

Issues in Planning and Design of Scenic, Recreational, and Parkway Roads

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Planning and design for recreational and scenic roads present a somewhat different set of criteria and restrictions than for other roads. Since the first parkways were built in the 1920s and 1930s and provided the impetus and criteria for all scenic and recreation roads, several important factors have changed: the age of these roads, the age of drivers, vehicle characteristics, and drivers' desires. Some road managers and agencies desire to retain the intent and function of scenic, recreational, and parkway roads, in terms of either new construction or reconstruction. It is important to recognize the role and nature of the recreational, scenic, or parkway road relative its users' needs. Comparisons are made between the early road standards, existing standards, and proposed lower road standards. The need to retain the role of the recreational, scenic, and parkway roads while addressing vehicle and driver factors is examined. One means to accomplish this is through more specific detailing in the design and construction stages. Differences within agencies and units show difficulties from a lack of consistency in philosophy and in design that results in inconsistencies in roadway geometrics, signing and marking, and especially lane width.

Planning and design for recreational, scenic, and parkway roads present a somewhat different set of criteria and restrictions than for other roads. These restrictions arise from three factors: (a) many of these roads are up to and over 50 years old; (b) these roads are themselves considered scenic or recreational only, or pass through scenic areas; and (c) any roadway is itself an obtrusion into the vista and scenic view. Generally these situations cause most recreational or scenic road managers to want to keep or design the road to a minimal standard. More importantly, the roads typically have an assumed lower design speed and reduced lane width.

Most of the original recreational or scenic roads were built to older standards and the lower design speeds of the 1930s and 1940s. Recreational road managers are hesitant to widen and flatten existing roads because of the cost and the visual impact. This is similarly true for new recreational and scenic roads since the desire is for a recreational and scenic road, not a thoroughfare.

This is illustrated by the FHWA as

A scenic road or byway has roadsides or corridors of aesthetic, cultural, or historical value. An essential part of this road is its scenic corridor. The corridor may contain outstanding scenic vistas, unusual geological formations, dramatic urban scenes, scientific features, or other elements—all providing enjoyment for the highway traveler. (1)

A similar situation exists when a state designates an existing roadway as a scenic roadway. Does the agency need to make

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any operational, signing or maintenance improvements to the roadway before it is officially designated and recreational travel encouraged? Obviously, the roadway is selected because it is scenic. This typically means that the roadway is low volume and probably historical in the sense of older design standards. The road may even have been built before the adoption of highway design standards.

HISTORICAL DEVELOPMENT

Newton describes the early development of recreational parkways (2). The first parkway was the Bronx River Parkway, started in 1913 and substantially completed in 1923. This parkway and three others in Westchester County, New York—the Hutchinson River, Saw Mill River, and Cross County—influenced future parkways by providing an environment that was extremely pleasant for driving and yet functionally efficient for commuting traffic. Manning describes the intrinsic beauty of these early parkways (3).

At the federal level, the Mount Vernon Memorial Highway in Virginia was completed in 1932. This parkway made provisions for scenic overviews and historical features and was an early model for federal parkways. The adjoining George Washington Memorial Parkway, started in 1935 and completed in 1965, included many of the parkway design and construction details developed on the Mount Vernon Memorial Highway (4). In the Blue Ridge Mountains, Skyline Drive, designed in 1930 and finished in 1934, was built in the early scenic parkway tradition. These parkways have provided design elements and philosophies that continue to be used. Today, many public use roads designed by the National Park Service (NPS), U.S. Department of the Interior (5) within the national parks are constructed in the parkway tradition.

Some believe that the crown jewel is the Blue Ridge Parkway, started in 1937 and completed in 1987. The concept for this scenic road connecting the Shenandoah Valley to the Great Smoky Mountains developed mostly during the Depression years. Scenic, historical, and cultural heritage features are combined in its coverage, development, and preservation. One prime goal, then and today, is to provide a user with a living museum of natural and manmade form. This obligation has led to certain mindsets in terms of land and vegetation management practices (6) that have influenced road design and maintenance practices.

The other major national parkway that has influenced both perceptions and design attitudes is the Natchez Trace, which runs through Mississippi, Alabama, and Tennessee. It has also presented design, construction, and maintenance challenges.

