

# The Highway Corridor as a Concept of Design and Planning

PHILIP LEWIS, University of Wisconsin

•IN 1961 Wisconsin established the basis for a far-reaching statewide program to develop various of its natural resources which, because of neglect or improvident practices in the past, were in danger of being wasted by the present generation and irreplaceably lost to future generations. Efforts to redirect the state's programs for conservation, reforestation, resources development, scenic and historic preservation, highway construction, and other objectives were organized to achieve total environmental planning. In this program, the portion relating to highway planning and design had an essential role. The importance of this role became clearer as the state's highway plans were studied in conjunction with those of other departments in a comprehensive survey of the state's potential for scenic and recreational development carried out by the Wisconsin Department of Resources Development.

In any program for planning transportation to serve recreational or scenic purposes we normally start out with the pattern of people. If we look at the United States very quickly and diagrammatically we see that, in traveling from Maine down through Virginia, we move in and out of one urban scene after another. It is a great megalopolis. We also see that there are major urban complexes along the coasts of Florida and the Gulf. There is a similar situation on the West Coast, with major urban concentrations developing.

In terms of outstanding scenic resources for these people to turn to for recreational or environmental experiences, the East Coast megalopolis has the Atlantic Ocean, the offshore islands, and the intercoastal waterway to turn to, provided we act promptly to set aside some of these lands and preserve them. They also have to the west of them the mountains with great contrasting scenic resources. On the West Coast there is a similar situation, with the Pacific Ocean on one side and the mountain ranges immediately to the east.

When we begin to look at our own Midwest, however, we start with urban area complexes in Detroit, Ann Arbor, Kalamazoo, Gary, East Chicago, Racine, Kenosha, Milwaukee, Madison, Minneapolis, St. Paul, Peoria, St. Louis, Paducah, Evansville, Cincinnati, Akron, Indianapolis. In the Midwest this urban complex is developing a more or less circular pattern of people with the flat prairie landscape, which does not have great scenic contrasts in its resources. People escaping from their urban patterns move outward. They go to the Smoky Mountains in the southeast, or the southwest where the Ozarks are, or even greater distances to Florida and the Gulf States in the wintertime. But in the hot, humid months the escape route is northward to Michigan, Wisconsin, Minnesota, and increasingly to Canada, and the pure unspoiled nature that is offered there.

When one begins to look at this pattern in more detailed fashion, one notes the counties which have populations of 50,000 or more. These show that there is beginning to develop a linear urban pattern here. Secondary patterns are beginning to develop, too, and it is interesting to see that these are developing in the major highway transportation corridor areas along such routes as US 66 between Chicago and St. Louis. The significant fact is that within this pattern are roughly 52,000,000 people, and immediately north of the Great Lakes region are another 6 million people, making a total of 58 million, or almost one-third of the population of the country.

One of the great present tasks of recreational and environmental planning is to make people in the Midwest aware that it is no longer a rural regional area, but an urban industrialized area which is making a tremendous urbanized impact on the national resource base. This area is blessed with mineral resources and food and fiber resources to support an ever-growing population. It has one of the greatest fresh-water supplies in the world. It has the Tennessee, the Cumberland, the Mississippi, the Ohio, the Wabash, the Kaskaskia, the Illinois, the Rock, the Wisconsin, and the Missouri making up a river system, in addition to the Great Lakes.

The present population may well double within the next 30 years. The impact of this urbanization on transportation and the area's natural resources indicates that a substantial additional effort should be directed toward planning for orderly and coordinated growth.

Not only will there be more people in smaller space, but these people will have more leisure time, and more ability to move around. What will these people seek when they leave the cities? There does not seem to be any question but that the urban dweller will seek the change of visiting the rural areas, and the rural resident will seek his change in the city. The typical urbanite, surrounded by his brick, steel, glass and asphalt, seeks variety; similarly, the farmer, surrounded by his rows and rows of cultivated crops, seeks variety, too.

