

# VIRGINIA SCENIC VIEWSHED ASSESSMENT PROJECT: LITERATURE REVIEW AND ASSESSMENT METHODOLOGY

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## ABSTRACT

Scenic Virginia strives to identify and highlight Virginia's 'scenery' and Virginia has a 'scenic' component in their new Conserve Virginia land conservation effort. As such the development of a universal assessment tool that can be used by citizens and professionals to identify and rate the value of scenic viewsheds is needed in Virginia. The goal of this presentation is to discuss how, using scientifically supported research, a protocol based on grassroots input can identify significant scenic resources in Virginia. The presentation will introduce scientific studies, based on an extensive literature review, that were used to develop an assessment tool. This new tool will be used by communities to help them understand and highlight their scenic resources. The goal is to gain greater awareness and support for protecting scenery in Virginia by using careful planning and preservation techniques.

## INTRODUCTION

When people hear that you live in Virginia, they often respond with, "Oh, Virginia is so beautiful." Virginia does have a beautiful diversity of landscapes from the shorelines of the Chesapeake Bay to the mountains of the Blue Ridge. Overlaid by a rich history of human use and dwelling, these landscapes are a heritage that the people of Virginia love. But this inheritance is at risk from sprawl and indiscriminate development. What to do? Perhaps a scenic viewshed register could draw attention to those views that are valued by the citizens of the commonwealth. What would be needed?

**Requirements of a viewshed register program:** To undertake a viewshed management program, one must have an understanding of visual management concepts and previous visual research. A review of the literature will provide an understanding of relevant concepts and research. Much of the past research and visual management work was undertaken on public lands that were managed by governmental agencies such as the US Forest Service and Bureau of Land Management. Assessing the visual impact of land alterations on public lands was the focus of much of this work. Viewshed management Virginia will involve private as well as public lands with a focus on preserving the scenic quality of viewsheds. Scenic Virginia is a non-profit organization of people who appreciate the scenic value of Virginia landscapes. Scenic Virginia was the impetus for undertaking a scenic viewshed program. Scenic Virginia gives a voice to people who know that the beauty of Virginia landscapes is not only critical to their quality of life and essential to attracting jobs and economic development, but it is also a legacy that they will leave to future generations.

**Public engagement:** A viewshed register program would also require recognition from the State of Virginia to have official status. Therefore, it was essential to the success of the project that the public be involved in the identification of scenic viewsheds. Scenic Virginia was the ideal organization for public engagement. Also, landscape architects associated with the Virginia Department of Recreation and Conservation, the agency in charge of administering the Virginia Scenic Rivers and Scenic Byways

program, played an important role in shaping the program to be consistent with state recognition in the future.

**Scenic Viewshed Project:** Scenic Virginia asked the faculty and students in the Landscape Architecture Program at Virginia Tech to develop a defensible procedure for identifying scenic viewsheds and assessing their scenic quality for possible inclusion in a viewshed register. The result was the Virginia Scenic Viewshed Project described below. The objective of this project was to develop a two-part process. The first was to create a way to engage the public in identifying or nominating viewsheds for potential inclusion on a scenic viewshed register. The second part was to develop a procedure, drawing on research and accepted professional practices, for assessing the scenic quality viewsheds identified in the first part of the process to determine if they merited placement on a scenic viewshed register.

**What is a Viewshed?** The term "viewshed" is derived from the concept of a watershed. A watershed is an area in which all of the rainfall that falls will flow past a specific point. A viewshed is "the 360-degree area" that is seen from a specific point, called a viewpoint. Portions of the area may not be visible from the viewpoint because the view is blocked by vegetation, topography, or other objects (see Figure 1). A "defined viewshed" is the specified portion of a viewshed that can be seen from a particular viewpoint and is defined by its view direction, view width, and view distance. The viewsheds referred to in this report are "defined viewsheds" but are referred to only as "viewsheds."