State-initiated parkways have included Oregon's start in 1913 and the multistate Great River Road, which was conceptualized in 1938 and has major portions still to be built. This concern for incorporating the scenic value of areas into highway building was a major factor in the development of scenic roads and parkways, and its influence has carried over into many of the scenic road design philosophies.

By the late 1930s, technical information had been gathered concerning the special needs for a parkway (e.g., ecology, vistas, and right of way). Differences in roadside vegetation by regions and climatic zone were identified and considered in the parkway development process. At the same time geometric features and roadside improvement were being considered.

Much attention was also given in the 1930s to landscaping improvements to the roadside. One example is the work by Boddy and Taylor (7) that gives roadside landscaping specifications.

By the 1940s, detailed specifications of roadside ecological construction were developed for specific applications. Curtiss in 1942 (8) wrote about roadside concerns in the national forests. Bell (9) described roadway standards for western scenic areas.

Dupre (10) reviewed the accomplishments and progress of roadside development in Ohio. One unique aspect was the development in the Lake Region states, especially in Ohio, of a specific grassed shoulder design to address the problem with vehicle tracking near the pavement edge on state roads (11,12).

After the 1940s the interest in research concerning the scenic roads and parkways and the roadside environment waned. The resurgence of interest in scenic roads returned in the 1960s with the emphasis on highway beautification. In 1966, the national program for scenic roads was initiated.

Pragnell (13) in 1970 wrote a report concerning scenic roads in forested lands. In 1984 the NPS published a report identifying and describing road standards for park roads (14). Interest in scenic roads has been growing. In 1988 a conference entitled "Scenic Byways—A National Conference To Map the Future of America's Roads and Highways" was held (1). Such activities emphasize the renewed interest in scenic roads.

HISTORICAL PERCEPTIONS VERSUS PRESENT SITUATIONS

The earliest parkways were built in Westchester County, New York, 75 years ago—really almost before the advent of recreational travel, much less automobile travel. Their purpose was "not to provide the fastest or most direct route between . . . origin and destination. These parkways were designed for moderate driving speeds to permit fullest enjoyment of the scenery" (1). It is doubtful that these parkways still carry out the same function for motorists, with today's heavy commuter traffic. Unfortunately, this purpose still guides most recreational road planners, who are unwilling to acknowledge that motorists may not have the same objectives or interests. Interestingly enough, the description of the George Washington Parkway by the NPS shows these differences:

Considered a commuter route by many local residents, the George Washington Memorial Parkway offers the traveler much more than convenience. It is a route to scenic, historic and recreational settings offering respite from the urban pressures of metropolitan Washington. It also protects the Potomac River shoreline and watershed. The Parkway links a group of parks that provide a variety of experiences to over 9 million people each year. (1)

Not only are the Westchester County parkways and the George Washington Parkway heavily used by commuter traffic, but other scenic and recreational roads and parkways in the United States also exhibit these characteristics. Part of the problem is that the intent of the scenic road and its purpose do not match its use by the motorists. The definition of a park road is that it is a "means to enable visitors to reach their goals and provides a goal in and of itself," whereas a parkway is "an elongated park featuring a road designed for pleasure driving and embracing scenic, recreational, or historical features of national significance. Park roads and parkways are designed with care and sensitivity with respect to the resource and visitor experience. Roads in the national parks are treated as scenic roads" (1).

Looking at major NPS parkways—Baltimore-Washington Parkway, Colonial Parkway, Rock Creek and Potomac Parkway, and Suitland Parkway around the Washington, D.C., area—it is apparent that these parkways carry heavy volumes of commuter traffic and do not ideally match the definition of a parkway, especially in terms of speeds and driver objective.

Other parkways or park roads in nonurbanized areas have similar characteristics. An example would be the entrance drive near Gatlinburg, Tennessee, to the Great Smoky Mountains National Park and its park road to Cherokee (both US-441), which not only carries commuter and commercial traffic but also is the only direct route (not an alternative route, as is sometimes assumed for a park road). Another example is Florida's Everglades National Park, where the park road not only serves the park visitor but acts as the major commuting route for local fisherman headed to Flamingo for the weekend with their oceangoing boats on trailers, to go fishing in the Florida Keys. The John D. Rockefeller Parkway between Grand Tetons and Yellowstone National Parks in Wyoming represents a rural parkway environment.

