ROAD MANAGEMENT GUIDELINES AND CONSIDERATIONS FOR THE GREAT SMOKY MOUNTAINS SCENIC BYWAY

Final Report: June 2011

INTRODUCTION

This section introduces national transportation programs and specific transportation policies that may be useful for the design, maintenance and management of a scenic byway or historic corridor. By understanding the language, application and flexibility within these national programs the Great Smoky Mountains Byway (GSMB) can protect key intrinsic qualities of the byway route and region while upholding standards for highway safety and efficiency. This section is illustrated with examples from along the GSMB, other communities in Tennessee, and helpful ideas/approaches from other byway and historic communities across the United States and beyond.

THE NEW POLICIES

At the national, tribal and state levels, greater attention is being directed toward developing transportation policies that reflect community values, flexibility in design and the value of historic resources. The Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), and state and local governments have been revisiting policy, analysis and design standards with these new objectives in mind. As a result, new attitudes, policies, laws, and procedures offer options and strategies for the management of scenic byways and historic roads across the nation.

The following section will introduce the new philosophies and policies of the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA).

FEDERAL HIGHWAY ADMINISTRATION

The Federal Highway Administration (FHWA) is the division of the U.S. Department of Transportation charged with the development of national policy, goals, objectives and standards for nation's roads, highways and bikeways. The FHWA works in areas as diverse as highway safety and tribal/state funding allocation, to the review of impacts on historic resources as a result of federally funded highway construction, and promotion of the national system of scenic byways. In addition to the main offices in Washington, DC, FHWA maintains a division office in each state and territory in the United States.

With the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991 transportation policy at the federal level has increasingly stressed flexibility in highway design, sensitivity to local cultural, environmental and historic resources and public involvement in the decision-making processes. Regarding flexibility in design and deviation from traditional highway standards, the 1991 act notes:

"If a proposed project…involves a historic facility or is located in an area of historic or scenic value, the Secretary (of Transportation) may approve such project…if such project is designed to standards that allow for the preservation of such historic or scenic value and such project is designed with mitigation measures to allow preservation of such value and ensure safe use of the facility."

(Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), Section 1016(a))

This focus on flexible design has been upheld in subsequent transportation acts (TEA-21, SAFETEA-LU[1]),

Roads in Tennessee that are a part of the National Highway System (NHS) must adhere to policies and directives from FHWA. Tribal, state or local roads that are not part of the NHS must follow local, state or tribal transportation policies as applicable. Depending on the road or jurisdiction, these policies may be based on FHWA guidance—as a locally or state determined policy, *not* as a federal requirement.

National Highway System

The National Highway System (NHS) was established by ISTEA in 1991. The NHS is separate and distinct from functional classification. The NHS consists of the nation's primary interconnected urban and rural highways (including toll facilities) which serve major population centers, international border crossings, public transportation facilities (such as ports and airports), major travel destinations, meet national defense requirements and serve interstate and interregional travel. While the system is principally comprised of freeway and arterial functional classifications, limited local and collector roads have been designated as part of the system. All NHS roads are required to meet FHWA design guidance and policies for safety, design and maintenance.

In Tennessee the entire route of the GSMB, U.S. Highway 321, is included on the NHS.

For roads <u>not</u> listed on the NHS, greater flexibility in design, even if federal funds are being used, is now permitted. It should be noted that listing in the NHS does not exempt any road from required federal reviews for listed or determined eligible properties on the National Register.

All roads in the United States, whether on the NHS or not, that utilize federal transportation funds, in whole or in part, must comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966 or Section 4(f) of the Department of Transportation Act of 1966 when impacting resources listed in or determined eligible for the National Register.

Section 106 of the National Historic Preservation Act of 1966

Popularly referred to as Section 106, or simply "106," Section 106 of the National Historic Preservation Act of 1966, 16 U.S.C. § 470f, requires all federal agencies to "take into account" the effects of their actions on historic sites. Section 106

[1] TEA-21 is the "Transportation Equity Act for the 21st Century" and SAFETEA-LU is the "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users." SAFETEA-LU expired in September 2009. At the time of this CMP publication a new transportation act has not been passed by the U.S.Congress.

applies only to historic sites (including historic roads) that are listed in or determined eligible (DOE) for the National Register of Historic Places. These actions involve federally sponsored or funded projects, as well as state, local, or private activities and projects that are subject to federal licensing, permitting or other approvals. Whether on the NHS or not, all roads in the United States that utilize, in whole or in part, federal transportation funds, must comply with Section 106 of the National Historic Preservation Act or Section 4(f) of the Department of Transportation Act of 1966.

Under Section 106, if the proposed action will have an “effect” or impact on a historic property, the owner or managing agency (local, state, tribal or federal) is required to undertake a review of the proposed action and consult with the THPO (Tribal Historic Preservation Officer) or SHPO (State Historic Preservation Officer) to determine its effects on the integrity of the historic property prior to approving and funding the project. For example, if a local road in a mountain community is listed in or determined eligible for listing in the National Register, and the local government received federal dollars either directly from FHWA or indirectly through TDOT to reconstruct the road (even if the federal funds were only a partial source of the total cost), the local transportation agency is required by federal statute to consult with the THPO or SHPO prior to beginning the project for approval. Often this consultation leads to a modification of the proposed action to protect the historic resource.

In some instances, the historic property can be altered, or even destroyed if there is a compelling reason for the action (a chronic accident site on a historic road, for example). Under such circumstances, mitigation for the loss of historic resources must be arranged in an agreement with the managing agency or owner and the THPO or SHPO. Mitigation agreements may take many forms, including documentation of the resource (photos and measured drawings), funding for another historic preservation project in the community, or the development of education and interpretation programs. If an agreement cannot be reached at the state level, the Advisory Council on Historic Preservation, an independent federal agency, may be called on to intervene and render a judgment.

