety along the southbound side of the Parkway. In addition, acceleration/deceleration lanes would be extended to allow safer merging and diverging. Other improvements would address drainage, signing, pavement markings, curbs, and rehabilitating or resurfacing existing ramps on the east side of the interchange and Route 123.

In the 2008 EA, five build options were developed for the ramps west of the interchange connecting with the southbound direction of the Parkway; the ramps east of the interchange would remain intact. However, only two out of five build options were carried forward in the analysis conducted for this EA because of associated impacts to resources or lack of added benefits to alternatives retained for detail analysis. In each option, the existing configuration (loss of one through lane in the southbound direction at the interchange) would be modified to provide two continuous through lanes southbound all the way

through the interchange. The various reconfigurations were devised to improve upon safety conditions associated with the tight radii of the on- and off-ramps, the substandard acceleration/deceleration lanes, the inadequate weaving distance between the two loop ramps, and the intersection Parkway off-ramp at Kirby Road (Earth Tech 2005). Option 1 (2008 EA option 4) with slight adjustments to improve safety and operations is the NPS preferred option.

The existing conditions and two build options for the Route 123/GWMP interchange reconfiguration are explained in this section as they are presented in the *George Washington Memorial Parkway North Section Improvements* (Earth Tech 2005). **Figure 9** and **Figure 10** show each build option. Each figure shows the reconfiguration under each option, removal of existing roadway, existing roadway that would remain intact, and a conservative estimate of the construction LOD.

In addition to the two build options for the Route 123/GWMP interchange reconfiguration, an option has been presented to shift the Parkway southbound mainline toward the median approximately five feet near the start of the off-ramp to Route 123. The purpose of this shift is to minimize cutting into the slope on the south side of the roadway and having to build a retaining wall. Because of the mainline shift of the southbound roadway, approximately 400 feet of additional median guardrail would be required. Without the mainline shift, approximately 650 feet of retaining wall would need to be constructed; however, with the mainline shift, 420 feet of the existing stone masonry guardwall would need to be reconstructed. If the mainline is not shifted, though, then at least 100 feet of the existing guardwall would need to be replaced with retaining wall, and the remainder would need to be integrated with (tied to) the retaining wall in some manner. Any modification to the road/ramp intersections with Route 123 requires review and approval by VDOT. In February 2018, a conditional approval of the Interchange Modification Report was received from VDOT (Sabra, Wang & Associates, Inc. 2018; VDOT 2018). The NPS and FHWA are working cooperatively with VDOT to enhance the safety of the interchange and provide a mutually acceptable reconfiguration regarding Route 123 intersections and lane widths.

#### ***No-Action Option – Route 123/GWMP Interchange Reconfiguration***

Under the no-action option, the reconstruction of the ramps at the Route 123/GWMP interchange would not occur. Traffic flow and patterns would remain in the current condition. Existing safety conditions and substandard geometry would remain and would be exacerbated over time with anticipated increases in future traffic volumes.

### Option 1 – Route 123/GWMP Interchange Reconfiguration (Modified 2008 EA Option 4; Preferred Option)

The following elements are included as part of option 1:

- Consolidate Route 123 on-ramps to southbound GWMP at a new intersection east of Pine Tree Road (modified diamond interchange).
- Realign entrance to the Route 123 eastbound on-ramp to southbound GWMP mainline. The roadway would be realigned to be opposite the consolidated off-ramp from southbound GWMP.
- Maintain tight northbound GWMP exit ramp to both eastbound and westbound Route 123.
- Remove existing ramps in the northwest quadrant of the interchange (Earth Tech 2005).
- Install SWM best management practices consistent with VDEQ requirements.

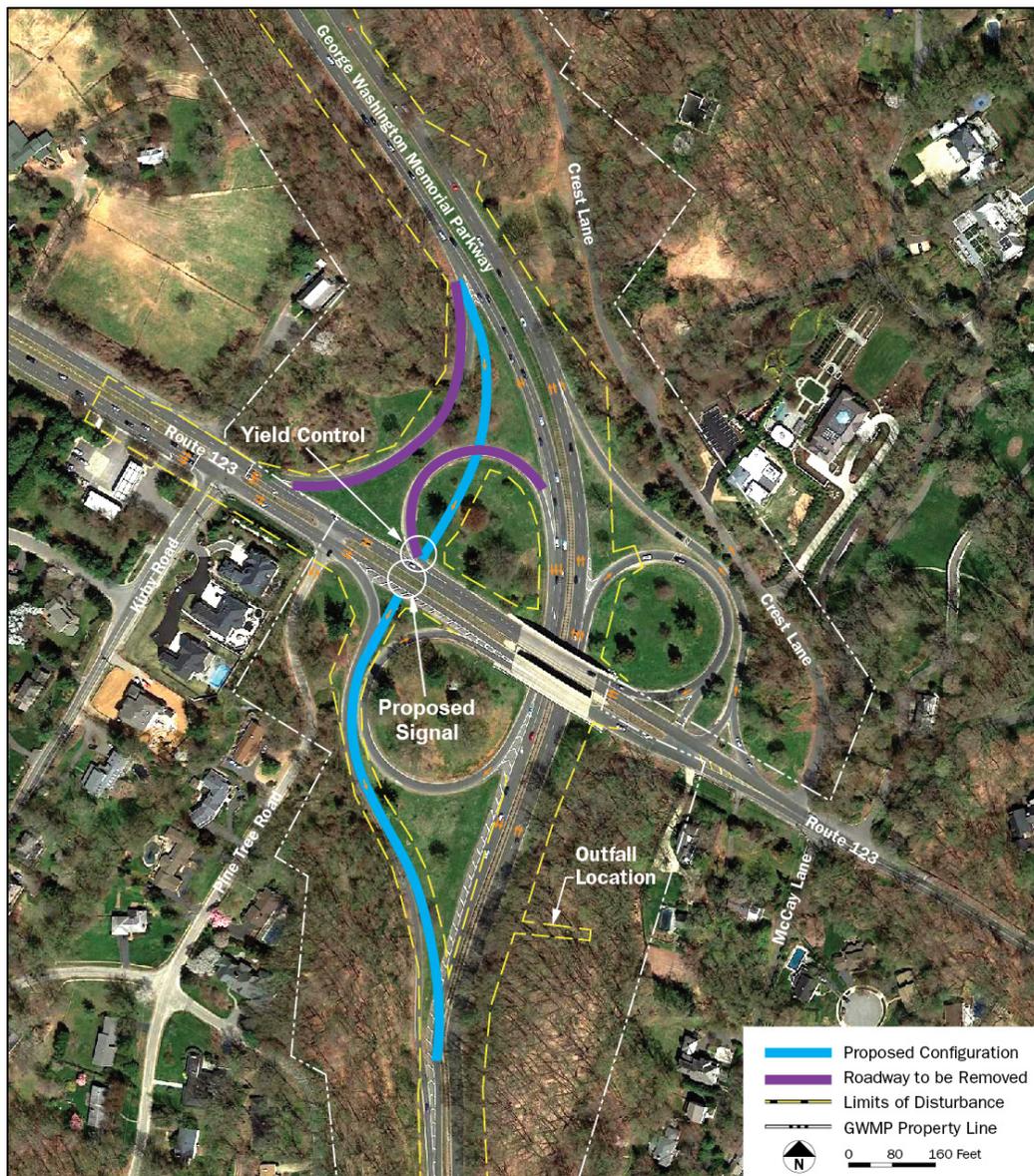


Figure 9. Route 123/GWMP Interchange Option 1

### Option 2 – Route 123/GWMP Interchange Reconfiguration (2008 EA Option 5)

The following elements are included as part of option 2:

- Modify existing Route 123 on-ramp to southbound GWMP at a new intersection east of Pine Tree Road (modified partial cloverleaf interchange).
- Use southbound GWMP off-ramp for both eastbound and westbound Route 123 movements.
- Maintain tight northbound GWMP exit ramp to both eastbound and westbound Route 123.
- Remove existing ramps in the northwest quadrant of the interchange.
- Install SWM best management practices consistent with VDEQ requirements.

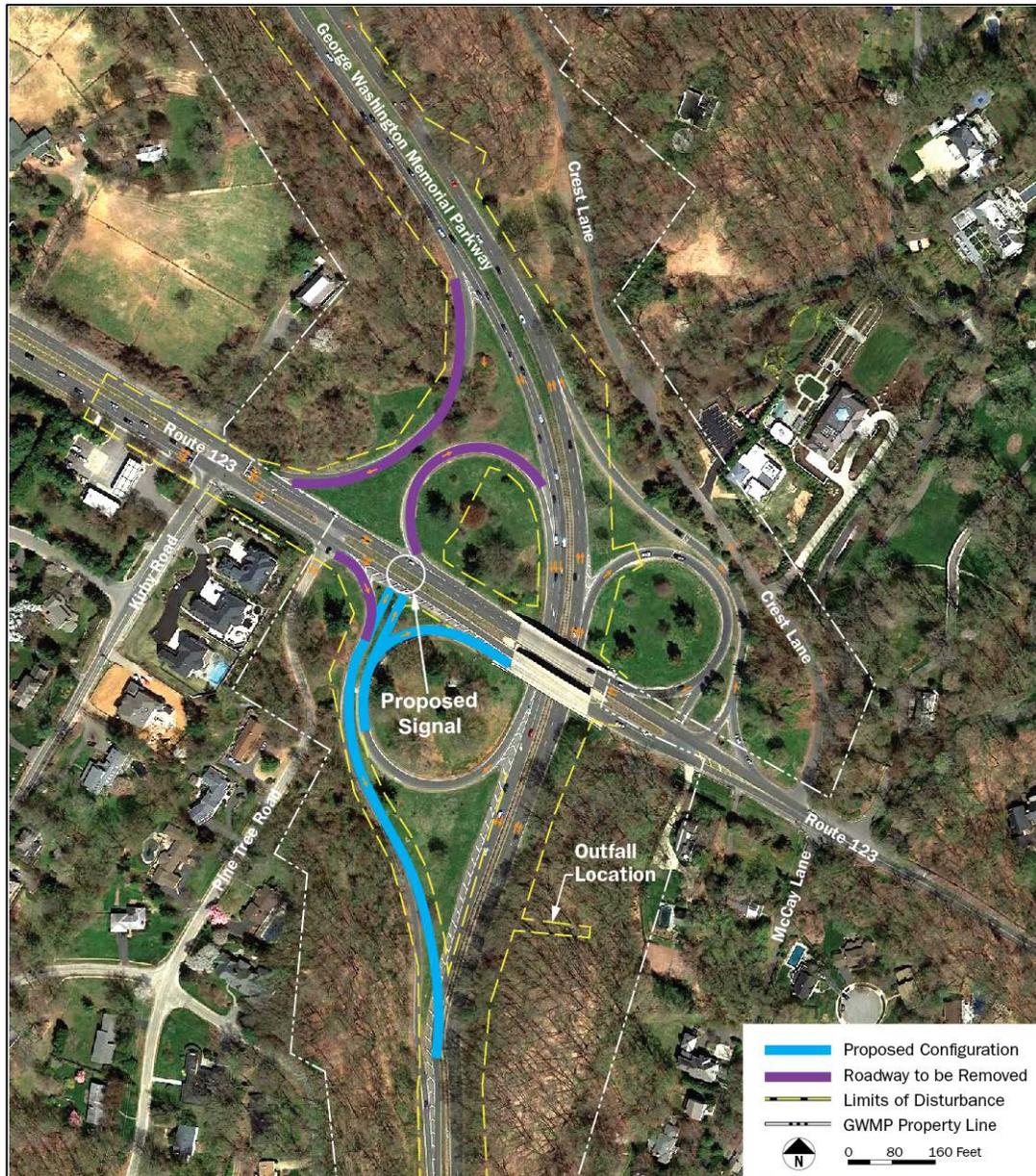


Figure 10. Route 123/GWMP Interchange Option 2

## Other Project Elements

Other project elements include rehabilitating the two existing overlooks, constructing emergency turnarounds, installing ITS infrastructure (conduit and pull boxes), and creating SWM facilities consistent with VDEQ requirements. A brief description of each is presented below.

**North and South Donaldson Run Overlooks Rehabilitation.** At the North and South Donaldson Run overlooks, the NPS proposes to replace the existing sidewalks, reconstruct or mill and overlay the asphalt in the parking areas and ramps, and replace the existing curbs. The existing historic stone masonry walls would remain in place and would be repaired as needed.

**Emergency Turnarounds.** During emergency incidents such as a snow event or crash, the NPS has limited abilities to redirect traffic on the Parkway. Grid lock can exist and, as part of this project, the NPS has identified four potential locations to install emergency turnarounds in the median. The crossovers would consist of a 12- to 30-foot area of stabilized turf. Crossovers were sited based on known previous areas of disturbance, site distance, and existing topography. At these crossover locations, the existing mountable curb would be removed. The crossovers would be stabilized with turf grass as to not make it apparent to motorists that a crossover exists and would only be used by USPP and NPS incident management.

**ITS Infrastructure Installation.** Within the existing disturbance resulting from the roadway rehabilitation, the NPS would install conduits and manholes to accommodate the future installation of ITS. ITS are intended to improve transportation safety and mobility through the integration of advanced communications technologies into the transportation infrastructure. ITS encompass a broad range of wireless and wire line communications-based information and electronic technologies, such as dynamic message signs (US Department of Transportation 2018). Currently, no plans or funding for ITS exists, but the rehabilitation of the Parkway is an opportunity to install ITS infrastructure while the earthwork associated with reconstruction is taking place.

**SWM Facilities.** The NPS would install SWM facilities consistent with VDEQ requirements, such as bioswales in the median, cloverleaves of the Route 123/GWMP interchange, or adjacent to the roadway to treat stormwater runoff from added impervious surface resulting from this project. To treat water from new impervious areas (new pavement) such as at the Route 123/GWMP interchange or GWMP Headquarters/USPP entrance, the NPS would construct small bioretention areas in the median or along the roadway shoulder. The bioretention areas would be sited to avoid sensitive resources areas and located within previously disturbed areas of GWMP to the extent feasible.

**Construction Maintenance of Traffic.** During construction, the contractor would implement a traffic control plan in phases which will include constructing temporary pavement, temporary crossovers, and installation of concrete barriers to maintain traffic flows during construction. The contractor would maintain a minimum of two lanes for GWMP northbound and GWMP southbound traffic during morning and afternoon rush hour periods to the extent possible. However, in select sections, it may be necessary to close to one lane in each direction. Traffic could also be reduced to one lane in each direction during work hours. The construction of the temporary pavement and crossovers would be located within previously disturbed areas of GWMP to the extent feasible.

## ALTERNATIVES DISMISSED FROM FURTHER CONSIDERATION

**The NPS considered a wide range of alternative elements for the proposed GWMP North Section Rehabilitation project that were ultimately dismissed from further consideration.**

**Barrier Option using Steel-Backed Timber Guardrail.** An option was considered that would replace all the existing stone masonry guardwalls with steel-backed timber guardrail. This option was considered because it would open existing views even further to the Potomac River. It would also provide some cohesiveness throughout the GWMP since steel-backed timber guardrails are already present in several places along the Parkway. However, it was determined that the historic materials, patina, and natural character of the stone guardwalls are essential character-defining features of the north section of the Parkway. Replacing the historic stone guardwalls with steel-backed timber guardrail opens the views to the Potomac, but the impacts to historic structures, the cultural landscape, and aesthetics and visual resources outweighed the benefits of the added view; therefore, this option was dismissed.

**Barrier Options using Selective Placement of Steel-Backed Timber Guardrail in Front of the Historic Stone Masonry Guardwalls.** An option was considered in which the NPS would install a 27-inch steel-backed timber guardrail in front of the historic stone masonry walls. The walls that pose low risk will be rehabilitated in place. Approximately 31,000 linear feet of steel-backed timber guardrails would need to be installed along the north section of the Parkway. The steel-backed timber guardrails would be installed in front of 23,230 linear feet of historic stone masonry guardwalls. It should be noted that the guardrail would extend beyond the existing walls and flared for safety purposes. Under this approach, the historic stone masonry guardwalls would not be removed and the historic fabric (e.g., historic stone) would be retained in place. However, placement of steel-back timber guardrail in front of the historic stone guardwalls would have impacts to historic structures, cultural landscape, and aesthetics and visual resources. Therefore, this option was dismissed.

**Barrier Options using High Tension Cable Barrier or Box Beam Guardrail.** The design speed for the north section of the GWMP, as well as the posted speed for most of its length, is 50 miles per hour. This design speed requires the installation of barriers that meet TL-3 safety performance standards. For the existing conditions along the north section of the Parkway (TL-3 condition), the typical deflection for high tension cable barriers installed with 10- to 15-foot post spacing ranges from 10 to 12 feet. High tension cable barriers can also be installed with a reduced spacing of 6 feet; however, the deflection is still approximately 6 feet. The typical offset between the curb and the guardwall along the Parkway is 5 feet and 3 inches, which does not meet the minimum clear area behind the barrier of 6 feet that is required for the high tension cable barrier. Therefore, the high tension cable barrier is not a feasible alternative for use along the Parkway, which is why the option was dismissed.

Similarly, box beam guardrail was also investigated. Box beam guardrail offers an added advantage of being more transparent than the stone masonry wall or timber-backed guardrail increasing views to the Potomac River Gorge from the Parkway. However, box beams would introduce a new barrier that does not exist today on the Parkway, and there are limitations, like the high tension cable, with the ability to have adequate space to install the box beam barrier. Therefore, this option was also dismissed.

**Reconfigure Entrance at Fort Marcy.** The existing entrance to Fort Marcy is a two-lane paved roadway that intersects with the northbound lanes of the GWMP. Acceleration and deceleration lanes are not provided, and the exit operates under stop control. Originally, the NPS considered relocating the park entrance approximately 575 feet to the north to allow for the addition of acceleration and deceleration lanes without any impacts to the Pimmit Run Bridge, but impacts to cultural resources, specifically the earthworks associated with Fort Marcy, outweighed the benefits of the geometric improvements; hence, the improvement alternative was dismissed (Earth Tech 2005). This decision was supported by the low number of crashes and a very low overall use of the Fort Marcy entrance/exit during peak travel periods.

**Extension of Acceleration and Deceleration at Overlooks.** NPS considered extending the acceleration and deceleration lanes at the two Donaldson Run Overlooks, but due to steep grades, cost of retaining walls needed, and resource impacts, the options were dismissed.

**Shift Parkway Baseline and Different Gutter Configurations.** Two alternatives were considered for the mainline alignment of the GWMP in the conceptual phase. The shifted baseline allowed for the modification to the curb and gutter section and/or shoulder on the median side, while minimizing the change in the footprint along the forest edge. Under this scenario, the baseline of each direction of the GWMP would be shifted closer to the median to allow for a new gutter pan on the outside lane and/or a wider shoulder on the outside edge of the roadway. This alternative is limited to where the alignment shift may occur because the median is too narrow in several areas, including in the vicinity of the Windy Run Bridge, Donaldson Run, Fort Marcy Park, Route 123, the CIA interchange, Turkey Run, and I-495/Capital Beltway. One of the disadvantages to this alternative is the cost associated with shifting the baseline. The second disadvantage would be the reduction of the median width and the resulting removal of trees from the median and subsequent impacts on cultural and natural resources. Moreover, the duration of construction would be much longer. For the reasons mentioned above, this alternative was dismissed.

A matrix of design options was considered for the applicability regarding curb and gutter configurations. Options included curb with a 12-inch gutter pan and curb with a 21-inch gutter pan. It was determined that either of these options would change the appearance of the Parkway resulting in impacts to park cultural and natural resources and, therefore, were dismissed from further consideration.

## **NPS PREFERRED ALTERNATIVE**

The NPS has identified alternative B, the proposed action alternative, as its preferred alternative for reasons described more fully in chapter 4. In addition, roadside barrier option 1 and Route 123/GWMP interchange option 1 are the preferred options under the action alternative. Alternative B allows for a comprehensive repair and rehabilitation of the approximately 7.6 miles of roadway and related transportation assets that will maintain the roadway to accommodate current uses in a safe manner. The roadside barrier option 1 meets the safety objectives while minimizing impacts on the cultural resources and visual resources, and the Route 123/GWMP interchange option 1 fulfills the goal to improve existing roadway geometry while minimizing impacts to the park's natural resources and cultural landscape.

## MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES OF THE PREFERRED ALTERNATIVE

The following mitigation measures and best management practices would be implemented to lessen the adverse impacts of the preferred alternative.

### Cultural Resources

The NPS would continue coordination with the VDHR, EFLHD, ACHP, and other consulting parties in accordance with Section 106 of the NHPA. As the project proceeds with project planning, design, and construction, the NPS and FHWA would follow the provisions described in the 2018 PA. A draft of the PA is available for review in **Appendix B**.

In addition, mitigation measures for cultural resources include, but are not limited to:

- Reconstructing the new 27-inch roadside barriers using stone from the existing guardwalls to the extent possible. A model wall would be constructed by the contractor at the start of the project for NPS review and acceptance to assure the craftsmanship meets NPS requirements.
- Replacement of vegetation and new planting plans would consider GWMP's original planting plan. Planting plans would be coordinated with GWMP staff and NPS Regional Office Cultural Landscape staff.
- High visibility construction fencing or other means of delineating sensitive no work areas during construction. In addition, archeological monitors would be used for excavations near or in areas with high potential for discovery (see outfall rehabilitation mitigation that follows).
- An education program implemented by the constructor would be used prior to construction to inform their staff of the sensitive resources in the area and protocols to follow for protection as well as new discovery.

Mitigation for this undertaking would be conducted in a manner that is consistent with the *Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Structures* and the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. In addition, the NPS has prepared an Archeological Resource Protection Plan (ARPP) for this project, which provides strategies for construction tasks and other activities associated with the undertaking to avoid, minimize, or mitigate impacts to archeological sites. This plan would be adhered to during design and construction.

If archeological resources are uncovered during construction, all excavation work in that area would cease and archeological resources would be investigated by archeologists of the park's cultural resources staff meeting the *Secretary of Interior's Qualification Standards*. If the archeological resources are determined to be potentially significant, the NPS would consult with the VDHR to determine the appropriate next steps and, if necessary, appropriate mitigation strategies. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3002) would be followed. All human remains, funerary objects, sacred objects, or objects of cultural patrimony would be left in place until the culturally affiliated tribe(s) was consulted and an appropriate mitigation or recovery strategy developed.

In the event human remains are discovered, ground disturbing activities would immediately cease, appropriate NPS Cultural Resources staff would be notified, as well as the local authorities, such as the police and/or the coroner, and the VDHR in compliance with the Code of Virginia 10.1-2035. Paleontological remains and archeological specimens found within the construction area would be removed only by the NPS or their designated representatives. Workers would be informed on the penalties for illegally collecting artifacts or intentionally damaging archeological or historic property. Workers would be informed of the correct notification procedures in the event that previously unknown resources were uncovered during construction. In designated areas, ground-disturbing activities would be monitored by a NPS qualified archeologist for unanticipated discovery of archeological resources. If cultural material is uncovered during construction, work in the immediate area would be stopped, the site secured and GWMP would consult with VDHR per 36 CFR 800.13.

## **Transportation, Traffic, and Safety Mitigation**

### ***Traffic Control and Management***

A TMP would be developed by the EFLHD in coordination with other DOTs and local governments and adhered to during construction by the contractor. Various work restrictions are necessary to minimize the impacts on traffic and safety. The EFLHD has prepared conceptual phasing options to determine the most desirable method of maintaining traffic during construction. The majority of the work would be constructed using median crossovers and temporary pavement widening to allow maintaining two lanes of traffic in both the inbound and outbound directions during the AM and PM rush hours. Where it is not feasible to construct median crossovers, or where there is insufficient width to construct the necessary pavement widening, the minimum traffic maintenance would include long-term continuous lane closures in one direction. This would leave only one lane open to traffic on the affected roadway at all times for the duration of construction on that roadway.

### ***Coordination of Regional Transportation Projects***

The EFLHD, working in close coordination with the NPS, would consider the potential short-term adverse cumulative impacts on traffic when scheduling construction projects on the Parkway. Specifically, the traffic control and construction for any other road/bridge improvements, being conducted on the GWMP or within the Region including FHWA, VDOT, and DDOT projects, such as the Arlington Memorial Bridge Rehabilitation Project, would be coordinated and scheduled to minimize the potential cumulative impacts to traffic on the Parkway.

### ***Trail Protection and Provisions***

The TMP would consider detours, closures, and protective measures for the Potomac Heritage Trail (PHT) to ensure that visitors are safely and efficiently routed around construction in the project area. This plan would include means for communicating construction and closure schedules to the public and adequate barriers to keep visitors clear of active construction. In the event of total trail or road closures, press releases and notices on the park website would be made and signage would notify drivers, DOTs, and local governments of the intended closure dates and times.

The PHT and a local trail provide access through the Route 123/GWMP interchange. Trail safety provisions such as detours and user notifications would be implemented and incorporated into the public notification efforts for the duration of the alternatives and design. The NPS would try to keep the trail open during park operating hours, and any trail closures between Theodore Roosevelt Island and South Donaldson Overlook would be temporary and only during the guardwall repair.

## **Natural Resources**

### ***Use of Best Management Practices***

Best management practices would be implemented by the contractor during construction to avoid and minimize impacts to natural resources. Soil compaction and disturbances would be kept to a minimal amount needed for construction activities. Appropriate sediment and erosion control measures (such as the installation of silt fences and inlet protection) would be implemented to reduce erosion and runoff from the construction area. Disturbed soils would be revegetated according to GWMP and VDEQ requirements for soil stabilization and revegetation, including weed control measures. The contractor would implement measures to control fugitive dust during construction. Construction fencing would be installed near all park designated sensitive resource areas. The EFLHD construction engineer and a biological monitor dedicated to the project would be responsible for monitoring and enforcing the no impact zones.

### ***Surface Waters***

The preferred alternative would be constructed in such a manner as to avoid degrading water quality to the maximum extent possible. During construction, measures would be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering waterways or wetlands. In addition, on-site water monitoring would be conducted if construction is needed on the banks of Windy Run, Gulf Branch, Dead Run, and known seeps to ensure that water bodies within the study area would not be adversely impacted by construction activity. The contractor would implement erosion control measures to protect local water bodies from contamination. Actions would be consistent with the state's water quality standards and the Clean Water Act Section 401 certification. In the event outfall repairs are in waters of the United States, a joint federal/state permit application would be prepared and submitted to Virginia Marine Resources Commission (VMRC) to obtain the appropriate authorization from the US Army Corps of Engineers (USACE), VDEQ, and VMRC, for impacts to regulated water resources.

### ***Vegetation***

Impacted trees and shrubs would be replaced on a one-to-one diameter at breast height (dbh) ratio to the extent practicable. Replanting would not occur in areas of significance vistas as defined in the VRI&A. Restored areas would be monitored by the responsible party identified in the construction specification for up to three years after construction to determine if reclamation efforts are successful or if additional remedial actions are necessary. Remedial actions would include installation of erosion-control structures, reseeding and/or replanting the area, and controlling non-native plant species. To avoid the introduction of non-native/noxious plant species, no imported topsoil or hay bales would be used during re-vegetation. On a case-by-case basis, the following materials would be evaluated for use for any erosion-control dams that would be necessary: certified weed-free rice straw, cereal grain straw that has been fumigated to kill weed seed, and wood excelsior bales.

Treatment of non-native vegetation would be completed in accordance with the NPS *Integrated Pest Management Program* (NPS 2018). To prevent the introduction and minimize the spread of non-native vegetation and noxious weeds, the following measures would be implemented during construction:

- Minimize soil disturbance through erosion and sediment control best management practices.
- Pressure wash and/or steam clean all construction equipment to ensure that all equipment, machinery, rocks, gravel, or other materials are cleaned and weed free before entering the Parkway.
- Cover all haul trucks bringing asphalt or other fill materials from outside the park to prevent seed transport.
- Limit vehicle parking to existing roadways, parking lots, or access routes.
- Limit disturbance to roadsides and culvert areas, including limiting equipment to the roadbed area; no machinery or equipment should access areas outside the construction zone.
- Obtain all fill, rock, or additional topsoil from the project area, if possible. If not possible, obtaining NPS approved weed-free sources from outside the park would be required.
- Initiate revegetation of disturbed sites immediately following construction activities.

These measures would be specified to the contractor in the contract documents.

#### ***Rare Plants and Exotic/Invasive Species Management***

- Perform rare plant surveys within the limits of outfall repairs to identify and delineate confirmed occurrences of eastern buttercup phacelia at the approved time of year immediately before construction for each phase of work.
- Minimize disturbance by specifying 6- to 12-foot wide access corridors to the contractor that minimize vegetation removal and avoid known occurrences of eastern buttercup phacelia.
- Realign or relocate construction access corridors if occurrences of eastern buttercup phacelia are identified to avoid the potential for disturbance whenever possible. Areas where eastern buttercup phacelia are identified would be fenced and included as a no impact zone during construction.
- Provide an independent biological monitor during outfall repairs near known occurrences of eastern buttercup phacelia.
- Reduce the introduction of exotic and invasive plant species by minimizing soil disturbance; pressure washing and/or steam cleaning construction equipment and materials; limiting vehicle parking to existing roadways, parking lots, or access routes; obtaining all fill, rock, or additional topsoil from the project area if possible, or weed-free sources from approved sources outside the park; and revegetating disturbed areas immediately following construction.
- On a case-by-case basis, minimize the introduction of exotic and invasive species using certified weed-free rice straw, cereal grain straw that has been fumigated to kill weed seed, and wood excelsior bales.
- Perform work near sensitive area during the winter months to prevent the likelihood of herbaceous exotic and invasive species establishment.

***Wildlife including Rare, Threatened, and Endangered Species***

For species of concern, areas with high potential or known resources would be surveyed at the approved time of year before construction for each phase of work. The approved time of year would be determined through ongoing consultation with the GWMP's Natural Resource Manager and the Virginia Department of Conservation and Recreation (VDNR). To minimize the potential for impacts to northern long-eared bats during construction, tree removal would not be conducted from April to October. If any species is discovered during the survey, the area would be fenced and included as a no impact zone.

***Outfall Repair Construction Access***

- Stake, flag, or mark construction limits and natural resource protection areas and cultural resources protection areas prior to construction.
- Identify and document the size and type of trees to be removed, and no impact zones that would include known occurrences of eastern buttercup phacelia, on access plans.
- Install appropriate barriers to protect individual trees and on both sides of construction access corridors.
- Surface construction access corridors with protective matting or similar best management practices.

**Outfall Rehabilitation**

In some instances, access to the areas for outfall rehabilitation is near known sensitive resources and outside of the existing disturbed areas. Many of these areas have been previously surveyed for rare plants and archeological resources. Additional natural and cultural resource surveys would be completed on a case-by-case basis, prior to subsequent design reviews, if required by GWMP resource management staff. Additional hydrological and hydraulic analysis would be performed as necessary during the detailed design process to determine the potential impacts to streams and to assure adequate channel and bank protection. In areas of known rare species, biological monitoring would be performed to help monitor water quality and minimize disturbance to suitable habitat. Best management practices to minimize ground disturbance would be applied globally to the entire project, particularly drainage outfall construction activities.

At each design review, the interdisciplinary team, including GWMP resource staff, would conduct a field review, using the most up-to-date plans, and make recommendations for additional mitigation strategies or special contract requirements. FHWA would make recommendations on how to provide construction access to outfalls that fall outside of existing disturbed corridors (i.e., over existing pipes) as soon as possible and prior to submission of the 70% design plans for GWMP resource staff review. Comments from GWMP resource management staff would be incorporated into the 70% design plans.

A six- to twelve-foot-wide access corridor would be specified to the contractor to minimize ground disturbance. The access corridors would avoid all areas of known sensitive resources. The access plan should identify the size and type of trees to be disturbed, and GWMP staff would document these trees prior to disturbance. Individual trees requiring protection would be identified and appropriate barriers constructed. Access corridors would be surfaced with appropriate protective matting or similar best management practices to further prevent disturbance. Construction barrier fencing would be required on both sides of construction access corridors. Access plans would also identify no impact zones, which would be the location of sensitive natural or cultural resources.