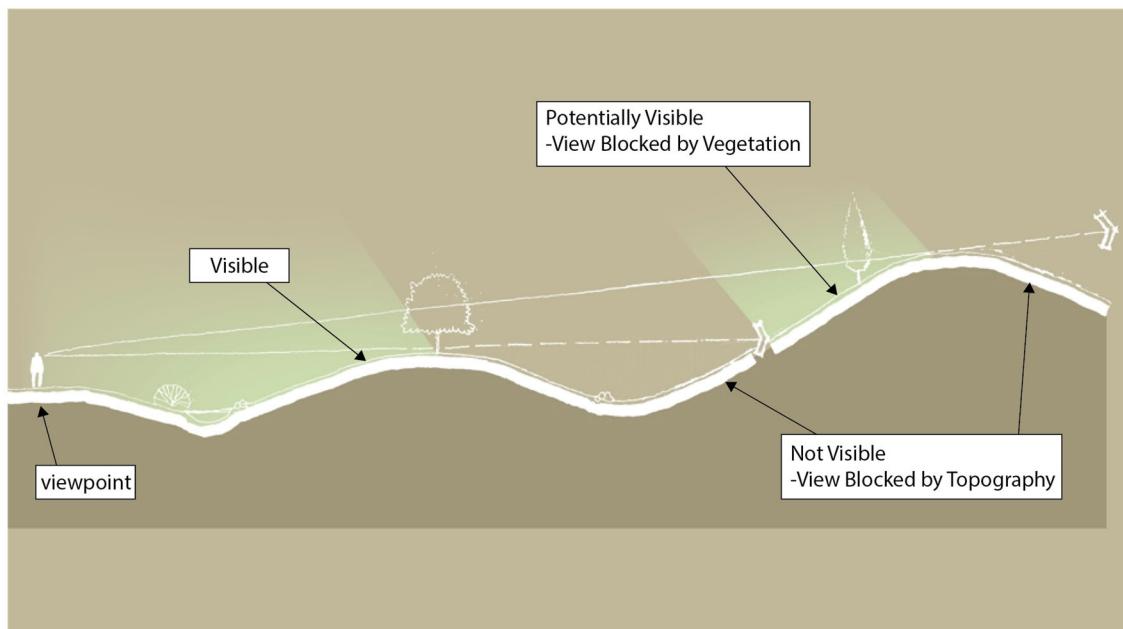


Figure 1 – Schematic section depicting seen and potentially seen areas from a viewpoint.

#### Viewshed Identification

It is envisioned that Scenic Virginia will administer the viewshed designation process. Scenic Virginia has an extensive public following and, for years, has engaged the public in a scenic landscape photo contest. Scenic Virginia will engage the public and local government officials in nominating viewsheds to be considered for the scenic viewshed register. Since the nominators were non-experts, the nomination form should include necessary descriptive information useful to Scenic Virginia in determining whether

to proceed to the second part of the process the scenic quality assessment. Nominations will come from:

- Citizens
- Landowners
- Government officials
- Local grassroots organizations

**Nomination process:** The first part of the viewshed designation process is the viewshed nomination.

The nomination includes the following descriptive information:

Basic information

- Location
- Viewpoint location
- Public accessibility (must be accessible from a public accessway)
- Viewshed physical area (direction, width, distance and approximate acreage of the viewshed)
- Photographs (maximum of 3 photographs, with 1 from viewshed viewpoint)
- Photograph meta-data 1024 pixels is the minimum photograph attribute (Billingsley, 1966)

Significant visual features contained in the viewshed

- Distinctive natural features (including predictable and relatively frequent ephemeral qualities)
- Positive manmade features
- Incongruent or negative features visible from the viewshed
- Written description of viewshed

Public awareness of and interest in the viewshed (from nomination description)

- Evidence of public recognition
- Potential for change

Nominators will use a nomination form and a checklist of potential landscape features. Figure 2 depicts the nomination form.

