Visual Prioritization Process

Lola Eileen Mason, *USDA Forest Service, San Dimas, California*

Incorporating aesthetics into corridor design is necessary, especially with the Intermodal Surface Transportation Efficiency Act (ISTEA). The challenge is how to incorporate aesthetic quality and transportation safety within budget constraints. The Visual Prioritization Process (VPP) was created to meet this challenge. The VPP is based on the fact that visual quality does vary and that a blanket approach to mitigation is not the best design. By prioritizing the visual elements, all areas will receive the minimal amount of mitigation with increases in mitigation only where necessary. The landscape architect and civil engineer work closely to ensure that the concerns of each are meet.

The demand for aesthetic quality of corridors has increased dramatically, especially since the Intermodal Surface Transportation Efficiency Act (ISTEA). Meeting this demand within project budget constraints has made the work of corridor designers very difficult. In the past, an equal level of mitigation was designed over the entire corridor construction project. In visually sensitive areas, the cost of using this blanket approach could be exorbitant. Joanne Gallaher, a landscape architect at Wheat-Gallaher and Associates, recognized the need for a process that would meet both visual and budget goals. The Visual Prioritization Process (VPP) was developed for this purpose. The VPP is based on the fact that there is variety in the visual elements as well as in their visibility within any corridor. Therefore, visual goals for a project can be met even though mitigation quantities are varied. The VPP ensures good communication among the engineers, landscape architects, and planners throughout the design process.

Although it is not necessary, the VPP can best be used with other agency visual management processes. The process can be limited to the project budget both in terms of analysis time and mitigation design. Staff supervised by a landscape architect can perform portions of the analysis. A majority of the analysis and design can be assisted by a computer. The final design and the reason for the various mitigation levels are understood by others involved in the corridor design and construction.

In July 1994 the VPP manual was published (*1*). An interdisciplinary interagency committee expanded upon Gallaher's original concept. The manual consists of an explanation of the process and four case study examples of VPP applications. This paper consists of an overview of the manual that generally states all that could possibly be incorporated by using the VPP. The process consists of three phases, starting with a general description of the project area and leading to the final mitigation design of the specific project site.

Phase I: Existing Visual Resources

Phase I deals with describing the general area of the corridor. The description of the area is considered the "character zone" within which the corridor will be evaluated. The description is based on the existing visual elements of the area. Typically, this portion of the pro-

cess is performed by the landscape architect or planner. Processes similar to Phase I are used by many agencies as a means of determining management goals.

Some of the other processes include the Forest Service Landscape Aesthetics Scenery Management System (SMS) process (*2*), the Bureau of Land Management Visual Resource Management (VRM) (*3*), and Technical Release 65 of the Soil Conservation Service (*4*). These processes can be used in place of or in conjunction with Phase I. VPP Phase I consists of the four steps described in the following sections.

Determine Character Zones

This step analyzes the distinctive natural, social, cultural, and historic resources of the area. During the analysis, the area can be divided into smaller units of similar character. The outcome of this step is the recognition of such visual elements as topography, geology, vegetation, land use, and others. These elements are the basis for defining visual quality.

Define Visual Quality and Variety

This step is a means of describing the visual elements that make up the character zone. The uniqueness and richness of the elements are defined specifically for the particular character zone. Also defined is the variety of elements within the character zone.

Define Visual Concern

This step is a means of determining the concern of the users, who may be campers, residents, motorists, or others in contact with the corridor area. These users have a variety of concerns for their area that need to be defined. The best means of defining the concerns is through direct contact with the users. Traffic counts are a less desirable means of determining the amount of concern.

Determine Visual Goals

The fourth step is determining the goal for the visual elements. The goal is the basis of management policy and reflects the desired visual condition for the area. The goal can be for the character zone as a whole or for the units. The goal should be based on the visual quality and variety and the visual concern of the area.

The final outcome of Phase I is an areawide plan. It is either policy or program oriented and is used as a guide for projects within the area. The plan is based on the goals for the visual elements. In cases where a management plan already exists, this phase may be used to validate or update the plan. This phase must be completed before moving on to Phase II.

Phase II: Visual Impacts

The preliminary VPP inventory is used to determine the impacts of a proposed design. The specific corridor design is compared with the areawide plan. Impacts are assessed on the basis of the visual goals for the area. Impacts may also be assessed through other studies for the area such as environmental analyses. This portion of the VPP is the main difference between this process and other agency visual management processes.

Conceptual/Preliminary Design

To perform Phase II, a proposed project needs to be about 30 percent through the preliminary design. The design should include plans, profiles, and cross sections for the corridor.