Prior to any drainage outfall construction activities (including clearing and grubbing, stockpiling of materials or equipment, and construction access routes), biological monitors and cultural resources staff would stake, flag, or mark construction limits and resource protection zones around cultural resource areas (i.e., historic stone headwalls) and natural resource areas (i.e., specimen trees, trees larger than four-inch dbh, seeps). All drainage outfall construction activities would be conducted within the established construction limits and outside resource protection zones.

Archeological monitoring would be implemented during ground disturbing activities near culturally sensitive resources identified on the final design plans. Should archeological resources be discovered during ground disturbing activities, work would be halted in the area and the site secured until further direction from the Contract Officer. Construction debris would be immediately hauled away to an appropriate disposal location. GWMP resource staff, in consultation with FHWA, would make recommendations for additional outfall channel rehabilitation beyond what is shown on the 30% review plans. Soft (minimal impact) solutions would be explored for channel rehabilitation to the next downstream confluence, and in some cases, beyond, to a logical termination.

During construction, a Spill Prevention and Response Plan/Stormwater Pollution and Prevention Plan would be in place, stating preventative measures as well as what actions would be taken in case a spill occurs. Construction debris would be immediately hauled to a NPS approved disposal location. Potential roadside habitat for small wildlife would be replaced if destroyed or damaged during construction. Restored areas would be monitored after construction to determine if reclamation efforts are successful or if additional remedial actions are warranted. Revegetation would be initiated immediately following construction using site adapted native seed and/or plants. At the request of GWMP staff, trees removed by construction efforts would be left on site. Drainage outfalls identified as requiring additional rehabilitation would be recontoured and revegetated to natural conditions (natural spacing, abundance, and diversity of native plant species in the local vicinity) specified by GWMP staff and would be initiated immediately following construction. Native topsoil would be stripped and stored prior to any construction activity and reused as part of recontouring and revegetation activities. Imported hay bales or imported topsoil would not be permitted for any outfall construction or rehabilitation activities. Seed and planting plans would be implemented at the GWMP resource staff's discretion.

During construction, the following mitigation measures are recommended, where practicable, to limit impacts because of outfall repair access and construction:

- An independent biological monitor in consultation with the NPS Natural Resources Manager should be present during the construction activities for outfall repair and wall reconstruction. It is recommended that the contractor consult with this individual in the field as to the best access routes to each outfall in need of repair to minimize impacts to natural resources. Furthermore, tree protection measures should be explored and impacts to trees documented in the field.
- Any necessary tree pruning and/or removal should be conducted under the guidance of a tree care professional, such as a licensed arborist.
- The contractor should seek ways to minimize ground disturbance, such as rutting from construction equipment to the extent possible.
- When feasible, work in sensitive areas should be performed during the winter months when the ground is frozen, and herbaceous invasive species are less likely to establish.

- Where slopes permit, the use of structural matting or similar best management practices, should be utilized. While protective tree fencing would not be practical at each outfall repair point, the structural matting would be a useful tool in laying out least impacting access routes as well as to minimize ground disturbance caused by construction equipment accessing the outfall.
- Equipment size would be kept to a minimum for what is needed on each access route.

Pedestrian detours would be established and maintained around construction areas where required (i.e., PHT). Trail safety provisions would be implemented along the PHT such as detours and closures. User notifications would be incorporated into the public notification efforts for the duration of design and construction. The NPS would make all feasible efforts to keep the trail open during park operating hours, and any trail closures would be temporary.

The GWMP Superintendent, NPS Denver Service Center Project Manager and GWMP Project Manager would ensure that each project phase remains within the parameters established in the compliance documents and that required mitigation measures and special contract requirements are properly implemented. GWMP resource staff and project managers would conduct and document a “Lessons Learned” field review/roundtable after the completion of each phase of construction to be incorporated into subsequent phases of construction.

An education program would be presented by the field contact representative to all construction personnel prior to any construction activities. Following the onset of construction activities, any new employees would be required to formally complete the education program prior to working onsite. As a minimum, the education program would cover the following topics: 1) culturally and naturally sensitive resource distribution/ occurrence; 2) sensitivity to human activities; 3) legal protection; 4) penalties for violation of state or federal laws; 5) reporting requirements; and 6) project protective mitigation measures. The NPS field contact representative would conspicuously stake, flag, or mark work area boundaries (including new access roads, realignments, and parking/turnout areas) to minimize surface disturbance to the surrounding habitat. Material stockpiling, machinery storage, and vehicle parking would only be permitted in designated areas.

As more information is available during the detailed design, the design and construction methods would be evaluated for environmental consideration by a natural resources specialist familiar with the conditions on the GWMP.

### **Public Outreach**

To notify park visitors and commuters of construction-related delays or changes in traffic patterns, the NPS would use a combination of public notification techniques such as posting information on the park’s website and public information meetings and/or open houses. Variable message boards on the Parkway would be posted two weeks in advance of construction and public notices would be placed in local newspapers or other sources. The public outreach measures would be described in the TMP.

## CHAPTER 3: AFFECTED ENVIRONMENT

The “Affected Environment” chapter describes the resources that could be affected as a result of implementation of any of the alternatives. The topics presented in this chapter are those related to the key issues described in chapter 1 that could inform the NPS decision on rehabilitation of the north section of the Parkway. The descriptions of each resource provide a baseline condition against which the potential impacts of the alternatives are compared. Information used to develop each description is referenced. The following resources are included in this chapter: surface water; vegetation including rare plants; wildlife; cultural resources (historic structures, archeological resources, and cultural landscapes); visual and aesthetic resources; visitor use and experience; and transportation (traffic).

### SURFACE WATERS

There are numerous streams within the study area that feed into the Potomac River basin and the Chesapeake Bay estuarine system. Donaldson Run, Gulf Branch, Dead Run, Turkey Run, Windy Run, and Pimmit Run are all named perennial streams within the study area that feed the Potomac River. The GWMP bridges each of these streams and the roadbed is approximately 25 to 30 feet above the streams. In addition, an unnamed stream flow is near the Route 123/GWMP interchange. The stream begins at a culvert near the pumping station and flows into a concrete pipe under the Parkway mainline. The stream is very shallow with good sinuosity and straight sections. **Figure 11** shows two photographs of the stream near the Route 123/GWMP interchange. Another similar stream, although further removed from construction activities, exists near the CIA interchange.



**Figure 11. Unnamed stream northwest of the Route 123/GWMP interchange**

Throughout the GWMP, many of the existing outfall structures are highly degraded and in need of repair and/or replacement. Some of the pipes and outfalls convey jurisdictional waters of the US (streams) from one side of the Parkway to the other that eventually drain into the Potomac River. A Jurisdictional Determination by the USACE will be necessary for pipes that convey streams (not drainage from the Parkway) to determine the jurisdictional status of the associated waters.

## VEGETATION INCLUDING RARE PLANTS

The vegetation of GWMP includes a complex of upland and floodplain forest and tidal marsh communities, as well as several rare vegetation types that occupy the bedrock terraces, exposed rocks, and frequently flooded river shores. Secondary forests are common in formerly cleared areas of the park. Much of the contemporary forest consists of maturing second-growth stands that belong to the following ecological groups: basic mesic forest, mesic mixed hardwood forest, acidic oak-hickory forest, oak/heath forest, and Piedmont/Mountain floodplain forest. In total, 1,284 species of vascular flora have been recorded within the GWMP. Of these, 375 species are non-native, and 46 are common enough in some areas to be considered invasive (NPS 2016a).

Turkey Run Park is considered one of the finest natural areas in the Potomac River Gorge because of its old-age forests and diverse flora. A total of 290 acres in Turkey Run Park contain stands of 10 forest community types that are valued because of their maturity, size, and/or overall quality. These forest communities cover areas on the north side of the GWMP and extend locally to the south side in the vicinities of Turkey Run and Dead Run. In addition, the understory and herbaceous vegetation of mature, mapped stands within this section are among the highest quality stands of several community types in the Piedmont of Virginia. Similarly, valued natural communities are found in the project area associated with Pimmit Run area, the strip of Parkway land southeast of Turkey Run Park, and the upland adjacent to the CIA interchange.

During the planning process for the GWMP North Section Rehabilitation EA completed in 2008, it was recognized that disturbances to vegetation would likely occur during project implementation. Vegetation surveys were conducted in July 2007, at a representative sample of existing stone masonry walls and outfalls that required reconstruction and/or repair, to characterize vegetation in areas where vegetative disturbances would occur.

During planning for this EA, the NPS determined that other than the removal of several ash trees that had been infested by the emerald ash borer (*Agrilus planipennis*), no other noticeable changes in vegetation have occurred along the north section of the Parkway since the 2007 surveys. Vegetation consists mainly of upland oak/heath forest habitat. Native trees generally dominate the mixed hardwood forest stands, including tulip poplar (*Liriodendron tulipifera*), intermixed with oaks (*Quercus* spp.), mockernut hickory (*Carya alba*), black walnut (*Juglans nigra*), red maple (*Acer rubrum*), and American beech (*Fagus grandifolia*). Typical understory species include American beech, red maple, and box elder (*Acer negundo*) at most of the survey locations, with pawpaw (*Asimina triloba*) also occurring at the outfall survey locations on the northbound side of the Parkway. Herbaceous ground cover within the surveyed areas averaged 40%, with 46% of that cover being invasive species. Several native herbaceous vine species were observed, with Virginia creeper (*Parthenocissus quinquefolia*) and poison ivy (*Toxicodendron radicans*) found throughout (Greenhorne & O'Mara 2007).

The GWMP is home to 47 species of vascular plants that are considered rare, threatened, or endangered in Virginia or Maryland. Of these, eastern buttercup phacelia has been observed at several locations within the project area along the north section of the Parkway. Eastern buttercup phacelia is a native, annual, vascular plant belonging to the Waterleaf family (*Hydrophyllaceae*) that occurs on several rich slopes in the Turkey Run area and is listed as a species of concern by the state of Virginia. Although no rare or locally important species or unique herbaceous vegetation communities were found within the

sample area during the 2007 vegetation survey, occurrences of eastern buttercup phacelia were mapped within portions of several outfall access/repair areas between Turkey Run and Dead Run and one outfall access/repair area south of the CIA interchange during a rare plant survey performed by the VDCR in May 2005 (VDCR 2005). Because eastern buttercup phacelia is an annual, it is possible that populations have shifted slightly from locations documented during the 2005 rare plant survey. Also, four specimens of American hazelnut (*Corylus americana*) are present near southbound GWMP approaching the Route 123 interchange. Although American hazelnut is not a federal- or state-listed species, its presence near the Route 123/GWMP interchange is only one of two known locations within the GWMP.

Several non-native species have been recorded throughout the park. Some of the most prolific non-native species within the GWMP were included on historical planting plans for the Parkway. These include porcelainberry (*Ampelopsis brevipedunculata*), English ivy (*Hedera helix* L.), Japanese honeysuckle (*Lonicera japonica*), amur honeysuckle (*Lonicera maackii*), and linden viburnum (*Viburnum dilatatum*) (NPS 2016a). Non-native species found throughout the north section of the GWMP include Japanese honeysuckle, Asiatic bittersweet (*Celastrus orbiculatus*), kudzu (*Pueraria montana*), porcelainberry, and English ivy (Greenhorne & O'Mara 2007). Japanese stiltgrass is a common invasive throughout the Potomac Gorge and has become established in areas where soils are compacted due to recreational use (NPS 2016a).

## WILDLIFE

### Migratory Birds

A number of bird species can be observed throughout the year within the GWMP. Many of these birds are year-round inhabitants while others are neotropical migratory birds traveling through the park from South and Central America, the Caribbean and southern United States to North American nesting habitats. Bird species that migrate through or nest in the habitats along the GWMP are likely to include warblers (family *Parulidae*), thrushes (family *Turdidae*), and numerous other neotropical migratory species (species that breed in North America and winter south of the United States). The Migratory Bird Treaty Act prohibits the take (i.e., wounding, killing, etc.) of migratory birds, including egg parts and occupied nests, even when such activities are unintentional. Executive Order 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds* directs federal agencies to design migratory bird habitat and population conservation measures into agency plans and planning processes; evaluate the impacts of actions and agency plans on migratory birds; and develop and use practices that will lessen the amount of unintentional take.

### Bald Eagle

The lower Potomac River south of Washington, DC is known to provide an important bald eagle habitat area. Bald eagles prefer habitats near large bodies of open water with an abundance of fish. They require mature stands of forests for roosting, nesting, and perching. At least one bald eagle nest has been identified within the north section of the GWMP, and a number of additional nest sites are located within several miles of the Parkway (Watts and Byrd 2013). Although the bald eagle was removed from the federal list of threatened and endangered species in 2007, the Bald and Golden Eagle Protection Act and associated *National Bald Eagle Management Guidelines* continue to regulate any “disturbances” to these

birds. A permit process is in place that authorizes the “take” of bald or golden eagles, generally where the take to be authorized is associated with otherwise lawful activities. However, a “take” is not anticipated to be necessary as a result of this project.

### **Northern Long-eared Bat**

The USFWS listed the northern long-eared bat as threatened on April 2, 2015. The Service found that listing was warranted due to the recent severe and ongoing decline of the species due to white-nose syndrome. The northern long-eared bat is a relatively wide-ranging bat, but its distribution appears patchy, and is usually found in low numbers in both roosts and hibernacula (Alberta Sustainable Resource Development and Alberta Conservation Association 2009; Amelon and Burhans 2006; Barbour and Davis 1969; Caire et al. 1979). Insufficient data are available at this time to estimate a range-wide population.

During the summer, northern long-eared bats inhabit forests and roost singly or in colonies in the cracks, crevices, and bark of both live and dead trees (Lacki and Schwierjohann 2001). They have been found roosting in structures such as buildings, barns, sheds, and cabins. Foster and Kurta (1999) have indicated that northern long-eared bats do not depend on any particular species of tree for roosting but tree characteristics, such as structure and decay, are important. Recent capture efforts have found northern long-eared bats in young stands and disturbed forests (Alberta Sustainable Resource Development and Alberta Conservation Association 2009; Crampton and Barclay 1998; Cryan et al. 2001; Foster and Kurta 1999; Henderson and Broders 2008; Henderson et al. 2008; Menzel et al. 2002).

During late summer and early autumn, cave-dwelling bats migrate from their summer habitats to swarming sites where breeding occurs. Suitable fall swarming habitat for northern long-eared bats consists of forested habitats typically within 5 miles of a hibernaculum. Swarming habitat can occur in a range of sizes, including large forested blocks, small woodlots, and linear features, such as fencerows, riparian forests, and other wooded corridors.

No northern long-eared bat hibernacula have been documented in Washington, DC. However, consultation with the USFWS regarding the potential presence of threatened and endangered species has provided that the northern long-eared bat or suitable habitat may be found in the proposed GWMP North Section Rehabilitation project area (see chapter 5, Consultation and Coordination). Under the final 4(d) rule for the northern long-eared bat, incidental take is prohibited if it results from tree removal activities within a quarter-mile of a hibernaculum, or from activities that cut down or destroy known occupied maternity roost trees during the pup-rearing season (June 1 through July 31). In addition, incidental take resulting from removal of any other trees within 150 feet of a maternity roost tree is prohibited (USFWS 2017).

### **Indiana Bat**

The USFWS listed the Indiana bat as endangered in 1967 due to episodes of people disturbing hibernating bats in caves during winter, resulting in the death of large numbers of bats. Indiana bats are vulnerable to disturbance because they hibernate in large numbers in only a few caves (the largest hibernation caves support from 20,000 to 50,000 bats) (USFWS 2018). Other threats that have contributed to the Indiana bat's decline include commercialization of caves, loss of summer habitat,

pesticides and other contaminants, and most recently, the disease white-nose syndrome. During the summer, Indiana bats inhabit forests and roost singly or in colonies in the cracks, crevices, and bark of both live and dead trees.

The Indiana bat is medium sized, with fairly uniform pinkish-brown fur that has a fine texture. It has short, inconspicuous toe hairs useful in distinguishing it from the little brown bat (*Myotis lucifugus*). The total length is 77 to 91 millimeters, wing spread 240-267 millimeters, and weight 1/4 to 1/3 ounces (5 to 8 grams). The Indiana bat breeds prior to entering hibernation. Females migrate north to establish nursery colonies under loose bark of dead trees in riparian woodland, upland woodlots, or in hedgerows. The one offspring is born late in June or early July. They begin to return to hibernation caves in August and will migrate up to 300 miles (Virginia Department of Game & Inland Fisheries 2018). In Virginia, the bats occurrences are only likely known in the western part of the state (Virginia Department of Game & Inland Fisheries 2018).

## HISTORIC STRUCTURES

The GWMP was established in 1930 by the US Congress as a memorial to George Washington. Ownership of the Parkway was transferred from the Office of Public Buildings and Public Works of the National Capital to the NPS on August 10, 1933 (The National Parks: Index 2001-2003). Constructed from 1929 to 1932, the MVMH is the initial portion of the GWMP that links the southwestern end of Arlington Memorial Bridge on Columbia Island (renamed Lady Bird Johnson Park in the 1970s) and Washington, DC, with Mount Vernon in Fairfax County, Virginia. The highway was designed and landscaped to maximize scenic, aesthetic, and commemorative qualities (NPS 1981).

The GWMP is significant because it is the first parkway constructed and maintained by the US government. Through its location paralleling the Potomac River, the GWMP contributed to the establishment of a regional park system, providing protection to the shorelines of the Potomac River Gorge from private encroachment, and preserved the lands for public enjoyment (NPS 1992). The original section of the GWMP, the MVMH, was listed in the NRHP in 1981 under criterion B for its commemoration of George Washington and criterion C for landscape architecture (NPS 1981). The entirety of the GWMP was listed in the NRHP in 1995 under the same criteria as well as for national significance in its association with “a long and continuous planning effort for the Washington, DC region” (NPS 1995). Furthermore, the GWMP “preserves a sizeable amount of territory once familiar to George Washington” (NPS 1995). The NPS is presently updating the NRHP nomination, which states that the GWMP possesses national and local significance under criteria A, B, and C for its association with “twentieth-century parkway design, engineering, landscape architecture, park planning and conservation, commemoration, and its association with George Washington” (Draft NR Nomination: George Washington Memorial Parkway Historic District, August 2017).

According to the NPS publication *Landscape Lines #16, Historic Roads* (2005a), the NPS received New Deal money through the Civil Conservation Corps (CCC) during the 1930s. Workers in the CCC upgraded existing roadways and constructed many new roadways for the NPS. This period is regarded as the “Golden Age” of the national park road building history and sets the foundation and building tradition for the north section of the Parkway. Evidence of this road-building tradition is illustrated through the use of the framed vista, curvilinear alignments, and attractive guardwall design. Throughout the national

park system, the use of stone walls reflected local materials, had a rugged appearance, and became an integral component of the park experience (NPS 2005a). Thus, it is not surprising that these road-building elements were successfully used for the construction of the north section of the Parkway while it was under the management of the NPS.

The stone masonry guardwalls along the north section of the Parkway range in height from 9 to 18 inches, with an average height of 16 to 18 inches. The walls serve to delineate the Parkway, help to frame views, and provide a barrier between the roadway and steep slopes where there are substantial drop-offs into the Potomac River Gorge. The Parkway was constructed in stages. Construction continued from Rosslyn to Spout Run in the 1940s, from Spout Run to the CIA interchange in 1959, and the last section, from the CIA interchange to I-495/Capital Beltway, in 1962. The walls have a slight variation of aesthetics and craftsmanship based on the period of construction.

The GWMP was designed to incorporate vistas of many of the cultural and natural elements along the Parkway, such as the Potomac River, rocky outcrops along the Potomac River Gorge, and the many monuments in Washington, DC.

The bridges, culverts, and guardwalls of the GWMP were faced or entirely constructed with materials such as rustic rough-cut stone masonry (**Figure 12**). Such structures were meant to complement the natural environment and are contributing resources to the GWMP historic district listed in the NRHP. Many sections of the stone walls on the Parkway between the Theodore Roosevelt Bridge and Spout Run have been replaced with higher walls that have a stone facing with reinforced concrete core, but the stone walls between Spout Run and I-495/Capital Beltway remain largely as originally constructed and thus retain their historic integrity.



**Figure 12. Photographs of Existing Stone Masonry Walls**

The Parkway south of Spout Run is surrounded by a number of historic, commemorative, and cultural resources, while the north section of the Parkway is more natural, dominated by various hills, valleys, wooded areas, and views of the Potomac River Gorge. Many nationally significant buildings and national historic resources, however, can be easily seen by motorists from the area between Spout Run and Pimmit Run. The most prominent of these include the Washington Monument, Kennedy Center,

Georgetown University, and the Lincoln Memorial. The ability to view these historic resources, as well as the Potomac River Gorge, is an important aspect of the landscape characteristics of the Parkway as well as a crucial element of the visitor experience.

## ARCHEOLOGICAL RESOURCES

The GWMP has considerable potential for the presence of archeological sites, including those that are many thousands of years old. Sites have been discovered throughout the GWMP from various field investigations. A detailed Historic Context can be found in the *Phase IA Archeological Assessment: GWMP North Section Rehabilitation, Fairfax and Arlington Counties, Virginia* (Kreisa et al. 2016). It is to be noted that archeological sites are sensitive resources and information regarding these sites is restricted. Several archeological investigations have been conducted in or near the study area during the past several years and these investigations have identified significant archeological sites. More than a dozen studies for various projects in or near the study area have been undertaken and considered for this EA.

### Overview of Recorded Archeological Sites near the Project Area

Fracchia et al. (2009:17–19) provide a detailed overview of the previously identified archeological sites located within one mile of the project study area. The authors report that 140 archeological sites have been registered within this one-mile buffer of the projects study area, most (133) in Virginia with a few across the Potomac River in both Washington, DC (4) and Maryland (3). Most (92) are Native American, followed by Historic period (30), and sites with both Native American and Historic Period components (14). A listing of all 140 registered archeological sites can be found in Fracchia et al. (2009: Appendix II). A number of these sites were recorded originally by Howard MacCord, a former Virginia State Archeologist and influential researcher and archeological advocate throughout the Mid-Atlantic region.

Most Native American sites are undated, although 16 have Woodland period and 13 have Archaic period components (Fracchia et al. 2009:17). Most Native American sites are small lithic scatters, although larger sites interpreted to be villages, camps, quarries and lithic workshops, and rockshelters are also present in the area. Many of the larger village and camp sites are located on terraces of the Potomac River or bluffs immediately adjacent to the river floodplain. Smaller sites are present along major and minor tributaries.

In sum, Fracchia et al. (2009:19) suggest that the from the I-495/Capital Beltway interchange to the CIA interchange has a high probability for Native American archeological sites. While site locations are described as widespread, concentrations are noted along Potomac River terraces and along Turkey and Dead Runs. Site density and size decreases from the CIA interchange to Pimmit Run as living areas and water sources are smaller in this part of the project area. Lastly, the segment from Pimmit Run to the westernmost terminus of the project is also characterized as having a high potential for archeological resources. Fracchia et al. (2009:19) note that several large village sites are in this vicinity. No discussion of known Historic period archeological sites was included by Fracchia et al. (2009).

A current archeological study has discovered additional archeological resources along the north section of the Parkway. However, this report has not yet been published.

## CULTURAL LANDSCAPES

A cultural landscape is a geographic area, including both cultural and natural resources and the wildlife and domestic animals, therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic value. As part of this project, the NPS completed a CLI for the north section of the GWMP in 2009. The CLI identifies and documents each landscape's location, size, physical development, condition, landscape characteristics, character-defining features, and other valuable information useful to park management. In this EA, the following summary is provided to give the reader a general understanding of the important features of the cultural landscape on the north section of the GWMP. More detailed information on the cultural landscape can be found in the GWMP-North CLI (NPS 2015b).

As described in the GWMP-North CLI (NPS 2015b), application of the NRHP Criteria for Evaluation to the cultural landscape of the north section of the GWMP reveals that it is nationally significant under Criteria A, B, and C for its unique associations with the history of Washington, DC and one of the nation's greatest leaders. First, it is significant under Criterion A for its association with the broader planning of Washington, DC, for its engineering as a late example of parkway construction, and for its employment of early 1950s engineering and transportation innovations. This landscape is also significant under Criterion B for its historical and commemorative associations with George Washington. Lastly, the north section of GWMP is significant under Criterion C for its unique landscape architecture, whose carefully engineered topography, vegetation, and small-scale features still provide both commuter and recreational drivers with designed views that showcase the capital's monumental core.

The period of significance for the north section of the GWMP is from 1930 to 1963, beginning with the US government's authorization of funding to expand the existing MVMH through the Capper-Cramton Act, and ending with the completion of the last bridge along the north section of the GWMP, at Dead Run. This section of the GWMP was built in two distinct sections, from Spout Run to the CIA interchange, between 1956 and 1959, and from there to I-495/Capital Beltway, between 1959 and 1963. Its innovative engineering, unique architecture and landscape design continue to illustrate the character of parkways from this period, and thus represent the development of both materials and ideas in the nation's history.

Both the NRHP nomination and the Historic American Engineering Record echo these qualities as character-defining features. The features on the north section of the GWMP include:

- the rolling topography and spatial alignment of northbound and southbound lanes having separate grades to enhance viewing opportunities;
- planned views and vistas of the Potomac Palisades, hardwood forests and deep ravines, and Washington's monumental core;
- small-scaled features such as stone walls, culverts, and native and ornamental vegetation planted; and
- variable width medians and grassy shoulders combined with distinct difference in alignment and grade between travel lanes.

An NPS planting plan from 1959 outlines the various types of vegetation that were anticipated for the north section of the Parkway. When the Parkway was built, GWMP planted an immense number of flowering dogwoods and other native understory trees and shrubs such as eastern redbud, nannyberry

and blackhaw. The plan from 1959 identifies a large variety of plantings for the Route 123/GWMP interchange and differences between the north and south portions of the cloverleaf. Today, many of the original species from the original planting plan exist.

## VISUAL AND AESTHETIC RESOURCES

The protection and management of scenic resources along the GWMP is grounded in congressionally legislated mandates. The NPS Organic Act of 1916 describes the NPS mission to include: *“to conserve the scenery and natural and historic objects...for the enjoyment of future generations.”* The GWMP enabling legislation, the Capper-Cramton Act, 1930, as amended in 1946, calls for the preservation of its scenery as follows: *“funds shall be appropriated as required for the development and completion—of the George Washington Memorial Parkway to include the shores of the Potomac, and adjacent lands... including the protection and preservation of the natural scenery of the Gorge and the Great Falls of the Potomac.”* NPS DO-28 Cultural Management (1998) and GWMP’s Long Range Interpretive Plan (2005b) and Foundation Document (2014b) all outline the NPS responsibility in the management and protection of scenic vistas. As described previously in the *Cultural Landscapes* section, the Parkway was designed to create scenic vistas of the Potomac River Gorge, Georgetown, and the monumental core of Washington, DC (**Figure 13**).

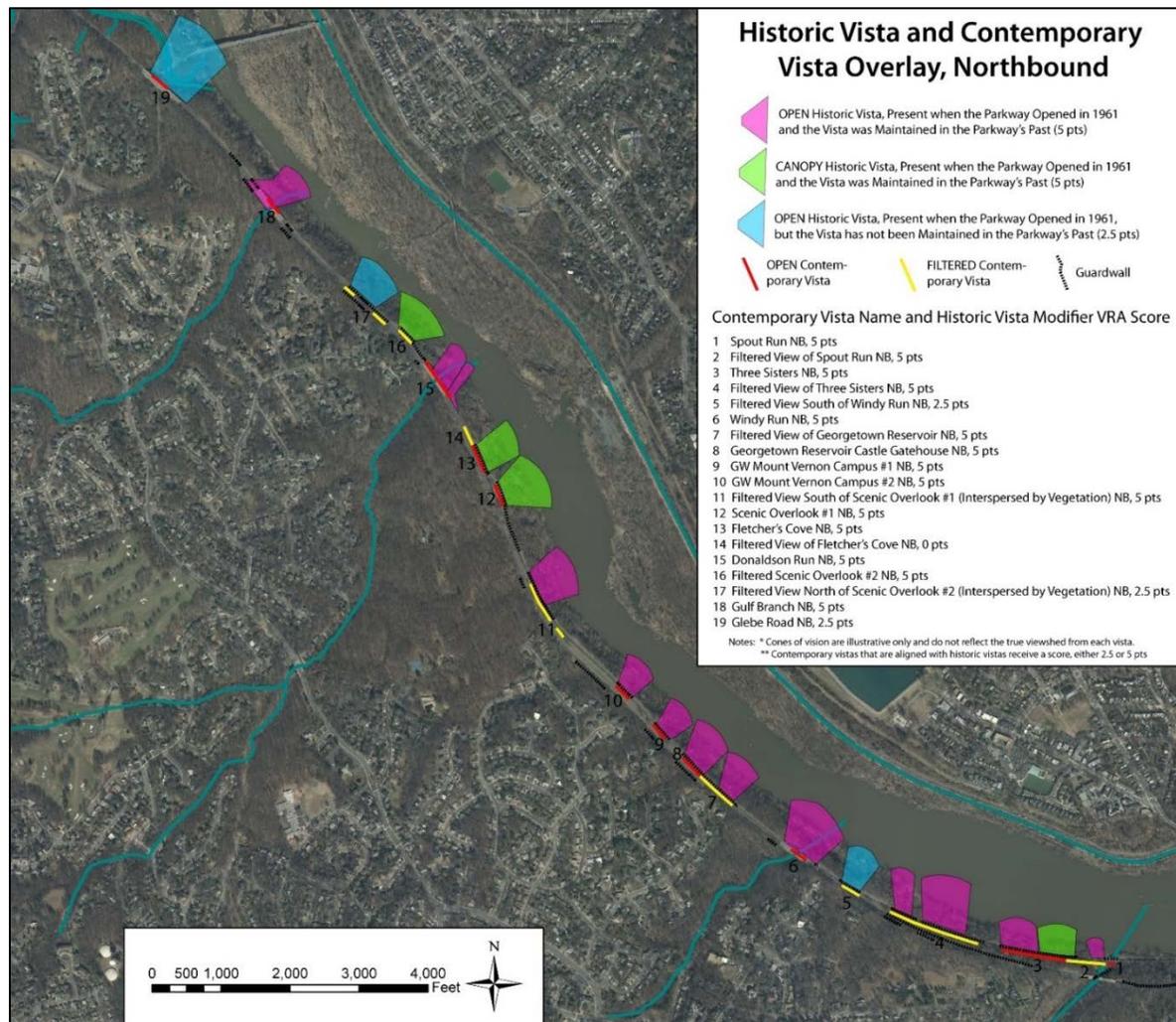


**Figure 13. View of Washington, DC, and the Potomac River Gorge from the southbound lanes on the GWMP**

To support the impact analysis and decision-making process on this project, the NPS prepared a detailed VRI&A in 2014, which primarily assessed views south of the Glebe Road Bridge (one view was assessed north of the bridge south of the CIA interchange). The VRI&A is, and will continue to be, one of the tools used by the project team throughout the planning and design process. The purpose of the VRI&A was to identify scenic vistas along the north section of the Parkway and to assess the relative rank and scenic value of the vistas. Assessments were completed using the VRA framework developed by the NPS and

implemented for other NPS units, such as Blue Ridge Parkway and Yosemite's front country roads and trails. The VRA framework is transparent and a replicable means of ranking relative scenic qualities of numerous vistas. In this EA, an abbreviated summary is provided to give the reader a general understanding of the visual resources and vistas on the north section of the Parkway. More detailed information on NPS methods and GWMP visual resources can be found in the *GWMP – North Visual Resources Inventory and Assessment* (NPS 2014a).

