Environmental Values in Regional Highway Design

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•AN overwhelming portion of the history of mankind is a record of man's efforts to discover and establish his relationships to the natural environment. Up to the present century most of man's time, energy, and intelligence has been dedicated to the sustenance and protection of human life, either in a struggle with the forces of nature itself, or with other men over the allocation of our environmental resources.

Today these same basic struggles continue, but we have reached a stage of scientific and social development in which land-use decisions need no longer be based only upon the immediate needs for survival. We have sufficient knowledge, abundance, and leisure so that a variety of choices is both possible and necessary for the intelligent allocation and utilization of the resources found in our natural environment.

An acre of land is no longer simply another acre to be drained, stripped of trees and foliage, fertilized, plowed, and planted for food crops. Now that same acre of land might be more effectively utilized as a corridor backdrop for scenic driving. There is a possibility of choice and our affluence and leisure make this choice possible.

ALTERNATIVE ENVIRONMENTAL CHOICES

In the Wisconsin Recreational Planning Program we divided the landscape resources into those physical resources possessing intrinsic values and those possessing extrinsic values. Intrinsic values are those found in the natural landscape. Extrinsic values are those that have been created by man-made changes, adaptations, and additions to the natural landscape resource.

When working, living, and playing, people value in the landscape what they can see, feel, and reflect upon as well as what they can do in natural and man-modified landscapes. One set of values (largely natural) recreates the mind, another supported by well designed facilities recreates or serves the body.

The modern-day rush to insure food, shelter, transportation, and play for as many people as possible, has overemphasized providing extrinsic values only (and often badly designed ones) at the expense of the intrinsic values. Both the intrinsic and well designed extrinsic resources are important to the full enjoyment of our environmental resources.

USE AND MODIFICATION

In this age of "choice" and of natural landscape "use" and "modification," the great task is one of achieving balanced development between these intrinsic and extrinsic values. For instance, we know that in our recreation landscapes, where picnic tables are plentiful, and trails and barbecue ovens are abundant, that these landscapes would provide considerably less enjoyment without grassy banks, steep bluffs, sandy spits, over-hanging trees, and shielding from traffic and other types of civilization encroachments.

Exploding populations, bigger bulldozers, and flowing urban sprawl make expansion of mediocre man-made facilities too easy, sacrificing our intrinsic values. Crowds of city dwellers in our metropolitan areas appreciate the stimulus of crowds, lights, abundance of stores, services, and the sophistication of city entertainment, but many

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TABLE 1

LANDSCAPE RESOURCES FOR REGIONAL DESIGN
(Examples of 260 Values)

Intrinsic	Extrinsic
(a) Water Resources	
Natural Resources	Man-Made Facilities
1. Waterfalls	19. Swimming facilities
2. Rapids, whitewater	20. Boating facilities, ramps
3. Bathing beaches	21. Fuel, repair and supplies
4. Agate beaches	22. Marinas
5. Natural springs, artesian flows	23. Boating areas
6. Canoe routes	24. Outfitting posts
7. Wild rice areas	25. Harbors of refuge
8. Exceptional islands	26. Campsites
9. Fish habitat	27. Canals
10. Chasms	28. Dams, fishways, drainage ways
11. Trout	29. Locks
12. Muskellunge	30. Lighthouses
13. Walleye	31. Fish hatcheries
14. Bass	32. Mill ponds
15. Northern pike	33. Reservoirs
16. Sturgeon	34. Shelters for ice skating areas
17. Catfish	
18. Panfish	
(b) Wetland Resources	
Natural Resources	Man-Made Resources
35. Exceptional wetlands	38. Observation platforms
36. Wildlife observation	39. Wetland projects, levees, ditching and dyking
37. Wildlife hunting	40. Wildlife preserves
	41. Hunting preserves
(c) Topographic Resources	
Natural Values*	Man-Made Values
42. Caves	50. Ski lifts
43. Balanced rocks	51. Ski rope tows
44. Castle rocks	52. Ski slope structures
45. Exceptional glacial remains	53. Snow play areas, sledding, etc.
46. Natural bridges	54. Ski trails
47. Stones and fossil collection areas	55. Ski (cross-country)
48. Mineral ore outcroppings	56. Riding
49. Outstanding soil conservation projects (also farm conservation)	57. Hiking
	58. Nature trails
	59. Trail shelters
	60. Picnic areas
	61. Golf courses
	62. Youth camps
	63. Nature camps
	64. Day camps

*Unique geological formations

Figure 1. Examples of resource symbols.

now and then feel need for a change; for a kind of vision and perspective that most of our core cities do not as yet provide.

A reflection of this trend in seeking change and variety is evident in the great growth of suburbia, and the vast numbers of people sightseeing and pleasure driving along our rural regional highways.

The task in the urban or metropolitan townscape is one of introducing at usually great cost the intrinsic values that once existed. The task in the rural regional landscape is one of identifying, preserving and enhancing the most outstanding intrinsic values, and seeing that introduced man-made values are developed in harmony with these quality resources.