Preliminary VPP Inventory

Conduct Detailed Visual Inventory

The VPP inventory is similar to the character zone portion of Phase I. It focuses on the specific elements of the corridor. It also focuses on the means of defining the elements and the corridor. This inventory is made up of the following four items.

Distance Zones

Distance zones are the zones in which the visual elements are located. Four distance zones need to be defined—immediate foreground, foreground, middle ground, and background. These zones vary depending on speed and the landscape and are defined by means of an FHWA report (*5*). Appendix B of the report contains a table with focusing distance, angle of vision, and peripheral angle for some design speeds.

Visual Elements

The VPP includes the identification of the existing visual elements as well as the new visual elements of the proposed project. The number of elements identified should be limited to those that are significant. Budget limitations on analysis time must also be considered. The ele-

ments that are identified are then categorized on the basis of the character zone as

- New visual elements that are neutral or positive,
- New visual elements that are negative,
- Existing positive and neutral visual elements that are lost, and
- Existing negative visual elements that are lost.

Visual Units

Within the corridor there will be areas that are similar in terms of character. Instead of treating all the individual elements separately, it is easier and saves analysis time to treat them as a unit. Land use and vegetation are examples of such units.

Viewpoints

The viewpoints that need to be included are determined. These viewpoints, which are defined by the users, are within as well as outside the corridor. Again, the number of viewpoints should be limited to those that are significant and budget constraints on analysis time must be considered. At this time, a decision is made on how to handle elements that can be seen from multiple viewpoints or within multiple distance zones.

Determine Values of Inventory Variables

In order to prioritize visual elements and units, numerical scores must be assigned to each. The scores are based on values assigned to six variables. The scores are always the same, 0 to 3, and the six variables are always the same. The values within each variable to which the numerical scores relate are determined at this time. This step is the most critical to VPP because the validity of the prioritization directly relates to the correctness of the values of the numerical scores.

It is imperative for sound decision making that values with equivalent numerical scores have equivalent relative importance and that equivalent increases in numerical scores mean equivalent increases in relative importance among the sets of values.

Distance from Viewer

These values are based on the distance between the viewer and the elements or units. They are defined by the distance zones, described previously, which are based on speed, angle of vision, and viewpoints.

Magnitude

The values for magnitude are based on the size of the elements or units for each type of element or unit, such as cuts and fills. The values relate to the character zone of the corridor.

Angle of View

The values for angle of view are based on the angle between the viewer's direct line of sight and the line of sight to the element or unit. This angle is both horizontal and vertical. The values relate to straightforward views, peripheral views, speed, and visibility.

Duration of View or Visibility

These values are based on the length of time the elements or units are visible. The value may vary if elements or units are visible from several locations. The values relate to short durations from drive-by viewing and long durations from stationary viewpoints.

Silhouette

The values for silhouette variable are based on the background of the elements or units. They relate to contrast, such as a rock with a sky background.

Aspect

The values for aspect are based on the angle of the element to the viewer. They relate to both vertical (standing up or lying flat) and horizontal (facing toward or away) visibility.

Set Up Unit VPP Inventory Forms

At this time, the elements or units are filled in on the inventory forms. The forms are separated into the four categories that are listed under visual elements. The use of a computer spreadsheet may make this task easier.

Perform Inventory

The remaining portion of the inventory forms is then completed. A numerical score is assigned to each variable for each element within the proper distance zones. The proposed project plans, profiles, and cross sections as well as field work along the staked corridor are used to determine the value each element or unit meets for each variable. The numerical score is assigned on the basis of the value. This work can be performed in the office by staff supervised by a landscape architect. Once completed, the scores should be field verified and revised, if necessary. If more than one person has been assigning scores, this verification is especially critical to make sure determination of the score is consistent for the entire project. The use of 3-D computer simulation

is extremely helpful, especially when dealing with the proposed new visual elements.

Tally Total Values

The numerical scores are added for a positive subtotal for each of the elements or units. The similar elements are then ranked from highest to lowest. The rank is divided into three sections and assigned a visual priority level (VPL) for each element: high, VPL 1; medium, VPL 2; and low, VPL 3. This information is used to fill out the VPL form.

Calculate Total and Net Visual Change

The individual elements have been prioritized using VPLs. Now the units that make up the corridor are prioritized by summing the scores of all the elements within the unit, including subtotals for each of the following four categories:

1. New visual elements that are neutral or positive,
2. New visual elements that are negative,
3. Existing positive and neutral visual elements that are lost, and
4. Existing negative visual elements that are lost.

