

Visual Assessment and Relational Database Management

by:

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Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University
in partial fulfillment of the requirement for the degree of

MASTER

in

LANDSCAPE ARCHITECTURE

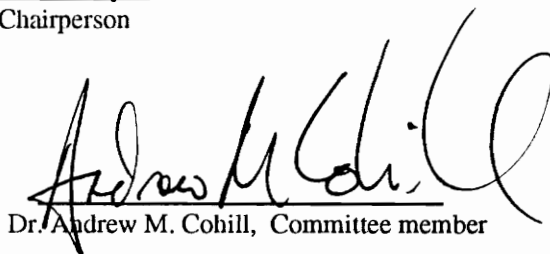
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July 1994

Blacksburg, Virginia

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Abstract: Protection of the visual environment begins with a comprehensive documentation and evaluation of existing conditions followed by the development of guidelines pertaining to future alterations. This thesis examines existing methods of visual assessment and the needs of the land planner for the purpose of understanding the necessary components of evaluating the visual environment effectively. The objective has been to develop a new method of visual documentation and evaluation that can be utilized by land planners for the visual assessment of road corridors.

In order to achieve this objective, a visual assessment of a significant road corridor in Blacksburg, Virginia has been conducted. Various necessary components have been included in the assessment and a relational database management program has been used in the storage of all collected data. As a result of this process, it was found that a new method, which borrows from past processes, addresses the needs of the land planner, and utilizes an interactive medium for storage of data, is successful in addressing the objective. The new method has been successful in including the necessary components such as qualitative evaluation with adaptive descriptive nomenclature and photographic documentation of the existing corridor.

The database has many qualities which are meaningful to land planners. Relational database management programs have the capability of storing text as well as photographs. For land planners to view the various aspects of the corridor, a simple pressing of their computer mouse button moves them from one aspect to another.

Acknowledgment

Thank you Paul Kelsch and Dr. Andrew Cohill for your help.

Thank you Dr. Patrick Miller. If patience were gold you would be a king.

Thank you Jimmy L., Lisa R., Scott K., John F., Harry G., Teresa P., and Johnny C. Every word in this thesis mirrors our discussions and friendships.

Thank you Audrey B. and Richard B. If a parents job description included the ability to tolerate an evolving child, you would both be over qualified.

Thank you L. Grayson W. B. You are the reason this document is complete. By our marriage, I am complete

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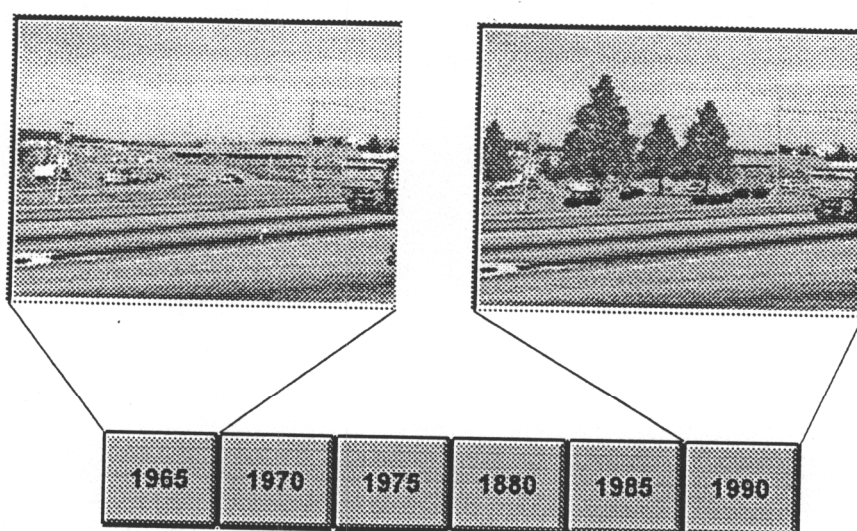
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Introduction



Is it possible to develop a database that allows the user to retrieve visual information from the past and compare it to a present day visual documentation by pressing a button with their computer mouse? Can a method of visual documentation and evaluation be developed that aids land planners in viewing a progression of visual change over time? Many methods of aesthetic documentation and evaluation have been assembled for assessment of the visual environment. With increased consciousness and concern for all aspects of the environment, interest in the visual environment has increased. Methods developed in the mid nineteen-sixties have contributed to the understanding of variables that comprise the visual environment. Since that time, many new methods and new variables have been introduced to add to the discipline. This thesis recognizes

that these past methods have been effective in the evaluation of the visual environment, and it attempts to add to them.

Land planners understand the difficulties involved in the evaluation of aesthetics. Most often, methods of visual assessment attempt to be evaluative with a high degree of objectivity. Still they are scrutinized for their subjectivity. The process presented in this thesis approaches assessment with documentation and management as the primary concern.

The objective of this thesis is to answer the question: Can a new method of visual documentation and evaluation be developed that is utilized by land planners for the visual assessment of road corridors?

To help answer this question, a review of literature related to Visual Assessment was conducted. It was discovered that each approach to visual assessment follows a similar process beginning with documentation and ending with recommendations. Differences are seen in various uses of nomenclature and descriptive variables. Each professional and organization in the field has their own jargon. This thesis attempts to analyze their significant attributes and negative qualities and apply what is discovered in the development of the new method.

The Methodology section establishes the components that are necessary to the land planner for the visual assessment of a road corridors. The established needs of the land planner are: method of documentation, living document, and management guidelines. As an overview, the proposed method involves the separation of the road into visual units and an evaluation utilizing variables selected from related literature. After the written evaluations are complete, photographs are taken to give picture representations of each visual unit. All information is then input into a relational database management program. This type of program enables the user to store information, including photographs, and allows for quick comparisons between the various scenes that are experienced throughout the road corridors. This process will allow for the development of interpretive photographs, visual evaluations over long periods of time, and the use of video clips as part of a visual assessment.

The Findings section discusses an application of the new method and examines the success of this application. For the purpose of this study, the gathered components have been applied to the assessment of a significant road corridor in Blacksburg, Virginia. Two reasons exist for why a travel corridor has been used in this research. Travel corridors can have a very diverse visual makeup, providing the opportunity to document an array of visual experiences. The second reason for using a travel corridor has been to address a growing concern in many small towns such as Blacksburg, Virginia. The concern has been with land use and the impact of fast, uncontrolled growth along road corridors. These attributes are often reflected in a locality's visual envi-

ronment. Of particular concern are areas with high environmental sensitivity and areas of historic value.

Success of this thesis is represented by a database with dynamic components. Each part is inter-connected with a series of retrieval and view commands. At their most simple level and at the level of their input, they are basic tables composed of descriptive literature. The complexity of the database is seen by the programmer only. The user is able to move among the data easily with little or no instruction. Although the proposed method of assessment by which this database is achieved is rooted in past processes, it attempts to assist the land planner with latest technologies and techniques.

Literature Review

Visual Assessment is a process of evaluation and documentation of the visual environment. Much of the work in the field of visual assessment is recent and only dates back as far as twenty years ago. Associated literature tends to fall into three categories: professional, behavioral, and humanistic (Zube 1986). While there is a general agreement, different professionals in the field of visual assessment tend to use different nomenclature to label visual variables.

The professional approach is described as that of planners and designers and is based on formal principals. The behavioral approach utilizes the observer or participant as the measuring devices. The humanistic approach is an attempt to "understand the transactions between humans and landscapes, personal experience and landscapes, and meanings of everyday landscapes" (Zube 1986, pg. 18). While the humanistic approach is qualitative, the behavioral is quantitative and seeks the preference of the user.

The following literature review is focused on professional approaches to visual assessment because they are representative of the suggested approach of this thesis and they offer valuable information to address the objective. The professional approach is primarily application-oriented and can be described as having "generalizable theories of landscape preference" (Itami 1989, 211). Assessment of the visual environment within the professional paradigm consists of written and/or mapped inventories based on professional knowledge and judgment. "Basically, the inventory approach requires that a set of landscape features or components, thought to be relevant to scenic beauty, be selected and, to some extent, defined" (Daniel et al. 1976, pg. 5).

Within each category (Professional, Behavioral, and Humanistic) the individual evaluative methods follow a simple process that resembles the design process. Generally, each has an initial stage of documentation, followed by evaluation, conceptualization, concluding with recommendations. The following written material attempts to address literature applicable to this thesis and extract information which can be utilized in an assessment of road corridors.

Literature has been separated into two general categories: governmental agency approaches to visual assessment and approaches of professionals outside of these agencies. Much of the work of the governmental agencies is required by law. Land management programs have been established by law encompassing all aspects of the environment, including visual resources. The following information outlines visual resource programs associated with these government agencies.

The second portion of the following literature review demonstrates other methods of visual assessment which are professional in approach but not related to the programs of the established legislation or agencies of the government. Professionals in the field of visual assessment have developed various methods that have addressed other types of situations such as city-scapes and rural environments. These approaches are site specific in that they can and must be altered to fit the environment to which they will be applied. The approaches of the government agencies tend to be more standardized and focus on the assessment of open lands.

Governmental Approaches

Professional approaches to the protection of the visual environment have, at times, been led by governmental agencies in pursuit of an effective method of land management. Many of the governmental approaches to visual management stem from legislation that requires agencies to comprehensively evaluate, classify, and manage the public land under their control. The National Environmental Policy Act (NEPA) of 1969 has had a lasting effect on federal processes in land management. NEPA required the establishment of the Council on Environmental Quality (CEQ). The CEQ was, among other things, involved in the design of standards for the Environmental Impact Statement (EIS). An EIS is required for all alterations proposed for public land. The statement must include all adverse affects, as well as positive repercussions of the alterations. Another requirement is that Federal agencies are to “continually monitor their own activities to enhance environmental quality” (Sloan 1979, pg. 2). “The Federal government needs no longer to be in the position of trying to repair damage to the environment after the damage has been done because the relevant factors were not considered at the time of the decision” (Sloan 1979, pg. 3).

Former Secretary of the Interior, Stewart L. Udall points out that, “to maintain man’s proper relationship to the land, it is plain that we must insist that our developers be more conservation-minded and we must broaden the role of resource planning in the management of our national state” (Udall 1961). The Environmental Impact Statement (EIS) is mandatory for any al-

terations to federal land. Two agencies with programs dealing with visual issues are the Forest Service and the Bureau of Land Management. Both organizations have developed methods for assessing their visual resources, and processes for evaluation of visual impacts of proposed alterations on their land, but both have some fundamental difference.

U.S. Forest Service

The U.S. Forest Service document titled National Forest Landscape Management, Volume I and II have been influential in the field of visual assessment. Volume I addresses the need to understand changes in the visual environment. Volume II, the Visual Resource Management System suggests a methodology by which visual management can occur (*Figure A*). Both Volumes are founded on the premise that people who visit our national forests expect to see “naturally occurring character” (U.S.D.A. 1975, pg. 2).

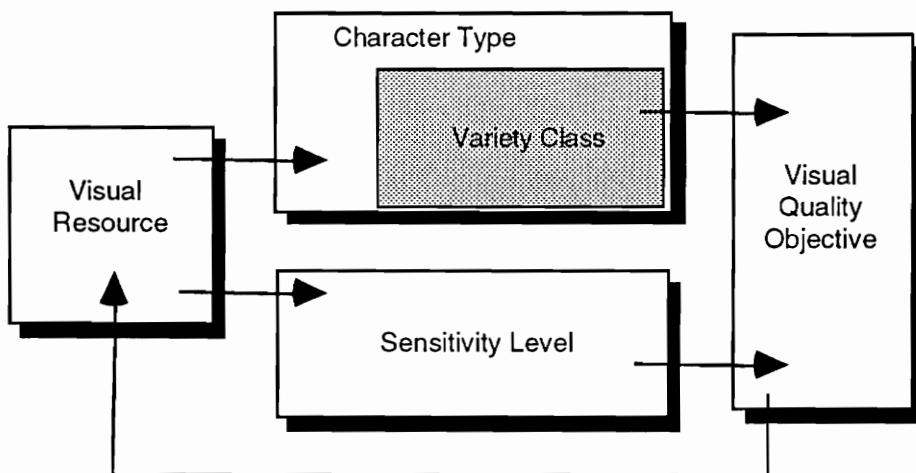


Figure A - U.S. Forest Service
Visual Resource Management System (U.S.D.A. 1975)

The Objectives of Volume I are as listed:

1. Provide a service wide approach to landscape management from which guidelines can be developed for designating the visual aspects of resource management.
2. Provide illustrations and terminology that describe basic landscape management concepts.
3. Foster an awareness of ways in which man reacts to the visual aspects of his non-urban environment.

4. Encourage and assist universities, conservation organizations, resource-based industries, government agencies, and others to adequately consider the scenic resource during the various phases of land use planning and development.

(U.S.D.A. 1973, pg. 3)

Much of the U.S. Forest Service land is open and primarily un-developed, therefore the objectives are focused on these types of settings. Although this thesis is focused on a more urban environment, many of the U.S. Forest Service concepts and terminology are applicable. Volume I suggests that Man's "visual reaction to his environment" is related to three aspects of the landscape (U.S.D.A. 1973, pg. 3): characteristic landscape, variety, deviation.

Characteristic landscape is an area with identifiable character. Panoramic, feature, enclosed, focal, canopied, detail, and ephemeral are all descriptions of landscape character (U.S.D.A. 1973, Litton 1968). The land will have an "overall impression created by its unique combination of visual features (such as land, vegetation, water, and structure) as seen in terms of form, line, color, and texture" (U.S.D.A. 1973, pg. 7, Bureau of Land Management 1980).

Variety of the landscape is the level of interest or intrigue it conveys. Areas of high interest are preferred although there is the chance that a landscape may contain too much variety, thus intimidating the viewer. Deviation from the characteristic landscape, referring to contrasts in form, line, color, and texture, creates the final visual reaction.

Many of the concepts written in Volume I are based on the work of R. Burton Litton, Jr. "Calling the landscape a scenic resource assumes that it has esthetic value. From this assumption, it follows that the discipline of design can provide a particular point of view as to what affects visual perception of the landscape, and how it may be managed" (Litton 1968, pg. 2). Litton lists six factors which affect our perception of the Landscape:

1. distance,
2. observer position,
3. form,
4. spatial definition,
5. light, and
6. sequence.

Distance is important since perceptions change with differing view distances. Litton notes three distance zones: foreground, middleground, and background (*Figure B*). A foreground view is from 0 to 1/4 mile away. Litton describes this view as the place where the viewer is. The middleground is between 1/4 mile to between 3 and 5 miles. Within the middleground view we see the "emergence of shapes and patterns" (Litton 1968, pg. 4). Alterations of dominance el-

ements are easily seen from this vantage. Background views are more than between 3 and 5 miles away. Surface texture and detail tend to blend together from this point, helping the foreground and middleground views to stand out more.

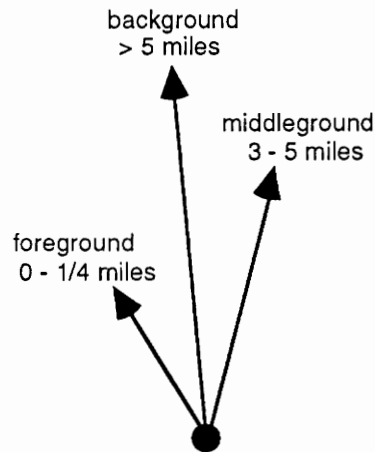


Figure B - Distance Zones (Litton 1968)

The landscape is experienced differently from different viewer positions. Litton has distinguished three observer positions: observer inferior, observer normal, and observer superior (*Figure C*). This concept is fairly self explanatory. If a viewer is in the observer inferior position, the landscape is above them. At a normal position, the viewer is at the same level as the landscape. A viewer in a superior position is looking down onto it.

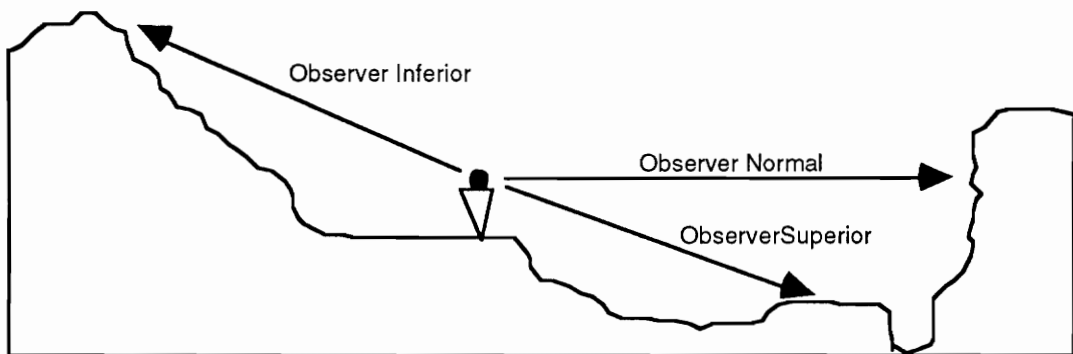


Figure C - Observer Positions (Litton 1968)

Form refers to the topographical features and to the “three-dimensional convex elements” of the landscape (Litton 1968, pg. 11). Litton notes that different geographic landforms

project different images such as ridges, knolls, islands, cliffs, and cinder cones. In order to reveal form, Litton feels that contrast is important. An element of the landscape which can, at times, emphasize contrast in nature is vegetation.