### **Scenic concepts and variables**

As mentioned above, a literature review identified scenic concepts and variables relevant to scenic viewshed management. The identification of additional relevant variables was done by consulting the public, not with a survey or focus group, but by examining past photographs submitted to the landscape photo contest held annually by Scenic Virginia. These photographs were examples of viewsheds that the public found to be scenic.

### **LITERATURE REVIEW**

Two databases were utilized for the literature review. The first database was compiled from keyword searches by the Virginia Tech researchers and contained 853 articles published between 1969 and 2018. The 9 keywords used to search for journal articles and books were: scenic value, scenic beauty, scenic quality, visual quality, visual resource management, visual assessment, landscape preference, landscape quality, and landscape quality. In addition to journal article citations, the first database also included abstracts and is searchable. It can be accessed using the following link: [https://drive.google.com/open?id=1r0DSI3wkZjQw-iicP6ooaoDFFd\\_Y3OB9](https://drive.google.com/open?id=1r0DSI3wkZjQw-iicP6ooaoDFFd_Y3OB9).

The second database created by Dr. Andrew Lothian of Scenic Solutions and contains 1,854 publications published between 1936 and 2014. It can be found on the Scenic Solutions website:

<https://scenisolutions.world/>. The second database is more extensive and includes articles published over a more extended period and a more diverse set of publications – but it does not include abstracts.

# **VIEWSHED NOMINATION INVENTORY FORM**

1. up to three photos, one must be from viewshed view point
  2. a minimum size of 1024 megapixels
  3. must be accessible to be nominated (e.g. trails, roads, public recreation zones and other)

## **Figure 2: Scenic Viewshed Nomination Form**

## **SCENIC QUALITY METHODS**

Scenic quality is a measure of the scenic importance of a viewshed based on human perceptions of the intrinsic beauty of landform, water characteristics, and vegetation patterns. When combined, these attributes determine the intrinsic scenic beauty of a landscape (Terry, 2001). Scenic quality can be described as being the product of the landscape according to the reactions of persons experiencing that landscape (Chenoweth & Gobster, 1990; Craik, 1975; Ulrich, 1977). It depends upon perception and reflects the particular combination and pattern of elements in the viewshed (Swanwick, 2002). These are the essential attributes of the landscape that when viewed by people cause positive physiological and psychological reactions in individuals and, therefore, to society in general.

**Useful concepts for scenic viewshed assessment:** In compiling these databases, the researchers identified theories, concepts, variables, and measures that have been used and are commonly accepted by scenic resource management professionals and scholars. The following terms and concepts from the past VRM literature were determined to be useful in for scenic viewsheds:

- Physiographic province or region (Ribe, 1986; Bishop, Wherrett, & Miller, 2001; Krönert, Steinhardt and Volk, 2001; and DCR 2016)
- Distance zones and scale (R. B. Litton, 1968; Bacon, 1979; Amedeo et al, 1989; and Forest Service, 1995).
- Diversity, variety and visual complexity (Arthur, Daniel, & Boster, 1977; and Litton, 2001)
- Coherence and legibility (US Forest Service 1995)
- View type (Litton, 1974)
- Viewer position (Litton, 1974; United States Federal Highway Administration Office of Environmental, 1981)
- Visual sensitivity or public awareness (Hull 1986)

**Photographs from the Scenic Virginia Landscape Photo Contest:** Photographs from the Scenic Virginia Photo contest were examined to determine if additional variables were needed to cover the range of scenic viewsheds found in Virginia. The photographs used for this study were first screened to eliminate photos that were not representative of the landscape, but rather the result of artistic expression of the photographer. Five additional variables were identified. There were things found in the landscape (i.e. content) that would contribute to scenic quality that were not apparent from the results of the literature review. The assessment of scenic viewsheds in Virginia must also include:

- the scenic value of historic content (see Figure 3)
- the scenic value of human-influenced landscapes including
  - cultural content in scenic viewsheds (see Figure 4)
  - urban content in scenic viewsheds (see Figure 5)
- the scenic value of ephemeral qualities (changing content in the landscape that are predictable and reasonably frequent) (Figure 6)



**Figure 3: Historic scenic content.**



**Figure 4 - Human-influenced (cultural) scenic content.**

### **Scenic Quality Assessment**

The purpose of designating viewsheds as “scenic” is to bring attention to and encourage consideration of their scenic value in public decision-making processes. It is intended that this Scenic Quality Evaluation framework would be applied by someone familiar with the visual concepts and variables.