Since the initial recreational roads (parkways) were built, three major changes have occurred. Different design standards have evolved for the design of new roads. The design standards for parkways built in the 1930s were developed to accommodate traffic moving at approximately 40 mph.

The second, more important, concern is that vehicles have changed. This issue is more complicated than automobile characteristics' having changed. Recreational vehicles (RVs) now are becoming common, and they are becoming larger. It is notable that an RV may be allowed on a recreational road while commercial traffic is restricted. In many cases, the RV and the commercial vehicle have similar characteristics.

The third change is in the driver. With the inherent aging of the population, the recreational driver has become much older and has a reduced driving capability. This problem is greater if an elderly driver is operating an RV. Motorists driving such vehicles typically are not familiar with their performance since they use them infrequently, and thus they control the vehicles less effectively.

This situation is compounded for an RV driver on a scenic or recreational road. The motorist not only has lower capability or driving skill with the RV, but also must become familiar with and adapt to lower road design features. The driver is used to wider pavement surfaces (12-ft lanes) and has initial (or sometimes continued) difficulty adapting to a lower design standard road, all while driving a vehicle that is typically wider, longer, and less stable than the driver is used to.

Many park visitors expect higher service and less inconvenience in their activities. Some motorists are in more of a hurry to complete the drive and are not tolerant of slow-moving vehicles. The same is true of the driving speed versus the speed limit (or design speed) of the roadway. This problem is compounded by the type of motorist. Near urbanized areas, many of these roads become a bypass, alternative, or even principal route for commuter traffic. Obviously, the speed and number of vehicles are much higher than for a purely recreational road.

The recreational road user today has different characteristics. One aspect having a more pronounced effect on the roadway designer is the trend of the recreational user wanting to see and do everything from the vehicle. Another ramification is the drive-through visitor. This type of visitor is obviously much different than the classical (and still present) visitor who wants a more leisurely and thorough visit, including side trails, walks, and programs. Overall, these trends translate into more driving loops and less use of trails and walkways. These conditions are compounded by changes in size and type of vehicles and driver performance in the user population. A further complication is that the number of visitors (users) has increased. Also, weekend or color season visitors provide even higher volumes, to a level that overburdens the roadway.

Further emphasizing the problem is that adjacent (access) roads probably were built at the same time as the scenic road with similar design standards but over time have been improved—especially with respect to pavement width. The roads may be similar in design but they meet a higher design standard and are wider in surface.

The realization that must develop is that retaining historical design features on recreational and scenic roads means that drivers will have more difficulty operating on them. This arises from drivers' lesser familiarity with their RVs or towed trailers and their performance. The average age of motorists is increasing with the attendant decreasing driving capability. Motorists are used to driving on wider (12-ft lane) roads and tend to position themselves by the same reference point when driving on narrower roads. Thus they are closer to the pavement edge. Recreational roads typically do not have shoulders, whereas at least a minimal shoulder is provided on the access road. Motorists get accustomed to interstate standards and 55-mph roadways and are reluctant to drive slower on other roadways. These problems need to be recognized and appropriately considered in roadway planning, design, and operation.

Trade-offs between design aesthetics and design capability may need to be modified. Many older roads have been widened on the same alignment, so on access roads, drivers have typically made only minor adjustments in speed and *no* adjustment in lane positioning. Drivers' expectations need to be considered, and adequate transition distances are needed.

The visual intrusion of a widened roadway surface needs to be weighed against the driver, vehicle, roadway, and environmental characteristics. Retention of a 1930s design for a recreational road may not be effective. Modifications, especially in terms of initial transitions and commuter roads, need to be more extensive. For those roadways that are considered recreational or scenic but exhibit the higher-volume characteristics of a thoroughfare, the need is to recognize the actual situation and incorporate appropriate modifications.

Examples of the difficulty of keeping an RV within its lane are illustrative. Figure 1 shows an RV "cheating the lane" on a park road at Elkmont, in the Great Smokies. Figure 2 shows the same vehicle off the pavement edge on the tangent section and the associated edge deterioration problem.

Other concerns arise. One is the high frequency of informal pulloffs on scenic and park roads, even when the practice is officially restricted. Edge dropoff, edge failure, and shoulder deterioration can result. Figure 3 shows the effect of roadside "tunnel/vista effect" and the presence of a "vee" at the tangent-to-spiral of a curve on driver behavior and vehicle positioning. Figure 4 shows what can happen if a vehicle outside tire does leave the road for a length of time.