As 'form' refers to convex landscape features, spatial definition refers to concave features. Litton describes these spaces as having a limit to them. Again, different terms used to describe these features provide an image of their nature: basin, canyon, meadow, pocket, and gorge (Litton 1968). Light has three aspects which impact the view: color, distance, and direction. These aspects need to be considered in visual assessment. The color aspect is based on hue and value. The hue of a color is the quality regarding red, green, yellow, etc. (Litton 1968). Value refers to the tonal quality of the color. Direction of light has an effect when viewing background landscapes. The direction of light refers to back light, side light, and front light. These differing light locations will affect the shading of the landscape. Sequence is defined as the "progressive interplay of forms, distances, space, lighting, and observer position" (Litton 1968, pg. 22). This component of the visual character of the landscape is important to the experience of a corridor.

National Forest Landscape Management, Volume II, The Visual Resource Management System, presents a method by which all previously mentioned concepts and corresponding definitions can be applied. With this process, federal lands are assigned a Visual Quality Objective. Visual Quality Objectives are derived from two separate evaluative systems: Variety Class Ratings and Sensitivity Levels.

Upon the separation of land into manageable characteristic landscapes. It is then classified into Variety Classes, which are representative of its scenic quality. There are three classes of scenic quality: Distinctive, Common, and Minimal. "Distinctive" is a classification which refers to "outstanding visual quality" (U.S.D.A. 1975, pg. 12). "Common" landscapes are moderately high in visual quality. Minimal landscapes are low in visual quality. These classifications are deduced from an evaluation of a number of landscape characteristics such as landform, vegetation, and water features. These aspects are important to this thesis and to the development of method of visual assessment. The descriptive variables are adaptive and representative of the land for which they are to be applied. The descriptions tend to be qualitative, where the professional describes the landscape and the visual variety that exists.

Sensitivity is separated into three levels: high, moderate, and low. "Sensitivity levels are a measure of people's concern for the scenic quality of the National Forests" (U.S.D.A. 1975, pg. 18). Significant factors in this evaluation include viewer duration and the quantity of viewers. Sensitivity levels are matrixes with Variety class information to determine Visual Quality Objectives.

The Visual Quality Objectives are: preservation, retention, partial retention, modification, and maximum modification. Additional classifications, rehabilitation and enhancement, represent short-term management goals. Visual quality objectives are a range of classifications where each “describes a different degree of acceptable alteration of the natural landscape based upon the importance of aesthetics” (U.S.D.A. 1975, pg. 28).

Land with the designation of **preservation** is assigned an objective where “management activities, except for very low visual-impact recreational facilities, are prohibited” (U.S.D.A. 1975, pg. 29). The **retention** objective requires that land management activities not be “visually evident” (U.S.D.A. 1975, pg. 30). The **partial retention** objective calls for management activities to remain “visually subordinate” to the characteristic landscape (U.S.D.A. 1975, pg. 32). For areas with **modification** as their objective, “management activities may visually dominate the original characteristic of the landscape. However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, and texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type” (U.S.D.A. 1975, pg. 34). Management activities on land with a **maximum modification** objective may also dominate the characteristic landscape as with the modification objective. However, if the alteration is viewed as a background, “the visual characteristics must be those of natural occurrences within the surrounding area or character type” (U.S.D.A. 1975, pg. 36).

The separation of land into manageable districts with similar characteristics, the use of adaptive descriptive variables, and the labeling of visual quality objectives are important aspects of the Visual Management System that can transcend into other types of assessments that are not directed toward the assessment of open lands. Some aspects of the process are questionable. It is an approach to visual assessment that is comprehensive and successful in protecting federal lands but it does tend to focus on the preparation of a written evaluation. Difficulty may arise for land planners when they look through a database of written information and try to envision what maximum modification might look like in a landscape for which it is suggested. A possible way to enhance the process may be to include photographic representations of various aspects. Burton Litton, who was involved in the initial stages of the Visual Management System has proposed another process of evaluation, Landscape Control Points, which moves toward documentation with photographs being most significant.

Landscape Control Points (LCP) is an evaluative process that has been valuable in the measurement of the visual effects of proposed alterations to the environment. LCPs are fixed

stations “from which a broad, intermediately distant view of the landscape may be seen” (Litton 1973, pg. 1). Litton lists the five steps of the LCP procedure:

1. Establish a network of LCPs to give a reasonably continuous view of an existing area.
2. Plot on a topographic map the limits of the visible area seen from each LCP.
3. Photograph a panoramic view from each of LCPs.
4. For more specific parts of a broad photographic panorama, prepare perspective field sketches as a base for more precise or finer grained studies of possible changes and alternatives.
5. As elements of a management plan or a Forest Service multiple-use studied and proposed, use the LCPs and the graphic information derived from them to project the possible impacts of planned proposals.

(Litton 1973, pg. 4)

During the time when these types of evaluations were in the development stage, visual simulation was not very complex. Most often it involved sketches, overlays, or spliced photographs. The method described in Landscape Control Points is different to the Visual Resource Management System in that the focus tends to lean more toward the preparation for simulation than it does toward documentation. Presently, simulation tends to involve computers as the medium. Computers have gained significance in the field of visual assessment, especially with professional assessments. Computer simulation allows users to predict future scenarios of development and to present alternatives for land development projects. The speed at which the computer can provide output information enables a system of image processing to help a designer or planner at all stages in the design process (Orland 1986).

Programs such as VIEWIT have been used extensively for visual assessment of public land. Much of the early literature relating to visual assessment speaks of this program’s application in determining seen areas and distance zones. More recently, photo images have been used to simulate alterations to the environment with picture-perfect accuracy. In this process, photos are scanned into the computer as raster images, manipulated, and printed to film. Modeling programs such as AutoCAD and Microstation work in a vector format. Vector images are three dimensional, providing scale accuracy to photo images. Richard Chenoweth describes four roles that photo manipulation can play:

1. To serve as a tool for the enforcement of public rights to know the aesthetic consequences of the environmental modification.

2. To create simulations that might serve as legal documents in the context of existing policies.
3. Help to establish perceptually based performance standards in land use regulation.
4. Assist in the assessment of monetary penalties for aesthetic damages.
(Chenoweth 1991, pg. 9)

Designers have an absolute dependence on simulation as a tool for presentation of ideas, but little is known about the effectiveness of methods used (Zube, Simcox, and Law 1987). These new process are effective for simulation purposes and should be included in developing new methods of assessment.

Bureau of Land Management

The Bureau of Land Management (BLM), like the Forest Service, has established a program for managing the visual environment. It is called the Visual Resource Management program (VRM) and is based on the premise that there are similarities in visual preferences.

One of the primary responsibilities of the BLM is to uphold legislation written in the Federal Land Policy Act of 1976, which stated that:

...public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmosphere, water resource, and archaeological values;
(Bureau of Land Management 1980, pg. 8)

This Act addresses environmental resources. It gives the visual environment as much importance during the design process as all other environmental attributes. The National Environmental Policy Act of 1969 states that it is the responsibility of the government to:

...assure for all Americans safe, healthy, productive, and aesthetically and culturally pleasing surroundings.
(Bureau of Land Management 1980, pg. 9)

As mentioned in an earlier section, this legislation has built the framework for regulation of alterations to public lands. Just as with the method used by the Forest Service for evaluating the visual environment, the BLM has developed a landscape rating system that helps describe and give numerical values to areas which have importance and are sensitive to change (*Figure D*). The work of the Forest Service is similar to that of the BLM in that both organizations are attempting to assess their visual resources. Similarities also exist in the separation of land into

manageable areas with consistent visual character. Differences are seen in the overall approach. The Forest Service relies more on subjective qualitative analysis with adaptive variables, while the BLM tends to rely more on a quantitative process using a set of distinct descriptive variables .

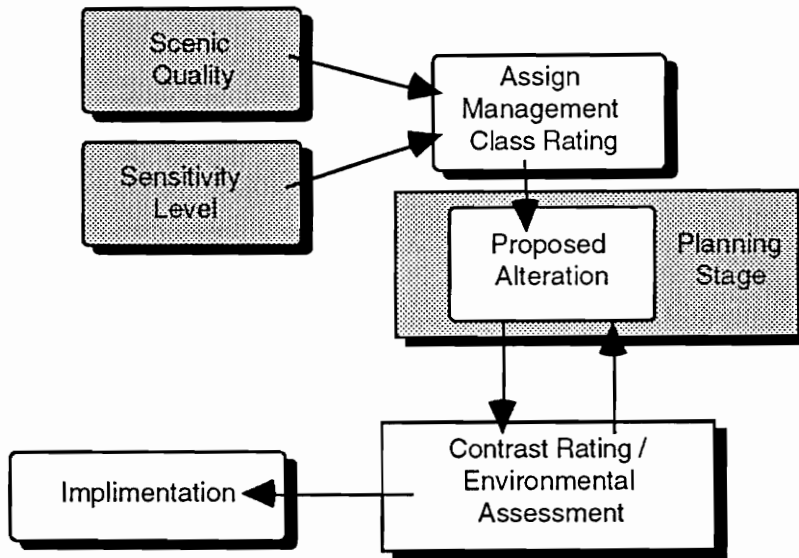


Figure D - Bureau of Land Management Visual Resource Management Program (Bureau of Land Management 1980)

After the landscape has been separated into sub-units which have a homogeneous character, a complete evaluation is performed to assign scenic quality ratings based on the “overall impression retained after driving through” (Bureau of Land Management 1980, pg. 18). The BLM uses the following features in developing a scenic quality rating:

1. landform,
2. vegetation,
3. water,
4. color,
5. adjacent scenery,
6. scarcity, and
7. cultural modifications.

The system of point rating is standardized, giving a number assignment that corresponds to the importance of each feature. If the landscape is strong in each category, it receives a high score. After the points have been added up, the sub-unit is categorized into a Scenic Quality Class.

There are three classes:

Class A • Areas that combine the most outstanding characteristics of each rating factor (19-33 points).

Class B • Areas in which there is a combination of some outstanding features and some that are fairly common to the physiographic region (12-18 points).

Class C • Areas in which the features are fairly common to the physiographic region (0-11 points).

(Bureau of Land Management 1980, pg. 18)

This system of assessment has proven to be a useful tool in quantifying landscapes (Bureau of Land Management 1980, Miller 1983).

The second step in the evaluation process is to determine sensitivity levels based on use volume and user reaction. "Volume" is based on traffic (by foot or motor transportation) through an area. A ranking is assigned as high, medium, or low. "User reaction" is judged with a survey technique. People familiar with the area are asked for feedback. This variable is also assigned a rating of high, medium, or low.

The third step in the procedure is determining distance zones. As with the Forest Service method, the land is assigned a foreground, middleground, or background designation. There is, however, an additional category of "seldom seen." These are areas that have low priority due to the probable proximity to the viewer. Many times these places are tucked behind ridges or surrounded with forest.

All of the preceding information is combined for management classifications designated as Class 1 through Class 5, with Class 1 including the most sensitive areas. "Management classes describe the different degrees of modification allowed to the basic elements of the landscape" (Bureau of Land Management 1980, pg. 24). The BLM describes the four basic visual elements of the landscape as: form, line, color, and texture. Form is the mass or shape of the object. Line is the path that the eye follows when perceiving abrupt differences in form, color, and texture. Color is the property of reflecting light that allows the eye to differentiate objects. Texture is the interplay of light and shadow. "The stronger the influence exerted by these elements, the more interesting the landscape" (Bureau of Land Management 1980, pg. 13). The class descriptions are as follows:

Class 1: Natural ecological changes and very limited management activity are allowed. Any contrast created within the characteristic landscape

must not attract attention. This classification is applied to wilderness areas, wild and scenic rivers, and other similar situations.

Class 2: Changes in any of the basic elements (form, line, color, and texture) caused by management activity should not be evident in the characteristic landscape. Contrasts are seen but must not attract attention.

Class 3: Contrasts to the basic elements caused by a management activity are evident, but should remain subordinate to the existing landscape.

Class 4: Any contrast attracts attention and is a dominant feature of the landscape in terms of scale, but it should repeat the form, line, color, and texture of the characteristic landscape.

Class 5: The classification is applied to areas where the natural character of the landscape has been disturbed to a point where rehabilitation is needed to bring it up to one of the four other classifications.

(Bureau of Land Management 1980, pg. 25 - 29)

Future alterations to the environment are evaluated on their contrast to the four basic elements of the landscape: form, line, color, and texture. The process of the impact assessment involves the comparison of the existing activity to the proposed activity. If the proposed alteration is acceptable and falls within the management class specifications then the project may proceed. If the alteration is rejected, then it must be re-designed until it fits the management class stipulations.

Although this process is well organized and straight forward, it should be noted that no process can be considered fool-proof and the effectiveness should be evaluated through research of public spaces that were designed with the public policy (Zube 1980).

Other Professional Approaches

Professional assessments of the visual environment are not limited to government agencies. An approach to visual management that examines the visual aspects of travel corridors is presented in View from the Road by Appleyard et al. (1964). The authors felt that in order to make any changes in the view from the road “the first essential is to develop a technique of recording, analyzing, and communicating its visual sequence” (Appleyard et al. 1964, pg. 19). Motion and space must be analyzed according to categories:

1. Apparent self-motion: speed, direction, and their changes (stop-go, accelerate-decelerate, up-down, right-left).

2. Apparent motion of the visual field: passing alongside, overhead, or underneath; rotation; translation; spreading or shrinking of outline or texture; general stability or instability; apparent velocity or lack of it.
3. Spatial Characteristics:
 - a. Presence and position of enclosing objects or surfaces, their solidity and degree of enclosure.
 - b. General proportions of the space enclosed; scale with respect to the observer; position of the observer.
 - c. Quality of light which makes the space apparent: intensity and direction.
 - d. Relationship of spaces in sequence: jointing and overlapping.
 - e. Direction of principle views, which draw the eye toward different aspects of the spatial enclosure.

(Appleyard et al. 1964, pg. 21)

Evaluation of a corridor using this method will show these characteristics as map notations (*Figure E*).

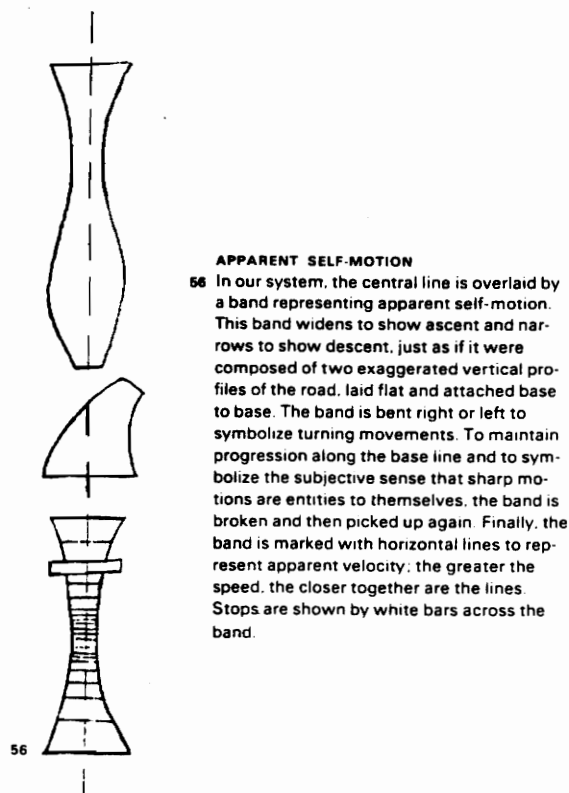


Figure E - Notation of Motion and Space (Appleyard et al. 1964, pg. 22)

Another important aspect of the road experience is the sense of orientation (Appleyard et al. 1964). Appleyard describes the notation of this image using Kevin Lynch's (1960) terminology. They are: path, nodes, districts, edges, and landmarks. Figure F demonstrates Appleyard notations of orientation. Lynch calls these elements "physical perceptual objects" and uses them for the classification of city form (Lynch 1960, pg. 46). Appleyard has transcended these elements to the analysis of a corridor; reiterating Lynch's notion that path, nodes, districts, edges, and landmarks can be experienced in linear travel. Lynch's description of these elements is as follows:

1. Paths. Paths are the channels along which the observer customarily, occasionally, or potentially moves.
2. Edges. They (edges) are the boundaries between two phases, linear breaks in continuity: shores, railroad cuts, edges of development, walls.
3. Districts. Districts are the medium-to-large sections of the city, conceived of as having two-dimensional extent, which the observer mentally enters 'inside of,' and which are recognizable as having some common, identifying character.
4. Nodes. Nodes are points, the strategic spots in a city into which an observer can enter, and which are the intensive foci to and from which he is traveling.
5. Landmarks. Landmarks are another type of point-reference, but in this case the observer does not enter within them, they are external.

