APPENDIX A:
ALTERNATIVES CONSIDERED BUT DISMISSED

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ALTERNATIVES/ELEMENTS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

Background

Alternatives (and alternative elements) for this project have been under development since early 2015. The NPS began with internal scoping of the project in March 2014, met with other agencies on October 9, 2014. At this point, the team had established few sideboards and were willing to consider a wide range of potentially large-scale improvements within the project area.

Public scoping was initiated to gather additional feedback from the public regarding the project. This information on the purpose and need for the project, the planning process that would be followed, and how to be involved was provided on the Parkway's Planning, Environment, and Public Comment (PEPC) website and through newsletters. Park staff were available in or near Memorial Circle to provide information and answer questions on September 9, 10, and 11, 2014; at the Arlington County Transportation Commission meeting on September 4, 2014; and at the Alexandria Farmers Market on September 13, 2014. The National Park Service (NPS) invited the public to provide their comments and feedback during an open comment period held from August 25, 2014, through September 30, 2014.

The NPS hosted a design charrette with other agencies on February 25-26, 2015. The output of this workshop was posted on PEPC and on display at a public open house on March 3, 2015, at the NPS National Capital Region Headquarters in Washington, DC. An accompanying second public comment period was held from March 3 to March 10, 2015.

Agencies offered with a chance to contribute to project scoping and initial alternatives development include: Advisory Council on Historic Preservation, Arlington County Department of Environmental Services, Arlington County Planning Commission, Army National Military Cemeteries, District Department of Transportation, District of Columbia State Historic Preservation Officer, Eastern Federal Lands Highway Division, National Capital Planning Commission, Metropolitan Washington Council of Governments, US Fish and Wildlife Service, Virginia Department of Game and Inland Fisheries, Virginia Department of Historic Resources, and Virginia Department of Transportation.

Following internal discussions of the large-scale proposed improvements, the NPS determined that many of the elements incorporated required impacts on the Parkway's resources that the team found unacceptable. Therefore, the scope of potential improvements was revisited. In March 2016, the project team identified 10 safety hotpots within the project area. During a workshop, team members used risk assessment principles (accident severity and accident probability) from Operational Leadership to rank risks at each hotspot. The safety-focused alternatives analyzed in the environmental assessment (EA) were developed to address those hotspots. The section below discusses the many options considered at some point but ultimately dismissed from further analysis and the rationale for that dismissal.

Alternatives/Elements Considered but Dismissed

Several alternatives or alternative elements were identified during the design process and internal and public scoping. Some of these were determined to be unreasonable, or much less desirable than similar options included in the analysis, and were therefore not carried forward for analysis in this EA.

Justification for eliminating alternatives or alternative elements from further analysis was based on factors relating to:

- conflicts with already-established Park uses;
- duplication with other less environmentally damaging alternatives;
- conflict with the statement of purpose and need, or other policy; or
- severe impacts on environmental or historic resources.

Alternative Element	Rationale
Circle Modifications	
Convert style of circle: · Traditional roundabout · Split roundabout · Super roundabout (all NB/SB traffic is directed to north/south side of Circle. Other roads are removed.) · Quasi-roundabout (realign entry/exit on N/S side of Circle toward center of Circle) · 6-leg roundabout (2-way in/out for US 50, GWMP N/S, VA 27, Memorial Ave, Bridge)	· Impacts on the cultural landscape would be significant due to major alteration of appearance and circulation patterns. · Infeasible to implement in the short or medium term. · Conflicts at the Circle would not be reduced. · Changes would result in a circle that is larger, is more congested, and/or has more lanes.
Eliminate through on east side of the Circle	Would limit access to Arlington National Cemetery.
Separate traffic at the Circle with islands/curbing with pedestrian and bicycle refuge on islands	Redundant with other solutions.
Crosswalks	
Install advance warning modifications: · Textured pavement · Rumble strips	Redundant with in-pavement yield markers and signage.
Install traffic lights at crossings	Would establish urban environment character and expectations. Impacts on cultural landscape would be substantial.
Replace surface with rough rocks or parallel grates to force cyclists to dismount	Would decrease mobility of bicyclists; as a result, may find alternative, undesirable paths.
Grade-separate crosswalks from roads	Substantial impacts on cultural landscape. Infeasible to implement in the short term
Install speed tables/raised crosswalks	Atypical for commuters and emergency access routes.
Install median islands at some crosswalks	Atypical configuration may lead to confusion because of separation of travel lanes.
Add new at-grade crossing of GWMP NB under Arlington Memorial Bridge	Location is not conducive for crossing due to lighting and expectancy.
Add new crossing with refuge at west side of Circle	Does not address safety at hotspots.
Change ramp junction at crosswalk #6 on Memorial Ave to right angle approach	Anticipated to be part of an Arlington County Project.
Historic Character	
Install historic district signing in the area Install gateways into the area	Out of scope of the project; do not address safety issues at hotspots.
Speed Limit and Enforcement	
Install speed cameras Create pull-off areas for enforcement	Redundant with proposed increase in daytime speed enforcement.
Reduce speed limit in project area	Changes in speed must be accompanied by physical changes to the roadway in order for motorists to respond. Without these changes, some motorists will obey newly posted speed limits and others will not modify their speed resulting in a greater speed differential along the road and increase in conflicts and/or crashes.

Alternative Element	Rationale
Restrict Road Use	
Restrict road use in project area: · Restrict roads to HOV 3+ only · Prohibit private vehicles in project area for through travel · Repurpose roads for transit, pedestrian, and bicycle use only	Impact on regional traffic patterns would be substantial/unacceptable. Does not account for connections or visitation by private vehicle.
Road Reconfiguration	
Reconfigure traffic merge areas at the Circle: · Provide grade-separation for traffic merge with the Circle and NB GWMP · Lengthen merge with traffic from the Circle and NB GWMP · Connect traffic from Circle and NB GWMP with overpass and right-side-of-road merge · Extend lanes at merge between SB traffic from Circle and SB GWMP · Grade-separate traffic from Circle and traffic to US 50 · Connect traffic from Circle to SB GWMP via Bridge over Boundary Channel. Repurpose existing SB lanes to NB traffic to US 50 bypass	Impacts on cultural landscape would be substantial/unacceptable. Infeasible to implement in the short to medium term.
Add other roundabouts within the study area for traffic circulation and calming	Impacts on cultural landscape would be substantial/unacceptable. Infeasible to implement in the short to medium term.
Alter roadway alignments to reduce vehicle speeds such as in a chicane	Does not address safety at hotspots. May increase crashes due to the complexity of the roadway network.
Modify or eliminate US 50 Bypass: · Eliminate US 50 bypass and reroute traffic to other roads in the project area · Relocate US 50 bypass and reroute traffic from NB VA 27 to NB GWMP and use ramp from GWMP to exit traffic to US 50 · Modify US 50 bypass and direct traffic from NB GWMP to US 50 after Bridge. Reduce ramp from NB GWMP to Circle to one lane.	Impacts on cultural landscape would be substantial/unacceptable. Infeasible to implement in the short to medium term.
Remove North Washington Boulevard bypass	Likely major operational impacts
Lengthen merge between US 50 and SB GWMP	Out of scope of the project; does not address safety issues at hotspots.
Remove and reconstruct ramp to Boundary Channel from SB GWMP to remove loop ramp	Out of scope of the project; does not address safety issues at hotspots. High cost with low benefit.
Modify Route 110: · connections to create diamond interchange · Reconstruct circular ramp from Memorial Ave to SB 110 to form LT diamond configuration	Out of scope of the project; does not address safety issues at hotspots. Introduces left-turn conflict between pedestrians and motorists along Memorial Ave.
Relocate SB GWMP lanes to east side of Boundary Channel	Out of scope of the project; does not address safety issues at hotspots. Major realignment requiring removal of SB lanes, reconstruction, and new interchange at Circle.
Relocate NB GWMP to west side of Circle	Viewsheds along river are not maintained.

Alternative Element	Rationale
Road Reconfiguration (cont.)	
Create one-way loop around Circle—SB US 50 and SB GWMP connect to N loop; NB VA 27 and NB GWMP connect to S loop	Impacts on cultural landscape would be substantial/unacceptable. Infeasible to implement in the short to medium term.
Relocate SB GWMP and connection to VA 27 to pass through north side of Circle	Impacts on cultural landscape would be substantial/unacceptable. Infeasible to implement in the short to medium term.
Relocate traffic from NB GWMP to Circle to existing SB lanes from Circle and provide a connection on the north side of the Circle	Infeasible to implement in the short to medium term.
Remove US 50 connection and replace with trail connection to MVT	Elimination of connection to US 50 will cause regional shift in travel patterns to already congested roadways.
Signage Improvements	
Install STOP sign at NB merge	In its current configuration, installation of a STOP can be expected to increase crashes. It is designed as a merge; therefore, many motorists would still treat it as such. Some drivers would try to comply with the STOP, resulting in a greater range of driver behaviors at this location. Furthermore, the sight distance needed for a STOP condition is poor.
Install trail guide signs and waterproof trail maps	Out of scope; does not address safety issues at hotspots.
Improve wayfinding and directional signage: · Replace guide signs · Install road name signs · Post mounted route guidance signs	Out of scope; redundant with proposed in-lane pavement markings.
Striping Improvements	
Reduce skewed intersection in 110 with striping	Out of scope.
Bicycle Accommodations	
Install bike lanes: · Memorial Avenue · Arlington Memorial Bridge	Out of scope. Vehicular capacity would be reduced. New conflict points between cyclists and vehicles at merges and diverges would be introduced.
Add Capital Bikeshare station	Out of scope; does not address safety at the hotspots.
Trails and Sidewalks	
Add new trails and trail connections: · Add a grade-separated connection to Mount Vernon Trail north of the Circle · Add new connection under Arlington Memorial Bridge on west side of GWMP NB lanes · Formalize social trail with at-grade or grade-separated connection north of Arlington Memorial Bridge · Move Mount Vernon Trail connection closer to Arlington Memorial Bridge · Connect major trail network gaps	Out of scope; does not address safety at the hotspots. Additionally, grade-separated trails may substantially impact cultural landscape. Infeasible to implement in the short to medium term.
Install trail overlooks north and south of Arlington Memorial Bridge	Out of scope; does not address safety at hotspots.
Remove and discourage use of social trails	Out of scope; does not meet purpose and need.
Install different, ADA-compliant surface treatments for trails and sidewalks	Out of scope; does not address safety at hotspots.
Widen trails and sidewalks, particularly Mount Vernon Trail under Arlington Memorial Bridge	Out of scope; does not address safety at hotspots. Widening of trail under bridge would reduce vehicular capacity.

APPENDIX B: HOTSPOT SIGNAGE RECOMMENDATIONS

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MEMORIAL CIRCLE
SAFETY IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

HOT SPOT SIGNAGE RECOMMENDATIONS

Submitted May 3, 2017

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TABLE OF CONTENTS

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INTRODUCTION

Over the past three years, the National Park Service (NPS) has been developing and evaluating options for improving transportation through and safety within the George Washington Memorial Parkway's (GWMP) Memorial Circle area. The goal of this project is to develop recommendations that reduce conflicts between trail, sidewalk, and roadway users and increase overall visitor safety while maintaining the historic character of the memorial landscape.

Early in the project, the NPS planning team coordinated with stakeholders to develop a series of draft alternatives that addressed corridor-wide infrastructure design and wayfinding improvements. However, given the large-scale cost and impacts associated with such changes, the NPS determined that a new approach, focused primarily on safety "hotspots" rather than a corridor approach, is needed. This more targeted approach is intended to produce revised alternatives that are reasonable and feasible and that emphasize treatments at locations with the highest risks on the corridor.

In considering candidate safety improvements for the hotspots, the project team considered three revised alternatives: No Action (Alternative A); Operational and Minor Capital Safety Improvements (Alternative B); and Moderate Capital Safety Improvements (Alternative C). The planning team used an alternatives matrix to evaluate each alternative and group treatments by category and feasibility. One of those groupings associated with Alternative B – signage – emerged as among the most feasible to implement in the short term and was identified as the first grouping to be further developed and refined.[1] This plan represents the first formal step to advance the recommended signage improvements toward implementation. This plan does not include design or the development of "construction plans" to be used for immediate installation of the proposed signs. Following confirmation of the treatments associated with each of the alternatives referenced above, the alternatives will be fully described and their impacts on park resources analyzed in an environmental assessment and assessment of effect to comply with the National Environmental Policy Act and National Historic Preservation Act, respecively.

The Hot Spot Signage Recommendations that follow were developed based on the signage solutions previously identified for implementation in the revised alternatives, including the FHWA Road Safety Audit (2012), and the public scoping (2014), charrette (2015), and preliminary draft alternatives package (2015) for the GWMP Memorial Circle Transportation Plan and EA.

The sign diagrams included in the Hot Spot Signage Recommendations focus on the ten previously identified "hot spots" to include proposed recommendations based on the following alternatives:

- Review existing signs' general conformance with the 2009 Manual on Uniform Traffic Control Devices (MUTCD),
- Install pedestrian warning signs with arrows on both sides of the roadway for crosswalks,
- Install advance pedestrian warning signs for crosswalks,
- Install ramp EXIT "gore" signs with directional arrows,
- Align YIELD signs with triangular pavement markings, and
- Identify where simplified signage and language on directional guidance signs should be considered.

[1] Alternative B entails minor operational and capital safety improvements focused at the hotspots, and includes modified or new signage, striping, refuge islands, moving curbs, and minor or removable lighting changes. In general, improvements associated with Alternative B do not require additional study prior to design and avoid adverse impacts to the memorial landscape.

Included in the Hot Spot Signage Recommendations are hot spot diagrams indicating existing and proposed sign messages and locations, details for non-MUTCD standard sign panels, a sign details table for each hot spot, and an overall sign project Class C cost estimate.

The recommendations included were developed based on a desktop review of existing signs. The review assumed that existing sign locations in the GIS sign inventory provided by the NPS were accurate for planning purposes. The 2007 NPS GIS inventory was supplemented using satellite and site photography (Google Earth and Google Streetview). Signs outside of the hot spots were only reviewed when there was a series of signs that began upstream of a hot spot that were deemed relevant to that hot spot.

The sign details table tracks how each sign location in the recommendations was evaluated against general compliance with the MUTCD. In cases where the existing sign panel sizes for regulatory and warning signs were provided in the 2007 NPS GIS inventory, these panel sizes were compared to the required panel sizes in the MUTCD. Larger sign panels were recommended where appropriate in order to comply with the MUTCD. For existing signs that do not appear in the 2007 NPS GIS inventory, no existing sign panel size is provided in the sign details table. The recommendations present the minimum number of modifications to existing signage in order to be more closely compliant with the MUTCD.

Aerial imagery was used to evaluate existing sign spacing against recommended distances provided in the MUTCD. In some cases, when existing spacing did not meet recommended distance, a sign was recommended to be relocated further upstream or downstream within the hot spot. However, due to the existing geometry of the GWMP Memorial Circle study area, not all signs could be relocated to meet the recommended distances.

Photographs of existing signs provided by the NPS and retrieved from Google Streetview were used to approximate whether the existing signs were mounted at the minimum required 7-foot height, measured vertically from the bottom of the sign panel. Existing signs that appear to be mounted significantly below this height were recommended to be reinstalled. The symbol and word messages on each sign panel were evaluated to confirm that these messages were being accurately and consistently conveyed.

The details provided for non-MUTCD standard sign panels include only the pertinent layout of these sign panels for planning-level cost estimates. Details included for each custom sign design are the legend/message, panel size, letter height, and panel color; these details follow the recommended sign panel layouts provided in the MUTCD. However, it is noted that the NPS has its own standard for sign panel design and may not always comply with the MUTCD.

The quantity estimates provided in the signs detail table are then summarized in two tables, one table for the overall Class C cost estimate and a second table for a summary of recommended quantities by hot spot. When an existing sign panel was recommended to be relocated to a new location or reinstalled at a higher mounting height, quantities for the new sign posts and foundations were included in the cost estimate. Estimated sign post sizes were calculated assuming a 7-foot mounting height above the finished grade and a minimum post depth of 4 feet below the finished grade. Centroid locations and maximum sign panel areas per post were generally estimated as:

- 10-foot centroid and 15 SF maximum per 4” x 6” post, and
- 12-foot centroid and 34 SF maximum per 6” x 8” post.

The proposed signage recommendations and new sign panel types/sizes are described in red text on the included sign diagrams. Information on existing signage and proposed improvements is presented in the sign diagrams as follows:

- Existing sign information is presented in black text.
- New or modified sign information is presented in red text.
- Proposed new sign locations are shown with solid red symbols on the diagrams.
- Existing sign locations for which modifications are recommended are shown with solid black symbols on the diagrams.
- Existing sign locations where there are no recommended changes are shown with hollow gray symbols on the diagrams.
- Existing sign locations for which the signs are to be removed or relocated are shown with a red "X" through a hollow black symbol on the diagrams. Those to be relocated have a dashed red line to a solid red symbol indicating the recommended relocation spot.
- The sign panel sizes provided in the 2007 NPS GIS inventory are located below each sign shown on the sign diagrams.

The Hot Spot Signage Recommendations are not intended to be 100% design plans, nor do the recommendations include identification of each and every sign located within the GWMP Memorial Circle area; existing signs located outside of the hot spots are not presented in the recommendations. Similarly, recommendations are only provided for static signs; electronic signs are not included in the plan.

It is recommended that the NPS complete a sign inventory in the field to verify signs existing sign types, sizes, messages, and locations and, when applicable, their actual mounting heights prior to implementation of the recommendations presented herein. It should be noted this is a planning level study, and the recommendations for sign placement, removal, and associated quantities should be verified with a field inventory when appropriate. Proposed sign locations are approximate and may need to be modified in the field to avoid conflict with underground utilities, trees or other obstructions. All sign locations and dimensions should be field verified by the NPS prior to fabrication or installation of signage included in this plan. The Hot Spot Signage Recommendations should be implemented in conjunction with new/modified pavement markings so that they work hand-in-hand to complement one another and promote safety and uniformity.

Hot Spot Areas

Memorial Circle Transportation Plan and Environmental Assessment
George Washington Memorial Parkway
United States Department of the Interior / National Park Service

HOT SPOT 1

Potomac River

Hot Spot #1

SignID: 1-1

R1-2 36x36x36 (ex.)

No Change

SignID: 1-2

R1-2 36x36x36 (ex.)

No Change

SignID: 1-3

~~W4-1L 30x30 (ex.)~~

W4-1L 36x36 (new)

Relocate sign 240ft upstream. Replace with enlarged 36x36 panel.

SignID: 1-6

~~W4-5p 24x18 (ex.)~~

Remove sign assembly.

SignID: 1-5

Before	After
	

W3-2 36x36* (ex.)

W4-5P 18x24 (new)

Install new supplemental plaque below existing sign panel.

SignID: 1-4

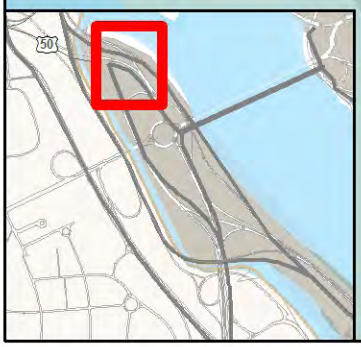
W3-2 36x36 (new)

W4-5P 18x24 (new)

Install missing sign panel and new supplemental plaque.