Listing or eligibility for listing in the National Register for a historic road, scenic byway or byway related resource does not exempt it from change. In the mountain community road example above, a compelling safety concern or overarching regional transportation goal may necessitate reconstruction of the historic road. It is not the purpose of Section 106 to prevent any change to the road, but rather to ensure that whatever action is finally determined will have recognized any historic resources and “taken into account” the full range of options to preserve those historic resources. The result of the Section 106 review in the above example may be the construction of a new road elsewhere to fully preserve the historic road, the application of flexible highway standards to the historic road to minimize negative impacts from the reconstruction, or the documentation of the historic road for future study prior to its alteration or demolition.

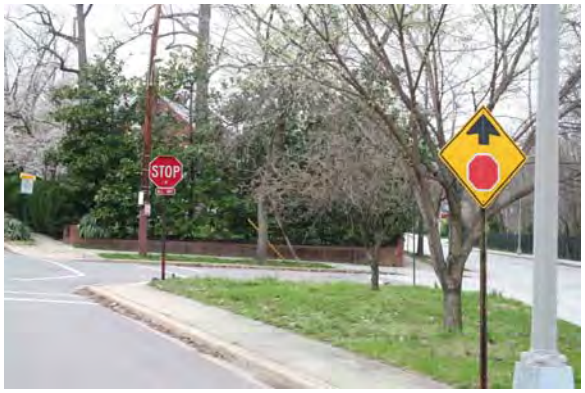
Section 4(f) of the Department of Transportation Act of 1966
Section 4(f) of the Department of Transportation Act of 1966, 49 U.S.C. § 303, is a substantive requirement that prohibits federal approval or funding of any transportation project that requires the "use" of any historic site, public park, recreation area, or wildlife refuge unless there is "no feasible and prudent alternative to the project" and "all possible planning to minimize harm to the project" has been addressed. (DOT Act, 1966, Sec 4[f])

The use of Section 4(f), long a powerful tool for the preservation of scenic byways and historic roads, was modified in 2005 so that it may be fulfilled in certain situations by the Section 106 process. If there is a finding of "no adverse effect" under Section 106, even with a minor use of an historic property, and the THPO or SHPO concurs, there is no further requirement for a 4(f) evaluation. An adverse effect finding, on the other hand, requires the agency (TDOT, or a local road agency, for example) to seek options/flexibilities for the preservation of an affected historic property, including a historic road (or other historic resources) negatively impacted by a federally funded highway project. In other words, where 106 and 4(f) were once invoked concurrently, 4(f) is now applied only if the Section 106 process results in an adverse effect to the historic property in question. Section 106 is the first course of action for historic properties impacted by federally funded transportation projects.

Manual on Uniform Traffic Control Devices
The Manual on Uniform Traffic Control Devices (MUTCD) is published by FHWA and directs warning and regulatory devices on roads and highways. Everything from the size and location of yellow diamond warning signs and the length of a red light at an intersection to width of highway paint stripes and the height and style of letters on signs is addressed in the MUTCD.

Similar to AASHTO guidance, MUTCD presents a range of options based on the road type. For example, the familiar yellow diamond warning sign used for curve, intersection, merging traffic and stop ahead signs may range in size from 24" x 24" to 48" x 48" depending on the type of road and local conditions. For scenic byways, historic roads and historic districts, ensure that the minimum size sign is installed, and that extraneous, redundant and unnecessary signage is rejected. MUTCD notes: "The use of warning signs should be kept to a minimum as the unnecessary use of warning signs tends to breed disrespect for all signs" (MUTCD Section 2C.02).

Caption: The Connecticut Department of Transportation worked closely with MUTCD to identify an alternative background color (dark green), border treatment (a saw-tooth pattern suggesting the rustic edges of the parkway's original wood signs) and alternative letter font that would distinguish the historic Merritt Parkway (National Scenic Byway) from the Interstate System while also providing the clarity of information required by MUTCD. *Merritt Parkway Conservancy*



Caption: There is a growing tendency to over-sign as seen here with an "Advance Traffic Control" (stop ahead) sign in a Washington, DC neighborhood. This sign violates MUTCD guidance that states: "These signs should be installed on an approach to a primary traffic control device (the stop sign, in this illustration) that is **not visible for a significant distance**…." (MUTCD Section 2C.29, emphasis added). MUTCD further recommends that advance traffic control signs on posted 25 MPH streets—as in this illustration—should be located 350 in advance if the stop sign is "not visible." This sign is approximately 40 feet from the stop sign. *Paul Daniel Marriott*

AASHTO

The American Association of State Highway and Transportation Officials, AASHTO, began as the American Association of State Highway Officials (AASHO) in 1914. AASHTO is a private nonprofit, nonpartisan association representing highway and transportation departments from all 50 states, the District of Columbia and Puerto Rico. AASHTO's role is to advance responsible practices for highway design and safety based on extensive research and testing. It is important to know that AASHTO recommends policies (often with a range of flexibility included in the recommendation). AASHTO's recommendations do not become *policy* unless adopted by the federal, state or local transportation agency—and they may be adopted by the tribal, state or local government in whole or with modifications from the standard guidance promoted by AASHTO. No transportation agency has ever been "required by AASHTO," to adhere to a certain standard, they may be required by federal, tribal, state or local policy.