### MAN-MADE CORRIDORS

If we look more closely at the life of a typical urbanite, we find that he wakes up in a little cubicle he calls his bedroom, staggers out of the bedroom down a man-made corridor to the bathroom. Here he shaves and dresses, and goes down another man-made corridor to another cubicle he calls a kitchen, where, if he is lucky, his wife has provided him toast and coffee to start his day. After that he goes down another man-made corridor to get his hat and coat, and then along a sidewalk corridor to the cubicle called the garage. Here he gets into a metal cubicle called an automobile, backs down a driveway corridor into the street, and he is on his way to work. The significant thing about all this, for present purposes, is that all of his waking moments this man's activity and movements are controlled by a series of right angles and man-made corridors.

He whizzes down the expressway at 60 miles an hour past the left elbow of his neighbor amid the exhaust of the city. He comes out of this into a network of asphalt runways, hubcap-to-hubcap with his neighbor, and together they crawl along toward and through a cluster of office buildings.

Generally these are corridors of brick, stone, glass and asphalt. But if he is fortunate, his city may have had some urban renewal applied, and introduced back into the city at great cost some of the features that once existed—the open space, the vegetation, flowers and foliage, and the feeling of space in which to move about. How much better it would be if on the fringe areas of our cities we would identify these outstanding natural and cultural features, and see that our urban patterns are developed in harmony with them as the urban areas grow out to engulf them.

Back to the typical urbanite, we find that he has arrived at his office and crossed the plaza, and entered his office building. Here he enters another cubicle and is shot up a tube 30 stories into the air. Of an evening he returns home, again going through this series of man-made corridors and cubicles. Most of his experience outside his office or his home is acquired in this highway corridor environment, so we begin to think simply about moving people from here to there, and getting them to their destinations rapidly. We simply have to begin to think in terms of the quality of the environmental experiences that people are having within these corridors, and in this process of transportation.

If the population of the United States doubles in another 30 years or so, what will urbanites really seek when they get out of the city and head toward the nearest recreational areas? In the Wisconsin studies, this was considered in terms of the passive and the active types of sports and exercises that people seek. From the Outdoor Recreation Review Commission came some idea of how many people were seeking

various types of activities. These data showed that by far the greatest stated desire for recreation was scenic and pleasure driving. This was also verified by studies conducted in Chicago and Minneapolis and certain other selected urban areas. Not only was this the most-stated desire, but it doubled all others in its magnitude. Thus the automobile and the highway system are having a terrific impact, and will continue to have this impact so that they cannot be overlooked. In terms of our planning studies, we found that the biggest impact was being felt in the rapidly urbanizing regions. Thus if you project the 80 million visits which are being made today to the year 2000 it may well be 244 million visits if there is any scenery along the corridors to be seen.

This leads to asking what basic cultural resources and features in our natural and cultural landscape support this recreational activity. To this new and rapidly developing tourism industry these resources are as iron ore has been to the steel industry. Recreation and tourism is one of the most rapidly growing industries in this country, and unless the states can protect, develop, and enhance these basic recreational and cultural features, there simply will be no basis for this new industry.

### CORRIDORS FOR TRAVEL AND RECREATION

In Wisconsin, the Department of Resources Development had one year to produce something meaningful in the way of a study to show what could be done. We knew we could not identify all of the resources of the state during that time, so we took Rock County as a demonstration project. From land use studies we had plotted all the urban impact on the natural resources base—the old core of the city, identified from studying the cores of the mature trees on the street; the new ring outward; and beyond that the suburban sprawl along the outlying transportation system. All the major rivers were noted, together with their major and minor tributaries, the Class A wetlands, the interesting topography and ridge lines with a topography of 15 percent or greater. When blocked in on a map, this pattern of water, wetlands and steep topography took on a linear system. And to show the importance of this pattern in a county as it affects the quality of the environment, it is this pattern of a combination of water-wetlands-and-steep-topography that gives the quality and personality to our environment.