(Lynch 1960, pg. 48)

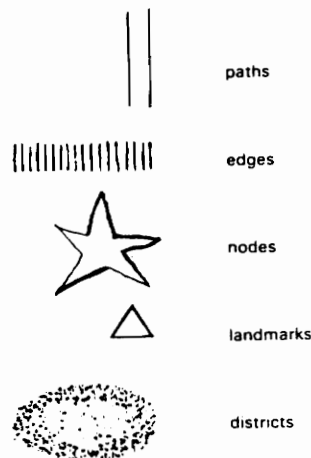


Figure F - Notation of Orientation (Appleyard et al. 1964, pg. 24)

For the purpose of this thesis' assessment of a Blacksburg road, the term **travel corridor** will be used to describe linear pathways or roadways by which people are passing from one destination to another. This definition is similar to Kevin Lynch's definition of path. The word "path" is just as relevant a term; the term **travel corridor** is used to give a better interpretation of the thesis' application to Blacksburg roads. Although the terminology is a reflection of this research, it is possible that the proposed process of evaluation and documentation can transcend to other types of visual experiences.

Another example of a professional approach to visual assessment is that of the project undertaken by the Vineyard Open Land Foundation of Martha's Vineyard (1973). The study is titled Looking at the Vineyard . It attempts to approach the problem of a degrading visual character associated with the development that was taking place on the island of Martha's Vineyard.

The first step of the project team was to categorize all of the island's scenery into visual units: the salt lands, the bluffs, the moors, the hilly thickets, the wooded moraines, the open plains, the flat thickets, and the wooded plains. This separation is similar to the method of the U.S. Forest Service. The categorical separation is based on visual homogeneity. This process aids in the protection of the visual resource by creating manageable districts by which general preservation practices can occur.

For each category, there are three descriptions made: characteristics, development of the scene (the effect that development would have), and guidelines in brief. The following abstracts have been taken from the description of the Wooded Plains scenery.

- **Characteristics:**
The ground is not really flat of course, for in addition to its persistent general slope and minor irregularities, it is also marked by the long 'bottoms' the former courses of glacial streams, which lead into the extremities of the salt ponds.
(Vineyard Open Land Foundation 1973, 35)
- **Development of the Wooded Plains:**
They can accept considerable development, and be improved by it. But, as always, the development must be done well, or we will substitute an aggressively dreary landscape for one that is now only mildly so.
(Vineyard Open Land Foundation 1973, 35)
- **Guidelines:**
Develop moderate to high density clusters, well separated in the forest.
(Vineyard Open Land Foundation 1973, 37)

This study helped the people of the Vineyard assess and plan the visual character of their island. The evaluative process was developed specifically for the Vineyard. Successful processes

of evaluation and documentation should be representative of the space for which they are designed. Another significant aspect of the process is its qualitative evaluations based on professional judgments. This approach gives the professional a flexible alternative to structure an evaluation that is not representative of the place that it is applied.

Methodology

Up to this point, the discussion has addressed various approaches to visual assessment. They have been separated into two categories: Governmental approaches and approaches by other professionals. This discussion has laid the ground work for a new method of visual assessment for the documentation of road corridors. Although methods exist for this purpose, the following section pulls the previous discussion together and addresses the needs of the land planner to form a coherent approach to travel corridor assessment. The objective is as follows:

- To develop a new method of visual documentation and evaluation that can be utilized by land planners for the visual assessment of road corridors.

The following proposed method is built around the needs of the land planner. Land planners are in need of a method of documenting the visual environment through a systematic process that is focused on understanding all components of the corridor. Data from the assessment has to allow for routine updates with minimal effort. For the method to be useful to the land planner, the method has to provide guidelines for the management of the visual environment. To aid in addressing these needs, this new method utilizes a computerized database management system. The system allows for the storage of written data as well as photographic material. The inclusion of this type of storage medium extends the capabilities of the land planner and enhances the process of visual assessment.

The primary goal of visual assessment is to accumulate information that aids and guides land planners in making decisions about land alterations. Decisions based on these assessments can help prevent adverse affects to the visual environment. The proposed method has to satisfy the needs of the land planner in addressing road corridor assessment and management. An evaluation of this type is similar to the process of Comprehensive Planning. Comprehensive planning

involves an evaluation of existing conditions, including assets and liabilities, and the development of objectives for future scenarios. The process is expected to help guide and focus a community's growth and economy for a number of years. Although comprehensive planning has a different focus than visual assessment, the basic needs of the planner are the same. In a method of visual evaluation and assessment of road corridors, the needs of the land planner are as follows:

1. method of documentation,
2. living document, and
3. management guidelines.

The following discussion explains these needs of the land planners and formulates a method of visual assessment from them. Each section is being discussed based on the necessary components to meeting the need. Although this thesis proposes a method that borrows from previous methods of visual assessment, it assesses the needs of the land planner to develop the method.

Method of Documentation

Site evaluation is an initial stage in land development. This is a crucial step where the designer attempts to become well equipped in making design decisions through land analysis techniques. The designer has an obligation to the public and land to understand all aspects of the existing environment before making decisions that affect the landscape. In the visual assessment of a road corridor, the land planner needs to acquire information and assess the existing visual environment before land alterations can happen. Having a database of information which is representative of the visual environment along a road corridor equips the land planner with a base understanding of how the land can be developed without undue harm to the landscape.

Knowledge of the following components is necessary to developing a method of documentation of the visual environment along road corridors:

1. visual units,
2. existing landscape features, and
3. descriptive variables.

The following information describes each component necessary to meeting the need for documentation and their purpose as they relate to the needs land planner.

Visual Units

A visual unit is an areas of land that exhibits distinguishing visual characteristics. Multiple visual units may exist along a road corridor, or a corridor can have one continuous character. Most communities are significant enough in size that management of the landscape requires separation into manageable units. As an example, towns are generally separated into zoning districts. Each district has a prescribed land use. Most methods studied for this research have demonstrated the need to partition the land into units which are similar in their visual make-up and are generally visually homogeneous. As with the use of zoning districts in town planning, separation of land into visual units helps land planners to prepare general guidelines that address particular needs of an area. Therefore, it is important that a new method of visual assessment include an initial stage of separation into visual units.

To accomplish the task of separating the corridor into visual units, the corridor is surveyed. In the assessment of open lands, the U.S. Forest Service separates land into character types based on land form, rock formations, water forms, and vegetation patterns. For the purpose of visually assessing a road corridor the aspects that affect how the land is separated are related more toward built environments. Aspects of the visual environment that affect how land is to be characterized are vegetation, hardscape, spatial definition, curvature of the road, and development type. As changes in these aspects occur, they are mapped. The visual units are labeled in a manner that is reflective of the type of visual aspects that are found within it. Each Visual Unit may not contain a single type visual character entirely. Each category is expressing an overall visual characteristic that is represented in its name. For example, a Medium Business area may have some residential characteristics, but the overall distinguishable visual character of the landscape is Medium Business. The separation into visual units helps the land planner in addressing the needs of particular types of visual situations. Land planners will have the opportunity to develop an overview of guidelines for a visual unit.

Existing Landscape Features

The Bureau of Land Management discusses the use of landscape features to aid in the assignment of scenic quality ratings to Federally owned open lands. Aspects of the landscape such as water, adjacent scenery, and scarcity all contribute to this classification. For the purpose of this research, the identification of features is focused on items in the landscape that can be singled out as points of interest and are adapted from Lynch's identification of "physical perceptual objects."¹ Features are identified as edges, nodes, landmarks, significant views, or historical places.

¹ Refer to page 17 for definitions of Lynch's terminology.

Visual features within the visual units can be either negative or positive and are, at times, items that are a visual contrast to the homogeneity of the visual unit. The purpose of identifying visual features is to help guide development decisions away from significant places and help enhance visual attributes found along the corridor. If the method of documentation includes a step of noting landscape features along the road corridor, the land planner has a better understanding of what is significant to the overall experience of that landscape.

To address the need to locate features along South Main Street, each visual unit is surveyed. All features are identified and documented onto a map of the South Main Street road corridor. Knowledge of all features along the South Main Street corridor will enable the land planner to isolate areas that may have to be protected or possibly enhanced.

Descriptive Variables

Descriptive variables are categories by which the visual character of the landscape is discussed. The U.S. Forest Service utilizes adaptive nomenclature in assessing multiple types of visual experiences. An evaluation which utilizes this type of descriptive process is adaptive to the type of landscape at hand. If there is a need to document the type of vegetation in an area, vegetation would become a variable by which the area is discussed. If a method is to be developed that helps land planners in making decisions about their communities, the process of evaluation has to be adaptable to the various types of visual situations that they may encounter. Land planners are often faced with these varied visual situations as most communities are not solely residential or downtown, but are composed of many visual components. Therefore, the proposed method should also include adaptive nomenclature in the written descriptions and initial assessment stages to help assess a diverse visual makeup.

To meet this need, nomenclature has been adopted from the Visual Management System of the National Forest Service (U.S.D.A. 1975) and other professionals in the field of visual assessment. Only nomenclature which is considered useful for the task of visual assessing road corridors has been chosen. For the purpose of assessing road corridors the descriptive variables are vegetation, hardscape, spatial definition, quantity of viewers, and velocity and self motion. An additional descriptive category titled general characteristics is used to aid in the description. The definitions are as follows:

1. **Vegetation:** The greenness of the corridor.
2. **Hardscape:** This term is in reference to man-made aspects of the visual environment.
3. **Spatial Definition:** Presence and position of enclosing objects.

4. Quantity of Viewers: Based on the number of vehicles to travel the corridor each day.
5. Velocity and Self Motion: Travel speed.
6. General Characteristics: General notations about the visual unit.

These descriptive variables are adaptive to the corridor in which they are being put to use. Assessments of different corridors may produce different results. Visual units are assessed during drive and walk throughs. For each visual unit, a rating of low, medium, or high is assigned to describe the corresponding variable and a definition which is representative of the corridor is established. The assignment is necessary for the development guidelines for each visual unit (This will be further discussed in the section titled Management Guidelines).

Living Document

A living document is a product that will allow for easy updates and re-evaluations. Land planners are in need of a visual assessment database that changes with the visual environment. Just as in comprehensive planning, this database of information accumulated from the visual assessment will have to be updated as development and change takes place along the road corridor. Two components are necessary to accomplish this:

1. landscape management points and
2. storage to an interactive medium.

Landscape Management Points are positions by which the landscape is to be monitored. Photographic representation of each visual unit from these points along the corridor will aid in controlling effects from alterations. The use of computers in the storage of the database allows the land planner to take advantage of computer capabilities such as speed, quick retrieval of data, and organization.

Landscape Management Points

Burton Litton has proposed the use of photographic representations to accompany a verbal assessment. He also suggests the use of management positions by which the visual environment can be monitored. This component not only enhances the understanding of the assessment at hand, it aids land planners in the simulation of proposed changes and gives future land planners an understanding of past visual situations. A proposed method should include photographs to aid

in the representation of the existing visual environment. These photographs should be taken from positions by which the landscape can be managed and monitored over time.

In order to include photographs and management points in a new method of visual assessment, the following criteria have been developed:

1. Position that is representative of the visual unit.
2. Area with 1/4 mile viewing distance.
- 3.. At an entering position in the visual unit.

The positions from which the photographs are taken are called Landscape Management Points (LMP). LMPs are precise positions along the road corridor which are photographed for the purpose of representing their corresponding visual unit. To monitor the visual environment, the LMPs are to be revisited over time. In order for land planners to revisit these positions and to utilize them as positions for monitoring the visual environment, the location and the direction of view are noted.

The inclusion of LMPs in an evaluation of the visual environment is important to the land planner for many reasons. It enhances the assessment with visual documentation of the landscape. It aids land planners in the simulation of proposed changes. Finally, it provides the land planner with points along the corridor that can serve as monitoring positions. These photographs will help land planners view incremental changes in the visual experience over long periods of time. This will be further discussed in the Conclusions section of this thesis. As mentioned in the work of Burton Litton, management of the visual environment and prediction of the impact of future alterations can be aided with an assessment involving photographic documentation.

Storage to an Interactive Medium

Technological advances in the recent past have contributed to the field of visual assessment a great deal. Each professional field has experienced advances that are particular and significant to that field. In visual assessment, most of these advances have been focused on the ability to visual simulate change. The components which are necessary to satisfying the need for computer technologies are as follows:

1. organizational and storage capabilities,
2. easy input and retrieval of data,
3. easy updating for periodic reviews,
4. storage of photographs,
5. speed, and
6. cost effectiveness.

Computers are beginning to aid land planners with **organizational and storage capabilities** beyond what has been used in the past. Most often, design is being accomplished with modeling programs and written documents produced on personal computers. In the past, a visual assessment would include written documentation and photographs that were arranged into a booklet format. If the information was to be reproduced, it was necessary to create copies from an original hard copy set of photographs and document print-outs. To utilize the latest technologies effectively, a new method of visual assessment should provide the land planner with the opportunity to have all available information from an assessment in one complete computerized file.

Computers have made a positive impact on the **ease of inputting and retrieving data**. With personal computers, the user is able to input data while on site. If descriptive variables are written into a computerized form, the process of assessment is simple. The planner is able to travel the corridor with their notebook computer and input the assessment directly into the relational database management program that is being utilized in the storage of data. Additionally, the planner is able to retrieve and compare related information from different documents with ease. Past visual assessment methods required that the land planner write information to paper and type the information at a distant location. They would also have to physically move through pages and books of information to retrieve past documentation. Many times this information is cumbersome and bulky. With new computer technologies this information becomes more manageable. Land planners should be able to load, examine, manipulate, and store the information related to a visual assessment in one computerized file. If a new method is to successfully include latest technologies, it should have easy access and retrieval capabilities.

To have an evaluation of the visual environment that continues to aid the land planners in making decisions it is necessary for the database of information to be up datable. As mentioned in the section titled "Landscape Management Points," the visual environment is to be monitored and re-evaluated over time. In order to address this need, the computerized storage process has to allow for **easy updating for periodic reviews**.

The significance of the use of photographs in visual assessment was discussed in the previous section titled "Landscape Management Points." With photographic representations of the road corridor, the land planner has the opportunity to monitor changes over time. For a relational database management system to be valuable to the land planner as a place for the storage of a visual assessment, it needs to accommodate the **storage of photographs**. In developing a database of information, photographs can be included as representations of visual units along the corridor.

Computers have aided land planners by **speeding** the time for which information can be produced and updated. With modeling programs, developers are able to re-open drawing files on their computer and make changes quickly. In the past, changes required that plans be re-drawn. In visual assessment, collected material often includes maps and photographs. A land planner is always interested in the most accurate and recent information. If alterations are to be made to a map or new photographs are to be taken, speed is essential. Documenting the initial information rather than updating the data of an assessment takes the most significant amount of time. Personal computers allow the user to make changes and reproduce information quickly. If land planners are to effectively utilize latest technologies for visual assessments, the new method should make the production and updating of files a quicker process.

The final necessary component is **cost effectiveness**. With speed and management capabilities, computer technologies have helped to decrease long term costs. Many communities do not have very large budgets for evaluations such as visual assessment. Many places such as Blacksburg direct their financial resources toward social and economic development. If all available resources were poured into an assessment, limited funds would remain available to make the necessary physical changes recommended by the assessment. A new process that is geared toward aiding land planners in visual assessments should be cost effective.

To adequately include these components, all collected data is input into a relational database management system. This type of program allows for the input of written and photographic documentation. The land planner using this database will have quick access to all information gathered in the visual assessment and will have the opportunity to update the database as necessary. These databases are complex in that the relationships between the various tables are created with macros and queries. When a computer programmer writes a program, they enter into the computer a series of commands that lead toward an ultimate goal. Part of the process involves entering criteria and sorting data. It can be compared to mapping out a trip. For the individual who only wishes to view the various aspects of this database, the process is simple and requires that they follow instructions and press buttons with their computer mouse.

Previous methods of visual assessment have been effective but can be enhanced with the utilization of computer technology for the storage and retrieval of data. Relational database management systems have proven to be valuable in the management of many types of data and are being tested in this thesis as a tool in the organization of information gathered as part of a visual assessment. With the increased capabilities of this type of system, the need for a living document are satisfied.

Management Guidelines

Management guidelines are important in controlling alterations that occur along the road corridor. With the categorization of visual units into classes, the units can be guided. Two aspects of establishing visual management guidelines are necessary to satisfy the needs of the land planner:

1. written guidelines and
2. visual assessment of proposed development.