The AASHTO guidance for highway design*, A Policy on Geometric Design of Highways and Streets*, is known most popularly as the "Green Book." The purpose of the Green Book is to recommend safe and efficient practices for the design of roadways. The recommendations contained in the Green Book are based on extensive research and study, and generally provide a range of acceptable design criteria based on the type of roadway and the expected traffic volume for the facility. The FHWA has adopted the Green Book as the minimum standard for projects on the National Highway System (NHS), which includes the Interstate System and other selected principal routes and connectors to intermodal facilities. For all other projects, whether developed with Federal-aid funds or not, design is directed by the standards adopted by the tribal, state or local government.

For most all recommendations in the Green Book, AASHTO presents a range of acceptable design solutions. These have been developed specifically to recognize the unique conditions that exist for many roads, and the need for flexibility in designing and maintaining a highway network. For example, while the

standard lane width is recommended at twelve feet, AASHTO presents a range of minimum lane widths for a rural or urban collector—from nine to twelve feet depending on traffic volume, speed and safety history.[2] Similarly, the recommended width of a shoulder on an arterial road varies from two to eight feet depending on conditions.[3] Further, the book makes frequent mention of maintaining existing road widths "where alignment and safety records are satisfactory."

The higher value within the allowable AASHTO ranges is often preferred by transportation agencies—sometimes as a safety improvement, sometimes as a precaution, sometimes for uniformity within the system. However, it must be remembered that the entire range of values, from low to high, has been reviewed and approved by AASHTO as safe. For scenic byways and historic roads, it is important to determine why a particular value within the allowable range is being selected—and if the safety history or use of the road may permit an alternative value that may better maintain the scenic and historic features of the road.

When working with the Green Book it is important to note the flexibility contained in the range of criteria recommended. As noted, this flexibility is at the discretion of tribal, state or local transportation department. It should also be noted, under special circumstances, that solutions outside the recommended range may be sanctioned by the FHWA for projects on the NHS. This special approval, known as a "design exception," is based on a clearly articulated need and demonstration that the proposed solution will not lead to a safety problem.

To learn more about AASHTO, visit: www.transportation.org

Flexibility in Highway Design

AASHTO has become a national leader in encouraging flexible options in highway design that are responsive to local transportation needs and has been a strong advocate for Context Sensitive Solutions (CSS)—a new approach to highway design that embraces local community values and concerns as a part of the design process. Through flexible design and CSS many of the scenic and historic preservation issues for byway routes can be addressed.

In their publication, *A Guide to Achieving Flexibility in Highway Design*, AASHTO states:

Many states and localities have adopted the AASHTO Green Book for use as the basis of their state guidelines with no change. However the intent of the AASHTO Green Book is that **individual states, cities, and counties have the freedom to develop their own design guidelines** and processes based on sound engineering principles that reflect local conditions and needs as well as the needs of the highway users. For such agencies, the design criteria in the

[2] *A Policy on Geometric Design of Highways and Streets*, (American Association of State Highway and Transportation Officials, 2004), p.425.
[3] *A Policy on Geometric Design of Highways and Streets*, p.448.

AASHTO Green Book can be a starting point or benchmark. Other published design criteria, such as that published by the Institute of Transportation Engineers, may also be referenced by an agency. The AASHTO Green Book is thus a guide, a reference, and a basis for the development of an agency's guidelines. Terrain, climate, **culture and values**, and driving habits differ across the nation; what is good and acceptable in one location may not be satisfactory or practical in another. (A Guide to Achieving Flexibility in Highway Design, p. 9, emphasis added)

Keep in mind that developing or finding alternative engineering solutions is not necessarily an easy task, but that it is an option. It is always best to try to find the flexibility or solution you are seeking within the existing guidance of AASHTO.

HELPFUL AASHTO GUIDES
AASHTO publishes a number of helpful guidebooks addressing roadway design. The following are particularly helpful for historic roads:

-A Guide for Achieving Flexibility in Highway Design
-Consulting Under Section 106 of the National Historic Preservation Act
-Guidelines for Geometric Design of Very Low-Volume Roads (ADT≤400)

For information on these, and other AASHTO publications, visit: www.transportation.org

For scenic byways and associated historic features, it is important to not only address the safety needs of the road, but also understand the implications the actions may have on historic integrity, National Register listing or eligibility, and aesthetic objectives. As always, be cognizant of the safety record of the feature—the difference between a stone fence that has been the site of numerous accidents versus an identical post that was last struck by an errant automobile in 1929, should be considered.

Transportation Enhancements Program
The Transportation Enhancement Program (TEP) is a federal reimbursement program under the ***Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)***, administered by the Tennessee Department of Transportation (TDOT).

In recognition that transportation systems are influenced and impacted by more than the condition of the traditional highway and bridge infrastructure, this program provides funding for transportation projects of cultural, aesthetic, historic and environmental significance. Eligible projects must fall into one or more of the twelve Federal Highway Administration (FHWA) categories. Additionally, the

project must have a transportation relationship with the surface transportation system and must be available for public access and use. This program enables many sponsors and applicants to participate—including local governments, advocacy organizations and citizen groups.

Eligible categories for transportation enhancements (not all states fund all categories):

1. Provision of facilities for pedestrians and bicycles.
2. Provision of safety and educational activities for pedestrians and bicyclists.
3. Acquisition of scenic easements and scenic or historic sites (including historic battlefields).
4. Scenic or historic highway programs (including the provision of tourist and welcome center facilities).
5. Landscaping and other scenic beautification.
6. Historic preservation.
7. Rehabilitation and operation of historic transportation buildings, structures or facilities (including historic railroad facilities and canals).
8. Preservation of abandoned railway corridors (including the conversion and use of the corridors for pedestrian and bicycle trails).
9. Inventory, control and removal of outdoor advertising.
10. Archaeological planning and research.
11. Environmental mitigation—(i) to address water pollution due to highway runoff; or (ii) reduce vehicle-caused wildlife mortality while maintaining habitat connectivity.
12. Establishment of transportation museums.

