HISTORY AND ECOLOGY IN REDESIGNED FOREST EDGES OF THE BALTIMORE-WASHINGTON PARKWAY

KELSCH, PAUL
Virginia Tech, pkelsch@vt.edu

1 ABSTRACT

This paper presents a proposal for forest edges along the Baltimore-Washington Parkway. It derives from a Cultural Landscape Report for the parkway and draws upon historical precedents as a means of addressing issues of traffic safety and forest vulnerability to colonization by invasive plant species. The Baltimore-Washington Parkway is historically significant for its role in regional forest conservation with forests comprising the dominant vegetation of the parkway landscape and shaping the experience of driving through it. In order to increase driver safety, the National Park Service is cutting forest edges back farther from the roadway, increasing sunlight into the forest interior and inviting competition from invasive species. But it also offers appealing views into the forest interior for passing drivers. This results in an intriguing challenge: is it possible to protect the forest from colonization by invasive species while maintaining the more engaging spatial experience created by the cleared edge? The parkway was studied using historic documents and present-day imagery combined with field observation and investigative design. The proposed design draws the forest edge back from the front line of trees, creating a new zone of seasonally mowed grasses where ample sunshine would favor invasive species. Behind this zone, where shade predominates, a new line of shade tolerant forest species is proposed where they can compete more effectively against the invasive plants. This composite edge is more spatially diverse and consistent with the picturesque traditions of the region's parkways.

1.1 Keywords:

Baltimore-Washington Parkway, highway landscapes, cultural landscapes, historic preservation, forest edge management

2 INTRODUCTION

Forests form a continuous backdrop for drivers on the Baltimore-Washington Parkway, a nineteen-mile roadway that extends northeast from Washington, DC toward Baltimore, MD. Traveling through a forested corridor, most drivers are probably unaware of the significance of the adjoining forest in regional conservation or even give much thought to the design and management decisions that have cultivated this forested drive. Yet the forests are key to the parkway's historical significance as well as its form and character as a cultural landscape.

Like many forests along highways, these are threatened by the establishment and spread of invasive plant species and more immediately by highway safety regulations that mandate a thirty-foot setback from the edge of the roadway. For a parkway characterized in very large part by the close presence of maturing forests, such a mandate poses an existential threat to the character of the landscape.

This paper presents a conceptual design proposal for managing the forest edge of the Baltimore-Washington Parkway in the wake of clearing for this thirty-foot setback. Truly, this is 'a modest proposal', one that aspires to create a more spatially intricate edge, grounded in the history of this landscape and of other parkways in the Washington, DC region. It seeks to control invasiveness through seasonal mowing and innovative planting to create a new kind of forest edge for the parkway that will be historically grounded, easier to maintain, and more beautiful for drivers of the parkway.

The proposal is a small part of a much larger Cultural Landscape Report (CLR)(Kelsch, 2021) for the National Park Service that documents the history and current conditions of the parkway and proposes design and management changes to mitigate specific highway safety concerns. The closeness of the forest to the edge of the roadway was but one of those safety concerns, and this proposal arose out of the historical documentation and interpretation at the core of the CLR. This proposal for the forest edges is intuitive, based in history and also in design imagination. Similarly, the threat from invasive plant species is based in general knowledge of the problem and observation of the parkway's vegetation. The proposal itself is somewhat generic, more of a management recommendation than a specific design proposal, and it would need site-specific and more scientific examination of the vegetation before implementation along the parkway. The purpose of this paper is to show an example of how historical information and design imagination can help address ecological problems in cultural landscapes.

To understand the goals and projected impacts of the proposal, this paper presents the historical significance of the parkway's design, its role in the history of regional forest planning, our mapping methodology to document forest conditions, and the role of the forest in shaping the sequential experience of driving the parkway. It then presents the actual proposal in the form of an imagined perspective drawing and a more detailed section showing the proposed edge condition. Finally, the paper presents historic precedents for the proposal that show it to be an historically relevant design for the parkway.