See Hot Spot #2

See Hot Spot #3



*Sign panel identified on Google Earth (7/15)

GIS Mapping Center, Arlington County, VA

Hot Spot 1

Memorial Circle Transportation Plan and Environmental Assessment

George Washington Memorial Parkway

United States Department of the Interior / National Park Service

Legend

- Existing Sign
- Sign to be Removed
- Sign to be Modified
- New Sign
- Hot Spots
- Study Area Boundary
- Sidewalks/Trails
- Existing Roadway
- Direction of Travel

North

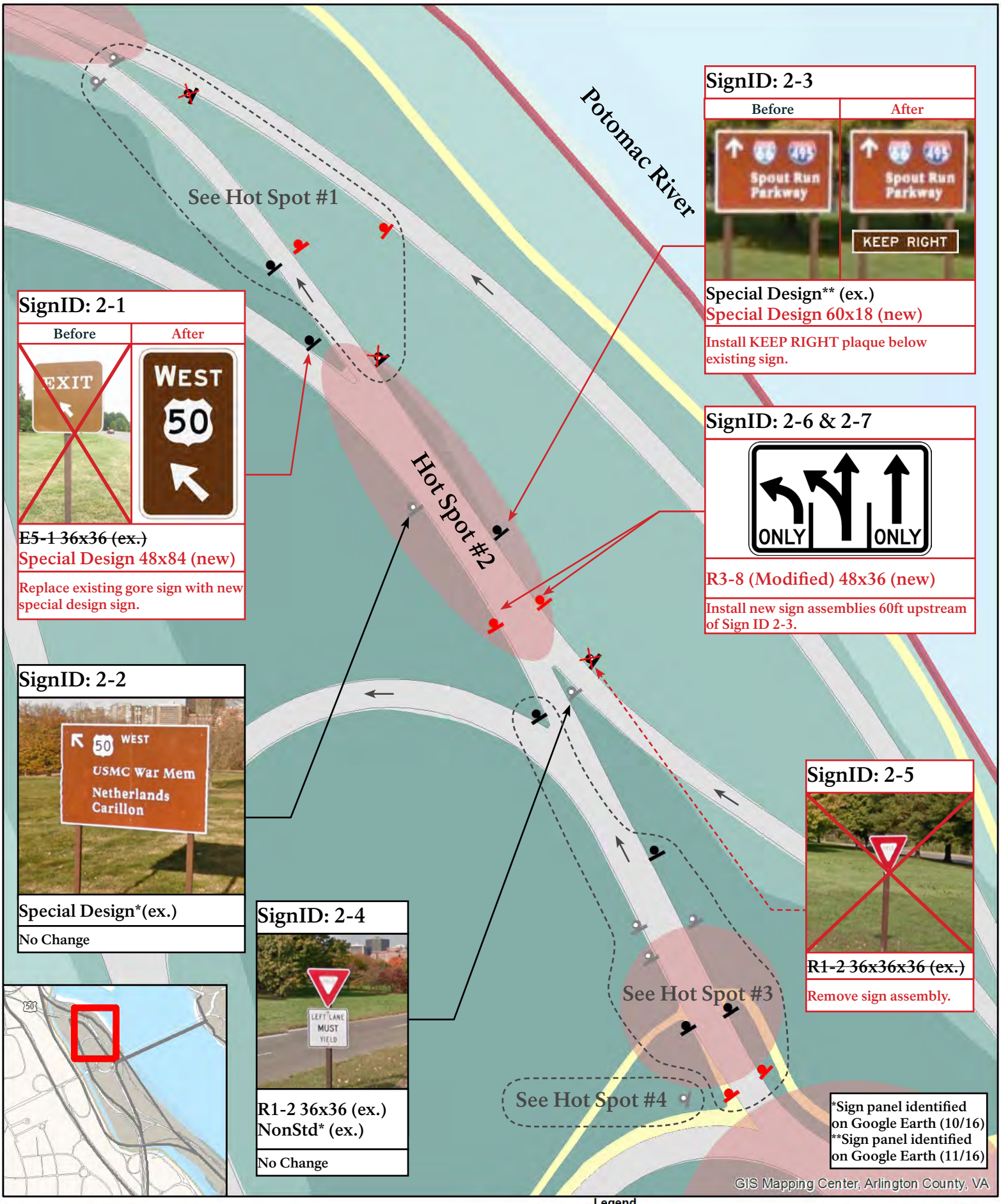
0 20 40 80 Feet

NATIONAL PARK SERVICE

HOT SPOT #1														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
1-1	R1-2	YIELD	36 X 36 X 36	-	-	-	-	-	-	-	-	No proposed changes.	-	Sign panel size and location is consistent with MUTCD requirements.
1-2	R1-2	YIELD	36 X 36 X 36	-	-	-	-	-	-	-	-	No proposed changes.	-	Sign panel size and location is consistent with MUTCD requirements.
1-3	W4-1L	MERGE (GRAPHIC)	30 X 30	No Proposed Change	36 X 36	1	(1) 4" X 6"	16'-0"	N/A	1	1	Install new enlarged sign panel approximately 240-ft upstream of existing location.	MUTCD Compliance Assessment	Minimum size for W4-1 signs is 36 X 36 for a multi-lane conventional roadway. For a posted speed limit of 40-mph, the MUTCD recommends MERGE signs to be installed 670-ft in advance of the merge, but may be adjusted for site conditions. The existing sign assembly location is approximately 310-ft in advance of the merge.
1-4	W3-2 ↑ YIELD (GRAPHIC)		36 X 36	↑ YIELD (GRAPHIC) W3-2 NO MERGE AREA W4-5P	N/A 18 X 24	N/A 1	N/A	N/A	N/A	N/A	N/A	Install new supplemental sign plaque below existing sign panel.	Simplified signage	Existing sign panel size is the "Oversized" MUTCD-required 36 X 36 sign panel size. For a posted speed limit of 25-mph, the MUTCD recommends YIELD AHEAD signs to be installed a minimum of 100-ft in advance of the yield. It is noted that some drivers may be able to access this location from roadways posted at 30-mph or 40-mph; the MUTCD recommends YIELD AHEAD signs to be installed a minimum of 100-ft and 125-ft, respectively, for these cases. The existing sign assembly meets all of these recommended locations. No proposed changes to existing sign panel or sign location. However, the MUTCD allows a "NO MERGE AREA" supplemental plaque to be mounted below a W3-2 sign for a yield-controlled movements entering onto a roadway without an acceleration lane that road users would expect an acceleration lane to be present.
1-5	N/A	N/A	N/A	↑ YIELD (GRAPHIC) W3-2 NO MERGE AREA W4-5P	36 X 36 18 X 24	1 1	(1) 4" X 6"	18'-0"	N/A	N/A	1	Install missing W3-2 sign panel with new supplemental sign plaque on new sign post.	Simplified signage	Existing sign panel shown in 2007 NPS GIS database is no longer present on Google Earth (7/15). For a posted speed limit of 25-mph, the MUTCD recommends YIELD AHEAD signs to be installed a minimum of 100-ft in advance of the yield. It is noted that some drivers may be able to access this location from roadways posted at 30-mph or 40-mph; the MUTCD recommends YIELD AHEAD signs to be installed a minimum of 100-ft and 125-ft, respectively, for these cases. The existing sign assembly meets all of these recommended locations. No proposed changes to sign location. However, the MUTCD allows a "NO MERGE AREA" supplemental plaque to be mounted below a W3-2 sign for a yield-controlled movements entering onto a roadway without an

														acceleration lane that road users would expect an acceleration lane to be present.
1-6	W4-5P	NO MERGE AREA	24 X 18	N/A	N/A	N/A	N/A	N/A	N/A	1	1	Remove existing sign assembly to consolidate existing signage.	MUTCD Compliance Assessment, Simplified signage	The MUTCD intends the "NO MERGE AREA" supplemental plaque to be installed with other sign panels, not as a standalone sign. It is recommended to install this plaque below the Yield Ahead warning signage.

HOT SPOT 2



Hot Spot 2

Memorial Circle Transportation Plan and Environmental Assessment
George Washington Memorial Parkway
United States Department of the Interior / National Park Service

SIGN DETAIL

SIGN NUMBER	Sign ID 2-1
WIDTH x HGHT.	4'-0" x 7'-0"
BORDER WIDTH	
CORNER RADIUS	
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Brown
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

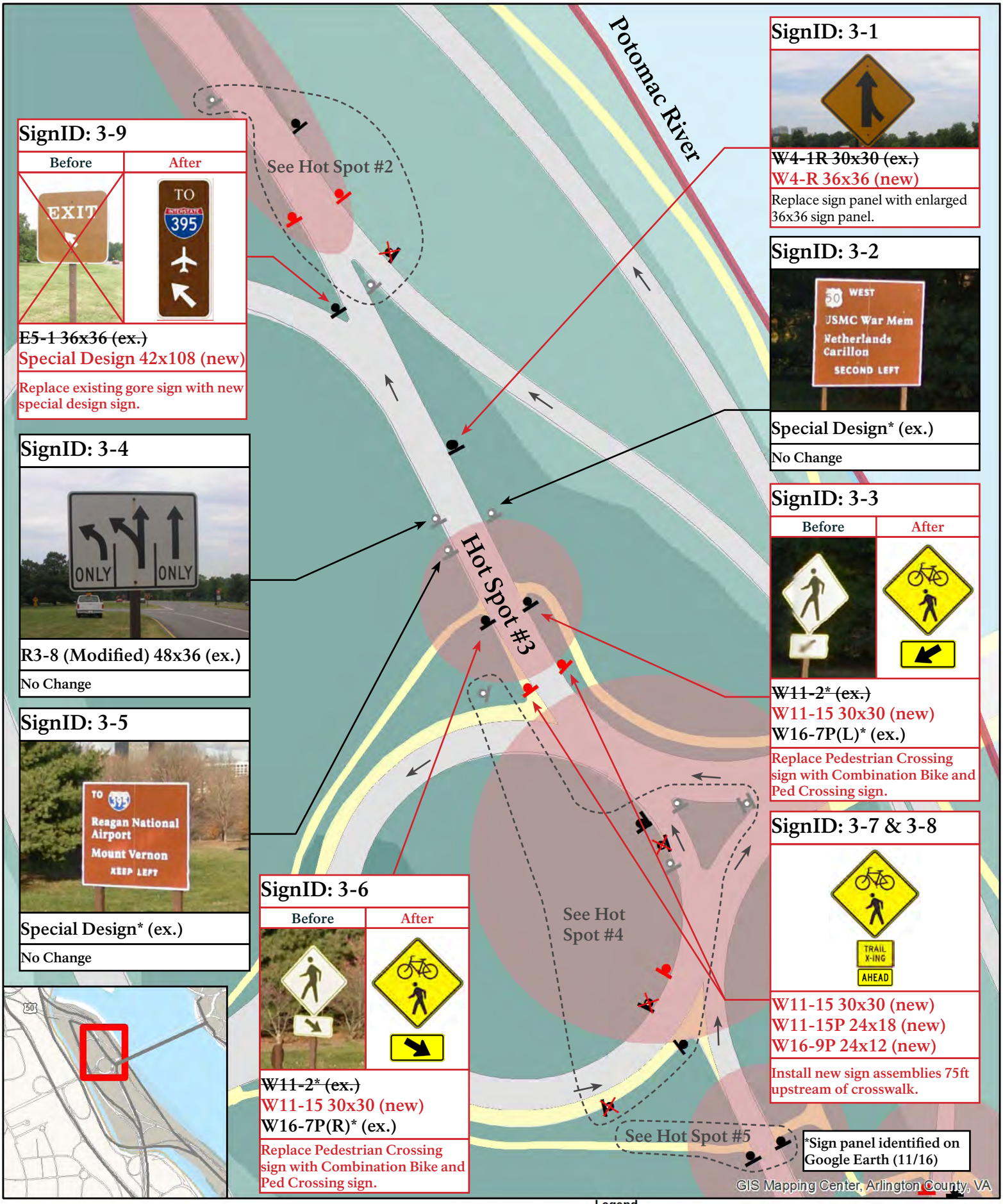
SIGN DETAIL

SIGN NUMBER	Sign ID 2-3
WIDTH x HGHT.	5'-0" x 1'-6"
BORDER WIDTH	
CORNER RADIUS	
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: **Brown**
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

HOT SPOT #2														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
2-1	E5-1	EXIT ↖	36 X 36	WEST 50 ↖ SPECIAL DESIGN	48 X 84	1	(1) 6" X 8"	20'-0"	N/A	1	1	Replace existing gore sign with route number and directional arrow gore sign.	Install ramp EXIT "gore" signs with directional arrows at "hot spots"	Proposed gore sign is designed using the gore signs shown on Figure 2D-15 of the MUTCD (page 169) as a template. Larger diagrammatic guide signs (such as that shown on Figure 2E-3, page 194) were not proposed since they are for overhead use only.
2-2	SPECIAL DESIGN	↖ 50 WEST USMC War Mem Netherlands Carillon	Identified on Google Earth (10/16)	-	-	-	-	-	-	-	-	No proposed changes.	-	Guide sign word message is consistent with other guide signs within the "hot spots". Existing guide sign is located approximately 50-ft downstream of Sign ID 2-3. If sight conditions allow, the MUTCD recommends a 100-ft minimum spacing between signs. However, the short weave area does not allow for increased spacing.
2-3	SPECIAL DESIGN	↑ 66 495 Spout Run Parkway	Identified on Google Earth (11/16)	↑ 66 495 Spout Run Parkway KEEP RIGHT SPECIAL DESIGN PLAQUE	60 X 18	1	N/A	N/A	N/A	N/A	N/A	Install KEEP RIGHT supplemental plaque below existing guide sign.	Simplified signage	Guide sign location and word message is generally consistent with other guide signs within the "hot spots". However, there is typically at least one advanced guide sign with "KEEP RIGHT" or "KEEP LEFT" upstream of exits - in this case there is only the "KEEP RIGHT" signage coming from the GWMP Bypass and not from GWMP Memorial Circle. It is recommended to install a "KEEP RIGHT" sign panel below the existing guide sign to provide consistent driver expectation for drivers coming from GWMP Memorial Circle. The existing straight-ahead arrow message may be confusing to drivers, as the additional context of the US 50 exit on the left is required for drivers to understand the need to keep right. Existing sign panel width assumed to be 5-ft wide based on aerial measurements.
2-4	R1-2 NON ST'D	YIELD LEFT LANE MUST YIELD	36 X 36 X 36 Identified on Google Earth (10/16)	-	-	-	-	-	-	-	-	No proposed changes.	-	Sign panel size and location is consistent with MUTCD requirements.
2-5	R1-2	YIELD	36 X 36 X 36	N/A	N/A	N/A	N/A	N/A	N/A	1	1	Remove existing sign assembly.	MUTCD Compliance Assessment	Existing sign panel does not match existing lane use. The right lane is not required to yield based on the lane geometry at this location. Recommend removing sign assembly to reduce sign clutter.
2-6	N/A	N/A	N/A	LEFT TURN ONLY | LEFT-THRU OPTION | THRU ONLY (GRAPHIC)	48 X 36	1	(1) 4" X 6"	16'-0"	N/A	N/A	N/A	Install new sign with lane use on left and right sides of roadway approximately	Simplified signage	For other "hot spot" locations, the R3-8 lane use signs have typically been included in advance of the guide signs. It is recommended to install

HOT SPOT #2														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
				R3-8 MODIFIED								60-ft upstream of existing Sign ID 2-3.		these signs in order to meet driver expectations to give advanced guidance on the lane geometry.
2-7	N/A	N/A	N/A	LEFT TURN ONLY | LEFT-THRU OPTION | THRU ONLY (GRAPHIC) R3-8 MODIFIED	48 X 36	1	(1) 4" X 6"	16'-0"	N/A	N/A	N/A	Install new sign with lane use on left and right sides of roadway approximately 60-ft upstream of existing Sign ID 2-3.	Simplified signage	For other "hot spot" locations, the R3-8 lane use signs have typically been included in advance of the guide signs. It is recommended to install these signs in order to meet driver expectations to give advanced guidance on the lane geometry.

HOT SPOT 3



Hot Spot 3

Memorial Circle Transportation Plan and Environmental Assessment
George Washington Memorial Parkway
United States Department of the Interior / National Park Service

Legend

- Existing Sign
- Sign to be Removed
- Sign to be Modified
- New Sign
- Hot Spots
- Study Area Boundary
- Sidewalks/Trails
- Existing Roadway
- Direction of Travel

North

0 20 40 80 Feet

SIGN DETAIL

SIGN NUMBER	Sign ID 3-9
WIDTH x HGHT.	3'-6" x 9'-0"
BORDER WIDTH	
CORNER RADIUS	
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Brown
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

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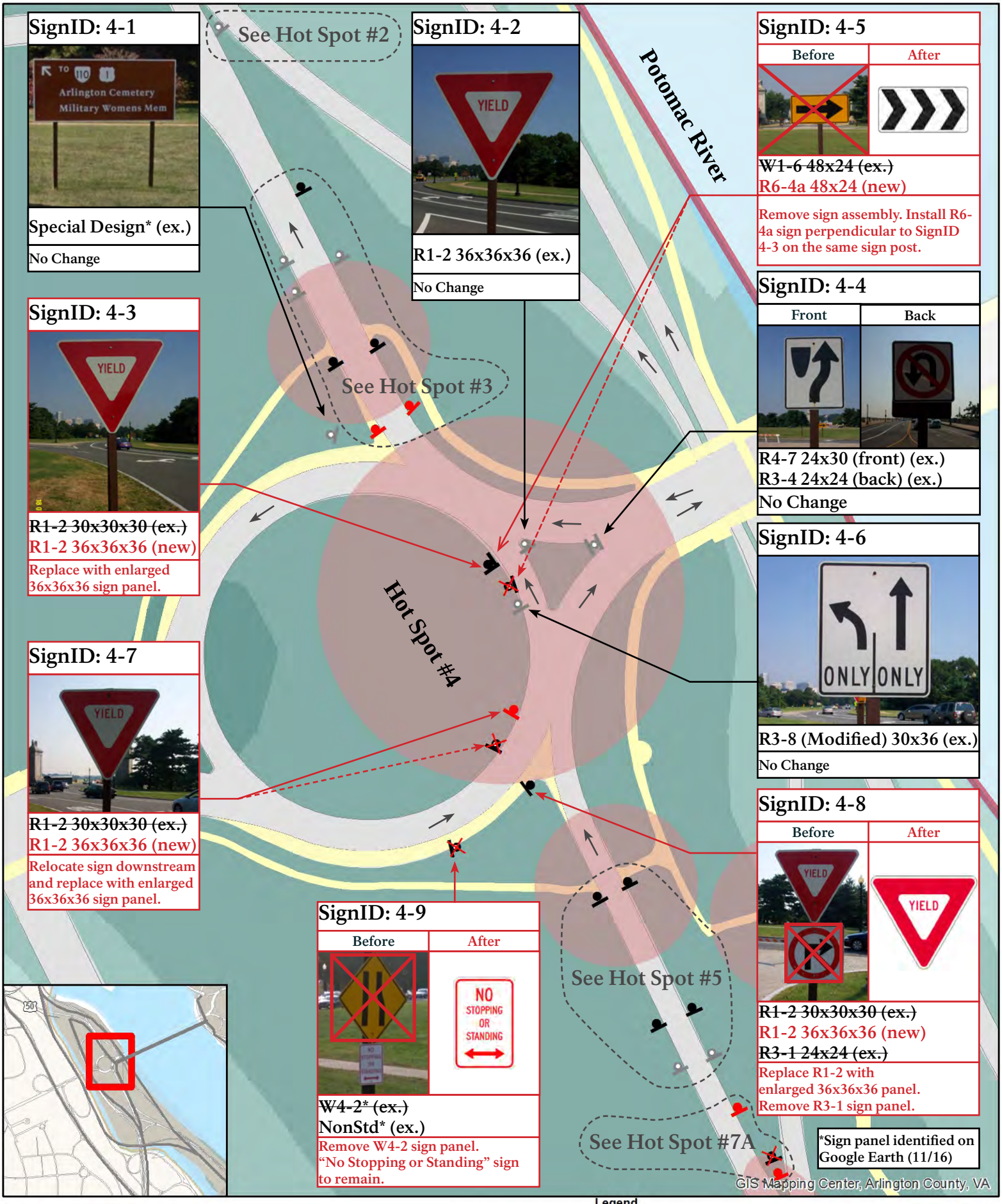
HOT SPOT #3														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
3-1	W4-1R	MERGE (GRAPHIC)	30 X 30	No proposed change	36 X 36	1	(1) 4" X 6"	16'-0"	N/A	1	1	Install new enlarged sign panel on new post.	MUTCD Compliance Assessment	Minimum size for W4-1 signs is 36 X 36 for a multi-lane conventional roadway. For a posted speed limit of 25-mph, the MUTCD recommends MERGE signs to be installed 325-ft in advance of the merge, but may be adjusted for site conditions. It is noted that some drivers may be able to access this location from roadways posted at 30-mph or 40-mph; the MUTCD recommends MERGE signs to be installed a minimum of 460-ft and 670-ft, respectively, for these cases. The existing sign assembly meets all of these recommended locations. The existing sign assembly location is approximately 225-ft in advance of the merge, which is less than the MUTCD recommended location for all speeds. However, the existing roadway geometry does not allow for increased spacing.
3-2	SPECIAL DESIGN	50 WEST USMC War Mem Netherlands Carillon SECOND LEFT	Identified on Google Earth (11/16)	-	-	-	-	-	-	-	-	No proposed changes.	-	Guide sign location and word message is generally consistent with other guide signs within the "hot spots". Existing guide sign is located approximately 25-ft downstream of Sign ID 3-5. If sight conditions allow, the MUTCD recommends a 100-ft minimum spacing between signs. However, the short weave area does not allow for increased spacing.
3-3	W11-2 W16-7P(L)	PEDESTRIAN CROSSING (GRAPHIC) ↙	Identified on Google Earth (11/16)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 No proposed change	30 X 30 N/A	1 N/A	N/A	N/A	N/A	1	N/A	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel.	FHWA comment on draft plan	Sign panels appear to be consistent with MUTCD requirements. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
3-4	R3-8 MODIFIED	LEFT TURN ONLY | LEFT-THRU OPTION | THRU ONLY (GRAPHIC)	48 X 36	-	-	-	-	-	-	-	-	No proposed changes.	-	Existing sign panel height is greater than the MUTCD 30" required sign panel height. For other "hot spot" locations, the R3-8 lane use sign is typically placed in advance of the guide signs. However, due to spacing limitations there is no recommended change to the sign location at this time.
3-5	SPECIAL DESIGN	TO 395 Reagan National Airport Mount Vernon KEEP LEFT	Identified on Google Earth (11/16)	-	-	-	-	-	-	-	-	No proposed changes.	-	Guide sign location and word message is generally consistent with other guide signs within the "hot spots". Existing guide sign is located approximately 80-ft downstream of Sign ID 3-3 and 3-6. If sight conditions allow, the MUTCD recommends a 100-ft minimum spacing between