RESOURCE VALUE INVENTORY

Under the Wisconsin Outdoor Recreation Act (penny-a-pack cigarette tax-supported program), an opportunity has been provided to observe and record the individual and collective environmental values in the Wisconsin landscape that make it an outstanding recreation state. In this planning program, intrinsic and extrinsic values have been identified, observed, and plotted on statewide mapping. Examples of these values are given in Table 1; examples of resource symbols are shown in Figure 1.

ENVIRONMENTAL CORRIDORS

At the end of the first phase of the inventory it was apparent that the extensive landscape resources of water, wetlands, and significant topography created by wind, water, and glacial action through the ages have etched predominantly linear patterns on the face of the Wisconsin landscape. The flat rolling farmlands and expansive forest patterns between these corridors have their share of beauty, but it is the bluffs, ridges, roaring and quiet waters, and mellow wetlands and sandy soils combining in elongated patterns that tie the landscape together in regional and statewide corridors of outstanding landscape quality. This program has called these patterns "environmental corridors," and by mapping these corridor values it is hoped to make the following points:

1. That a vast quantity of resource values still remains within Wisconsin's landscape, with a linear distribution.
2. That within these linear environmental corridors lie four major surface resources (Fig. 2).

   a. Water. All navigable water in Wisconsin belongs to the public. Kept clean, water offers vast acreages of resources and open space within the corridor patterns.

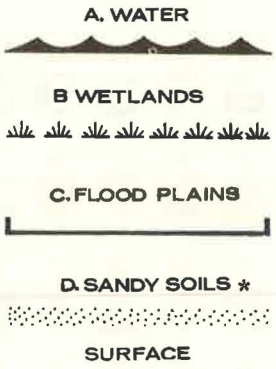


Figure 2. Four major surface resources.

b. Wetlands. Wetlands serving as headwater marshes, wildlife habitat, aquifer recharge areas, and sources of natural springs within the corridor pattern should be protected.
c. Flood Plains. Flood plains offer exceptional opportunities as natural channels for surface water drainage. Subject to flooding, these "surface" patterns offer little opportunity for safe man-made development and should be protected from such encroachments.
d. Sandy Soils. Sandy soils are often found adjacent to water "surface" and offer outstanding areas for swimming if protected from cabin and urban related development.

3. That the surfaces of water, wetlands, flood plains, and sandy soils adjacent to water are, in most cases, enclosed by varying degrees of "slope" (Fig. 3). Most surfaces are bracketed by slope and since slope is subject to various degrees of erosion, they should be protected and stabilized to prevent silting and pollution of the surface resources at lower elevations.

4. That the "rims" of slope offer the best opportunity to observe and contemplate the surface resources (Fig. 4). To assure as many Wisconsin citizens an opportunity to traverse the rims along bridle, hiking, bicycle trails or scenic roads and parkways, certain controls over rim development should be considered in the area.

5. That the surfaces, slopes, and rims of Wisconsin combine to form the environmental corridors (Figs 5, 6, and 7).

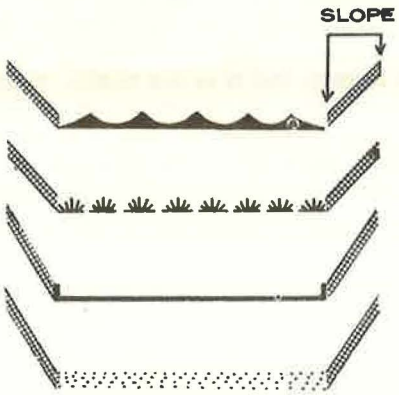


Figure 3. Slope.

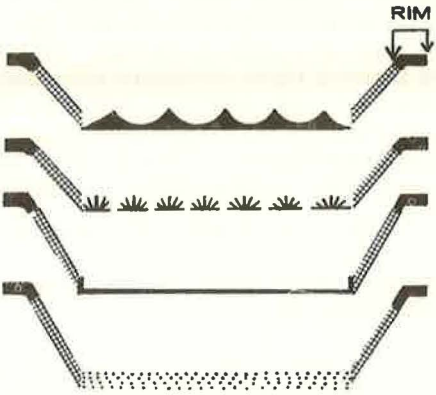


Figure 4. Rims.

Figure 5. Corridors found along rivers, flood plains and wetlands.