Caption: Restoration and rehabilitation of the historic U.S. 60 roadbed and bridges, that parallel much of the GSMB west of Pawhuska, as a bicycle/pedestrian trail could be funded under Transportation Enhancements categories numbers: 1, 2, 4, 6 and 7. *Paul Daniel Marriott*

CONTEXT SENSITIVE SOLUTIONS

Context Sensitive Solutions, CSS (also known as Context Sensitive Design-CSD) is one of the newest movements in transportation policy and planning. As its name suggests, the movement encourages transportation design solutions that are *sensitive* to the natural and built environment—the contextual setting—of a community or locale. Transportation projects, under this theory, should not

merely function efficiently and effectively, but also contribute to and enhance the historic, cultural and environmental characteristics of the community. Context sensitive solutions recognizes that every community and setting is unique and that through thoughtful design and planning traffic, safety and mobility requirements can be accomplished through flexible and creative means.

Under Context Sensitive Solutions basic transportation needs and function are not divorced from the communities and landscapes for which they are designed to serve. Context Sensitive Solutions acknowledges that transportation facilities have a direct impact on the daily use, structure, economic development (through tourism) and aesthetics of communities and as such need to respond to the larger "context" when addressing the impacts and design of highway construction. Thus, considerations for scenic views, native plant communities, historic features and traditional cultural activities are taken into account during the scoping and design process of a new highway project. Ideally, as one administrator for the Maryland Department of Transportation noted, "we get an improved facility, and when we leave the community it looks like we were never there."[4]

AASHTO and FHWA have been encouraging all the states to adopt Context Sensitive Solutions/Context Sensitive Design as an overarching philosophy directing all transportation projects.

"In the view of AASHTO, established processes and design guidance are not in conflict with the movement (Context Sensitive Design). Furthermore, a well-designed *context sensitive* design solution need not increase the risk of tort lawsuit to an agency. AASHTO supports the concepts and principles of flexibility in highway design and feels that all professionals responsible for highway and transportation projects should understand how to accomplish a flexible design solution within current design processes and approaches." (AASHTO Flexibility Guide, p. xv)

The FHWA states:
"The FHWA fully supports the concepts and principles…referred to as "Context Sensitive Design" (CSD). CSD is a collaborative approach to developing and redesigning transportation facilities that fit into their physical and human environment while preserving the aesthetic, historic, community, and natural environmental values. CSD contributes to community, safety, and mobility."

CSS AND FLEXIBLE DESIGN POLICIES OUTSIDE OF TENNESSEE
Context Sensitive Solution policies and activities are being employed by an ever-increasing number of states.[5]

[4] Preserving the Historic Road in America conference, Omaha, NE, 2002.
[5] In partnership with FHWA and AASHTO five state transportation departments volunteered to serve as pilot study states in developing and implementing program and policy changes. They are: Connecticut, Maryland, Kentucky, Minnesota and Utah.

In Hawaii

For example, the legislature of Hawaii issued a policy statement (SB 1876 “A Bill For An Act Relating To Highways”) noting both traditional cultural uses and transportation needs. For the GSMB the language and respect for Native Hawaiian traditions may be a helpful reference. The following excerpt showcases traditional cultural values, considerations for transportation planning and a finding that flexible design is not inherently less safe.

Hawaii's rural communities are the heart and soul of the islands, reflecting the aloha spirit and natural beauty that are the essence of our State. As urbanization spreads throughout Hawaii, our rural communities are at risk of losing their unique identities. The imposition of uniform, conventional highway design can significantly alter and detract from the historical identities of these communities.

During the past decade, highway design has undergone significant change. Today, engineers and planners are employing greater flexibility in the way they design road projects through context-sensitive solutions and design. Through the use of the Federal Highway Administration Flexibility in Highway Design book, and the American Association of State Highway and Transportation Officials Green Book, and A Guide for Achieving Flexibility in Highway Design (May 2004), engineers and planners are able to consider more than safety and efficiency when building new roads or reconstructing old roads. These additional design considerations include the environment, scenic and historic preservation, community effects, and aesthetics.

Congress expressly acknowledged the importance of flexible highway design sensitive to the surrounding environment, especially in historic and scenic areas. Section 1016(a) of the Intermodal Surface Transportation Efficiency Act of 1991 allows approval of projects designed to allow for historic and scenic value preservation, while ensuring safe use. Highway design under the National Highway System Act (other than interstates) may consider the constructed and natural environment of the area, and the environmental, scenic, aesthetic, historic, community, and preservation impacts of the project. The National Highway System Act authorizes states the flexibility to develop and apply criteria they deem appropriate for federal-aid projects not on the National Highway System. This federal policy framework recommends early identification of critical project issues and encourages thorough consideration of community concerns and input prior to any major decision that could limit other options.

Despite the flexibility under the Federal Highway Administration, American Association of State Highway and Transportation Officials, and federal law, Hawaii's state department of transportation (DOT) has been reluctant to develop and implement flexible design processes and guidelines that consider historical, scenic, and environmental impacts in highway construction.