Written Guidelines

Land planners are better prepared to make decisions regarding land alterations if a method of visual assessment includes management guidelines. The intent of building this database is not solely to document the existing visual situation, but rather to make recommendations that are able to guide changes to the visual environment. In reviewing other methods of visual assessment, it can be seen that management guidelines are a factor by which possible changes are regulated. It is a way for a community like Blacksburg to list the types of alterations that are acceptable for different areas. For this new method of visual resource management to be as effective as other types of management methods, it is essential to include management guidelines.

To address this need, management guidelines are established for each visual unit's descriptive variables. The guidelines are separated into the categories of low, medium, and high, just as the descriptive variables have been. As an example, if a visual unit receives a rating of "low" in relation to its vegetation, the management guideline will reflect the types of necessary things that the land planner should do to help achieve a higher level. This process of establishing guidelines will aid in the management of the visual environment along road corridors.

Visual Assessment and of Proposed Development

As development is proposed for an area of a road corridor, the land planner is interested in the visual alteration that the development will have. Methods of visual assessment in the past have included photographic doctoring and computer aided modeling. More recently, photographic simulations have played a role in visual assessment. For land planners to utilize photographic simulation techniques, they need to scan photographs into the computer, load the computerized photograph into an image editing program, and alter the photograph with the available

tools of the program. For a new method to address the need of the land planner to simulate proposed change, it has to allow for the inclusion of computerized photographs. These photographs should be accumulated and inserted into the database. If development is proposed along the road corridor, these computerized photographs can be the base for simulations. If the proposed development does not meet the guidelines that have been established along that particular portion of the corridor, redesign is necessary.

To include visual assessment of proposed alterations in the method, representative photographs of each visual unit, taken from the Landscape Management Points are scanned and inserted into the relational database management system. This will allow the land planner to extract the photograph from the database, simulate the proposed changes, and evaluate the alteration as to how it follows the management guidelines.

Findings

The objective of this thesis has been to develop a method of visual documentation and evaluation that aids land planners in corridor assessment. To address this objective past methods of visual assessment have been discussed in the Literature Review. What has been seen is that although many methods exist for the purpose of visual assessment, each is a process consisting of separate elements. For this thesis, a new method has been pieced together utilizing components of past methods. To determine which components were relevant and necessary to address the stated objective, the needs of the land planner were established in the Methodology. Their needs are significant to the development of a new method because they are the potential users. The following discussion evaluates the success of the new method based on the adequacy in addressing the needs of the land planner.

Blacksburg, Virginia has been the site for the application of the newly proposed method. The road corridor used in the assessment has been South Main Street. As with all planning processes, the new method of visual assessment has followed a series of steps:

1. separate the corridor into manageable visual units,
2. evaluate each visual unit,
3. select landscape management points, and
4. input all information to a relational database management system.

The following discussion addresses the new method's success in fulfilling the objective of this thesis. It has been structured in a fashion similar to that of the Methodology section and is based on three needs of the land planner: A Method of Documentation, Living Document, and Management Guidelines.

Method of Documentation

It was indicated in the Methodology section of this thesis that the land planner has a need for a method of documentation. As mentioned, site evaluation is an initial stage in land development where the designer attempts to become well equipped for making land planning decisions. Acquiring information and assessing the existing visual environment is an important stage in land planning. As mentioned, having a database of information which is representative of the visual environment along a road corridor equips the land planner with a base understanding of how the land can be developed appropriately and without undue harm to the landscape. Knowledge of the following components is necessary to developing a method of documentation of the visual environment along road corridors:

1. visual units,
2. existing landscape features, and
3. descriptive variables.

The following discussion addresses the new method and how it fulfills the need to include each of these components.

Visual Units

The proposed method of evaluation involves the separation of the selected corridor into visual units. Visual Units are portions of the road corridor that exhibit a similar visual make-up with a relatively homogeneous character. For the assessment of South Main Street, the visual units are as follows, each is relatively self explanatory, but brief descriptions have been provided:

- Entrance: This visual unit is located at the beginning of the corridor where the Blacksburg Town Limit begins. The space is marked with signage and ornamental landscaping. It is position where the driver is making a decision. The alternative to entering the town by way of South Main Street is to travel the Route 460 Bypass. This route diverts the drivers away from the downtown area.
- Residential: The structures within this visual unit are homes. There is a tendency for these portions of the corridor to have a more narrow width when compared to other portions of the corridor. Most often this portion of the corridor is lined with street trees and other types of ornamental plantings. This vegetation is mature compared to other visual units along South Main Street.
- Business: This category has been separated into Low, Medium, and High Business. Selection has been based on the amount of retail busi-

ness, closeness to the road, and whether there are businesses on one or two sides of the road.

- Low Business Portion of the corridor which has retail business along one side of the corridor with the other side left as open land.
- Medium Business Portion of the corridor which has business along both sides of the corridor. The structures are one story in height and set back from the road a distance of more the 50 feet.
- High Business Portion of the corridor that has business along both sides. The structures are taller than one story and are set back from the road a distance of less than 50 feet.

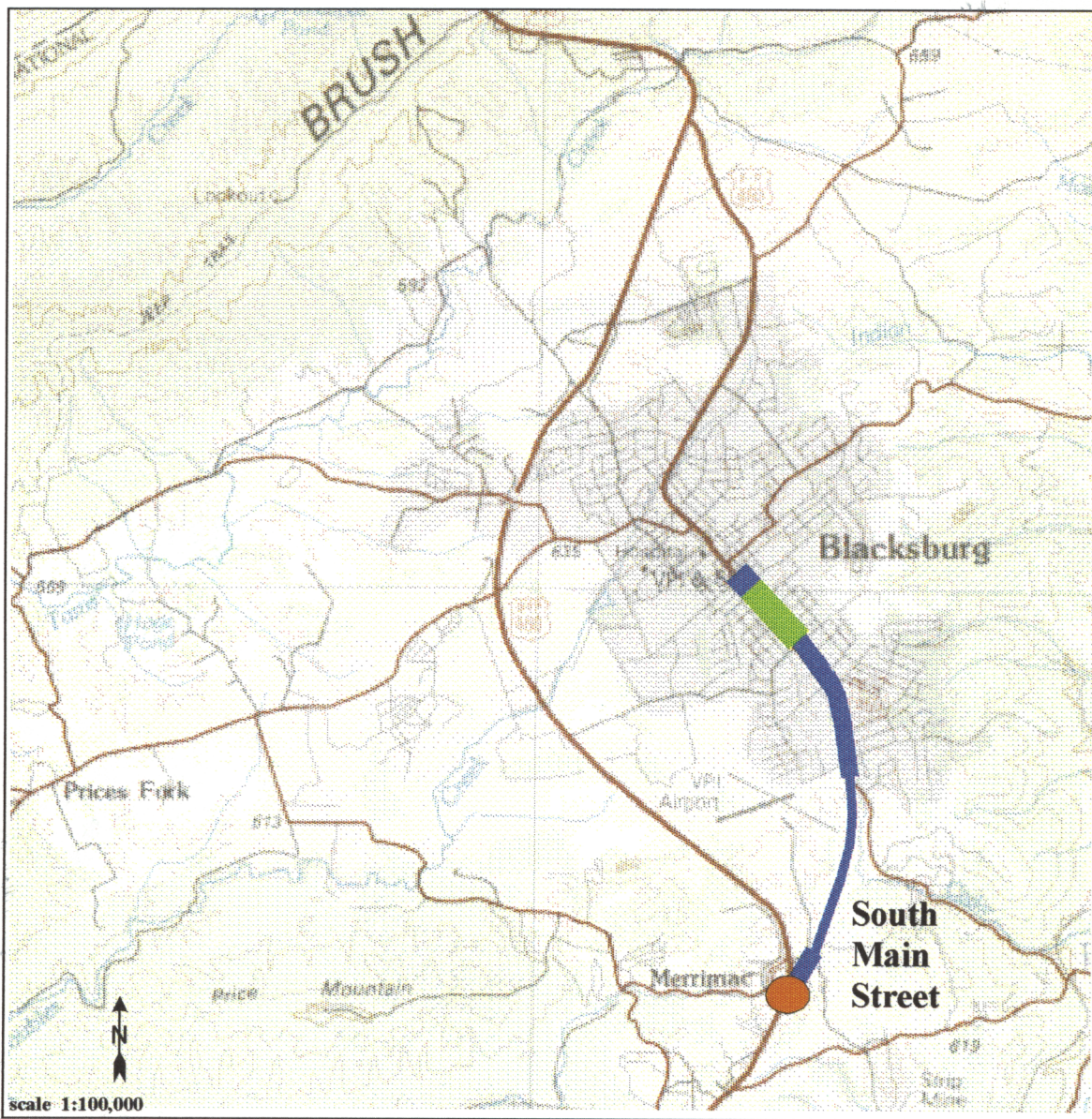
While planning for new development, many aspects of the existing environment are studied. Generally, the existing infrastructure, building codes, and zoning among other things, are all evaluated and assessed before construction takes place. With the separation of the corridor into visual units, a general statement and guideline can be established that enumerates the types of things that exist within the visual unit and the types of development that can and should occur, as related to the visual environment.

With a separation into visual units, the land planner has an easier task in avoiding development that is adverse to the visual environment. It is not necessary to develop a different evaluation and guideline for every lot along the corridor. However, evaluations and guidelines for areas of similar character should be established. If development were proposed for a lot within the residential visual unit, the land planner would have an opportunity to review all information which pertains to the visual unit and include the information gathered in a visual assessment along with other gathered information in a review prior to development. Figure G demonstrates all visual units that have been defined along the South Main Street corridor.

Existing Landscape Features

Landscape features are points of interest along the corridor. As mentioned in the methodology section, access to this information can help guide development decisions with adverse impacts away from significant places along the corridor. Features along the South Main Street corridor fall into one or more of the following three categories:

South Main Street Visual Units



Legend


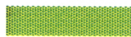



Entrance	
Residential	
Business	
Low	
Medium	
High	

Figure G - South Main Street Visual Units

1. edges,
2. nodes,
3. landmarks,
4. significant views, and
5. historical places.

Edges are points by which a change occurs in continuity (Lynch 1960). As an example, a point where there is an intersection may be classified as an “edge.” **Nodes** are areas that the observer would enter into (Lynch 1960). **Landmarks** are a type of “point-reference” (Lynch 1960, pg. 48). If land planners are to understand traffic flow, it is necessary to understand the features that are helping the driver find their way through the town. Features along the South Main Street road corridor that are aiding the driver in orientation are signs, structures, and traffic lights. Blacksburg has many significant structures and areas that are **historical** in nature. Land planners have to exhibit knowledge of these features in preparing for development and land alterations. **Significant views** exist throughout the town of Blacksburg, sometimes occurring along road corridors. It is best if these views are documented in order to avoid land planning decisions that may disrupt it.

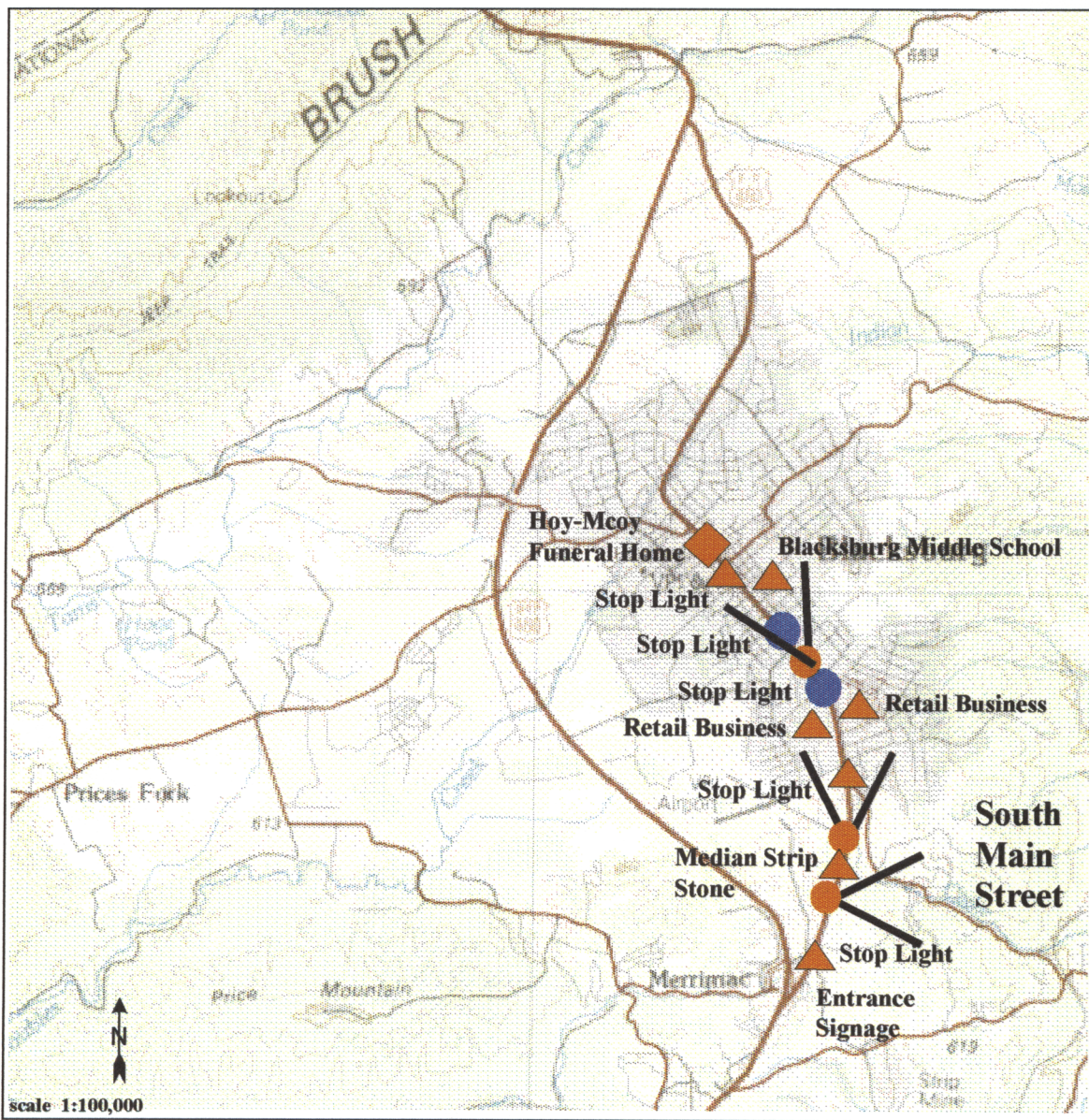
To include the notation of all features along South Main Street, the corridor was assessed and features were mapped (*Figure H*). If the land planner is interested in the types of features that can be found along the Residential visual unit, they can review the corresponding map. Such mapping becomes a valuable tool in planning for new development along the corridor. Land planners then have the opportunity to quickly view all features that may be impacted by development.

Land planners have an obligation to recognize all aspects of the visual environment that are “significant.” If an element along the corridor is as historical, a significant view, and/or as object for orientation for the driver, it is being red flagged as an item that deserves special attention. Whether the feature is significant as an adverse item or is positive to the success of the visual environment, does not make a difference. The process of noting all significant features is important to the needs of the land planner as they address future alterations.

Descriptive Variables

Descriptive variables are categories by which written evaluations have been developed for each visual unit. The selection of descriptive variables here has primarily been adopted from the U.S. Forest Service. The purpose of having a qualitative process is so that the assessment involves descriptive evaluations based on professional judgments that are specific to an area. To

South Main Street Landscape Features



Legend

- Edge
- Landmark
- Significant View
- Node
- Historic Place

Figure H - South Main Street Visual Features

simply assign the entrance portion of the corridor a number rating would exclude some important elements such as the welcome sign and the ornamental plantings. for the purpose of this study, each variable has been separated into the categories of low, medium, and high. This separation aids in the development of management guidelines.² The descriptive variables and their definitions selected for South Main Street are as follows:

Vegetation: The greenness of the corridor. The category and general description of vegetation which is adjacent or within the corridor (Shafer 1969). The following categories of vegetation are in reference to the existing vegetation. The reference is made primarily to large trees and ornamental trees because this type of vegetation has the greatest impact of the viewer. Three categories of vegetation are as listed:

- Low There is no significant vegetation immediately adjacent or within the visual unit.
- Medium This category is assigned to visual units which have moderate amounts of vegetation throughout the visual unit.
- High Portions of the visual unit which have significant amounts of vegetation on both sides of the corridor.

Hardscape: This term is in reference to man-made aspects of the visual environment. Items that fall into this category are road surface, curbing, walls, structures, signage, and lighting. The categories of hardscapes are as follows.

- Low This category is assigned to areas with hardscaping that is in disrepair. Hardscapes throughout this visual unit are in poor condition.
- Medium This category is assigned to visual units which have hardscapes in a moderate condition.
- High This category is assigned to visual units which have hardscapes in good condition and are not a visual problem.