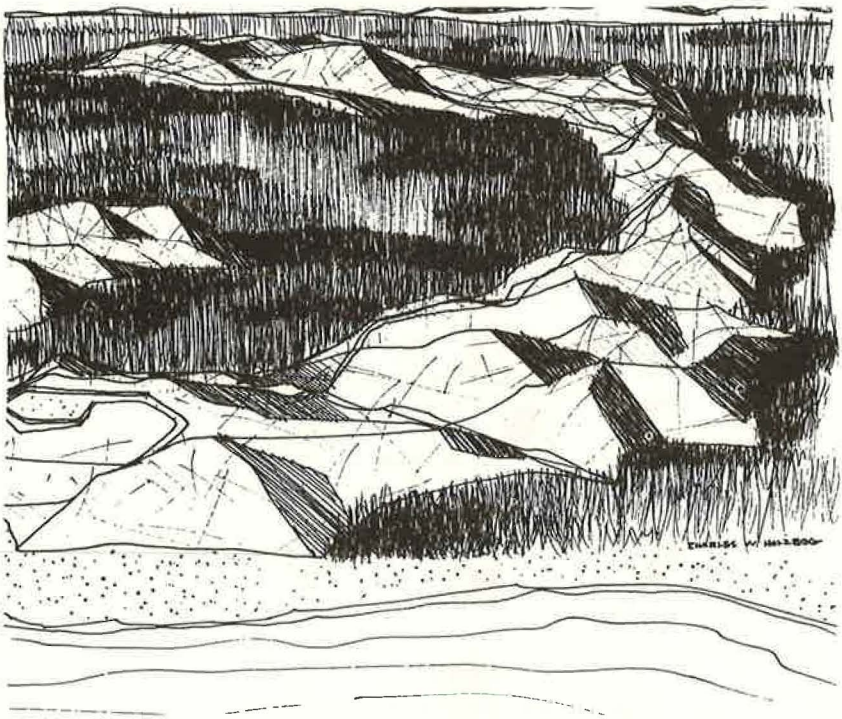


Figure 6. Corridors found along ridges and shorelines.

Figure 7. Total corridor pattern.

RESOURCE NODES

Perhaps the most rewarding result of the statewide resource inventory was not so much the success of working with many of the local people (the mere fact of involving them develops a greater appreciation of environmental values); but the fact that, after identifying the environmental corridor patterns (Fig. 8), we discovered that more than 85 percent of all the individual intrinsic and extrinsic values (Table 1; Fig. 1) also lie within the corridor patterns often in concentrated areas we called resource nodes.

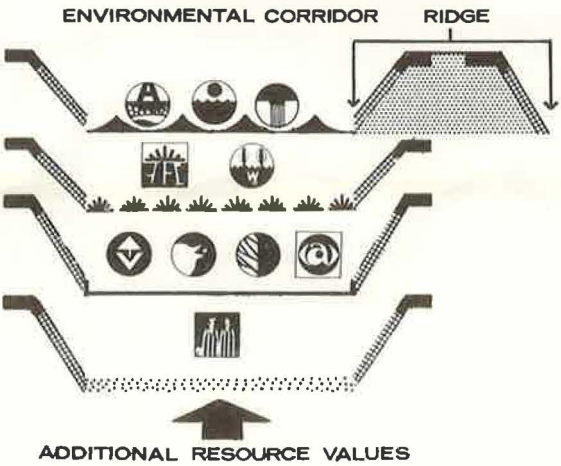


Figure 8.

Nodes possessing many different resources contain the choice park areas within the environmental corridor having multi-purpose possibilities. With protection and proper development these nodes of interest, like beads on the corridor necklace, will provide outstanding aesthetic values with a variety of environmental experiences.

Three other landscape patterns of varying scales could also be considered as resource nodes:

1. Scientific Patterns. In the analysis of resources in Illinois and Wisconsin it is apparent that small areas of landscape as yet relatively untouched by the ax and the plow still remain. Science needs these natural areas as check points; medicine and agriculture may still find in these natural patterns new drugs and new crops; and mankind can always profit in the relief these natural textures afford as an escape from the brick, steel, glass, and asphalt of our cities. These areawide patterns might vary from one tenth of an acre to many thousands in various parts of the country.
2. Landscape Personalities. Aside from what remains of these relatively untouched patterns, we can further identify the varied forms and combinations of man-modified natural resources in different parts of the landscape that give each area its distinguishing characteristic. The visual sum of these combined patterns of water, soils, topography, wetlands, or forests results in a unique series of regional personalities. The various patterns of agricultural production, urbanization (townscape), and transportation, also have their own unique personalities and add to the perceptual patchwork that is our environment.
3. Ethnic Patterns. A variety of local architecture, cooking, handicrafts, museums, customs, and holidays exists within these cultural patterns. This variety is important to the quality of our environment, and needs continued recognition if it is not to be submerged in the current tendency toward conformity.

The ethnic heritage serves as a valuable environmental valve and as a tie with the past. It serves also as an important recreational and tourist attraction. It is a heritage not to be exploited, but to be protected and valued. It can continue to help make life in America interesting and pleasant to both residents and visitors.

SCENIC MAN-MADE CORRIDORS

The concept of the scenic route is that to experience both the extrinsic and intrinsic values of natural and man-made landscape resources, man needs a path to and through areas where they are abundant—a path that is in keeping with the values sought.

The common linearity of roads (man-made corridors) and scenic corridors emphasizes the concept that scenic roads are generally those that parallel or penetrate environmental corridors and link nodes of interest, thus giving the traveler an intimate and extended aesthetic experience.

The coincidence of road and scenic corridor, however, does not necessarily guarantee a desired scenic experience. Several aesthetic conditions must be met and meshed. Essentially, these involve the necessity of fitting the road to the landscape; shaping the road and its accouterments as an attractive physical structure; and finally, manicuring and protecting the resources of the corridor for the enjoyment and pleasure of the traveler. The action of balancing these separate considerations requires a high degree of technical landscape design skill, public concern, legislative authority, and financial resources.