In the VRI&A, the NPS considered both contemporary (today) vistas and historic vistas. **Figure 14** and **Figure 15** depict an overlay of the contemporary and historic vistas along the north section of the Parkway. Each vista was assessed in the field for a wide array of scenic quality criteria including vividness (expansiveness, framing, focal points, depth, variety, ephemeral image), uniqueness, desired landscape elements, and visual harmony. Additional consideration was given to historic vistas and the duration of the vistas from a driver's perspective. **Table 1** presents the results of a multi-disciplinary team assessment of the vistas.



**Figure 14. Historic Vista and Contemporary Vista Overlay, Northbound (NPS 2014a)**

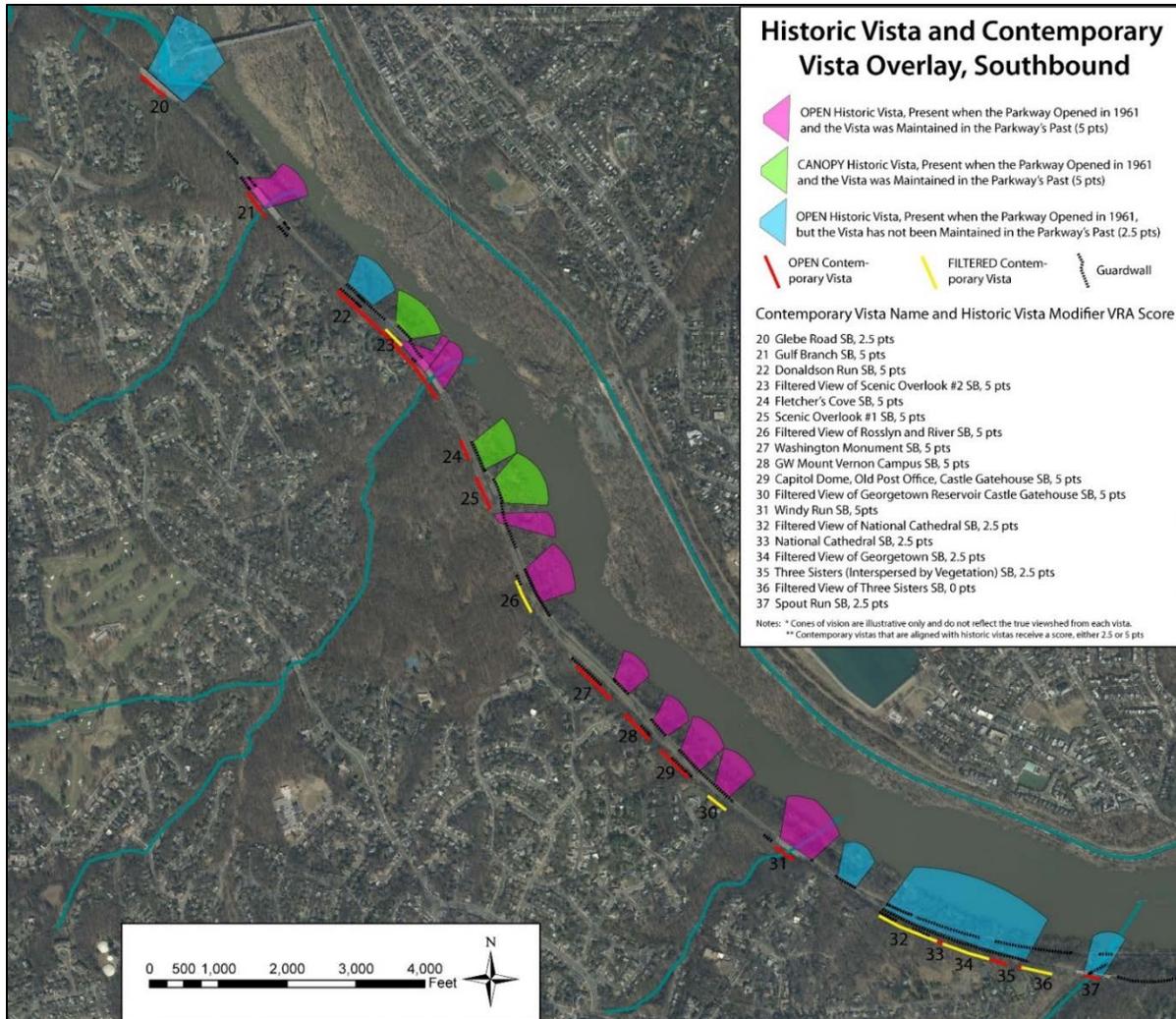


Figure 15. Historic Vista and Contemporary Vista Overlay, Southbound (NPS 2014a)

**Table 1. VRI&A Final Scores and Scenic Classes for GWMP**

Vista No. and Name	Direction	Open or Filtered	Mile Points	Scenic Quality Subtotal 0-18 pts	Historic Vista Modifier 0-5 pts	Duration Modifier 0-1 pts	Open View Modifier 0-1 pts	Final Score 0-27 pts	Scenic Class
(#1) Spout Run NB	NB	Open	17.769-17.805	13.407	5	0	1	19.407	High
(#2) Filtered Spout Run NB	NB	Filtered	17.808-17.882	10.035	5	3	0	18.035	High
(#3) Three Sisters NB	NB	Open	17.878-18.019	12.771	5	3	1	21.771	Superior
(#4) Filtered Three Sisters NB	NB	Filtered	17.923-18.018, 18.037-18.196	10.378	5	3	0	18.378	High
(#5) Filtered South of Windy Run NB	NB	Filtered	18.322-18.366	8.478	2.5	1	0	11.978	Very Low
(#6) Windy Run NB	NB	Open	18.451-18.476	6.871	5	1	1	13.871	Very Low
(#7) Filtered Georgetown Reservoir NB	NB	Filtered	18.630-18.726	11.764	5	3	0	19.764	High
(#8) Georgetown Reservoir Castle Gatehouse NB	NB	Open	18.730-18.771	11.285	5	1	1	18.285	High
GW Mt. Vernon Campus #1 NB	NB	Open	18.830-18.860	9.95	5	1	1	16.95	Medium
(#10) GW Mt. Vernon Campus #2 NB	NB	Open	18.944-18.970	10.521	5	1	1	17.521	Medium
(#11) Filtered South of Scenic Overlook #1 (Interspersed by Vegetation NB)	NB	Filtered	19.872-19.982, 20.007-20.037	8.285	5	3	0	16.285	Medium
(#12) Scenic Overlook #1 NB	NB	Open	19.424-19.473	12.064	5	3	1	21.064	Superior
(#13) Fletcher's Cove NB	NB	Open	19.503-19.563	14.192	5	1	1	21.192	Superior
(#14) Filtered Fletcher's Cove NB	NB	Filtered	19.543-19.593	10.642	0	1	0	11.642	Very Low
(#15) Donaldson Run NB	NB	Open	19.668-16.769	12.05	5	3	1	21.628	Superior
(#16) Filtered Scenic Overlook #2 NB	NB	Filtered	19.808-19.852	10.385	5	3	0	18.385	High
(#17) Filtered North of Scenic Overlook #2 (Interspersed by Vegetation) NB	NB	Filtered	19.808-19.852	6.685	2.5	2	0	11.185	Very Low
(#18) Gulf Branch NB	NB	Open	20.176-20.212	8.692	5	1	1	15.692	Low
(#19) Glebe Road NB	NB	Open	20.490-20.586	9.1	2.5	1	1	13.6	Very Low
Filtered Riverview near CIA HQ NB	NB	Filtered	22.784-22.854	6.264	0	3	0	9.264	Very Low
(#20) Glebe Road SB	SB	Open	20.599-20.487	7.425	2.5	2	1	12.925	Very Low
(#21) Gulf Branch SB	SB	Open	20.259-20.166	8.2	5	2	1	16.2	Medium
(#22) Donaldson Run SB	SB	Open	19.815-19.674	8.712	5	3	1	17.712	Medium
(#23) Filtered Scenic Overlook #2 SB	SB	Filtered	19.859-19.815	8.521	5	2	0	15.521	Low
(#24) Fletcher's Cove SB	SB	Open	19.579-19.548	8.756	5	1	1	15.756	Low

Vista No. and Name	Direction	Open or Filtered	Mile Points	Scenic Quality Subtotal 0-18 pts	Historic Vista Modifier 0-5 pts	Duration Modifier 0-1 pts	Open View Modifier 0-1 pts	Final Score 0-27 pts	Scenic Class
(#25) Scenic Overlook #1 SB	SB	Open	19.497-19.423	6.068	5	2	1	14.068	Low
(#26) Filtered Rosslyn and River SB	SB	Filtered	19.277-19.184	13.121	5	2	0	20.121	Superior
(#27) Washington Monument SB	SB	Open	19.073-18.953	13.878	5	3	1	22.878	Superior
(#28) GW Mt. Vernon Campus #2 SB	SB	Open	18.900-18.851	9.131	5	2	1	17.131	Medium
(#29) Capitol Dome, Old Post Office, Castle Gatehouse SB	SB	Open	18.821-18.645	13.631	5	3	1	22.631	Superior
(#30) Filtered Georgetown Reservoir Castle Gatehouse SB	SB	Filtered	18.699-18.606	7.657	5	1	0	13.657	Very Low
(#31) Windy Run SB	SB	Open	18.525-18.459	10.043	5	1	1	17.043	Medium
(#32) Filtered National Cathedral SB	SB	Filtered	18.239-18.130	10.307	2.5	3	0	15.807	Low
(#33) National Cathedral SB	SB	Open	18.126-18.110	10.187	2.5	0	1	13.687	Very Low
(#34) Filtered Georgetown SB	SB	Filtered	18.108-18.053	14.392	2.5	3	0	19.892	High
(#35) Three Sisters (Interspersed by Vegetation) SB	SB	Open	18.014-17.998, 17.955-17.946	10.968	2.5	1	1	15.468	Low
(#36) Filtered Three Sisters SB	SB	Filtered	17.981-17.959	13.664	0	2	0	15.664	Low
(#37) Spout Run SB	SB	Open	17.826-17.778	14.225	2.5	1	1	18.725	High

NB = Northbound, SB = Southbound, Source: NPS2014a

For more information on the scenic classes and methodology, please refer to the VRI&A (NPS 2014a), which is a supporting document to this EA.

## TRANSPORTATION

### Traffic Forecasting and Operations

The GWMP corridor from Spout Run to I-495/Capital Beltway is heavily traveled with current year average annual weekday traffic volumes ranging from 57,000 to 85,000 vehicles per day (Sabra, Wang & Associates, Inc. 2016a). To forecast the temporary impacts of construction, the FHWA retained Sabra, Wang & Associates, Inc. to prepare two traffic studies. Each study evaluated the potential impacts of a total closure of half of the existing four lanes on the Parkway in the year 2020. This action was viewed as being the most restrictive construction option likely to be considered. The year 2020 was chosen as an estimated timeframe for the initiation of major construction activities along the Parkway mainline. The exact timing of construction and how the project will be phased is dependent on future funding for the project.

The first traffic study examined the potential impacts on daily traffic volumes and peak period movements on the GWMP and adjacent traffic diversion on routes in Virginia, Maryland, and

Washington, DC. The second study evaluated the operations of the corridor using traffic modeling. More detailed information on the travel forecasting and diversion analysis can be found in the *GWMP North Design Environmental Assessment Travel Forecasting/Diversion Analysis Report* prepared by Sabra, Wang & Associates, Inc. for EFLHD (Sabra, Wang & Associates, Inc. 2016a). Information on the traffic operations study is presented in the *GWMP North Design Environmental Assessment Traffic Operations Analysis Report* (Sabra, Wang & Associates, Inc. 2016b). These studies were conducted in coordination with VDOT, DDOT, and MSHA to gather their input into the methodologies and results. A summary of each study and baseline conditions follow. Results from each study are described in chapter 4. It should also be noted that for each phase of the project, a detailed TMP will be completed by FHWA and NPS prior to construction and will be coordinated with the VDOT, DDOT, MSHA, and the local government transportation agencies in Arlington and Fairfax counties, Virginia and Montgomery County, Maryland.

FHWA used the currently adopted regional travel demand model as developed and maintained by the Metropolitan Washington Council of Government's Transportation Planning Board. This model was used to forecast the 2020 base no-build daily and peak hour traffic volumes and to estimate the potential impacts and diversions resulting from the lane reductions during the construction period. The road segments analyzed as part of the study included, but were not limited to:

- I-495/Capital Beltway from I-66 to MD 190 (River Road)
- MD 190 from I-495/Capital Beltway to Wisconsin Avenue
- MD 396/ Massachusetts Avenue from MD 614 (Goldsboro Road) to Wisconsin Avenue
- Foxhall Road from Canal Road to Nebraska Avenue
- Cabin John Parkway from Clara Barton Parkway to I-495/Capital Beltway
- Clara Barton Parkway/Canal Road from I-495/Capital Beltway to the Key Bridge
- MacArthur Boulevard from Falls Road to Foxhall Road
- I-66 from I-495/Capital Beltway to the GWMP
- Route 193 (Old Georgetown Pike) from I-495/Capital Beltway to the Route 123/Route 193 intersection
- Route 123 (Dolly Madison Boulevard) from I-495/Capital Beltway to the Route 123/GWMP interchange
- US 29 (Lee Highway) in Virginia from I-66 to Rosslyn

The 2020 no-build 24-hour volumes and the estimated traffic growth from the 2015 base year to the year 2020 are presented in **Table 2**.

**Table 2. 2020 Construction Scenario 24-hour Volumes and % Change from No-Build**

No.	Facility	Location	GWMP 2015 24-hour Assigned Volume	GWMP 2020 No-Build 24-hour Assigned Volume	% Change
1	GWMP	East of I-495/Capital Beltway	54,543	57,623	5.65%
2	GWMP	North of Route 123	56,910	59,832	5.13%
3	GWMP	South of Route 123	70,795	76,306	7.78%
4	GWMP	South of Spout Run	93,808	99,797	6.38%
5	I-495/Capital Beltway	American Legion Bridge	272,243	280,617	3.08%
6	Route 123	Chain Bridge	32,739	32,101	-1.95%
7	Key Bridge		53,838	55,718	3.49%
8	I-66	Theodore Roosevelt Bridge	96,530	98,568	2.11%
9	Arlington Memorial Bridge		48,082	49,780	3.53%
10	I-395	14 <sup>th</sup> Street Bridge	221,028	225,026	1.81%
11	River Road	East of I-495/Capital Beltway	54,479	57,228	5.05%
12	Cabin John Pwky	East of I-495/Capital Beltway	27,455	29,128	6.09%
13	Clara Barton Pkwy	East of I-495/Capital Beltway	16,229	16,521	1.80%
14	Route 123	West of GWMP	37,183	38,872	4.54%
15	I-495/Capital Beltway	North of VA-267	213,662	243,681	14.05%
16	VA 267	North of I-66	59,230	48,935	-17.38%
17	I-66 (Main & HOT)	Between Fairfax Dr. and Sycamore St.	143,220	149,118	4.12%

Source: Sabra, Wang &amp; Associates, Inc. 2016a.

In the *GWMP North Design Environmental Assessment Traffic Operations Analysis Report* (Sabra, Wang & Associates, Inc. 2016b), information on traffic volumes, levels of service, queueing, and travel times are presented for the year 2015 baseline, 2020 no-build, and 2020 build (construction scenario). The traffic operational analysis was performed using the microscopic simulation software, VISSIM. Travel time and speed were obtained from the simulation runs of the VISSIM network for the 2015 baseline, 2020 no-build, and 2020 build conditions. The segment level travel times and speeds during the AM and PM peak hours along the Parkway mainline travel lanes are presented in **Table 3** and **Table 4**, respectively.

**Table 3. AM Travel Time and Speeds for 2015 and 2020 No-Build**

	Travel Times (minute:second)		Speed (miles per hour)	
	2015	2020 No-Build	2015	2020 No-Build
<b>Northbound</b>				
Key Bridge to Spout Run	0:15	0:15	51	51
Spout Run to Route 123	4:49	4:52	52	49
Route 123 to After Route 123	0:10	0:12	52	50
North of Route 123 to I-495/Capital Beltway Ramps	3:50	8:27	52	16
Total Northbound	9:05	12:47	51	34
<b>Southbound</b>				
I-495/Capital Beltway to Route 123	3:54	3:55	51	51
Route 123 to after Route 123	0:31	0:32	51	43
Route 123 to Spout Run	6:18	9:26	52	25
Spout Run to Key Bridge	1:02	1:20	37	33
Total Southbound	11:45	14:55	42	33

Source: Sabra, Wang &amp; Associates, Inc. 2016b.

**Table 4. PM Travel Time and Speeds for 2015 and 2020 No-Build**

	Travel Times (minute:second)		Speed (miles per hour)	
	2015	2020 No-Build	2015	2020 No-Build
<b>Northbound</b>				
Key Bridge to Spout Run	0:16	0:22	47	26
Spout Run to Route 123	5:10	10:51	53	44
Route 123 to After Route 123	0:11	0:17	49	25
North of Route 123 to I-495/Capital Beltway Ramps	6:27	10:04	28	16
Total Northbound	12:05	21:35	38	21
<b>Southbound</b>				
I-495/Capital Beltway to Route 123	3:50	3:51	52	52
Route 123 to after Route 123	0:30	0:32	52	52
Route 123 to Spout Run	4:34	4:36	52	52
Spout Run to Key Bridge	0:45	0:46	51	51
Total Southbound	9:41	9:46	51	50

Source: Sabra, Wang & Associates, Inc. 2016b.

## Safety

The FHWA conducted a Wall Safety Risk Assessment in 2010 (updated in 2018) to facilitate addressing the need to improve safety and infrastructure conditions on the GWMP while preserving the scenic, aesthetic, and historic resources. The Wall Safety Risk Assessment takes into consideration various criteria, or risk factors, associated with each of the historic stone masonry walls. The criteria include roadway features, such as roadway grade and roadside elements (collectively called “nominal safety”), as well as criteria related to roadway performance, for example, crashes (termed “substantive safety”). The Wall Safety Risk Assessment is an evaluation of the overall safety risk of the north section of the Parkway as well as how prone a given guardwall location is to risk, which allows the study team to understand a relative ranking and priority of the walls along the Parkway that present the highest risk to public safety. To support this EA, FHWA prepared an updated version of the Wall Safety Risk Assessment using the crash data from 2006-2012 (2013-2015 data was not available).

The Wall Safety Risk Assessment follows the guidelines established in the *NPS Barrier Inventory Program Business Practices* document for guardrail inventory and condition assessment. It uses a spreadsheet to facilitate the evaluation of risk for each of the 69 walls, including non-historic walls. A total risk score was determined for each wall by adding the values of seven risk contributing factors: the higher the score, the more risk the wall represents to roadway users. The contributing factors are: weighted crashes, speed, average daily traffic, horizontal curvature, hazard severity, length of barrier, and roadway grade.

The 2010 Wall Safety Risk Assessment assigned three risk categories to the walls based on their overall score: high, medium, and low. However, in October 2017, the FHWA and NPS met to re-evaluate the data in the Wall Safety Risk Assessment and how the walls were categorized based on their safety risk in order to reduce project impacts. Based on these efforts, and collaboratively working through decisions addressing safety concerns at walls under specific rankings, adjustments to the categories were made. FHWA reconsidered the three categories and, in response to NPS concerns, divided the medium risk category into three sub-categories (medium-high, medium-medium, medium-low) based on the three

most critical safety risk factors (hazard severity, horizontal curves, and weighted crashes). The distribution of historic walls (built prior to 1962) by risk category was as follows: 18 walls ranked “high,” 10 walls ranked “medium-high,” 2 walls ranked “medium-medium,” 14 walls ranked “medium-low,” and 15 walls ranked “low.” The additional 11 non-historic walls were ranked as “low.” Additional modern walls were captured in this category of the matrix but were not assessed as part of this exercise. A table summarizing the information is provided as **Appendix A**. The result of this assessment is one of the tools that was used to help determine the appropriate treatments on a case-by-case design approach for the roadside barrier modifications. Other safety considerations included ponding in the road surface, erosion at outfalls creating unstable embankments, and the inadequate site distances and acceleration and deceleration lanes along the Parkway as mentioned in chapter 2.

### VISITOR USE AND EXPERIENCE

In fiscal year 2016, the GWMP totaled over 10 million recreational visits (NPS 2016b). The Parkway is open year-round, with the highest visitation in the summer and fall. The typical visitor experience includes travel to many of the historical, natural, or recreational areas along the Parkway either by automobile on the roadway or by foot or bicycle on the trail network. The GWMP provides visitors and residents of the area a scenic, historic, and recreational setting that offers a respite from the urban pressures of a metropolitan area. Recreational activities along the Parkway include, but are not limited to fishing, picnicking, bird watching, kayaking and canoeing, jogging, bicycling, hiking, educational nature walks, and auto touring.

The PHT is a 10-mile segment of the larger Potomac Heritage Network that connects to the Mount Vernon Trail and is located along the Potomac River and the GWMP. The PHT is a well-marked trail that has several access points and provides visitors with scenic views of natural and historical landscapes. The trail starts at I-495/Capital Beltway and proceeds to the Theodore Roosevelt Island, just south of the Key Bridge interchange with the Parkway. The PHT winds along steep, rocky hillsides, forested stream valleys, and sites like Fort Marcy, Turkey Run Park, and other areas of historic significance. The trail is adjacent to several stone masonry guardwalls and passes through the Route 123/GWMP interchange approximately 5½ miles north of the southern terminus of the project area limits.

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## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

### GENERAL METHODOLOGY

Chapter 4 describes the potential environmental consequences of implementing any of the alternatives being considered. This chapter is organized by resource topic as presented in chapter 3 and provides a comparison among the alternatives and options that are described in chapter 2. In accordance with the CEQ regulations found in 40 CFR 1502.16, direct, indirect, and cumulative impacts are described, and the impacts are assessed in terms of context, intensity, and duration. Mitigation measures, actions taken to lessen the severity and probability of the potential impact, are also described and taken into consideration in the impact analysis, when applicable. The impact analyses in this chapter are based on a reasonable level of effort to synthesize the best available data, professional judgment of park staff and experts in the field, as well as supporting literature. For each resource topic, the applicable analysis methods are discussed including assumptions and geographic area identified for each resource.

### CUMULATIVE IMPACTS ANALYSIS METHODOLOGY

The CEQ regulations, which implement the NEPA, require assessment of cumulative impacts in the decision-making process for federally funded projects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively moderate, or major actions taking place over a period of time. Cumulative impacts are considered for all alternatives and are presented at the end of each impact topic discussion analysis.

Cumulative impacts were determined by combining the impacts of the alternatives with other past, present, and reasonably foreseeable future actions. Therefore, past, ongoing, or foreseeable future projects within the GWMP and, if necessary, the surrounding region were identified. Cumulative impacts are evaluated in a regional context, which varies for each impact topic; however, in general, the regional context is the Parkway, the Ronald Reagan Washington National Airport to the south, the Clara Barton Parkway to the north, I-495/Capital Beltway to the west, and the properties abutting the Parkway to the south. A brief description is provided of the proposed projects identified in the cumulative impact scenario. Projects that have the potential of contributing to cumulative impacts are discussed further in the impact analysis.

## Past Actions

**Past Rehabilitation Projects of the Parkway.** The NPS, in cooperation with the EFLHD, undertook a comprehensive rehabilitation project on the section of the GWMP from Theodore Roosevelt Bridge north to Spout Run interchanges. The project was completed in 1997. The scope of the proposed project included rehabilitating the pavement, replacing existing guardwalls with stone-faced concrete core walls that meet AASHTO guidelines, and other safety related improvements.

**Bridge Rehabilitation Projects on GWMP.** Over the past 20 years, most of the bridges on the north section of the Parkway have been rehabilitated. The work included deck repair, pavement rehabilitation, painting, and extension and modification to the existing guardwalls.

## Current and Future Actions

**Arlington County and Vicinity Boathouse.** In August 2002, the NPS released a study entitled *Facility and Site Analysis for a Boathouse on the Potomac River*. The study was initiated at the request of the US Congress for assessing a potential site of a boathouse along the Potomac River within Arlington County. In 2012, the NPS announced that it has reinitiated the NEPA process and is preparing an EA for four project alternatives. The proposed project includes building a boathouse with indoor storage space and floating docks at four possible locations: two on the Rosslyn Waterfront near Key Bridge, one south of the CSX/14<sup>th</sup> Street Bridges, and one on Gravelly Point Island.

**Rehabilitation of the Arlington Memorial Bridge.** The NPS is proposing to rehabilitate the Arlington Memorial Bridge to restore the bridge's structural integrity while protecting and preserving, to the extent possible, its historic character and significant design elements. In accordance with the 2017 EA/FONSI prepared for the project, the NPS would repair Arlington Memorial Bridge by replacing the steel draw span, called a bascule span; repairing deteriorated portions of the abutments, piers, and concrete arch spans; replacing the concrete bridge deck; and resurfacing travel lanes. The rehabilitation project also includes replacing concrete sidewalks and refitting granite curbs; repairing granite bridge railings, lamp posts, and access panels; installing a better drainage system; and making minor, nonstructural improvements.

**Memorial Circle Transportation Plan.** NPS has initiated work on a Transportation Plan and EA for the Memorial Circle area of the GWMP. The purpose of the plan is to reduce conflicts between trail, walkway, and roadway users and to increase overall visitor safety, while maintaining the memorial character of the area and improving mobility for vehicles, pedestrians, and bicycles.

**Langley Fork Park Land Exchange.** Fairfax County Parks Authority (FCPA) has proposed to the GWMP a land exchange in the Drainesville District of Fairfax County, Virginia. Langley Fork Park is a 50-acre site owned by the federal government and administered by the GMWP. Langley Fork Park has been maintained and operated by FCPA since 1980 on a special use permit issued by NPS. Nearby Langley Oaks Park is a 100-acre FCPA site adjacent to NPS land. In conjunction with a new master planning process for Langley Fork Park, FCPA is proposing NPS transfer Langley Fork Park to FCPA. In return, FCPA would transfer an equally-valued portion of Langley Oaks Park to NPS. An EA evaluating this land exchange was released for public review in April 2018.

**Potomac Yard Metrorail Station.** The proposed Potomac Yard Metrorail Station consists of construction of a new Metrorail station and ancillary facilities located at Potomac Yard within the City of Alexandria along the existing Metrorail Blue and Yellow Lines between the Ronald Reagan Washington National Airport Station and the Braddock Road Station. The project will serve existing neighborhoods and retail centers as well as high-density, transit-oriented developments planned by the City of Alexandria. The project will provide access to the regional Metrorail system for the US Route 1 corridor of north Alexandria. The Potomac Yard area is currently without direct access to regional transit services, such as the Metrorail. The Federal Transit Administration (FTA) and the City of Alexandria prepared their Final EIS and Section 4(f) Evaluation, dated June 1, 2016 for the project. FTA served as the lead Federal agency, the City of Alexandria was the project sponsor and joint lead agency, and the Washington Metropolitan Area Transit Authority (WMATA) and NPS served as cooperating agencies. The NPS served as a cooperating agency because of the project's impacts to natural and cultural resources of the GWMP. Under the project, NPS will consider issuance of a permit for the temporary use of land under its administration for construction staging and the exchange of property for the proposed permanent use of a portion of that land for the project. The Record of Decision has been signed for this proposed project.

## **SURFACE WATERS**

### **About the Analysis**

To analyze potential impacts of each alternative on surface waters, park-wide mapping in geographic information systems (GIS) and field investigations were used to understand the existing surface waters in the study area. The study area includes the streams that are conveyed under the Parkway from Spout Run to I-495/Capital Beltway including areas of outfall repairs. Preliminary design plans including potential LOD for outfall repairs and outfall conditions assessments conducted by FHWA aided in the impact analysis.

### **Alternative A: No-Action**

Under the no-action alternative, the NPS would continue management actions that would include minimum rehabilitation of the roadway to maintain the Parkway near its existing state. The no-action alternative would have a negligible adverse impact on surface waters because of soil erosion at outfall structures. The existing drainage system has very small and localized impacts on nearby surface waters from increased sediment transport from channel erosion.

**Cumulative Impacts.** Future projects such as the Arlington Memorial Bridge Rehabilitation and Arlington County and Vicinity Boathouse have the potential to have long-term adverse impacts on surface waters from construction activities. The no-action alternative, when added to these reasonably foreseeable future actions, would contribute a very small increment to the cumulative impacts on surface waters because the impact is minor and localized when compared to the length of perennial streams on the Parkway. Collectively, the adverse cumulative impacts on surface waters would be minor as impacts would affect only a small percentage of existing waterways along the Parkway.

**Conclusion.** Under the no-action alternative, there would be negligible long-term adverse impacts on surface waters. There would be minor adverse cumulative impacts on surface waters.

### Alternative B (Proposed Action and NPS Preferred Alternative)

Major project components, including the rehabilitation of the roadway, stabilization of the road shoulder, modification to the existing roadside barriers, and the construction and/or extension of acceleration/deceleration lanes would have no direct impacts to surface waters.

Most of the outfall structures on the Parkway convey stormwater from the roadway surface. There are a few instances where repairs would be required for drainage pipes that convey streams under the Parkway. Repair of these outfall structures would have minor adverse impacts to surface waters from in-stream construction activities. The primary concern would be physical impacts to the streams and streambanks during construction. While minimizing the footprint of construction, eroded banks would be graded and stabilized to control erosion. Minor indirect impact from sediment erosion from construction into nearby waterways could occur. It is anticipated that impacts would be temporary during construction. Long-term, the outfall repairs would have a beneficial impact to streams and other receiving waters by reducing future channel erosion and sediment transport. Mitigation measures for surface waters are presented in chapter 2.

A detailed outfall survey was completed and preliminary recommendations for stabilization were made by FHWA. The outfall survey rated each outfall channel condition on a scale of 1 to 5 as well as the pipe condition. **Table 5** presents the outfalls where corrective measures are proposed in perennial or intermittent streams. More detailed impact analysis would be conducted once design plans are refined. For these streams, the NPS would comply with Section 404 of the Clean Water Act and applicable state regulation for waters of the US. **Appendix C** shows the locations of the outfalls by number and roadway stationing. In each case, the project includes the repair of existing culverts and/or pipes. In some cases, rip rap exists. Each individual stream or drainage channel corrective action is estimated to result in less than 0.1 acres of disturbance to the stream or drainage channel.

An intermittent stream exists in the northwest quadrant of the Route 123/GWMP interchange. Some of the interchange options considered in the 2008 EA would have a direct impact to the stream channel. The options carried forward in this EA would avoid the stream and, therefore, have no direct impact to surface waters.

During construction, ground disturbance has the potential to increase sediment loads to receiving waters. Increased sediment loads could destroy or damage aquatic habitat for macro-invertebrates and spawning fish, but this would be mitigated with erosion and sediment control measures. While the initial response to increased sediment due to construction-related activities is the reduction of a species' numbers, they generally repopulate within 12 months of construction. Construction activities would have minor short-term adverse impacts on surface waters. Indirect impacts to water quality would be minor and are discussed in more detail in the 2008 EA and dismissed from further analysis in this EA.

**Table 5. Proposed Outfall Repairs in Perennial/Intermittent Streams**

Outfall No.	Approx. Station	Roadway	Outfall Channel Condition Rating	Preliminary Corrective Measures
9	980+50	NBL	4	Riprap at outfall
18	953+00	NBL	4	Riprap at outfall
61	321+75	SBL	1	Deep outfall channel fill
64	312+75	SBL	3	Deep outfall channel fill
66	308+25	SBL	1	Deep outfall channel fill
74	783+50	NBL	2	Riprap at outfall; reset end section
77	776+25	NBL	1	Riprap at outfall
82	759+75	NBL	3	Deep outfall channel fill
83	750+25	NBL	4	Riprap at outfall
85	737+50	NBL	3	Deep outfall channel fill
86	735+00	NBL	4	Riprap at outfall
90	114+75	CIA	4	Riprap at outfall
91	114+50	CIA	3	Riprap at outfall; patch concrete endwall; fill area behind wingwall
97	708+50	NBL	3	Riprap at outfall
109	671+00	NBL	4	Riprap at outfall
118	650+00	NBL	3	Riprap at outfall
119	637+75	NBL	4	Riprap at outfall; replace end section
120	635+50	NBL	4	Riprap at outfall; replace end section

**Notes:**

Outfall Channel Ratings from George Washington Memorial Parkway North Section Improvements Hydraulics Report, 2006. (Rating Scheme: **1** Poor: Severe erosion, channel is far below original grade, sides are very steep; **2** Substandard: Sizable erosion, channel appears to be very erodible; **3** Fair: Some erosion, channel appears to be below original bed elevations; **4** Good: minor erosion, channel does not appear to be erosion-prone; **5** Excellent: little to no erosion).