Spatial Definition: Presence and position of enclosing objects. The types of objects that are defining the corridor and forming the parameters through which the viewer is traveling (Appleyard 1964, Litton 1968).

- Low Spatial definition is not coherent. Design and layout of existing defining objects is difficult to comprehend and is confusing.
- Medium Defining objects are moderately coherent to the driver.
- High Design and placement of defining objects is good.

² Refer to the section titled "Management Guidelines," pg. 51 for a further discussion.

Quantity of Viewers: Based on the number of vehicles to travel the corridor each day (USDA 1973). Three categories have been developed from 1991 Blacksburg traffic data:

- Low 3,000 - 10,500 vehicles per day,
- Medium 10500 - 18,000 vehicles per day, and
- High 18,000 - 26,000 vehicles per day.

Velocity and Self Motion: Travel speed (Appleyard 1964).

- Low 25 - 35 mph,
- Medium 35 - 45 mph, and
- High > 45 mph

General Characteristics: General notations about the visual unit including architectural styling and discussions on other types of hardscape materials found within the visual unit.

As discussed in the Methodology, to address the need for descriptive variables the corridor was examined during drives and walk throughs, while written information about each visual unit was supplied, and ratings for each variable were assigned. As an example, while assessing the residential visual unit, vegetation was described as being heavily planted primarily with canopy trees. The assigned rating was “high.” Regarding spatial definition, the residential visual unit is described as having good definition with canopy trees defining the space. The rating under spatial definition is “high.”

A chart displaying all descriptions for South Main Street is given in Figure I. Each unit has been assigned a letter association. The letters are assigned as A through F, with A being Entrance and F being High Business. The purpose of assigning a letter to each unit is to aid in describing these. A designation of residential is descriptive but it does not give the user an idea of where the unit is located along the corridor. Also, the assignment of letters helps to distinguish between two areas with the same visual unit designation that are located in different areas along the corridor.

The primary concern in assessing a visual environment is that the written documentation accumulate a comprehensive database of information. The proposed method includes descriptive variables and is successful in addressing the need to have a method of documentation. The selected variable in conjunction with the other information collected, such as landscape features and photographs, is successful in addressing all aspects of the visual environment.³

³ Refer to the section titled “Living Document,” pg. 40 for a further discussion on the inclusion of photographs.

South Main Street Visual Units

Description											
View	Visual Unit	Vegetation	Rating	Hardscape	Rating	Spatial Definition	Rating	Quantity of Viewers	Velocity	Direction of Views	General Characteristics
A	Entrance	There is introduced plant material. Most plants are perennial grasses and other flowering perennial plants. Some carnivorous trees and some shade trees.	Medium	Structures are sited away from the corridor. The road surface is not as dominant as vegetation.	Medium	The space is defined primarily by terrain. Upward slopes are located on both sides. Plants have not grown enough to define the space.	Medium	Medium	45 mph - Medium	Views are directed into the curve due to the downward slope and the curvature of the road. Motorists are most often concentrating on traffic situations.	The viewer is at a point of decision making, signage is critical. This is the location of the Blacksburg bypass entrance. There are some structures located back from the road to the East.
	Medium Business	New vegetation, primarily maple trees, have been introduced but it is immature at this point in time. Plants are spaced at approximately 35 feet on center.	Medium	There are automobile dealers along the west side of the corridor. This area is visually dominated by parked automobiles. The paved surface is four lanes wide.	Low	As they enter into the landscape the motorist is exposed to a wide field of view as compared to the entrance. As the street tree plantings mature they will define the corridor.	Low	Medium	45 mph - Medium	Views are directed toward the downtown. If the motorist is coming from the entrance distant mountains become visible toward the East.	Road becomes very wide. There is no division between you and the motorist coming from the mountains become other direction. There is some retail business on the western side of the corridor.
	Low Business	Green but mostly grass. Some new vegetation exist but it is immature.	Low	The paved surface is four lanes wide with a turning lane. The corridor is lined with a sidewalk. The center turning lane is decorated with a stone pattern.	Low	Corridor is five lanes wide including the turning lane. The adjacent terrain is birmed up from the road on the western side, and drops off on the eastern side.	Low	Medium	45 mph - Medium	View is directed down South Main Street from both directions. A significant view of distant mountains exist toward the east.	Corridor is wide with no vegetated median strip. Stone in the turn lane is minimal and difficult for the motorist to see.

Figure I - Visual Unit Descriptions

South Main Street Visual Units

View	Visual Unit	Vegetation	Rate	Hardscape	Rate	Spatial Definition	Rate	Quantity of Viewers	Velocity	Direction of Views	General Characteristics
D	Medium Business	Median strip is planted with some ornamental Pear trees, perennials, and annuals. Shade trees are located along the sides of the corridor toward the northern end.	Medium	Structures are the most evident visual element. Some structures are dilapidated and vacant. Paving is four lanes with a vegetated median strip.	Low	Median strip is helping to reduce the visual field making it seem as though there is more enclosure. Businesses are set back from the road. Some large parking areas.	Low	High	35 mph - Low	Extended views are minimal when driving from the south. When driving from the north there is a distant mountain view.	The median strip increases safety for the driver by eliminating the on-coming traffic flow just off to the left. Bus stops along the corridor are frequently used.
E	Residential	Corridor is heavily planted. Most vegetation is old. Large canopy trees help to increase the greenness of the space.	High	Paving is four narrow lanes. Most structures are close to the road surface and are residential in nature. Four structures toward the north end of the visual unit are restored structures. A middle school exist at the northern end.	Medium	Canopy trees are defining the corridor, at some points creating a ceiling. Buildings are set relatively close to the street surface. There is no median strip through this visual unit.	High	High	35 mph School Zone - 25 mph - Low	Distant mountains can be seen when traveling north.	Corridor seems narrow through this unit although it is four traffic lanes wide. Vegetation along the roadside is significant to this landscape.
F	High Business	Relatively no vegetation.	Low	Structures are dominant throughout the unit. Some structures are two stories. Most structures are constructed with brick. Both sides of the corridor are lined with sidewalks. Corridor is two lanes with a turn around lane.	Medium	Road width is reduced to two travel lanes with one center turning lane. Structure on either side are defining the space.	High	Medium	25 mph - Low	View north is significant due to the distant mountains. This same view has been maintained through most of this corridor.	Businesses along this portion do not have continuity in style of architecture. Differences are also seen in the mixed uses.

Figure I - Visual Unit Descriptions continued

Living Document

As discussed in the Methodology, a living document is a product that allows for easy updates and re-evaluations. The database of information accumulated from the visual assessment will have to be updated as change takes place along the road corridor. Two components are necessary to accomplish this:

1. landscape management points and
2. storage to an interactive medium.

Landscape Management Points are positions by which the landscape is to be monitored. Storage of the database to an interactive medium will allow the land planner to take advantage of computer capabilities such as speed, quick retrieval of data, and organization. Both components are necessary to aid the land planner in re-evaluating the visual environment and up-dating the assessment.

Landscape Management Points

Inclusion of photography has been a major component of this database. The photographs will be valuable in understanding the written assessment with a visual representation and viewing gradual changes in the visual environment over time. Future evaluations should include photographs from the identical positions in order to understand visual changes. To address the need for photographs in the evaluation, the entire corridor was photographed. Many photographs were taken and only those that were most representative of each visual unit were used as part of the database. Each selected photograph was scanned into computer format. The purpose of scanning the photograph was to prepare them for storage to the computerized database. Further detail on this topic is given in the following section. "Storage to an Interactive Medium."

The importance of written information in this new method has been discussed, but even with a complete written evaluation it is difficult to visualize some of the different aspects of the South Main Street corridor. Photographs have been successful as part of this method to aid in understanding the existing visual environment. As an example, if the user of this database were interested in visualizing exactly what a residential visual unit would look like, they are able to see it by viewing the representative photograph. This will aid in visualizing all data that has been collected.

It is being suggested that land planners use photographs to understand and monitor the progression of visual change in a community over long periods of time. Just as vegetation, spatial

definition, and velocity are a component of the evaluation, incremental change over time is to be a component of visual management. Written descriptions are of equal importance, but the use of photographs to actually see the changes is a substantial addition. Forms A and B are used to demonstrate a possible scenario. They are presented as forms due to the fact that the visual assessment database is stored in this medium. More information regarding the storage of the data is discussed in the following section titled "Storage to an Interactive Medium."

Development trends are generally carefully watched by land planners and community leaders. Photographs will aid in tracking and evaluating development trends along the South Main Street corridor. If the trends are progressing in such a manner that the visual environment is threatened, land planners will be able to react and adjust development.

Storage to an Interactive Medium

Microsoft Access is the mode by which the database of information is being stored, therefore this is the means by which the need for an interactive storage medium is being applied. To re-state the necessary components of a method of visual assessment that utilizes an interactive medium, the method needs to have:

1. organizational and storage capabilities,
2. easy input and retrieval of data,
3. easy updating for periodic reviews,
4. storage of photographs,
5. speed, and
6. cost effectiveness.

Microsoft Access is a relational database management program that stores information with a series of tables. To view the information, the user opens forms which are linked by macros and queries to the tables. When building a database such as the one developed in the South Main Street corridor visual assessment, each bit of gathered information has a specific place to be stored. (Understanding the inner-workings of the Access system is not important to the use of the database, but the user should be well versed with the basic components that exist within the database and the various places for database storage.) Figure J demonstrates the types of relationships that exist within the South Main Street database.

Organizational and Storage Capabilities: Past methods of documentation of the visual environment involved multiple pages of written material. With the proposed method, the storage of information involves the use of computer software and hardware. All information gathered in this assessment has been stored to a computerized format which will fit onto floppy disks. Compared to past methods of documentation, this has increased the ease of storage immensely.

South Main Street

Return to Visual Units
Location Map

Please use vertical scroll bar to aid in viewing other parts of the form.

Select a different Visual Unit.

A B C D E F

Visual Unit **A - 1928**

Down Town



Landscape Management Point

Photograph from Landscape Management Point

Vegetation:

Some vegetation exist at the transition into different visual units. Along the road corridor itself there is some vegetation. There is a small park located at the north entrance of the visual unit.

Hardscape:

The road surface is gravel. Corridor terminates with stone wall entrance to campus. The downtown structures are built from brick.

Spacial Definition:

The corridor is wide with structures and power poles giving most of the definition. Sidewalks are located on both sides of the corridor.

Landmarks:

The corridor terminates at the entrance of the campus. This act as a landmark. Taller downtown buildings is also acting as a landmark.

Quantity:

H

Velocity:

L

General Characteristics:

Generally most traffic is pedestrian in nature.

Descriptive Variable Definitions

Visual Quality and Visual Sensitivity Ratings

Management Class: III

Press the appropriate Management Class button below.

III
IV

Form A - Downtown Blacksburg, 1928

South Main Street

Return to Visual Units
Location Map

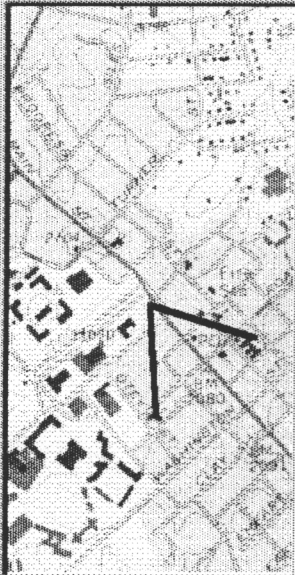
Please use vertical scroll bar to aid in viewing other parts of the form.

Select a different Visual Unit.

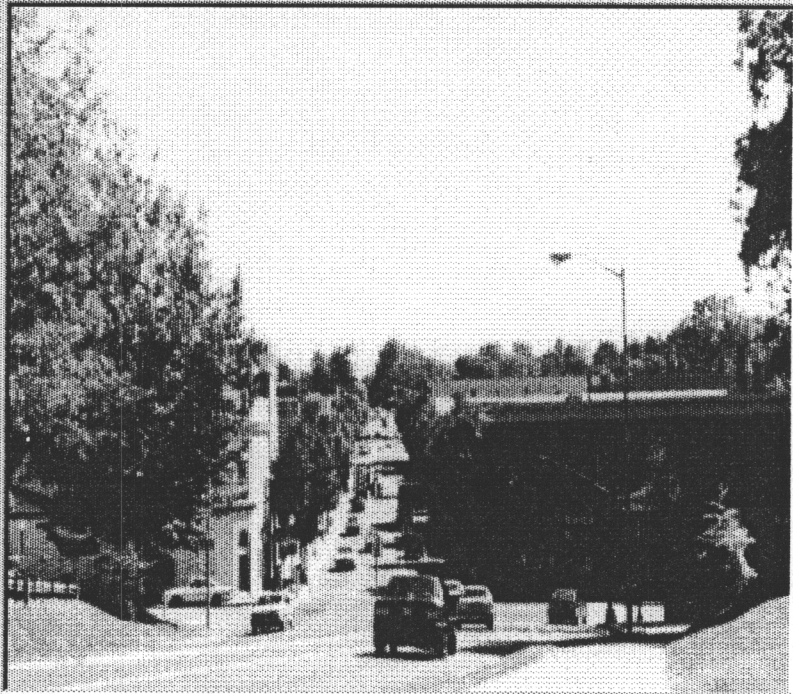
A B C D E F

Visual Unit **A - 1993**

Down Town



Landscape Management Point



Photograph from Landscape Management Point

Vegetation:

Greeness of the space is high. New plantings exist along the corridor.

Hardscape:

The downtown structures are primarily built from brick. There is a sidewalk that lines the corridor.

Spacial Definition:

Definition of the space is narrow. Buildings and vegetation are the defining factor.

Landmarks:

Traffic signal is acting as a landmark.

Quantity:

H

Velocity:

L

General Characteristics:

Primary mode of travel through the visual unit is by automobile. The corridor is narrow in comparison to other portions of the corridor.

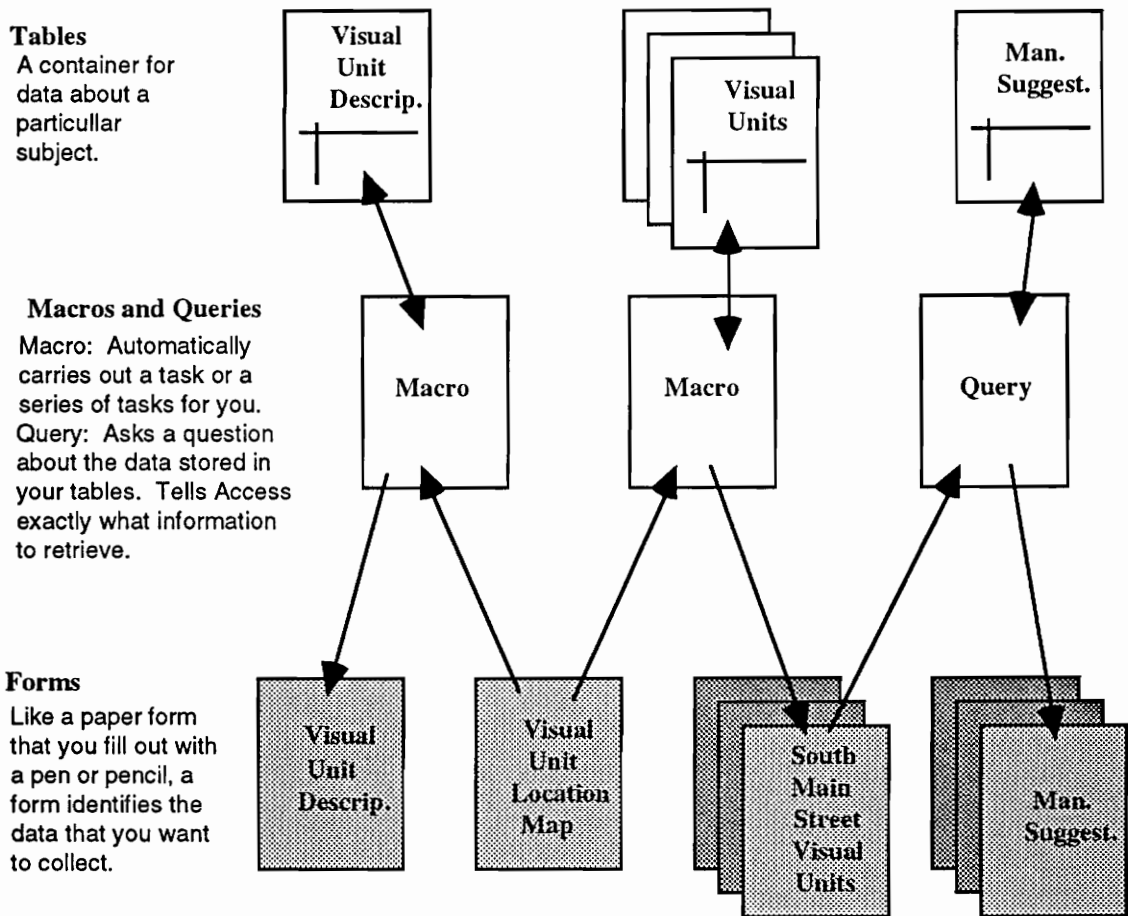
Descriptive Variable Definitions

Visual Quality and Visual Sensitivity Ratings

Management Class: **I**

Press the appropriate Management Class button below.