The legislature adopts the concept of flexible highway design and determines as a matter of policy that the department should address these concerns by developing guidelines that:

1. Create a process to weigh community traditions, values, and practices, and environmental, aesthetic, and social impact with safety, financial, political, social, and economic policy considerations including the department's own institutional experience, cost benefit analysis, and relevant studies;

2. Lead to an overall highway design choice that is "reasonable", reflects sound and accepted engineering practices, provides a consistent driving experience, and includes reasonable notice to highway users;

3. Recognize the variety of conditions that different projects may present;

4. Require documentation of the process and reasoning leading to the flexible design decision, including the circumstances of each project, the choices available, and the considerations reviewed, as well as a complete explanation for the decision itself; and

5. Incorporate qualitative and safety studies where advisable.

The legislature expressly finds that flexible designs are not themselves less safe than earlier engineering practices. Rather, flexible design is simply part of the ongoing evolution within engineering that takes a broader range of considerations into account than may have been done in the past. Flexible design is not inherently less safe than some different or prior design; flexible design is a different and broader combination of factors to be considered in being safe.

To this end, the legislature determines as a matter of policy that when the government chooses to use flexibility in highway design, no legal claims or causes of action should be made against the State, DOT, the counties, and officers, employees, or agents of the State, DOT, the counties, or a public utility regulated under chapter 269 that places its facilities within the highway right of way, for the decision to select or apply flexible highway design.

In New York

In New York State, the New York State Department of Transportation (NYSDOT) notes:

"CSS is not a separate process or set of standards. CSS is a philosophy that guides NYSDOT in all phases of project development, from planning through project scoping, design and into construction and maintenance. CSS strives for outcomes that meet transportation service and safety needs, as well as environmental, scenic, aesthetic, cultural, natural resources, and community needs. Context sensitive projects recognize community goals, and are planned, scoped, designed, built and maintained while minimizing disruption to the community and the environment." (NYSDOT Engineering Instruction, EI 01-020)

Further refining this statement, NYSDOT has established the following definition and six key points for CSS in New York State.

Definition
Context Sensitive Solutions (CSS) is a philosophy wherein safe transportation solutions are designed in harmony with the community. CSS strives to balance environmental, scenic, aesthetic, cultural and natural resources, as well as community and transportation service needs. Context sensitive projects recognize community goals, and are designed, built and maintained to be sustainable while minimizing disruption to the community and the environment.

6 Key Points
-The project is in harmony with the community and it preserves the environmental, scenic, cultural and natural resources of the area.

-The project satisfies both transportation and community needs as agreed to by a full range of stakeholders; i. e. local governments, community groups, facility users, other agencies and the Department.

-The project incorporates early, effective and continuous Public Involvement.

-The project identifies and addresses community issues using an ongoing, structured format as appropriate for information exchange (citizens' workshops, advisory committees, etc.), and active partnership with municipal or other state/local agencies.

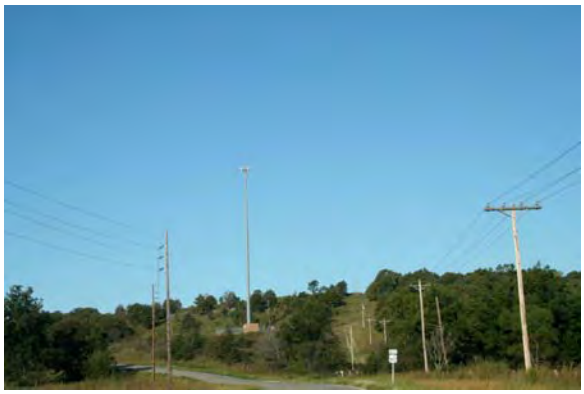
-The project incorporates innovative and safe technical solutions that add value for the user and community.

-The project shows measurable success in improving the community's environmental, scenic, aesthetic, historic, and natural resources, above and beyond mitigation requirements. (NYSDOT website)

For scenic byways and historic roads in all states and on tribal lands, Context Sensitive Solutions offer both the philosophical and practical resources to guide the management, restoration, rehabilitation, and reconstruction of historic design features, and the accommodation of scenic and aesthetic environmental features in the design process.

The restoration of historic light fixtures, the addition of a modern guiderail designed to blend into the countryside or restoration of historic bridges for a bicycle route, are all examples of CSS. Additionally, CSS may be used to justify or support a narrower shoulder, develop a safety plan that allows a one-lane bridge to remain in place or influence summer mowing patterns to protect native plants or protect nesting grassland birds.

Caption: In Burkittsville, Maryland, CSS was utilized for an intersection improvement project by the Maryland State Highway Administration. Utility lines were undergrounded, historic stone gutters were redesigned and reconstructed to serve modern drainage needs, and the road was paved in concrete scored to reflect the pattern of the nineteenth-century stone pavement—the roughly-textured surface also serving as a traffic calming function. *Photos: Paul Daniel Marriott*



Caption: This new cellular communications tower along the GSMB is located on axis with U.S. Route 60 (a typical location preferred by cellular companies, but one that potentially distracts from the natural beauty of the landscape). CSS is not always about design treatments; sometimes it is about policy decisions for land use and services within the byway viewshed. *Paul Daniel Marriott*

CSS—CONTEXT SENSITIVE SOLUTIONS

Context Sensitive Solutions are not an aesthetic treatment; rather, CSS involves developing a transportation solution that fits into its context. Yet throughout the country communities are clamoring for decorative pavements, ornate lights and exotic plantings under CSS programs. In many instances these additions are inappropriate at best and comical at worst. For historic roads and scenic byways it is essential to work with the transportation agency to identify and select the details and features that are historically and environmentally appropriate to your road. Multi-globe Victorian-era street lights in a rural town historically illuminated by stamped reflectors with exposed bulbs, or brick sidewalks when historic documents show simple concrete walks, introduce false history, and could risk the integrity of National Register listings.