Corrective measures will be refined during more detailed design.

**Cumulative Impacts.** Future projects such as the Arlington Memorial Bridge Rehabilitation and Arlington County and Vicinity Boathouse have the potential to have long-term adverse impacts on surface waters from construction activities. Alternative B would have a long-term benefit, so when added to these reasonably foreseeable future actions, there would be no cumulative impact.

**Conclusion.** Alternative B would have minor short-term adverse impacts during construction because of outfall repairs. Long-term, alternative B would have a beneficial impact from the stabilization of stream and drainage channels, thereby reducing future erosion. Route 123/GWMP interchange options 1

(preferred alternative) and 2 would have no impact on surface waters because these options avoid the nearby stream. No cumulative impacts on surface waters would occur.

## VEGETATION INCLUDING RARE PLANTS

### About the Analysis

To analyze potential impacts of each alternative, data collected during vegetation surveys conducted in 2007 was used to quantify impacts from proposed barrier wall modifications and outfall repairs. It has been assumed for the analysis that data from the 2007 surveys remain accurate. Impacts to vegetation from other alternative elements are described qualitatively. In addition, potential impacts to eastern buttercup phacelia are addressed, as outfall repairs may disturb this plant species of concern.

### Alternative A: No-Action

The NPS would continue management actions that would include minimum roadway maintenance under the no-action alternative. Except for hazardous tree removal and occasional trimming of tree branches that overhang the roadway and pose a potential safety hazard to motorists if they were to fall, no disturbance to vegetation, including eastern buttercup phacelia, would be expected to occur because no individual plants would be removed or damaged to the extent that their survivability would be affected. Outfall conditions would also lead to localized bank failures, which would impact a small number of trees and shrubs along the Parkway.

**Cumulative Impacts.** There would be no cumulative impacts because there would be no impacts to vegetation under the no-action alternative.

**Conclusion.** There would be no direct, indirect, or cumulative impacts to vegetation under the no-action alternative because vegetation would not be removed or damaged to the extent that their survivability would be affected.

### Alternative B (Proposed Action and NPS Preferred Alternative)

Pavement reconstruction would not result in disturbance to vegetation because the work would be confined to the existing roadway. Turf grass would be reestablished to stabilize the existing unpaved shoulders along the Parkway. Shoulder widths would be reduced to as low as 3 feet, where appropriate, to avoid adjacent trees and shrubs; therefore, no disturbance to roadside vegetation is anticipated. Roadway drainage improvements, including the replacement of existing curb and inlets, and the installation of new inlets, would not be expected to result in disturbance to trees and shrubs because the work would be confined to the existing roadway, adjacent shoulders, and median. Herbaceous ground cover disturbed during construction would be reestablished prior to construction completion. Pavement reconstruction, shoulder stabilization and roadway drainage improvements would not be expected to disturb eastern buttercup phacelia, because the plant species is not known to occur within the existing maintained roadway area.

In some instances, the replacement of the historic guardwalls with 27-inch stone masonry guardwalls would have impacts to vegetation. To quantify vegetative disturbance from roadside barrier modifications, vegetation was characterized within the LOD identified in the preliminary design plans for the project for 30 percent of the existing stone masonry guardwalls to be reconstructed. Field scientists identified and measured the diameter of each tree within 8 feet of the walls (anticipated LOD), and saplings/shrubs and herbaceous species were also identified. For the assessment, it was assumed that trees within 5 feet of the walls would potentially be removed. Survey data was then used to extrapolate potential vegetative disturbance from roadside barrier modifications for the entire project. Since the assessment, the NPS and FHWA has drastically reduced the number of walls to be reconstructed, thus reducing impacts to vegetation. Repair of the existing walls is anticipated to require minor pruning and clearing immediately adjacent to the wall.

The results of the vegetation surveys concluded that an estimated 42 trees occur within the 5-foot distance of the entire length of approximately 25,000 linear feet of existing historic and non-historic guardwalls. It should be noted that the NPS tries to maintain a mow zone in many instances behind the wall for maintenance when feasible. Under alternative B, the reconstruction of the roadside barriers will require removal of less than 15 trees with a dbh of greater than 20 inches. Tree removal beyond 5 feet of the stone masonry guardwalls would be prevented by the installation of silt fencing and orange safety fencing that would clearly delineate the boundary of grading and vegetative disturbance. Furthermore, tree protection measures should be explored and potential impacts to trees documented in the field. Roadside barrier modifications would not be expected to disturb eastern buttercup phacelia because the plant species is not known to occur within the forest edge habitat adjacent to the existing stone masonry guardwalls.

Ground disturbance from the reconstruction of the stone masonry guardwalls has the potential to result in the introduction of exotic and invasive herbaceous plant species that could outcompete native vegetation. Several measures may be implemented to reduce their introduction, including minimizing soil disturbance; pressure washing and/or steam cleaning construction equipment and materials before entering the Parkway to remove potential seed sources; limiting vehicle parking to existing roadways, parking lots, or access routes; obtaining all fill, rock, or additional topsoil from the project area, if possible, or weed-free sources from approved sources outside the park; and the initiation of revegetation of disturbed areas immediately following construction. On a case-by-case basis, certified weed-free rice straw, cereal grain straw that has been fumigated to kill weed seed, and wood excelsior bales may also be used to minimize the introduction of exotic and invasive species. These measures would be specified to the contractor in the contract documents. If possible, work in sensitive areas should be performed during the winter months to minimize the likelihood of herbaceous exotic and invasive species establishment.

Following construction, revegetated areas would be monitored to determine if stabilization efforts are successful or if additional remedial actions are necessary, which may include over seeding and/or replanting the area, as well as controlling exotic and invasive plant species. Additionally, trees removed within the LOD of the stone masonry guardwall reconstruction would be replaced at a 1:1 dbh ratio within the Parkway with similar species.

Replacing temporary Jersey barriers with 27-inch steel-backed timber guardrail or stone masonry guardwalls is not expected to result in the removal of trees or shrubs because the work would be

conducted within the median or on bridges where minimal or no vegetation occurs. Herbaceous ground cover disturbed during construction would be reestablished prior to construction completion.

The construction and/or extension of acceleration/deceleration lanes would require selective removal of trees, shrubs, and herbaceous ground cover. Vegetative disturbance would be localized and would generally involve small areas where the work is proposed, including at the CIA/GWMP interchange, where disturbance of the adjacent forest edge may be necessary to construct the retaining structure needed to accommodate the deceleration lane. Following construction, herbaceous ground cover would be reestablished and native trees and shrubs would be planted to compensate for any removal, as appropriate. The construction and/or extension of acceleration/deceleration lanes would not be expected to disturb eastern buttercup phacelia because the plant species is not known to occur within the forest edge habitat adjacent to the maintained roadway.

For the outfall repairs, the number of trees per acre was calculated within representative sample plots along proposed access corridors of 13 of the 86 outfalls to be repaired, including five on the southbound side of the Parkway and eight on the northbound side. Based on the data collected at the 13 sample plots, an average of 174 trees per acre occur within the study area. As stated in the *Outfall Access and Repair Investigation Report* (Earth Tech 2007), the total area of access routes proposed for the repair of 86 outfall structures is 4.51 acres. Based on field observations and the number of live trees per acre, it is estimated that approximately one-third (265 trees) ranging in size from 2.5 to 19 inches in diameter, or approximately three trees per outfall, would be removed. It was estimated that fewer than 10 trees in size class 20 inches in diameter or larger would be removed. The type of vegetation to be removed is generally characterized as native trees in the mixed hardwood forest stands, including tulip poplar, intermixed with oaks, mockernut hickory, black walnut, and red maple. Typical understory species that could be impacted include American beech, red maple, and box elder. In the context of the 7.6-mile Parkway section and acreage of existing hardwood forest, impacts would be minor but noticeable, and mitigation would help to offset vegetation loss.

Based on surveys completed by the VDCR in 2005, some outfall locations are near known populations of the globally rare eastern buttercup phacelia. Outfall repairs have the potential to cause ground disturbance that could disrupt suitable habitat and damage or destroy individuals or small populations of the species. Prior to construction, rare plant surveys would be performed within the limits of outfall repairs, including construction access corridors, to identify and delineate confirmed occurrences of eastern buttercup phacelia. Surveys would occur at the approved time of year immediately before construction for each phase of work. The approved time of year would be determined through ongoing consultation with the GWMP's Natural Resource Manager and the VDCR. Construction access corridors would be realigned or relocated if occurrences of eastern buttercup phacelia are identified to avoid the potential for disturbance whenever possible. If site constraints limit flexibility to modify construction access, areas where eastern buttercup phacelia were identified would be fenced and included as a no impact zone during construction. During construction, an independent biological monitor, in consultation with the NPS Natural Resources Manager, would be present during outfall repairs near known occurrences of eastern buttercup phacelia. It is recommended that the contractor consult with this individual in the field as to the best access routes to each outfall in need of repair to minimize potential impacts to natural resources.

Through planning, design, and the implementation of appropriate mitigation measures, it is anticipated that the area of disturbance of the outfall repairs would be greatly reduced. Prior to outfall repairs, construction limits and natural resource protection areas would be staked, flagged, or marked. Disturbance would be minimized by specifying 6- to 12-foot wide access corridors to the contractor that minimize vegetation removal and avoid known occurrences of eastern buttercup phacelia. Access plans would identify the size and type of trees to be removed and park staff would document these trees prior to disturbance. Access plans would also identify no impact zones that would include known occurrences of eastern buttercup phacelia. Individual trees requiring protection would be identified and appropriate barriers installed. Access corridors would be surfaced with appropriate protective matting or similar best management practices to further prevent ground disturbance. Construction barrier fencing would be required on both sides of construction access corridors.

Introduction of exotic and invasive species is also a concern because they may outcompete eastern buttercup phacelia for resources. Measures to minimize the spread of exotic and invasive species would be similar to those described under the roadside barrier modification discussion. Also, following construction, disturbed areas would be revegetated and monitored to determine if stabilization efforts are successful or if additional remedial actions are necessary, which may include over seeding and/or re-planting the area, as well as controlling exotic and invasive plant species. Additionally, trees removed within the LOD of the outfall repairs would be replaced at a 1:1 dbh ratio within the Parkway with similar species. As more information becomes available during detailed design, the design and construction methods would be evaluated for environmental consideration by a natural resources specialist familiar with the conditions in GWMP.

For the Route 123/GWMP interchange reconfiguration, potential impacts to vegetation for each option is described below.

Route 123/GWMP Interchange Option 1. The hardwood forest and American hazelnut specimens to the northwest of the intersection would be avoided under option 1. However, five large trees would be removed in the southwest cloverleaf of the interchange, including one eastern white pine, one eastern red cedar, one pin oak, and two red maples. Following construction, herbaceous ground cover would be reestablished, and native trees and shrubs would be planted to compensate for any removal, as appropriate.

Route 123/GWMP Interchange Option 2. The hardwood forest and American hazelnut specimens to the northwest of the intersection would be avoided under option 2. Only one large tree, a pin oak, would be removed. Following construction, herbaceous ground cover would be reestablished and native trees and shrubs would be planted to compensate for any removal, as appropriate.

For the North and South Donaldson Run Overlooks Rehabilitation, no trees, shrubs, or other vegetation would be disturbed because all work would be performed on existing structures within the limits of the overlooks. Also, the installation of emergency turnarounds is not expected to impact that trees or shrubs because they would be sited at previously disturbed areas within the median of the Parkway. Turf grass would be established at the turnarounds. If removal of trees and/or shrubs is necessary, they would be replaced within GWMP with similar species to compensate for the disturbance. Likewise, the installation of ITS infrastructure would occur within the disturbance of the roadway rehabilitation and would not

result in additional disturbances to vegetation. New SWM facilities may, depending on the determined locations, require selective removal of trees, shrubs, and ground cover. Work would be localized and involve small areas. Following construction, herbaceous ground cover would be reestablished and native trees and shrubs would be planted to compensate for any removal, as appropriate.

**Cumulative Impacts.** Past projects, including rehabilitation of several bridges on the GWMP, have resulted in minor long-term adverse impacts to vegetation from construction-related disturbances. Current and future projects such as the Potomac Yard Metrorail Station and the Arlington County and Vicinity Boathouse construction are anticipated to also result in minor long-term adverse impacts to vegetation from land clearing necessary to construct the new facilities. Alternative B requires vegetative disturbance that would be noticeable, but only a small percentage of existing forested area in the context of the Parkway. Mitigation measures, including 1:1 dbh replacement ration for tree and shrubs, would ultimately result in a minor long-term adverse impact. Overall, alternative B would contribute a noticeable increment to the adverse cumulative impact of other projects and actions to vegetation. The cumulative impact would be minor.

**Conclusion.** Under alternative B, outfall repairs and roadside barrier modification would result in the removal of vegetation within the Parkway. The type of vegetation is generally characterized as native trees and typical understory that comprise of mixed hardwood forest stands. Alternative B would result in an estimated 25 large trees (diameter greater than 20 inches) being removed along the 7.5 miles of North Section of the Parkway. Outfall repairs also have the potential to disturb habitat or damage individuals or populations of eastern buttercup phacelia. Other alternative elements, including roadway rehabilitation, acceleration/deceleration lanes extension, reconfiguration of the Route 123/GWMP interchange, and other project elements would result in minimal disturbance to vegetation. The potential introduction of exotic and invasive species into disturbed areas may also occur because of construction activities. Numerous mitigation measures have been identified to reduce impacts to vegetation and to minimize the spread of exotic and invasive species. In the context of the larger park setting and the vegetation that exists at GWMP, the impacts would be noticeable but would not be significant. In consideration of measures to avoid and minimize impacts to vegetation and to compensate for tree and shrub removal with a 1:1 ration of diameter at breast height replacement within the park, the proposed action is anticipated to result in minor long-term adverse impacts to vegetation. The proposed action would contribute a small adverse increment to the minor adverse cumulative impact. As a result, Route 123/GWMP interchange option 1 would have the greatest potential for tree removal.

## WILDLIFE

### About the Analysis

Potential impacts to wildlife were analyzed in consideration of species of concern expected to inhabit the GWMP. The analysis was based on the habitat areas utilized by species of concern and the potential impacts of the proposed actions on these habitat areas. The study area was limited to the areas of disturbance and abutting forested areas on the Parkway. The severity of potential impacts was determined using professional judgement and known impacts to wildlife and habitat from similar projects and literature resources.

**Alternative A: No-Action**

Under the no-action alternative, a minimal amount of roadway maintenance would be performed to maintain the existing condition and character of the GWMP. Maintenance actions would generally include mowing, brush clearing, and branch trimming to maintain clear zones and the right-of-way. Wildlife, such as the existing bald eagles that have an active nest on the Parkway, have generally adapted to the existing traffic noise and human activities on the Parkway. Ongoing maintenance activities would have an adverse impact to the existing wildlife habitat within GWMP, but the impact would be minor because most species would move to nearby suitable habitat during the park maintenance.

**Cumulative Impacts.** Other past, present, and reasonably foreseeable future projects have or have the potential to impact wildlife on the GWMP. The past rehabilitation projects had similar construction activities that generated noise and vegetation clearing that impacted certain wildlife species. The no-action alternative would add a small increment to the overall adverse cumulative impact on wildlife. In general, there would be a minor adverse impact to wildlife because of the loss of habitat and disturbance (noise) created by maintenance activities.

**Conclusion.** There would be no direct, indirect, or cumulative impacts to wildlife under the no-action alternative because existing wildlife habitat would be unchanged.

**Alternative B (Proposed Action and NPS Preferred Alternative)**

Issues identified during scoping related to wildlife species of concern included potential impacts to migratory birds, bald eagles, the northern long-eared bat, and the Indiana bat. Under alternative B, construction noise associated with proposed rehabilitation actions would have the potential to disturb these species. Individuals in the vicinity of the Parkway are likely to have adjusted to traffic noise, but there would be additional noise generated by heavy construction equipment. At a distance of 50 feet from the highway, levels of traffic noise are estimated at 70 to 80 dBA (Corbisier 2003). Maximum average noise levels generated by construction activities typically range from 78 to 89 dBA at a distance of 50 feet for excavation, grading, and finishing activities (Bolt, Beranek, and Newman 1971). These species are likely to avoid active construction areas, so noise impacts would be minimal.

Vegetation clearing would also have the potential to disrupt wildlife. Minor removal of trees, shrubs and herbaceous groundcover would be required to rehabilitate roadside barriers and establish new acceleration/deceleration lanes in different locations. Based on the small amounts of clearing required to establish these improvements and the reestablishment of vegetation following construction in the areas, impacts to wildlife habitat associated with these actions are expected to be minimal. The proposed outfall structure repairs would have a higher potential to affect wildlife habitat. Conditions at the outfalls vary. In some cases, outfalls are not currently accessible due to steep slopes and dense vegetation, and the proposed actions require access for construction. Although the disturbed areas would be restored with herbaceous groundcover and plantings following construction, small localized wildlife habitat (trees) would be removed at each outfall location to gain access for repairs. Correspondingly, the proposed actions would have the potential to disrupt or displace species such as migratory birds and bat species.

To minimize potential impacts to wildlife habitat, the NPS would employ a variety of mitigation measures. Prior to construction, the extents of construction would be staked, flagged or marked prior to vegetation clearing. Access corridors would be limited to 6- to 12-foot-wide corridors to minimize the amount of wildlife habitat to be cleared. Trees to be removed would be identified by park staff and documented; trees to be preserved would be marked using protective barriers. Following construction, trees that were removed would be replaced at a 1:1 ratio, which would enhance wildlife habitat elsewhere within the park.

A biological monitor would be employed to prevent potential impacts to wildlife. The monitor would assess potential impacts of construction noise on species of concern and would recommend modifications to construction plans as appropriate in coordination with contractors. Also, the NPS Resource Manager would assess potential impacts on known habitat areas, such as bald eagle nest sites, and recommend changes to plans to avoid impacts. If necessary, an Eagle Conservation Plan would be developed. In addition, the NPS would require its contractors to recognize time of year restrictions. Migratory bird breeding and summer residency periods range from April 1 to October 31. A nest survey could be completed in advance of construction to further help avoid impacts during this timeframe. If disturbances to migratory birds are apparent during construction, work would be suspended and further actions would be determined through coordination between the contractor, biological monitor, the NPS Natural Resources Manager, and the USFWS.

Early- to mid-summer (approximately June through July) represents a sensitive period for the northern long-eared bat and Indiana bat. At this time, bats are likely to be killed or injured during this period as bat pups are flightless and flying juveniles are inexperienced. As a conservation measure, construction would not occur during this period or other conservation measures would be employed in consultation with the USFWS if habitat or populations are determined to exist based on further consultation with USFWS. If bats are present, construction would be suspended and further actions would be determined through coordination between the contractor, biological monitor, the NPS Natural Resources Manager, and the USFWS. NPS will continue consultation with the USFWS to determine the likely presence of this species in the study area and appropriate conservation measures to employ.

**Cumulative Impacts.** Other past, present, and reasonably foreseeable future projects have or have the potential to impact wildlife on the GWMP. The past rehabilitation and bridge rehabilitation project had similar construction activities that generated noise that impacted certain wildlife species. Alternative B would add a small increment to the overall adverse cumulative impact on wildlife. In general, there would be a minor adverse impact to wildlife resulting from the loss of habitat and disturbance (noise) created by construction activities.

**Conclusion.** Under alternative B, there would a slight loss of habitat and noise generation during construction that contribute to an adverse impact on wildlife. In the context of the Parkway, the impacts would be minor and short-term. There would be a minor adverse cumulative impact.

## HISTORIC STRUCTURES

### About the Analysis

In the past, rehabilitation efforts on the Parkway have failed to replicate the exact texture and feel of the original stone walls, introducing a wall with a more uniform and finished look. Special efforts have been taken for the north section rehabilitation to ensure that the replacement guardwalls would retain as much of their historic materials, character, and association as possible. For NEPA analysis purposes, the impact assessment uses the results of the Wall Safety Risk Assessment and the VRI&A of views to determine the proposed roadside barrier modifications (i.e., walls to be raised to 27 inches versus walls to be repaired). This approach is the primary difference from the 2008 EA, which took a more uniform approach to replace all the walls to the 27-inch barrier height.

This section describes the impacts of the proposed action on historic structures of the GWMP and focuses on the issue of the roadside barrier modifications (changes to the historic guardwalls). For brevity, the issue of potential impacts stemming from changes to the Parkway's original designs and spatial orientation are described in the *Cultural Landscapes* impact analysis. Furthermore, viewshed impacts resulting from the increase of the roadside barrier height is described in the *Visual and Aesthetic Resources* impact analysis.

### Alternative A: No-Action

Under the no-action alternative, the NPS would continue management actions that would include minor repairs of the roadway, including the historic guardwalls, to maintain the existing integrity and character of the Parkway. Implementing the no-action alternative would have no impact on historic structures because the NPS would maintain the Parkway like its existing condition through minimum rehabilitation and maintenance efforts.

**Cumulative Impacts.** No cumulative impact would occur because implementing the no-action alternative would have no impact on historic structures.

**Conclusion.** Under the no-action alternative, no impacts to historic structures would occur because the NPS would continue to conduct only minor repairs to maintain existing integrity and historic character of the Parkway. No cumulative impacts would occur.

### Alternative B (Proposed Action and NPS Preferred Alternative)

Full pavement reconstruction on the northbound and southbound sides of the Parkway from Spout Run to I-495/Capital Beltway would have negligible impact on the Parkway's historic character. The Parkway has been resurfaced on other occasions in the past and there would be no further loss of the road's character-defining features. The Parkway shoulders would be stabilized as part of the alternative B, including the removal of fixed objects (e.g., trees, signs) that present hazardous driving conditions. This action would be a slight modification to a feature of the GWMP, but the overall integrity would not be diminished. The addition of drainage inlets and changes to curbs also would contribute to minor modifications to the roadway, but overall, integrity would remain. The impacts resulting from roadside

barrier modifications for each option are as follows. It is to be noted that this analysis considers that mitigation outlined in chapter 2 would be implemented.

As discussed in chapter 2, select historic stone masonry guardwalls, varying in height from 9 to 18 inches and in length from 40 feet to 740 feet that are categorized as high, medium-high, or medium-medium risk, would be replaced with a safety barrier that meets current AASHTO safety guidelines for crashworthiness, or additional counter safety measures would be implemented and the existing stone wall repaired. The historic stone masonry guardwalls are an integral part of the Parkway, contributing to the historic character of the north section. Removal of these contributing features would have an adverse physical and visual impact to the Parkway, resulting in a loss of integrity of materials, workmanship, design, feeling, and association.

Based on the results of the 2018 Wall Safety Risk Assessment and decision tree, alternative B would alter 38% (7,508 linear feet) of the cumulative length of the 59 historic walls (19,946 linear feet). The length of the new stone masonry guardwalls would be expanded from the existing historic stone walls to flare at the ends to prevent blunt end collisions. The other 62% of the historic walls would be repaired (repointed and stones reset). This percentage of the historic walls includes walls within the medium-low and low risk category and select guardwalls with the superior and high views, as detailed in chapter 2. The NPS and FHWA working in consultation with the VDHR and consulting parties would continue to seek to mitigate impacts on a wall-by-wall basis using the consultation approach outlined in the project's PA (**Appendix B**).

Alternative B calls for the new walls to be crafted based on the *NCHRP Report 554 for Aesthetic Concrete Barrier Design* and the *Secretary of the Interior's Standards for Rehabilitation*. Alternative B would use as much of the existing historic building materials as practicable with consideration given to their characteristics. Design characteristics include the rough-cut shape and random pattern of massive through stones to smaller stones, the range of colors in the stones from grays with hints of blues to browns, and tans, the spatial relationship (depth of mortar and space between stones), and the coarse texture of the mortar. The massive through stones span the entire length of the wall. The replacement walls would be within the same footprint to the extent feasible except for the added length.

Another consideration of the 27-inch high concrete-core, stone masonry guardwalls is that the higher walls would create a "tunneling" effect in certain areas on the Parkway. In short, the road prism would appear physically narrower because of the increased height of the walls. This was a concern with past rehabilitation efforts on the Parkway.

Under alternative B, the GWMP as a historic structure would incur moderate long-term adverse impacts. The removal of the historic stone masonry guardwalls, features that contribute to the NRHP eligibility of the Parkway, would result in a loss of design, setting, materials, workmanship, feeling, and association. Further details regarding impacts to the viewshed are discussed in the *Visual and Aesthetic Resources* section of this document.

The existing W-beam guardrail would be replaced with steel-backed timber guardrails. This replacement would be consistent with the past PA between the NPS and VDHR. The W-beam guardrail was intended to be a temporary measure. The replacement of the W-beam and other non-conforming

guardwalls would have no impact on historic structures since this barrier was intended to be temporary and not a contributing feature to the Parkway's historical significance.

The extension of the acceleration and deceleration lanes at the GWMP Headquarters/USPP entrance and the CIA interchange would add a new structural element different from the Parkway's original design. As part of the drainage improvements to the GWMP, additional inlets would be installed along the Parkway corridor. These changes would slightly alter the historic character because of the deviation from the original design.

During the survey work for the drainage improvements, two culverts were noted to have architectural features of stone headwalls similar to those of the MVMH/south section (outfall 75 and outfall 80), and all the culverts are listed as contributing resources to GWMP. Because outfall 80 was rated to be in "excellent" condition, no repair work is proposed. Once design plans are further developed for outfall 75, NPS Cultural Resources staff would review the plans and make recommendations regarding avoidance and/or minimization measures to protect the contributing historic resource per the *Secretary of the Interiors Standards for the Treatment of Historic Properties*. Drainage improvements would require a slight modification of features of the Parkway, but the overall integrity of GWMP would not be diminished.

Impacts resulting from changes to the Route 123/GWMP interchange, installation of the ITS infrastructure, construction of new emergency turnarounds, and installation of SWM facilities are described in the cultural landscape section of this EA.

No noticeable viewshed impacts to historic resources outside the Parkway such as the historic Georgetown neighborhood were identified because of the small-scale nature of the changes on the Parkway given the distance to other historic resources in Washington, DC. Pavement reconstruction or changes to roadside barriers would not be noticeable from points outside the Parkway.

Construction activities associated with alternative B would have adverse impacts on the GWMP as a historic resource because of the addition of construction equipment, temporary signage, and other non-conforming elements to the landscape for traffic control and construction. Impacts would be short-term, phased to smaller sections of the Parkway, and detectable.

**Cumulative Impacts.** Other past, present, and reasonably foreseeable future actions have had adverse impacts on the historic character of the Parkway. For instance, the past rehabilitation of the GWMP adversely affected the historic character of the Parkway by changing the architectural style and design features of the guardwalls in addition to raising the wall heights to AASHTO guidelines. Future actions such as the Arlington Memorial Bridge Rehabilitation and the Arlington County and Vicinity Boathouse projects would add non-conforming elements to the Parkway, impact historic fabric of the resources, change the viewsheds in their areas, and change the landscape of the GWMP. The rehabilitation of the north section of the GWMP would add a noticeable adverse increment to the cumulative impact for the reasons described previously (change to the historic stone masonry guardwalls). Overall, alternative B would have a moderate adverse cumulative impact.

**Conclusion.** Alternative B would have moderate long-term adverse impacts on the historic character of the Parkway because of changes to original design elements (i.e., guardwalls, acceleration/deceleration

lanes) necessary to meet today's safety standards in roadway design. Under alternative B, there would be no adverse impact on other nearby historic resources eligible for or listed in the NRHP. A moderate adverse cumulative impact would occur.

## ARCHEOLOGICAL RESOURCES

### About the Analysis

The analysis uses past studies to evaluate the potential impacts on archeological resources. The study area for the purposes of NEPA is the LOD and access routes needed for the roadway reconstruction, outfall repairs, and other project elements. For compliance with Section 106, a PA will be executed. A draft PA is provided in **Appendix B**.

### Alternative A: No-Action

Under the no-action alternative, the NPS would continue with minimum rehabilitation of the roadway to maintain existing integrity and character of the Parkway. Implementing the no-action alternative would have no impact on archeological resources of the GWMP because the NPS, through minimum rehabilitation and maintenance efforts, would maintain the roadway near its existing condition, and no operations would occur that would impact archeological resources on or near the north section of the GWMP. Erosion from outfalls in disrepair would continue to negatively impact archeological resources adjacent to several of the outfall locations.

**Cumulative Impacts.** Past activities such as Parkway and bridge rehabilitation projects have likely had a minor adverse impact on archeological resources. In the context of the Parkway resources, the no-action alternative would contribute a small adverse increment to the overall cumulative impact. Overall, a minor cumulative impact would occur.

**Conclusion.** Under the no-action alternative, there would be no impact to archeological resources from minimum rehabilitation of the roadway. However, adverse impacts could occur if the NPS does not repair outfalls that are causing erosional impacts to adjacent archeological resources. This soil and bank erosion at the outfalls would impact the existing integrity and character of archeological sites. A minor cumulative impact would occur to archeological resources.

### Alternative B (Proposed Action and NPS Preferred Alternative)

Pavement reconstruction and associated actions including constructing new curbs, replacing/adding drainage inlets, rehabilitating shoulders, rehabilitation of existing overlooks, and constructing crashworthy roadside barriers, would result in earth disturbance generally confined to areas previously disturbed by past Parkway construction. The reconfiguration of the Route 123 interchange and extending acceleration/deceleration lanes at the GWMP Headquarters/USPP entrance and CIA interchange would result in substantial earth disturbance and addition of pavement. Similarly, rehabilitation of stormwater outfalls would slightly alter the landscape and result in localized earth disturbance.

An archeological assessment for the maximum LOD of the GWMP North Section Rehabilitation project has identified areas of archeological resource potential. The NPS will implement an ARPP to guide decision-making, investigation efforts, and treatment options for areas identified as having archeological resource potential or identified archeological sites that are within the limits of earth disturbance. An executed PA will then provide a process for consultation and decision-making regarding the findings of archeological investigations. NPS intends to avoid impacts to areas found to contain significant archeological resources. If upon consultation avoidance is not practicable, NPS will consult with SHPO on minimization and mitigation measures.

Reconstructing the pavement, installing new curb, rehabilitating the shoulders, constructing new concrete-core guardwalls, and reconstructing or installing new drainage inlets would result in minor earth disturbance and excavation on the Parkway. The Area of Potential Effects (APE) for these actions will be determined by the LOD for the construction activities as plans are developed. The Phase IA archeological assessment indicates that there is little potential for impacts to known or potential archeological resources by these project elements due to prior disturbance and APEs that are limited in size. These project elements will have no to negligible impacts on archeological resources.

The LOD for options 1 and options 2 of the Route 123/GWMP interchange reconfiguration, extending acceleration/deceleration lanes at the GWMP Headquarters/USPP entrance and extending acceleration/deceleration lanes at the CIA interchange were surveyed, and no significant archeological resources were found. Therefore, there would be no impact on archeological resources from these actions.

The Phase IA archeological assessment considered 84 stormwater outfall repair and stabilization locations, some of which have been surveyed for the presence of archeological resources. Previous surveys found no archeological resources at 28 outfalls. Additional investigations are recommended at 56 locations due to changes in the LOD or the presence of archeological sites near the outfalls.

Once the archeological field survey has been completed, for outfall locations where significant archeological resources are located, NPS in consultation with SHPO will redesign to avoid the resource if possible. Other treatment options may include confining repair work to areas previously disturbed by the installation of the pipe, placement of protective mats to allow construction vehicles to access the outfall without ground disturbance or confining work to periods of ground freeze to minimize ground disturbance by construction vehicles. Special protection fences and best management practices as described in the mitigation section of this EA will minimize ground disturbance and potential impacts to resources at locations identified as having significant archeological resources. By implementing the avoidance and best management practices, impacts to archeological resources at stormwater outfalls would be negligible to minor.