CONCLUSION

By integrating the scientific and perceptual values of these five basic environmental value patterns (environmental corridors, resource nodes, scientific, ethnic and personality patterns) with necessary functional aspects of urban and regional planning, we can go beyond the blending of ribbons of concrete with ribbons of nature. We can, in fact, create a new design-form for our metropolitan areas and arrange the forms of human objects to fit the quality of the landscape.

The design form which evolves from this systematic approach will not likely be arbitrary or preconceived. Rather, it will be a functional expression consistent with the inherent qualities of our American landscape.

DEVELOPMENT OF SCENIC ROUTES--DEMONSTRATION

Preservation and wise development in the natural corridors is important, but equally important is the wise design and redevelopment of our man-made corridors. As more and more people seek scenic and pleasure driving along our highway corridors, it is becoming increasingly important to emphasize what they perceive along these ribbons of concrete and asphalt.

To illustrate what has happened, is happening, may happen or could happen along the network of Wisconsin highways, let's "get in our auto and visit" a few of our man-made corridors.

Do such scenes as shown in Figure 9 look familiar to you? Chances are, if you live in a city or town and ride in an automobile, they are all too familiar. Many of us object to the constant billboard, the glaring neon or the absence of trees. At the root of the problem, however, is that most urban streets look the same--they all are characterized by the same monotony which unravels block after block of thoroughfare as straight as an arrow.

Once in the country, so often thought of as a relief from the urban scene, we tend to find more of the same: monotony. Again, roads tend to be straight, flanked by great

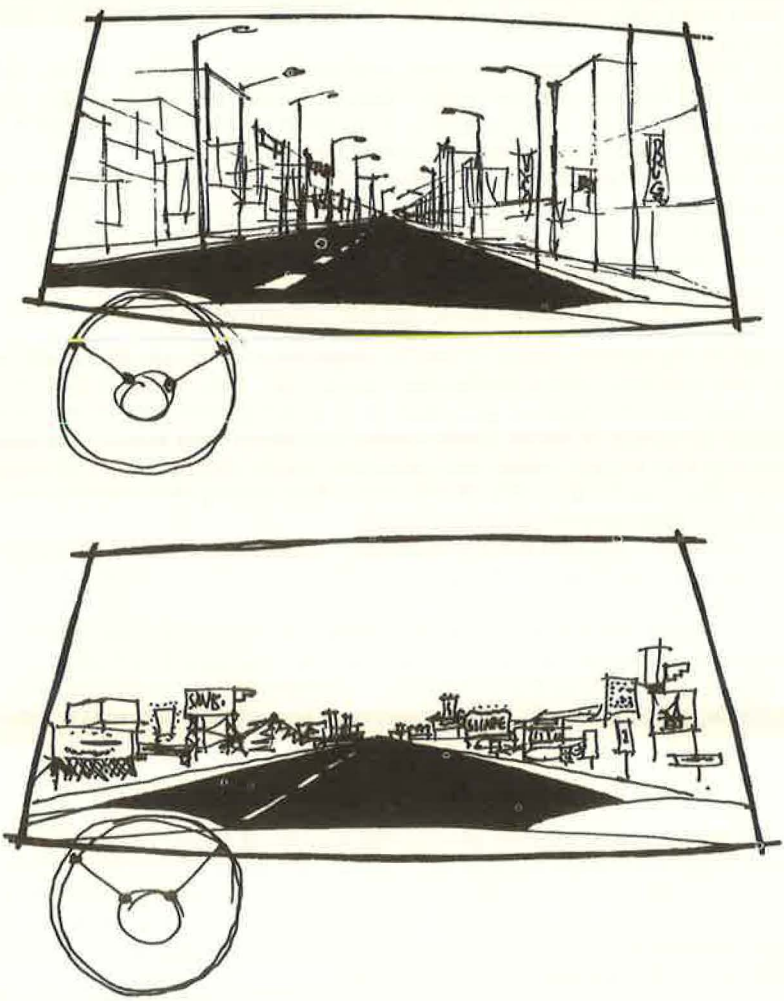


Figure 9. Urban monotony.