We then set out to identify some individual isolated specific resources, like archeological sites, historical buildings, pheasant habitat, deer habitat, lands identified by the Audubon Society as outstanding, lands owned or leased by the Conservation Department, and lands being proposed for acquisition by the state. It was discovered that most of these isolated specific resources, which do not occupy much space on the land, also fell within this same corridor pattern identified by the water-wetlands-and-interesting-topography. By superimposing these two patterns together, a major environmental pattern became recognizable.

How does this help in planning land acquisitions? One way it helps is by indicating the type of demand that needs to be satisfied. For example, if one has originally visualized a certain area as a hunting reserve, and subsequently finds that the greatest interest in the area is as a wetland where people come just to see water birds in their native habitat, one may well want to change the kind of land that will be acquired, or the extent of it. A good land acquisition policy will be flexible enough to accommodate changes in the demands for public recreation facilities.

From the Rock County study, we concluded that it was feasible to identify the major linear systems and patterns within the state, and the isolated specific features—such as sandy soils adjacent to rivers and lakes—which were meaningful either by themselves or in combination with other features. The interesting topography, being too steep to develop without the risk of excessive erosion, could be preserved as scenic features. Also, the rims and ridges of the scenery were identified. These are the places which make the best parkways for scenic driving, or hiking and bicycling trails. All of these fell into a pattern of corridors, and this pattern dominates the landscape.

This corridor also is essential for most of the quality and variety of the environment not only for recreation, but also for all living and working activities. If we could reach in and pull this pattern out of the topography, we would remove the thing

that gives quality and variety to the region, not just for recreation, but for making it a pleasant environment for living, working and playing. These patterns are the major rivers and tributaries, and the steep imposing slopes. They are the major shore lines, and major ridge lines made up of mountains, hills, plateaus, and so on.

These remaining patterns are linear. In Wisconsin, the early pioneers began to put under the plow small patches of tillable land, and by 1900 most of the tillable land had been put into cultivation, leaving those linear patterns of the flood plains and topography too steep to plow. Today, in certain areas, these little villages which were laid out years ago have grown until they are beginning to run together. By 1980—or even today in certain areas—these urban areas will flow one into another, obliterating all the natural qualities of environment, as well as the rich farmland. Until we identify these quality patterns and devise modes of conduct toward them, and mold the impact of our urbanization and transportation system growth to harmonize with them, we have two alternatives. We will either protect them and develop them wisely, or we will obliterate them, and they will not be available for future generations unless we pay great sums to provide them all over again.

The natural corridors formed one of the major patterns which we discovered in our study. After this came the job of identifying the other significant resources. Using symbols which could be put on a map, we looked for several categories of features. In the area of natural resources we listed waterfalls, rapids, chasms, bathing beaches, natural springs, fossil collecting areas, natural bridges, glacial moraines, caves, balanced rocks, and so on. In the man-made resources which had meaning to someone, we found blacksmith shops, pioneer trading posts, taverns, mines, historic churches, covered bridges, lumber camps, battlefields, and old forts. We identified wildlife habitats by the silhouette of the animal.

Some 260 elements which were meaningful to someone or some profession or group were identified. Inventorying these elements meant getting out into the field and looking for them. With only a small task force in the Department of Resource Development, we turned to the state agencies and Federal agencies which had their own regional offices and regional staff people. We also turned to the highway department, and found they had excellent photographs of many parts of the state. U. S. Geologic Survey maps were enlarged to a scale of 1 inch to 2,000 feet on milar sheets so inexpensive "blue-line prints" of each county could be obtained. These were given to the various agencies that had staff people in the field—the state conservation agency, foresters, fish and game wardens, and park supervisors. These people knew the county better than any others we could find, and so we gave them our blue-line maps and the list of resources we wanted inventoried. Within three weeks they had inventoried this list and plotted the locations of everything on the blue-line print. When these were returned to the Department of Resources, they were turned over to the state agricultural extension service, where certain other resources were added.