I II III
IV

Figure J - Database Relationships ⁴

In addition to the increased storage capability there is an increase in data organization capacity. Access displays only the information that is requested. This aids the land planner in avoiding information that they may not need at the time or may not have the time to review. For a land planner to inquire about information on the Residential visual unit along the South Main Street corridor, they simply need to load the South Main Street database into the Microsoft Access program. This file contains all information that pertains to that corridor, including scanned photographs and written documentation. By pressing appropriate computer buttons, various information about the residential visual unit is displayed.

⁴ The definitions have been extracted from the Microsoft Access User's Guide, 1992.

Problems with “Access” have occurred with the inclusion of too much written information. Records are capable of handling only up to 255 characters. The program has a tendency to shut down if more than the specified number are inserted. At times an evaluation may include more than the allowable amount of data. The programmer would be forced to include this additional information in another record. This would require more work in the development of the form.

Easy Input and Retrieval of Data: To address the need for an interactive storage medium, the new method has to include the easy input and retrieval of data. New computer technologies make information more manageable at all stages of database management. For this study, it is proposed that the input of data can occur on site. If the land planner were developing a database they would first establish a form that could be brought into the field on a notebook computer. As the evaluation is conducted information is input into the database with the keyboard as the interface. Microsoft Access is a relational database management system with the specific purpose of managing data. As mentioned in the Methodology, land planners should be able to load, examine, manipulate, and store the information related to a visual assessment.

All information in the database is displayed on various forms. Each form has many assigned attributes. If the land planner were interested in viewing all information about the Residential visual unit, they would load the “Visual Units Location Map” (*Form C*) and press the “E” button above the area of the map where the visual unit is located. The database program automatically opens the appropriate form and utilizes the “South Main Street” table for the corresponding information (*Form D*). If the user were interested in descriptive variable definitions they would press the appropriate button on the “South Main Street” form and the definitions would appear (*Form E*). If they were interested in the viewing visual features found along the corridor they are able to press the “Visual Features” button on either the “South Main Street” form or the “Visual Units Location Map” (*Form F*). Although the process that the program goes through is complex, the land planner in need of information is only required to load a single file and select the appropriate buttons.

This program has proven valuable in retrieving data. In the past, visual assessment storage processes involved many pages and maps of information. If new copies of the assessment were needed, it was necessary to have them done professionally. With this new process, the land planner is able to produce multiple copies of the assessment by retrieving the information on their computer and printing to their local printing device.

Visual Units Location Map

Visual Features

Descriptive Variable Definitions


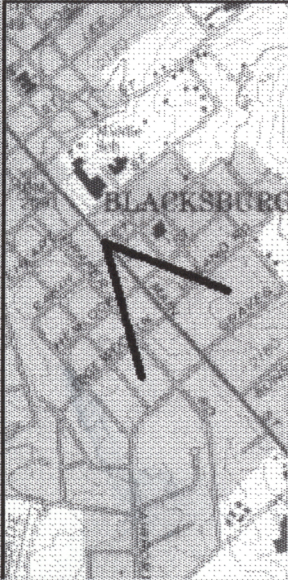
Management Guidelines

To learn some general characteristics about a particular Visual Unit type press the corresponding button above.

Each number and associated button above is representing a visual unit along South Main Street. Press the button to view its corresponding information.

Form C - Visual Units Location Map

<h2 style="margin: 0;">South Main Street</h2>			Return to Visual Units Location Map	Please use vertical scroll bar to aid in viewing other parts of the form.
Visual Features	Descriptive Variable Definitions	Management Guidelines	Select a different Visual Unit. A B C D E F	

Visual Unit <input style="width: 40px;" type="text" value="E"/> <input style="width: 150px;" type="text" value="Residential"/>	
	Photograph from Landscape Management Point

Vegetation:	<input style="width: 20px;" type="text" value="H"/>	Corridor is heavily planted. Most vegetation is old. Large canopy trees help to increase the greenness of the space.
Hardscape:	<input style="width: 20px;" type="text" value="M"/>	Paving is four narrow lanes. Most structures are close to the road surface and are residential in nature. Four structures toward the north end of the visual unit are restored structures. A middle school exist at the northern end.
Spacial Definition:	<input style="width: 20px;" type="text" value="H"/>	Canopy trees are defining the corridor, at some points creating a ceiling. Buildings are set relatively close to the street surface. There is no median strip through this Landscape.
Features:		There is one traffic light. Some rehabilitated structures are located toward the northern portion of the Unit. Across from these structures is the Blacksburg High School.
Quantity:	<input style="width: 40px;" type="text" value="H"/>	Velocity: <input style="width: 40px;" type="text" value="L"/>
General Characteristics:		Corridor seems narrow through this Unit although it is four traffic lanes wide. Vegetation along the roadside is significant to this Landscape.

Form D - Residential Visual Unit

Descriptive Variable Definitions

Return to Visual Units
Location Map

Visual
Features

Management
Guidelines

Select a different Visual Unit.

A B C D E F

Vegetation:	The greenness of the corridor. The category and general description of vegetation which is adjacent or within the corridor.
Hardscape:	This term is in reference to man-made aspects of the visual environment. Items that fall into this category are road surface, curbing, walls, structures, signage, and lighting.
Spacial Definition:	Presence and postion of enclosing objects. the types of objects that are defining the corridor and forming the parameters through which the viewer is traveling.
Quantity:	Based on the number of vehicles to travel the corridor each day.
Velocity and Self Motion:	Tavel speed.

Form E - Descriptive Variable Definition

Easy updating for Periodic Reviews: A living document is one that accommodates continual revision and up-dates. Land planners are in need of a document that can change as time goes on. As the South Main Street corridor changes through development and age, the database will have to be up-dated.

The use of this relational database management system has aided in the update of information. As new assessments of the South Main Street are conducted, the tables of information can be changed. The forms which display the information do not have to be altered because they are still accessing the same tables and the same variables. Only the key-stroking and inserting the new information is necessary. It will all be accessed the same way, by pressing the appropriate buttons.

Storage of Photographs: The purpose of including photographs has been demonstrated in the previous section titled "Landscape Management Points." Representative photographs will aid the land planner in viewing incremental changes over time. As mentioned, all photographs were scanned. The "Access" program has proven successful in storing this type of information. If the user of the database were interested in viewing a photograph of the Residential visual unit, they would simply follow the same process to view all written information. The photographs have been included on the Visual Unit form.

As the programmer inserts computerized photographs, the database file size increases. Adding new information from new assessments may require the construction of new databases. It may be best to have a database for each year, or whatever time interval is chosen for the assessments. "Access" allows the programmer to simply copy the database they wish to model after. No new formatting is necessary. The smaller databases would be more easily handled and stored.

Speed: As discussed in the Methodology, the use of a relational database management system as a data storing tool will result in saved time with future evaluations. As an example, if a land planner needs to update the Residential visual unit, the re-formatting of forms is not necessary. Once those tasks have been done and an adequate style of presentation has been established, new information can be added without adjusting the existing layout. If a change is needed, for example the inclusion of a new descriptive variable, it could be inserted with minimal difficulty. In the initial stage of inserting data and formatting the information, the process is slow, (but is the same as time spent in past methods of visual assessment.)

Cost Effectiveness: Preservation of the visual environment is important to most communities although preservation of any type can be a costly process. The proposed method of visual assessment is a costly process in its early stages because of the ground work involved. A lot of area has to be covered and a complete knowledge of the landscape is necessary. As time goes on, however, the evaluations become less costly because of the time saved by having the information already in this format, as discussed above.

The use of a relational database management tool is costly in two ways. It requires an initial cost for the set up of the system and it is costly in the learning stages. The initial costs, i.e. purchase of software, hardware, etc., are apparent but the learning of the program may not be as obvious. The development of this database for South Main Street required many hours of work, most of which was spent in the understanding of the different processes needed for the creation of tables and forms and the links between them. This is a complex program with many required attributes. If Access is not receiving the proper commands, the desired outputs are not possible. While creating the database is a lengthy and complicated process, individuals simply wishing to use the database do not need to learn the processes involved in its development. Any individual should be able to view and understand the various information made available.

Management Guidelines

As discussed in the Methodology, management guidelines are important in controlling alterations that occur along the road corridor. With the categorization of visual units into classes, general guidelines can be applied to help guide the types of development that takes place along the corridor. Two aspects have been established as important to satisfying the needs of the land planner in visual management of road corridors:

1. written guidelines and
2. visual assessment of proposed development.

Written Guidelines

All written guidelines for the South Main Street road corridor are presented in the following figure (*Figure K*). Each guideline is targeting the descriptive variables that were used in the initial evaluation of the corridor. For the variables vegetation, hardscape, and spatial definition, guidelines are established that are applied to visual units. For example, the Residential

visual unit is given the ratings of H, M, and H, with each letter corresponding to their respective variable. The guidelines are to be applied to their corresponding rating.

Rating	Guidelines		
	Vegetation	Hardscape	Spatial Definition
H	Preservation of existing vegetation is required. No alterations should occur within the visual unit that would disrupt the existing vegetation. If new vegetation is planned, it should be of the same type as what exists.	Preservation of existing hardscaping is required. No hardscape alterations can occur along the visual unit that are in conflict with the existing visual unit. Photographic simulation is required for all alterations.	Preservation of the existing spatial definition is required. The existing design is significant to the success of the visual unit. No alterations should be made that would disrupt the design of this space.
M	Enhancement of existing vegetation is suggested but not required. If alterations are planned, new vegetation should follow a similar planting concept as what exists.	Enhancement of existing hardscaping is suggested. All alterations should focus on enhancement but should not be in contrast to the existing visual unit.	Spatial definition enhancements is suggested. Existing design should be further evaluated and restructured but should follow the present design patterns of the visual unit.
L	Rehabilitation of plantings is necessary. Existing vegetation is in poor condition. This portion of the corridor should become the focus of beautification efforts to enhance the existing vegetation and introduce new plantings.	Rehabilitation of hardscaping is necessary. This visual unit should be considered for capital improvement efforts.	Redesign of the existing landscape is necessary. Space is presently unorganized and incoherent and would require a better proportioning of spatial objects. Capital improvement efforts should be focused on this visual unit.

Figure K - Management Guidelines

The use of Management Guidelines will prove successful as time goes by. At this point in the assessment it is difficult to present an evaluation of this aspect of the database due to the lack of application. One judgment that can be made is with the presentation of the information in the "Access" program. If the land planner were interested in the management guidelines that pertain to the Residential visual unit, they would have the opportunity to press the appropriate Management Class button on the South Main Street form. With a query method of database management within the program the management guideline table is accessed to provide the appropriate information (*Form G*).

Management Guidelines

Return to Visual Units
Location Map.

Visual
Features

Descriptive
Variable
Definitions

Select a Visual Unit to view.

A B C D E F

Visual
Unit: E

Residential

H

**Vegetation
Guideline:**

Preservation of existing vegetation is required. No alterations should occur that would disrupt the existing vegetation. If new vegetation is planned, it should be of the same type as what exist.

M

**Hardscape
Guideline:**

Enhancement of existing hardscaping is suggested. All alterations should focus on enhancement but should not be in contrast to the existing visual unit.

H

**Spatial
Definition
Guideline:**

Preservation of the existing spatial definition is required. The existing design is significant to the success of the visual unit. No alterations should be made that would disrupt the design of this space.

Form G - Management Guidelines

Visual Assessment of Proposed Development

In the field of visual assessment, the representation of possible design scenarios and the simulation of proposed alterations to the landscape frequently includes the process of photographic simulation. This is a process by which photographs are computer altered to demonstrate developmental changes to the environment. The process involves a series of steps: photographing the existing site; developing three dimensional computer models; and altering the photograph the of existing site. The final product of the simulation is a “photograph” of the proposed change. Land planners are interested in the impact of proposed development on the landscape, therefore the process of photographic simulation is necessary to include in a new method of visual assessment.

The following images offer a possible scenario. The images were first used in the “Introduction” of this thesis as a glimpse of how a visual assessment database could be used. They are, however, a photographic simulation. If a site existed along the corridor that was labeled as low in vegetation, a photographic simulation could demonstrate how a vegetation enhancement should look (*Figure L and Figure M*).

On the other end of the spectrum, photographs can be used to simulate proposed changes to the visual environment. If development were proposed for an area within the Residential visual unit, the representative photograph could be extracted from the database and used for the purpose of simulation. If the development were proposed for an area that is not included in the representative photograph, the site of the proposed development could be photographed and included in the database after the appropriate simulation has been done.

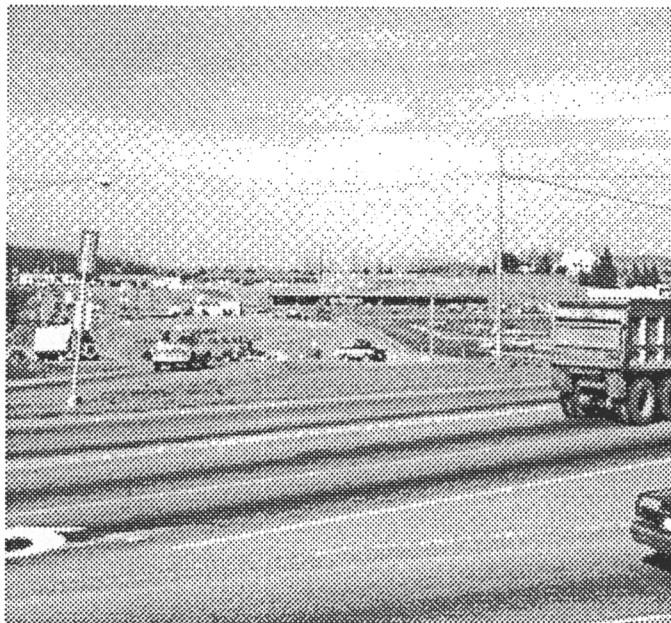


Figure L - Low Vegetation

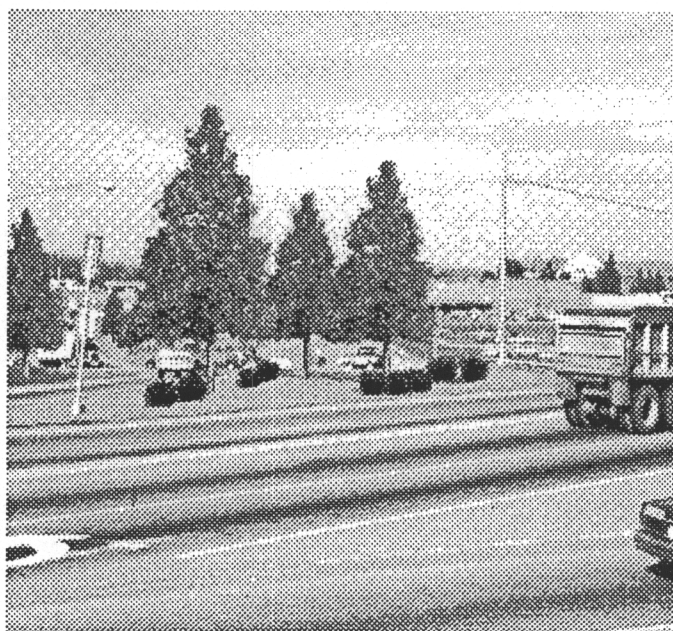


Figure M - Vegetation Enhancement

Conclusions

In visual resource management, land planners are in need of an evaluation of all visual aspects of their environment. This thesis has proposed a new method of visual assessment and documentation that aids land planners in the visual management of road corridors. The method has been evaluated based on its ability to meet the needs of the land planner. Although the method has demonstrated validity in this area, it has other validities and impacts as well.

Land planning of all types has as its purpose the management of the landscape. Visual assessment is a process of land planning that focuses on the landscape's visual attributes. The proposed method of visual management will have an impact on the landscape in many ways. One impact is the recognition of the visual environment as a controllable element in land planning. The proposed method places the visual environment at a similar level of importance as other environmental aspects. The visual environment can weigh as heavily in the decision making process of site planning as infrastructure and engineering. The second impact involves management of existing developed areas. The proposed method acknowledges critical spaces and spaces that are in need of rehabilitation. With an assessment of this type, these places are addressed and documented and an understanding of these particular places in the landscape is developed. A third impact on the landscape relates to future development. As development occurs along the corridor, the potential visual impact can be addressed prior to construction. This will enable land planners to require alterations to the proposed development that will help to preserve or enhance the existing visual environment.