Caption: A wheelchair ramp in Delaware is “decorated” with dwarf pine trees—the prickly pines well placed to scratch the hands of anyone using a wheelchair. Should the pines grow to their mature size, they will block the access ramp. *Paul Daniel Marriott*

TRAFFIC CALMING

Traffic calming is a relatively new, highly popular and effective tool at reducing the speed of vehicles in urban/pedestrian environments and residential neighborhoods. For the GSMB traffic calming principles may be best applied to the community and secondary streets along the byway corridor. Traffic calming is based on the premise that physically slowing a vehicle is the only way to guarantee lower speeds in areas where multiple users and activities intersect—pedestrians, bicyclists, street parking, school crossings, children playing—with local or through automobile traffic. To accomplish this goal traffic calming introduces physical features/alterations that require a vehicle to slow down. These include roundabouts or circles at minor intersections that force cars to slow down; chicanes, projecting "islands" along the street that force cars to zigzag, thus reducing speed; and perhaps most popular, speed humps, a raised segment of pavement forcing vehicles to slow. Traffic calming is not recommended for streets with a posted speed limit over 30MPH. In pedestrian areas it is important to establish traffic calming in advance of pedestrian zones or intersections.

Caption: Speed humps, such as this one in Washington, DC, are the most common form of traffic calming. *Paul Daniel Marriott*

Caption: The Dutch were one of the first to adopt traffic calming to rural communities. As a rural community is approached a series of highway markings and tree plantings gradually increase until the village gateway. At the "gateway" the pavement color changes and a hedge visually "narrows" the road, suggesting a new roadside condition and causing drivers to slow down. In the village the road width remains the same but is visually narrowed by red bands indicating the road is shared equally with pedestrians and non-motor vehicles. *Photos: Paul Daniel Marriott*

Historic Roads as Traffic Calming

The addition of physical features (speed humps, chicanes) to reduce speed is demonstrated effective in communities across the United States. But for scenic

byways and historic roads, such physical additions may negatively impact scenic character and historic fabric. The addition of a roundabout at a rural town intersection may introduce a physical feature more associated with urban settings than the quiet countryside. Narrowed intersections, for better pedestrian visibility, may compromise the integrity of a broad avenue as envisioned by nineteenth century town leaders. Speeding traffic verses historic resources—how do you choose between the two?
Perhaps you don't have too.

The features, geometry and details of many historic roads already provide desirable traffic calming features. Drivers instinctively slow down due to the vibrations of a brick street, when crossing a one-lane bridge or experiencing a narrow and winding road. Before adding speed humps, roundabouts or traffic circles to a scenic byway or historic road, consider the following:

- Any construction associated with traffic calming may be subject to Section 106 or 4(f), and may impact National Register listing or determination of eligibility.
- Many historic and scenic roads, by their very design "calm" traffic through features such as narrow lanes, coarse pavements (brick, gravel, cobblestone), narrow bridges.
- Parallel street parking along the main streets of many older communities, is recognized as a desirable traffic calming measure and recommended by traffic calming experts to new and suburban communities as a desirable feature.
- The absence of shoulders suggests a road more local or rural in character and suggests to drivers that slower speeds are in order.

Remember too, sometimes non-historic, but simple (and cheaper) solutions may effect the same result as traffic calming with less physical impact on historic fabric—a four-way stop intersection will slow traffic as effectively as a traffic circle, or visually "reducing" the width of the street with painted white edge lines. Other options, that are not part of standard traffic calming devices, may reduce speed and restore a historic feature as well. Consider the big budget option of restoring the brick or cobblestones several asphalt layers below the current pavement.

Lastly, if traffic calming features such as chicanes or roundabouts are implemented resist the temptation to decorate them with ornamental plantings and public art—these are traffic management devices, not civic spaces—keep the attention on your historic buildings and scenic landscapes, not topiary or sculpture between parked cars.

Caption: Roundabouts in Seattle are simply planted with minimal warning signs—keeping attention on the road and architecture of the neighborhood. *Paul Daniel Marriott*

DESIGN EXCEPTIONS

Design exceptions are documented approvals allowing a legal divergence from standard road design and management policies. For any road exhibiting unique resources or special characteristics, a design exception documents the reason for the departure from standard design, outlines the analysis process for the proposed design alternative and identifies how safety considerations will be accommodated. A well researched, thoughtfully considered, and thoroughly prepared design exception can serve as a powerful legal tool should any future liability claim cite the non-standard design.

A design exception should never be sought as a first solution and cannot be granted as a "blanket" approval for a scenic byway or historic road. The full use of flexibilities within existing standards should always be sought as the first course of action.

Regarding design exceptions, AASHTO notes:

"Finally there are occasions in which even the most creative use of design criteria produces an unacceptable or infeasible solution. The judicious application of *design exceptions* (the incorporation of design values outside the typical ranges to avoid a conflict or constraint) is appropriate in the context-sensitive environment as long as the safety and legal risks are understood by the designer, are considered acceptable given site-specific conditions, and are documented well." (AASHTO *Flexibility in Highway Design* guide p. xvi)

AASHTO further notes:

"The need for design exceptions is not new and is not inextricably linked to the concept of *design flexibility*. Designers should understand that design exceptions are an acceptable and indeed useful tool *when evaluated and applied properly*. Just as design exceptions should not be sought routinely, acceptance of a design exception should not be viewed as an admission of failure. It does not mean that the design criteria are inappropriate or that a resulting design is automatically less safe substantively than traditional design. **Finally, in discussing design exceptions and criteria with stakeholders, designers should avoid labeling a value that is outside the norm as "unsafe" in specific circumstances**

unless he/she has a clear understanding or evidence that it is so."
(AASHTO *Flexibility in Highway Design* guide, p. 11, emphasis added)

Design exceptions in Tennessee for NHS roads must be approved by FHWA. For non-NHS state roads in Tennessee consult with TDOT regarding the required process.