As staging areas are refined during the design process, NPS staff would coordinate with project designers to ensure that equipment staging, and storage be placed in locations that are not archeologically sensitive. Since staging areas are loosely defined during the planning process, selecting locations such as the Turkey Run parking lot and the GWMP maintenance yard would have negligible to minor impacts to archeological resources.

**Cumulative Impacts.** With the implementation of the ARPP and the NPS preference for avoidance of known archeological resources, Alternative B would have negligible to minor impacts to archeological resources. Past, present, and reasonably foreseeable future project such as past bridge and parkway rehabilitation projects have resulted in a minor cumulative impact on archeological resources from earth disturbance in activities along the Parkway. Alternative B would contribute a small increment to the cumulative impact. Overall, the cumulative impact would be minor in the context of the existing resources at the Parkway.

**Conclusion.** The Parkway, in general, has high archeological potential and through assessments, field surveys, and guidance in the ARPP, the GWMP North Section Rehabilitation project is being designed in such a manner to avoid impacts to these resources. Roadway reconstruction, shoulder rehabilitation, roadside barrier modifications, and acceleration/deceleration extensions would have no or negligible long-term adverse impact on archeological resources because the areas with known archeological resources would be avoided and mitigation measures implemented as described in the Mitigation Section of this EA. Under Route 123/GWMP interchange option 1 and option 2, no impacts would occur to archeological resources because the options would avoid the disturbance of two sites and the sites have been determined not to be eligible for listing in the NRHP. Similarly, there would be negligible to minor long-term adverse impacts on archeological resources at stormwater outfalls because the areas with known archeological resources would be avoided or protection and mitigation measures would be implemented as described in the *Mitigation Measures of the Preferred Alternative* section of this EA.

NPS would continue coordination with the SHPO in accordance with Section 106 of the NHPA and an executed PA. A list of mitigation measures is provided to protect archeological resources as outlined in the Mitigation Section of this EA and incorporated into an ARPP. The NPS considers potential impacts from ground disturbance as well as soil compaction in areas near known resources as negligible and minor. Several potential measures to avoid adverse impacts have been suggested including the use of structural matting to reduce soil compaction, restricting the work to periods of soil freeze, and constraining activities to areas of known prior disturbance by use of fencing. Identification of appropriate methods would be made in consultation with SHPO during the development of the ARPP and consultation under the executed PA. In the event archeological resources are inadvertently discovered, ground disturbing activities would stop, appropriate NPS staff would be notified, and SHPO would be consulted in accordance with Section 106 of the NHPA and the executed PA. Minor cumulative impacts would occur under alternative B.

## CULTURAL LANDSCAPES

### About the Analysis

For the purposes of NEPA, this analysis focuses on the potential impacts of the project on the cultural landscape, which includes the geographic area including cultural and natural resources associated with a historic event, activity, or person or exhibiting other cultural or aesthetic value. The impact assessment utilizes the information collected as part of the 2009 CLI prepared for the GWMP North Section Rehabilitation project. In this section, the NPS considers the potential changes to the landscape conditions, characteristics, special relationship, and character-defining features of contributing elements of the sites overall historic significance. Impacts to natural resources, historic structures, archeological

resources, and visual resources are analyzed in detail in other sections. For compliance with Section 106, a new PA will be executed (**Appendix B**).

### **Alternative A: No-Action**

Under the no-action alternative, the NPS would continue with minimum rehabilitation of the roadway to maintain existing integrity and character of the Parkway. Implementing the no-action alternative would have no impact on the cultural landscape of the GWMP because the NPS, through minimum rehabilitation and maintenance efforts, would maintain the roadway near its existing state and no new nonconforming elements would be added to the cultural landscape.

**Cumulative Impacts.** No cumulative impacts would occur because implementing the no-action alternative would have no impact on the cultural landscape.

**Conclusion.** Under the no-action alternative, no impacts on the cultural landscape would occur because the NPS would maintain the roadway near its existing condition. No cumulative impacts would occur because the no-action alternative would have no impact on the cultural landscape.

### **Alternative B (Proposed Action and NPS Preferred Alternative)**

Reconstruction of the pavement would have no to little change to the spatial relationship of the road corridor to the surrounding landscape. The Parkway shoulders, would be reconstructed and stabilized as part of alternative B and a desired shoulder width of up to 10 feet obtained. In areas of sensitive resources (i.e., archeology and vegetation), a 3-foot shoulder would be used to minimize impacts. Following completion of construction, there would not be a noticeable change to the cultural landscape resulting from roadway reconstruction and shoulder stabilization. There would be an increase in the number of drainage inlets and curb modifications along the roadway, which would not result in a noticeable change to the cultural landscape.

Modification to the historic stone masonry walls would have long-term moderate adverse impacts to the cultural landscape. Alternative B would result in reconstructing 38% of the historic stone masonry guardwalls based on the 2018 Wall Safety Risk Assessment and decision tree. Any reconstruction of the walls for safety purposes would change the architectural style of the guardwalls and raise the walls to 27 inches. Each wall reconstructed would be extended and flared as necessary to meet safety design standards, which would change the length and location when compared to the original wall designs. Overall, there would be a loss of integrity of design and change in form and spatial organization for the reconstructed guardwalls.

The extension of the acceleration/deceleration lanes at the CIA interchange and the GWMP Headquarters/USPP entrance would have minor long-term adverse impacts on the cultural landscape. The new pavement would change the footprint of the Parkway, but the change would only slightly alter the Parkway's original design.

For the reconfiguration of the Route 123/GWMP interchange, the proposed action would change the layout of the intersection from the original design and, in some cases, alter the cultural landscape. The off-ramp from the southbound lanes would be lengthened and relocated to a new intersection point on

Route 123. These changes to the design of the interchange would have a minor long-term adverse impact on the cultural landscape of the Parkway due to the change in the design, form, spatial organization, and circulation pattern. These changes are similar for the two options. The primary difference under each option is related to the level of impact to the landscape. Option 1 would impact five large trees and option 2 would impact one large tree. It is believed that these trees were part of the original landscaping plan of the Parkway. In addition, the new designs could prevent the NPS from restoring the landscape in the future with plants of similar species and same location to that of the original landscape plan while maintaining the GWMP vegetative character. The planting of new trees would take into consideration the original parkway planting plan for this interchange. Also, there would be a very slight shift in the southbound alignment near Route 123. Overall, the reconfiguration of the Route 123/GWMP interchange would result in a loss of integrity of design and setting, through the modification of the overall design of the Parkway's spatial organization and circulation pattern.

Other project elements such as emergency turnarounds, installation of ITS infrastructure, and SWM facilities would add non-conforming elements and would deviate from the Parkway's original planned landscape design. The emergency turnaround and SWM facilities would be designed in such a manner to blend into the landscape with minor structural features. The ITS infrastructure would add conduit boxes at a regular interval along the Parkway shoulder. For all the project elements, the NPS would consult with the VDHR in accordance with the provision of the PA to find a context sensitive design that minimizes impacts to the landscape.

**Cumulative Impacts.** Other past, present, and reasonably foreseeable future actions have had adverse impacts on the Parkway's cultural landscape. For instance, the past rehabilitation of the Parkway adversely affected the cultural landscape by raising the wall heights and changing the architectural style of some of the guardwalls with a finished stone that was geometrically cut and finished. Future actions such as the Memorial Circle project and the Arlington County and Vicinity Boathouse would add elements to the cultural landscape and/or change the viewsheds in their respective areas. The rehabilitation of the north section of the Parkway would add an appreciable adverse increment to the cumulative impact for the reasons described previously. Overall, alternative B when added to other projects would have a moderate adverse cumulative impact to the cultural landscape.

**Conclusion.** Alternative B would have a moderate long-term adverse impact on the cultural landscape because of the change in feeling, location, and spatial organization of the barrier walls and other changes to the historically-designed landscape. The rehabilitation of the north section of the GWMP would be conducted in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (NPS 1996) and in accordance with the provision outlined in a new PA for the project. The options for the Route 123/GWMP interchange reconfiguration would have minor adverse impacts to the landscape. Removed trees would be replaced in kind or with similar species to maintain the GWMP vegetative character and to be consistent with the Parkway's designed landscape. Alternative B would add an appreciable increment to the moderate adverse cumulative impact to the cultural landscape.

## VISUAL AND AESTHETIC RESOURCES

### About the Analysis

The Capper-Cramton Act, 1930, as amended in 1946, calls for the preservation of the scenery of the GWMP. Thus, it is important that the NPS consider the potential impacts of the project on the Parkway's visual resources including historic and contemporary views. The impact assessment within relies heavily on information collected as part of the VRI&A and CLI. The impact analysis focuses primarily on the roadside barrier modification since the other infrastructure improvements are at or near existing grade and would have negligible impacts on views to and from the Parkway. The 2018 Wall Safety Risk Assessment was used by the NPS and FHWA in the consideration of the treatment of each historic stone masonry wall in the project area.

### Alternative A: No-Action

Implementing the no-action alternative would have no short-term or long-term impacts on the aesthetics and visual resources of the Parkway because the NPS would continue management actions that would include minimum rehabilitation of the roadway to maintain the aesthetics and existing vistas to the Potomac River and Washington, DC. The visual quality of the Parkway would not be affected because there would be no modifications or additions to the landscape.

**Cumulative Impacts.** No cumulative impacts would occur because implementing the no-action alternative would have no impact on aesthetics and visual resources.

**Conclusion.** Under the no-action alternative, no impacts to aesthetics and visual resources would occur because the NPS would maintain the Parkway near its existing state. No cumulative impacts would occur.

### Alternative B (Proposed Action and NPS Preferred Alternative)

The major project components include the rehabilitation of the roadway, stabilization of the road shoulders, repairs to the drainage and outfalls, and the construction and/or extension of acceleration/deceleration lanes at various areas along the north section of the Parkway. The new pavement, striping, and curb would generally improve the appearance of the roadway surface on the Parkway. Furthermore, the elimination of W-beam guardrails with steel-backed timber guardrails in some locations, as well as the replacement of the Jersey barriers, would likely improve the visual quality of GWMP. The drainage improvements are not expected to detract from the Parkway's visual quality as these improvements are not visible to most visitors and in remote areas and are shielded by existing vegetation. The extension of the acceleration/deceleration lanes would have negligible impacts to the aesthetics of the Parkway because changes would not be noticeable to most visitors. Options for the reconfiguration of the Route 123/GWMP interchange would have similar impacts on aesthetics and visual resources, but to varying degrees. Each interchange option would affect a small number of trees planted as part of the park's original landscape design. Also, additional signage and roadway markings would add new visual elements within the landscape. The addition of these small scale visual elements to the GWMP and removal of trees would have a minor impact on aesthetics. Any planting of new trees

would take into consideration maintaining historic or contemporary views that are identified in the VRI&A.

Over the approximately 7.6-mile long stretch of Parkway from Spout Run to the I-495/Capital Beltway interchange, there are 69 existing stone walls. These walls are visually pleasing as they illustrate and define the rustic style of the north section of the Parkway, serve as visual recognition “tools” to the steep topography, and are often distinctive features in the foreground of many of the viewsheds. It is evident that the stone walls are intrinsic features of many of the most treasured views to the Potomac River Gorge and Washington, DC.

The construction of higher, permanent, roadside barriers has the potential to impact superior and high-quality vistas on the Parkway. Therefore, the NPS underwent a comprehensive study of many different roadside barrier options. The NPS examined each individual wall and considered driver safety and the significance of the contemporary and historic vistas. To aid in this assessment, the NPS developed tools to help resource staff to understand the composition of the views, actual impacts to the views, and the overall aesthetic quality the stone masonry guardwalls provide to the feeling and rustic character of the north section of the Parkway. The VRI&A was used to define and rank the significance of the views independent of the roadside barrier treatment decisions. The 2018 Wall Safety Risk Assessment was used by the NPS and FHWA in the consideration of the appropriate roadside barrier treatment. A decision tree was also formed to help in the decision-making process. Additionally, design visualizations of a 27-inch barrier at areas designated with high quality or significant views were created by FHWA. **Figure 16** represents an example design visualization comparing the views from the Parkway of an existing wall versus the wall being raised to 27 inches. From this assessment, one option was retained for detailed assessment in this EA. As a result of this collaborative evaluation process, NPS and FHWA determined that 38% of historic stone masonry walls would be reconstructed to a height of 27 inches for safety purposes. Based on the review of the design visualizations, wall # 1N, 5N, 9N and 29S were all noted that, if the walls were raised to 27 inches, there would be noticeable impacts to the superior and high-quality views. For wall # 7N, 8N, 10N, and 12N, the design visualizations indicated that the impacts to the views would be negligible to motorists because of the road architecture (road elevation and viewing distance). The remaining 62% of the historic stone masonry walls would be retained and repaired. To retain these walls while meeting safety goals, safety countermeasures would be implemented, as outlined in chapter 2, to enhance safety along the corridor and specifically at each wall location.

The impacts to vistas rated superior and high based on the results of this assessment are presented in **Table 6**.

**Table 6. Results of VRI&A to Superior or High-Quality Vistas**

Wall	Risk Category	Action Under Alternative B	Vista Rank	Visual Impact
1N	High	Repair existing wall and implement safety countermeasures	Superior	Repair of the existing wall would have a long-term benefit to visual resources by maintaining the existing vista to the Potomac River gorge, including the Three Sisters Islands in the middleground. Three Sisters Islands were a noticeable landmark in colonial times along the Potomac River.
5N	Medium-High	Repair existing wall and implement safety countermeasures	Superior	Repair of the existing wall would have a long-term benefit to visual resources by maintaining the vistas to the Potomac River Gorge and Historic Georgetown.
7N	Medium-High	Reconstruct wall to 27" high	Superior	From a driver's perspective headed northbound on the Parkway, construction of a new 27" wall would result in a slight loss of the Potomac River Gorge and potentially the Georgetown Reservoir Castle Gatehouse.
8N	High	Reconstruct wall to 27" high	Superior	From a driver's perspective headed northbound on the Parkway, construction of a 27" wall would result in a slight loss of the Potomac River Gorge and potentially the Georgetown Reservoir Castle Gatehouse.
9N	High	Repair existing wall and implement safety countermeasures	Superior	Repair of the existing wall would have a long-term benefit to visual resources by maintaining the vistas to the Potomac River Gorge. This wall is part of the South Donaldson Run Overlook; thus, repair would preserve the aesthetic value of the wall in the foreground for visitors who drive into and park at the overlook.
10N	High	Reconstruct wall to 27" high	Superior	From a driver's perspective headed northbound on the Parkway, construction of a 27" wall would result in a slight loss of the Potomac River Gorge including Fletcher's Cove along the far bank of the Potomac River.
12N	High	Reconstruct wall to 27" high <sup>1</sup>	High	From a driver's perspective for those exiting into the Donaldson Run Overlook, construction of a 27" wall would result in a slight loss of the views to filtered views of the Potomac River Gorge. The change in wall type would also change the visual quality of the foreground at the North Donaldson Run Overlook for visitors at the overlook.
29S	Medium-Medium	Repair existing wall and implement safety countermeasures	High	Repair of the existing wall would have a long-term benefit to visual resources by maintaining the vistas to the Potomac River Gorge and Washington, DC.

<sup>1</sup> For Wall 12N, NPS and FHWA will re-evaluate the reconstruction of this wall during more detailed design.



**Figure 16. FHWA Design Visualization of Historic Stone Masonry Wall (top photo – existing wall; bottom photo – wall raised to 27 inches)**

Through these design visualizations as well as video simulation and observations driving the Parkway, it is evident that replacing any of the existing stone guardwalls with a 27-inch high concrete-core stone masonry wall would create a noticeable change to the viewshed in the foreground, especially from a driver/passenger's perspective. The higher stone walls would be perceptible not only from places with sensitive viewsheds, but throughout the project length. The loss of the varied stone wall height, and historic patina would be noticeable as one travels either northbound or southbound along the Parkway. In addition, the higher barrier walls would have a perceptible impact to middleground views of the Potomac River Gorge. From the driver/passenger's perspective of the Parkway, the viewshed includes the walls as the immediate foreground and the view to the Potomac River Gorge as the middleground. The higher barrier and expanded wall length would block many of the smaller filtered views and portions of the open vistas to the Potomac River Gorge and Washington, DC monumental core. Therefore, alternative B would have moderate long-term adverse impacts to the visual resources of the GWMP.

Construction activities associated under alternative B would have adverse impacts on visual resources because of the addition of construction equipment, temporary signage, and other non-conforming elements to the landscape for traffic control and construction. Impacts would be short-term moderate and adverse, detectable only during construction but of little long-term consequence to the resource.

**Cumulative Impacts.** The past projects such as the rehabilitation of the Parkway from Theodore Roosevelt Bridge to Spout Run Parkway have resulted in changes in wall heights and impacts to visual resources. Future actions such as the Arlington County and Vicinity Boathouse and Potomac Yard Metrorail Station project will add additional larger scale elements to the landscape visible from portions of the GWMP. Furthermore, construction activities associated with each of these projects would have short-term adverse impacts due to the presence of construction equipment and signage. Alternative B would contribute an appreciable long-term adverse impact to the cumulative impact on aesthetics and visual resources. The modification of roadside barriers (including the installation of the higher permanent, concrete-core guardwalls at some locations) and the short-term impacts associated with construction activities would adversely affect the aesthetics and visual resources along the Parkway. Overall, the impacts of other past, present, and reasonably foreseeable future actions, in combination with the moderate long-term impacts of alternative B, would result in moderate short and long-term adverse cumulative impacts.

**Conclusion.** Alternative B would have a moderate long-term adverse impact from the noticeable changes to the original designed landscape and the addition of new elements. Of note, the change in roadside barrier type and height (27 inches) to four historic stone masonry walls with superior or high-quality vistas would have a slight, but noticeable impact on the significant views of the Potomac River palisades and Washington, DC monumental core. The planting of new trees would take into consideration maintaining historic or contemporary views that are identified in the VRI&A. A minor short-term adverse impact would occur during construction because of the equipment and signage necessary for construction activities. Moderate short-term and long-term adverse cumulative impacts would occur.

## TRANSPORTATION (TRAFFIC AND SAFETY)

### About the Analysis

To assess the short-term impacts on traffic during construction of the project, the FHWA prepared two traffic studies and consulted with the affected state DOTs and local governments. Each traffic study is described in chapter 3 and this information is the basis for assessing traffic impacts during construction. It should be noted that the project purpose and need is focused on the rehabilitation of the Parkway. Adding roadway capacity is not part of the project scope; therefore, the evaluation of existing and future traffic and levels of service is not part of this impact analysis. In addition to potential impacts on traffic operations during the period of construction, the potential impacts of the alternatives considered on the safety of the traveling public are also presented.

### Alternative A: No-Action

Under the no-action alternative, the NPS would continue management actions that would include minimum rehabilitation of the roadway to maintain the Parkway near its existing state. Implementing the no-action alternative would have no short-term impact on existing traffic volumes or movement patterns. However, the roadway conditions would continue to present added hazards (such as roadway ponding and potholes) that could increase in the total number of automobile crashes or incidents and result in delays on the Parkway. In the event of any such incidents, no designated emergency turnarounds would be available under the no-action alternative to reroute traffic.

The no-action alternative would continue to have adverse impacts on safety because of the following:

- The ponding of water on the road surface during storm events would continue to present a safety hazard because of the risk of the vehicle hydroplaning;
- The tight geometry of the southbound off-ramp at the Route 123/GWMP interchange would remain a safety concern because motorists have a short distance to stop prior to their merging with cross traffic on Route 123;
- Short acceleration and deceleration lanes on the Parkway mainline would continue to increase the likelihood of accidents for motorists entering or existing the two overlooks and GWMP Headquarters/USPP entrance;
- The existing guardwalls would continue to be below AASHTO guidelines, which causes an added risk of vehicles mounting the wall during impact; and
- Existing erosion at the outfall structures would continue to present a safety hazard for visitors hiking in the Parkway because of the falling hazards resulting from existing deep gulleys and erosive banks.

**Cumulative Impacts.** No projects were identified in the cumulative impact scenario that would have long-term adverse impacts on traffic and safety; therefore, no cumulative impact would occur.

**Conclusion.** Despite NPS continuing management actions to maintain the Parkway, the no-action alternative would have short- and long-term moderate adverse impacts on transportation and traffic safety because of existing substandard roadway conditions. There would be no cumulative impact.

### Alternative B (Proposed Action and NPS Preferred Alternative)

Rehabilitation of the Parkway includes the reconstruction of pavement, stabilization of the shoulders, installation of new and additional inlets, repair of the outfall structures, modification to the roadside barriers, and the construction of extended acceleration/deceleration lanes. These infrastructure improvements would improve the existing Parkway conditions for motorists/visitors by improving traffic operations and safety. The improvement would not have a noticeable impact on roadway capacity or traffic volumes.

Each of the options to reconfigure the Route 123/GWMP interchange would have a long-term beneficial impact to traffic operations and safety for the reasons described below.

Route 123/GWMP Interchange Option 1. Under this option, motorists would have a yield control condition for the movement from the ramp from southbound GWMP to westbound Route 123. The eastbound Route 123 right-turn, free-flow movement to the southbound GWMP ramp would remain. Relocating the ramp from southbound GWMP to westbound Route 123 would increase the distance between the ramp tie-in point and the Kirby Road intersection, making it easier to make the left-turn maneuver at Kirby Road. A final advantage is that no additional traffic signal would be required for option 1.

A disadvantage is that the traffic movement from westbound Route 123 to southbound GWMP currently served by a loop ramp would have to turn left onto the southbound GWMP entry ramp against a considerable amount of opposing traffic on eastbound Route 123; however, this is a low-volume ramp movement (Earth Tech 2005). Overall, the impact on traffic operations would be long-term and beneficial.

The elimination of the traffic weave on southbound GWMP between the on- and off-ramps to Route 123 would have a beneficial impact on safety. Although this weave does not involve large traffic volumes, the short weave length (550 feet) is presently undesirable because the weave creates a conflict between motorists. Furthermore, relocating the ramp from southbound GWMP to westbound Route 123 would increase the distance between the ramp tie-in point and the Kirby Road intersection, making it easier and safer to make the maneuver to turn left at Kirby Road. Option 1 would have long-term beneficial impact on safety.

Route 123/GWMP Interchange Option 2. One advantage under option 2 is that it would eliminate the traffic weave on southbound GWMP between the on- and off-ramps to Route 123. Although this weave does not involve large traffic volumes, the short weave length (550 feet) does not meet AASHTO guidelines.

The disadvantage is that all southbound traffic proposing to go eastbound or westbound onto Route 123 would have to use the same ramp. Two Parkway exit ramps now carry this traffic, and the proposed use of a single ramp for both of these southbound GWMP exit movements would create an operation similar to that which exists to accommodate the northbound Parkway exit ramp movement to Route 123. Therefore, there would be the potential for vehicle queuing onto the southbound GWMP mainline travelway. Overall, the impact on traffic would be minor, long-term, and adverse due to the potential for this queuing of vehicles attempting to exit back onto the Parkway.

Option 2 reduces the amount of merging situations by one, thus eliminating the number of weaving and merging situations. Option 2 would thus likely have a long-term beneficial impact on safety.

To assess the potential impacts of construction on traffic operations and safety, the FHWA retained a consultant (Sabra, Wang & Associates, Inc.) to model the potential traffic impacts associated with the proposed alternative actions. A VISSIM traffic model was used to analyze traffic operations in the study area. The study assumptions included that under the 2015 Existing, and 2020 No Build scenarios, the Parkway would continue its existing form as a two way, four-lane divided, limited access highway. For the 2020 build scenario, the assumption is that one of the two existing roadways would be closed to all traffic, with the single remaining roadway being converted into a two-way, two-lane, undivided highway. However, as discussed in chapter 2, the contractor would maintain a minimum of two lanes for GWMP northbound and GWMP southbound traffic during morning and afternoon rush hour periods to the extent possible.

The demand volumes in the year 2020 on the GWMP developed from the travel forecasting effort are predicted to be near capacity for the parkway mainline section between the Route 123/GWMP and Spout Run Parkway interchanges, thus, the overall level of service, average speeds, and travel times are predicted to be similar to those observed today in existing conditions. However, this assumes that traffic patterns in the corridor, including adjacent parallel routes, reach equilibrium, so these results would not be expected until several weeks into the construction scenario (Sabra, Wang & Associates, Inc. 2016b). In some cases, the build scenario has better travel times and speeds which is attributed to the travel being diffused to other routes after construction begins. Queuing under the 2020 Build scenario is generally expected to be contained within the study corridor except for the northbound GWMP traffic movement at the Spout Run Parkway interchange diverge point, where queues may back up on the GWMP mainline lanes towards Key Bridge as vehicles merge and weave to enter the single lane northbound construction zone (Sabra, Wang & Associates, Inc. 2016b).

The traffic operation analysis concluded that the estimated number of year 2020 vehicle trips anticipated to move along the GWMP corridor between I-495/Capital Beltway and Spout Run Parkway under the mainline roadway construction scenario are forecasted to experience a decrease of more than 50% compared to the 2020 no-build levels. The analysis concluded that the traffic volumes diverted from the Parkway would be dispersed across the regional highway network to points well beyond the defined boundaries of the study area, but typically would be more diffused and relative minor in scale (Sabra, Wang & Associates, Inc. 2016b). The result of these studies by percent change in travel times and speeds for various segments of the Parkway are presented in **Table 7** and **Table 8**.

During construction, a TMP would be developed and traffic control plan would be implemented. This plan would include temporary closing of lanes, sequencing of construction events to minimize impacts to traffic, and restricting contractor work. All these actions would be designed to reduce the impact to traffic. With these measures, a moderate adverse impact would occur from increased traffic congestion caused by construction activities, which is estimated to take four years pending funding availability and construction phasing.

**Table 7. Percent Change in AM Travel Time and Speeds for 2020 Build**

	Travel Times (minutes: seconds)			Speed (miles per hour)		
	2020 No-Build	2020 Build	% Change 2020 Build*	2020 No-Build	2020 Build	% Change 2020 Build*
<b>Northbound</b>						
Key Bridge to Spout Run	0:15	0:26	72%	51	48	-6%
Spout Run to Route 123	4:52	5:03	5%	49	49	-6%
Route 123 to after Route 123	0:12	0:14	32%	30	50	-4%
North of Route 123 to I-495/Capital Beltway Ramps	8:27	3:58	3%	16	48	-8%
Total Northbound	13:47	9:41	7%	34	48	-6%
<b>Southbound</b>						
I-495/Capital Beltway to Route 123	3:55	0:26	3%	51	50	-2%
Route 123 to after Route 123	0:32	0:29	-6%	43	49	-4%
Route 123 to Spout Run	9:26	4:50	-23%	25	50	-4%
Spout Run to Key Bridge	1:02	0:45	-28%	33	48	30%
Total Southbound	14:55	10:50	-14%	33	49	16%

Source: Sabra, Wang & Associates, Inc. 2016b. \* percent change from 2015 existing baseline condition for the 2020 build.

**Table 8. Percent Change in PM Travel Time and Speeds for 2020 Build**

	Travel Times (minutes: seconds)			Speed (mile per hour)		
	2020 No-Build	2020 Build	% Change 2020 Build*	2020 No-Build	2020 Build	% Change 2020 Build*
<b>Northbound</b>						
Key Bridge to Spout Run	0:22	0:15	-4%	26	48	2%
Spout Run to Route 123	10:51	5:08	-1%	44	50	-6%
Route 123 to After Route 123	0:17	0:12	4%	25	46	-6%
North of Route 123 to I-495/Capital Beltway Ramps	10:04	4:00	-38%	16	48	71%
Total Northbound	21:35	9:36	-21%	21	48	26%
<b>Southbound</b>						
I-495/Capital Beltway to Route 123	3:51	4:00	4%	52	50	-4%
Route 123 to after Route 123	0:32	0:28	-7%	52	50	-4%
Route 123 to Spout Run	4:36	4:48	5%	52	50	-4%
Spout Run to Key Bridge	0:46	0:42	3%	51	49	-4%
Total Southbound	9:46	10:00	1%	50	49	-3%

Source: Sabra, Wang & Associates, Inc. 2016b. \* percent change from 2015 existing baseline condition for the 2020 build.

From a safety perspective, the pavement reconstruction would fix the road surface to minimize safety hazards, such as potholes. Rehabilitation of the shoulder would allow for a stabilized shoulder for cars to pull off or onto the Parkway. In some cases, fixed objects would be removed that create safety concerns. The installation of additional inlets would reduce ponding from being a driving hazard in the travel lanes. In addition, corrective actions to repair outfall structures would fix erosion and stabilize areas. Therefore, this alternative would reduce the potential hazard of landslides on the banks of the Potomac River and at outfalls in Turkey Run Park. Extending the acceleration and deceleration lanes would provide visitors more distance to enter and exit the Parkway mainline travel lanes at the two overlooks

and the GWMP Headquarters/USPP entrance and therefore, reduce the risk of vehicle collisions. These improvements would have a long-term beneficial impact on safety.

Roadside barrier modifications would improve safety on the Parkway. The VRI&A, CLI, 2018 Wall Safety Risk Assessment, and FHWA-NPS decision tree were used in siting new locations for the roadside barriers, which considers factors such as weighted crashes, speed, average daily traffic, horizontal curvature, hazard severity, length of barrier, and roadway grade. The roadside barrier modifications are crashworthy and offer similar safety benefits. The increase in barrier height is designed to deflect the vehicle during collision. This height reduces the likelihood of a vehicle topping or mounting the wall. Barrier end treatments presently do not exist, and these additions would also offer added benefits to redirect errant vehicles and/or prevent the severity of abrupt impacts during a collision.

**Cumulative Impacts.** The rehabilitation of the north section of the GWMP and the reconfiguration of the Route 123/GWMP interchange would beneficially impact transportation (traffic operations and safety) because the actions upgrade existing infrastructure to meet highway safety standards. Future projects such as the Arlington Memorial Bridge Rehabilitation would also have long-term beneficial impacts on transportation. Alternative B, when added to these reasonably foreseeable actions, would contribute noticeably and beneficially to the long-term cumulative impact on traffic by improving the roadway infrastructure and changing certain roadway features to be in accordance with AASTHO guidelines.

The construction activities under alternative B would be phased over time. There is the potential for traffic impacts to occur simultaneously with future projects such as the Arlington Memorial Bridge Rehabilitation. One concern raised during project scoping was the potential impacts on traffic during the Metrorail Safe Track project. It is anticipated that this Metrorail project would be completed prior to the start of the GWMP North Section Rehabilitation project. To minimize impacts, the NPS and FHWA would coordinate construction with other large-scale regional projects to minimize traffic impacts to the extent practicable. The TMP would be prepared in coordination with DOTs and local governments and would identify the communication protocol with other DOTs and local governments. In addition, the TMP would include a public outreach strategy to notify the public of construction related delays. With proper planning, short-term cumulative impacts resulting from multiple transportation projects occurring around the same timeframe would be minimized so as to not result in significant impacts to the regional transportation network.

**Conclusion.** There would be moderate short-term adverse impacts to traffic under alternative B associated with construction and lane closures. Under alternative B and the preferred Route 123/GWMP interchange option, there would be long-term beneficial impacts on transportation. The long-term cumulative impact would be beneficial. Short-term cumulative impacts on traffic would be minimized through implementation of a TMP which includes interagency coordination and public outreach, as well as coordination of construction timeframes with other projects in the region.

## VISITOR USE AND EXPERIENCE

### About the Analysis

The potential impacts on visitor use and experience are based on the professional judgment of the project team on similar projects and knowledge of the GWMP.