FIGURE 1 Vehicle cheating centerline.



FIGURE 2 Edge deterioration problem.



FIGURE 3 Example of "vee" at tangent-to-spiral of curve.

Obviously, there must be government concerns with the safety and operation of RVs on these scenic, recreational, and parkway roads. An example is the Scenic Byways Study Act of 1989 (15), which called for forecasts of significant changes in traffic volumes and safety consequences.

A limited study conducted by the Ohio Department of Transportation as part of its Highway Safety Improvement Program of 1990 (16) looked at general accident characteristics on designated state scenic roads as compared with all other two-lane roads. The 4 years of data showed that scenic roads had a higher accident rate than the other two-lane roads. The study results showed that for scenic roads accidents were overrepresented (compared with other two-lane roads) in several categories: driver had been drinking, dry road conditions, at curved sections, and for other vehicle types (RVs). For the general analysis, these factors were significantly different. The number of scenic road accidents was 3,621 as compared with 36,752 on other two-lane roads for the 4-year period. Scenic highways have 8.7 percent more accidents than the average two-lane highways (without divided sections) in Ohio. Figure 5 illustrates the historical accident rate trends. The provisional limits were developed using a chi-square test (16).

These difficulties should be considered not only in the rehabilitation of existing roads but also in the planning and design of new recreational and scenic roads and parkways. These concerns should extend to the new National Scenic



FIGURE 4 Example of extreme deviation outside pavement.

Byways program of the U.S. Department of Agriculture (USDA) Forest Service.

CONSTRUCTION OF RECREATIONAL ROADS VERSUS MAINTENANCE NEEDS

A basic premise of recreational road managers is that recreational and scenic roads are used by recreational travelers. However, many scenic and park roads and parkways carry commuter traffic. In some locations, the parkways carry heavy volumes of traffic and act as commuter roads or urban by-passes. An example is the Blue Ridge Parkway in Roanoke, Virginia.

At the same time, driver characteristics are changing with the growing predominance of the older (retired) driver. Historically the recreational traveler was a younger (family) vacationer. Thus, the mix of visitors to recreational areas has changed. This factor has not been considered in the design and planning process in terms of older drivers' declining capabilities.

Also changing are vehicle characteristics. The greater number of larger RVs and longer trailers is compounded by the increasing presence of fifth-wheel trailers. Also more common is a large RV towing a motor vehicle. For many of these combinations, overall vehicle size approaches that of commercial trucks, which typically are restricted from operating

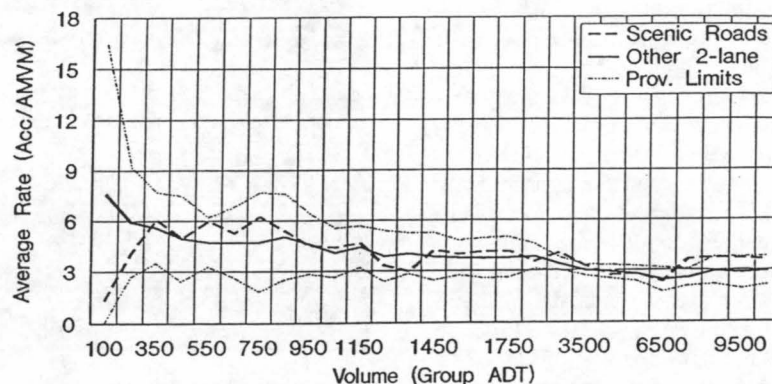


FIGURE 5 Accident rates on Ohio scenic and other two-lane roads.

on a recreational road. RVs are typically as wide and as long and as heavy as some single-unit trucks. When a 50,000-lb 45-ft motor home tows a boat trailer or car, its length and characteristics approach those of an over-the-road truck.