3 SIGNIFICANCE OF THE DESIGN

The Baltimore-Washington Parkway is listed on the National Register of Historic Places as part of a set of parkways radiating from Washington, DC out into the surrounding region. (National Park Service, 1991) The others include the George Washington Memorial Parkway, Rock Creek & Potomac Parkway, the Clara Barton Parkway, and Suitland Parkway. Though treated as a set, each was designed and built separately with different intentions. The Baltimore-Washington Parkway was the last to be designed, and it is often referred to as being transitional in style, more modern than its earlier siblings but not as modern as later interstate highways. (HAER, MD-129).

As its name implies, the Baltimore-Washington Parkway links the cities of Baltimore and Washington and was completed in 1954 as an alternative to U.S. Route 1, the traditional link between the two cities that had become overly-congested by the 1940s and 50s. Although the roadway extends the full distance between the cities, only the southern two-thirds (nineteen miles) were built by the Bureau of Public Roads as the Baltimore-Washington Parkway and are included today within the National Park system. The rest of the route to Baltimore continues as MD 295, which is similar in alignment but different in character.

The difference in character between the Baltimore-Washington Parkway and MD 295 is part of the parkway's historical significance. Despite their similar alignments, the two roadways differ in key characteristics that distinguish the Baltimore-Washington Parkway as a modern *parkway* whereas MD 295 is a conventional modern *highway*. Comparable images of the two roads illustrate the differences between them. (Figure 1.) The parkway is distinguished by its narrower roadway, mountable curbs, guard walls, and

spatial variation derived from the juxtaposition of grass medians and planted trees against the continuous backdrop of maturing forests. In contrast, MD 295's wider roadway, ordinary steel guardrails, overhead signs, and homogenous spatial corridor give it a conventional highway character. Part of the parkway's significance as a designed landscape is that it shows that an ordinary highway can instead be designed as a parkway with careful attention to conditions such as the width of the roadbed, the integrity of the enclosing landscape, the character of construction details, and thoughtful variation of the sequential experience.

Figure 1. Comparison of the Baltimore-Washington Parkway (left) and MD 295 (right) showing differences between their respective characters. (Google Maps street view, April 2018)

4 HISTORICAL BACKGROUND

The Baltimore-Washington Parkway had a surprisingly long gestation period given that it is the most modern of Washington's parkways. Significantly, its earliest conception is directly tied to regional forest conservation. Over time, the proposed parkway would gain additional purposes, but the importance of forests remained fundamental to its conception and design.

The parkway was originally conceived as part of architect William C. Ellicott's plan to create a capital area national forest on lands northeast of Washington in 1910. (Ellicott, 1910) In a revised 1920 version of the proposal, Ellicott included a memorial avenue commemorating those who died in WWI, and this is the first vision of what would become the Baltimore-Washington Parkway. (Ellicott, 1920) The national forest proposal ultimately failed in the 1930s, but numerous federal properties were developed on the lands Ellicott had proposed for the forest. These included the U.S. Army's Fort Meade, the Department of Agriculture's Beltsville Agricultural Research Station, the U.S. Fish and Wildlife Service's Patuxent Research Refuge and the National Park Service's Greenbelt Park. Collectively these properties conserve much of Ellicott's proposed national forest lands. Parkway planners expanded the purpose of the roadway to include access to these federal properties, especially Fort Meade in the event of a national emergency. The ability to have safe and fast access to the fort was a critical argument for construction of the parkway during the early years of the Cold War. Parkway planners also stressed the importance of having a 'dignified' entrance into the city akin to those provided by the George Washington Memorial Parkway and the Rock Creek and Potomac Parkway.

Traffic congestion and frequent accidents on U.S Route 1 led to further impetus to develop a faster and safer inter-city route between Baltimore and Washington. (HAER, undated. Kelsch, 2021) This emphasis on inter-city travel led to ambiguity about whether the parkway was to be truly a parkway, with an emphasis on scenic driving and important destinations, or a regional highway that emphasized efficient transportation. The National Park Service portion of the roadway was built as a scenic parkway restricted to passenger vehicles and leading to the various federal properties. The State of Maryland, however, built the twelve-mile extension to Baltimore as an efficient highway that can carry larger trucks and commercial vehicles. These discrepancies have led to calls for the parkway to be transferred to Maryland, but state officials only want it if the Park Service upgrades it to carry commercial traffic. The cost of that upgrade has prevented the transfer of ownership. (HAER, undated. Kelsch, 2021)