For each visual unit, the following is calculated:

Total Visual Change (TVC) = $a + b + c + d$

Net Visual Change (NVC) = $b + d - a - c$

TVC is necessary when new positive and negative elements are proposed. Users are typically concerned about any change to visual elements, whether positive or negative. The designer should be aware of where the largest changes occur instead of concentrating on how to handle the negative impacts. NVC determines where negative impacts are highest.

Field Check Preliminary Visual Priority Levels

The VPLs should be field checked to verify accuracy. An interdisciplinary team is the best means of determining accuracy for the project as a whole. The numerical scores and the VPL ranking should be revised at this time, if necessary, in order to finalize the TVCs and NVCs. The prioritization of the units is then determined on the basis of the highest TVCs and NVCs.

Design Mitigation Measures

Next, the management goals are used to determine the necessary mitigation measures. Mitigation must be determined for the proposed new elements as well as for those that will be lost. The appropriate amount of mitigation for each priority level, typically three, must also be determined. The needs expressed by other environmental studies should be incorporated at this time.

Develop Mitigation Plan

The next step is to determine how the mitigation measures will be distributed. The final prioritization is based on one or a combination of the following:

1. Units in which TVC and NVC are highest;
2. Units in which significant positive and neutral visual elements that are lost are highest;
3. Units in which detrimental new visual elements are highest;
4. Units in which highest visibility occurs (highest VPLs per negative element), in which opportunities for enhancing positive visual element and views remain, and in which increasing visual quality and variety are greatest;
5. Units in which visual concern is highest; and
6. Each element or unit's importance/cost, with the total unit value being the importance.

The plan should reflect the visual management goals as well as other environmental goals. At this time, the plans can be developed into specific design details for mitigation. These designs need to be incorporated into the proposed project design. These designs will be unique to each corridor project based on the character zone.

Estimate Preliminary Mitigation Costs

A cost estimate for the mitigation designs is now necessary. The costs should reflect high cost where mitigation has the highest impact and variation in mitigation costs throughout the project.

Evaluate Overall Mitigation Plan

This evaluation is based on the costs versus the available budget for mitigation. Any large differences can be adjusted by reviewing the proposed design, the visual elements or units, the mitigation designs for the various priority levels, or other areas for potential adjustments. The interdisciplinary team should perform this review.

Phase III: Implementation

In this phase all portions of the project are finalized and any unforeseen circumstances that arise during con-

struction are dealt with. It may also be used to handle future maintenance needs as well as future changes in user needs and concerns.

Intermediate Design

The proposed project should be about 60 percent completed. The design should incorporate the mitigation designs and the visual mitigation plan.

Final VVP Inventory

The mitigation plan is made final, which basically means that the preliminary VPP inventory performed in Phase II is reviewed and revised. The review includes changes in the proposed project plans, profiles, and cross sections up to the intermediate design. Any changes may affect the defined visual units and elements, numerical scores of visual elements, and rankings of visual priority levels. The VPLs, TVCs, and NVCs are checked and finalized. The design details for the mitigation measures are finalized including a review of the distribution of mitigation. The cost estimate is finalized and compared to budget constraints. The need for reducing mitigation costs can be based on importance per dollar with the VPP analysis showing importance.

Final Design

The final design for the project is completed based on the final mitigation plan and design. Both the engineering concerns and the visual concerns should be reflected in the final construction documents.

Construction

The VPP can be used during construction to handle unforeseen conditions. The final VPP inventory step of Phase III can be used to modify final design features and mitigation measures. The VPP can also be used to determine future maintenance needs and future management plans as the visual elements mature and the needs of the users change.

Concluding Remarks

The VPP manual was written to assist a variety of agencies working with visual resource management. A variety of methods are available, although there is a need for a single approach in order to compare the results of different studies. The VPP is meant to be a common method that handles the concerns of both the landscape architect and engineer. It provides a method by which all disciplines involved in corridor design can work together by communicating and continually incorporating each other's needs. VPP is useful through construction and is an aid to future maintenance needs and changes in user needs.

VPP incorporates the means to be efficient and economical. The process is not difficult to understand, and many portions can be performed by staff with landscape architect supervision. The filling out of forms can be performed on a computer spreadsheet. Because this paper is only a brief overview of the process, it may appear difficult because of the lack of detailed explanation. The VPP manual explains all the necessary steps in greater detail with many corresponding figures. The manual also provides four case studies as examples that use the VPP in different approaches.

References

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