These vehicle characteristics are important when combined with the roadway and driver characteristics present. Because it is a recreational road, the lower design standards also include reduced lane widths. A driver typically positions a vehicle in a lane on the basis of experience. Being more experienced with the typical 12-ft lane, a driver will try to position the vehicle at the same distance from the roadway centerline (as for a 12-ft lane). Obviously, this places the outside wheels of the vehicle nearer the edge of the pavement. It might be expected that the driver would reposition the vehicle within the narrower lane; however, the combination of opposing traffic, tighter geometrics, and larger vehicle tends to make the driver unwilling to do so. Drivers are also not used to being as close to the roadway centerline as is necessary in narrower lanes. However, they do recognize the narrowness of the lane and the tighter geometrics. Drivers will compensate for the geometrics and narrowness typically by "cheating" the centerline if there is no opposing traffic. If there is opposing traffic, then a motorist will move away from the centerline and reposition the vehicle closer to the edge of the lane. This will also happen at horizontal curves where motorists can not observe whether opposing traffic is present. This repositioning can result in the outer wheels' riding on or outside the paved surface.

All of these circumstances—narrower roadways, tighter geometrics, older drivers, and larger and longer vehicles—result in vehicle wheels being positioned close to the pavement edge or, in some locations, off the pavement edge on the shoulder. This leads to two problems: pavement edge failure, and rutting of the adjacent shoulder edge. Even if pavement edge failure or rutting has not occurred, the wheel loads are causing deterioration of the pavement or shoulder structure, with fatigue and failure of the pavement edge to follow. Interestingly enough, if rutting of the shoulder occurs, the pavement edge fatigue is less extensive, but the situation is a greater potential hazard to motorists.

EDGE PROBLEM

Vehicle positioning by a driver has a major influence on the occurrence of pavement edge deterioration. While the combination of driver capability, vehicle performance, and change in alignment consistency interact, the other factors of driver expectations, actual (or potential) presence of opposing traffic, and roadway width versus vehicle path determine the presence or lack of pavement edge problems.

An important but not obvious factor is that the roadway pavement must match the actual and perceived path of the vehicle wheels. This aspect is important because the margin for location error both by the driver (in terms of lateral wheel placement relative to the pavement edge) and in the constructed location of the pavement is much smaller because of the narrower lane width. Thus in constructing a recreational road or improving its surface, better quality control of the pavement placement, in terms of lateral position, is necessary because small differences relative to driver positioning can

lead to pavement edge fatigue and failure problems or shoulder rutting. Thus there is a greater need for accuracy in lateral positioning of the pavement to match the vehicle placement for the narrower lanes than for normal-width lanes. An alternative is to use a wider lane, to compensate for the geometrics and positioning problems. If a wider pavement surface is unacceptable, there is a need for higher quality control and tighter controls of the paving operations and pavement positioning relative to vehicle wheel location than is current practice. This means more detailed work for design and more specific and rigorous operational controls for the construction and reconstruction of a roadway paved surface.

The reluctant use or nonacceptance of a widened pavement surface is not the only problem that generates concern. Just as there was with centerline striping of park and scenic roads in the 1960s, there is strong opposition to the use of painted edge stripes on park and scenic roads because it distracts from the scenic vista. This same reluctance carries over into the use of raised pavement markers, delineators, pavement widening, and paved shoulders. This dilemma arises from the fundamental problem of trying to preserve the natural surroundings while allowing access for its use and enjoyment.

For many parkways, the retention of an antiquated concept of the parkway is not in tune with the actual use of the roadway. Problems arise from differences in treatments, such as curve design. Other examples are the lack of advisory warning signs and the intentional lack of informational signs on some recreational roads. Other examples are the use of curve warning and advisory signs, and the nonuse of post-mounted delineators for curves. Practices vary widely.

It becomes obvious that uniformity does not exist for the motorist. Significant changes between design elements (e.g., degree of curvature being greatly different between two consecutive curves) can be troublesome. These differences become more of a concern with larger vehicles, higher speeds, and—especially—situations with large traffic volumes or adverse weather.

Although a road may be designated a parkway, it may operate as a thoroughfare. To better design, operate, and maintain scenic roads and parkways, the operational practices of those with low-volume characteristics must be distinguished from those with high-volume characteristics.

Unfortunately, most recreational road agencies and their managers still cling, rightly or wrongly, to the old concept and definition of a scenic or park road, or parkway. Even if a parkway designed in the 1930s has a moderate speed design for today, the operating behavior of motorists is appropriate for a higher-speed roadway. Driver expectations are difficult to change with a turn from an access road to a parkway or scenic road. With good intentions, most agencies have allowed some transitional design to be provided. A good example is the Blue Ridge Parkway's general treatment of prohibiting direct access from an Interstate highway. In the one instance where there is direct access, a transition roadway several miles long is provided.