HOT SPOT #3														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
														signs. However, the short weave area does not allow for increased spacing.
3-6	W11-2 W16-7P(R)	PEDESTRIAN CROSSING (GRAPHIC) ↘	Identified on Google Earth (11/16)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 No proposed change	30 X 30 N/A	1 N/A	N/A	N/A	N/A	1	N/A	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel.	FHWA comment on draft plan	Sign panels appear to be consistent with MUTCD requirements. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
3-7	N/A	N/A	N/A	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 TRAIL X-ING W11-15P AHEAD W16-9P	30 X 30 24 X 18 24 X 12	1 1 1	(1) 4" X 6"	20'-0"	N/A	N/A	N/A	Install new sign assembly approximately 75-ft upstream of existing W11-2 sign assembly.	Install advance pedestrian warning signs at "hot spots"	For a posted speed limit of 25-mph, the MUTCD recommends PEDESTRIAN AHEAD signs to be installed a minimum of 125-ft in advance of the crosswalk. It is noted that some drivers may be able to access this location from roadways posted at 30-mph; the MUTCD recommends PEDESTRIAN AHEAD signs to be installed a minimum of 100-ft for this cases. Due to the geometry in this vicinity, these minimums cannot be met therefore it is recommended to install these signs at a closer distance than the MUTCD recommended location.
3-8	N/A	N/A	N/A	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 TRAIL X-ING W11-15P AHEAD W16-9P	30 X 30 24 X 18 24 X 12	1 1 1	(1) 4" X 6"	20'-0"	N/A	N/A	N/A	Install new sign assembly approximately 75-ft upstream of existing W11-2 sign assembly.	Install advance pedestrian warning signs at "hot spots"	For a posted speed limit of 25-mph, the MUTCD recommends PEDESTRIAN AHEAD signs to be installed a minimum of 125-ft in advance of the crosswalk. It is noted that some drivers may be able to access this location from roadways posted at 30-mph; the MUTCD recommends PEDESTRIAN AHEAD signs to be installed a minimum of 100-ft for this cases. Due to the geometry in this vicinity, these minimums cannot be met therefore it is recommended to install these signs at a closer distance than the MUTCD recommended location.
3-9	E5-1	EXIT ↖	36 X 36	TO 395 (AIRPLANE SYMBOL) ↖ SPECIAL DESIGN	42 X 108	1	(1) 6" X 8"	20'-0"	N/A	1	1	Replace existing gore sign with route number and directional arrow gore sign.	Install ramp EXIT "gore" signs with directional arrows at "hot spots"	Proposed gore sign is designed using the gore signs shown on Figure 2D-15 of the MUTCD (page 169) as a template. Larger diagrammatic guide signs (such as that shown on Figure 2E-3, page 194) were not proposed since they are for overhead use only.

HOT SPOT 4



Hot Spot 4

Memorial Circle Transportation Plan and Environmental Assessment
George Washington Memorial Parkway
United States Department of the Interior / National Park Service

Legend

- Existing Sign
- Sign to be Removed
- Sign to be Modified
- New Sign
- Hot Spots
- Study Area Boundary
- Sidewalks/Trails
- Existing Roadway
- Direction of Travel

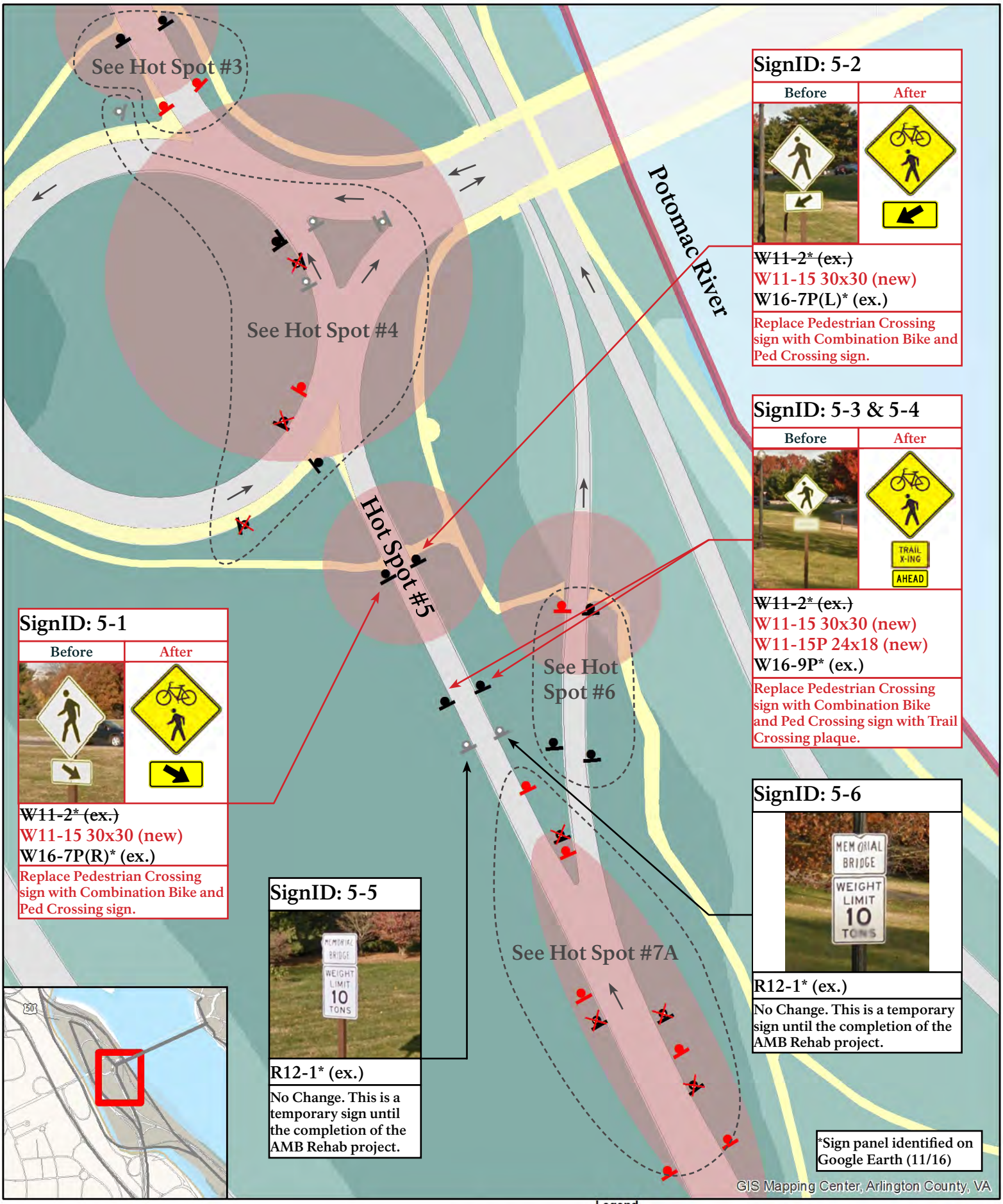
North

0 20 40 80 Feet

HOT SPOT #4														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
4-1	SPECIAL DESIGN	↖ TO 110 1 Arlington Cemetery Military Womens Mem	Identified on Google Earth (11/16)	-	-	-	-	-	-	-	-	No proposed changes.	-	Guide sign location and word message is consistent with other guide signs within the "hot spots".
4-2	R1-2	YIELD	36 X 36 X 36	-	-	-	-	-	-	-	-	No proposed changes.	-	Minimum size for R2-1 signs is 36 X 36 X 36 for a multi-lane conventional roadway if sign panels are installed on both the right and left sides of the roadway.
4-3	R1-2	YIELD	30 X 30 X 30	No Proposed Change	36 X 36 X 36	1	(1) 4" X 6"	16'-0"	N/A	1	1	Install new enlarged sign panel on new post. New sign panel to replace existing sign panel located at Sign ID #4-5 to be installed perpendicular to R2-1 sign.	MUTCD Compliance Assessment	Minimum size for R2-1 signs is 36 X 36 X 36 for a multi-lane conventional roadway if sign panels are installed on both the right and left sides of the roadway.
4-4	R4-7 R3-4	KEEP RIGHT (GRAPHIC) NO U-TURN (GRAPHIC)	24 X 30 24 X 24	-	-	-	-	-	-	-	-	No proposed changes.	-	Back to back sign panels. Although GWMP Memorial Circle is not a traditional roundabout, the MUTCD advises that signs to prohibit turns along the circulatory roadway might confuse drivers about the possible legal turning movements. Directional arrows (R6-4) and/or ONE WAY signs are the more appropriate signs to indicate the direction of travel. Additionally, the U-Turn movement prohibited by the sign can easily be accomplished by remaining in the circle. Although the U-Turn sign is not necessary for drivers, there are no proposed changes to this sign in order to allow USPP to enforce this no U-Turn movement. It is noted that an R4-7 sign panel is not currently installed on the western side of GWMP Memorial Circle as the MUTCD identifies this is an optional sign panel.
4-5	W1-6	→	48 X 24	> > > (GRAPHIC) R6-4a	48 X 24	1	N/A	N/A	N/A	1	1	Remove existing W1-6 sign assembly. Install R6-4a sign panel at minimum 5-ft mounting height on the same sign post as Sign ID #4-3 in order to better align with approaching traffic and to consolidate signs.	MUTCD Compliance Assessment	The intention of the W1-6 large arrow sign is to delineate a change in horizontal alignment or emphasize abrupt curvature. The MUTCD states that the W1-6 sign shall not be used in the central island of a roundabout. However, the MUTCD states that R6-4a roundabout directional arrow shall be used in the central island of roundabouts and other circular intersections. The required mounting height is at least 5-ft, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way.

HOT SPOT #4														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
4-6	R3-8 MODIFIED	LEFT TURN ONLY | THRU ONLY (GRAPHIC)	30 X 36	-	-	-	-	-	-	-	-	No proposed changes.	-	Existing sign panel height is greater than the MUTCD 30" required sign panel height. Fishhook arrows may be used in advance of roundabouts/circular roadways instead of standard arrows, however this sign is located within the circle, and therefore standard arrows provided clearer guidance to the driver.
4-7	R1-2	YIELD	30 X 30 X 30	No Proposed Change	36 X 36 X 36	1	(1) 4" X 6"	16'-0"	N/A	1	1	Install new enlarged R2-1 sign panel on new sign post approximately 15-ft downstream of existing sign post location in order to better align with existing yield line pavement markings.	Aligned YIELD signs with triangular pavement markings at "hot spots"	Minimum size for R2-1 signs is 36 X 36 X 36 for a multi-lane conventional roadway if sign panels are installed on both the right and left sides of the roadway.
4-8	R1-2 R3-1	YIELD NO RIGHT TURN (GRAPHIC)	30 X 30 X 30 24 X 24	No Proposed Change N/A	36 X 36 X 36 N/A	1 N/A	(1) 4" X 6"	16'-0"	N/A	2	1	Remove existing R3-1 sign panel. Install new enlarged R2-1 sign panel on new post.	MUTCD Compliance Assessment	Minimum size for R2-1 signs is 36 X 36 X 36 for a multi-lane conventional roadway if sign panels are installed on both the right and left sides of the roadway. Although GWMP Memorial Circle is not a traditional roundabout, the MUTCD advises that signs to prohibit turns along the circulatory roadway might confuse drivers about the possible legal turning movements. Directional arrows (R6-4) and/or ONE WAY signs are the more appropriate signs to indicate the direction of travel.
4-9	W4-2 NO STOPPING OR STANDING NON ST'D	LANE ENDS (GRAPHIC) NO STOPPING OR STANDING	Identified on Google Earth (11/16)	N/A No Proposed Change	N/A -	N/A -	N/A -	N/A -	N/A -	1 -	N/A -	Remove existing W4-2 sign panel from existing light pole.	MUTCD Compliance Assessment	W4-2 signs are intended to warn of the reduction in the number of traffic lanes in the direction of travel on a multi-lane. The existing lane geometry of the circle does not reduce the number of through travel lanes from two to one. The existing "No Stopping Or Standing" sign located below the W4-2 sign panel is recommended to remain.

HOT SPOT 5



Hot Spot 5

Memorial Circle Transportation Plan and Environmental Assessment
George Washington Memorial Parkway
United States Department of the Interior / National Park Service

HOT SPOT #5														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
5-1	W11-2 W16-7P(R)	PEDESTRIAN CROSSING (GRAPHIC) ↘	Identified on Google Earth (11/16)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 No proposed change	30 X 30 N/A	1 N/A	N/A	N/A	N/A	1	N/A	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel.	FHWA comment on draft plan	Sign panels appear to be consistent with MUTCD requirements. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
5-2	W11-2 W16-7P(L)	PEDESTRIAN CROSSING (GRAPHIC) ↙	Identified on Google Earth (11/16)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 No proposed change	30 X 30 N/A	1 N/A	N/A	N/A	N/A	1	N/A	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel.	FHWA comment on draft plan	Sign panels appear to be consistent with MUTCD requirements. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
5-3	W11-2 W16-9P	PEDESTRIAN CROSSING (GRAPHIC) AHEAD	Identified on Google Earth (11/16)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 TRAIL X-ING W11-15P No proposed change	30 X 30 24 X 18 N/A	1 1 N/A	(1) 4" X 6"	20'-0"	N/A	1	1	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel and TRAIL X-ING sign panel.	FHWA comment on draft plan	Sign panels appear to be consistent with MUTCD requirements. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
5-4	W11-2 W16-9P	PEDESTRIAN CROSSING (GRAPHIC) AHEAD	Identified on Google Earth (11/16)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 TRAIL X-ING W11-15P No proposed change	30 X 30 24 X 18 N/A	1 1 N/A	(1) 4" X 6"	20'-0"	N/A	1	1	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel and TRAIL X-ING sign panel.	FHWA comment on draft plan	Sign panels appear to be consistent with MUTCD requirements. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
5-5	R12-1 MODIFIED	MEMORIAL BRIDGE WEIGHT LIMIT 10 TONS	Identified on Google Earth (11/16)	-	-	-	-	-	-	-	-	No proposed changes. These are temporary signs until completion of the AMB Rehab project when the ton limits are lifted.	-	Sign panel appears to be consistent with MUTCD requirements. However, the required MUTCD mounting height is at least 7-ft, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way.
5-6	R12-1 MODIFIED	MEMORIAL BRIDGE WEIGHT LIMIT 10 TONS	Identified on Google Earth (11/16)	-	-	-	-	-	-	-	-	No proposed changes. These are temporary signs until completion of the AMB Rehab project when the ton limits are lifted.	-	Sign panel appears to be consistent with MUTCD requirements. However, the required MUTCD mounting height is at least 7-ft, measured vertically from the bottom of the sign to the elevation of the near edge of the traveled way.

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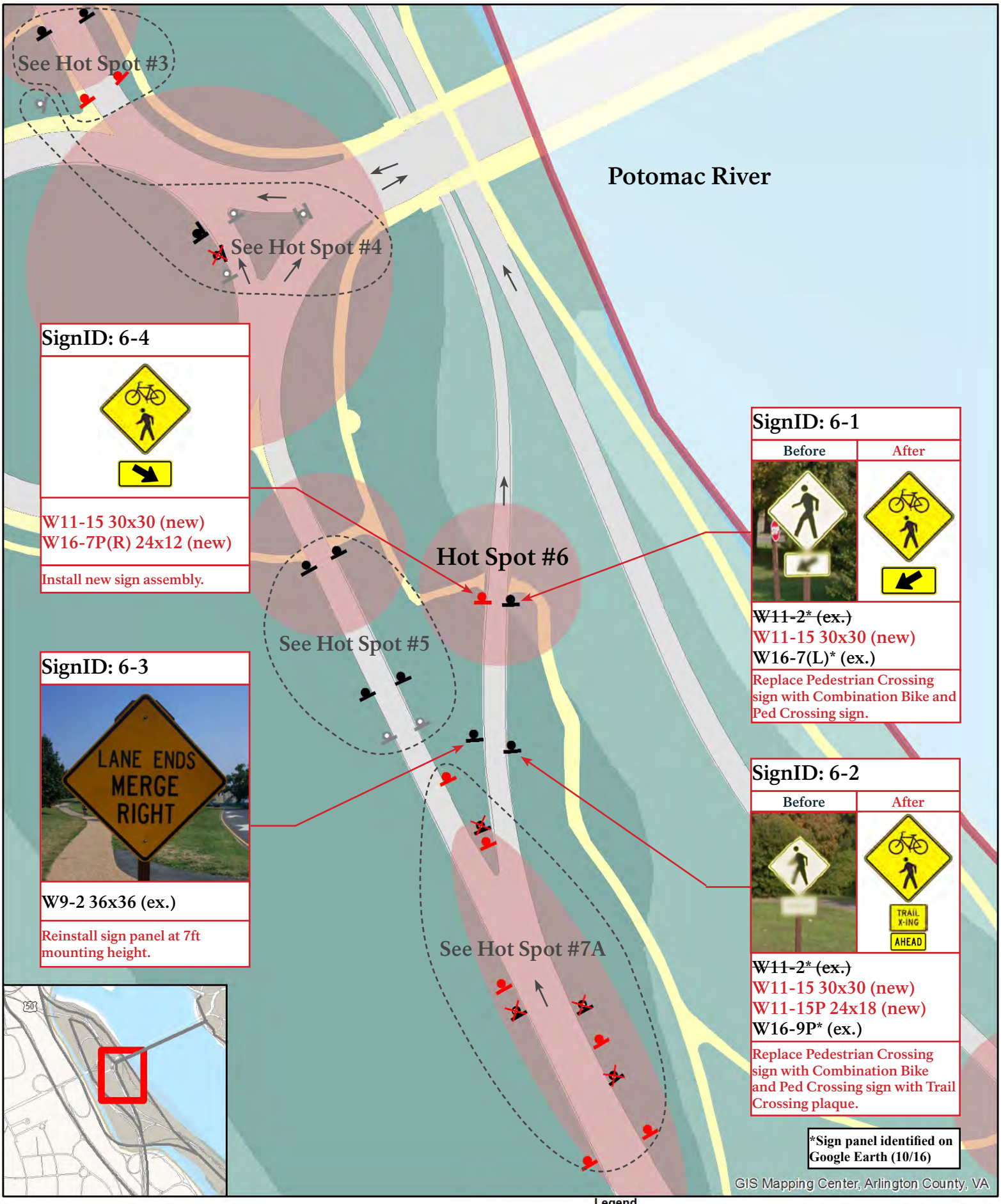
HOT SPOT 6



Hot Spot 6

Memorial Circle Transportation Plan and Environmental Assessment
George Washington Memorial Parkway
United States Department of the Interior / National Park Service

HOT SPOT #6														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
6-1	W11-2 W16-7P(L)	PEDESTRIAN CROSSING (GRAPHIC) ↙	Identified on Google Earth (10/16)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 No proposed change	30 X 30 N/A	1 N/A	N/A	N/A	N/A	1	N/A	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel.	FHWA comment on draft plan	Sign panels appear to be consistent with MUTCD requirements. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
6-2	W11-2 W16-9P	PEDESTRIAN CROSSING (GRAPHIC) AHEAD	Identified on Google Earth (10/16)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 TRAIL X-ING W11-15P No proposed change	30 X 30 24 X 18 N/A	1 1 N/A	(1) 4" X 6"	20'-0"	N/A	1	1	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel and TRAIL X-ING sign panel.	FHWA comment on draft plan	Existing sign assembly is located approximately 135-ft upstream of Sign ID #6-1. This meets MUTCD spacing recommendations. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
6-3	W9-2	LANE ENDS MERGE RIGHT	Identified on Google Earth (10/16)	No Proposed Change	N/A	N/A	(1) 4" X 6"	16'-0"	1	N/A	1	Reinstall sign panel on new sign post in order to meet 7-ft mounting height requirement.	MUTCD Compliance Assessment	Existing sign assembly is located only approximately 60-ft upstream of Sign ID #6-2; if sight conditions allow, the MUTCD recommends a 100-ft minimum spacing between signs. However, location of gore does not allow for increased spacing. The sign panel includes an older style design of the word message arrow; however, it is compliant with the MUTCD.
6-4	N/A	N/A	N/A	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 ↘ W16-7P(R)	30 X 30 24 X 12	1 1	(1) 4" X 6"	18'-0"	N/A	N/A	N/A	Install new bicycle/pedestrian warning sign on left side of crosswalk.	Install pedestrian warning signs with arrows on both sides at "hot spots"	Crosswalk signage at this location is inconsistent with other "hot spots". Even though this approach only has one vehicular thru lane, additional warning signage on left side of roadway is also recommended.