As always, whether seeking a design exception or not, it is wise to have documentation demonstrating that scenic, aesthetic or preservation issues were carefully and rationally weighed with safety considerations in determining the executed design for any scenic byway or historic road. Such documents, should an accident occur, demonstrate that the road's design was not arbitrary and capricious, or based on some vague byway goal, but rather a carefully considered balance between safety and resource conservation. Well-documented design exceptions have held up in many liability cases in courts across the country.

IN SUMMARY
Transportation policies at the federal, tribal, state and some local levels already contain language favorable for the protection of scenic byways and the preservation of historic roads. In addition, many new creative options and flexible alternatives have become increasingly accepted for use on our nation's highways and byways. Selecting or advocating for the most appropriate solutions for the GSMB will be incumbent on a commitment to balance highway safety and efficiency with traditional and cultural goals, and new goals for tourism through byway travel.

ROADSIDE AND STREETSCAPE DESIGN CONSIDERATIONS FOR THE GREAT SMOKY MOUNTAINS SCENIC BYWAY

INTRODUCTION

This section will outline helpful considerations for road and roadside details and elements to enhance the Great Smoky Mountains Byway (GSMB) as a desirable byway visitor destination for Tennessee. The National Scenic Byways Program emphasizes the intrinsic qualities of byway communities and corridors through the six recognized intrinsic qualities (scenic, historic, cultural, natural, recreational and archaeological). Sensitive and thoughtful byway management, including highway design, management and safety; community revitalization, interpretation and visitor services and land and environmental stewardship will establish the byway as a national destination and economic engine for the region. Examples from the GSMB, Tennessee and other notable roads and designated byways from across the nation have been provided as relevant examples and to provide insights into the many options and opportunities available the GSMB for byway design and management.

PERIOD OF SIGNIFICANCE

Before beginning any serious discussion on the best design details and streetscape enhancements for a byway route or road in a historic district or cultural corridor, it is useful to determine a period or periods of significance. A period or periods of significance represent dates associated with momentous

occasions, design and construction activity, transition points or simply periods of prolonged stability. They should be distinctive and cohesive periods with a strong historic context.[6]

A period of significance associated with a particular historic byway community or route will share a common history, technology and details. For roads with extended histories there may be multiple periods of significance. Periods of significance may be very short—five days for Dr. Martin Luther King's civil rights march along the Selma to Montgomery Highway in Alabama—or last over a period of decades—1926 to 1960 representing the heyday of auto travel and culture on Route 66.[7] It is possible to have single periods of significance; some byway routes have multiple distinct and different periods of significance. The National Road (six-state National Scenic Byway, All-American Road) in Pennsylvania, for example, has identified four primary periods of significance—Early Trails and Military Roads (1750-1810), Construction of the National Road (1806-1834), Toll Road Era (1830-1900), and The Automobile Era (1890's to present). Each of these periods represents a particularly intensive time of activity, use and change. Across the border in Maryland (the same byway designation), three periods of significance have been identified for the National Road.[8] For each state, fortifications, taverns, tollhouses and gas stations are among the architectural artifacts from these eras. Maryland and Pennsylvania, sharing the same historic road, demonstrate that there is considerable latitude in the development of a period(s) of significance.

The GSMB will need to establish or identify the significant dates or eras for which the byway route was noteworthy to determine the period or periods of significance relevant to communities, segments or districts along the byway corridor. Remember it is generally better to err on the side of a broader period of significance than a narrow one.

BASIC DESIGN PRINCIPLES

As communities along the Great Smoky Mountains Byway begin to consider the different options available to enhance the byway corridor, it may be helpful to have a brief introduction to some of the basic concepts of design. These terms will assist communities in better analyzing the scenic, cultural and historic features of the route and in selecting new features that are appropriate for the GSMB.

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[6] The National Register of Historic Places recognizes periods of significance through the term "historic context." Historic context, as defined by the Register are "those patterns or trends in history by which a specific occurrence, property or site is understood…."

[7] This period of significance is generally cited by Route 66 scholars. A National Park Service study, Special Resource Study: Route 66, identified 1926 to 1970 as the period of significance for Route 66. It is often impossible to assign exact dates for periods of significance. The 1960 date, often cited, applies more to the popular culture of Route 66, while the 1970 Park Service date is a more technical reference looking broadly at Route 66 resources.

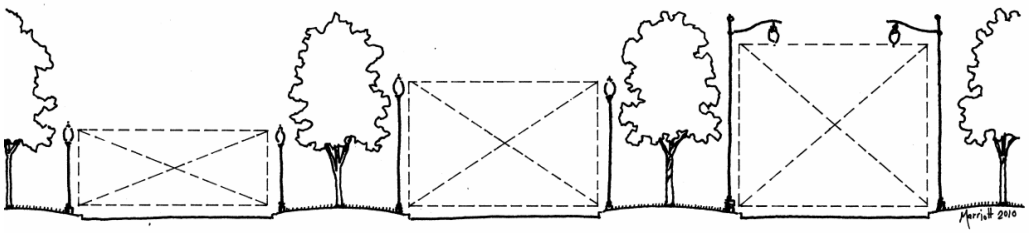
[8] The State of Maryland identifies three periods of significance for its stretch of the National Road: Heyday of the National Road (1810-1850), Agriculture and Trade (1850-1910) and Revival of the National Road (1910-1960).