For other parkways, however, these transitions usually are inadequate or nonexistent. A telling illustration of a poor transition is the access to the Foothills Parkway from I-40 to the Great Smoky Mountains National Park. This is a new parkway, only a few miles of which are completed that is intentionally being built in the 1970s tradition. There is a very

short and severe transition from the interstate ramp to the parkway.

Differences between and within recreational road agencies arise in their approaches to addressing the trade-offs of the function of a scenic or park road versus motorists's objectives and use of a roadway. Enjoying a leisurely drive along a scenic road is a preferred form of recreation for many Americans. Since the original conceptualization of parkways, more families and individuals possess the resources, time, and desire to enjoy the recreational driving experience. The recreational road has retained this idyllic image for its managers even though many of its actual characteristics have changed with heavy traffic and commuting volumes and speeds. It must be remembered that while the recreational road is important, so is the safety of the road user, especially with current liability issues.

DESIGN STANDARDS

The design standards of the 1930s are quite different than current design standards. They are illustrated both in the AASHTO Green Book (17) and the FHWA FAR 75 Manual (18). Early design standards for parkways are still in place because reconstruction of these roads appears to be on a nearly 50-year cycle. For some, such as the Blue Ridge Parkway, Natchez Trace, and Great River Road, 50 years covers the span of building the road. Thus design standards have changed since the earliest parkways were started (and also as each section was being built).

In 1984 the NPS recommended design standards for the construction of new park roads and for upgrading older park roads (14). Design widths indicated are primarily determined by the traffic volume. In the new standards, however, increased design speeds do not necessarily provide for increased design width.

Glennon (19) presented lane and shoulder width guidelines for low-volume rural roads. Here the criterion is that as design speeds increase, recommended design widths also increase. Downs and Wallace (20) make shoulder-width recommendations for rural roads with fewer than 400 vehicles daily. They suggest a 2-ft minimum graded shoulder on rural collectors and 4 to 8 ft of usable (paved or stabilized) shoulder on rural arterials.

Table 1 provides a comparison of lane and shoulder widths for low-volume roads as given in the NPS 1984 design standards for park roads and in Glennon's guidelines. The following table presents a comparison between the Blue Ridge Parkway design standards (as built) and the 1984 NPS standards:

	Blue Ridge	NPS 1984
Travel lane width (ft)	10	11
Shoulder width (ft)	3	4
Shoulder surface type	Unpaved (grass)	Paved

As the first comparison shows, park and scenic roads meeting the 1984 standards compare favorably with Glennon's recommended design widths at lower design speeds. At higher design speeds, however, the comparison is less favorable. As the table indicates, the comparison with the design standards to which the Blue Ridge Parkway was built is also unfavorable.

The concern here is not only with the older park roads and parkways that have not been upgraded. Some recently upgraded park roads, particularly those with higher design speeds, are considered to be narrower than the guidelines specify and therefore potentially troublesome.

Another real problem occurs when a new parkway is built and designers attempt to retain a 1970s design, such as in the Foothills Parkway at Great Smoky Mountains National Park. On other updated park roads, such as Trail Ridge in the Rocky

TABLE 1 Comparison of Recommended Lane and Shoulder Widths for Low-Volume Roads

	NPS (84)	Glennon
Design Speed (Mountain) (mph)	20-30	20-30
Lane Width (ft)	9*	10-11
Shoulder Width (ft)	1-2+	0
Total Width (single direction)	10-11	10-11
Design Speed (Rolling)	25-40	25-40
Lane Width (ft)	9*	11-12
Shoulder Width (ft)	1-2+	0
Total Width (single direction)	10-11	11-12
Design Speed (Flat)	30-50	30-50
Lane Width (ft)	9*	11-13
Shoulder Width (ft)	1-2+	0-2
Total Width (single direction)	10-11	11-15

* The National Park Service recommends an additional foot of lane width on roads where RV's exceed 5% of design volume or where tour buses are permitted. Lane widening may be used on inside edges of sharp curves.

Mountain National Park (Colorado), increased lane and shoulder widths were used. A good example of a park road that blends with its surroundings is in Wilson Creek Battlefield National Park in Missouri. It is clear that there is not yet total consensus on parkways and scenic road design parameters, especially with respect to design speeds and geometrics, and that the newest design standards are meeting with resistance in terms of their use for recreational roads.