### **Alternative A: No-Action**

Under the no-action alternative, the NPS would continue management actions that would include minor rehabilitation of the roadway to maintain the Parkway near its existing state. There are existing conditions such as poor drainage on the Parkway surface, short acceleration/deceleration lanes, and tight roadway curvature at the off-ramp of the Route 123/GWMP interchange that affect the quality of the visitor experience. These existing conditions detract from the visitor experience by creating an unwanted concern that removes the visitor's enjoyment. These impacts are relatively minor and would continue to occur under the no-action alternative. The existing historic stone masonry walls would be maintained in place and contribute to the parkway rustic feel and help to frame existing viewsheds, which is a benefit of the no-action.

**Cumulative Impacts.** Certain elements of past projects have had adverse impacts on the visitor experience; however, these projects overall have resulted in a net beneficial impact on the visitor experience. One example is the change to the barrier walls from the past rehabilitation of the Parkway that had an adverse impact on the visitor experience by obstructing certain views to the Potomac River and changing the character of the barrier walls. This project also improved the parkway roadway conditions and safety, thereby increasing visitor enjoyment for motorist driving the parkway. The no-action alternative would contribute a small increment to the cumulative impact scenario on the visitor experience because poor pavement conditions detract from the visitor experience and reduce the visitor's enjoyment. In the context of the entire GWMP, the no-action alternative, when added to other past projects such as the past rehabilitation projects, would have a minor long-term adverse cumulative impact on the visitor experience.

**Conclusion.** Under the no-action alternative, minor long-term adverse impacts on visitor experience would occur because the visitor's enjoyment would continue to be affected by existing conditions on the north section of the Parkway. Maintaining the historic stone masonry guardwalls would be a benefit to the visitor experience. Minor adverse cumulative impacts would occur.

### **Alternative B (Proposed Action and NPS Preferred Alternative)**

The visitor experience is a combination of resources that make up how visitors feel when using the Parkway. The rehabilitation of the north section of the GWMP would have a long-term beneficial impact to visitor use and experience. Visitors using the Parkway would be able to enjoy the Parkway's aesthetics and cultural landscape better and more safely from improvements to the road surface and added road safety elements. The visitor experience would be impacted slightly by the change to the feeling and character of the Parkway and by slight change of views to superior and high-quality vistas from the roadside barrier modifications described in this impact analysis.

The impacts for each Route 123/GWMP interchange reconfiguration are explained below.

Route 123/GWMP Interchange Option 1. Under option 1, the visitor experience would be enhanced because of added safety resulting from improved geometrics, longer stopping

distance, and removal of the weave condition. Overall, the impact would be long-term and beneficial.

Route 123/GWMP Interchange Option 2. Option 2 (option 5 from 2008 EA) would not handle the capacity of the traffic volumes existing on the Parkway at Route 123 and potentially would result in queuing onto the mainline. Safety would also be compromised by this layout because it would be difficult for motorists making left-hand turns to go westbound on Route 123. These conditions would adversely affect traffic on the Parkway and, therefore, option 2 would have a moderate long-term adverse impact on the visitor experience.

All other project elements would generally enhance the quality of the visitor experience.

During construction activities, short-term impacts to visitor experience are interrelated with the short-term impacts described for transportation, cultural landscapes, and visual resources that occur during construction activities. Access to park locations like Turkey Run could be temporarily interrupted or detoured. Visitors would experience an inconvenience from temporary delays and roadway closures. The impacts would be minimized by implementing a TMP that includes a detailed traffic control plan, construction sequencing, and public outreach. Impacts to the cultural landscape and aesthetics would occur during construction from equipment and temporary traffic barriers used for traffic control, which would impact visitor experience. Construction signage and automated vehicular messenger signs would also detract from the setting. Thus, implementing alternative B would have a moderate short-term adverse impact on the visitor experience.

**Cumulative Impacts.** Future projects such as the Arlington Memorial Bridge Rehabilitation have the potential to have long-term beneficial impacts on visitor use and experience. Alternative B, when added to these reasonably foreseeable future actions, would contribute noticeably to the cumulative impact on the visitor experience. These actions would provide a better flow of traffic and create a more aesthetically pleasing and safe roadway, thus enhancing the visitor experience. Collectively, a long-term beneficial cumulative impact on the visitor experience would occur.

Short-term impacts related to other future projects on visitor use and experience are interrelated with the short-term impacts described for transportation, cultural landscapes, and visual resources that occur during construction activities. Visitors would experience an inconvenience from temporary delays; roadway closures; construction activities; and construction equipment and signage would detract from the Parkway setting. Impacts would be minimized by implementing a detailed traffic control plan, phasing construction, and coordinating with other on-going construction projects on the Parkway and throughout the region, resulting in short-term moderate adverse cumulative impacts.

**Conclusion.** Under alternative B, visitors would experience an added sense of protection and comfort while traveling the roadway after construction is complete. The long-term impact would be beneficial. Roadside barrier modifications would have minor short-term and long-term adverse impacts on the visitor experience from the change to the viewsheds and wall appearance. Short-term, visitors would experience moderate adverse impacts on the visitor experience from added delays and temporary changes to the Parkway during construction. Impacts associated with Route 123/GWMP interchange option 1 would be long-term and beneficial. Moderate long-term adverse impacts would occur from Route 123/GWMP interchange option 2. Overall, a long-term beneficial cumulative impact from

improvements to the Parkway and a moderate short-term adverse cumulative impact would occur from construction activities.

## CHAPTER 5: CONSULTATION AND COORDINATION

### AGENCY AND PUBLIC SCOPING

Scoping is the effort to involve agencies and the general public in determining the scope of issues to be addressed in the environmental document. Among other tasks, scoping determines important issues; eliminates issues that are not important; allocates assignments among the interdisciplinary team members and/or other participating agencies; identifies related projects and associated documents; and identifies other permits, surveys, consultations, etc., required by other agencies. Internal scoping at the park level creates a schedule that allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made.

Previously, a proposal for the rehabilitation of the north section of the Parkway was analyzed in an EA released in 2008. In 2005, the NPS conducted two public scoping informational open houses for the 2008 EA. In 2009, the project was put on hold and the NEPA and Section 106 processes were not completed as the NPS and FHWA found it necessary after reviewing public and agency comments to gather more data on safety, cultural landscapes, and scenic viewshed prior to making any further decisions regarding the project. Comments from the public outreach and on the 2008 EA were taken into consideration in the preparation of this EA.

Since 2008, the NPS and FHWA worked together to complete a number of studies, and as the need for rehabilitation became more pressing, the NPS moved forward with project planning. On June 6, 2016, the NPS issued a public scoping announcement as well as a press release to area wide news organizations to announce the re-initiation of the project. In addition to the press release, scoping letters, and other written announcements, the NPS posted project information including the scoping newsletter to the NPS PEPC website. Members of the public were invited to submit comments on the project electronically, through the PEPC website or by mailing written comments.

A public scoping meeting was held June 15, 2016 at the Turkey Run Park Headquarters at 700 George Washington Memorial Parkway in McLean, Virginia. This meeting was held to provide citizens with an opportunity to learn about the project; to provide input as to their issues and/or concerns about the project; and provide comments or feedback. This meeting also was held to provide citizens with a greater opportunity for public involvement.

A total of 15 public correspondences were submitted during the scoping period, which was held between June 3, 2016 and July 8, 2016. Comments were in favor of many of the same Parkway improvements that were brought up in 2005. In addition, comments expressed concern regarding anticipated traffic during project construction and coordination with timing of other projects in the vicinity.

## AGENCY CONSULTATION

As with public scoping, previous NHPA Section 106 and ESA Section 7 coordination efforts were conducted for the 2008 EA. These efforts are further summarized in the 2008 EA that was released to the public. The following is a summary of agency coordination and consultation conducted for this EA.

### National Historic Preservation Act Section 106 Consultation

In accordance with Section 106 of the NHPA, the NPS sent a package of information to the VDHR, DC HPO, MHT, and ACHP on May 25, 2016 to reinitiate the consultation process for the project. Each of these letters described prior Section 106 consultation and invited the corresponding agency to submit preliminary comments regarding the re-initiation process by June 17, 2016. The MHT and DC HPO sent email responses in June 2016 stating that they do not expect the need to be involved in formal project consultation. The DC HPO expressed the desire to be given opportunities to review and comment on any project plans that are anticipated to have a visual impact on Washington, DC. The NPS also sent letters on May 19, 2016 and follow-up email invitations on May 26, 2016 to VDHR, DC HPO, MHT, and ACHP inviting representatives to attend a Section 106 consulting parties meeting on June 6, 2016 at the Turkey Run Park Headquarters (and via teleconference for those representatives not able to attend in-person). This consulting parties meeting was held to discuss updates to the project, studies conducted since 2008, and the Section 106 consultation process. Representatives from VDHR and ACHP attended the meeting via teleconference and representatives from MHT and DC HPO were unable to attend. The DC HPO sent an email response to the NPS on June 10, 2016 thanking the park for the invitation to the consulting parties meeting and requested an electronic copy of the presentation given at the meeting. The VDHR, DC HPO, MHT, and ACHP were sent email invitations on October 13, 2016 to attend the second Section 106 consulting parties meeting held on November 2, 2016 at the Turkey Run Park Headquarters (and via teleconference for those representatives not able to attend in-person). The second consulting parties meeting was held to discuss project purpose and need, options for project alternatives, roadside barrier types, the NHPA Section 106 compliance pathway and PA development, and the context sensitive design to be used to evaluate proposed project elements. A representative from VDHR attended the meeting via teleconference and representatives from MHT, DC HPO, and ACHP were unable to attend. The NPS sent a post-meeting email indicating that, in early 2017, the NPS anticipated providing the consulting parties with refined draft alternatives.

With the re-initiation of the Section 106 process, a new project PA is being developed. In this 2018 PA, the NPS outlines the approach to further consultation under Section 106, which includes a context sensitive design approach to help to further minimize impacts once more design details are available. The NPS will continue to coordinate with VDHR, ACHP, and other consulting parties on the new PA that will be executed with stipulations for mitigation. A draft of the PA is provided as **Appendix B**.

### Endangered Species Act Section 7 and Special Concern Species Consultation

**Section 7 Consultation.** Section 7 of the Endangered Species Act of 1973 (ESA) requires federal agencies to consult with the USFWS to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The NPS submitted a project review request through the USFWS's ECOS-IPaC System to obtain an official list of species and/or critical habitat that may occur within the boundary of the

north section of the GWMP and/or may be affected by the proposed action. The official species list identified two federally listed species: the northern long-eared bat and the Indiana bat.

On March 6, 2017, the NPS received a letter from the USFWS Virginia Field Office containing a list of threatened and endangered species that may occur within the project limits. Subsequently, the NPS coordinated with the USFWS Virginia Field Office on additional information and/or conservation measures pertaining to these species in consideration of the proposed project. The NPS anticipates that the Indiana bat and northern long-eared bat are not likely to be affected, as conservation measures would be implemented to protect these species. Therefore, these species were not evaluated in detail during the development of the EA.

**Special Concern Species.** According to information received from the VDCR, the proposed project area intersects three conservation sites of significance: Turkey Run Park Slopes, Chain Bridge, and the Rosslyn Riverbank. These sites support natural heritage resources and habitat as well as one or more rare plant, animal, or natural communities (VDCR 2004). In 2004, VDCR recommended additional rare plant surveys and identification of seeps near the LOD for the alternatives. Additional rare plant surveys were completed and seeps identified and locations surveyed. Species of concern are evaluated in chapter 4 for this EA and mitigation proposed is included in chapter 2.

#### **State Departments of Transportation Coordination**

During the NEPA process, NPS and FHWA have consulted with VDOT, MSHA, DDOT, Montgomery County, Arlington County, and Fairfax County to inform each agencies of the anticipated temporary traffic diversion during construction and seek input into the process to minimize project impacts on public road network. Additionally, the NPS and FHWA would oversee the development and implementation of a TMP for each phase of design and construction to minimize traffic impacts during construction. The TMP would include a public outreach strategy to inform the public of construction activities, detours, and changes in traffic patterns during the pavement reconstruction.

As the project proceeds into design and more detailed information is available on impacts, additional agency coordination would be conducted with agencies such USACE, VMRC, and VDEQ to obtain other authorizations or permits needed for compliance with Section 401, Section 402, and Section 404 of the CWA and appropriate state regulations.

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## **Appendix A – Wall Safety Risk Assessment (2018)**

2018 Wall Safety Risk Assessment

Wall # (NPS)	GWMP Guardwall Location	Barrier Length	Cum barrier length (FT)	Cum. barrier length (%)	GIS MP	Crashes 2006-2012			Risk Factors							RISK SCORE	Risk Category	Comments	Vista Rank	Viewshed Impact Analysis Results/Action	
						PDO	Injury	Fatal	Frequency of Crashes in Segment	Weighted Crashes 2006-2012	Speed	ADT	Hor Curve	Hazard Sev	Length						Grade
1N	NB GWMP (921)	840	840.00	4.2%	7.44-7.61	80	12	0	92	140	40	40	0	24	20	0	264	HIGH	2:1 & steeper slope; > 30' height	#3 superior (NB); #2 high (NB)	Significant impact / Repair and safety counter measures
16S	SB Approach to Gulf Branch Bridge	177	1,017.00	5.1%	5.12-5.17	53	15	0	68	128	40	40	0	18	10	15	251	HIGH	2.5:1 & steeper slope; < 25' height		
17S	SB Approach to Glebe Road Bridge	38	1,055.00	5.3%	4.80-4.82	53	15	0	68	128	40	40	0	18	0	0	226	HIGH	2:1 & steeper slope; 20' height		
18S	SB GWMP (149)	155	1,210.00	6.1%	5.24-5.29	53	15	0	68	128	40	40	0	18	0	0	226	HIGH	2:1 & steeper slope; > 20' height		
10N	NB GWMP (363 - N of South Donaldson Run Overlook)	366	1,576.00	7.9%	9.08-9.16	50	10	0	60	100	40	40	0	30	10	0	220	HIGH	1.5:1 slope; > 30' height	#13 superior (NB); #24 low (NB); #14 very low (NB)	No Impact/ Raise to 27' crashworthy design
11N	NB Approach to Donaldson Run Bridge	235	1,811.00	9.1%	9.22-9.27	50	10	0	60	100	40	40	0	24	10	0	214	HIGH	Steeper than 2:1 slope; > 25' height		
13N	NB GWMP (605 - N of North Donaldson Run Overlook)	577	2,388.00	12.0%	9.45-9.58	50	10	0	60	100	40	40	0	24	10	0	214	HIGH	1.5:1 slope; > 25' height	#17 very low (NB)	
12N	NB GWMP (117 (of 447 total) - S of North Donaldson Run	117	2,505.00	12.6%	9.34-9.40	50	10	0	60	100	40	40	0	24	0	0	204	HIGH	1.5:1 & steeper slope; > 20' height	#16 high (NB); #22 medium (SB); #23 low (SB)	No Impact/ Raise to 27' crashworthy design
8N	NB GWMP (692)	588	3,093.00	15.5%	8.75-8.88	42	8	1	51	97	40	40	0	30	10	0	217	HIGH	1.5:1 & steeper slope; > 30' height	#25 superior (SB); #11 medium (NB)	No Impact/ Raise to 27' crashworthy design
15N	NB GWMP (110) trailing from Gulf Branch Bridge	110	3,203.00	16.1%	9.83-9.87	37	12	0	49	97	40	40	0	24	0	0	201	HIGH	2:1 slope; < 30' height		
17N	NB Approach to Glebe Road Bridge	129	3,332.00	16.7%	10.03-10.08	37	12	0	49	97	40	40	0	18	10	30	235	HIGH	2.5:1 & steeper slope; < 25' height	#19 very low (NB); #20 very low (SB)	
16N	NB GWMP (263)	170	3,502.00	17.6%	9.90-9.94	37	12	0	49	97	40	40	0	18	10	0	205	HIGH	2.5:1 & steeper slope; < 25' height		
18N	NB GWMP (160) Trailing from Glebe Road Bridge	127	3,629.00	18.2%	10.18-10.22	37	12	0	49	97	40	40	0	18	0	15	210	HIGH	2:1 & steeper slope; 20' height		
14N	NB Approach to Gulf Branch Bridge	100	3,729.00	18.7%	9.73-9.76	37	12	0	49	97	40	40	0	18	0	15	210	HIGH	steep drop, less than 20' drop	#21 medium (SB); #18 low (NB)	
9N	NB GWMP (368 (of 692 total) - S of South Donaldson Run	368	4,097.00	20.5%	8.91-9.02	42	8	1	51	97	40	40	0	9	10	0	196	HIGH	minimal slope; frees greatest hazard	#12 superior (NB); #25 low (SB)	Significant impact / Repair and safety counter measures
19N	NB GWMP (1,234)	1120	5,217.00	26.2%	10.25-10.49	42	9	0	51	97	40	40	0	30	20	0	217	HIGH	1.5:1 slope; > 40' height		
20N	NB GWMP (781)	696	5,913.00	29.8%	12.36-12.50	34	10	0	44	84	40	30	15	24	20	15	228	HIGH	2:1 slope; > 30' height		
21N	NB GWMP (500)	343	6,256.00	31.3%	11.65-11.73	38	9	0	43	83	40	30	0	18	10	0	181	HIGH	2.5:1, 30' height		

Summary: 18 walls are in the highest overall risk category and represent 31.4% of the cumulative length of historic walls.  
8 of the 18 walls in the highest overall risk category have superior or high views associated with them and represent 11.3% of the cumulative length of historic wall

Wall # (NPS)	GWMP Guardwall Location	Barrier Length	Cum barrier length (FT)	Cum. barrier length (%)	GIS MP	Crashes 2006-2012			Risk Factors							RISK SCORE	Risk Category	Comments	Vista Rank	Viewshed Impact Analysis Results/Action	
						PDO	Injury	Fatal	Frequency of Crashes in Segment	Weighted Crashes 2006-2012	Speed	ADT	Hor Curve	Hazard Sev	Length						Grade
25N	NB GWMP (554) near CIA interchange	395	6,651.00	33.3%	12.92-13.01	21	8	0	29	61	40	30	15	24	10	15	195	MEDIUM	2:1 & steeper slope; > 30' height		
5N	NB GWMP (898)	815	7,466.00	37.4%	8.21-8.38	28	6	0	34	58	40	40	0	30	20	0	188	MEDIUM	1.5:1 & steeper slope; > 30' height	#29 superior (SB); #7 high (NB); #6 high (NB)	Significant impact / Repair and safety counter measures
26N	NB Ramp from Turkey Run (425)	425	7,891.00	39.6%	13.42-13.52	38	3	1	42	68	40	30	0	24	10	15	187	MEDIUM	1.5:1 slope; > 20' height		
19S	SB GWMP (380)	295	8,186.00	41.0%	5.43-5.49	27	6	0	33	57	40	40	0	24	10	15	186	MEDIUM	1.5:1 & steeper slope; > 20' height		
30N	NB GWMP (259)	180	8,366.00	41.9%	13.91-13.96	38	3	1	42	68	40	30	15	18	10	0	181	MEDIUM	2.5:1 & steeper slope; < 30' height		
6N	NB GWMP (350)	220	8,586.00	43.0%	8.41-8.46	28	6	0	34	58	40	40	0	30	10	0	178	MEDIUM	1.5:1 & steeper slope; > 30' height	#9 medium (NB); #28 medium (SB)	
7N	NB GWMP (337)	232	8,818.00	44.2%	8.52-8.58	28	6	0	34	58	40	40	0	30	10	0	178	MEDIUM	1.5:1 & steeper slope; > 30' height	#27 superior (SB); #10 medium (NB)	No Impact/ Raise to 27' crashworthy design
12S	SB GWMP (478)	420	9,238.00	46.3%	3.26-3.35	24	3	0	38	39	40	30	15	24	10	15	173	MEDIUM	2:1 slope; > 30' height		
29N	NB GWMP (183)	74	9,312.00	46.7%	13.88-13.90	38	3	1	42	68	40	30	15	9	0	0	162	MEDIUM	flatter than 3:1 slope; < 20' height		
9S	SB GWMP (170)	145	9,457.00	47.9%	2.47-2.51	31	7	0	38	66	40	30	0	24	0	0	160	MEDIUM	2:1 slope; 30' height		

Summary: 10 walls are in the overall medium-high risk category and represent 16% of the cumulative length of historic walls.  
3 of the 10 walls in the overall medium-high risk category have superior or high views associated with them and represent 5.3% of the cumulative length of historic wall

Wall # (NPS)	GWMP Guardwall Location	Barrier Length	Cum barrier length (FT)	Cum. barrier length (%)	GIS MP	Crashes 2006-2012			Risk Factors							RISK SCORE	Risk Category	Comments	Vista Rank	Viewshed Impact Analysis Results/Action	
						PDO	Injury	Fatal	Frequency of Crashes in Segment	Weighted Crashes 2006-2012	Speed	ADT	Hor Curve	Hazard Sev	Length						Grade
25S	SB Approach to Windy Run Bridge	74	9,531.00	47.8%	6.87-6.91	34	3	0	37	49	40	40	0	24	0	0	153	MEDIUM	2:1 slope; < 30' height		
29S	SB GWMP (1,692 - median)	1687	11,218.00	56.2%	7.15-7.48	11	4	0	15	31	30	40	0	30	20	0	151	MEDIUM	1.5:1 slope; > 50' height	#34 high (SB); #32 low (SB); #35 low (SB); #33 very low (SB)	Significant impact / Repair and safety counter measures

Summary: 2 walls are in the overall medium risk category and represent 8.8% of the cumulative length of historic walls.  
1 of the 2 walls in the overall medium risk category have superior or high views associated with them and represent 6.3% of the cumulative length of historic wall

Wall # (NPS)	GWMP Guardwall Location	Barrier Length	Cum barrier length (FT)	Cum. Barrier length (%)	GIS MP	Crashes 2006-2012			Risk Factors							RISK SCORE	Risk Category	Comments	Vista Rank	Viewshed Impact Analysis Results/Action	
						PDO	Injury	Fatal	Frequency of Crashes in Segment	Weighted Crashes 2006-2012	Speed	ADT	Hor Curve	Hazard Sev	Length						Grade
EFL33	SB GWMP (261) - S of 123 interchange	223	11,441.00	57.4%	3.88-3.93	12	4	0	16	32	40	40	25	18	10	15	180	MEDIUM	2.5:1 & steeper slope; < 25' height		
15S	SB GWMP (281)	208	11,649.00	58.4%	4.32-4.37	28	8	0	36	68	40	40	0	18	10	0	176	MEDIUM	2.5:1 slope; < 30' height		
22S	SB GWMP (433)	410	12,059.00	60.5%	6.34-6.43	14	6	0	20	44	40	40	15	18	10	0	167	MEDIUM	2:1 & steeper slope; > 20' height		
10S	SB GWMP (408)	290	12,349.00	61.9%	2.60-2.67	31	7	0	38	68	40	30	0	18	10	0	164	MEDIUM	2.5:1, 30' height		
24S	SB GWMP (416)	279	12,628.00	63.3%	6.63-6.69	34	3	0	37	49	40	40	0	24	10	0	163	MEDIUM	1.5:1 slope; > 20' height		
2N	NB GWMP (1,147)	725	13,353.00	66.9%	7.63-7.84	15	3	0	18	30	40	40	0	24	20	0	154	MEDIUM	Varies 1:1 to 2:1 slope; > 20' height	#4 high (NB)	Significant impact / Repair and safety counter measures
3N	NB GWMP (1,147)	290	13,643.00	68.4%		15	3	0	18	30	40	40	0	24	20	0	154	MEDIUM	Varies 1:1 to 2:1 slope; > 20' height		Significant impact / Repair and safety counter measures
8S	SB GWMP (358) ramp to CIA	322	13,965.00	70.0%	1.96-2.04	22	3	0	25	37	40	30	10	24	10	0	151	MEDIUM	2:1 & steeper slope; > 30' height		
6S	SB GWMP (499) near NPS Entrance	415	14,380.00	72.1%	1.76-1.85	22	3	0	25	37	40	30	0	18	10	15	150	MEDIUM	2:1 slope; < 25' height		
21S	SB GWMP (194)	145	14,525.00	72.8%	6.14-6.18	14	6	0	20	44	40	40	15	9	0	0	148	MEDIUM	minimal slope; frees greatest hazard		
23S	SB GWMP (197)	118	14,643.00	73.4%	6.53-6.57	34	3	0	37	49	40	40	0	18	0	0	147	MEDIUM	2.5:1; < 20' height		
14S	SB GWMP (750)	750	15,393.00	77.2%	4.15-4.31	12	4	0	16	32	40	40	0	24	10	0	146	MEDIUM	2:1 & steeper slope; > 30' height		
7S	SB GWMP (363)	220	15,613.00	78.3%	1.89-1.94	22	3	0	25	37	40	30	0	9	10	15	141	MEDIUM	3:1 slope; 20' height		
4N	NB GWMP (288)	250	15,863.00	79.8%	7.90-7.96	15	3	0	18	30	40	40	0	18	10	0	138	MEDIUM	1.5:1 slope; < 20' height	#6 very low (NB)	

Summary: 14 walls are in the overall medium-low risk category and represent 23.3% of the cumulative length of historic walls.  
3 of the 14 walls in the overall medium-low risk category have superior or high views associated with them and represent 8.5% of the cumulative length of historic wall

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Wall # (NPS)	GWMP Guardwall Location	Barrier Length	Cum barrier length (FT)	Cum. Barrier Length (%)	GIS MP	Crashes 2006-2012				Frequency of Crashes in Segment	Risk Factors										RISK SCORE	Risk Category	Comments	Vista Rank
						PDO	Injury	Fatal	Crashes		Speed	ADT	Hor Curve	Hazard Sev	Length	Grade								
2S	SB GWMP (485)	327	16,190.00	81.2%	0.55-0.63	3	1	0	4	8	40	30	15	18	10	15	136	LOW	2:1 slope, 20' height					
31N	NB GWMP (514)	465	16,655.00	83.5%	14.01-14.10	1	0	0	1	1	40	30	15	24	10	15	135	LOW	2:1 & steeper slope, 30' height					
27S	SB GWMP (278)	217	16,872.00	84.6%	7.15-7.20	11	4	0	15	31	30	40	0	18	10	0	129	LOW	2:1 & steeper slope, > 20' height					
28S	SB GWMP (271)	195	17,067.00	85.6%	7.23-7.27	11	4	0	15	31	30	40	0	18	10	0	129	LOW	1.5:1 slope, < 20' height					
28S	SB GWMP (211)	170	17,237.00	86.4%	7.04-7.08	11	4	0	15	31	40	40	0	18	0	0	129	LOW	2.5:1, < 20' height					
29N	NB GWMP (278) - S of 123 interchange	240	17,477.00	87.6%	11.12-11.19	9	2	0	11	19	40	40	10	9	10	0	128	LOW	3:1 slope, < 20' height					
4S	SB GWMP (604)	474	17,951.00	90.0%	0.84-0.94	3	1	0	4	8	40	30	0	24	10	15	127	LOW	2:1 slope, 30' height					
22N	NB GWMP (365)	265	18,216.00	91.3%	11.98-12.04	3	1	0	4	8	40	30	0	18	10	15	121	LOW	2.5 to 3:1, < 30' height					
4N	NB Approach to Windy Run Bridge	35	18,251.00	91.5%	8.01-8.03	15	3	0	18	30	40	40	0	9	0	0	119	LOW	minimal slope					
EFL22	NB GWMP (132) ramp to CIA	350	18,601.00	93.3%	0.04-0.12	28	2	0	30	38	40	30	0	9	0	0	117	LOW	minimal slope					
3S	SB GWMP (210)	172	18,773.00	94.1%	0.65-0.69	3	1	0	4	8	40	30	15	18	0	0	111	LOW	2.5:1 & steeper slope, < 25' height					
32N	NB GWMP (515)	458	19,231.00	96.4%	14.31-14.39	1	0	0	1	1	40	30	0	30	10	0	111	LOW	1:1 & steeper slope, > 30' height					
11S	SB GWMP (500)	370	19,601.00	98.3%	2.93-3.02	2	0	0	2	2	40	30	0	24	10	0	106	LOW	2:1 slope, 30' height					
23N	NB GWMP (396)	345	19,946.00	100.0%	12.12-12.20	3	1	0	4	8	40	30	0	18	10	0	106	LOW	2.5:1, 30' height					
EFL26	SB GWMP (181) - NOT existing wall		19,946.00	100.0%	2.79-2.86	2	0	0	2	2	40	30	0	18	0	0	90	LOW	culvert headwall, < 10' drop					

Summary: 15 walls are in the overall low risk category and represent 20.5% of the cumulative length of the historic walls.