Using the variables identified from reviewing the literature and from the examination of the photographs from the Scenic Virginia scenic landscape photo contest, the Virginia Tech Research Team developed a methodology to assess the scenic quality of viewsheds.

The following guidelines were followed in developing the assessment methodology:

- Concepts, variables, and measures should have a history of use that indicates a high degree of acceptance and credibility among scholars in this field.
- Variables and measures should be intuitively meaningful and make sense to those using them.
- Measurement scales should:
  - Be as straightforward and uncomplicated as possible (understandable)

- Use descriptive interval scales when possible (meaningful distinctions for measurement)
- Contain no more than seven intervals (seven is considered the number of categories most people can distinguish between (Miller 1956)).
- Not use mathematical functions other than addition and subtraction (reduce variability in measurement)
- Be capable of easy disaggregation when combined mathematically (i.e., understand how the parts contribute to the final product).

Following these guidelines ensures that the proposed nomination and evaluation methodology is not only credible, but assures that users will be able to apply them consistently and with minimal variation.



**Figure 5 - Human-influenced (urban) scenic content.**

**Scenic assessment methodology:** The viewshed scenic quality assessment has two parts: first, the scenic quality of the viewshed, and second, the public concern or sensitivity of the viewshed. The viewshed scenic quality variables are:

- Viewshed Size (R. B. Litton, 1968)
- Variety and Visual Complexity (S. Kaplan, 1979)
- Coherence and Legibility (Lynch, 1960; S. Kaplan 1979)
- Presence of Ephemeral Content (Litton, 1968)
- Presence of Positive Human-influenced Content (Jones, 2003)
- Incongruent or distracting

The Viewshed Public Concern or Sensitivity variables are:

- Demonstrated Public Concern or Sensitivity (Hull 1986)
- Number of Viewers (Daniel, 2001; McCool, Benson, & Ashor, 1986)
- Viewer Activity (Daniel, 2001; McCool, Benson, & Ashor, 1986)
- Landscape Content (S. Kaplan, 1979)

- Historical and Cultural Significance features ( Zube 1970, Iverson, 1985; Laurie, 1975)



**Figure 6 - Scenic value of ephemeral qualities, such as flowers (upper) and livestock (lower) (ephemeral content that changes expectedly and occurs on reasonably frequent period of time).**

Figure 7 depicts a Virginia viewshed used to demonstrate the viewshed scenic quality scoring (see figure 8) and viewshed public concern scoring (see figure 9).



**Figure 7 – Example viewshed to demonstrate viewshed scenic quality assessment.**

VIEWSHED SCENIC QUALITY	HIGH	MODERATE	LOW
1. Viewshed Size <i>How wide is the view?</i>	panoramic <sup>a</sup> 3	medium view <sup>b</sup> 2	limited view <sup>c</sup> 1
2. Variety and Visual Complexity <i>How much variation in the visual characteristics of the landscape (patterns, color, form, line and textures)?</i>	High 2	Moderate 1	Low 0
3. Coherence and Legibility <i>How the visual composition fits together, and is distinct and memorable?</i>	High 2	Moderate 1	low 0
4. Natural Condition <i>How natural or undeveloped is the viewshed?</i>	natural/ undeveloped 2	scattered developed <sup>d</sup> 1	developed 0
5. Ephemeral qualities in foreground and middle ground <i>Are ephemeral qualities a common content of the viewshed?</i>	frequent/ predictable 2	not frequent but predictable 1	not predictable 0
6. Incongruent or distracting content in viewshed <i>Are incongruent elements (powerlines, mines, junkyards) visible in the viewshed?</i>	Highly visible -2	Visible <sup>e</sup> -1	not visible 0
a. wide view and includes all distance zones b. includes at least two distance, but not wide c. one distance zone and narrow d. scattered developed, but subordinate to natural characteristics of the landscape e. visible, but subordinate to visual elements and characteristics of the landscape	TOTAL SCORE		
	CLASS	H: 11 ~ 7	M: 6 ~ 3

Figure 8 - Example scoring of the “scenic quality” component of viewshed scenic assessment based on the viewshed in Figure 7.