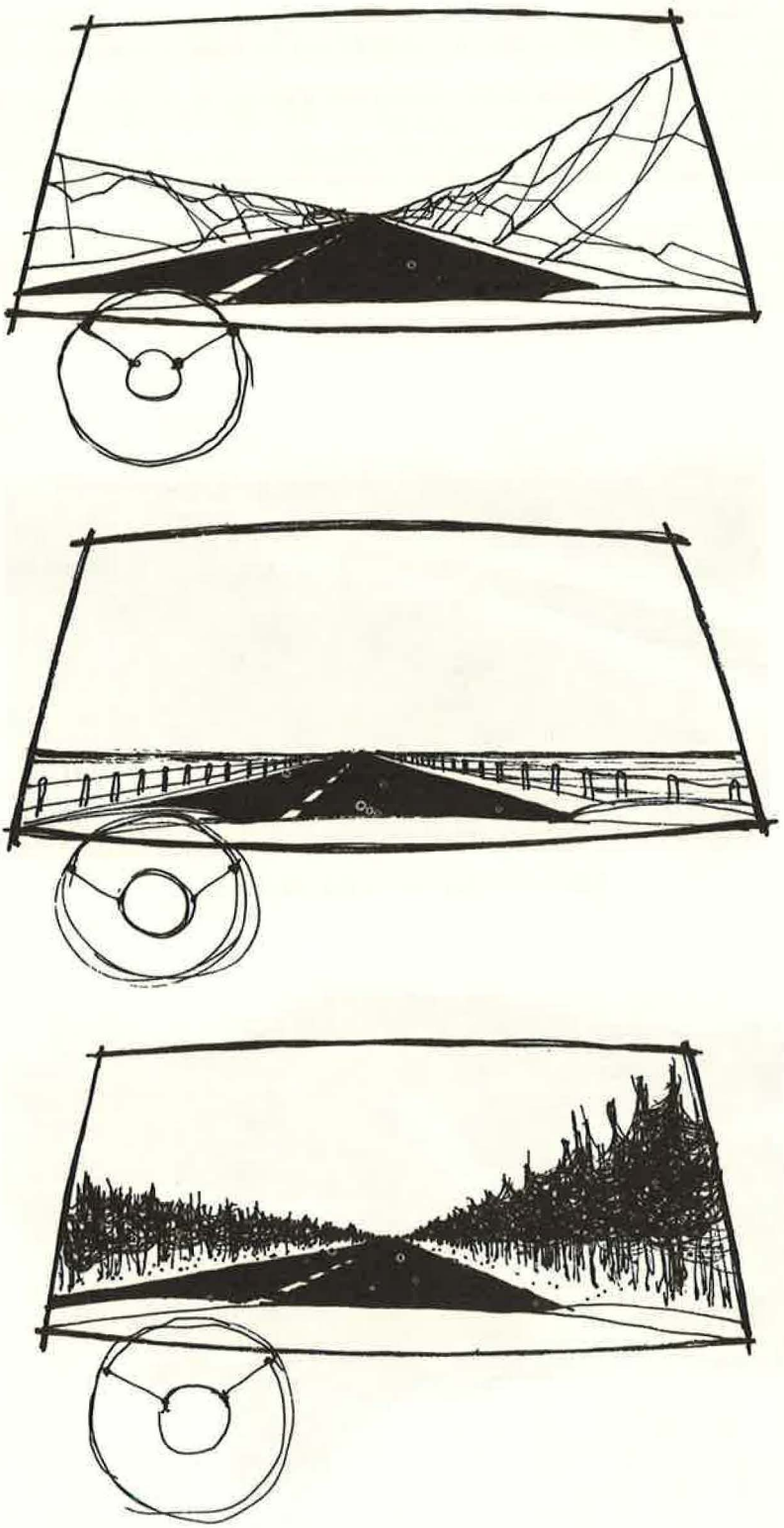


Figure 10. Rural monotony.

distances of the same thing, as demonstrated in Figure 10. The driver must watch the road for there is little else to see, but sometimes the trance of boredom can be even more dangerous.

And so the rural road is no more without the element of monotony than the urban street: and the North Woods are no exception. (See Fig. 11.) If the area is inspired to develop its rich landscape to attract the urbanite seeking recreation, one essential consideration would be the creation of more changes and variety along its corridors of travel.

And we know the potential for change and variety is there. We can see from above the rich pattern of water, wetland and topography that comprises the natural corridor. What we must see is the same thing from the road. (See Fig. 12 and 13.) Let's bend that same road just a bit.

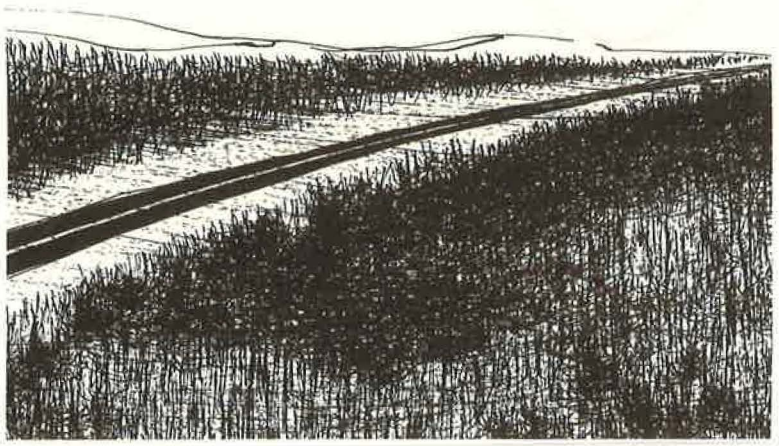


Figure 11. Monotony in the North Woods.

Figure 12. Pattern of water wetland and topography obscured.

Figure 13. Road taking advantage of each recreational resource encountered.

Figure 14. Before selective cutting.