Regardless of ownership, the original design of the parkway had become quite dangerous with increasing traffic loads, and the parkway was significantly rehabilitated in the 1990s to make it safer. Among the changes, longer exit lanes and wider bridges were constructed to allow drivers to exit the roadway more quickly and prevent dangerous back-ups at interchanges. New shoulders with mountable curbs were added so drivers could pull off onto the grass in an emergency, and concrete guard walls that mimic the original stonework of the bridges replaced aging guardrails. In addition, a planting design was developed and implemented for the first time along the full-length of the parkway. The planting design emphasized the interchanges, composing the vegetation at these junctures to be transitions between the adjoining vernacular landscape of the surrounding suburbs and the forested corridor of the parkway. The plans also included reforestation in places and plantings to thicken the forest edge and adorn it with ornamental species. Almost all species planted were indigenous to the forests of the mid-Atlantic piedmont and coastal plain, the forests that line the parkway. (HAER, undated. Kelsch, 2021)

5 MAPPING THE PARKWAY'S FORESTS

As indicated above, the conditions of the forest were documented as part of a cultural landscape report (CLR) for the parkway contracted with the National Park Service. (Kelsch, 2021) The goal of a CLR is to document the history and current conditions and assess historical integrity of the landscape, and then use that historical information as a basis for proposing solutions to specific problems. In the case of this CLR for the Baltimore-Washington Parkway, most of the problems related to highway safety.

Despite the rehabilitation of the parkway in the 1990s, there continue to be safety concerns. (Eastern Federal Lands Highway Division, 2007) For example, the mountable curbs that allow cars to pull off in emergencies, do not allow park police to pull over buses or other commercial vehicles, so the police literally are unable to enforce the ban on commercial traffic. Simply adding emergency pull-offs would facilitate that need, but it would interrupt the clear edge provided by the mountable curbs, one of the design details that characterize the parkway. Design decisions like this distinguish the Baltimore-Washington Parkway from ordinary highways, so it is critical that proposals be grounded in the specific history and character of this landscape, and that is the goal of the CLR.

In order to understand better the importance of the forests, graduate students Amanda Cortez, Jake Fettig and Alexandra Schiavoni and I mapped the parkway at three scales. Forests figure prominently at each scale. (Kelsch, 2021)

Maps at 1" = 10,000' show the full parkway in regional context. In Figure 1A, the parkway corridor (in red) is mapped in relationship to the 1911 proposed national forest lands (in yellow), current forests (in green), and federal properties (with light gray overlay). The importance of the parkway as a forest corridor is clearly visible in this geographical and historical context, connecting the federal properties to one another and to the Anacostia River in Washington.

Maps at 1" = 2000' show the parkway in three segments of about six miles each, and these maps reveal pattern and structure of the landscape. In figure 1B, upland and lowland deciduous forests (green), scrubland (orange) and mowed grass (yellow) create a rhythm of grassy openings and forested medians in the southern third of the parkway as the roadway undulates over ridges and spans small streams in the swales. Clues to forest histories are visible in the orange patches of early successional shrub vegetation and also in the dark-textured, successional forests. Many of the successional forests are growing in places that had been completely disturbed during initial construction, and they are younger than the forests that were undisturbed at that time. Early successional shrubland is due to cessation of mowing or to disturbance from more recent construction.

Maps at 1" = 700' divide the parkway into nine segments of two-miles each and reveal specific conditions in more detail. In Figure 1C, a map of the second segment from the southern end shows the 1993 planting design developed as part of the 1990s rehabilitation of the parkway. The map shows composed plantings at the interchanges with specimen oaks and maples (in green), flowering trees (in pink), and native grass meadows (in pale green) creating a more intricate and spatially articulated landscape as a transition onto or off the parkway. Between the interchanges, edge plantings (dashed outlines) cultivate a more robust forest edge along most of the length of the parkway. These areas show that parkway designers were concerned about the character of the full forest edge and not just the interchanges.