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HOT SPOT 7

See Hot Spot #4

See Hot Spot #5

See Hot Spot #6

Potomac River

Hot Spot #7

See Hot Spot #9

SignID: 7-2

NonStd 24x42 (ex.)

Relocate sign downstream.

SignID: 7-10

Special Design 48x84 (new)

Install new gore sign with special design sign.

SignID: 7-3

Before / After

Special Design* (ex.)
W12-2 36x36 (new)

Relocate sign assembly upstream and install SignID 7-4 below sign panel.

SignID: 7-1

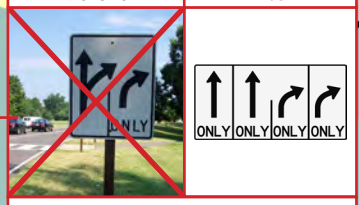
Before / After

Special Design* (ex.)
Overlay Panel (new)

Relocate sign assembly upstream and add "up" arrow overlay panel.

SignID: 7-5

Before / After



~~R3-8R 30x36 (ex.)~~
Special Design 36x72 (new)

Remove sign assembly and install two new special design signs downstream.

SignID: 7-4

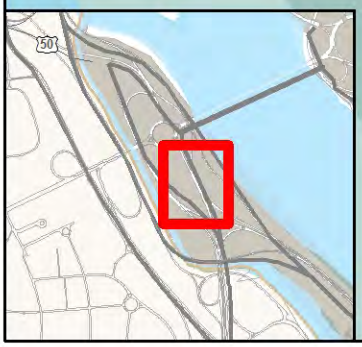
~~W12-2 36x36 (ex.)~~

Relocate sign panel below SignID 7-3 on the same sign post.

SignID: 9-1

R1-2 36x36x36 (ex.)
NonStd 30x30 (ex.)

Relocate sign assembly 25ft downstream.



*Sign panel identified on Google Earth (11/16)

GIS Mapping Center, Arlington County, VA

Hot Spot 7-A (At Hot Spot)

Memorial Circle Transportation Plan and Environmental Assessment
George Washington Memorial Parkway
United States Department of the Interior / National Park Service

Legend

- Existing Sign
- Sign to be Removed
- Sign to be Modified
- New Sign
- Hot Spots
- Study Area Boundary
- Sidewalks/Trails
- Existing Roadway
- Direction of Travel

North

0 20 40 80 Feet

NATIONAL PARK SERVICE

See Hot Spot #8

Potomac River

SignID: 7-7

~~R3-7 30x30 (ex.)~~

Remove sign assembly.

SignID: 7-6

Before	After
	

~~Special Design* (ex.)~~

Special Design 192x66 (new)

Remove sign assembly.
Replace with new sign panel.

SignID: 7-8

Special Design* (ex.)

No Change

SignID: 7-9

~~NonStd* (ex.)~~

Remove sign assembly.

See Hot Spot #10

*Sign panel identified on Google Earth (11/16)

GIS Mapping Center, Arlington County, VA

Hot Spot 7-B (S of Hot Spot)

Memorial Circle Transportation Plan and Environmental Assessment
George Washington Memorial Parkway
United States Department of the Interior / National Park Service

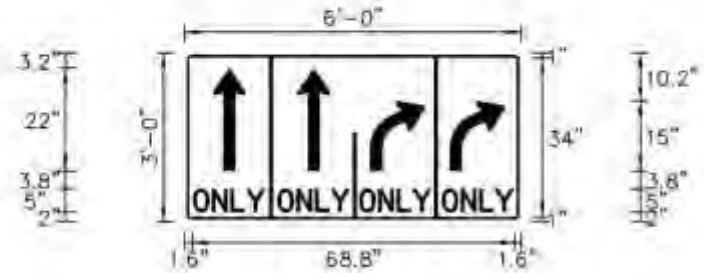
Legend

- Existing Sign
- Sign to be Removed
- Sign to be Modified
- New Sign
- Hot Spots
- Study Area Boundary
- Sidewalks/Trails
- Existing Roadway
- Direction of Travel

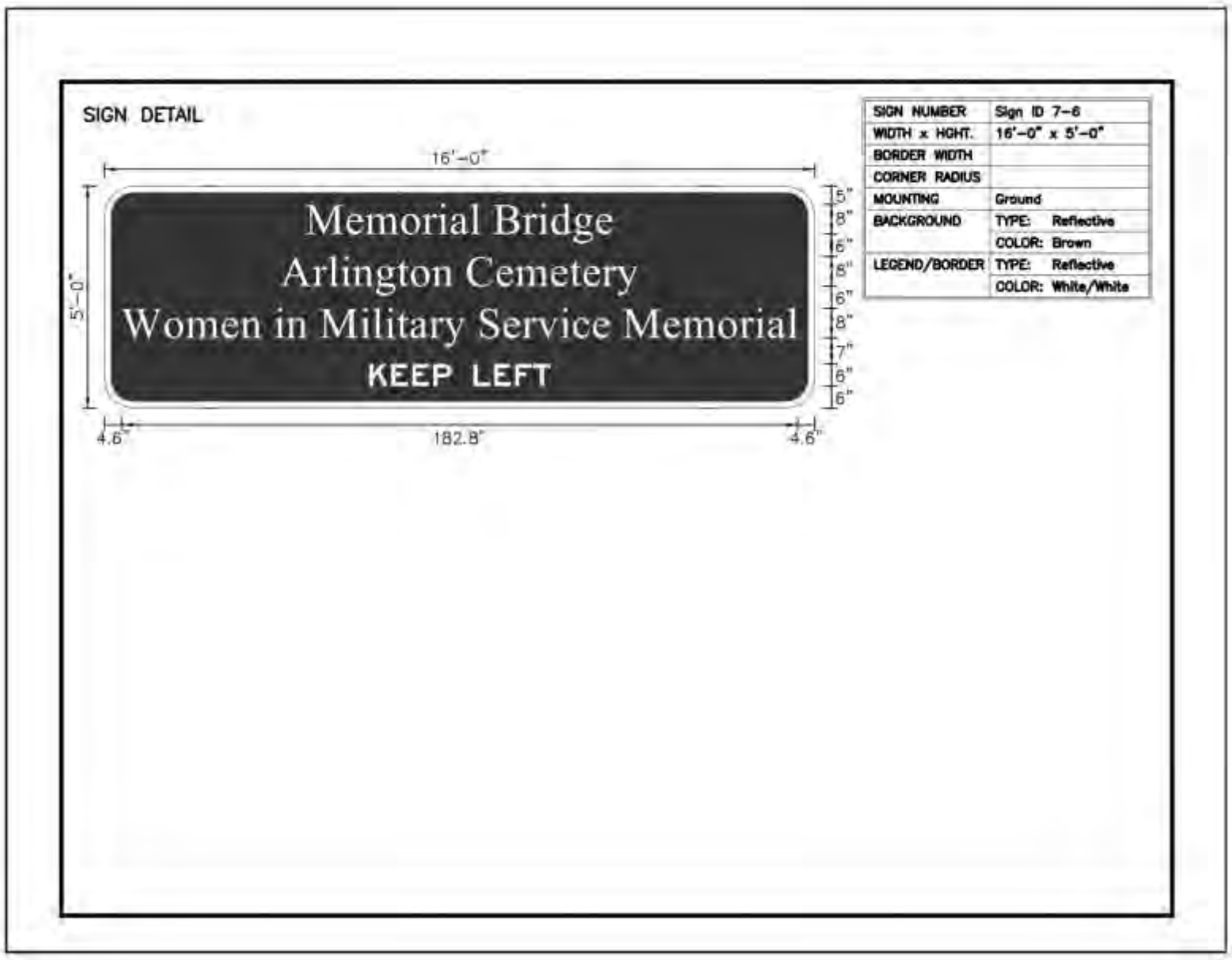
North

0 20 40 80 Feet

SIGN DETAIL



SIGN NUMBER	Sign ID 7-5
WIDTH x HGHT.	6'-0" x 3'-0"
BORDER WIDTH	
CORNER RADIUS	
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: White
LEGEND/BORDER	TYPE: Reflective
	COLOR: Black/Black


SIGN DETAIL
16'-0"
5'-0"
Memorial Bridge
Arlington Cemetery
Women in Military Service Memorial
KEEP LEFT
5"
8"
6"
8"
6"
8"
7"
6"
6"
4.6"
182.8"
4.6"
SIGN NUMBER
Sign ID 7-6
WIDTH x HGHT.
16'-0" x 5'-0"
BORDER WIDTH
CORNER RADIUS
MOUNTING
Ground
BACKGROUND
TYPE: Reflective
COLOR: Brown
LEGEND/BORDER
TYPE: Reflective
COLOR: White/White

SIGN DETAIL

SIGN NUMBER	Sign ID 7-10
WIDTH x HGHT.	4'-0" x 7'-0"
BORDER WIDTH	
CORNER RADIUS	
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Brown
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

HOT SPOT #7														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
7-1	SPECIAL DESIGN	↖ Memorial Bridge Arlington Cemetery	Identified on Google Earth (11/16)	↑ Memorial Bridge Arlington Cemetery OVERLAY PANEL	24 X 24 OVERLAY PANEL ("UP" ARROW)	1	(2) 6" X 8"	21' - 0" (EA)	1	N/A	2	Relocate existing sign panel approximately 160-ft upstream of existing location. Overlay existing sign panel with "up arrow" overlay sign panel.	Simplified signage	Existing location of guide sign is located near the "gore" area whereas other guide signs in the "hot spots" are typically located upstream of the "gore." Relocate sign assembly so the guide sign location is more consistent with other guide signs throughout the "hot spots". The guide sign currently includes an up arrow rotated at 45 degrees which typically would represent an "exit" condition which is inconsistent with the intent of this Hotspot (the right two lanes represent the "exit" lanes). Additionally, due to the recommended new location of the guide sign it is recommended to overlay the existing arrow with an overlay sign panel that includes a vertical "up" arrow.
7-2	R2-1 MODIFIED	SPEED LIMIT 25 RADAR ENFORCED	24 X 42	No Proposed Change	N/A	N/A	(1) 4" X 6"	17' - 0"	1	N/A	1	Relocate existing sign approximately 240-ft downstream on right side of roadway.	MUTCD Compliance Assessment	The MUTCD provides guidance that signs should be located on the right-hand side of the roadway where they are easily recognized and understood by road users. Signs in other locations are typically considered to be only as supplementary to signs in the normal locations. Sign panel size meets MUTCD required size for a multilane roadway since the speed limit is less than 35 MPH. It is recommended to move the SPEED LIMIT sign downstream of the existing weave area where it can be placed on the right side of the roadway.
7-3	SPECIAL DESIGN	50 WEST ↗ USMC War Mem Netherlands Carillon	Identified on Google Earth (11/16)	No Proposed Change 12'6" LOW CLEARANCE (See Sign ID #7-4)	N/A	N/A	(2) 6" X 8"	22' - 0" (EA)	1	N/A	2	Relocate existing sign approximately 40-ft upstream.	Simplified signage	Relocate sign assembly approximately 40-ft upstream to provide more sign spacing between sign assemblies with different messages as well as consistent sign spacing within Hotspot. See also recommendations for Sign ID #7-4.
7-4	W12-2	12' - 6" LOW CLEARANCE	36 X 36	No Proposed Change	36 X 36	1	N/A	N/A	N/A	N/A	N/A	Install missing W12-2 sign panel on sign post below Sign ID #7-3.	Simplified signage	Existing sign panel shown in 2007 NPS GIS database is no longer present on Google Earth (11/16). The existing sign location does not clearly identify which roadway has low clearance. The MUTCD guidance states that where the clearance is less than the legal maximum vehicle height, the W12-2 with a supplemental distance plaque should be placed at the nearest intersecting road at which a vehicle can detour or turn around. Therefore, it is recommended to reinstall this sign panel below Sign ID #7-3 to clearly show which roadway has the low-clearance.

HOT SPOT #7														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
7-5	R3-8R	THRU-LEFT OPTION | RIGHT-TURN ONLY (GRAPHIC)	30 X 36	THRU ONLY | THRU ONLY | RIGHT-TURN ONLY | RIGHT-TURN ONLY (GRAPHIC) R3-8 SPECIAL DESIGN	36 X 72	2	(1) 4" X 6"	14' - 0"	N/A	1	1	Remove existing sign panel. Install new sign panels with updated lane use on left and right sides of roadway approximately 230-ft downstream of existing location.	MUTCD Compliance Assessment	Existing sign panel does not match existing lane use. In order for vehicles in the left-lane to continue to GWMP Memorial Circle, they must make a lane change. Therefore, the left-lane is not an option lane, rather a mandatory turn lane. Remove existing sign assembly. Install new sign assemblies with correct lane use on the left and right sides of the roadway approximately 230-ft downstream from existing Sign ID #7-5 in order to align with the weave section.
7-6	SPECIAL DESIGN	Arlington Cemetery Military Womens Mem KEEP LEFT	Identified on Google Earth (11/16)	Memorial Bridge Arlington Cemetery Women in Military Service Memorial KEEP LEFT SPECIAL DESIGN	192 X 66	1	(2) 6″ X 8″	14′ - 0"	N/A	1	2	Replace sign panel with new sign panel in order to include Memorial Bridge message.	Simplified signage. Park comment on draft plan.	Guide sign location is consistent with other guide signs within the "hot spots". However, guide sign word message is inconsistent with other guide signs in this series. Information regarding Memorial Bridge is not included on the existing guide sign. Install new sign panel to provide consistent message to drivers. Word message change from "Military Womens Mem" to "Women in Military Service Memorial" was requested by the Park.
7-7	R3-7	RIGHT LANE MUST TURN RIGHT	30 X 30	N/A	N/A	N/A	N/A	N/A	N/A	1	1	Remove existing sign assembly in order to consolidate existing signage.	Simplified signage	Existing sign generally conforms to MUTCD requirements. However, the right lane is a mandatory exit lane - not a mandatory turn lane. Additionally, use of this sign is inconsistent with other "hot spots" as there are several locations with mandatory exit lanes that do not include similar signage.
7-8	SPECIAL DESIGN	50 WEST USMC War Mem Netherlands Carillon KEEP RIGHT	Identified on Google Earth (11/16)	-	-	-	-	-	-	-	-	No proposed changes.	-	Guide sign location and word message is consistent with other guide signs within the "hot spots".
7-9	SPECIAL DESIGN	Arlington Cemetery Military Womens Mem KEEP LEFT	Identified on Google Earth (11/16)	N/A	N/A	N/A	N/A	N/A	N/A	1	2	Remove existing sign assembly.	Simplified signage	Remove existing sign assembly based on the following rationale: 1) Existing guide sign assembly is redundant with Sign ID #7-6. Removing one of these sign assemblies will consolidate existing signage. 2) Existing sign assembly is located only approximately 40-ft upstream of Sign ID #7-8; if sight conditions allow, the MUTCD recommends a 100-ft minimum spacing between signs. 3) On examples of advance guide signs in the MUTCD, the KEEP RIGHT guide signs are typically placed in advance of the KEEP LEFT guide signs. The redundant downstream sign is located in the correct sequence based on driver expectation.

HOT SPOT #7														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
7-10	N/A	N/A	N/A	WEST 50 ↗ SPECIAL DESIGN	48 X 84	1	(1) 6" X 8"	20'-0"	N/A	1	1	Replace existing gore sign with route number and directional arrow gore sign.	Install ramp EXIT "gore" signs with directional arrows at "hot spots"	Proposed gore sign is designed using the gore signs shown on Figure 2D-15 of the MUTCD (page 169) as a template. Larger diagrammatic guide signs (such as that shown on Figure 2E-3, page 194) were not proposed since they are for overhead use only.
7-11	R1-2 NON ST'D	YIELD LEFT LANE MUST YIELD	36 X 36 X 36 30 X 30	No Proposed Change	No Proposed Change	No Proposed Change	(1) 4" X 6"	18'-0"	2	N/A	1	Relocate sign assembly approximately 25-ft downstream.	Aligned YIELD signs with triangular pavement markings at "hot spots"	Relocate sign assembly approximately 25-ft downstream to: 1) more closely align with existing yield line pavement markings, 2) provide more sign spacing between upstream existing Sign ID #9-2 (existing spacing is only 35-ft), and 3) still allow for 2-ft vehicle overhang from both directions of NB traffic.

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HOT SPOT 8

Potomac River

Hot Spot #8

See Hot Spot #7A

See Hot Spot #9

See Hot Spot #7B

See Hot Spot #10

SignID: 8-1

Before	After
	

~~W11-2* (ex.)~~
W11-15 30x30 (new)
RRFB (ex.)
W16-7P(L)* (ex.)

Replace Pedestrian Crossing sign with Combination Bike and Ped Crossing sign.

SignID: 8-2

Before	After
	

~~W11-2* (ex.)~~
W11-15 30x30 (new)
RRFB (ex.)
W16-7P(R)* (ex.)

Replace Pedestrian Crossing sign with Combination Bike and Ped Crossing sign.

SignID: 8-3

R1-5*

Reinstall sign panel at 7ft mounting height.

SignID: 8-4

R1-5*

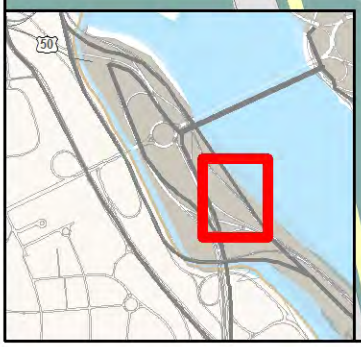
Reinstall sign panel at 7ft mounting height.

SignID: 8-5 & 8-6

Beore	After
	

~~W11-2* (ex.)~~
W11-15 30x30 (new)
W11-15P 24x18 (new)
W16-9P* (ex.)

Replace Pedestrian Crossing sign with Combination Bike and Ped Crossing sign with Trail Crossing plaque.



*Sign panel identified on Google Earth (10/16)

GIS Mapping Center, Arlington County, VA

Hot Spot 8

Memorial Circle Transportation Plan and Environmental Assessment
George Washington Memorial Parkway
United States Department of the Interior / National Park Service

Legend

- Existing Sign
- Sign to be Removed
- Sign to be Modified
- New Sign
- Hot Spots
- Study Area Boundary
- Sidewalks/Trails
- Existing Roadway
- Direction of Travel

North

0 20 40 80 Feet

HOT SPOT #8														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
8-1	W11-2 W16-7P(L)	PEDESTRIAN CROSSING (GRAPHIC) RRFB ↙	Identified on Google Earth (10/14)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 RRFB (no proposed change) No proposed change	30 X 30 N/A	1 N/A	N/A	N/A	N/A	1	N/A	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel.	FHWA comment on draft plan	Sign panels appear to be consistent with MUTCD requirements. The W16-7P includes an older style arrow, however it is compliant with the MUTCD. Additionally, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
8-2	W11-2 W16-7P(R)	PEDESTRIAN CROSSING (GRAPHIC) RRFB ↘	Identified on Google Earth (10/14)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 RRFB (no proposed change) No proposed change	30 X 30 N/A	1 N/A	N/A	N/A	N/A	1	N/A	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel.	FHWA comment on draft plan	Sign panels appear to be consistent with MUTCD requirements. The W16-7P includes an older style arrow, however it is compliant with the MUTCD. Additionally, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
8-3	R1-5(L)	YIELD HERE TO PEDESTRIANS	Identified on Google Earth (10/14)	No Proposed Change	N/A	No Proposed Change	(1) 4" X 6"	16'-0"	1	N/A	1	Reinstall sign panel on new sign post in order to meet 7-ft mounting height requirement.	MUTCD Compliance Assessment	Existing sign assembly is located approximately 50-ft upstream of Sign ID #8-2 and #8-3. This meets MUTCD spacing recommendations (20-ft to 50-ft).
8-4	R1-5(R)	YIELD HERE TO PEDESTRIANS	Identified on Google Earth (10/14)	No Proposed Change	N/A	No Proposed Change	(1) 4" X 6"	16'-0"	1	N/A	1	Reinstall sign panel on new sign post in order to meet 7-ft mounting height requirement.	MUTCD Compliance Assessment	Existing sign assembly is located approximately 50-ft upstream of Sign ID #8-2 and #8-3. This meets MUTCD spacing recommendations (20-ft to 50-ft).
8-5	W11-2 W16-9P	PEDESTRIAN CROSSING (GRAPHIC) AHEAD	Identified on Google Earth (10/14)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 TRAIL X-ING W11-15P No proposed change	30 X 30 24 X 18 N/A	1 1 N/A	(1) 4" X 6"	20'-0"	N/A	1	1	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel and TRAIL X-ING sign panel.	FHWA comment on draft plan	Existing sign assembly is located approximately 250-ft upstream of Sign ID #8-3 and #8-4. This meets MUTCD spacing recommendations. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
8-6	W11-2 W16-9P	PEDESTRIAN CROSSING (GRAPHIC) AHEAD	Identified on Google Earth (10/14)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 TRAIL X-ING W11-15P No proposed change	30 X 30 24 X 18 N/A	1 1 N/A	(1) 4" X 6"	20'-0"	N/A	1	1	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel and TRAIL X-ING sign panel.	FHWA comment on draft plan	Existing sign assembly is located approximately 250-ft upstream of Sign ID #8-3 and #8-4. This meets MUTCD spacing recommendations. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.