Symbols were also created for twelve landscape scourges, such as billboards and junkyards, and these were plotted. Thus we had some idea of the impact that these were making on our natural resources base. We turned to the Soil Conservation Service and plotted their values for the soil.

When these symbols were plotted on an overlay and viewed in conjunction with the map of the corridor pattern which had been discovered earlier, we found that 90 percent of these natural resources were concentrated within the corridors. So everything seemed to come together here—the waterfalls, the wildlife and fish habitat, the rapids, the archeological sites—in conjunction with the water. We were able to define concentrated areas of these features which we called "nodes of interest." So the corridors and nodes provided concentrated areas of diversity of interest providing many different types of recreational experiences. A numerical evaluation for each of these resources was developed so that the resources within a given node could be tallied and given a value which could be compared with the value of another. This was needed to help guide our program of acquisition of property under Wisconsin's \$50 million recreation development program.

There was one other pattern that was very important for scientific study. This was the pattern of the natural scientific areas which needed to be preserved in an

undisturbed condition for scientific study. Many universities and professional scientific groups are concerned about the rapid disappearance and destruction of these areas, and warn that without them future generations will have nothing with which to study the original character of their areas.

As this study has continued, there has been developed, county-by-county, on a state-wide basis the following information: (a) the water and wetland patterns, (b) the "12 per cent slope" pattern, (c) the timber pattern, and (d) corridor pattern which results from blocking out these first three elements. The corridor is basically important both to our study and to the community; in many cases it is the "back 40 acres" with the low tax base which has all of these desirable characteristics in terms of recreational experiences. Also, from plotting the roughly 260 symbols representing the location of the specific resources, we found that about 90 percent of these human and natural values lie within the corridor system.

### PLANNING THE HIGHWAY CORRIDOR

The value of this corridor system in laying out networks of scenic highways is, therefore, obvious. By superimposing the proposed highway pattern on this set of maps, vertical and horizontal alignments can be made in harmony with these qualities. These data also provide aid in determining priorities in highway development. The conservation department's data, for example, identified the first, second and third priority fish and game areas. Because these fish and game areas are within the water and wetlands, the pattern was identical to the corridor pattern.

In Wisconsin we now know where these major resources patterns are. This, however, has not solved the problem of getting people from here to there. We have invented all sorts of vehicles for moving people over the land, and we have produced them in such great numbers that they are readily available. But we should not forget that whenever we make a highway facility for moving people by these vehicles, we make a man-made linear corridor impact on the natural resource base.

We can take our natural corridor system and superimpose a highway corridor pattern on it along with our trail systems, and see where the systems run parallel or cross. If the natural ecological area will suffer unduly from the highway, the highways can be realigned to relieve this pressure. The same thing can be done in connection with development of the scenic potential of the highway corridor. Wisconsin plans to have funds to acquire up to 2,000 miles of scenic easements along its state highways. This corridor pattern study will provide guidance in the acquisition of those easements.

There are other patterns that the planner should be aware of in designing facilities for urban areas and transportation systems. He should look in a generalized way at his state's landscape, and block out the interesting topography and the wildlife areas. He should then superimpose on it the water system and the map of its soil system. These visual combinations of water and wetland topography produce the textures and colors which give an area its landscape personality. In Wisconsin, we found 62 different personalities in the landscape, as compared with 15 that were identifiable in the Illinois landscape. The Illinois study pointed out that the prairie was the predominant personality feature for that area. Wisconsin found, therefore, that it had great scenic variety to draw upon for its tourist industry. But, again, to lay out a scenic route depends upon making inventories to know where the quality exists.