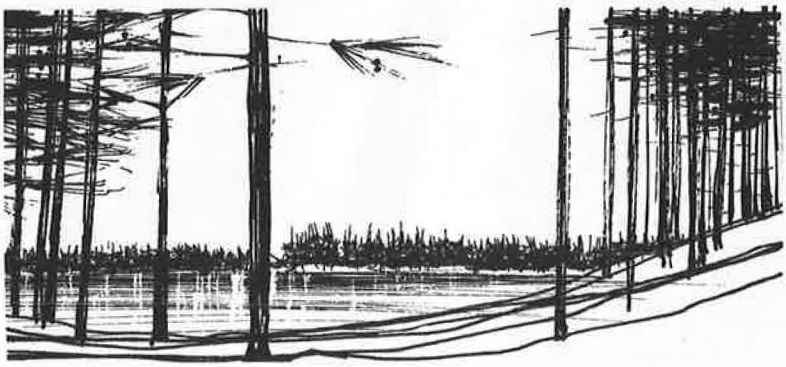


Figure 15. After selective cutting.

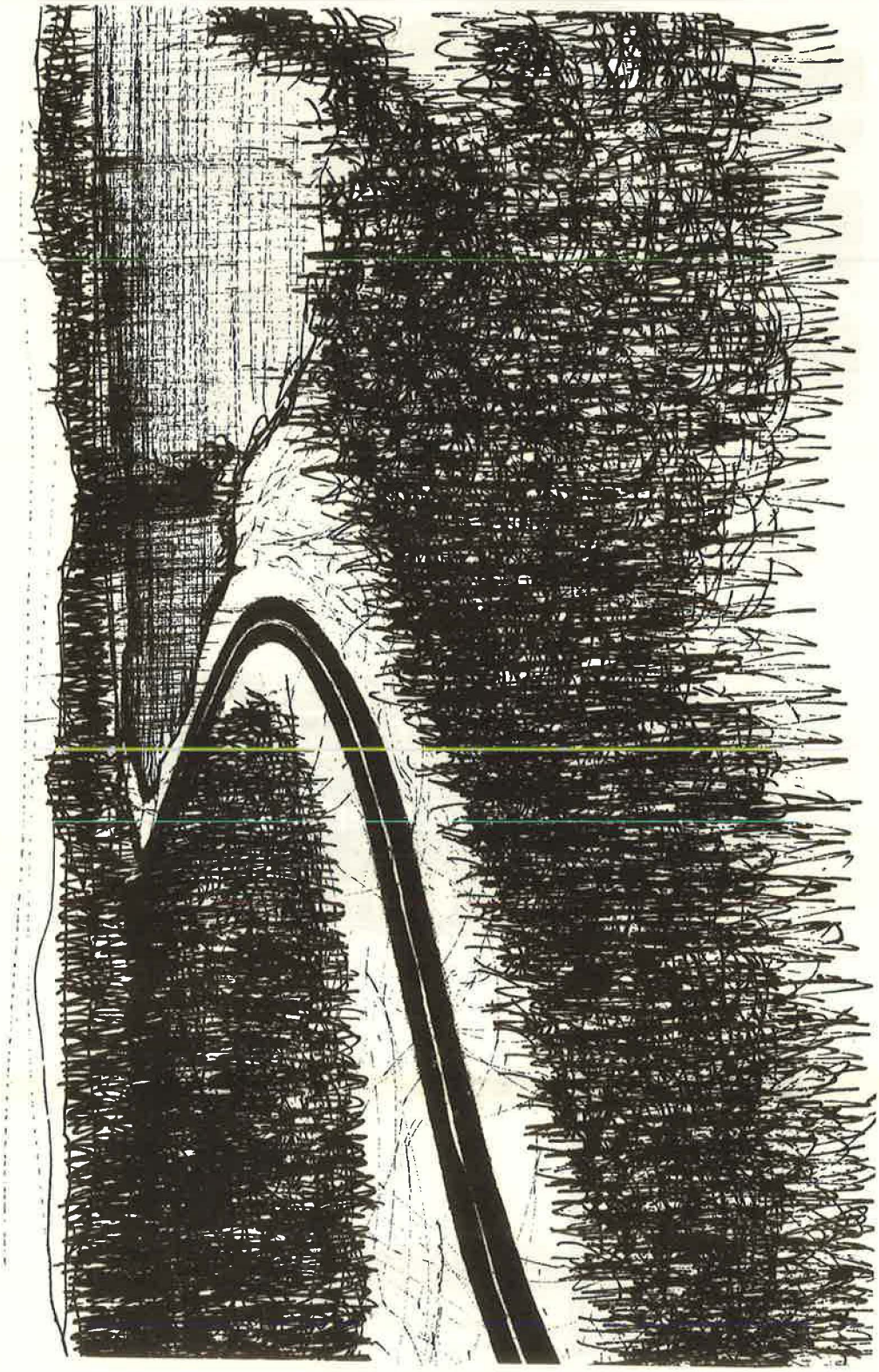
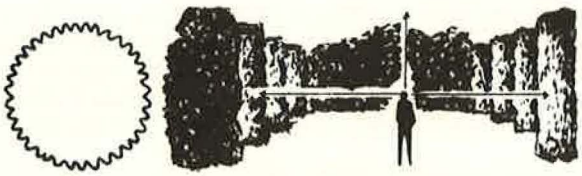
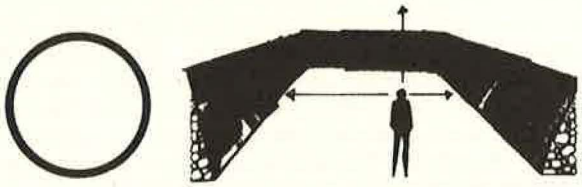


Figure 16. Apprcach to a lake.