The Viewshed Public Concern or Sensitivity variables are:

- Demonstrated Public Concern or Sensitivity (Hull 1986)
- Number of Viewers (Daniel, 2001; McCool, Benson, & Ashor, 1986)
- Viewer Activity (Daniel, 2001; McCool, Benson, & Ashor, 1986)
- Landscape Content (S. Kaplan, 1979)
- Historical and Cultural Significance features ( Zube 1970, Iverson, 1985; Laurie, 1975)

PUBLIC CONCERN OR SENSITIVITY	HIGH	MODERATE	LOW
1. Demonstrated the public awareness <i>Example: media articles, tourism guides, public meetings and gov. public relations</i>	Highly awareness 2	Moderate awareness 1	Low awareness 0
2. Number of viewers <i>Estimated number of people who see the viewshed</i>	seen over 100/day 3	seen over 100/week 2	seen under 100/week 1
3. Viewer activity <i>What people are doing when they view the landscape</i>	visible while recreating 2	visible from residents 1	visible while passing 0
4. Incongruent or distracting content not in viewshed but visible <i>Can powerlines, minings, junkyards be seen near the viewshed</i>	Highly visible -2	Visible -1	not visible 0
5. Historical and cultural features <i>Does the viewshed contain historical and cultural features</i>	National 3	State 2	Local 1
	TOTAL SCORE		
	CLASS	H: 10 ~ 7	M: 6 ~ 3

Figure 9 – Example scoring of the “public concern” component of viewshed scenic assessment based on the viewshed in Figure 7.

### Scenic viewshed designation

Scenic Viewshed Designation is determined by the combination of the scores for Scenic Quality and Public Concern (see Figure 10). A viewshed with a High Scenic Quality score and High Public Concern score would merit be “designated” as a “Scenic Viewshed.” Such a designation would also typically be the case for viewsheds with High Scenic Quality and Moderate Public Concern. Any viewshed with a Low Scenic Quality score should not be designated as a scenic viewshed, regardless of Public Concern. Not meriting scenic viewshed designation also applies to viewsheds with only Moderate Scenic Quality and Moderate Public Concern.

SCENIC VIEWSHED DESIGNATION			
VIEWSHED SCENIC QUALITY	PUBLIC CONCERN OR SENSITIVITY		
	HIGH	MODERATE	LOW
	HIGH	I	I
MODERATE	SC	N	N
LOW	N	N	N

**FINAL Viewshed DESIGNATION:** \_\_\_\_\_

Figure 10 - Scenic Viewshed Designation.

**Special Consideration:** There are, however, two scenarios in the viewshed designation that would require additional consideration before a final designation is determined: 1) Viewsheds that score only Moderate Scenic Quality but that possess High Public Concern, and 2) viewsheds with High Scenic Quality but only Low Public Concern. For example, in the first case, a viewshed may have only a Moderate Scenic Quality score but also possess a unique sense of place or meaning to local people that are not fully reflected in the score and thus might require additional consideration before a designation decision can be made. In the second case, a viewshed may have a High Scenic Quality score but possess a low Public Concern score that requires additional consideration before a decision is made. For example, the viewshed may have unique visual qualities or content that the scenic rating framework could not adequately take into account and therefore merit consideration for designation, even though there is Low Public Concern.

Figure 11 depicts the Scenic Evaluation and Designation Form that would be used in the scenic assessment and designation process. This form would be filled out by individuals knowledgeable in scenic concepts and variables used.