Another impact of this type of visual assessment is on the field of Landscape Architecture. With the use of relational database management systems for the storage of data, Landscape Architects are able to present design alternatives and site plans in a new medium. Just as AutoCAD has become a new and efficient method of drawing and presenting plans, relational database management programs can become the storage medium for entire projects. This type of

storage medium is capable of handling many different types of data. As an example, if a Landscape Architect were involved in a planting plan for a new structure, much of the information could be stored in this fashion. The various buttons on the computer could contain information pertaining to aspects of the design such as plant types, construction materials, and construction processes. Other windows in the database could provide photographs that display what the final design should look like. This could become an effective way to convey design ideas.

A final impact of the proposed method of visual assessment is on education. As mentioned, Landscape Architects may be able to use this type of medium in project management. Many of these concepts are also applicable to the teaching of land management as a discipline. Databases can be constructed that are interpretive in nature, giving students the opportunity to learn various aspects of the environment through the use of relational database management. With the increasing use of the Internet system, these types of databases can be transmitted to any place in the world. Students everywhere are able to learn the visual aspects of a place like Blacksburg, Virginia. Universities can and should include computerized methods of database management in their students' curriculum in order to provide them with a global understanding of visual environments.

The proposed application has some limitations. Although the proposed process of evaluation attempts to follow a U.S. Forest Service approach to visual management, it falls short on the inclusion of public opinion as a measurement tool in the evaluation. The process stays within the paradigm of professional approaches to visual management but it may be enhanced with the inclusion of a preference study or citizen surveys. While writing *Image of the City*, Kevin Lynch (1960) relied on citizen interviews to test his theories of "imageability". His process involved two steps: a professional examination of the physical environment and interviews with citizens to "evoke their own images." In the interview process, a small sample population was asked a series of questions pertaining to their city's environment. In short, the respondents were asked to broadly describe their city and describe their commute each day. Additionally, they were asked to map, to the best of their ability, portions of their city. Other professionals have also relied on public opinion to understand the visual environment. Therefore, public opinion is important and should be further researched as a component of this type of visual assessment.

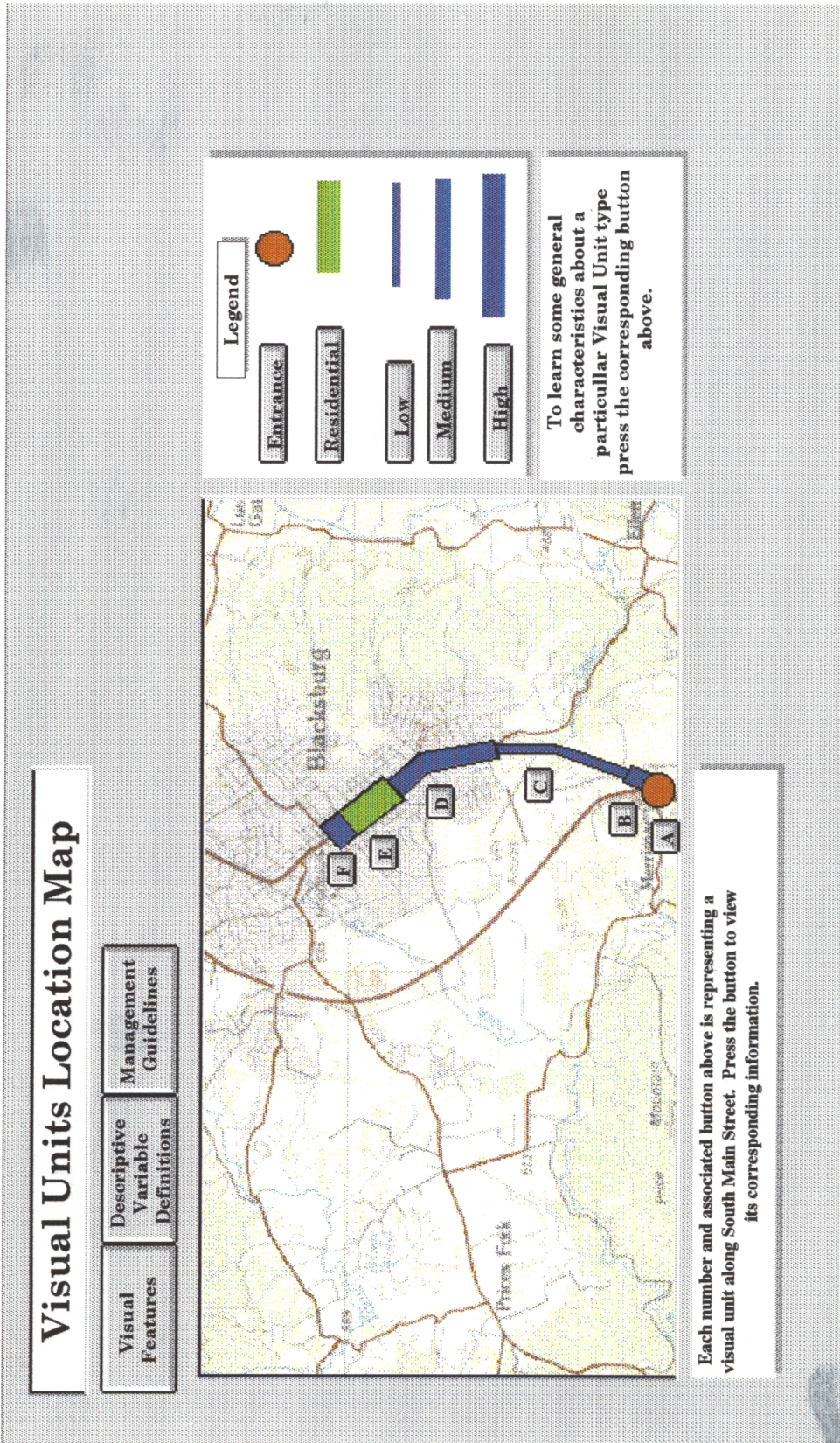
Another limitation of the method involves the inclusion of other types of visual experiences and other descriptive variables. Road corridors are not the only type of visual environment within a community. Other areas of a community can be included adding many more visual units and variables to the database. Also, these databases do not have to be limited to just the visual attributes. Other variables such as geology, zoning, and history can be included.

The proposed method has been valuable in understanding the existing visual environment along the South Main Street road corridor in Blacksburg, Virginia. Beyond this knowledge is this new understanding of relational database management and its applications within the field of Landscape Architecture. With this new method of the database storage and retrieval, land planners will have an extended and enhanced ability to manage their visual environment.

Bibliography

- Appleyard, Donald, Kevin Lynch, John R. Myer. 1964. The View from the Road. Cambridge, Massachusetts: M.I.T. Press.
- Bureau of Land Management. 1980. Visual Resource Management Program. Washington D.C.: U.S. Government Printing Office.
- Chenoweth, Richard. 1991. "*Seeing*" the Future: Aesthetic Policy Implications of Visualization Technology. Journal of the Urban and Regional Information Systems Association 3: 6 - 13.
- Daniel, Terry C., Ron S. Boster. 1976. Measuring Landscape Esthetics: The Scenic Beauty Estimation Method, U.S.D.A. Research Paper RM-167. Rocky Mountain Forest and Range Experiment Station: Fort Collins, Colorado.
- Dunay, Donna ed. 1986. Blacksburg Town Architecture: Understanding a Virginia Town. Penn Washington.
- Itami, Robert M. 1989. *Scenic Perception: Research and Application in the U.S. Visual Management System*. Landscape Evaluation: Approaches and Applications, eds. P. Dearden, and B. Sadler, Victoria B.C.: University of Victoria, 211 - 241.
- Kaplan, R. 1975. *Some Methods and Strategies in the Prediction of Preference*. Landscape Assessment, eds. Robert O. Brush, Julius Gy. Fabos, and Ervin H. Zube, Stroudsburg, Pennsylvania: Dowden, Hutchinson & Ross, Inc., 118 - 129.
- Kaplan, S. 1983. *An Informal Model for the Prediction of Preference*. Landscape Assessment, eds. Robert O. Brush, Julius Gy. Fabos, and Ervin H. Zube, Stroudsburg, Pennsylvania: Dowden, Hutchinson & Ross, Inc., 92 - 101.
- Litton, Burton R. 1968. Forest Landscape Description and Inventories: A Basis for Land Planning and Design. U.S.D.A. Forest Service Research Paper PSW-49. Pacific Southwest Forest and Range Experiment Station: Berkeley, California.
- Litton, Burton R. 1973. Landscape Control Points: A Procedure for Predicting and Monitoring Visual Impacts. U.S.D.A. Forest Service Research Paper PSW-91. Pacific Southwest Forest and Range Experiment Station: Berkeley, California.
- Lynch, Kevin. 1960. The Image of the City. Cambridge, Massachusetts: The M.I.T. Press.

- Miller, Patrick A. 1984. *A Comparative Study of the BLM Scenic Quality Rating Procedure and Landscape Preference Dimensions*. Landscape Journal 3:123 - 135.
- Orland, Brian. 1986. *Image Advantage: Computer Visual Simulations*. Landscape Architecture Jan/Feb 58 - 63.
- Shafer, Elwood L., John F. Hamilton, Jr., Elizabeth A. Schmidt. 1969. Natural Landscape Preferences: A Predictive Model.
- Sloan, Irving J. 1979. Environment and the Law. Dobbs Ferry, New York: Oceana Publications, Inc.
- Udall, Stuart L. 1961. A Plea for a Green Legacy.
- U.S.D.A. Forest Service. 1975. National Forest Landscape Management, Volume 2, Chapter 1, The Visual Resource Management System, Agricultural Handbook No. 462. U.S. Government Printing Office: Washington, D.C.
- Vineyard Open Land Foundation. 1973. Looking at the Vineyard: A Visual Study for a Changing Island. West Tisbury, Massachusetts: Vineyard Open Land Foundation.
- Zube, Ervin H. 1980. Environmental Evaluation: Perception and Public Policy. Belmont, California: Brooks/Cole.
- Zube, Ervin H. 1986. *Introduction*. Foundations for Visual Project Analysis, eds. John P. Felleman, James F. Palmer, Richard C. Smardon, New York: John Wiley & Sons, 1 - 19.
- Zube, Ervin H., Charles S. Law, and David E. Simcox. 1987. *Perceptual Landscape Simulations: History and Prospect*. Landscape Journal 6: 62 - 80.



Visual Unit Descriptions

[Return to Visual Units Location Map.](#)

Visual Features

Descriptive Variable Definitions

Management Guidelines

Select a Visual Unit to view.

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#)

Visual Unit: Entrance

Description: This unit is located at the beginning of the corridor where the Blacksburg town limits begin. The space is marked with signage and ornamental landscaping.

Visual Unit: Low Business

Description: Portions of the corridor which has retail business along one side with the other side left as open land.

Visual Unit: Medium Business

Description: Portions of the corridor which has business along both sides. The structures are one story in height and set back from the road a distance of more than 50 feet.


Visual Unit: High Business

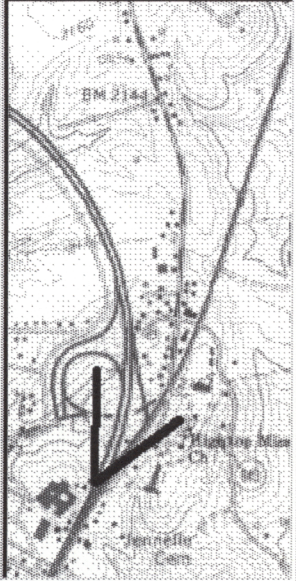
Description: Portions of the corridor that has business along both sides. The structures are taller than one story and are set back from the road a distance of less than 50 feet.

Visual Unit: Residential

Description: The structures within this visual unit are homes. There is a tendency for these portions of the corridor to have a more narrow width when compared to other portions of the corridor. These areas are highly vegetated with street trees.

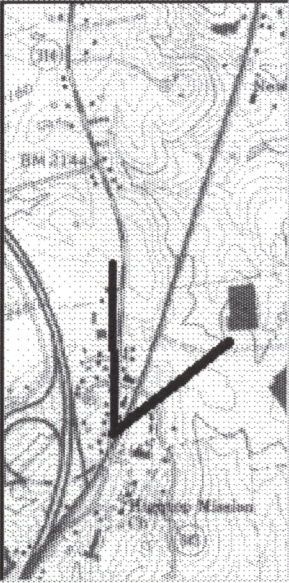
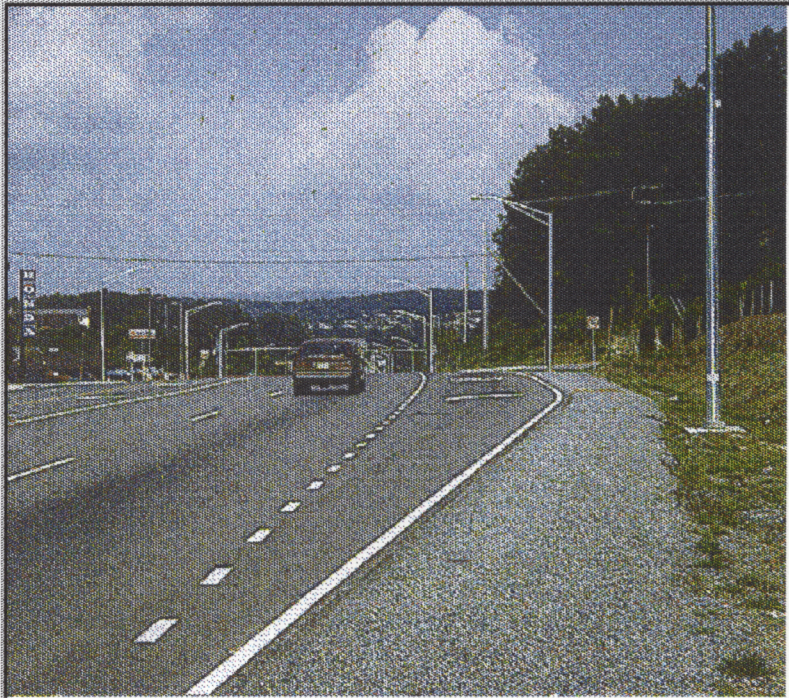
<h1 style="margin: 0;">South Main Street</h1>			Return to Visual Units Location Map	Please use vertical scroll bar to aid in viewing other parts of the form.
Visual Features	Descriptive Variable Definitions	Management Guidelines	Select a different Visual Unit. <input type="button" value="A"/> <input type="button" value="B"/> <input type="button" value="C"/> <input type="button" value="D"/> <input type="button" value="E"/> <input type="button" value="F"/>	

Visual Unit <input style="width: 30px;" type="text" value="A"/>	
Entrance <input style="width: 150px;" type="text"/>	

	<p>Landscape Management Point</p> <p style="text-align: center;">Photograph from Landscape Management Point</p>
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Vegetation:	<input type="text" value="M"/>	There is introduced plant material. Most plants are perennial grasses and other flowering perennial plants. Some carnivorous trees and some shade trees.
Hardscape:	<input type="text" value="M"/>	Structures are sited away from the corridor. The road surface is not as dominant as vegetation.
Spacial Definition:	<input type="text" value="M"/>	The space is defined primarily by terrain. Upward slopes are located on both sides. Plants have not grown enough to define the space.
Features:	Signage is acting as a landmark. The signs which indicate the beginning of the Blacksburg corporate limits also acts as an indicator and landmark.	
Quantity:	<input type="text" value="M"/>	Velocity: <input style="width: 50px;" type="text" value="M"/>
General Characteristics:	The motorists is at a point of decision making, signage is critical. This is the location of the Blacksburg bypass entrance. There are some structures located back from the road to the East.	

<h2 style="margin: 0;">South Main Street</h2>			Return to Visual Units Location Map	Please use vertical scroll bar to aid in viewing other parts of the form.
Visual Features	Descriptive Variable Definitions	Management Guidelines	Select a different Visual Unit. <input type="button" value="A"/> <input type="button" value="B"/> <input type="button" value="C"/> <input type="button" value="D"/> <input type="button" value="E"/> <input type="button" value="F"/>	

<p>Visual Unit <input type="text" value="B"/></p> <p>Medium Business</p> 	
Landscape Management Point	Photograph from Landscape Management Point



Vegetation:	<input type="text" value="M"/>	New vegetation, primarily maple trees, has been introduced but it is immature at this point. Plants are spaced at approximately 35 feet on center.
Hardscape:	<input type="text" value="L"/>	There are automobile dealers along the west side of the corridor. This area is visually dominated by parked automobiles. Paved surface is wide.
Spacial Definition:	<input type="text" value="L"/>	As they enter into the landscape the motorist is exposed to a wide field of view as compared to the entrance. As the street tree plantings mature they will define the corridor.
Features:		The stop light located toward the end of the visual unit is acting as an indicator if the motorist is entering the town.
Quantity:	<input type="text" value="M"/>	Velocity: <input type="text" value="M"/>
General Characteristics:		Road becomes very wide. There is no division between you and the motorists coming from the other direction. There is some retail business on the western side of the corridor.