Non-Historic - Added after 1962

Wall # (NPS)	GWMP Guardwall Location	Barrier Length	Cum barrier length (FT)	Cum. barrier length (%)	GIS MP	Crashes 2006-2012				Frequency of Crashes in Segment	Risk Factors										RISK SCORE	Risk Category	Comments
						PDO	Injury	Fatal	Crashes		Speed	ADT	Hor Curve	Hazard Sev	Length	Grade							
33N	NB Approach to Dead Run Bridge	146	20,092.00	78.4%		78	14	1	93	163	40	30	15	18	0	0	266	HIGH	> 20' height to Dead Run				
33N	NB Trailing from Dead Run Bridge	48	20,140.00	78.6%		78	14	1	93	163	40	30	15	9	0	0	257	HIGH	minimal slope				
EFL15	NB Approach to Turkey Run Bridge	361	20,501.00	80.0%		38	3	1	42	68	40	30	0	24	10	15	187	MEDIUM	2:1 slope, < 30' height				
5S	SB Approach to Turkey Run Bridge	115	20,616.00	80.5%		22	7	0	29	57	40	30	0	24	0	15	166	MEDIUM	Sleep drop to Turkey Run, = 30' height				
EFL20	Median at CIA interchange (1.740')	1745	22,361.00	87.3%		22	3	0	25	37	40	30	0	30	20	15	172	MEDIUM	Median < 30' some areas - extreme severity				
EFL48	SB Approach to Donaldson Run Bridge	61	22,422.00	87.5%		27	6	0	33	57	40	40	0	18	0	0	155	MEDIUM	steep drop, less than 20' drop				
1S	SB Trailing from Dead Run Bridge	363	22,785.00	88.9%		28	2	0	30	38	40	30	0	18	10	15	151	MEDIUM	2.5:1 & steeper slope, < 30' height				
EFL13	NB Trailing from Turkey Run Bridge	47	22,832.00	89.1%		38	3	1	42	68	40	30	0	9	0	0	147	MEDIUM	minimal slope				
1S	SB Approach to Dead Run Bridge	124	22,956.00	89.6%		28	2	0	30	38	40	30	0	18	0	15	141	MEDIUM	steep drop, less than 20' drop				
5S	SB Trailing from Turkey Run Bridge	142	23,098.00	90.1%		22	7	0	29	57	40	30	0	9	0	0	136	MEDIUM	3:1 slope, 20' height				
4N	NB Approach to Windy Run Bridge	35	23,133.00	90.3%		15	3	0	18	30	40	40	0	9	0	0	119	LOW	minimal slope				
EFL 42A	SB GWMP Approach to Gulf Branch Bridge	32	23,168.00	90.4%																			
EFL 43A	SB GWMP Trailing at Gulf Branch Bridge	33	23,200.00	90.5%																			
EFL 49A	NB GWMP Approach to Donaldson Run Bridge	33	23,233.00	90.7%																			
EFL 50A	NB GWMP Trailing at Donaldson Run Bridge	33	23,266.00	90.9%																			
EFL 106	SB GWMP Trailing at Gulf Branch Bridge	33	23,299.00	90.9%																			
EFL 47A	NB GWMP Approach to North Donaldson Run Overlook	33	23,332.00	91.1%																			
EFL 44A	NB GWMP Approach to Gulf Branch Bridge	33	23,365.00	91.2%																			
EFL 41A	NB GWMP Trailing at Gulf Branch Bridge	33	23,398.00	91.3%																			
EFL 39A	NB GWMP Approach to Glebe Road Bridge	33	23,431.00	91.4%																			
EFL 37A	NB GWMP Trailing at Glebe Road Bridge	33	23,464.00	91.6%																			
EFL 107	NB GWMP Approach to Pimmit Run Bridge	72	23,497.00	91.7%																			
EFL 105	SB GWMP Approach to Pimmit Run Bridge	73	23,569.00	92.0%																			
EFL 109	NB GWMP Fort Marcy Entrance	47	23,642.00	92.3%																			
EFL 108	GWMP Median on Pimmit Run Bridge	347	23,689.00	92.4%																			
EFL 110	GWMP Median south of VA 123	705	24,036.00	93.8%																			
EFL 100	SB GWMP Approach to Dead Run Bridge (median)	153	24,741.00	96.6%																			
EFL 101	NB GWMP Approach to Dead Run Bridge (median)	160	24,894.00	97.1%																			
EFL 102	SB GWMP Approach to Turkey Run Bridge (median)	153	25,054.00	97.8%																			
EFL 103	NB GWMP Approach to Turkey Run Bridge (median)	170	25,207.00	98.4%																			
EFL 104	Ramp from NB GWMP to CIA	248	25,377.00	99.0%																HISTORIC			
EFL 60A	SB GWMP Approach to Windy Run Bridge	33	25,625.00	100.0%																			

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**Appendix B – Draft Programmatic Agreement (2018)**

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## PROGRAMMATIC AGREEMENT

### AMONG THE NATIONAL PARK SERVICE, THE FEDERAL HIGHWAY ADMINISTRATION, THE VIRGINIA STATE HISTORIC PRESERVATION OFFICER, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

#### REGARDING

#### THE GEORGE WASHINGTON PARKWAY NORTH SECTION REHABILITATION

WHEREAS, the George Washington Memorial Parkway (hereinafter GWMP or Park), a unit of the National Park Service (hereinafter NPS) located in Fairfax and Arlington counties in Virginia, operates, manages, administers, maintains, preserves, and interprets, unimpaired, the historic properties of the Park for the enjoyment of future generations; and

WHEREAS, the GWMP was established pursuant to what is known as the Capper-Cramton Act, Public Law 71-284, 46 Stat. 482, (May 29, 1930) for purposes "to include the shores of the Potomac, and adjacent lands, from Mount Vernon to a point above the Great Falls on the Virginia side, including the protection and preservation of the natural scenery of the Gorge and the Great Falls of the Potomac," and became a unit of the National Park System pursuant to Executive Order 6166 of June 10, 1933 (taking effect August 10, 1933), and the Park is administered by the NPS; and

WHEREAS, the NPS is charged in its administration of the units of the National Park System to meet the directives of other laws, regulations, and policies including the NPS Organic Act as codified in Title 54 United States Code (USC) 100101(a) to "conserve the scenery, natural and historic objects, and wild life in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations;" and

WHEREAS, the Park is a nationally significant historic property entered in the National Register of Historic Places (hereinafter NRHP) on June 2, 1995 for the Parkway's commemorative, design, and scenic qualities; and

WHEREAS, the North Section of the GWMP between Interstate 495 (Capital Beltway) and Spout Run is a significant cultural landscape entered in the NPS Cultural Landscape Inventory (CLI) database with concurrence from the Virginia State Historic Preservation Office (VASHPO) on September 2, 2009; and

WHEREAS, the NPS intends to rehabilitate approximately 7.6 miles of the North Section of the GWMP between Interstate 495 (Capital Beltway) and Spout Run (the Project); and

WHEREAS, the Project will include reconstructing the asphalt pavement and constructing new concrete curbs; replacing drainage inlets and culverts; stabilizing erosion at drainage outfalls; improving safety with options for crash-worthy roadside barriers; reconfiguring the interchange at Route 123/GWMP; and other smaller project elements such as creation of emergency turnarounds, small scale

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rehabilitation of two scenic overlooks, short extensions of acceleration and deceleration lanes, installation of a fiber optic backbone for future Intelligent Transportation System (ITS) components, and creation of nonstructural storm water management facilities for new impervious surfaces; and

WHEREAS, the NPS has identified treatment options that are applicable for the roadway rehabilitation and interchange modifications; and has further identified the proposed treatment for each historic guardwall in the North Section based on criteria including physical condition, associated views/vistas, and safety risk assessment data; and

WHEREAS, the Project involves undertakings that will affect historic properties (as defined in 36 CFR Part 800.16(l)), which are therefore subject to review under applicable sections of the National Historic Preservation Act (NHPA) as amended (54 USC 300101 et seq.), such as 106, 110(f), 111(a), and 112, and the regulations of the Advisory Council on Historic Preservation (ACHP) (36 CFR Part 800); and

WHEREAS, the NPS has notified the public and conducted combined NEPA scoping and Section 106 consulting parties consultation meetings on October 27 and 28, 2015 and February 10, 2016; a public scoping meeting on June 15, 2016 in order to inform the public of the Project and to solicit verbal and written comments; and Section 106 consultation meetings held on June 6, 2016 and November 2, 2016, to provide additional opportunities for the consulting parties to comment on historic preservation concerns regarding the Project; and

WHEREAS, the NPS anticipates the phased implementation of the rehabilitation by sections as funds are appropriated and

WHEREAS, the NPS has applied the criteria of adverse effect, which is provided for in 36 CFR Part 800.5(a) and has determined that historic properties would be adversely affected chiefly due to the proposed alteration of approximately 38% of the total linear feet of historic guardwalls which will modify historic fabric, diminish views and vistas, and change small-scale landscape features; and WHEREAS, the NPS has consulted with the VASHPO regarding development of this Programmatic Agreement (PA) pursuant to 36 CFR Part 800; and

WHEREAS, the NPS has notified the ACHP of the intention to develop a project specific programmatic agreement, pursuant to 36 CFR Part 800.14(b)(1)(ii) and has invited the ACHP to participate in consultation and the ACHP has accepted/declined to participate; and

WHEREAS, the Federal Highway Administration (hereinafter FHWA) will assist the NPS with contracting and management of construction activities, may provide funding necessary to carry out undertakings in the future and has designated the NPS as the lead federal agency to fulfill its responsibilities under Section 106; and

WHEREAS, under its authorities specified in the National Capital Planning Act (40 U.S.C. 8701 et seq.), the National Capital Planning Commission (hereinafter NCPC) has advisory review authority over federal projects outside the District of Columbia, pursuant to 40 U.S.C. § 8722(b)(1). Therefore, in carrying out

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its review of the project, NCPD does not have an independent obligation to satisfy the requirements of Section 106 of the NHPA; and

WHEREAS, pursuant to 36 CFR Part 800.2, the NPS has invited the Catawba Indian Nation to participate in government-to-government consultation in accordance with 36 CFR Part 800.2(c)(2)(ii)(C) and the Catawba Indian Nation has not responded to this invitation; and

WHEREAS, pursuant to 36 CFR Part 800.2, the NPS has invited the Delaware Nation to participate in government-to-government consultation in accordance with 36 CFR Part 800.2(c)(2)(ii)(C) and the Delaware Nation responded on April 14, 2017 requesting to be a signatory to this PA; and

WHEREAS, pursuant to 36 CFR Part 800.2, the NPS has invited the Pamunkey Indian Tribe to participate in government-to-government consultation in accordance with 36 CFR Part 800.2(c)(2)(ii)(C) and the Pamunkey Indian Tribe has not responded to this invitation; and

WHEREAS, the NPS in accordance with 36 CFR 800.2(a)(4), has invited individuals and organizations with a demonstrated interest in the Project to participate as consulting parties in the Section 106 process, with the full list of invited consulting parties compiled in Attachment A; and

WHEREAS, the purpose of this PA is to establish a consultation process for the rehabilitation of the North Section of the GWMP in compliance with Section 106 of the NHPA; and

WHEREAS, the NPS will be guided by the planning and management documents listed in Attachment B; and

NOW, THEREFORE, the NPS, FHWA, ACHP (if participating) and VASHPO agree that the PA shall be implemented in accordance with the following stipulations and processes in order to take into account the effects of the Park's undertakings on historic properties.

## STIPULATIONS

The NPS shall ensure that the following measures are carried out:

### **I. GENERAL REQUIREMENTS**

A. **Applicable Codes and Standards.** The Undertaking shall be planned, developed and executed by NPS in consideration of the recommended approaches contained in the Secretary of the Interior's *Standards for the Treatment of Historic Properties* ("Secretary's Treatment Standards") and other prevailing applicable codes.

B. **Qualifications.** NPS shall ensure that all historic preservation and/or archeological work performed on its behalf pursuant to this PA shall be accomplished by, or under the direct supervision of a person or persons who meet(s) or exceed(s) the pertinent qualifications in the Secretary's Professional Standards (*Archeology and Historic Preservation: Secretary of the*

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*Interior's Standards and Guidelines [As Amended and Annotated]*, formerly located at 36 CFR Part 61 in those areas in which the qualifications are applicable for the specific work performed.

## II. CONSULTATION

The NPS shall consult with the Signatories to this PA in carrying out the terms of this agreement. Such consultation may include but not be limited to written correspondence, conference calls, face- to-face visits and/or field visits.

## III. DESIGN REVIEW AND CONSULTATION

- A. The NPS anticipates that design review and construction may be phased by segments within GWMP North Section and will provide the VASHPO and other consulting parties with advance notification when funding is allocated and design review is to be initiated.
- B. The NPS will submit all construction drawings and documents in draft form at 30%, 70% and 90% completion to the VASHPO and other consulting parties for review and comment. This includes all required plans, including detailed construction plans, for each segment of GWMP North Section. The plans will include the types of equipment to be used, staging areas, equipment access, ground disturbing activities, tree and vegetation removal, traffic control, and purpose and need for wall treatment. The construction drawings and documents for review and comment will include proposed actions for reconstructing the asphalt pavement and constructing new concrete curbs; replacing drainage inlets and culverts; stabilizing erosion at drainage outfalls; improving safety with options for crash-worthy roadside barriers; reconfiguring the interchange at Route 123/GWMP; and other smaller project elements such as creation of emergency turnarounds, small scale rehabilitation of two scenic overlooks, short extensions of acceleration and deceleration lanes, installation of fiber optic backbone for future ITS, and creation of nonstructural storm water management facilities for new impervious surfaces.
- C. A to-scale representative sample of a proposed replacement guardwall be made available to the consulting parties on site so that the design of the rough-cut stone shape, color, size, and spatial relationship of the stones to the mortar can be reviewed in the context of the existing historic stone masonry guardwalls.
- D. Guidance documents listed in Appendix A will be used to review designs and determine appropriate treatment options. These documents may include, but are not limited to, the FHWA safety and traffic data, cultural landscape inventories, archeological resource management plans, and visual resource inventories.
- E. General treatment options may include signage, traffic calming devices, shifting the alignment of the current roadbed, and other treatment options as developed and deemed appropriate by the design team. Wall treatment options may include full reconstruction of walls with stone-faced concrete cores, raising wall heights, flaring or extending walls, and other technologies and treatment options as developed and deemed appropriate by the design team.

- F. The Innovative and Sustainable Transportation Evaluation Process (INSTEP) checklist will be employed and made available to the Signatories and consulting parties as a project accountability and compliance tracking tool. INSTEP is a sustainable transportation rating system unique to the NPS and is used during project planning to track, employ, and share sustainable transportation practices and outcomes on NPS projects.
- G. The VASHPO and other consulting parties agree to provide their comments to the NPS within 30 days from the date of receipt of the draft plan/construction documents. NPS will take all comments received in a timely manner into account in the following stage of the design plan. If no comments are received within the 30-day period, the NPS may assume that the non-responding party has no comments. All final plans/drawings will be provided to the SHPO, Signatories, and consulting parties no less than 30 days prior to the commencement of construction.
- H. No construction may occur on that phase until after the NPS has notified the VASHPO and other consulting parties in writing of the schedule for implementation of the approved treatment plan, including completion of any mitigation measures as appropriate, and until after NPS has authorized the FHWA to proceed. Mitigation actions may include but are not limited to reconstructing the new 27-inch roadside barriers using stone from the existing guardwalls the extent possible, and replacement of vegetation and new planting plans utilizing the park's original planting plan.

#### **IV. ARCHEOLOGICAL RESOURCES IDENTIFICATION AND EVALUATION**

- A. NPS has prepared in consultation with the VASHPO and other consulting parties an Archeological Resources Protection Plan (ARPP) to guide all actions concerning archeological resources within the GWMP North Section. The ARPP provides direction to NPS Program Managers, NPS consulting archeologists, and Design-Construction consultants on areas of resource potential, documentation methods, and notification protocols. Information will be shared with the VASHPO and, as appropriate and in conformance with ARPA and NHPA Section 304.
- B. The NPS will take into account the results of any archeological investigations conducted in the intervening period between the preparation of the final ARPP and the preparation of the design plan.
- C. The NPS shall review the proposed design plans focusing on any potential for ground-disturbing activities and make a determination as to whether archeological investigations are warranted prior to the final approval of the plan.
- D. The NPS will notify the VASHPO and other consulting parties of its decision on the need for additional archeological investigations and will follow the notification and consultation process as detailed in Stipulation III.
- E. The NPS shall ensure that an archeological survey program for identification of archeological sites within an undertaking's Area of Potential Effects (APE; see Attachment C), is developed in consultation with the SHPO and other consulting parties. Prior to affecting any potentially eligible archeological site, the NPS shall develop a testing

program of sufficient intensity to provide an evaluation of eligibility for the National Register of Historic Places (NRHP) in consultation with VASHPO and other consulting parties, following the regulations outlined in 36 CFR Part 800.4(c).

- F. If, as a result of the testing program, archeological sites are identified within an undertaking's APE that are determined eligible for the NRHP, the NPS shall develop a plan for their avoidance, protection, or recovery of information in consultation with the VASHPO and other consulting parties. Prior to implementation, the plan shall be submitted to the VASHPO and other consulting parties for a 30-day review and comment period starting upon receipt.
- G. All data recovery plans prepared under the terms of this PA shall include the following elements:
  - 1. Information on the archeological property or properties where data recovery is to be carried out, and the context in which such properties are eligible for the National Register;
  - 2. Information on any property, properties, or portions of properties that will be destroyed without data recovery;
  - 3. Discussion of the research questions to be addressed through the data recovery with an explanation/justification of their relevance and importance;
  - 4. Description of the recovery methods to be used, with an explanation of their pertinence to the research questions; and
  - 5. Information on arrangements for any regular progress reports or meetings to keep the VASHPO and other consulting parties up to date on the course of the work. The plan should contain the expected timetable for excavation, analysis and preparation of the final report.
  - 6. NPS shall ensure that the approved treatment plan or data recovery plan is implemented prior to those project activities that could affect the archeological site(s).
  - 7. NPS shall notify the VASHPO and the other consulting parties in writing once the fieldwork portion of the treatment plan or data recovery plan is complete and provide a brief management summary so that a site visit may be scheduled, if requested. Project activities may proceed following this notification while the technical report is in preparation. NPS may proceed with implementation of construction or construction related ground disturbing activities in the area and within the boundary of the affected archeological site(s) while the technical report is in preparation.

## **V. REPORTING REQUIREMENTS**

- A. The NPS shall provide to the VASHPO and other consulting parties a draft summary or letter report in electronic or print format as requested briefly describing the findings of the work for a 30-day review and comment period starting upon receipt. Information will be shared with the VASHPO and, as appropriate and in conformance with ARPA and NHPA Section 304.

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- B. The summary/letter report shall include, as appropriate, recommendations on NRHP eligibility or potential eligibility of all identified archeological sites (and if applicable any newly identified historic properties), recommendations for further archeological investigations, the potential effects of the undertaking on historic properties, and suggested measures to resolve adverse effects through avoidance, minimization or mitigation.
- C. The VASHPO and other consulting parties shall provide their comments to the NPS within thirty (30) days from the date of receipt of the draft summary/letter report. If no comments are received within the 30-day period, the NPS shall assume that the non-responding party has no comments. If the consulting parties concur with the recommendations for that phase, the NPS may proceed with the next step in the process for that phase. If the consulting parties do not concur with the NPS' recommendations for that phase, the parties shall consult further to resolve the issues following the provisions for dispute resolution in Stipulation IX of this document. The NPS shall ensure that the draft summaries/letter reports for all phases of the Project are incorporated into one final technical report. The VASHPO and other consulting parties shall provide their comments on the draft technical report to the NPS within thirty (30) calendar days from date of receipt of the draft report. If the NPS does not receive comments within the thirty (30) day comment period, the NPS shall assume that the non-responding party has no comments. A lack of comments has the same effect as a concurrence, it is not an impediment. The NPS shall ensure that all comments on the draft technical report received during the 30-day period are considered in preparation of the final report. The NPS shall submit two (2) archivally bound hardcopies and one electronic copy in Adobe® Portable Document Format (.pdf) of its approved final report to the VASHPO and to the other consulting parties in an agreed upon format.
- D. All cultural resource work performed under the terms of this Agreement shall be carried out by or under the direct supervision of a professional who meets the *Secretary of the Interior's Professional Qualifications Standards* (48 FR 44739) in the appropriate discipline.
- E. All archeological studies conducted pursuant to this Agreement shall be consistent with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (48 FR 44716-44742, September 1983), the ACHP's *Section 106 Archeology Guidance* (June 2007) and the SHPO's *Guidelines for Conducting Historic Resources Survey in Virginia* (2011), and subsequent revisions or replacements.

### VI. POST-REVIEW DISCOVERIES

- A. The NPS shall ensure that all construction documents include the following provisions:
  - 1. If previously unidentified historic properties or unanticipated effects to historic properties are discovered in the park during construction, the construction contractor shall immediately halt all activity within a 100-foot radius of the discovery, notify the NPS within 24 hours of the discovery, and implement interim measures to protect the discovery from looting and vandalism.

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2. Immediately following upon NPS' receipt of the notification the NPS shall
  - a) inspect the construction site to determine the extent of the discovery and ensure that construction activities have halted;
  - b) clearly mark the area of the discovery;
  - c) implement additional measures, as appropriate, to protect the discovery from looting and vandalism;
  - d) have an archeologist meeting *Secretary of the Interior's Professional Qualifications Standards for Archeologists* inspect the construction site to determine the extent of the discovery and provide recommendations regarding its NRHP eligibility and treatment; and
  - e) notify the VASHPO and other consulting parties of the discovery describing the measures that have been implemented to comply with Stipulation VI.A. Information will be shared with the VASHPO and, as appropriate and in conformance with ARPA and NHPA Section 304.
3. Within 48 hours of NPS' receipt of the notification described in Stipulation VI.A.1 of this document, the NPS shall provide the VASHPO and other consulting parties with its assessment of the NRHP eligibility of the discovery and the measures the NPS proposes to take to resolve adverse effects. In making its official evaluation, the NPS, in consultation with the VASHPO and other consulting parties may assume the discovery to be NRHP-eligible for the purposes of Section 106 pursuant to 36 CFR Part 800.13(c). The VASHPO and other consulting parties shall respond within 48 hours after their receipt of NPS' submission of its official evaluation.
4. The NPS, which shall take into account the consulting parties' recommendations on eligibility and treatment of the discovery, shall ensure that appropriate actions are carried out and provide the VASHPO and the other consulting parties with a report on these actions when they have been implemented.
5. Construction activities may proceed in the area of the discovery when the NPS has determined that implementation of the actions undertaken to address the discovery pursuant to Stipulation VI.A are complete.

### VII. EMERGENCIES

Should an emergency situation occur which represents an imminent threat to public health or safety, or creates a hazardous condition, after the NPS learns of it and notifies appropriate law enforcement and emergency personnel as necessary, the NPS shall immediately notify the VASHPO and the ACHP of the condition which has initiated the situation and the measures taken to respond to the emergency or hazardous condition. Should the VASHPO or the ACHP desire to provide technical assistance to the NPS, they shall submit comments to NPS within seven (7) calendar days from notification, if the nature of the emergency or hazardous condition allows for such coordination.

## VIII. HUMAN REMAINS

- A. The NPS shall make all reasonable efforts to avoid disturbing gravesites and associated funerary artifacts. The NPS shall treat all human remains in a manner consistent with the ACHP's "Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects" (February 23, 2007; <http://www.achp.gov/docs/hrpolicy0207.pdf>) or ACHP policy in effect at the time remains and funerary artifacts are handled. Information will be shared with the VASHPO and, as appropriate and in conformance with ARPA and NHPA Section 304.
1. The NPS shall contact law enforcement and emergency personnel as appropriate if human remains are discovered.
  2. If the remains found on federal lands are determined to be of Native American origin, the NPS shall comply with the provisions of the Native American Graves Protection and Repatriation Act, 25 USC § 3001 et seq. and the accompanying regulations at 43 CFR Part 10. If the remains are found on non-federal lands or are determined not to be of Native American origin, the NPS shall comply with the Virginia Antiquities Act, Section 10.1-2305 of the Code of Virginia, final regulations adopted by the Virginia Board of Historic Resources published in the Virginia Register on September 20, 2016, 17VAC5-and found in the Code of Virginia 10.1-2305 et seq., Virginia Antiquities Act, Section 10.1-2305 of the Code of Virginia, final regulations adopted by the Virginia Board of Historic Resources and published in the Virginia Register on July 15, 1991, or subsequent revisions; or follow appropriate regulations established by the state of jurisdiction.
  3. The NPS shall use reasonable efforts to ensure that the general public is excluded from viewing any burial site or associated funerary artifacts. Subject to applicable law, the VASHPO and other consulting parties to this PA shall release no photographs or images of any burial site or associated funerary artifacts to anyone including the press and general public. If they do release such photographs or images, accidentally, voluntarily, or pursuant to applicable law, they will notify the NPS and the other parties as soon as possible. The NPS shall notify the appropriate federally recognized tribes when burials, human skeletal remains, or funerary artifacts are encountered on the project.

## IX. DISPUTE RESOLUTION

- A. Should any party to this PA object at any time to any actions proposed, or the manner in which the terms of this PA are implemented, the NPS, VASHPO, FHWA, and ACHP (if participating) shall consult with the objecting party(s) to resolve the objection. If the NPS determines that such objection(s) cannot be resolved through this consultation, the NPS will:

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1. Forward all documentation relevant to the dispute to the ACHP and the other parties of the dispute in accordance with 36 CFR Part 800.2(b)(2). Upon receipt of adequate documentation, the ACHP shall review and advise the NPS on the resolution of the objection within 30 days. Any comment provided by the ACHP, and all comments from the parties to the PA, will be taken into account by the NPS in reaching a final decision regarding the dispute.
2. If the ACHP does not provide comments regarding the dispute within 30 days after receipt of adequate documentation, the NPS may render a decision regarding the dispute. In reaching its decision, the NPS will take into account all comments regarding the dispute from the parties to the PA.
3. The NPS' responsibility to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged. The NPS will notify all parties of its decision in writing before implementing that portion of the Project subject to dispute under this stipulation. The NPS' decision will be final.
4. At any time during implementation of the measures stipulated in this PA, should an objection pertaining to this PA or the effect of the Project on historic properties be raised by a member of the public, the NPS shall notify the other consulting parties, and attempt to resolve the objection. If the NPS determines that the objection cannot be resolved, the NPS shall comply with Stipulation IX.A of this document.

### **X. ANTI-DEFICIENCY ACT**

The NPS' obligations under this PA are subject to the availability of appropriated funds, and the stipulations of this PA are subject to the provisions of the Anti-Deficiency Act. The NPS shall make reasonable and good faith efforts to secure the necessary funds to implement this PA in its entirety. If compliance with the Anti-Deficiency Act alters or impairs the NPS's ability to implement the stipulations of this agreement, the NPS shall consult in accordance with the amendment and termination procedures found later in this PA.

### **XI. TERMINATION**

- A. If any signatory to this PA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation XIII. If within 30 days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the PA upon written notification to the other signatories.
- B. Should the PA be terminated, the NPS shall either consult in accordance with 36 CFR Part 800.14(b) to develop a new PA or comply with 36 CFR Part 800 for individual undertakings.

## **XII. ANNUAL REPORT**

- A. On or before January 31 of each year, the NPS shall prepare and provide to all consulting parties of this PA an annual report addressing, at a minimum, the following topics:
  - 1. a general summary of how this PA has been implemented during the preceding year;
  - 2. a listing of Undertakings reviewed and carried out in accordance with stipulations II and III, including a listing of all historic properties affected by the Undertakings;
  - 3. NPS' assessment of the effectiveness of this PA;
  - 4. any recommendations NPS may have for improving the PA.
- B. The consulting parties shall have the opportunity to review the annual report and within thirty (30) days of its receipt and to provide comments to the NPS. Any objections to the handling of specific undertakings or way the PA is implemented may be assessed using the process outlined in Stipulation IX. The NPS shall make the annual report available to the public on its Planning, Environment and Public Comment website.

## **XIII. AMENDMENTS**

- A. This PA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the day the copy is signed by all the signatories and is filed with the ACHP.
- B. Appendices may be revised with the written agreement of the signatories without a revision being made to the underlying PA.

## **XIV. DURATION**

This PA will terminate 15 years from the date of its execution. Twelve months prior to such time, the NPS may consult with the other signatories to reconsider the terms of the agreement and revise or amend the document.

EXECUTION of this PA by the NPS, VASHPO, and ACHP (if participating), and implementation of its terms, is evidence that the NPS has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

[Signatures follow on separate pages]

# GWMP DRAFT PA

## PROGRAMMATIC AGREEMENT

**AMONG THE NATIONAL PARK SERVICE,  
THE FEDERAL HIGHWAY ADMINISTRATION,  
THE VIRGINIA STATE HISTORIC PRESERVATION OFFICER, AND  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION**

**REGARDING  
THE GEORGE WASHINGTON PARKWAY NORTH SECTION REHABILITATION**

National Park Service

By: \_\_\_\_\_ Date: \_\_\_\_\_

Alexcy Romero

Superintendent

DRAFT

# GWMP DRAFT PA

## PROGRAMMATIC AGREEMENT

**AMONG THE NATIONAL PARK SERVICE,  
THE FEDERAL HIGHWAY ADMINISTRATION,  
THE VIRGINIA STATE HISTORIC PRESERVATION OFFICER, AND  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION**

**REGARDING  
THE GEORGE WASHINGTON PARKWAY NORTH SECTION REHABILITATION**

Virginia Department of Historic Resources

By: \_\_\_\_\_ Date: \_\_\_\_\_

Julie V. Langan

Director

Virginia State Historic Preservation Officer

# GWMP DRAFT PA

## PROGRAMMATIC AGREEMENT

**AMONG THE NATIONAL PARK SERVICE,  
THE FEDERAL HIGHWAY ADMINISTRATION,  
THE VIRGINIA STATE HISTORIC PRESERVATION OFFICER, AND  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION**

## REGARDING

**THE GEORGE WASHINGTON PARKWAY NORTH SECTION REHABILITATION**

Federal Highway Administration

By: \_\_\_\_\_ Date: \_\_\_\_\_

DRAFT

# GWMP DRAFT PA

## PROGRAMMATIC AGREEMENT

**AMONG THE NATIONAL PARK SERVICE,  
THE FEDERAL HIGHWAY ADMINISTRATION,  
THE VIRGINIA STATE HISTORIC PRESERVATION OFFICER, AND  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION**

## REGARDING

**THE GEORGE WASHINGTON PARKWAY NORTH SECTION REHABILITATION**

Advisory Council on Historic Preservation

By: \_\_\_\_\_ Date: \_\_\_\_\_

DRAFT

# GWMP DRAFT PA

## PROGRAMMATIC AGREEMENT

AMONG THE NATIONAL PARK SERVICE,  
THE FEDERAL HIGHWAY ADMINISTRATION,  
THE VIRGINIA STATE HISTORIC PRESERVATION OFFICER, AND  
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

## REGARDING

THE GEORGE WASHINGTON PARKWAY NORTH SECTION REHABILITATION

### Concurring Parties:

Delaware Nation

By: \_\_\_\_\_ Date: \_\_\_\_\_

DRAFT

# GWMP DRAFT PA



North Section of the George Washington Memorial Parkway

# GWMP DRAFT PA

## Attachment A George Washington Memorial Parkway North Section Rehabilitation Consulting Parties

DC Historic Preservation Office (not “actively” participating, but wants to be kept informed)

Maryland Historical Trust (not “actively” participating, but wants to be kept informed)

National Trust for Historic Preservation (no response to date)

Arlington County (participating)

Fairfax County (participating)

US Commission of Fine Arts (no response to date)

American Society of Landscape Architects (participating, through George Washington University)

DC Preservation League (no response to date)

Preservation Arlington (no response to date)

Paul Daniel Marriott & Associates (participating)

Arlington Historical Society (no response to date)

Arlington National Cemetery (participating)

Dr. Stephen Kaiser (no response to date)

National Capital Planning Commission (participating)

# GWMP DRAFT PA

## Attachment B

### George Washington Memorial Parkway North Section Rehabilitation Baseline Documentation

**Cultural Landscape Inventory (CLI):** *Cultural Landscape Inventory: George Washington Memorial Parkway – North*. Prepared by National Park Service, Division of Cultural Resources, National Capital Region, Washington, District of Columbia.

Based on a history of the GWMP, this document presents the results of the CLI of the North Section. Elements of the cultural landscapes are described, with the historical landscape compared with that of the existing landscape. Included in the inventory are the character defining landscape and natural systems, views and vistas, small scale features, buildings and structures, vegetation, land use patterns, topography, circulation, and the spatial organization of these elements. These elements are illustrated by photographs and their locations provided in a series of maps. The condition of the features described is also presented.

**Visual Resource Inventory (VRI):** *George Washington Memorial Parkway – North Visual Resource Inventory & Assessment: Spout Run to the Capital Beltway*. Prepared by National Park Service, Division of Cultural Resources, National Capital Region, Washington, District of Columbia.

This document presents analysis and characterization of the scenic qualities of the Parkway and assess the relative rank and scenic value of the vistas. An essential aspect of the project was to locate as much information as possible on the planned scenic vistas historically located along the Parkway. The rank of the vista's relative value takes into consideration scenic factors such as vividness and uniqueness as well as non-scenic factors such as duration and historicity. Vistas are described, and historic and modern visual documentation is provided.

**Wall Risk Safety Assessment and Matrix:** *Wall Risk Safety Assessment for GWMP North Section*. Prepared by the Federal Highway Administration, Eastern Federal Lands, Highway Division, Washington, District of Columbia.

The GWMP walls safety matrix is a context sensitive solution developed by FHWA to provide the basis for flexibility in the design of roadway barriers within the North Section of the GWMP to facilitate the need to improve safety and infrastructure conditions while preserving the scenic, aesthetic, and historic resources. The Wall Risk Safety Assessment takes into consideration various criteria, or risk factors, associated with each of the historic walls. The criteria include roadway features like roadway grade and roadside elements (called "nominal safety"), as well as criteria related to roadway performance, for example crashes (termed "substantive safety"). The Wall Risk Safety Assessment is essentially an evaluation of how prone a given wall location is to risk, which allows determining which of the walls along the GWMP present the highest risk to public safety. The risk assessment evaluated 69 walls within the North Section of GWMP.

## GWMP DRAFT PA

**Memo:** *Summary of Working Group Accomplishments, Including Wall Risk Assessment Vista Ranking and Decision Tree, February 2018.* Prepared by National Park Service, George Washington Memorial Parkway, McLean, Virginia, and Federal Highway Administration, Eastern Federal Lands, Highway Division, Washington, District of Columbia.

NPS and FHWA formed a smaller working group to seek efforts to reduce the proposed impacts, particularly on those guardwalls associated with superior and high value views/vistas. The Wall Risk Safety Matrix was reviewed and a decision tree for recommended treatment was utilized in reviewing those walls with superior and high rated views/vistas, which were also in the high, medium-high, and medium-medium safety risk categories. The NPS also proposed several safety countermeasures that could be implemented in order to further reduce the number of walls that would be altered. A summary memo to accompany the decision tree and the wall risk assessment vista ranking matrix was prepared by George Washington Memorial Parkway in 2018.