Another resource which could be brought into the planning of scenic and tourist systems was revealed when the University of Wisconsin identified the various ethnic groups in the state, and plotted the pattern of their locations on maps. This element could then be added to the inventory of resources, and the attractiveness of these nodes of interest enhanced with the traditional foods, festivals, architecture, crafts, and costumes of the ethnic groups. Thus variety can be added to the resource base. One proposal for utilizing this resource called for a highway system called "The Heritage Trail" which would follow these linear systems of quality, and tie together various natural personality features. In Wisconsin, for example, tourists coming up from the direction of Chicago could be directed first to the Great River Road, then through the lake district across the state to Door County and Green Bay, down the



Kettle Moraine drive, and back to Chicago. The state highway engineers and planning department could use the information developed in this inventory and study to build a highway system that would accommodate this type of traffic in the increasing volume that would be generated in the future.

In 1958 Professor Wetmore presented a paper before the Highway Research Board on the subject of visual values in highway planning (1). At that time it appeared there might be some risk in taking the platform and arguing for aesthetics before a group of highway engineers. Yet the room was packed, and afterwards an engineer from California who had heard the paper said, "You know, we believe in these values you have talked about. But you must remember that the soil scientist and the geologist develop the various patterns of soils that will support our ribbons of concrete, while no one is identifying these outstanding natural and cultural features and patterns in a way that we can use in our work." I am glad to say that at least in Wisconsin, working with the planning section of the highway department, we have found that it is possible to map these resources and evaluate them for use in the highway planning process. Hopefully, the new highways that are going to be built will be designed in such a way as to harmonize with the quality-giving features of the environment. We have tested our conclusions, at least in some initial stages, in the Hiawatha Trail, linking four states, and found that once the inventory has been made, so that the locations of the scenic and other resources are known, they can be linked like beads on a string by a network of scenic highways.

Corridor patterns are very important in the alignment of highways, but they also can be very important to guiding and serving as urban "form-determinants" in the growth pattern of our cities. We can allow our cities to grow in a sprawl fashion or we can begin to identify these form patterns and develop our cities around them. There is evidence that planners are getting away from the old technique of identifying bits and pieces of parkland, and adopting the concepts of developing some of these linear systems that have been used in Milwaukee, Boston, Minneapolis, and other older cities. It has also been seen that, because these corridor systems lend themselves to scenic alignments with the various man-made facilities for hiking, bicycling, and so on, they can be used in identifying some 6,000 miles of scenic roads for the Federal Scenic Roads and Parkways Program Study.

In urban areas these corridor greenways lend themselves to serving as urban form determinants dividing the city into various land uses. Particularly does this appear in the fringe areas, and hopefully highway programs will respect their integrity instead of cutting them into bits and pieces by residential street systems.

Hopefully, also, designers will blend the human facilities in harmony with the natural systems. To do so would be to offer the resident of the urban core an opportunity to traverse both urban and rural scenery without the danger of traffic and the cost of taxicabs. Protected, the corridor of green may well provide cooler air above it, and serve as an air conditioning unit for the urbanite. It is well known that the air above some of these green spaces is as much as 12 degrees cooler than air over the city. Also, the clean air above these corridors can greatly disperse atmospheric pollution. Another important factor is that, by preserving the corridors and preserving the slope, siltation of the aqua recharge areas can be overcome, protecting the urban surface water supply.

Once these urban systems are inventoried, they have more value than merely providing more recreation through scenic driving. These are the major functions, but one should not neglect mentioning the minor ones which are becoming important. Retained as natural ribbons or web-like patterns of green, they serve as a background of ever-changing natural colors and textures and serve as a natural foil that unifies and makes tolerable the miles and miles of man-made ticky-tack. They may well serve to enhance property values and serve as a design catalyst throughout the urban fabric because of their linear nature. Protected, the corridor can provide most of the areas needed for sports and exercise in the future. As was pointed out in the Milwaukee regional study, they really provide all the wildlife and fish habitat needed within an urbanizing region. Protected from development and possessing most of the

soils unsuitable for septic systems, corridors can help control serious health problems, and, encompassing most of the flood plains, corridors can help reduce flood damage.