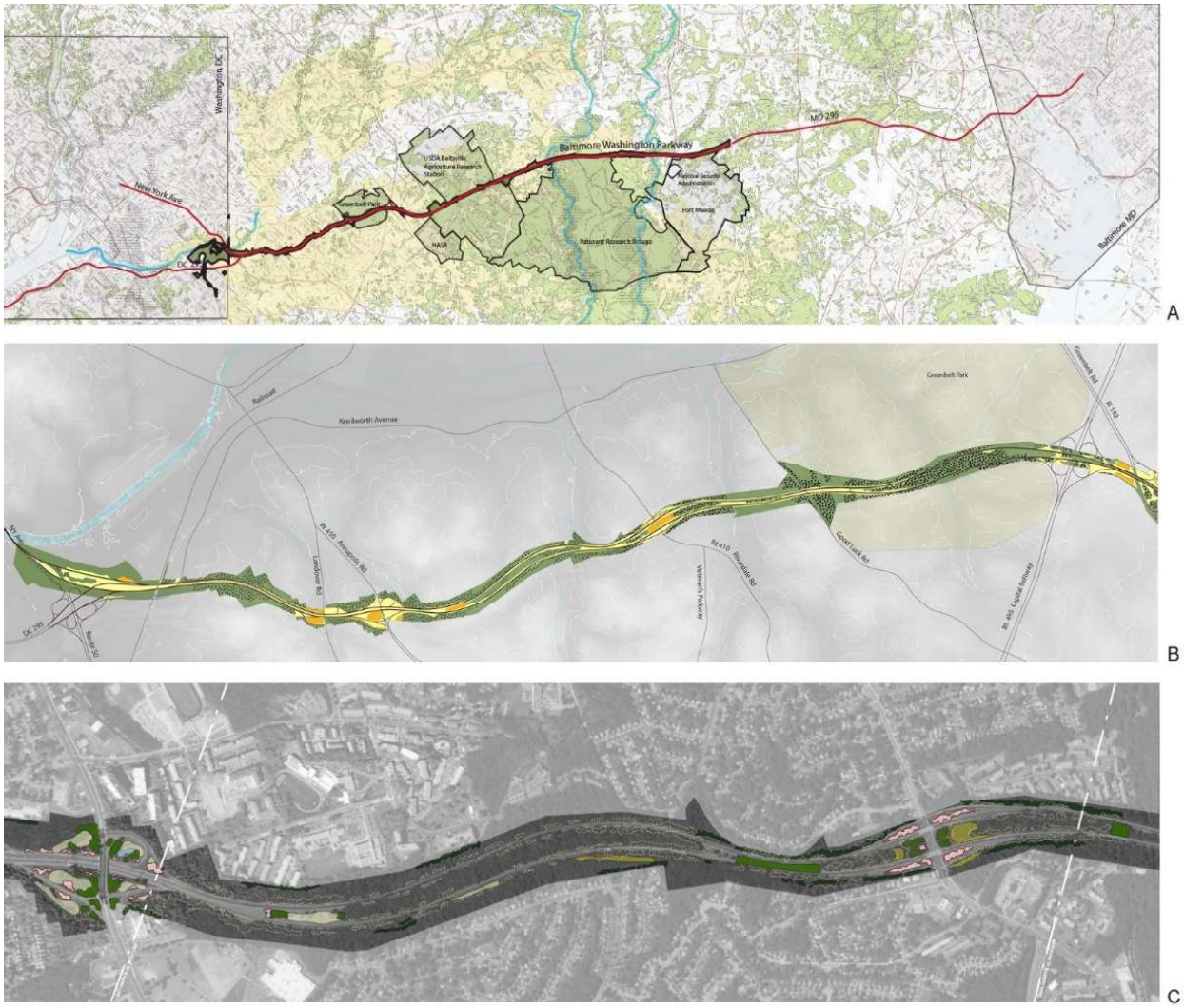


Figure 2. Baltimore-Washington Parkway mapped at varying scales. b: 1:10,000, B: 1:2000, C: 1:700

6 SECTIONAL ANALYSIS

The various maps at these three scales reveal and document much about the parkway, but they are unable to represent the experience of driving it. For this, we used thirty-eight repetitive sections, drawn at half-mile increments along the nineteen miles of the parkway. The individual sections document the topography, vegetation, road alignment, and open space at each section cut, and collectively they depict the changes in spatial conditions as one drives through the landscape. The sections correspond with the 1:700 maps such that five consecutive sections document the spatial sequence of each two-mile segment. Sections E – I (Figure 3) represent the spatial sequence of the segment shown in Figure 2C. Viewing the sections sequentially and guided with descriptive text, one can 'read' the experience of the parkway while imaginatively traveling from bottom to top, south to north.