Obviously, some agencies, managers, and designers believe that it is not suitable for a scenic or park road to be designed as a rural arterial. However changes in design standards will not entirely solve the recreational road problem. Part of the problem is the informal pulloff or stopping along a scenic or park road by motorists and their disregard for the roadside ecology. This is occurring along with a demand for more drive-through roads so that motorists do not have to get out of their vehicles to see the attractions. These developments present another set of challenges.

DETAIL NEEDS

A continuing theme is that a recreational road—be it a scenic, parkway, or access road—requires more attention to detail. If narrower lane widths are present or planned to be less than 12 ft, then even greater quality control, lane positioning, and detailing are needed in the design and construction phase. This is particularly true for longer scenic roads and parkways.

CONCLUSION

The challenge, as always, is to find acceptable design and construction procedures and approaches that continue to address the concerns and issues of these roads in terms of user, setting, and agency objectives while incorporating needed changes to address current situations. More detailed design and construction steps are a means to alleviate part of the problem. Maybe the title of W. H. Simonson's 1933 paper states it best: "the roadside picture: a hindrance to traffic? or an inspiring asset to travel?" (6). After 60 years, has anything changed?

REFERENCES

1. *Scenic Byways*. Report FHWA-DF-88-004. FHWA, U.S. Department of Transportation, July 1988.

2. Newton, N. Parkway and Their Offspring. In *Design on the Land: Development of Landscape Architecture*. Belknap Press, 1971.
3. Manning, W. H. Travelways of Beauty. *Landscape Architecture*, Vol. 20, 1930.
4. Zapatka, C. The American Parkway: Origins and Evolution of the Park-Road. *Lotus International*, Vol. 56, 1988.
5. Monis, F. *Bibliography on Roadside Control*. U.S. Bureau of Public Roads, 1949.
6. Simonson, W. H. The Roadside Picture: A Hindrance to Traffic or an Inspiring Asset to Travel? *Landscape Architecture*, Vol. 23, No. 2, 1933.
7. Boddy, J., and A. D. Taylor. Landscape Construction Notes XLIV—Supplemental Specifications for Roadside Improvement. *Landscape Architecture*, Vol. 26, No. 3, 1936.
8. Curtiss, H. L. The Roadside Zone in Our National Forests: An Administrative Policy in Answer to a Challenge. *Landscape Architecture*, Vol. 32, No. 1, 1942.
9. Bell, J. H. New Road Construction in Western National Parks: Notes on the Building of Roads in Scenic Areas. *Landscape Architecture*, Vol. 31, No. 2, 1941.
10. Dupree, D. D., Jr. Roadside Improvement: Landscape Design or Pansy Planting? *Landscape Architecture*, Vol. 30, No. 2, 1940.
11. Dupree, D. D., Jr. What Ohio Is Doing in the Roadside Development Program. Short Course on Highway Development. *Architecture. Ohio Transportation Engineering Conference Proc.*, Department of Architecture and Landscape Architecture, Ohio State University, 1941.
12. Committee of the Associated Landscape Architects of Cleveland Ohio. A Permanent Policy of Roadside Improvement: Improved Planning and Planting of Highways. *Landscape Architecture*, Vol. 26, No. 2, 1936.
13. Pragnell, R. C. *Scenic Road: A Basis for Its Planning, Design and Management*. Engineering Technical Report 7700-2. Division of Engineering, USDA Forest Service, 1970.
14. *Park Road Standards*. National Park Service, U.S. Department of the Interior, 1984.
15. *Scenics Byways Study Act*. 23 C.F.R., 1989.
16. *Highway Safety Improvement Programs, Progress and Evaluation Report 1990*. Ohio Department of Transportation, Columbus, 1990.
17. *Guide for Geometric Design of Urban Streets and Highways*. AASHTO. Washington, D.C., 1985.
18. *Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects*. FHWA, U.S. Department of Transportation, 1985.
19. Glennon, J. C. *NCHRP Report 214: Design and Traffic Control Guidelines for Low-Volume Rural Roads*. TRB, National Research Council, Washington, D.C., 1979.
20. Downs, H. G., Jr. and E. W. Wallace. *NCHRP Report 254: Shoulder Geometrics and Use Guidelines*. TRB, National Research Council, Washington, D.C., 1982.

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