ENCLOSED BY VEGETATION



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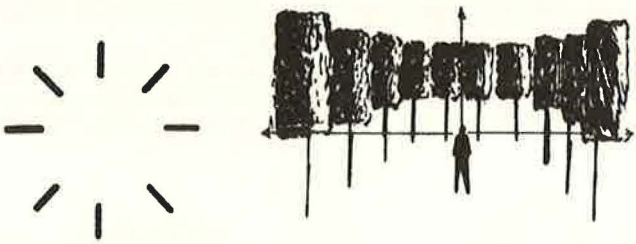
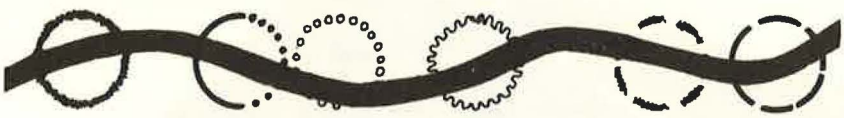


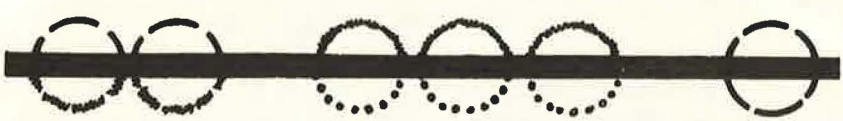
ENCLOSED BY OPEN VEGETATION

Figure 17. Visual quality of space—rural regional classification.

MONOTONOUS



MAXIMUM VARIETY



MINIMUM VARIETY

Figure 18. Hiking and bicycle pathways or auto parkways-visual qualities.

The object is to build pleasant curves as well as straight runs into the road alignment. Now the road can take advantage of each recreational resource it encounters: the view from the top of the next ridge, the spring at the side of the road, the forest where the species and ages of trees begin to change. When a lake or another resource is obscured by trees, selective cutting (Fig. 14) can open the space to reveal a glorious view.

What you can see after selective cutting (as sketched in Figure 15) is a well designed view of a North Woods environment.

No matter how a lake or river is approached, it should be approached (Fig. 16). Think how many bodies of water are completely missed by highways in the State. As they are so often the core of recreation—rich natural corridors—waterways offer visual as well as active pleasure to the vacationing tourist. Therefore, wise planning and design of the corridor should be incorporated. This provides adequate use of current resources as well as preserving recreational resources for the future.

Nor is the magic of the landscape confined solely to the water, marsh and topography of the natural corridor. Where the traveler is between the quality areas of corridors, his view can be constantly changed and varied with such elements as forests and land forms. (See Fig. 17 and 18.)

The wonderful thing about trees is that they can be found in all textures, sizes and degrees of density. By utilizing the inert design possibilities of trees, the designer may create a pleasing experience for the motorist (Fig. 19).

There are, unfortunately, blights as well as beauty marks upon the landscape. Junk yards, gravel pits, borrow pits, and dumps are only examples of elements which mar otherwise pleasant scenery (Fig. 20). With a little imagination and care, however,

Figure 19. Utilizing inert design possibilities of trees.

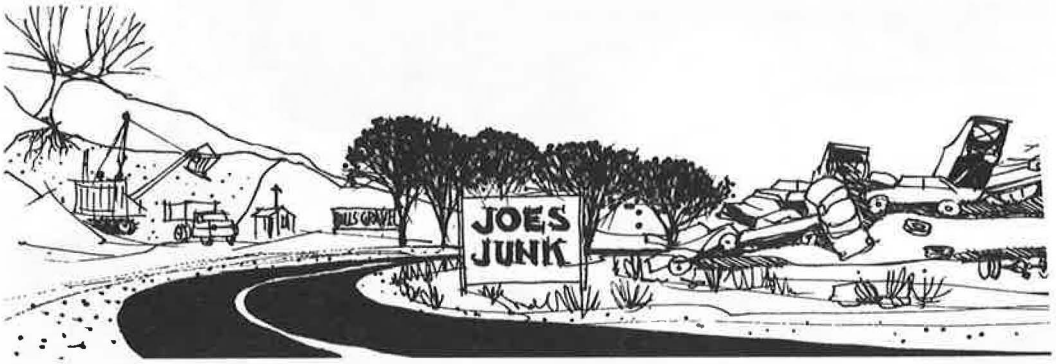


Figure 20. Blights on the landscape.