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HOT SPOT 9

Potomac River

See Hot Spot #7A

See Hot Spot #8

Hot Spot #9

SignID: 9-2

Before	After
	

~~W11-2 30x30 (ex.)~~
W11-15 30x30 (new)
W16-7P(R) 24x12 (ex.)

Replace Pedestrian Crossing sign with Combination Bike and Ped Crossing sign.

SignID: 9-1

Before	After
	

~~W11-2 30x30 (ex.)~~
W11-15 30x30 (new)
W16-7P(L) 24x12 (ex.)

Replace Pedestrian Crossing sign with Combination Bike and Ped Crossing sign.

SignID: 9-3 & 9-4

Before	After
	

~~W11-2* (ex.)~~
W16-9P* (ex.)
W11-15P (new)
W11-15 30x30 (new)

Replace Pedestrian Crossing sign with Combination Bike and Ped Crossing sign with Trail Crossing plaque.

*Sign panel identified on Google Earth (10/16)

GIS Mapping Center, Arlington County, VA

Hot Spot 9

Memorial Circle Transportation Plan and Environmental Assessment
George Washington Memorial Parkway
United States Department of the Interior / National Park Service

Legend

- Existing Sign
- Sign to be Removed
- Sign to be Modified
- New Sign
- Hot Spots
- Study Area Boundary
- Sidewalks/Trails
- Existing Roadway
- Direction of Travel

North

0 20 40 80 Feet

NATIONAL PARK SERVICE

HOT SPOT #9														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
9-1	W11-2 W16-7P(L)	PEDESTRIAN CROSSING (GRAPHIC) ↙	30 X 30 24 X 12	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 No proposed change	30 X 30 N/A	1 N/A	N/A	N/A	N/A	1	N/A	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel.	FHWA comment on draft plan	W-11 sign panel size is inconsistent with other W11-2 sign panels within the "hot spots". However, the sign panel meets MUTCD minimum size requirements for a multi-lane conventional roadway since sign panels are installed on both the right and left sides of the roadway. The W16-7P includes an older style arrow, however it is compliant with the MUTCD. Additionally, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
9-2	W11-2 W16-7P(R)	PEDESTRIAN CROSSING (GRAPHIC) ↘	30 X 30 24 X 12	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 No proposed change	30 X 30 N/A	1 N/A	N/A	N/A	N/A	1	N/A	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel.	FHWA comment on draft plan	W-11 sign panel size is inconsistent with other W11-2 sign panels within the "hot spots". However, the sign panel meets MUTCD minimum size requirements for a multi-lane conventional roadway since sign panels are installed on both the right and left sides of the roadway. The W16-7P includes an older style arrow, however it is compliant with the MUTCD. Additionally, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
9-3	W11-2 W16-9P	PEDESTRIAN CROSSING (GRAPHIC) AHEAD	Identified on Google Earth (10/16)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 TRAIL X-ING W11-15P No proposed change	30 X 30 24 X 18 N/A	1 1 N/A	(1) 4" X 6"	20'-0"	N/A	1	1	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel and TRAIL X-ING sign panel.	FHWA comment on draft plan	Existing sign assembly is located approximately 180-ft upstream of Sign ID #9-2 and #9-3. This meets MUTCD spacing recommendations. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.
9-4	W11-2 W16-9P	PEDESTRIAN CROSSING (GRAPHIC) AHEAD	Identified on Google Earth (10/16)	Combined Bicycle/Pedestrian (GRAPHIC) W11-15 TRAIL X-ING W11-15P No proposed change	30 X 30 24 X 18 N/A	1 1 N/A	(1) 4" X 6"	20'-0"	N/A	1	1	Replace Pedestrian Crossing sign panel with Combined Bicycle/Pedestrian sign panel and TRAIL X-ING sign panel.	FHWA comment on draft plan	Existing sign assembly is located approximately 180-ft upstream of Sign ID #9-2 and #9-3. This meets MUTCD spacing recommendations. However, the MUTCD allows the Combined Bicycle/Pedestrian sign to be used where both bicyclists and pedestrians might be crossing the roadway, such as at intersections with shared-use paths.

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HOT SPOT 10

Potomac River

Hot Spot #10

SignID: 10-1 & 10-2

Before	After
	

W3-2 36x36 (ex.)
W4-5P 18x24 (new)
Relocate two signs 375ft downstream. Install supplemental plaques.

SignID: 10-3

Before	After
	

~~W4-2 36x36 (ex.)~~
W4-2 36x36 (new)
Relocate sign assembly 225ft upstream and update panel to new W4-2 graphic.

SignID: 10-4

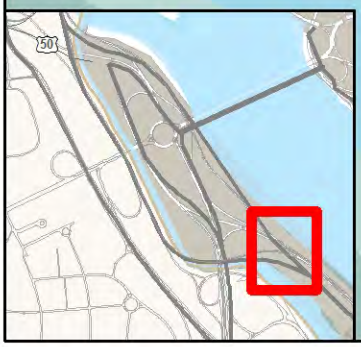
R1-2 30x30x30 (ex.)
No Change

SignID: 10-5

R1-2 30x30x30 (ex.)
No Change

SignID: 10-6

W4-1L 36x36 (ex.)
Relocate sign assembly 225ft upstream.



GIS Mapping Center, Arlington County, VA

Hot Spot 10

Memorial Circle Transportation Plan and Environmental Assessment
George Washington Memorial Parkway
United States Department of the Interior / National Park Service

Legend

- Existing Sign
- Sign to be Removed
- Sign to be Modified
- New Sign
- Hot Spots
- Study Area Boundary
- Sidewalks/Trails
- Existing Roadway
- Direction of Travel

North

0 20 40 80 Feet

HOT SPOT #10														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
10-1	W3-2	↑ YIELD (GRAPHIC)	36 X 36	↑ YIELD (GRAPHIC) W3-2 NO MERGE AREA W4-5P	N/A 18 X 24	N/A 1	(1) 4" X 6"	17' - 0"	1	N/A	1	Relocate sign assembly approximately 375-ft downstream and install new plaque.	MUTCD Compliance Assessment for Sign ID #10-3	Existing sign panel size is the "Oversized" MUTCD-required 36 X 36 sign panel size. For a posted speed limit of 25-mph, the MUTCD recommends YIELD AHEAD signs to be installed a minimum of 100-ft in advance of the yield. It is noted that some drivers may be able to access this location from roadways posted at 30-mph or 45-mph; the MUTCD recommends YIELD AHEAD signs to be installed a minimum of 100-ft and 175-ft, respectively, for these cases. The existing sign assembly meets all of these recommended locations (approximately 575-ft). However, due to the existing location of Sign ID #10-3 it is recommended to relocate the W3-2 sign panel downstream so it is approximately 200-ft in advance of the R1-2 YIELD signs - this will allow for Sign ID #10-3 to be moved upstream. Additionally, the MUTCD allows a "NO MERGE AREA" supplemental plaque to be mounted below a W3-2 sign for a yield-controlled movements entering onto a roadway without an acceleration lane that road users would expect an acceleration lane to be present. It is recommended to install the supplemental plaque for consistency with the "hot spots" (see Hotspot #1).
10-2	W3-2	↑ YIELD (GRAPHIC)	36 X 36	↑ YIELD (GRAPHIC) W3-2 NO MERGE AREA W4-5P	N/A 18 X 24	N/A 1	(1) 4" X 6"	17' - 0"	1	N/A	1	Relocate sign assembly approximately 375-ft downstream and install new plaque.	MUTCD Compliance Assessment for Sign ID #10-3	Existing sign panel size is the "Oversized" MUTCD-required 36 X 36 sign panel size. For a posted speed limit of 25-mph, the MUTCD recommends YIELD AHEAD signs to be installed a minimum of 100-ft in advance of the yield. It is noted that some drivers may be able to access this location from roadways posted at 30-mph or 45-mph; the MUTCD recommends YIELD AHEAD signs to be installed a minimum of 100-ft and 175-ft, respectively, for these cases. The existing sign assembly meets all of these recommended locations (approximately 575-ft). However, due to the existing location of Sign ID #10-3 it is recommended to relocate the W3-2 sign panel downstream so it is approximately 200-ft in advance of the R1-2 YIELD signs - this will allow for Sign ID #10-3 to be moved upstream. Additionally, the MUTCD allows a "NO MERGE AREA" supplemental plaque to be mounted below a W3-2 sign for a yield-controlled movements

HOT SPOT #10														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
														entering onto a roadway without an acceleration lane that road users would expect an acceleration lane to be present. It is recommended to install the supplemental plaque for consistency with the "hot spots" (see Hotspot #1).
10-3	W4-2	LANE ENDS (GRAPHIC)	36 X 36	LANE ENDS (GRAPHIC) Sign panel to be updated to new W4-2 graphic.	36 X 36	1	(1) 4" X 6"	14' - 0"	N/A	1	1	Relocate sign assembly approximately 225-ft upstream and update to new W4-2 panel type.	MUTCD Compliance Assessment	For a posted speed limit of 25-mph, the MUTCD recommends LANE ENDS signs to be installed 325-ft in advance of the lane reduction, but may be adjusted for site conditions. It is noted that some drivers may be able to access this location from roadways posted at 30-mph or 45-mph; the MUTCD recommends YIELD AHEAD signs to be installed a minimum of 460-ft and 775-ft, respectively, for these cases. The existing sign assembly location is approximately 350-ft in advance of the lane reduction, which only meets the MUTCD recommended distance for 25-mph. It is recommended to relocate the sign assembly approximately 225-ft upstream to maximum sign placement in advance of the lane ending since vehicles may be traveling at speeds greater than 25-mph. Site conditions will not allow the sign to be moved further upstream than the recommended 225-ft upstream distance. Additionally, the existing W4-2 sign is an older style graphic, therefore it is recommended to update the sign panel to the newer style.
10-4	R1-2	YIELD	30 X 30 X 30	-	-	-	-	-	-	-	-	No proposed changes.	-	Existing sign panel size is the "Minimum" MUTCD-required 30 X 30 X 30 sign panel size. For single-lane conventional roadways, the MUTCD minimum size for R2-1 signs is 36 X 36 X 36. Since "Minimum" sized sign panels are installed on both the left and right sides of roadway, the sign panels are consistent with MUTCD requirements.
10-5	R1-2	YIELD	30 X 30 X 30	-	-	-	-	-	-	-	-	No proposed changes.	-	Existing sign panel size is the "Minimum" MUTCD-required 30 X 30 X 30 sign panel size. For single-lane conventional roadways, the MUTCD minimum size for R2-1 signs is 36 X 36 X 36. Since "Minimum" sized sign panels are installed on both the left and right sides of roadway, the sign panels are consistent with MUTCD requirements.

HOT SPOT #10														
SIGN ID #	EXISTING			PROPOSED									RATIONALE	ADDITIONAL REMARKS
	MUTCD PANEL TYPE	SIGN MESSAGE	SIZE (INCHES) (W X H)	SIGN MESSAGE MUTCD PANEL TYPE	SIZE (INCHES) (W X H)	SIGN PANEL QUANTITY	# AND SIZE OF WOOD POSTS	POST LENGTH	# OF SIGN PANELS TO RELOCATE	# OF SIGN PANELS TO REMOVE	# OF SIGN POSTS TO REMOVE	RECOMMENDATION		
10-6	W4-1L	MERGE (GRAPHIC)	36 X 36	No Proposed Change	N/A	N/A	(1) 4" X 6"	16'-0"	1	N/A	1	Relocate sign panel approximately 225-ft upstream of existing location.	MUTCD Compliance Assessment	For a posted speed limit of 25-mph, the MUTCD recommends MERGE signs to be installed 325-ft in advance of the merge, but may be adjusted for site conditions. It is noted that some drivers may be able to access this location from roadways posted at 30-mph or 45-mph; the MUTCD recommends MERGE signs to be installed a minimum of 460-ft and 775-ft, respectively, for these cases. The existing sign assembly location is approximately 200-ft in advance of the merge, which does not meet any of these MUTCD recommended locations. It is recommended to relocate the sign assembly approximately 225-ft upstream to maximum sign placement in advance of the lane ending since vehicles may be traveling at speeds greater than 25-mph. Site conditions will not allow the sign to be moved further upstream than the recommended 225-ft upstream distance.

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CLASS C COST ESTIMATE

United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

BASIS OF ESTIMATE

PROJECT INFORMATION

Project:	Hot Spot Signage Recommendations
Park:	George Washington Memorial Parkway
Park Alpha:	GWMP
PMIS Number:	TBD
Estimate Date:	Apr-17
Prepared By:	JP
Company:	VHB
Address:	351 McLaws Circle, Suite 3
City, State Zip:	Williamsburg, VA 23185
Phone:	757.220.0500

BACKGROUND SUPPORTING MATERIAL (Scope of Work):

The draft Hot Spot Signage Recommendations were developed based on the signage solutions previously identified for implementation in the revised alternatives. The Hot Spot Signage Recommendations focus on the ten previously identified "hot spots" to include proposed recommendations and a review of existing signs general conformance with the 2009 Manual of Uniform Traffic Control Devices (MUTCD).

SOURCE OF COST DATA:

VDOT Northern Virginia District Averages (see attached), RS Means Site Work & Landscape Cost Data 2016

ESTIMATE ASSUMPTIONS:

Assumed the project will be advertised as competitive negotiation and not 8A contractors. It is also assumed that the work to be performed will be using local contractors.
Assumptions for specific Item Nos.: (1) Mobilization cost assumed using 2X the emergency mobilization cost. (2) Maintenance of traffic assumed from combination of MOT pay items, incl. TMA, channelizing devices, PCMS, arrow board, flagger service, inlet protection. (9) Remove sign panel is 75% of cost to relocate sign panel. Remaining Item Nos. are taken directly from VDOT NOVA item numbers.

MAJOR CHANGES FROM PREVIOUS ESTIMATE:

N/A

United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

BASIS OF ESTIMATE

PROJECT INFORMATION

Project: Hot Spot Signage Recommendations

Park: George Washington Memorial Parkway
Park Alpha: GWMP
PMIS Number: TBD
Estimate Date: Apr-17

DESCRIPTION OF MARK-UP & ADD-ONS:

Location Factor:	-1.50%	Washington DC, based on RS Means Site Work & Landscape Cost Data 2016
Remoteness Factor:	0.00%	NA
Wage Rate Factor:	0.00%	Wage rate is lower than national average, therefore 0.
State & Local Taxes:	5.75%	5.75% Washington, D.C. Sales Tax
Design Contingency:	25.00%	Appropriate for SD level cost estimate. Typical range for Class C Estimate is 15%-30%.
Standard, General Conditions:	10.00%	Relatively simple construction project with few it any additional trades. Job-site indirect costs should be minimal.
Government General Conditions:	8.00%	Appropriate for SD level cost estimate. Typical range is between 5%-10%
Historic Preservation Factor:	0.50%	Majority of the sign locations are not near or adjacent to cultural sites that would require protection/modificatication to the plan.
Contractor Overhead:	8.00%	
Contractor Profit:	10.00%	
Bonds and Permits:	2.00%	Typical range is between 1%-3%.
Contracting Method Adjustment:	5.00%	It is assumed that the contract will be bid as competitive negotiation and not 8A.
Annual Inflation Escalation Factor:	4.00%	Projected annual inflation rate.
Time Until Project Midpoint (Months)	12	Number of months from estimate (or data) date until the projects midpoint of construction.

OTHER COMMENTS:

Provide any additional information, qualifications, etc.

United States Department of the Interior
National Park Service
Class C Construction Cost Estimate

PROJECT COST SUMMARY

Project: Hot Spot Signage Recommendations
Park: George Washington Memorial Parkway
Alpha: GWMP
PMIS: TBD

Estimate By: JP
Date: 04/28/17

Reviewed By: Reviewer
Date: Review Date

Item No.	Description	Quantity	Unit	Cost/Unit	Total
1	Mobilization/Demobilization	1	LS	$30,000	$30,000
2	Maintenance of Traffic	1	LS	$5,000	$5,000
3	Sign Panel (Item 50108)	445	SF	$62	$27,590
4	Overlay Sign Panel (Item 50110)	4	SF	$88	$352
5	Sign Post - Wood 4" x 6" (Item 50204)	490	LF	$15	$7,350
6	Sign Post - Wood 6" x 8" (Item 50206)	175	LF	$27	$4,725
7	Concrete Foundation for Wood Post (Item 50817)	37	EA	$246	$9,102
8	Relocate Sign Panel (Item 50617)	11	EA	$200	$2,200
9	Remove & Dispose Sign Panel	34	EA	$150	$5,100
10	Remove & Dispose Wood Post/Foundation (Item 50867	38	EA	$531	$20,178
	Subtotal Direct Construction Costs				**$111,597**
	Value of Government Furnished Property (GFP) Included in Direct Cost (see footnote)*				$0
	Direct Cost Subtotal without GFP				$111,597
	Published Location Factor	-1.50%			-$1,674
	Remoteness Factor	0.00%			$0
	Federal Wage Rate Factor	0.00%			$0
	State & Local Taxes	5.75%			$6,417
	Design Contingency	25.00%			$27,899
	Total Direct Construction Costs				**$144,239**
	Standard General Conditions	10.00%			$14,424
	Government General Conditions	8.00%			$11,539
	Historic Preservation Factor	0.50%			$721
	Subtotal NET Construction Cost				**$170,923**
	Overhead	8.00%			$13,674
	Profit	10.00%			$17,092
	Estimated NET Construction Cost				**$201,690**
	Bonds & Permits	2.00%			$4,034
	Contracting Method Adjustment	5.00%			$10,084
	Inflation Escalation	12	Months	4.00%	$8,632
	Total Estimated NET Cost of Construction				**$224,440**

* GFP costs are only used when the Government pre-purchases items, or provides other materials out of Government inventory, to be installed by contractor. Adjustments and Markup on GFP only include Inflation Escalation; No other adjustment factors or O&P markup have been applied.