## CONCLUSIONS

There is greater public interest today and more need to protect our valuable scenic viewsheds. We can draw upon ideas and concepts of those pioneering landscape architects who developed Visual Resource Management systems for public lands. But, if we are to be successful, we must also additional ways of assessing scenic viewsheds that includes positive content, resulting from human use of the landscape, including historic landscape content and cultural landscape content. These include content such as cultural patterns of human use and urban content. We must also include those ephemeral contents in the landscape that are predictable and relatively regular and that people enjoy and appreciate. As we develop new scenic concepts and methodologies, we must also test them empirically. That is our next step.

## SCENIC VIEWSHED EVALUATION AND DESIGNATION FORM

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VIEWSHED SCENIC QUALITY	HIGH	MODERATE	LOW
1. Viewshed Size <i>How wide is the view?</i>	panoramic <sup>a</sup> 3	medium view <sup>b</sup> 2	limited view <sup>c</sup> 1
2. Variety and Visual Complexity <i>How much variation in the visual characteristics of the landscape (patterns, color, form, line and textures)?</i>	High 2	Moderate 1	Low 0
3. Coherence and Legibility <i>How the visual composition fits together, and is distinct and memorable?</i>	High 2	Moderate 1	Low 0
4. Ephemeral qualities in foreground and middle ground <i>Are ephemeral qualities a common content of the viewshed?</i>	frequent/predictable 2	not frequent but predictable 1	not predictable 0
5. Positive human-influenced content in viewshed <i>positive, human-influenced content in the views</i>	Visual Striking 2	noticeable but not visual striking 1	not visible 0
6. Incongruent or distracting content in viewshed <i>Are incongruent elements (powerlines, mines, junkyards) visible in the viewshed?</i>	Highly visible -2	Visible <sup>d</sup> -1	not visible 0
a. wide view and includes all distance zones b. includes at least two distance, but not wide c. one distance zone and narrow d. visible, but subordinate to visual elements and characteristics of the landscape		<b>TOTAL SCORE</b>	
		<b>CLASS</b>	<b>H: 11 ~ 7    M: 6 ~ 3    L: 2 ~ -1</b>

PUBLIC CONCERN OR SENSITIVITY	HIGH	MODERATE	LOW
1. Demonstrated the public awareness <i>Example: media articles, tourism guides, public meetings and gov. public relations</i>	Highly awareness 2	Moderate awareness 1	Low awareness 0
2. Number of viewers <i>Estimated number of people who see the viewshed</i>	seen over 100/day 3	seen over 100/week 2	seen under 100/week 1
3. Viewer activity <i>What people are doing when they view the landscape</i>	visible while recreating 2	visible from residents 1	visible while passing 0
4. Incongruent or distracting content not in viewshed but visible <i>Can powerlines, minings, junkyards be seen near the viewshed</i>	Highly visible -2	Visible -1	not visible 0
5. Historical and cultural features <i>Does the viewshed contain historical and cultural features</i>	National 3	State 2	Local 1
		<b>TOTAL SCORE</b>	
		<b>CLASS</b>	<b>H: 10 ~ 7    M: 6 ~ 3    L: 2 ~ 0</b>

### SCENIC VIEWSHED DESIGNATION

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*Scenic viewshed designation is based on scenic quality and public concern*

- I = INCLUDE (designate as a Scenic Viewshed)
- SC = SPECIAL CONSIDERATION (designate as a Scenic Viewshed if other special considerations merit)
- N = NOT INCLUDE (not designate as a Scenic Viewshed)

VIEWSHED SCENIC QUALITY	PUBLIC CONCERN OR SENSITIVITY		
	HIGH	MODERATE	LOW
HIGH	I	I	SC
MODERATE	SC	N	N
LOW	N	N	N

### FINAL Viewshed DESIGNATION:

(See 'Definition of Terms' for additional information and literature related to each variable.)

Figure 11 – Scenic viewshed evaluation and designation form.

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