<h2 style="margin: 0;">South Main Street</h2>			Return to Visual Units Location Map	Please use vertical scroll bar to aid in viewing other parts of the form.
Visual Features	Descriptive Variable Definitions	Management Guidelines	Select a different Visual Unit. <input type="button" value="A"/> <input type="button" value="B"/> <input checked="" type="button" value="C"/> <input type="button" value="D"/> <input type="button" value="E"/> <input type="button" value="F"/>	

<p>Visual Unit <input type="text" value="C"/></p> <p>Low Business</p> 	
Landscape Management Point	Photograph from Landscape Management Point

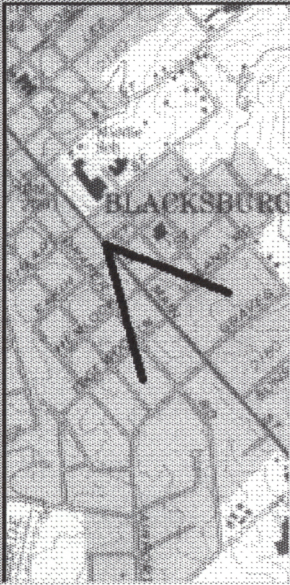

Vegetation:	<input type="text" value="L"/>	Green but mostly grass. Some new vegetation exist but it is immature.
Hardscape:	<input type="text" value="L"/>	The paved surface is four lanes wide with a turning lane. The corridor is lined with a sidewalk. The center turning lane is decorated with a stone pattern.
Spacial Definition:	<input type="text" value="L"/>	Corridor is five lanes wide, including the turning lane. The adjacent terrain is birmed up from the road on the western side, and drops off on the eastern side.
Features:	Center turning lane of the corridor has granite stones placed in an arraangement.	
Quantity:	<input type="text" value="M"/>	Velocity: <input type="text" value="M"/>
General Characteristics:	Corridor is wide with no vegetated median strip. Stone in turn lane is minimal and difficult to see.	

<h2 style="margin: 0;">South Main Street</h2>			Return to Visual Units Location Map	Please use vertical scroll bar to aid in viewing other parts of the form.
Visual Features	Descriptive Variable Definitions	Management Guidelines	Select a different Visual Unit. <input type="button" value="A"/> <input type="button" value="B"/> <input type="button" value="C"/> <input type="button" value="D"/> <input type="button" value="E"/> <input type="button" value="F"/>	


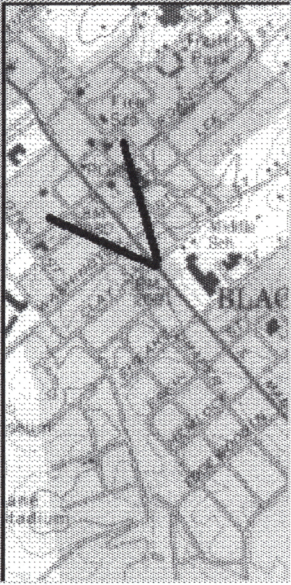
<p>Visual Unit <input style="width: 40px;" type="text" value="D"/></p> <p>Medium Business</p> 	
<p>Landscape Management Point</p>	<p>Photograph from Landscape Management Point</p>

Vegetation:	<input style="width: 20px;" type="text" value="M"/>	Median strip is planted with some ornamental Pear trees, perennials, and annuals. Shade trees are located along the sides of the corridor toward the northern end.
Hardscape:	<input style="width: 20px;" type="text" value="L"/>	Structures are the most evident visual element. Some structures are delapidated and vacant. Paving is four lanes with a vegetated median strip.
Spatial Definition:	<input style="width: 20px;" type="text" value="L"/>	Median strip is helping to reduce the visual field making it seem as though there is more enclosure. Businesses located along the corridor are set back from the road. Some large parking areas.
Features:		Large retail businesses act as a landmark. Stop light at either end of the Characteristic Landscape also acts as a landmark.
Quantity:	<input style="width: 40px;" type="text" value="H"/>	Velocity: <input style="width: 40px;" type="text" value="M"/>
General Characteristics:		The median strip increase safety for the driver by eliminating the on-coming traffic flow just off to the left. Bus stops along the corridor are frequently used.

<h2 style="margin: 0;">South Main Street</h2>			Return to Visual Units Location Map	Please use vertical scroll bar to aid in viewing other parts of the form.
Visual Features	Descriptive Variable Definitions	Management Guidelines	Select a different Visual Unit. <input type="button" value="A"/> <input type="button" value="B"/> <input type="button" value="C"/> <input type="button" value="D"/> <input type="button" value="E"/> <input type="button" value="F"/>	

Visual Unit <input style="width: 30px;" type="text" value="E"/> <hr/> Residential <hr/> 	
Landscape Management Point	Photograph from Landscape Management Point

Vegetation:	<input style="width: 20px;" type="text" value="H"/>	Corridor is heavily planted. Most vegetation is old. Large canopy trees help to increase the greenness of the space.
Hardscape:	<input style="width: 20px;" type="text" value="M"/>	Paving is four narrow lanes. Most structures are close to the road surface and are residential in nature. Four structures toward the north end of the visual unit are restored structures. A middle school exist at the northern end.
Spacial Definition:	<input style="width: 20px;" type="text" value="H"/>	Canopy trees are defining the corridor, at some points creating a ceiling. Buildings are set relatively close to the street surface. There is no median strip through this Landscape.
Features:		There is one traffic light. Some rehabilitated structures are located toward the northern portion of the Unit. Across from these structures is the Blacksburg High School.
Quantity:	<input style="width: 40px;" type="text" value="H"/>	Velocity: <input style="width: 40px;" type="text" value="L"/>
General Characteristics:	Corridor seems narrow through this Unit although it is four traffic lanes wide. Vegetation along the roadside is significant to this Landscape.	

<h2 style="margin: 0;">South Main Street</h2>			Return to Visual Units Location Map	Please use vertical scroll bar to aid in viewing other parts of the form.
Visual Features	Descriptive Variable Definitions	Management Guidelines	Select a different Visual Unit. <input type="button" value="A"/> <input type="button" value="B"/> <input type="button" value="C"/> <input type="button" value="D"/> <input type="button" value="E"/> <input type="button" value="F"/>	
Visual Unit <input type="text" value="F"/> High Business				
	Photograph from Landscape Management Point			
Landscape Management Point				
Vegetation:	<input type="text" value="L"/>	Relatively no Vegetation.		
Hardscape:	<input type="text" value="M"/>	Structures are dominant throughout the unit. Some structures are two stories. Most structures are constructed with brick. Both sides of the corridor are lined with sidewalks. The corridor is two lanes with a turn around lane.		
Spacial Definition:	<input type="text" value="H"/>	Road width is reduced to two travel lanes with one center turning lane. Structures on either side are defining the space.		
Features:	Stop lights, taller buildings, increased pedestrian traffic, and slower vehicular traffic acts as an indicator to the motorist that they have entered the downtown.			
Quantity:	<input type="text" value="M"/>	Velocity:	<input type="text" value="L"/>	
General Characteristics:	Businesses along this portion do not have continuity in their style of architecture. Differences are also seen in the mixed uses.			

Descriptive Variable Definitions

Return to Visual Units
Location Map

Visual
Features

Management
Guidelines

Select a different Visual Unit.

A B C D E F

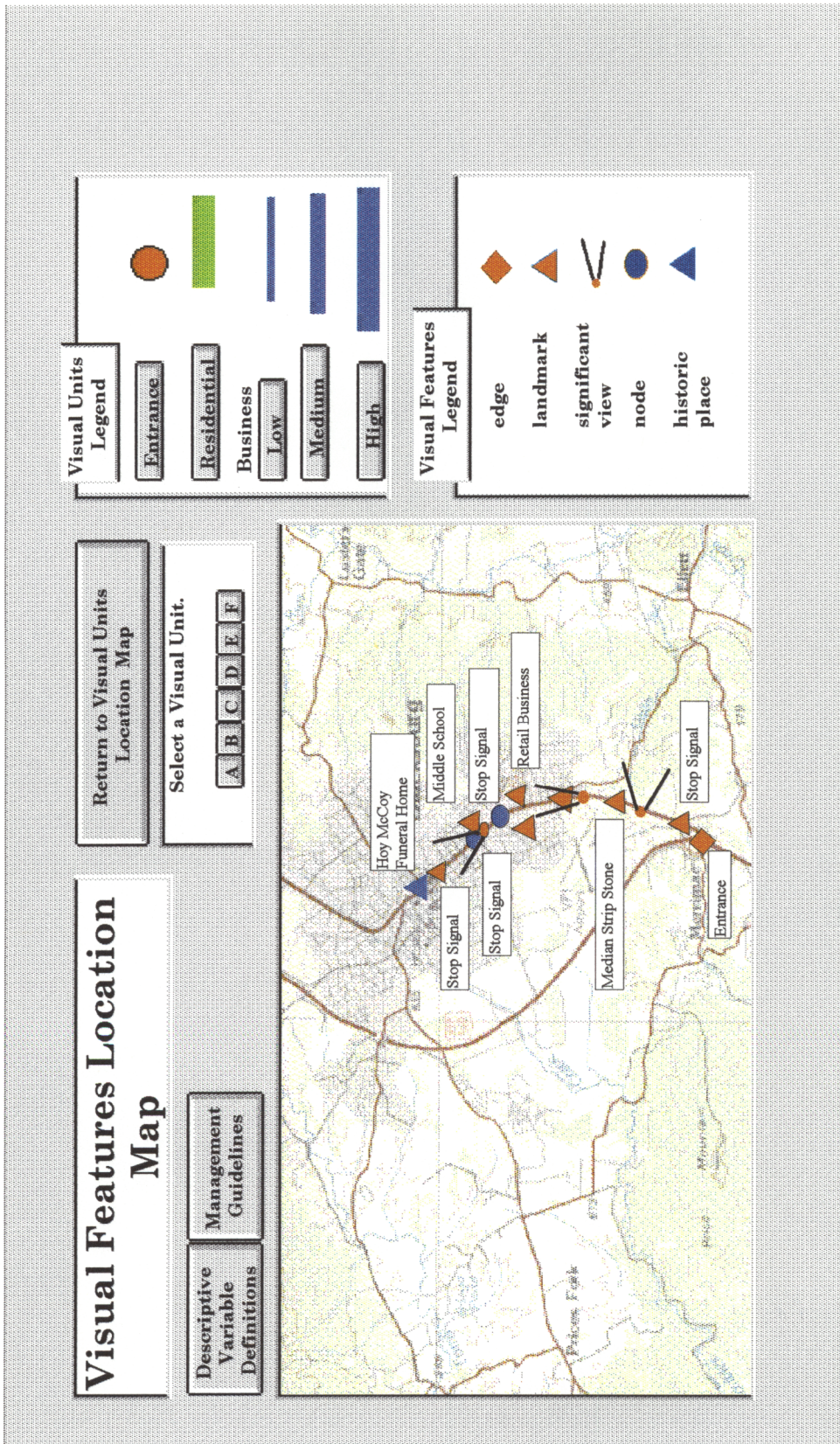
Vegetation: The greenness of the corridor. The category and general description of vegetation which is adjacent or within the corridor.

Hardscape: This term is in reference to man-made aspects of the visual environment. Items that fall into this category are road surface, curbing, walls, structures, signage, and lighting.

Spacial Definition: Presence and postion of enclosing objects. the types of objects that are defining the corridor and forming the parameters through which the viewer is traveling.

Quantity: Based on the number of vehicles to travel the corridor each day.

Velocity and Self Motion: Tavel speed.



Management Guidelines

[Return to Visual Units Location Map.](#)

Visual Features

Descriptive Variable Definitions

Select a Visual Unit to view.

A **B** **C** **D** **E** **F**

<p>Visual Unit: A</p> <p>Entrance</p>	<p>M</p>	<p>Vegetation Guideline:</p>	<p>Enhancement of existing vegetation is suggested but not required. If alterations are planned, new vegetation should follow a similar planting concept as what exists.</p>
	<p>M</p>	<p>Hardscape Guideline:</p>	<p>Enhancement of existing hardscaping is suggested. All alterations should focus on enhancement but should not be in contrast to the existing visual unit.</p>
	<p>M</p>	<p>Spatial Definition Guideline:</p>	<p>Spatial definition enhancement is suggested. Existing design should be further evaluated and restructured but should follow the present design patterns of the visual unit.</p>

Management Guidelines

Return to Visual Units
Location Map.

Visual
Features

Descriptive
Variable
Definitions

Select a Visual Unit to view.

A B C D E F

Visual
Unit: B

Medium Business

M

**Vegetation
Guideline:**

Enhancement of existing vegetation is suggested but not required. If alterations are planned, new vegetation should follow a similar planting concept as what exists.

L

**Hardscape
Guideline:**

Rehabilitation of hardscaping is necessary. This visual unit should be considered for capital improvement efforts.

L

**Spatial
Definition
Guideline:**

Redesign of the existing landscape is necessary. Space is presently unorganized and incoherent and would require a better proportioning of spatial objects. Capital improvement efforts should be focussed of this visual unit.

Management Guidelines

Return to Visual Units
Location Map.

Visual
Features

Descriptive
Variable
Definitions

Select a Visual Unit to view.

A B C D E F

Visual
Unit: C

Low Business

L

**Vegetation
Guideline:**

Rehabilitation of plantings is necessary. Existing vegetation is in poor condition. This portion of the corridor should become the focus of beautification efforts to enhance the existing vegetation and introduce new plantings.

L

**Hardscape
Guideline:**

Rehabilitation of hardscaping is necessary. This visual unit should be considered for capital improvement efforts.

L

**Spatial
Definition
Guideline:**

Redesign of the existing landscape is necessary. Space is presently unorganized and incoherent and would require a better proportioning of spatial objects. Capital improvement efforts should be focussed of this visual unit.

Management Guidelines

Return to Visual Units
Location Map.

Visual
Features

Descriptive
Variable
Definitions

Select a Visual Unit to view.

A B C D E F

Visual
Unit: **D**

Medium Business

M

**Vegetation
Guideline:**

Enhancement of existing vegetation is suggested but not required. If alterations are planned, new vegetation should follow a similar planting concept as what exists.

L

**Hardscape
Guideline:**

Rehabilitation of hardscaping is necessary. This visual unit should be considered for capital improvement efforts.

L

**Spatial
Definition
Guideline:**

Redesign of the existing landscape is necessary. Space is presently unorganized and incoherent and would require a better proportioning of spatial objects. Capital improvement efforts should be focussed of this visual unit.

Management Guidelines

Return to Visual Units
Location Map.

Visual
Features

Descriptive
Variable
Definitions

Select a Visual Unit to view.

A B C D E F

Visual
Unit: E

Residential

H

**Vegetation
Guideline:**

Preservation of existing vegetation is required. No alterations should occur that would disrupt the existing vegetation. If new vegetation is planned, it should be of the same type as what exist.

M

**Hardscape
Guideline:**

Enhancement of existing hardscaping is suggested. All alterations should focus on enhancement but should not be in contrast to the existing visual unit.

H

**Spatial
Definition
Guideline:**

Preservation of the existing spatial definition is required. The existing design is significant to the success of the visual unit. No alterations should be made that would disrupt the design of this space.

Management Guidelines

Return to Visual Units
Location Map.

Visual
Features

Descriptive
Variable
Definitions

Select a Visual Unit to view.

A B C D E F

Visual
Unit: **F**

High Business

L

**Vegetation
Guideline:**

Rehabilitation of plantings is necessary. Existing vegetation is in poor condition. This portion of the corridor should become the focus of beautification efforts to enhance the existing vegetation and introduce new plantings.

M

**Hardscape
Guideline:**

Enhancement of existing hardscaping is suggested. All alterations should focus on enhancement but should not be in contrast to the existing visual unit.

H

**Spatial
Definition
Guideline:**

Preservation of the existing spatial definition is required. The existing design is significant to the success of the visual unit. No alterations should be made that would disrupt the design of this space.

Vita

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Education

Master of Landscape Architecture, Fall 1994
Virginia Polytechnic Institute and State University
Blacksburg, Virginia

Bachelor of Landscape Architecture, Spring 1990
University of Rhode Island
Kingston, Rhode Island

Experience

- | | |
|----------------|---|
| 1993 - present | Anderson and Associates, Inc.
Blacksburg, Virginia |
| 1991 - 1993 | Community Design Assistance Center
Blacksburg, Virginia |
| 1991 | Information Support Systems Laboratory
Blacksburg, Virginia |

Affiliations and Awards

A.S.L.A. Associate Member
Sigma Lambda Alpha Honor Society, Omega Chapter, inducted 1991
A.S.L.A. Student Merit Award, May 1990
South County Gardeners Club Scholarship, September 1989

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