> *After passing under the bridge at Annapolis Road, Section E, the roadways diverge and reduce to two lanes in each direction, creating an open median with planted specimen trees at Section F. The significance of this change of scenery is underscored by a National Park Service sign identifying this as the Baltimore Washington Parkway (for northbound travelers) even though the parkway actually begins two miles to the south. The roadways diverge further at Section G, separated by a wide swath of mature forest, and consequently drivers are unaware of the opposite lane of traffic. Travelers experience continuous forest*

in this segment, usually with a mowed edge along the roadway. At Section H, the roadways are near enough to each other to have another open median with planted specimen trees, and then they diverge again at Section I, where the median is forested once again with wider mowed grass strips along the edge of the roadway. (Kelsch, 2021)

Figure 3. Sectional analysis showing prominence of forests in the driving experience

The text in this description was not written to specifically highlight the forest, but the prominence of references to the forest are indicative of its importance in shaping the experience of the parkway. This is especially true when the median is wide, and the northbound and southbound lanes are enclosed by rich, mature forest on each side of the roadway.

Alexandra Schiavoni developed the thirty-eight sections needed to cover the full length of the parkway. Each is a combination of site-specific and modular drawing. (Figure 3.) She first drew topographically accurate profile lines at each of the section cuts and then added graphic modules that represented a typology of vegetation along the parkway: mature forest, successional forest, forest with cleared understory (often for the safety setback), open-grown specimen trees, shrubland, and mowed grass. She added red hatching to indicate invasive vegetation and blue view cones to show the extent of views from passing cars. Automobiles show the locations of traffic lanes, and bridges, signs and overhead wires depict individual characteristics of each section.

Because of the length of the roadway and the breadth of the CLR, invasive vegetation was identified only through driving surveys. Hence our ecological assessment is general in nature. Easily recognizable and common invasive species (Ailanthus, Bradford pear) and tangled masses of vines and perennial forbs were assumed to indicate the presence of significant numbers of invasive plants. This was not intended as an accurate ecological assessment. Its goal was to look for patterns and repetitive conditions. For example, Ailanthus has established behind guardwalls built in the 1990s, and Bradford pear is common in areas recently released from mowing. As stated earlier, more thorough documentation of the forest edges is needed, hopefully before further clearing is done.

Sections G, H and I illustrate the issues related to the management of the forest edges. In each of the three sections, the successional forest on the outer edges has no understory because the forest has been cut back to make a larger setback from the lanes of traffic. Light blue view cones extend into the forest in these places because of the lack of a developed forest edge. Although the views into the woods are more alluring, the clearing allows more sunshine to extend into the forest, and this is likely to promote the

establishment of invasive plant species better adapted to the disturbed, sunny environment. In Section G, invasive species are already established along the median edges, so they are poised for rapid seed dispersal and colonization.

7 A NEW FOREST EDGE

As stated earlier, the goal of this CLR is to address specific safety concerns within the historical context of the parkway. The proximity of the forest to the edge of the road as seen in the distant left of Figure 1 and present along most of the parkway poses a threat to drivers who veer off the road. Park managers are charged to create and maintain a thirty-foot setback for the forest, except where guard walls prevent drivers from hitting trees and where topography affords extra safety. (Eastern Federal Lands Highway Division, 2007)

Our analysis documented the historical and ecological importance of the forests lining the parkway. Much of the forest edge has already been cleared, leaving it vulnerable to establishment and spread of fast-growing, shade intolerant species, many of which are invasive in this context. Currently, park maintenance staff are mowing the cleared areas once per year, which prevents woody species from establishing but allows thick growth of perennial plants, many of which are invasive. The thick, new plant growth also eclipses the new view into the forest for motorists. It may not be a stable edge, but it provides a more interesting experience for drivers and passengers.

