Aesthetics of Highway Design

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INTRODUCTION

There is a danger in looking at highway design strictly from the viewpoint of aesthetics without indicating how this relates to other phases of design. An optimum design is only possible when the standards of structural design, geometric design, and aesthetic design are integrated and in perfect balance with each other. However, not being qualified to discuss structural or geometric design, no attempt will be made to cover these phases except as they directly affect the aesthetics. It is assumed that the reader will add the following viewpoints on aesthetic design to his own on these other aspects so as to never lose sight of the optimum or total concept in highway design.

Before discussing this topic of aesthetics in highway design, it is worthwhile to first briefly define the title of this discussion.

Aesthetics—theories on the essential character of beauty.
Highway—a public road.
Design—(from a landscape architectural point of view)—the art of organizing outdoor space for people to use and enjoy.

Simply stated, aesthetics of highway design is the art of locating and integrating public roads into the total environment for people to use and enjoy. As the last part of this definition implies, we are dealing with a marriage between function and beauty. They cannot be separated without losing the quality of optimum highway design.

The other point to be made clear is the similarity of objectives in design whether considering structural, geometric, or aesthetic design. The similarity is in the philosophy of highway design, which briefly stated are safety, efficiency, economy, and simplicity.

Highway beauty involves more than the planting of trees and shrubs along the roadside, or providing scenic areas for the motoring public. To be aesthetically acceptable, the highways must reflect in their location and design a recognition of the existing natural and social environment through which they pass. The highways should unite and integrate the communities with the surrounding landscape. Too often highways
become ugly scars on the rural landscape, or concrete jungles in urban areas. The unfortunate nature of this situation is the futility of attempting to cover up the ugliness with landscaping. Landscaping should be an integral phase of the total highway design and should not be used just as a cosmetic treatment to conceal the ugliness. This requires collaboration between the engineer and landscape architect from the earliest stages of highway design to its completion.

HISTORICAL BASIS

Before dealing with specific concepts, consider briefly the historical basis for consideration of landscaping and aesthetics in highway design. Over 2000 years ago, trees were planted along the roadside as a guide and for shade for the traveler. Many years later, the early settlers planted trees along the roadside for shade, increased property value, and beauty. With the advent of the automobile, trees along our highways have continued to play an important although changing role. No longer are trees located close to the road for shade, except in urban situations. In fact, there are some highway designers who question the value of any trees on high speed highways because of their danger as an obstacle for vehicles out of control. However, trees and other features of the landscape are probably more important than ever before in providing an interesting and therefore safer highway, because of the tendency for monotony on our highways.

Although it may seem that we have just recently emphasized the importance of highway beautification, this actually has been a topic of concern for many years. H. J. Schnitzius, a landscape engineer from Indiana, commented 25 years ago that there was an unfortunate tendency to lay out a road upon the country instead of making it an inherent part of that country. He also stated that economy, safety and simplicity are important principles of landscape design. Obviously, the general principles of design have not changed, but surely the implementation of these principles, requires many changes in our thinking as compared to that of 25 years ago.

To cite a good example, the Merritt Parkway in New York which was built about that time was certainly outstanding aesthetically and probably outstanding from all other aspects. It is still one of the most attractively landscaped roads I have traveled, but it certainly does not meet the standards for safe travel at today’s speed limits. No longer is general tree planting recommended for the median or close to the road—trees should not be closer than 30 feet from the roadbed on interstates.
A current dilemma is cited to conclude the historical perspective of aesthetics in highway design. Because of the high speed on modern highways, both the engineer and the landscape architect are concerned with areas much farther out from the center line of the road. The engineer is concerned about removing anything which obstructs the driver’s view or which might be a hazard in pull-off areas. The landscape architect requires control over a greater expanse of land adjacent to the highways in order to create, enhance, or protect interesting and beautiful views which provide for safer driving. Usually these adjacent land areas are not included in land acquisition for highway development. Consequently, a very narrow right-of-way is presented to the landscape architect when he is called in to do the landscaping. Faced with limited space and rigid regulations on tree placement, he frequently resorts to planting rows of trees along the edge of the right-of-way. This not only fails to create an attractive roadside development. It tends to accentuate the “corridor” effect that already exists and which is so monotonous. Sometimes this is complicated by the location of utility lines along these same rights-of-way. One or the other is a problem by itself which is more than doubly complicated when both exist together.

PRINCIPLES OF DESIGN

When discussing the general principles of design, of concern are: simplicity, scale or proportion, balance, rhythm, contrast, and unity. As applied to highway design, many of these principles are frequently enhanced but at the same time, others are abused. For example, the principle of rhythm is certainly present in highway development, but usually at the expense of contrast. In fact, if there is one element of design that is deficient in our highway system, it is the lack of contrast or as we have suggested the tendency towards monotony. This will be discussed in more detail later. Another principle that is frequently abused is that of scale. The landscape architect often locates islands of shrubs in interchanges and along rights-of-way which are generally out of scale with the total highway environment, particularly when one views these at 70 miles per hour. The problem of unity in highway design is also critical and as already pointed out, the most important task of the highway designer, from the aesthetic viewpoint, is to integrate or unite the highway into the total environment, whether it be rural or urban. These are the broad principles rather briefly stated. To develop all of these in detail would take more space than is available. But briefly consider this one principle of contrast to show how it can be implemented in highway landscaping and design.
Contrast relieves monotony—which in turn makes a safer highway. In considering aesthetics, we are also concerned with safety but more of a macro highway safety design in contrast to a micro highway safety design, which is concerned with the design features in localized areas.