DISTRICT AVERAGES FEBRUARY 15, 2015 THROUGH FEBRUARY 15, 2017

ITEM	ITEM DESCRIPTION	UNIT	MINIMUM	MAXIMUM	AVERAGE	DISTRICT	
69639	DRY RIPRAP CL. II	TON	$ 70.00	$ 70.00	$ 70.00	LYNBG	69639
70012	CLOSE SEPTIC TANK	EA	$ 2,000.00	$ 2,000.00	$ 2,000.00	LYNBG	70012
70112	CAT II NF ACM	SF	$ 50.00	$ 50.00	$ 50.00	LYNBG	70112
70114	CAT I NF ACM	SF	$ 5.00	$ 5.00	$ 5.00	LYNBG	70114
00100	MOBILIZATION	LS	$ 10,000.00	$ 1,904,630.01	$ 250,000.44	NOVA	100
00101	CONSTRUCTION SURVEYING (CONSTR.)	LS	$ 2,000.00	$ 1,347,858.46	$ 108,901.61	NOVA	101
00102	CONSTRUCTION SURVEYING(MIN.-PLAN)	LS	$ 7,500.00	$ 92,500.00	$ 50,000.00	NOVA	102
00104	DESIGN BUILD	EA	$ 31,085,000.00	$ 45,482,021.00	$ 38,818,007.00	NOVA	104
00110	CLEARING AND GRUBBING	LS	$ 2,500.00	$ 2,424,914.51	$ 446,297.12	NOVA	110
00120	REGULAR EXCAVATION	CY	$ 21.74	$ 200.00	$ 25.84	NOVA	120
00124	ROCK EXCAVATION	CY	$ 125.00	$ 220.00	$ 148.75	NOVA	124
00125	GRADING	LS	$ 9,500.00	$ 106,000.00	$ 59,458.33	NOVA	125
00140	BORROW EXCAVATION	CY	$ 1.00	$ 50.00	$ 5.09	NOVA	140
00143	BORROW EXCAVATION MIN. CBR-30	CY	$ 75.00	$ 75.00	$ 75.00	NOVA	143
00150	EMBANKMENT	CY	$ 24.00	$ 200.00	$ 27.32	NOVA	150
00211	MINOR STR. EXCAV., PIPE CULVERT	CY	$ 9.00	$ 50.00	$ 10.91	NOVA	211
00212	MINOR STR. EXCAV., BOX CULVERT	CY	$ 18.43	$ 18.43	$ 18.43	NOVA	212
00270	SELECT MATL. TY. I MIN. CBR-30	TON	$ 26.22	$ 50.00	$ 26.26	NOVA	270
00272	SELECT MATL. TY. I MIN. CBR-30	CY	$ 51.32	$ 156.76	$ 55.06	NOVA	272
00355	GEOTEXTILE (SUBGRADE STAB.)	SY	$ 1.15	$ 6.00	$ 1.26	NOVA	355
00504	BED.MAT.FINE AGR.OR AGGR.NO.8	TON	$ 75.00	$ 75.00	$ 75.00	NOVA	504
00505	BEDDING MATL.AGGR.NO. 25 OR 26	TON	$ 26.80	$ 40.00	$ 28.14	NOVA	505
00522	CONCRETE CLASS A4 BOX CULVERT	CY	$ 1,430.03	$ 1,430.03	$ 1,430.03	NOVA	522
00525	CONCRETE CLASS A3 MISC.	CY	$ 250.00	$ 3,500.00	$ 866.24	NOVA	525
00529	FLOWABLE BACKFILL	CY	$ 200.00	$ 1,250.00	$ 229.71	NOVA	529
00540	REINF. STEEL	LB	$ 1.27	$ 10.00	$ 2.69	NOVA	540
00585	UNDERDRAIN UD-2	LF	$ 20.63	$ 20.63	$ 20.63	NOVA	585
00587	UNDERDRAIN UD-3	LF	$ 9.72	$ 9.72	$ 9.72	NOVA	587
00588	UNDERDRAIN UD-4	LF	$ 6.84	$ 16.24	$ 9.17	NOVA	588
00590	COMB. UNDERDRAIN CD-1	LF	$ 13.54	$ 16.39	$ 16.08	NOVA	590
00591	COMB. UNDERDRAIN CD-2	LF	$ 8.26	$ 50.00	$ 17.25	NOVA	591
00595	OUTLET PIPE	LF	$ 10.93	$ 100.00	$ 20.09	NOVA	595
00596	ENDWALL EW-12	EA	$ 497.14	$ 1,800.00	$ 918.00	NOVA	596
00700	POST INSTALLATION INSPECTION	LF	$ 2.30	$ 300.00	$ 3.77	NOVA	700

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DISTRICT AVERAGES FEBRUARY 15, 2015 THROUGH FEBRUARY 15, 2017

ITEM	ITEM DESCRIPTION	UNIT	MINIMUM	MAXIMUM	AVERAGE	DISTRICT	
17352	STRUT AND YOKE ASSEMBLY GR-7	EA	$ 1.00	$ 118.00	54.87	NOVA	17352
17355	POST S3X5.7 GR-3	EA	$ 1.00	$ 2.00	1.67	NOVA	17355
17357	END POST CAPS, GR-3	EA	$ 1.00	$ 2.00	1.67	NOVA	17357
17361	HOOK BOLTS, GR-3	EA	$ 1.00	$ 2.00	1.67	NOVA	17361
17371	RE-TENSION EXIST. CABLE GUARDRAIL, GR-3	EA	$ 2.00	$ 250.00	24.55	NOVA	17371
17374	EMERGENCY MOBILIZATION	EA	$ 15,000.00	$ 15,000.00	15,000.00	NOVA	17374
17381	POST(BENT PLATE OR S3X5.7 STEEL) GR-8	EA	$ 50.00	$ 91.30	64.08	NOVA	17381
17385	42" DIA. CONCRETE FOOTING GR-8	EA	$ 200.00	$ 200.00	200.00	NOVA	17385
17451	GUARDRAIL DELINEATOR	EA	$ 1.00	$ 10.00	6.05	NOVA	17451
21020	MEDIAN STRIP MS-1	SY	$ 114.00	$ 114.00	114.00	NOVA	21020
21110	MEDIAN STRIP MS-1A	SY	$ 97.75	$ 135.00	120.26	NOVA	21110
21215	MEDIAN STRIP MS-2	LF	$ 34.50	$ 35.00	34.55	NOVA	21215
22501	FENCE FE-W1	LF	$ 100.00	$ 175.00	121.32	NOVA	22501
22643	FENCE FE-CL	LF	$ 15.37	$ 75.40	18.73	NOVA	22643
22645	FENCE FE-CL VINYL COATED	LF	$ 78.53	$ 78.53	78.53	NOVA	22645
22653	LINE BRACE UNIT FE-CL	EA	$ 114.07	$ 130.00	118.62	NOVA	22653
22663	CORNER BRACE UNIT FE-CL	EA	$ 120.06	$ 145.00	127.80	NOVA	22663
22665	CORNER BR.UNIT FE-CL VINYL COATED	EA	$ 232.00	$ 232.00	232.00	NOVA	22665
22674	GATE FE-CL L=3'	EA	$ 870.00	$ 870.00	870.00	NOVA	22674
22677	GATE FE-CL L=14'	EA	$ 1,140.63	$ 1,140.63	1,140.63	NOVA	22677
22909	GATE FE-G L=14'	EA	$ 1,200.00	$ 1,200.00	1,200.00	NOVA	22909
23560	TEMP. SAFETY FENCE 4'	LF	$ 2.88	$ 10.00	3.56	NOVA	23560
24100	ALLAYING DUST	HR	$ 1.00	$ 125.00	59.87	NOVA	24100
24150	TYPE III BARRICADE 4'	EA	$ 270.00	$ 750.00	425.33	NOVA	24150
24152	TYPE III BARRICADE 8'	EA	$ 63.44	$ 750.00	257.74	NOVA	24152
24160	CONSTRUCTION SIGNS	SF	$ 0.01	$ 50.00	7.13	NOVA	24160
24260	CR. RUN AGGR. NO. 25 OR 26	TON	$ 38.00	$ 73.00	52.77	NOVA	24260
24272	TRUCK MOUNTED ATTENUATOR	HR	$ 0.10	$ 120.00	11.58	NOVA	24272
24278	GROUP 2 CHANNELIZING DEVICES	DAY	$ 0.01	$ 8.00	0.49	NOVA	24278
24279	PORT.CHANGEABLE MESS. SIGN	HR	$ 0.01	$ 30.00	2.06	NOVA	24279
24281	ELECTRONIC ARROW	HR	$ 0.01	$ 22.50	4.07	NOVA	24281
24282	FLAGGER SERVICE	HR	$ 1.00	$ 75.00	22.12	NOVA	24282
24288	WARNING LIGHT TY. B	DAY	$ 25.00	$ 25.00	25.00	NOVA	24288
24290	TRAFFIC BARRIER SER. CONC.	LF	$ 5.80	$ 50.00	8.08	NOVA	24290

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DISTRICT AVERAGES FEBRUARY 15, 2015 THROUGH FEBRUARY 15, 2017

ITEM	ITEM DESCRIPTION	UNIT	MINIMUM	MAXIMUM	AVERAGE	DISTRICT	
27325	SOIL STAB. MAT EC-3 TYPE A	SY	$ 2.41	$ 13.92	3.22	NOVA	27325
27326	SOIL STAB. MAT EC-3 TYPE B	SY	$ 2.41	$ 40.00	27.79	NOVA	27326
27345	TEMPORARY DIVERSION DIKE	LF	$ 2.30	$ 18.56	7.50	NOVA	27345
27410	CHECK DAM, ROCK TY. I	EA	$ 353.81	$ 2,000.00	657.66	NOVA	27410
27415	CHECK DAM(ROCK) TY. II	EA	$ 300.00	$ 782.00	416.34	NOVA	27415
27422	DEWATERING BASIN	EA	$ 1,765.00	$ 7,500.00	1,784.58	NOVA	27422
27430	SILTATION CONTROL EXCAVATION	CY	$ 1.00	$ 60.32	8.61	NOVA	27430
27440	MOWING	HR	$ 5.75	$ 5.75	5.75	NOVA	27440
27451	INLET PROTECTION , TYPE A	EA	$ 185.00	$ 880.00	316.81	NOVA	27451
27461	INLET PROTECTION , TYPE B	EA	$ 166.75	$ 650.00	221.50	NOVA	27461
27500	GEOTEXTILE FABRIC	SY	$ 1.76	$ 20.00	11.43	NOVA	27500
27505	TEMP. SILT FENCE	LF	$ 1.00	$ 11.00	2.84	NOVA	27505
27506	TEMP. FILTER BARRIER	LF	$ 1.90	$ 10.00	2.63	NOVA	27506
27545	STORM WATER MAN. BASIN EXCAV.	CY	$ 2.81	$ 32.00	10.14	NOVA	27545
27550	STORM WATER MAN.DRAIN.STR.SWM	LF	$ 930.84	$ 2,400.00	1,232.72	NOVA	27550
27580	TEMP. SEDIMENT BASIN EXCAVATION	CY	$ 3.50	$ 3.50	3.50	NOVA	27580
28811	REMULCHING	CY	$ 64.00	$ 105.00	100.73	NOVA	28811
28820	WATERING	UNIT	$ 180.00	$ 2,250.00	245.45	NOVA	28820
28864	VEGETATION CONTROL	UNIT	$ 2,610.50	$ 3,700.00	3,518.42	NOVA	28864
29083	EASTERN REDBUD 1.0" CAL.	EA	$ 92.00	$ 92.00	92.00	NOVA	29083
29122	FRINGETREE 0.75" CAL.	EA	$ 80.50	$ 80.50	80.50	NOVA	29122
30058	RED MAPLE 2.50" CAL.	EA	$ 207.00	$ 207.00	207.00	NOVA	30058
30488	AMERICAN SWEETGUM 2.50" CAL.	EA	$ 207.00	$ 207.00	207.00	NOVA	30488
30558	BLACK GUM 2.50" CA..	EA	$ 207.00	$ 207.00	207.00	NOVA	30558
30667	WHITE OAK 2.0" CAL.	EA	$ 195.50	$ 195.50	195.50	NOVA	30667
30707	SCARLET OAK 2.0" CAL	EA	$ 195.50	$ 195.50	195.50	NOVA	30707
30757	WILLOW OAK 2.0" CAL.	EA	$ 907.00	$ 907.00	907.00	NOVA	30757
30767	NORTHERN RED OAK 2.0" CAL.	EA	$ 784.00	$ 784.00	784.00	NOVA	30767
30832	COMMON SASSAFRAS 0.75" CAL.	EA	$ 92.00	$ 92.00	92.00	NOVA	30832
30887	COMMON BALD CYPRESS 2.0" CAL	EA	$ 195.50	$ 195.50	195.50	NOVA	30887
32132	EASTERN REDCEDAR 5'	EA.	$ 358.00	$ 358.00	358.00	NOVA	32132
32144	EASTERN REDCEDAR 8'	EA	$ 172.50	$ 172.50	172.50	NOVA	32144
32304	VIRGINIA PINE 8'	EA	$ 172.50	$ 172.50	172.50	NOVA	32304
33025	RED CHOKEBERRY 4'	EA	$ 43.70	$ 43.70	43.70	NOVA	33025

DISTRICT AVERAGES FEBRUARY 15, 2015 THROUGH FEBRUARY 15, 2017

ITEM	ITEM DESCRIPTION	UNIT	MINIMUM	MAXIMUM	AVERAGE	DISTRICT	
41820	FIRE HYDRANT	EA	$ 4,800.00	$ 8,500.00	$ 6,206.46	NOVA	41820
41828	ADJ.EXIST.WATER MANHOLE FRAME & COVE	EA	$ 5,000.00	$ 5,000.00	$ 5,000.00	NOVA	41828
41970	5/8" WATER METER & BOX	EA	$ 1,968.23	$ 1,968.23	$ 1,968.23	NOVA	41970
41971	3/4" WATER METER & BOX	EA	$ 4,849.72	$ 4,849.72	$ 4,849.72	NOVA	41971
41972	1" WATER METER & BOX	EA	$ 4,890.38	$ 4,890.38	$ 4,890.38	NOVA	41972
41974	1 1/2" WATER METER & BOX	EA	$ 4,667.74	$ 4,667.74	$ 4,667.74	NOVA	41974
41976	RELOC. EXIST. WATER METER & BOX	EA	$ 2,000.00	$ 2,000.00	$ 2,000.00	NOVA	41976
41977	ADJUST EXIST. WATER METER BOX	EA	$ 419.75	$ 475.00	$ 430.80	NOVA	41977
42044	4" SANITARY SERVICE LATERAL CONNECTION	LF	$ 83.38	$ 83.38	$ 83.38	NOVA	42044
42080	8" SAN. SEWER PIPE	LF	$ 99.76	$ 99.76	$ 99.76	NOVA	42080
42082	8" DI SANITARY SEWER PIPE	LF	$ 131.10	$ 131.10	$ 131.10	NOVA	42082
42120	12" SAN. SEWER PIPE	LF	$ 147.49	$ 147.49	$ 147.49	NOVA	42120
42160	16" SAN. SEWER PIPE	LF	$ 164.74	$ 164.74	$ 164.74	NOVA	42160
42712	12" SANITARY DROP CONNECTION	LF	$ 2,866.49	$ 2,866.49	$ 2,866.49	NOVA	42712
42755	SANITARY SEWER MANHOLE	LF	$ 548.55	$ 548.55	$ 548.55	NOVA	42755
42758	MANHOLE FRAME & COVER WF & C-1	EA	$ 637.39	$ 637.39	$ 637.39	NOVA	42758
42764	MANHOLE FRAME & COVER F&C-1	EA	$ 556.49	$ 800.00	$ 565.19	NOVA	42764
42765	ADJUST EXIST FRAME & COVER	EA	$ 259.90	$ 1,350.00	$ 1,025.79	NOVA	42765
42771	RECONSTRUCT EXISTING SANITARY MANHOLE	LF	$ 770.50	$ 770.50	$ 770.50	NOVA	42771
42845	4" SEWER CLEANOUT	EA	$ 1,094.51	$ 1,094.51	$ 1,094.51	NOVA	42845
45505	CONNECT TO EXIST. A/C PIPE	EA	$ 2,500.00	$ 2,500.00	$ 2,500.00	NOVA	45505
45506	REMOVE EXIST. A/C PIPE	LF	$ 55.00	$ 55.00	$ 55.00	NOVA	45506
45562	16" STEEL ENCASE. PIPE	LF	$ 120.18	$ 120.18	$ 120.18	NOVA	45562
50012	ROAD EDGE DELINEATOR, ED-2	EA	$ 55.00	$ 55.00	$ 55.00	NOVA	50012
50108	SIGN PANEL	SF	$ 15.00	$ 66.12	$ 61.77	NOVA	50108
50110	OVERLAY SIGN PANEL	SF	$ 87.87	$ 87.87	$ 87.87	NOVA	50110
50204	SIGN POST WOOD 4"	LF	$ 15.00	$ 15.00	$ 15.00	NOVA	50204
50206	SIGN POST WOOD 6"	LF	$ 26.42	$ 26.42	$ 26.42	NOVA	50206
50404	SIGN POST STEEL 4"	LF	$ 226.20	$ 226.20	$ 226.20	NOVA	50404
50406	SIGN POST STEEL 6"	LF	$ 221.85	$ 221.85	$ 221.85	NOVA	50406
50410	SIGN POST STEEL 10"	LF	$ 220.40	$ 220.40	$ 220.40	NOVA	50410
50412	SIGN POST STEEL 12"	LF	$ 150.00	$ 203.00	$ 199.24	NOVA	50412
50414	SIGN POST STEEL 14"	LF	$ 232.00	$ 232.00	$ 232.00	NOVA	50414
50430	SIGN POST STP-1, 2"	LF	$ 4.00	$ 48.03	$ 25.91	NOVA	50430

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DISTRICT AVERAGES FEBRUARY 15, 2015 THROUGH FEBRUARY 15, 2017

ITEM	ITEM DESCRIPTION	UNIT	MINIMUM	MAXIMUM	AVERAGE	DISTRICT	
50432	SIGN POST STP-1, 2 3/16"	LF	$ 22.00	$ 369.80	209.33	NOVA	50432
50434	SIGN POST STP-1, 2 1/2"	LF	$ 40.00	$ 67.23	50.91	NOVA	50434
50490	CONCRETE FOUNDATION STP-1	EA	$ 125.00	$ 600.00	246.36	NOVA	50490
50502	CONC.FOUND.SSP-V A 1'9" DIA.X 4'6" D	EA	$ 1,711.00	$ 1,711.00	1,711.00	NOVA	50502
50506	CONC.FOUND.SSP-VI A 2'3" DIA.X 4'6"	EA	$ 4,785.00	$ 4,785.00	4,785.00	NOVA	50506
50510	CONC.FOUND.SSP-VI A 2'9" DIA.X 4'6"	EA	$ 1,500.00	$ 1,500.00	1,500.00	NOVA	50510
50524	CONC.FOUND.SSP-VI A 3'0" DIA.X 6' DE	EA	$ 5,510.00	$ 5,510.00	5,510.00	NOVA	50524
50528	CONC.FOUND.SSP-VI A 3'0" DIA.X 7' DE	EA	$ 5,887.00	$ 5,887.00	5,887.00	NOVA	50528
50575	CONC.FOUND.O/H SIGN STRUCTURE	CY	$ 3,393.00	$ 3,393.00	3,393.00	NOVA	50575
50613	RELOC.EXIST.SIGN - STRUCT.TY.VA	EA	$ 319.00	$ 319.00	319.00	NOVA	50613
50614	RELOC.EXIST.SIGN - STRUCT.TY.VIA	EA	$ 14,500.00	$ 14,500.00	14,500.00	NOVA	50614
50617	RELOC.EXIST.SIGN - STR.TY.WP-1	EA	$ 200.00	$ 200.00	200.00	NOVA	50617
50663	REM.SALVAGE SIGN STRUCT.TY.VA	EA	$ 2,117.00	$ 2,117.00	2,117.00	NOVA	50663
50664	REM.SALVAGE SIGN STRUCT.TY.VIA	EA	$ 5,220.00	$ 5,220.00	5,220.00	NOVA	50664
50667	REM.SALVAGE SIGN STR.TY.WP-1	EA	$ 1,044.00	$ 1,044.00	1,044.00	NOVA	50667
50668	REM.SALVAGE SIGN STR.TY.WP-2	EA	$ 2,088.00	$ 2,088.00	2,088.00	NOVA	50668
50702	REM.SAL.O/H STR.& LGTS.TY.CS-1	EA	$ 17,608.80	$ 17,608.80	17,608.80	NOVA	50702
50759	RELOC.EXIST.SIGN PANEL TY.SP-1	EA	$ 150.00	$ 650.00	457.31	NOVA	50759
50761	RELOC.EXIST.SIGN PANEL TY.SP-2	EA	$ 1,281.80	$ 1,281.80	1,281.80	NOVA	50761
50762	RELOC.EXIST.SIGN PANEL TY.SP-3	EA	$ 7,714.00	$ 7,714.00	7,714.00	NOVA	50762
50860	REM.-DISPOSE SIGN STRUCT.TY.I	EA	$ 130.00	$ 1,065.00	359.09	NOVA	50860
50863	REM.-DISPOSE SIGN STR. TY. V A	EA	$ 1,711.00	$ 1,711.00	1,711.00	NOVA	50863
50864	REM.-DISPOSE SIGN STR.TY. VI A	EA	$ 3,538.00	$ 3,538.00	3,538.00	NOVA	50864
50867	REM.-DISPOSE SIGN STR.TY. WP-1	EA	$ 130.00	$ 638.00	530.75	NOVA	50867
50868	REM.-DISPOSE SIGN STR.TY. WP-2	EA	$ 870.00	$ 870.00	870.00	NOVA	50868
50881	REM.DIS.SIGN TY.SP-1 FROM O/H ST	EA	$ 525.00	$ 21,199.00	13,582.26	NOVA	50881
50882	REM.DIS.SIGN TY.SP-2 FROM O/H ST	EA	$ 21,199.00	$ 21,199.00	21,199.00	NOVA	50882
50883	REM.DIS.SIGN TY.SP-3 FROM O/H ST	EA	$ 23,084.00	$ 23,084.00	23,084.00	NOVA	50883
50884	REM.DIS.SIGN TY.SP-4 FROM O/H ST	EA	$ 26,680.00	$ 26,680.00	26,680.00	NOVA	50884
50885	REM.DIS.SIGN TY.SP-5 FROM O/H ST	EA	$ 29,000.00	$ 29,000.00	29,000.00	NOVA	50885
51137	INSTALL CONTROLLER	EA	$ 4,025.00	$ 4,025.00	4,025.00	NOVA	51137
51160	ELEC.SERV.GROUNDING ELECTRODE (10')	EA	$ 120.00	$ 465.00	253.44	NOVA	51160
51162	FLASHING BEACON FB-2	EA	$ 9,000.00	$ 9,000.00	9,000.00	NOVA	51162
51170	ELECTRICAL SERVICE SE-5	EA	$ 4,485.00	$ 4,485.00	4,485.00	NOVA	51170

Page 72 of 157

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GWMP SIGN MEMO

Memorandum

To: David Vela, Superintendent

From: Kate Barrett, GWMP Sign Coordinator

Through: Garth Shull, Chief of Technical Services

Date: January 4, 2008

RE: Sign Program for Letter Heights

As stated in the introduction to the UniGuide "Signs are perhaps the most frequently used means of communicating with park visitors. Entrance signs offer greetings, welcoming visitors and reminding them that the place they are entering is part of a system of parks cared for by the National Park Service. Other signs guide visitors as they travel to or within parks, informing them of potential dangers, helping them to understand and appreciate what they encounter, reminding them of their role in caring for parks, directing them to various events and facilities, and helping them have a pleasant stay." Although the UniGuide summarizes the standards that apply to the development of new signs, the park has an obligation to implement the standards so that they are consistent with the NPS Management Policies and with the legislation that created the George Washington Memorial Parkway.