Given that forests line both sides of the parkway for nearly all of its nineteen miles and often in the median, too, changes to the edge of the forest would have huge impact on the character of the parkway. The combination of the threat of invasive species and the appeal of more intriguing views into the forest, provoked a desire to design a more sustainable and safer edge for the forest that is also more beautiful and consistent with the parkway's careful design.

In many places where the edge has not been cleared, the existing forest is well-developed with layered understory and denser vegetation along the sunnier edges. When mature forest lines both sides of the roadway and the gap in the canopy is narrow, drivers can often peer into the woods even when leaves are on the trees, because the edge isn't not opaque with foliage. This is especially true in the long stretches through the Beltsville Agriculture Research Center and the Patuxent Wildlife Refuge where mature forest extends far beyond the boundaries of the parkway. In these and other stretches, the lack of recent disturbance has limited the establishment of invasive species.

Figure 4. Perspective and section showing edge management proposal

As an alternative edge, I have proposed mowing the cleared land frequently enough to keep it in long grasses and to prevent shrubs and forbs from dominating the vegetation. (Figure 4.) Mowing would extend under the canopy of the first several trees, because this is the sunniest zone where fast-growing, disturbance species most likely would outcompete native shrubs and forbs. Behind these vanguard canopy trees, a thick edge of understory trees and shrubs of the mid-Atlantic piedmont and coastal plain would be planted to define a line of greater shade where they could more effectively compete with the sunnier species. Recommended species were derived from the plant palettes from historical planting plans for the parkway. All are indigenous to the piedmont and coastal plain forests.

This would create a quite different edge, spatially. Individual tree trunks would stand out from the forest, carrying the canopy out over the mowed grasses, and then a denser understory edge would form in the shadier recesses. Individual specimen flowering trees could be planted among the free-standing trunks to further ornament the edge.

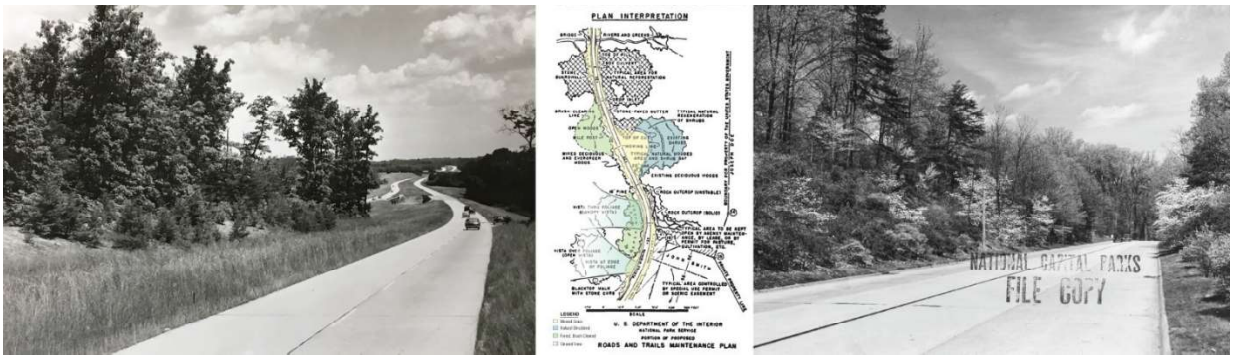
8 HISTORICAL PRECEDENTS

Are there precedents for this proposed redesign of the forest? Given the goal of the CLR to ground proposals in historic precedence, is there justification for this proposal? I have identified three precedents that offer support for this redesign of the edge.

The first is the early history of the parkway itself. Historic photographs from the 1950s show a very different landscape from the present-day condition. (Figure 5A.) Areas that had been cleared during construction were mowed and kept as grasslands in contrast to the forest. In the foreground, the forest is expanding through the establishment of young trees, and the edge is similarly intricate to that in my proposal. In time, almost all the grasslands were allowed to succeed into the forests that line the parkway today, but it is clear in this photo that in its early years the parkway had greater diversity of vegetation than the current, continuous forests. Thus, there is historical precedent for greater variety in the vegetation.