The problem of monotony is particularly acute in parts of the Midwest. Anything continued for too long a time becomes tiring. This holds true for solid woodland, long avenues of trees, or field after field of corn. Variety or contrast is essential for beauty. Therefore, open spaces enhance the beauty of the woodlands. But where openness dominates the highway view, as in many parts of the Midwest, it is necessary to close the landscape view with patches of woodland or with the addition of mass plantings. Ideally these should not be off in the distance but should be driven through to provide for an element of surprise. This requires bringing the woodland fairly close to the highway and perhaps across the median, using shrubs rather than trees for safety purposes. If I was to offer one criticism of the efforts of highway beautification, it would be that the real impact of highway landscaping is lost by doing limited plantings along an entire highway rather than extensive landscaping at selected sites.

Contrast can be provided by existing landscape features other than trees. For example, rock outcroppings are particularly interesting and if allowed to remain in the median as well as on the right-of-way, they will provide a dramatic element of surprise. Man-made features such as buildings and highway interchanges all add to the interest of driving and help relieve some of the monotony. However, even the highway interchanges have a tendency to become monotonous when the same structural design is employed on all of the overpasses and the interchange pattern becomes repetitious. One of the weaknesses of man-made landscape features is the lack of originality. As man is frequently concerned with function first, which is certainly understandable, he usually is quite content to use the same design repeatedly until a more functional design replaces it. This unfortunately ignores the importance of aesthetics which can only be achieved by imagination in design without losing usefulness.

One reason the interchanges are extensively landscaped is because it is one way to add variety and it is also one of the few areas in which sufficient area is allowed for developing interesting plantings. The dramatic change in the method of landscaping these interchanges over the past few years has been quite obvious. In the past, the islands of shrubs were extensively used and created a two-dimensional patch effect that did little to add interest to the interchange. Now, the trend
is towards large trees and evergreens in mass plantings that will be seen from quite a distance. These will be more effective because they are more in scale with the total highway environment and they add that important element of contrast.

Now consider other factors that constitute beauty on a highway and how the principles of design apply. An important point that needs to be emphasized is that beauty is found in nature and therefore beauty can be achieved by preservation of existing natural features. Although everything natural is not beautiful, the surest approach to highway beauty is to preserve as much existing beauty as possible, in the initial location of the highway. This has implications for the geometry as well as the aesthetics of design. It is also the reason why the landscape architect should be involved in the initial selection and layout of the highway.

For example, one of the most pleasing styles of highway design is the variable median or independent roadway style in which both the alignment and grade of each roadway of divided highway are handled separately. This means that the separated roadways may be at different elevations. This style of design can take advantage of existing terrain and other natural features for safe and pleasant driving conditions. This approach also saves excavation, preserves natural growth, eliminates head-on collisions, and head-light glare, and provides space for future lanes if necessary. This approach to highway design, which doubles the engineering problems, has not been used very extensively in Indiana. Yet, this is a most effective way of relieving the monotony of fixed cross sections and therefore provides for a safer highway. Frequently, in an attempt to design and build high-speed highways for relaxed driving, we have lulled the driver to sleep. Gentle curves in conjunction with the variable median are useful means of achieving more alert driving as well as a pleasing appearance. The importance of this initial step in providing aesthetics in highway design can not be over emphasized. Once the road is designed and built, it is very difficult to correct geometrical errors.

As for the aesthetics of site selection, preserve and protect as many of the existing natural and man-made landscape features as possible. This may require the variable median to preserve a natural stand of trees, or if none are available, perhaps some steps should be taken to allow for the development of such a planting. Faced with the fixed-width median, the landscape architect sometimes resorts to a uniform planting pattern in the median to reduce headlight glare, but in doing this he again accentuates the monotonous “corridor” effect of our
highways. As there is 15-25 years involved in establishing a tree or a natural stand, the primary effort should be in conserving the existing plantings. Not only should these existing plantings be preserved, but supplemental landscaping should be aimed at enhancing these natural plantings. This may require establishing native vegetation on some road cuts rather than grass. The reason this hasn't been done very often is because of the difficulty in preventing erosion and eliminating weeds during the establishment period. In fact, my association with the subject of highway development is related to some of these technical landscape problems which we are attempting to alleviate. The objectives are to provide the technology which will allow for more flexibility in planting design. The present knowledge of landscaping pertains to residential problems which certainly is quite different from those encountered on the highway.

Following are some of the functional aspects of highway landscaping which are an integral part of this topic. The landscape architect is concerned with both aesthetics and function. Plantings can contribute to soil erosion control, reduction of headlight glare, traffic guidance, snow drift and wind control, crash barriers, dust, noise and fume absorption, screening unsightly areas, shade at turnout areas, and other uses. Ideally plants used for these functional purposes will be integrated with the total design so that they contribute to the aesthetics as well.

SUMMARY

In summary, the highway designer has at least two responsibilities: to provide for the most efficient transportation, which is quite obvious, but he also has a social obligation to maintain or create a highway environment that both the driver and pedestrian can live in. The role of the highway designer is to create an aesthetic road design that combines beauty with utility. This combination will, over a period of time, provide a more economical and safer road. The aesthetic principles of landscape design should not be thought of something supplemental to the actual highway design, but rather an integral phase that requires collaboration between the engineers and landscape architect from the very beginning. Highway beauty should not just happen. It needs to be created intentionally just as safe and efficient highways are designed intentionally.