**Archeological Resource Protection Plan (ARPP):** *Archeological Resource Protection Plan for the George Washington Memorial Parkway North Section Rehabilitation.* Prepared by Stantec Consulting Services Inc., for the National Park Service, Division of Cultural Resources, National Capital Region, Washington, District of Columbia.

The ARPP provides guidance on the treatment of archeological resources known to be or potentially within the GWMP North Section Rehabilitation LOD. When consulted in concert with technical studies, the ARPP can be used to identify best archeological practices for the treatment of known resources, appropriate methods for investigating unsurveyed portions of the LOD, and the proper procedures to follow in the event that human burials or Unanticipated Archeological Discoveries are encountered.

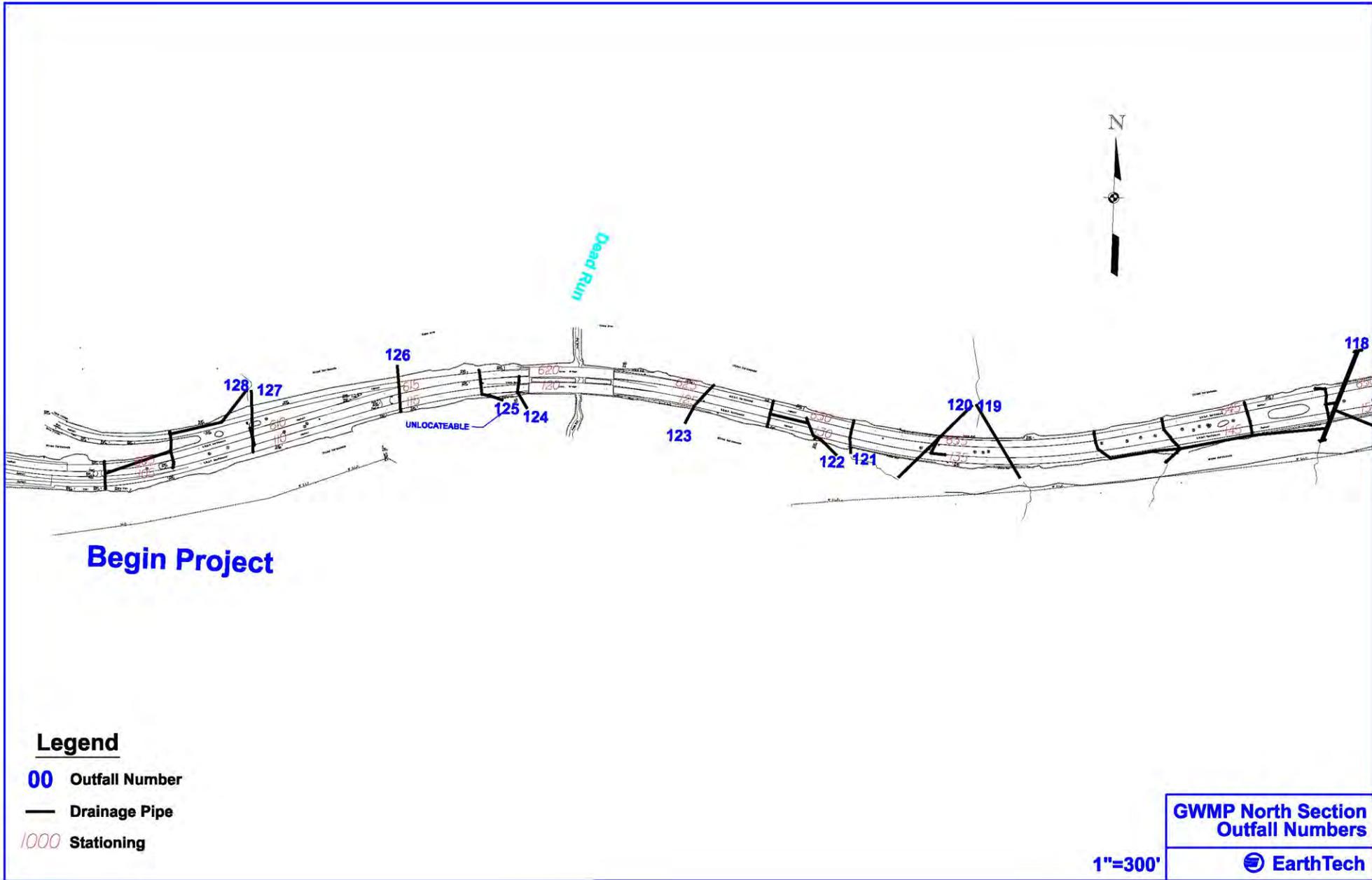
**Transportation Study (aka Traffic Study):** *George Washington Memorial Parkway (GWMP) EA Travel Forecasting/ Diversion Analysis.* Prepared by Sabra, Wang, and Associates, Inc. for the Federal Highway Administration, Eastern Federal Lands, Highway Division, Washington, District of Columbia.

The transportation study was conducted to examine the potential impacts of a total closure of half (two) of the existing four lane parkway facility of the North Section of the GWMP. This study examined the potential effects on daily traffic volume and peak period movements on the GWMP and adjacent traffic diversion routes in Northern Virginia, suburban Maryland, and the District of Columbia using the MWCOG Model. The results are presented in a series of tables and graphics.

**INSTEP:** *Innovative and Sustainable Transportation Evaluation Process.* Program and database created by the Denver Service Center Transportation Division, National Park Service, Denver, Colorado.

This NPS-tailored transportation sustainability checklist, soon to be a searchable database, provides a tracking system for project personnel to determine the status of all project compliance requirements, and provides access to all applicable laws, regulations, policies, and best practices. The program is designed to be used through all project stages, from scoping through construction, to track compliance with the NEPA and NHPA processes.

# Appendix C – Locations of Outfalls



**Legend**

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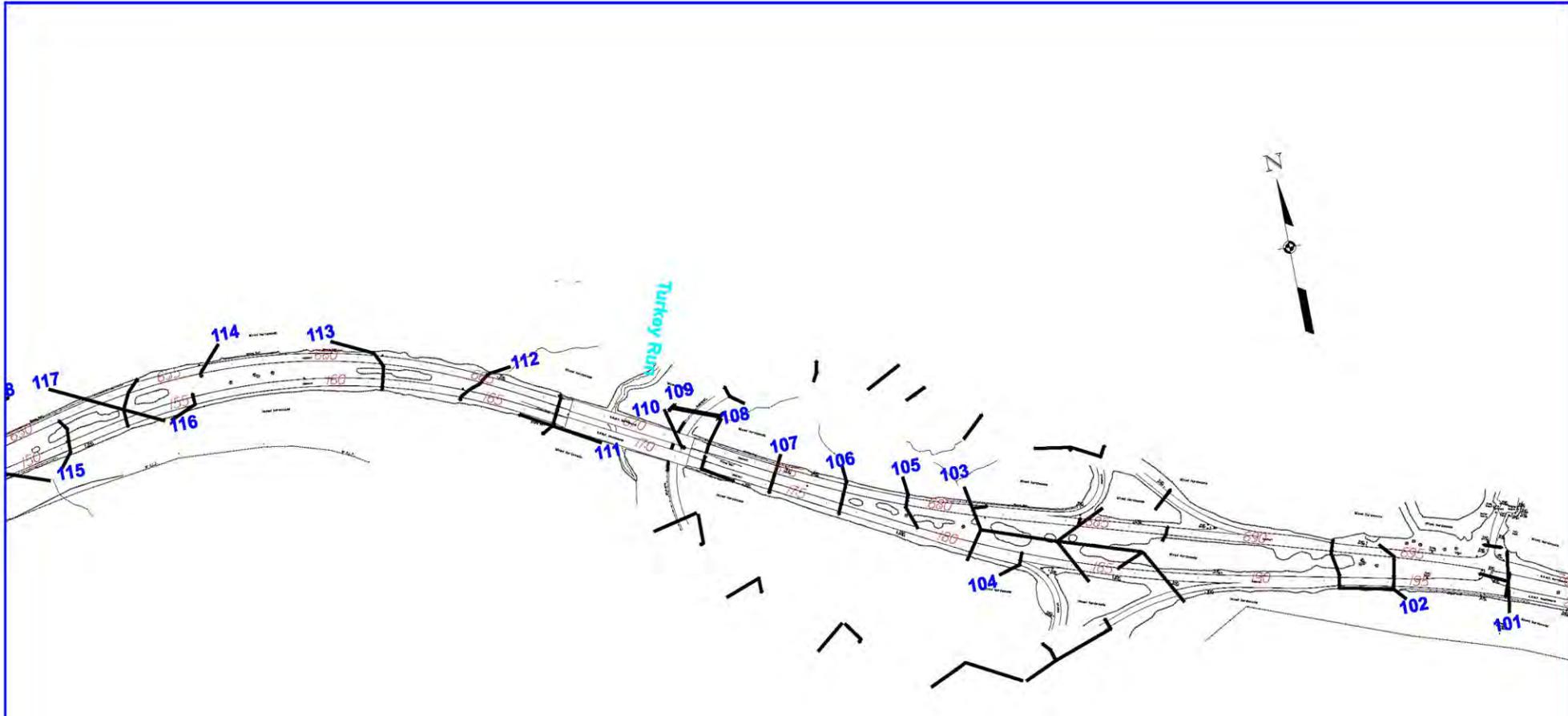
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*1000* Stationing

**GWMP North Section  
Outfall Numbers**

1"=300'





**Legend**

**00** Outfall Number

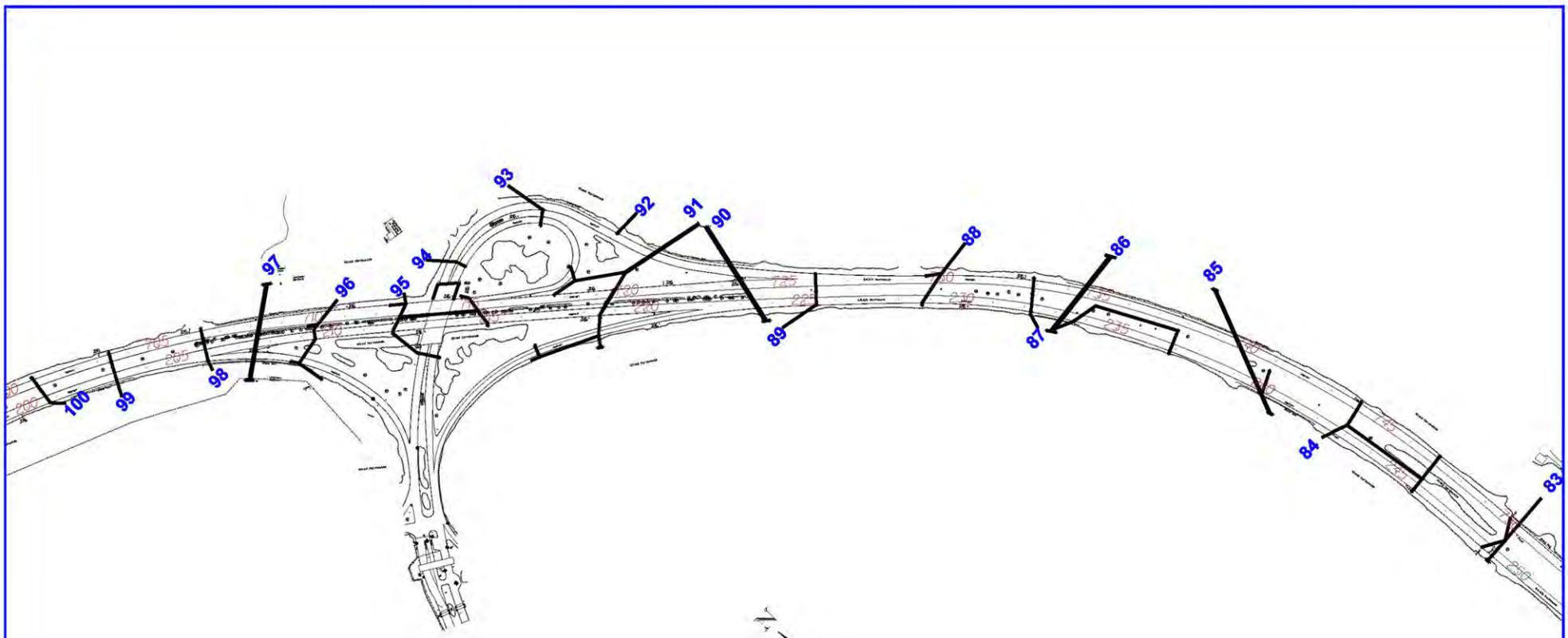
— Drainage Pipe

1000 Stationing

**GWMP North Section  
Outfall Numbers**

1"=300'

 EarthTech



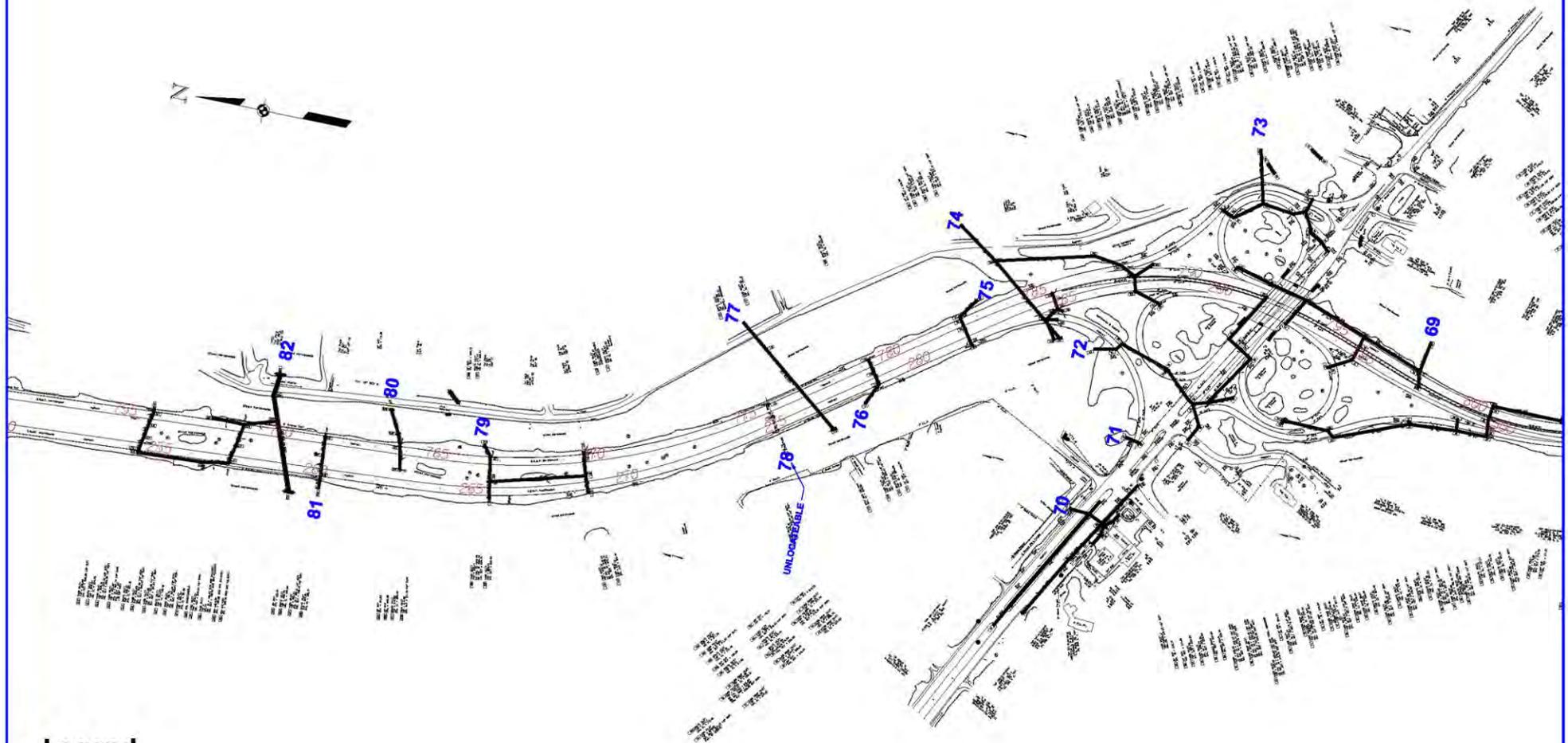
**Legend**

- 00** Outfall Number
- Drainage Pipe
- 1000 Stationing

**GWMP North Section  
Outfall Numbers**

1"=300'





**Legend**

**00** Outfall Number

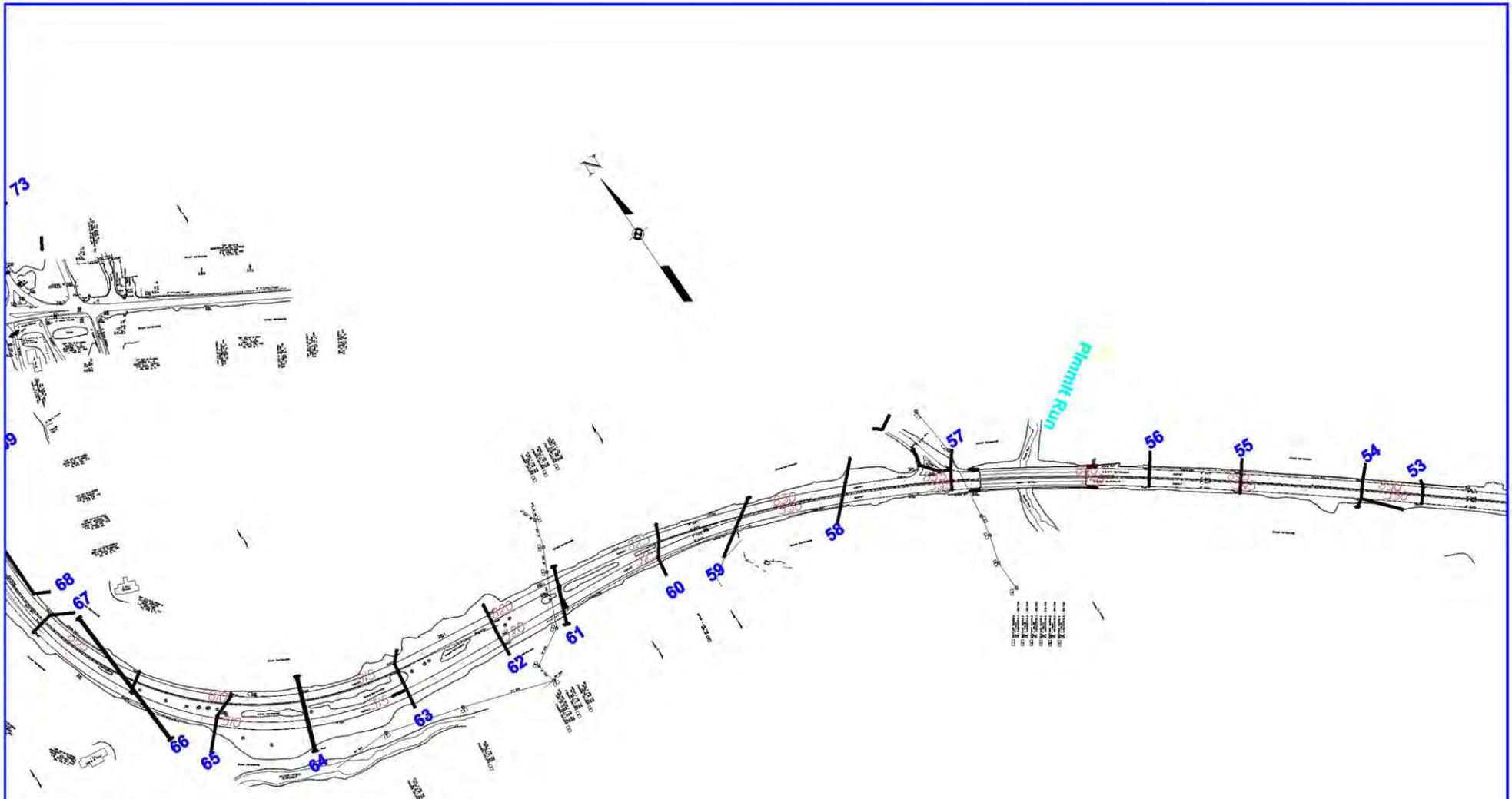
— Drainage Pipe

1000 Stationing

**GWMP North Section  
Outfall Numbers**

1"=300'





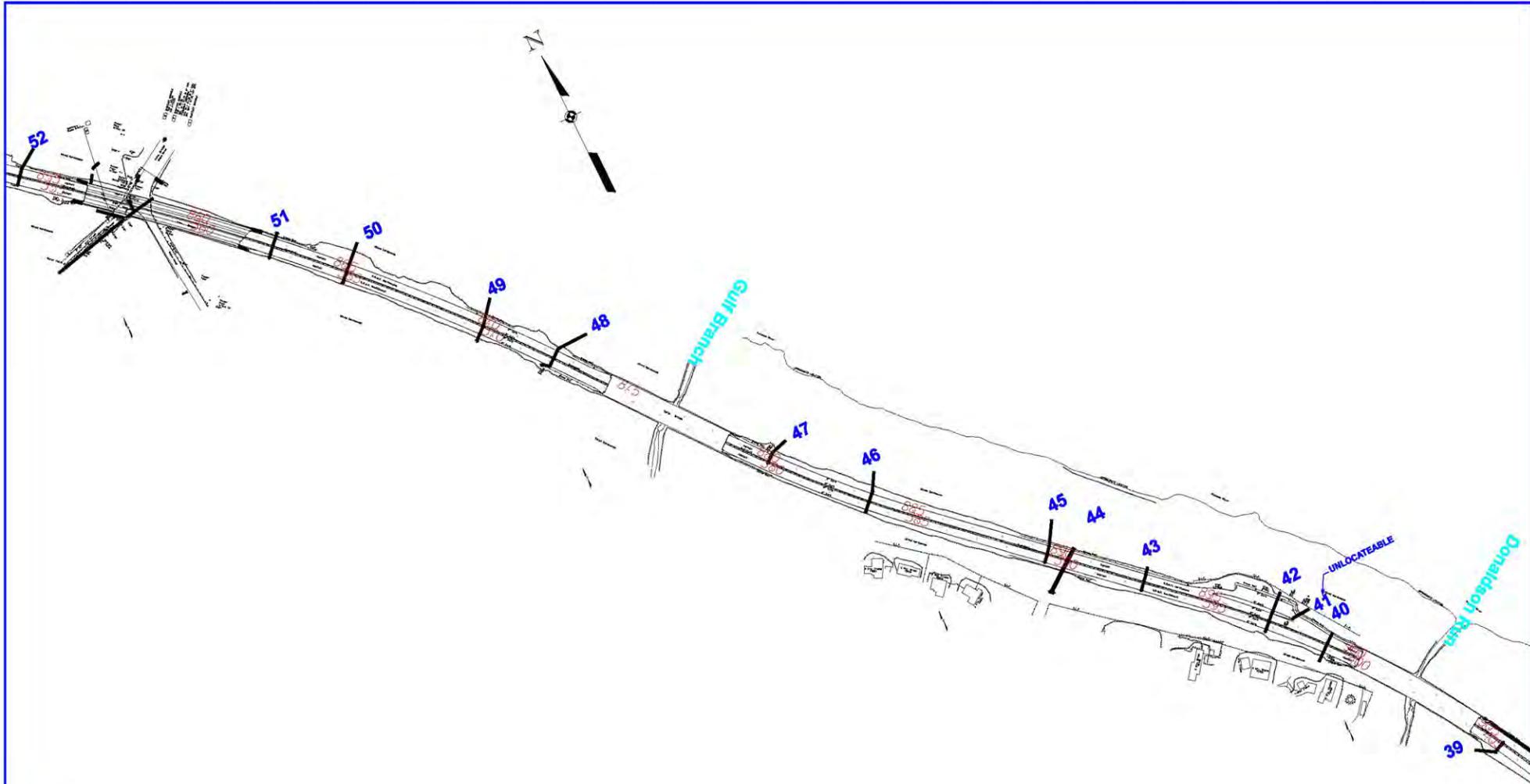
**Legend**

- 00** Outfall Number
- Drainage Pipe
- 1000 Stationing

**GWMP North Section  
Outfall Numbers**

1"=300'





**Legend**

**00** Outfall Number

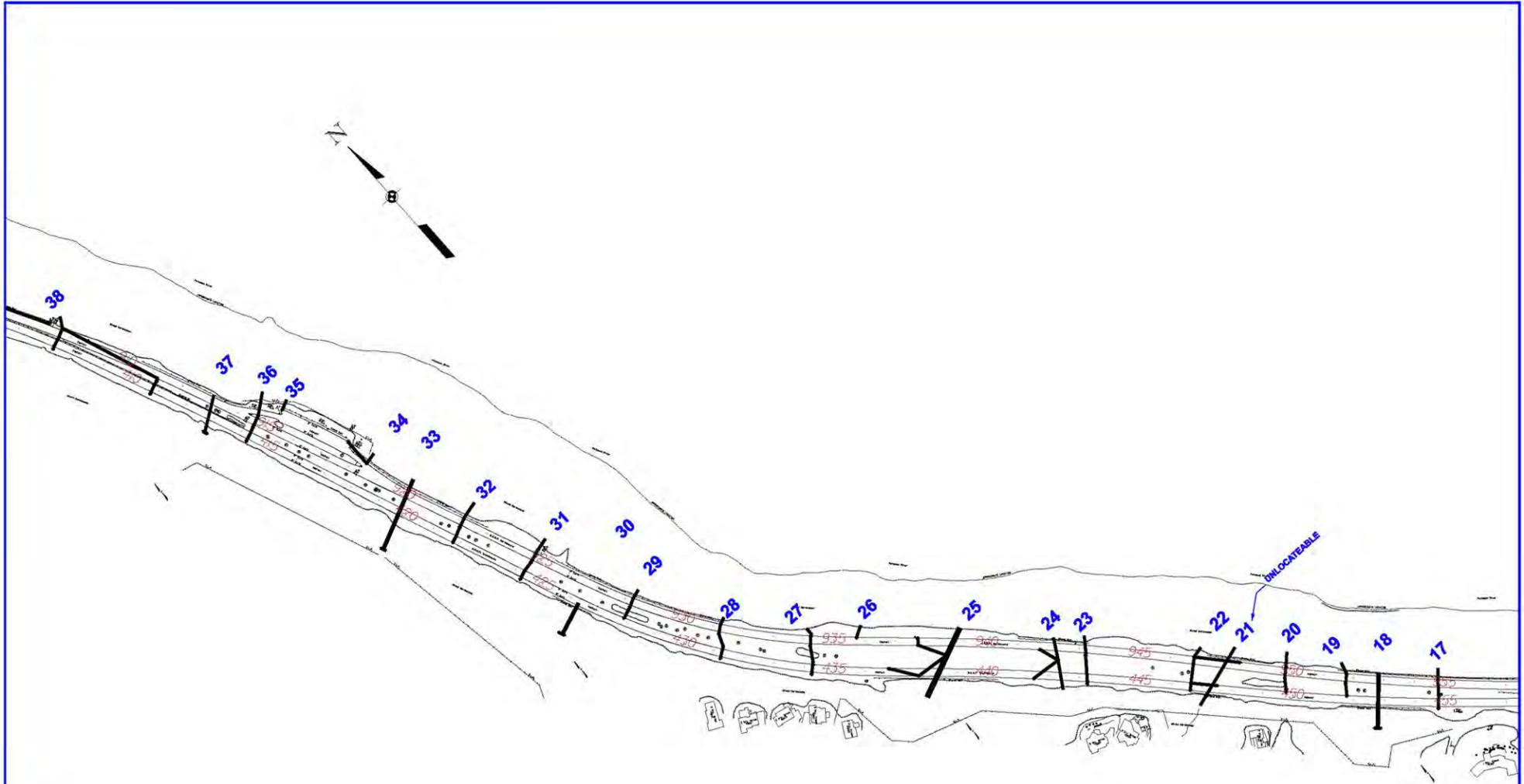
— Drainage Pipe

1000 Stationing

**GWMP North Section  
Outfall Numbers**

1"=300'

 EarthTech



**Legend**

- 00** Outfall Number
- Drainage Pipe
- 1000 Stationing

**GWMP North Section  
Outfall Numbers**

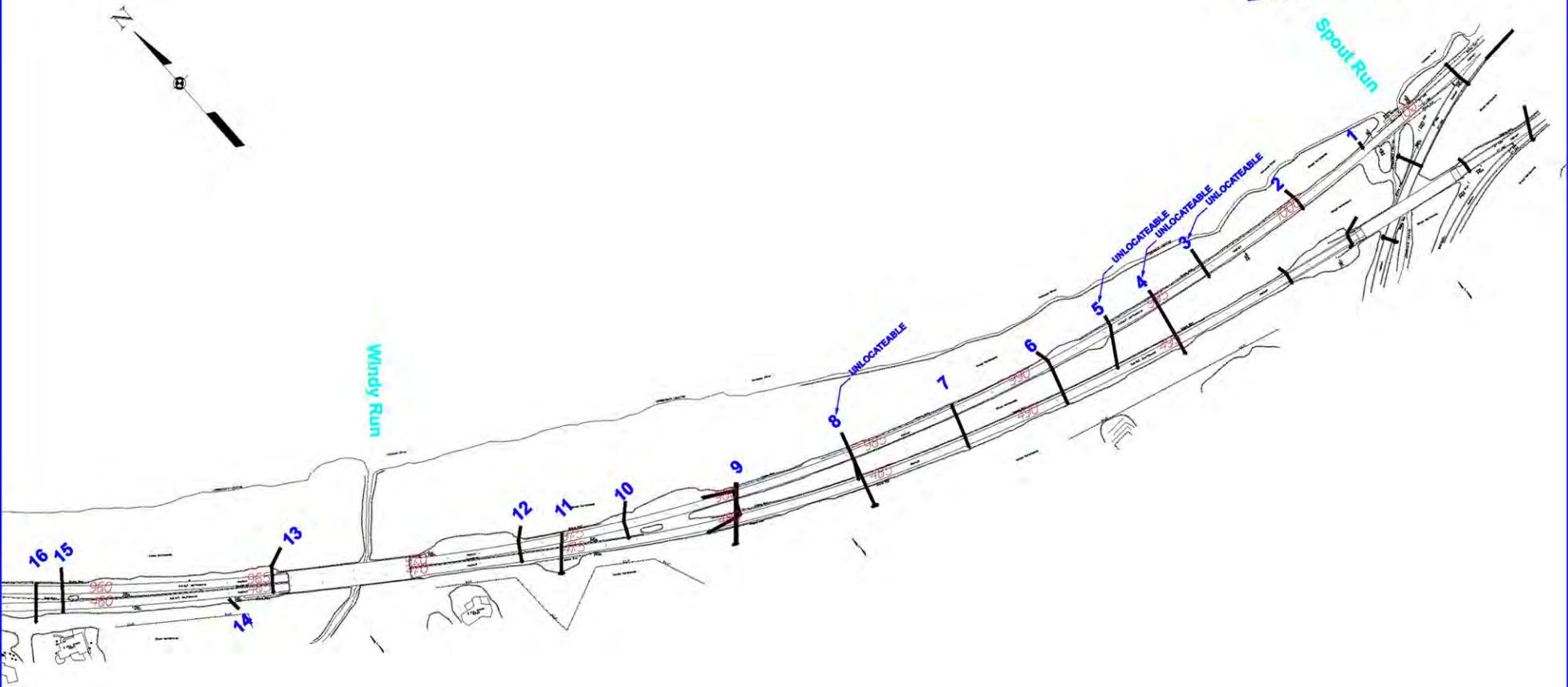
1"=300'



End Project

Spout Run

Windy Run



**Legend**

- 00** Outfall Number
- Drainage Pipe
- 1000 Stationing

GWMP North Section  
Outfall Numbers

1"=300'



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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under US administration.

Document # 850 / 145674      June 2018

US Department of the Interior – National Park Service

US Department of the Interior  
National Park Service

**George Washington Memorial Parkway North Section Rehabilitation Environmental Assessment**  
June 2018