A second precedent is from a paper by Douglas C. Bayliss, “Planning Our National Park Roads and Our National Parkways”, written shortly after the Baltimore-Washington Parkway opened. (Bayliss, 1957) Bayliss illustrates different strategies for maintaining vegetation along an imagined segment of a parkway. (Figure 5B.) In his diagram, he distinguishes between open grass (yellow), open shrubland (blue), woods cleared of undergrowth (green), natural forest (uncolored), and areas cleared for views (blue gradation). His article does not anticipate the current needs of the forest edges of the Baltimore-Washington Parkway, but it shows that treating the grasses, shrubs and trees as distinct layers is a long-standing maintenance practice in parkway management, and it can create a more diverse vegetative and spatial edge.

A third precedent is from the Mount Vernon Memorial Highway, the parkway that inspired the rest of Washington, DC’s parkways. (Figure 5C.) The southern portion of the Mount Vernon Memorial Highway was built along the edge of existing forest, and Wilbur Simonson, the landscape architect who developed the planting design, called for extensive plantings of ornamental trees and shrubs to cultivate a lush and picturesque edge to the forest. As with the Baltimore-Washington Parkway, the vegetation grew into mature forest over time, but at least in the beginning, Simonson’s plantings for the parkway were more intricate and stylized than a natural forest edge. They set a precedent for a different kind of forest edge within the Washington parkways.



A. Baltimore-Washington Parkway B. Bayliss C. Mount Vernon Memorial Parkway

Figure 5. Precedents in parkway design and management of parkway vegetation.

9 CONCLUSION

Forests shape the experience of driving the Baltimore-Washington Parkway and are critical to its historical significance as a regional corridor among other large forested properties. The need to clear more of the edge for driver safety poses an existential threat to the landscape. It is not unreasonable to imagine that the nineteen miles of forested parkway could become a corridor of invasive species like ailanthus and Bradford pear which have already established in certain locations. This proposal for a redesigned forest edge seeks to cultivate a different kind of edge that would be historically grounded, maintainable through

mowing, and beautiful for drivers on the parkway. Its spatially intricate edge would be different from the more natural edges of the current parkway, many of which are strikingly beautiful today. In time this new edge might mature and return to a more natural forest edge as mowing regimes become more lax and forest vegetation spreads. The edge is likely to become more like those that exist today, but in the interim, it would resemble forest edges that existed earlier along this parkway and on the Mount Vernon Memorial Highway.

10 REFERENCES

Bayliss, D. C. (1957). Planning our National Park Roads and our National Parkways. Washington DC - U.S. Department of the Interior, National Park Service.

Eastern Federal Lands Highway Division (2003). Baltimore-Washington Parkway, Safety Study. Washington, DC - U.S. Department of Transportation, Federal Highway Administration.

Eastern Federal Lands Highway Division (2007). Final Construction Report – Project BW 1E16 (MD Route 197). (NPS TIC, BAWA 842/100502 [id167167]). Washington, DC - U.S. Department of Transportation, Federal Highway Administration.

Ellicott, W. M. & Besley, F.W. (1910). A National Capital Forest, *American Forestry,* June (4).

Ellicott, W. M. (1920). Report of the American Society of Landscape Architects on National Forest and Regional Plan. Washington DC - National Archives, in RG 66, Box 27.

Historic American Engineering Record (undated). Baltimore-Washington Parkway. (HAER MD-129). Washington DC – U.S. Department of the Interior, National Park Service.

Kelsch, P. (2021) Cultural Landscape Report: Baltimore-Washington Parkway. Washington DC – U.S. Department of the Interior, National Park Service.

Kelsch, P. Bayer, D, Sheehan, D. (2009). Cultural Landscape Inventory, Mount Vernon Memorial Highway: Alexandria to Mount Vernon, National Park Service. (CLI # 975888). Washington DC – U.S. Department of the Interior, National Park Service.

Krakow, J. L. (1990). Historic Resource Study: Rock Creek and Potomac Parkway, George Washington Memorial Parkway, Suitland Parkway, Baltimore-Washington Parkway. Washington DC – U.S. Department of the Interior, National Park Service.

National Park Service (1991). Parkways of the National Capital Region, 1913 – 1965. (National Register of Historic Places – Registration Form). Washington DC – U.S. Department of the Interior, National Park Service.