The purpose of the Parkway (ideal and legislation) was to create a memorial to George Washington by constructing an attractive Parkway that would preserve the scenery of the Potomac River Gorge and shoreline. Designers of the original Mount Vernon Memorial Highway portion of the GWMP and later extensions saw existing roads lined with industrial sites, trash dumps, billboard signs, trailer parks, and a host of other unsightly features that they wished to remedy.

As is often the case with the many directives within the NPS and those adopted by the NPS from outside agencies, there is a gray area for contradiction with NPS Management Policies and Mission when it comes to implementing these directives. The NPS and GWMP Sign Programs guidance is a case in point, whereby they provide certain direction for sign sizing that would cause a level of visual intrusion to the landscape and viewsheds of the Parkway.

The following is a summary of the relevant documents that relate to signage within the park and the recommendations for implementing the standards.

CURRENT SIGN STANDARDS

According to 23 CFR Part 655, the Manual on Uniform Traffic Control Devices (MUTCD) is "…the national standard for all traffic control installed on any street, highway, or bicycle trail open to public travel". The Federal Highway Administration (FHWA) has determined that the NPS UniGuide is in "substantial conformance" with the MUTCD as stated in the Memorandum of Understanding (MOU) between FHWA and NPS signed in 2006. The definition of "substantial conformance", from 23 CFR Part 655, means that we follow the minimum standards statements in the MUTCD unless the FHWA administrator determines that "the non-conformance does not create a safety concern." That determination would require documentation provided by NPS. In order to substantiate the safety of using alternative typefaces, for example, a comprehensive study was conducted by Pennsylvania State University.

The UniGuide varies from the standards set forth in the MUTCD only in the areas of sign colors, typefaces, and the design of park entrance signs. The standards for letter heights, along with the quantity of text on a sign, are what determine the overall size of a particular sign.

According to the MUTCD, all signs north of Alexandria should have letters a minimum of 8" cap height. The only signs that currently meet this standard are at the interchanges with I-395 and I-495. Most of the signs are below standard having a 6" cap height.

On the south parkway, all the signs should have a 6" cap height. In this section we have many that meet this standard, but a few are sub-standard at 4" cap height.

PREVIOUS SIGN STANDARDS

The MOU signed in 2006 replaced one from 1973. From 1973 to 2006, the signs along the parkway should have been formatted using the same letter heights that we are to follow today, so they have been sub-standard for some time. In addition to using the smaller letter heights many signs show variations in the width of borders, the spacing between letters, and the spacing between lines of text. These variations may have been a method for reducing sign sizes due to the views and the cultural landscape or they might just reflect the changes in personnel over time.

IMPLEMENTATION OPTIONS

1. Following the current standards as stated in the MOU:

If we were to follow the current standards including an 8" cap height on the north parkway and 6" for the entire south section of the parkway, we will have substantially larger signs than what currently exists. Just changing the text from 6" to 8" would increase a sign by 78%. This assumes that the 6" cap height sign had the correct spaces between letters, lines of text and border. As mentioned before, many signs don't have that, so the actual increase would be more.

2. Following the current formatting standards with cap heights consistent with what exists:

This is what we have been doing for the past two years. In general, the new signs are larger than the existing for two reasons:

- The UniGuide format has more clear space than the previous signs.
- Spacing between letters and lines of text and clear area around the text has been modified by past sign designers.

3. Implementing #2 above but adding additional zones with lower cap heights

This is the proposed implementation option.

NEXT STEPS

If implementation option 2 or 3 is selected, they are an exception to the standards found in the MOU and require some type of waiver. 23 CFR 655 states that the administrator of FHWA can determine that the non-conformance does not create a safety concern after a study has been done. Since our agreement with FHWA is an agency agreement, this avenue would require an agency to agency approach.

Rather than the above we could use the avenue found in Director's Order 52C, Section 6. It states "Use of the standards in cultural landscapes, historic districts, and backcountry and wilderness areas will be moderated by the special nature of these areas and in accordance with established policies and practices."

This approach is also supported by the NPS Management Policies (2006). Section 9.2.3 of the policies states that "Signs will be limited to the minimum necessary to meet information, warning, and regulatory needs and to avoid confusion and visual intrusion" and Section 9.3.1.1 states that "Each park should have an approved parkwide sign plan based on Service-wide design criteria and tailored to meet individual park needs" and "Signs will be held to the minimum number, size, and wording required to serve their intended functions and to minimally intrude upon the natural and historic settings. They

will be placed where they do not interfere with park visitors' enjoyment and appreciation of park resources."

The current practice of using 6" letter heights in the north section of the parkway and 4"-6" in the south section could be considered to be "in accordance with established policies and practices." The records show that we have been using these letter heights starting in the late 1990's. The practice of modifying the size of borders and line and letter spacing also occurred during this period.

RECOMMENDATIONS

Currently, existing signs are significantly smaller than the standards. The standards are based on studies that have determined what letter size and spacing will "give road users enough time to read and comprehend the sign" based on speed limits and sight distances. These determinations were not focused on the convenience of drivers but on their safety. Signs that are hard to read or are only briefly visible can distract drivers and create unsafe conditions. For these reasons large sections of the parkway with signs formatted using smaller letters is not recommended.

The proposal is that we limit the 5" letter height to the guide signs between the I-395 and I-66 interchanges This idea is in keeping with the intent of the design of Columbia Island roads to capture views of Washington DC. In the 1994 HABS documentation project, they refer to the roadway on the island as a "circulation system that was designed in part to slow down motorists so they would appreciate these views at a more leisurely pace."

The MUTCD recognizes that interchanges create less certainty for drivers and suggests that letter heights adjacent to interchanges be increased to a minimum of 10.6". These are the primary areas where a large letter size is most necessary because drivers change lanes and make decisions in a limited amount of time. Using a text height of 8" in these interchange areas would probably offer the best balance between the standards and preserving the cultural landscape.

In summary, the proposal is to apply the following standards for the Parkway:

LOCATION	LETTER HEIGHT
Mt Vernon Circle	5”
M V Circle to I-395	6”
I-395 Interchange*	8”
Between I-395 to I-66	5”
I-66 Interchange*	8”
I-66 to I-495	I-66 to I-495
Clara Barton Parkway	6”

*For one sign in advance of ramps

APPENDIX C: RELEVANT CORRESPONDENCE

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COOPERATING AGENCY LETTERS

On August 1, 2014, the National Park Service (NPS) distributed letters to the following recipients inviting their agencies to be cooperating agencies for the Memorial Circle safety improvements project:

- Dennis Leach, Deputy Director of Transportation, Arlington County Department of Environmental Services
- Matthew T. Brown, Acting Director, District Department of Transportation
- Melisa Ridenour, Division Engineer, Federal Highway Administration—Eastern Federal Lands Highway Division
- Christine Sam, Director, Urban Design and Plan Review Division, National Capital Planning Commission
- Helen L. Cuervo, P.E., NOVA District Administrator, Virginia Department of Transportation

The following letter serves as an example of the letters sent to the above recipients. With the exception of the recipient, the content of each letter was the same.

United States Department of the Interior

NATIONAL PARK SERVICE
George Washington Memorial Parkway
c/o Turkey Run Park
McLean, Virginia 22101

IN REPLY REFER TO:
1.A.2. (GWMP)

August 1, 2014

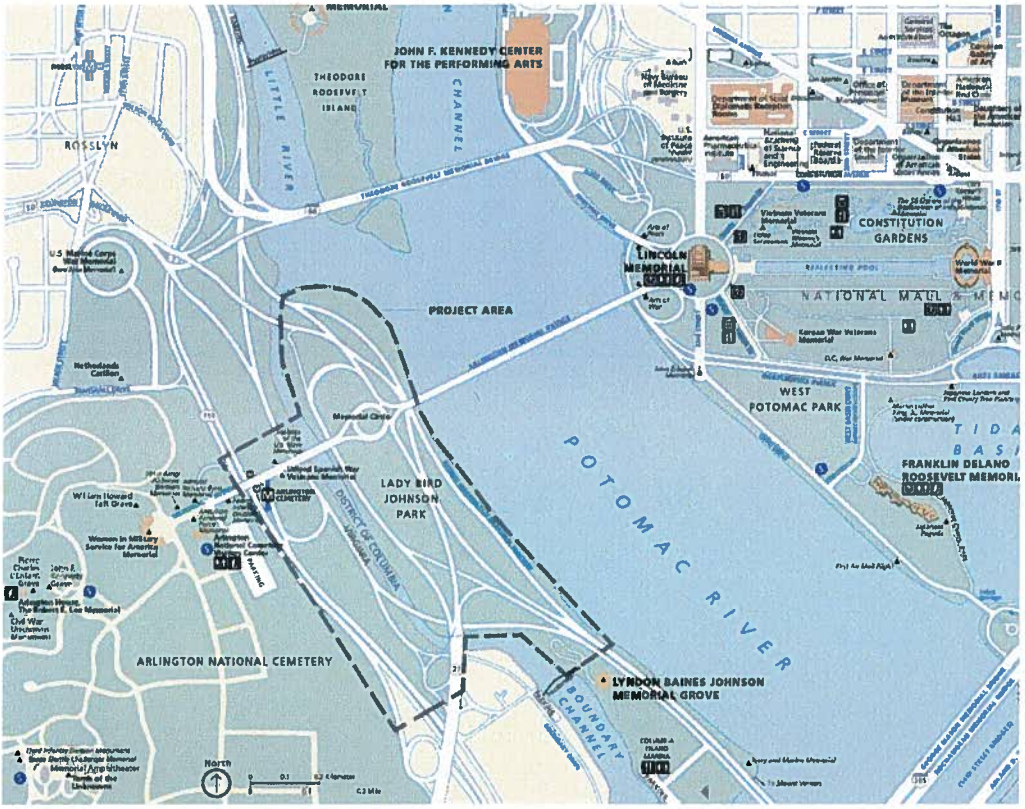
Dennis Leach
Deputy Director of Transportation
Arlington County Department of Environmental Services
2100 Clarendon Boulevard, Suite 900
Arlington, VA 22201

Dear Mr. Leach:

Per the National Environmental Policy Act (NEPA) P.L. 91-190 U.S.C 4321, and the Council of Environmental Quality (CEQ) Regulations §1501.5 and 1501.6. The National Park Service (NPS) would like to invite you to participate as a cooperating agency in the environmental assessment (EA) process regarding the Memorial Circle Transportation Planning and Environmental Assessment. This request is based on your agency's expertise in transportation planning and visitor services. This memo serves as a formal request and outlines roles and responsibilities of Arlington County in the capacity of a cooperating agency.

The EA would evaluate site schematic alternatives to improve the Memorial Circle area (see project area map) within the George Washington Memorial Parkway (GWMP). The purpose of the improvements is to substantially reduce conflicts between trail, walkway and roadway users and increase visitor safety, while maintaining historical and cultural context and adequate level of service for vehicles, pedestrians, and bicyclists. The National Park Service is the lead agency on the project and is responsible for general oversight associated with planning, alternative development and environmental compliance. Your agency's involvement as a cooperating agency should entail those areas within your expertise in transportation planning and visitor services.

Should your agency choose to assume cooperating agency status, you would have the opportunity to provide early input on the environmental assessment and would be a part of the NPS internal review team responsible for preparing and reviewing the EA. If you choose to be a cooperating agency, please provide us with the name, phone number and email address to the point of contact for your agency.



Project Area Map

We look forward to your response to this request and your role as a cooperating agency on this project. If you have any questions or would like to discuss the project or our agencies' respective roles and responsibilities during the preparation of the NEPA document, please contact GWMP's superintendent Alex Romero at (703) 289-2500.

Sincerely,

Alexcy Romero
Superintendent

Cc:
Kate Barrett, GWMP
Tammy Stidham, NCR
Linda Macintyre, DSC

COOPERATING AGENCY RESPONSE LETTERS

The following letters were received in response to the August 1, 2014 NPS invitation to be cooperating agencies. The following agencies accepted the invitation:

- Federal Highway Administration—Eastern Federal Lands Highway Division
- Virginia Department of Transportation
- National Capital Planning Commission

U.S. Department of Transportation
Federal Highway Administration

Eastern Federal Lands
Highway Division

21400 Ridgetop Circle
Sterling, VA 20166-6511

AUG 13 2014 In Reply Refer to: HFPP-15

Alex Romero
Superintendent
George Washington Memorial Parkway
c/o Turkey Run Park
McLean, VA 22101

Subject: Request to be a Cooperating Agency for the Preparation of the Memorial Circle Transportation Planning and Environmental Assessment (EA)

Dear Mr. Romero:

This letter is in response to your request dated August 1, 2014, for the Eastern Federal Lands Highway Division (EFLHD) to participate as a cooperating agency during the preparation of the Memorial Circle Transportation Planning and EA proposed by the National Park Service (NPS). EFLHD agrees to participate as a cooperating agency during the preparation of the EA for the project.

EFLHD intends to work as a cooperating agency within the limit of our resources to help define the scope of analysis, identify sources of information and to offer input on those areas within our expertise in transportation planning. We look forward to being part of the team working on this EA.

If you have any questions about this letter or EFLHD's involvement in the EA process, please contact Ms. Lisa Landers, Environmental Protection Specialist, at (571) 434-1592 or Ms. Norah Ocel, Highway Safety Engineer, at (703) 948-1405.

Sincerely,

Kevin S. Rose
Environmental Compliance Specialist

cc:
Ms. Kate Barrett, GWMP, NPS
Ms. Tammy Stidham, NCR, NPS
Ms. Linda Macintyre, DSC, NPS

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
4975 Alliance Drive
Fairfax, VA 22030

CHARLES A. KILPATRICK, P.E.
COMMISSIONER

August 13, 2014

Alexcy Romero, Superintendent
George Washington Memorial Parkway
National Park Service
U.S. Department of the Interior
c/o Turkey Run Park
McLean, VA 22101

Dear Alexcy:

Helen Cuervo has asked me to thank you for and respond your letter of August 1, 2014, inviting the Virginia Department of Transportation (VDOT) to participate as a cooperating agency in the environmental assessment (EA) process regarding the Memorial Circle Transportation Planning and Environmental Assessment.

VDOT would like to participate as a cooperating agency. Hari K. Sripathi, P.E., our Northern Regional Operations Director, will be the point of contact. He can be reached at (703) 259-2223 or hari.sripathi@vdot.virginia.gov.

Sincerely,

Renée N. Hamilton

Renée N. Hamilton
Deputy District Administrator
Northern Virginia District

Copy: Helen L. Cuervo, P.E.
Hari K. Sripathi, P.E.

National Capital Planning Commission 401 9th Street, NW North Lobby, Suite 500 Washington, DC 20004 Tel: 202.482.7200 Fax: 202.482.7272 www.ncpc.gov

IN REPLY REFER TO:
NCPC File #7611

September 8, 2014

Alexcy Romero, Superintendent
National Park Service
George Washington Memorial Parkway
c/o Turkey Run Park
McLean, Virginia 22101

Re: Invitation to Participate as a Cooperating Agency, Memorial Circle Transportation Planning and Environmental Assessment

Dear Mr. Romero:

I am writing to accept your invitation for the National Capital Planning Commission (NCPC) to participate as a cooperating agency in the Memorial Circle Transportation Planning and Environmental Assessment (EA) process. According to your letter, the National Park Service (NPS) is preparing the EA in accordance with National Environmental Policy Act (NEPA) and Council of Environmental Quality (CEQ) regulations to evaluate site improvements for the Memorial Circle area within the George Washington Memorial Parkway. The study purpose is to substantially reduce conflicts between trail, walkway, and roadway users and to increase visitor safety, while preserving the location's historic and cultural context and maintaining an adequate level of service for vehicles, pedestrians, and bicyclists.

As stated in your invitation, NCPC is being invited to be a cooperating agency based on the agency's expertise in Comprehensive Planning for the National Capital Region (NCR). As the central planning agency for the federal government, NCPC has a particular interest in the continued growth, expansion, and improvement of transportation systems throughout the NCR for all travel modes. Due to the nature of the project, NCPC staff appreciates your efforts to improve the area in a manner that eliminates conflicts and maintains adequate levels of service, while preserving local historical and cultural resources. As part of our cooperating agency role, NCPC staff would appreciate the opportunity to participate in all future Section 106 consultation meetings with relevant state historic preservation officials.

The NCPC point of contact for this project will be Michael Weil, who can be reached at (202) 482-7253 or michael.weil@ncpc.gov.

Sincerely,

Shane L. Dettman, Director
Urban Design and Plan Review Division

cc: Kate Barrett, GWMP
Tammy Stidham, NCR
Linda Macintyre, DSC

PUBLIC AND AGENCY SCOPING LETTERS

On September 15, 2014, the NPS distributed letters to the following recipients during the public and agency scoping period, requesting initial input on the project:

- Reid Nelson, Director, Federal Agency Programs, Advisory Council on Historic Preservation
- Dennis Leach, Deputy Director of Transportation, Arlington County Department of Environmental Services
- Steve Cole, Director, Arlington County Planning Commission
- Patrick Hallinan, Executive Director, Army National Military Cemeteries, Arlington National Cemetery
- David Maloney, State Historic Preservation Officer, DC Office of Planning
- Kanti Srikanth, Metropolitan Washington Council of Governments
- Christine Saum, Director, Urban Design and Plan Review Division
- Leopoldo Miranda, US Fish and Wildlife Service
- Robert Lee Walker, VA Department of Game and Inland Fisheries
- Julie Langan, VA Department of Historic Resources

The following letter serves as an example of the letters sent to the above recipients. With the exception of the recipient, the content of each letter was the same. An Area of Potential Effect (APE) map, included after the sample letter, was attached to the letters sent to the Advisory Council on Historic Preservation, the DC State Historic Preservation Officer, and the VA Department of Historic Resources. Federal- and state-listed species reports, included after the APE map, were attached to the letters sent to the US Fish and Wildlife Service and the VA Department of Game and Inland Fisheries.

United States Department of the Interior

NATIONAL PARK SERVICE
George Washington Memorial Parkway
Turkey Run Park
McLean, VA 22101

IN REPLY REFER TO:
1.A.1 (GWMP)

September 15, 2014

Mr. Steve Cole
Director
Arlington County Planning Commission
5429 N. Carlin Springs Rd.
Arlington, VA 22203

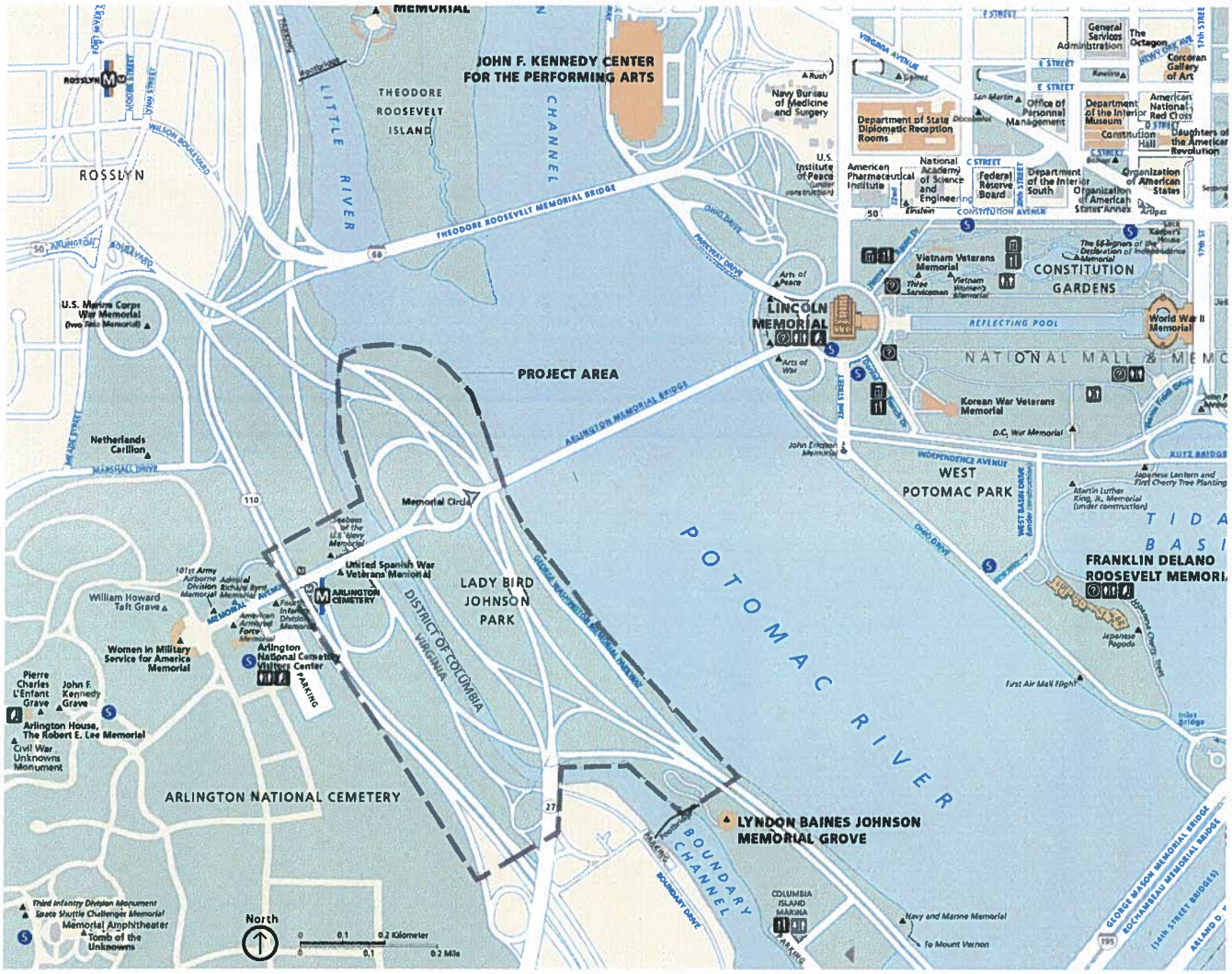
Dear Mr. Cole:

The National Park Service (NPS) is starting a Transportation Plan and Environmental Assessment (EA) for the Memorial Circle area of the George Washington Memorial Parkway (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. The project area is shown on the attached figure.