Since 1913, when LIFE magazine ran a story on what our environment was going to be like, we have been talking about doing something to improve our environment. It appears that now we are going to do something about it. In England they have been doing something about it through an educational program, making the public aware of its surroundings and what it costs the community. The same thing is needed in the United States. We know that the surroundings of highways can be monotonous, both in the urban scene and the natural scene. There is a monotony in seeing the same hill with the same bit of timber on it for miles and miles without any relief. In landscape architecture, we break up this form of monotony by creating what are called "outdoor rooms." These are created by varying use of landforms, deciduous materials, or water. We can classify the visual quality of these outdoor rooms or spaces, and can create a graphic shorthand or symbols to plot them on a regional map. We can, in other words, arrange things so that we see the three-dimensional quality of the space through which we pass. As designers we know there are all sorts of techniques for laying out trails or highway systems through these patterns in an interesting way. We know that if we have the same type of space with the same straight alignment, the result can be pure monotony. But if we introduce variety in the right amounts—because too much variety defeats and prevents a pleasing impression as well as too little—we can create a beneficial experience for people.

We are beginning to study the effects on people of changing their environment in this way. What happens when they are subjected to monotony for a period of time? We are also quite concerned—as all of us should be—about the visual quality and the carrying capacity of those given corridors to support different activities. In Wisconsin the studies of existing highway systems in the north country were used to point out to the people of Lake Superior that in many stretches of highway one must travel along monotonous forest roads without knowing that nearby is an exciting lake or an interesting marshland. The studies also showed that this northern route along Lake Superior could be a much more exciting experience than it now is if there were windows cut in the forest to see the lake occasionally. The necessary selective cuttings could be made by local labor which is unemployed during some seasons of the year.

The same effects of selective cutting can be used to open up a view from the road of an interesting church, or hilltop, barn, or other man-made feature which adds variety to the driving experience.

In urban areas, man-made features predominate, and the need for diversification of the visual features along the motorist's route of travel may be met by providing openings in the otherwise solid walls of buildings on each side of the street. These open spaces may be either permanently or temporarily vacant lots; the point which is important is that they be recognized as a potential scenic asset, and developed (by landscaping, or simply by cleaning them up) to enhance the experience of the city street traveler. If there is something diverting once in a while it breaks the monotony of any section of highway, and is a safety factor.

In laying out these new scenic systems, one of the main concerns is that the new highway corridors will not destroy the basic quality of the environment. If highway systems are going to be laid out in close proximity to natural features, a completely new approach to design standards will be needed. Hopefully it will be an approach with more and closer collaborative efforts between the design team and the engineering team. Each of these linear systems creates varying impacts upon the natural resource base, and through an integrated effort of the natural scientists we can try to get the basic information to make these wise decisions.

Our state and Federal highway programs have built a network of corridors of concrete which have vastly increased traffic between our cities, increased the markets, and encouraged private capital to furnish many of the services adjacent to these highways to take care of the traveling public. There are, however, understandable objections to taking too much land off the tax rolls, and understandable arguments that we should be developing our land rather than preserving it. An accommodation of public and private interests must be reached. What we would like to suggest is that these

corridors of natural quality be protected, that minimum features (like hiking trails and other facilities) for outdoor recreation be provided, and that, hopefully, scenic highways can be created to move traffic between these areas and the population centers, to again encourage private capital to come in under design controls to provide some of these extensive recreational facilities that the state seems to want to build itself today. When the systems of channels or corridors through which people travel are studied, they will show where the greatest impact of the public's travel is going to be felt, and also permit the pinpointing of our chief patterns along these corridor systems. As I see it, we have two alternatives. We can either inventory what is meaningful to all of us, see where these patterns are, and develop modes of conduct toward them, designing our facilities in harmony with them, or we forget about them and let them be destroyed for future generations.

#### REFERENCE

1. Wetmore, Louis B. Visual Approach to Highway Planning and Design. HRB Bull. 190, pp. 29-40, 1958.