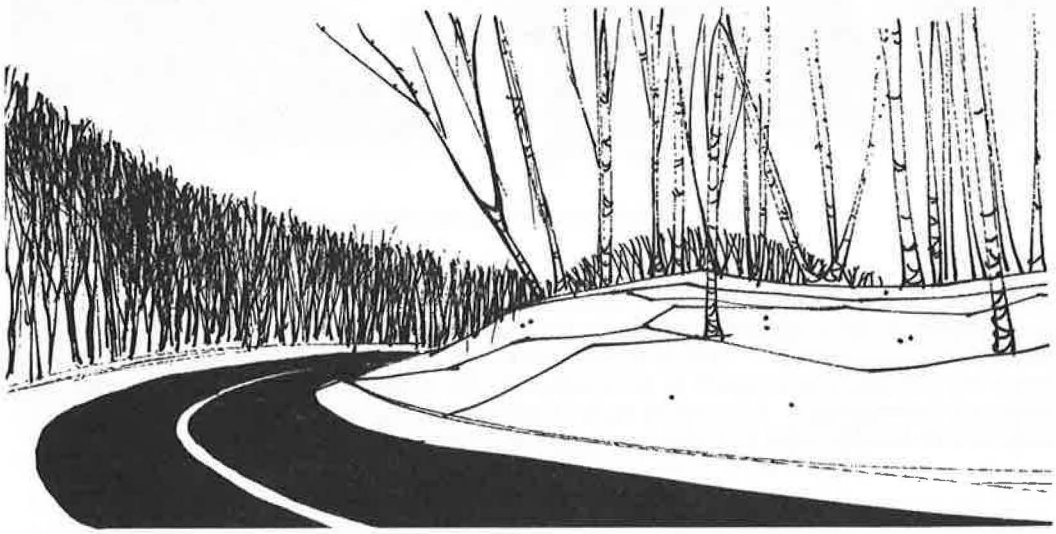


Figure 21. Deliberate application of positive landscape aspects.

these blights can be obscured by utilizing pleasant land forms and planting. We do this inadvertently with positive aspects of the landscape, and we should begin to apply the concept deliberately to the negative aspects (Fig. 21).

Part of planning for a better region then, is not only the realization of the natural corridor as a concentration of recreational activity, but the development of the highway—the man-made corridor—as more than a means of travel, but as an experience in itself.

Creating a visually attractive man-made corridor can only be accomplished through professional judgment and the cooperation of the local administrators. Highway alignments must be evaluated, natural corridors identified, and their integration properly designed. This can only be achieved by considering every visual element along the highway and by providing a maximum of change and variety along the right-of-way.

The future of the State may rest heavily on the extent to which it prepares for the ever-increasing number of tourists seeking weekend and vacation escapes from urban

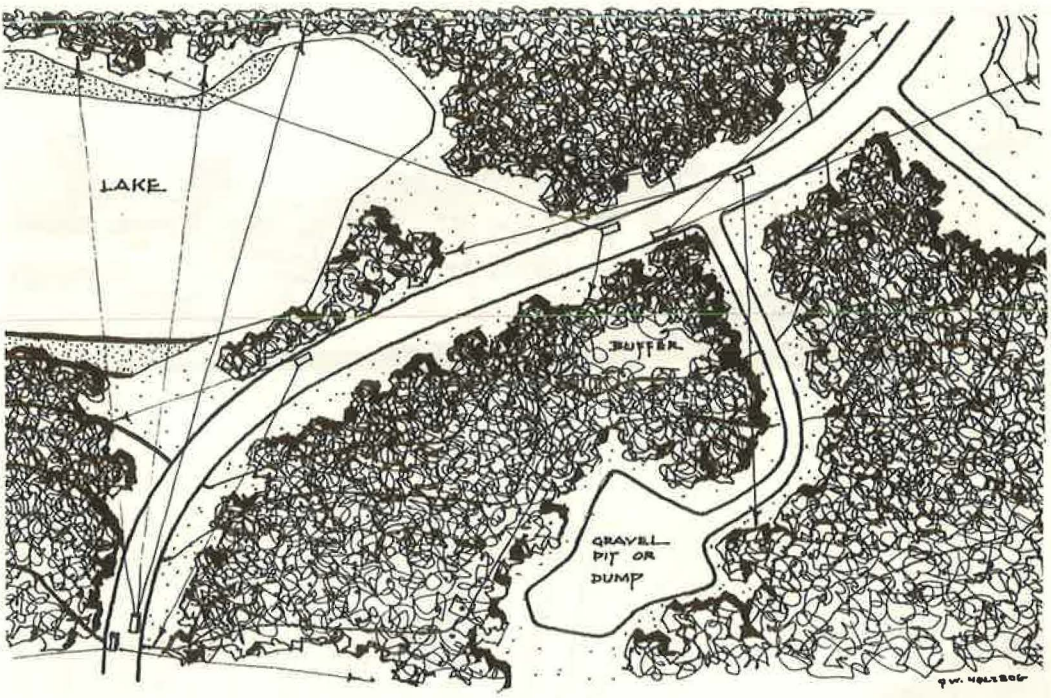


Figure 22. Development of the man-made corridor.

tension. They will seek not only a pleasant destination, but a memorable journey as well. Since most of them will come by automobile, the highway is the obvious focus for much of the preparation. This is a new era of recreation involving highway experience, and it is overdue with respect to accomodating the motoring tourist. Wisconsin's highways can be beautiful. A constant view of anything—even Lake Superior—does not achieve full beauty until it is changed and varied enough to invite the eye.

ACKNOWLEDGMENTS

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