The project area is heavily used by motorists, cyclists, and pedestrians both for recreation and for commuting, and other local travel as well as special events, such as funeral processions en route to Arlington National Cemetery. The Mount Vernon Trail travels through the project area along the waterfront, contributing greatly to the bicycle and pedestrian use within the circle. The heavy use of the roads, bridges, trails, and sidewalks within the project area contribute to a number of safety concerns, especially at the six un-signalized, crosswalks within the vicinity of the circle.

To comply with the provisions of the National Environmental Policy Act (NEPA), the plan/EA is being prepared to assess potential impacts on natural and cultural resources. This letter serves as notification that George Washington Memorial Parkway has begun the NEPA compliance process and is proposing to have an EA available for public and regulatory review in the spring of 2016.

Between August 15 and September 30, 2014, the park is soliciting scoping comments from interested agencies, groups, and individuals. Information regarding the current status of this project is available through the NPS Planning, Environment, and Public Comment (PEPC) website at http://parkplanning.nps.gov/gwmp.

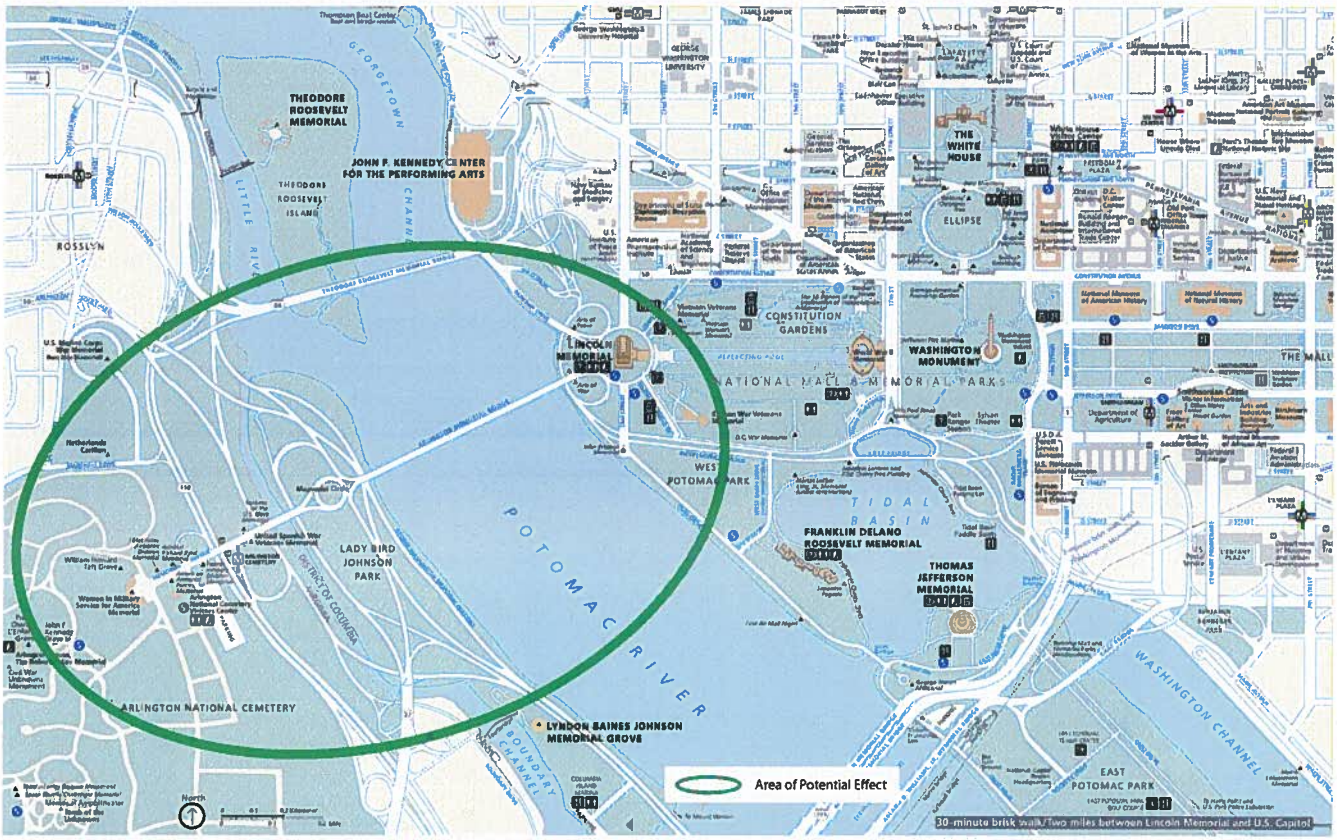


Project Area Map

We appreciate your initial input on this project and look forward to working with you as we move forward. We will be holding an informational meeting specifically for agency stakeholders in the near future. Once a date is finalized, we will notify you of the opportunity. If you would like any additional information regarding this project, please contact Kate Barrett by telephone at 703-419-6426 or by email at kate_barrett@nps.gov.

Sincerely,

for Alexcy Romero
Superintendent



Area of Potential Effect

U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

Virginia Ecological Services Field Office
6669 SHORT LANE
GLOUCESTER, VA 23061
(804) 693-6694
http://www.fws.gov/northeast/virginiafield/

Chesapeake Bay Ecological Services Field Office
177 ADMIRAL COCHRANE DRIVE
ANNAPOLIS, MD 21401
(410) 573-4599

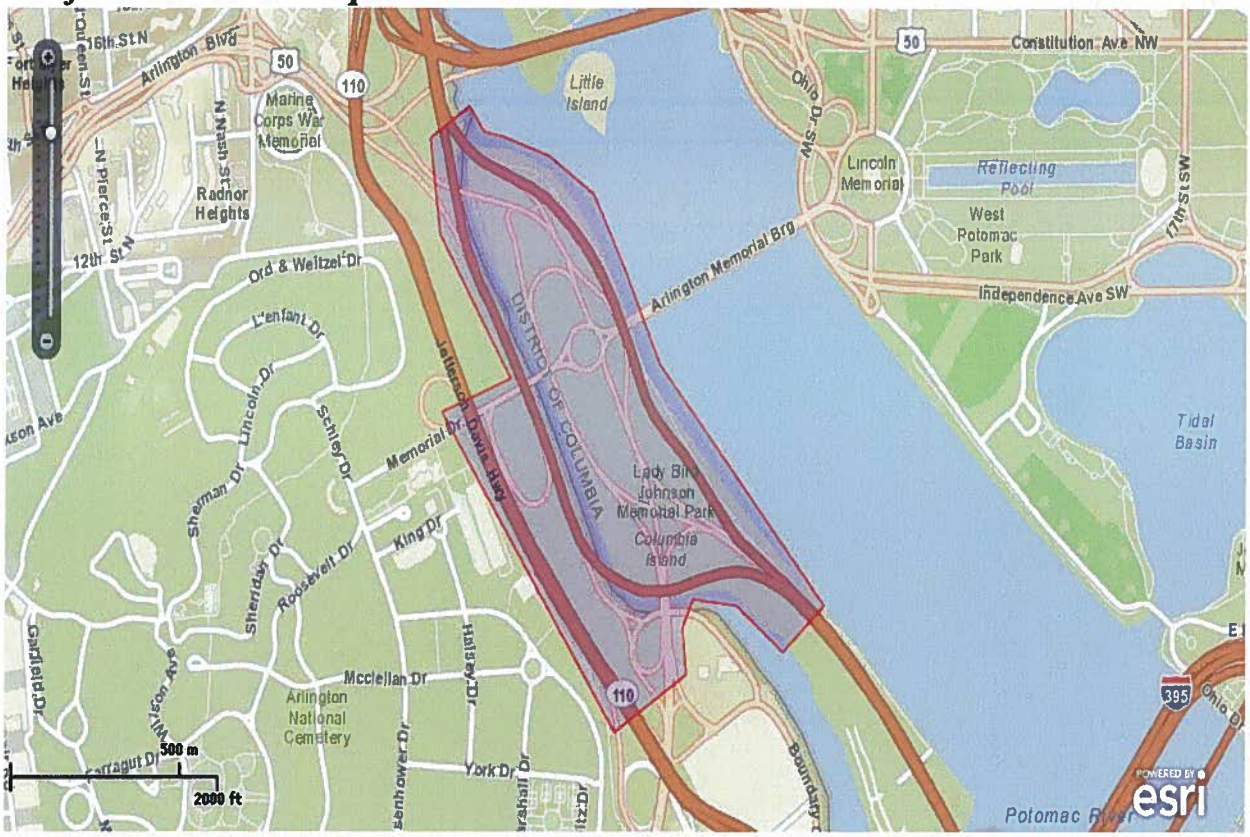
Project Name:

GWMP TransPlan/EA

U.S. Fish and Wildlife Service

Natural Resources of Concern

Project Location Map:



Project Counties:

District of Columbia, DC | Arlington, VA

Geographic coordinates (Open Geospatial Consortium Well-Known Text, NAD83):

MULTIPOLYGON (((-77.0652707 38.8900784, -77.0639403 38.8907448, -77.0634253 38.8902086, -77.0627816 38.8901084, -77.0611937 38.8897076, -77.0596488 38.8889059, -77.058533 38.8872691, -77.0573743 38.885365, -77.0517094 38.8803206, -77.0531256 38.8793518, -77.0547135 38.8803206, -77.0562155 38.8804542, -77.0565589 38.8798529, -77.0564301 38.8788841, -77.0588763 38.8776813, -77.0648415 38.8843628, -77.0624812 38.8850644, -77.0649274 38.8880708, -77.0652707 38.8900784)))

Project Type:

Transportation

U.S. Fish and Wildlife Service

Natural Resources of Concern

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of 1 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

Species that should be considered in an effects analysis for your project:

Flowering Plants	Status		Has Critical Habitat	Contact
sensitive joint-vetch (*Aeschynomene virginica*)	Threatened	species info		Virginia Ecological Services Field Office

Critical habitats within your project area:

There are no critical habitats within your project area.

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program).

There are no refuges found within the vicinity of your project.

FWS Migratory Birds (USFWS Migratory Bird Program).

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bald eagles and golden eagles receive additional protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668). The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

Migratory bird information is not available for your project location.

U.S. Fish and Wildlife Service

Natural Resources of Concern

NWI Wetlands (USFWS National Wetlands Inventory).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

The following wetlands intersect your project area:

Wetland Types	NWI Classification Code	Approximate Acres
Riverine	R1USN	0.371059
Riverine	R1USN	3.179585
Lake	L1UBH	58.633935
Riverine	R1UBV	16371.812281

VaFWIS Search Report Compiled on 4/9/2014, 7:54:57 AM

Help

Known or likely to occur within a **3 mile radius around point 38,53,08.4 -77,03,36.7** in **013 Arlington County, VA**

View Map of Site Location

473 Known or Likely Species ordered by Status Concern for Conservation (displaying first 20) (19 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name
010032	FESE	II	Sturgeon, Atlantic	Acipenser oxyrinchus
040129	ST	I	Sandpiper, upland	Bartramia longicauda
100155	FSST	I	Skipper, Appalachian grizzled	Pyrgus wyandot
050022	FP		Bat, northern long-eared	Myotis septentrionalis
010038	FC	IV	Alewife	Alosa pseudoharengus
100248	FS	I	Fritillary, regal	Speyeria idalia idalia
040093	FS	II	Eagle, bald	Haliaeetus leucocephalus
100154	FS	II	Butterfly, Persius duskywing	Erynnis persius persius
030063	CC	III	Turtle, spotted	Clemmys guttata
040225		I	Sapsucker, yellow-bellied	Sphyrapicus varius
040319		I	Warbler, black-throated green	Dendroica virens
040038		II	Bittern, American	Botaurus lentiginosus
040052		II	Duck, American black	Anas rubripes
040213		II	Owl, northern saw-whet	Aegolius acadicus
040105		II	Rail, king	Rallus elegans
040320		II	Warbler, cerulean	Dendroica cerulea
040304		II	Warbler, Swainson's	Limnothlypis swainsonii
040266		II	Wren, winter	Troglodytes troglodytes
070020		II	Amphipod, Pizzini's	Stygobromus pizzinii
030068		III	Turtle, eastern box	Terrapene carolina carolina

To view **All 473 species** View 473

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; CC=Collection Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Anadromous Fish Use Streams (2 records)

View Map of All Anadromous Fish Use Streams

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE*	Highest Tier**	
C25	Fourmile run	Confirmed	2			Yes
C64	Potomac river	Confirmed	6	FC	IV	Yes

Impediments to Fish Passage

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests (1 records)

View Map of All Query Results Bald Eagle Nests

Nest	N Obs	Latest Date	DGIF Nest Status	View Map
AR0801	6	Feb 28 2010	RECENTLY ACTIVE	Yes

Displayed 1 Bald Eagle Nests

Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

Habitat Predicted for Terrestrial WAP Tier I & II Species (2 Species)

View Map of Combined Terrestrial Habitat Predicted for 2 WAP Tier I & II Species Listed Below

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
040038		II	Bittern, American	Botaurus lentiginosus	Yes
040105		II	Rail, king	Rallus elegans	Yes

Virginia Breeding Bird Atlas Blocks (4 records)

View Map of All Query Results
Virginia Breeding Bird Atlas Blocks

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE*	Highest Tier**	
54192	Alexandria, NE	32		II	Yes
54191	Alexandria, NW	58	FS	II	Yes
54203	Washington West, CW	28		IV	Yes
54205	Washington West, SW	65		IV	Yes

Public Holdings: (5 names)

Name	Agency	Level
Arlington House National Historical Site	National Park Service	Federal
George Washington Memorial National Parkway	National Park Service	Federal
Arlington National Cemetary	U.S. Dept. of Army	Federal
Fort Myer Military Reservation	U.S. Dept. of Army	Federal
The Pentagon	U.S. Dept. of Army	Federal

Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
013	Arlington	458	FESE	I

USGS 7.5' Quadrangles:
Alexandria
Washington West

USGS NRCS Watersheds in Virginia:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL24	Potomac River-Pimmit Run	64	FCST	I
PL25	Potomac River-Fourmile Run	63	FCST	I

Compiled on 4/9/2014, 7:54:57 AM V536212.0 report=V searchType= R dist= 4828.032 poi= 38,53,08.4 -77,03,36.7

PUBLIC AND AGENCY SCOPING RESPONSE LETTERS

The following letters were received in response to the September 15, 2014 letters requesting input during the public and agency scoping period.

Barrett, Kate <kate_barrett@nps.gov>

ESSLog 35178; Transportation Plan and Environmental Assessment for the Memorial Circle Area in Arlington, VA/Washington, DC area

1 message

Aschenbach, Ernie (DGIF) <Ernie.Aschenbach@dgif.virginia.gov> Fri, Oct 3, 2014 at 12:43 PM
To: "kate_barrett@NPS.gov" <kate_barrett@nps.gov>, "troy_andersen@fws.gov" <troy_andersen@fws.gov>, "vdotprojects (DCR)" <vdotprojects@dcr.virginia.gov>, "nhreview (DCR)" <nhreview@dcr.virginia.gov>
Cc: "ProjectReview (DGIF)" <ProjectReview@dgif.virginia.gov>, "Cason, Gladys (DGIF)" <Gladys.Cason@dgif.virginia.gov>

We have reviewed the cover-letter announcing the above-referenced preliminary scoping of the Transportation Plan and Environmental Assessment for the Memorial Circle Area of the George Washington Memorial Parkway in Arlington. NEPA scoping request. Scope is crosswalk, safety improvements within existing previously disturbed right of way. Instream work is not mentioned.

Based on the project scope, location, and aerial map, we do not anticipate the proposed transportation safety improvements within existing right of way to result in adverse impact to resources under our purview, provided adherence to the following recommendations.

We recommend strict adherence to erosion and sediment (E&S) controls during all land-disturbing activity. This project is located within 2 miles of a documented occurrence of a state or federal threatened or endangered plant or insect species and/or other Natural Heritage coordination species. Therefore, we recommend & support coordination with VDCR-DNH regarding the protection of these resources. We also recommend & support contacting the USFWS regarding federally listed species.

If instream work and/or wetland impacts become necessary, we anticipate a Joint Permit Application (JPA) will be distributed for agency review. We will review and provide comments at that time, as appropriate. We recommend strict adherence to E&S controls as applicable.

Thanks.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries

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City of Alexandria, Virginia
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William D. Euille
Mayor

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Fax: (703) 838-6433
william.euille@alexandriava.gov

October 14, 2014

Alexcy Romero, Superintendent
Turkey Run Park
700 George Washington Memorial Parkway
McLean, VA 22101

Re: Memorial Circle Transportation Plan and Environmental Assessment

Dear Superintendent Romero:

At their September 17, 2014 meeting, the Alexandria Transportation Commission received an update on the National Park Service (NPS) Transportation Plan and Environmental Assessment for the Memorial Circle (the "Circle") area of the George Washington Memorial Parkway ("the Parkway"). The Alexandria City Council further discussed the issue at their September 23, 2014 meeting.

We understand that 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 bicyclists.

The area is heavily used by motorists, cyclists, and pedestrians both for recreation and commuter travel. The Mount Vernon Trail travels through the project area along the waterfront, contributing greatly to the bicycle and pedestrian use near the Circle. The heavily travelled transportation facilities within the project area contribute to a number of safety concerns, especially at the six un-signalized, at-grade crosswalks within the vicinity of the Circle.

In response to the NPS request for feedback on the project, the City of Alexandria is providing the following input:

- Bicyclist and pedestrian needs should be given parity with motorists, and should not be subordinate to motor vehicles as currently prioritized by the NPS. The National Park Service needs to take a Complete Streets approach to the Transportation Plan and Environmental Assessment for the Circle that includes a plan that provides safe routes for all users of the Parkway, including bicyclists and pedestrians. This approach has

proven effective in Alexandria, and should be embraced by federal stewards of the multi-use recreation and transportation corridor.

- Signalization should be considered through the plan to address safety issues and conflict points (including both sides of the west end at Arlington Memorial Bridge where there is an existing paved bike path, as well as a bike/pedestrian created dirt path), including the use of High-Intensity Activated Crosswalk (HAWK) Beacons, which have been demonstrated with success at several crossings in Alexandria.
- The plan should consider grade separation where trails intersect with the roadway. The Boundary Channel Humpback Bridge Replacement Project, completed by the NPS in 2012, is a good example of where this has been done recently.
- The plan should also consider simplifying the flow of traffic to reduce conflict points between roadway and trail users.
- More frequent enforcement by U.S. Park Police is warranted in the Circle area of the Parkway, and the plan should design improvements to allow for police to have pull-off areas necessary for safe enforcement.

We appreciate your consideration of the City of Alexandria's position on the Memorial Circle Transportation Plan and Environmental Assessment.

Sincerely,

William D. Euille
Mayor, City of Alexandria

cc: The Honorable Members of City Council
Rashad M. Young, City Manager
Mark Jinks, Deputy City Manager
Yon Lambert, AICP, Acting Director, Transportation and Environmental Services
Sandra Marks, AICP, Deputy Director, Transportation and Environmental Services, Transportation Division
Dennis Leach, Director of Transportation, Arlington County

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As the nation's principal conservation agency, the Department of the Interior has responsibilities for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic 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. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for American Indian reservation communities and for people who live in island territories under US administration.

NPS/GWMP/November 2018