-scale

How large or small are the elements that define the landscape and communities along the GSMB, and how do they relate to one another? Does the road width overwhelm a community like an airport runway, or does it fit comfortably between the buildings along the street? Do sidewalks and tree lawns seem generous and commodious, or crowded and narrow? Do highway signs seem sized for an interstate highway or a local street? Do streetlights seem more appropriate for a mall parking lot or stadium than a historic town? Consider the impacts of potential changes on the historic scale of your historic road and setting—and remember different segments of the byway may have different scales.

Caption: Left: Compare the scale difference between historic lights (small gray) and new taller "teardrop" lights (left) in Washington, DC. As lamps double in height, the character and residential scale of the street changes. Right: New streetlights in Dewey, Tennessee are nicely scaled to the architecture of the street and present a good pedestrian scale for a small town. The small banner does little to enhance the streetscape and, it could be argued, detracts from the simplicity of the lamp and flag. *Photos: Paul Daniel Marriott*

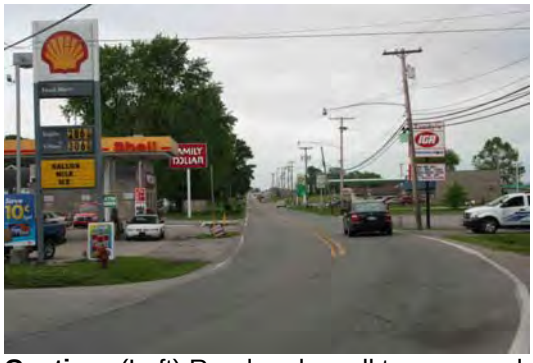
Caption: Downtown Pawhuska, OK (Kihekah Avenue) has two scales of streetlights. *Paul Daniel Marriott*



Schematic cross-section showing how street light heights can influence spatial perception along a road of the same width. Some transportation theories suggest that larger-scale highway features (such as lights) that are associated with higher speed roads, may create an “interstate-scale” and possibly cause people to drive faster—oversized features in residential, commercial and other high pedestrian/bicycle areas should be carefully considered. *Sketch: Paul Daniel Marriott*

-edges

How do different elements meet? Is the curb a hard white concrete line, or a more irregular stone edge? Does the road even have a “hard” edge or is it a “soft” edge that merges into the grass or ranch lands? At a larger scale, is the edge of a community defined by an abrupt line between historic houses and ranch lands, or do gas stations, commercial centers or new subdivisions cloud the historic edge? Does a country lane look bonded with its landscape or look like it fell out of the sky and landed on the ground? Is the edge of a scenic road a precipitous drop off a rocky ledge or a broad grassland that disappears into the morning mist? How will proposed changes, large or small, impact the edges associated with the GSMB?



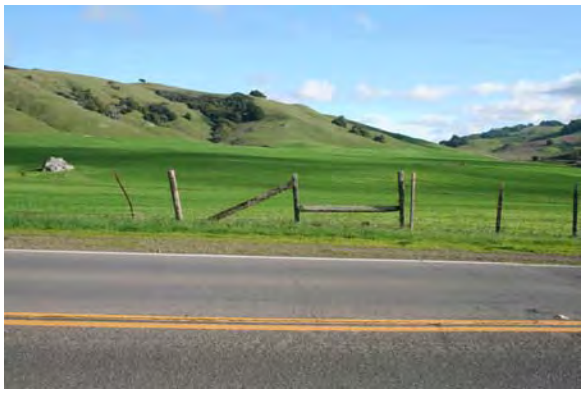
Caption: (Left) Rural and small town sprawl development characterizes the gateway to many historic communities. The Ohio River Scenic Route in Indiana (National Scenic Byway) markets attractive small town visitor destinations, such as Rising Sun. Rising Sun’s gateway district is a disappointment to visitors attracted by marketing/tourism images of the historic town center. *(Right)* New development on the edge of historic communities should be as carefully considered as development within the historic center. *Photos: Paul Daniel Marriott*

-design details
Design details, both historic and contemporary, are the subtle elements that often distinguish a community as a desirable destination.

Caption: Chevy Chase, Maryland, objecting to the standard galvanized-steel post and speed camera hardware, designed a compact and attractive speed camera that blends nicely into the historic district landscape (note the companion camera across historic Connecticut Avenue). Unfortunately, the attention to detail did not extend to the concrete pad that is oversized and off-angle with the fixture. Failure to consider and monitor installation details often diminishes carefully considered aesthetic choices. *Paul Daniel Marriott*

-patterns
Are there repeating elements or relationships along the overall byway route or along segments of the GSMB? Street trees every twenty-five feet block after block? Or larger repeating regional patterns along the byway such as ranch land to river valley to mountain land? What about patterns marking geographic features? How important are these patterns to understanding the GSMB? Consider how decisions, both micro and macro, will support the historic structure of your road within the larger landscape.

-landscape setting
The character of the roadside landscape is extremely important for a scenic byway. A visitors' appreciation for the beauty of an area, its topography and the landscape in which cultures and traditions occurred is essential for the understanding of a byway's intrinsic qualities. The term "cultural landscape" defines the patterns, design and structure of a landscape influenced, altered or changed by human activity. Hallmarks of a cultural landscape may include the size and shape of agricultural fields and ranchlands, the characteristic layout of communities (a grid pattern, a linear alignment along a road, or settlements at water sources or river confluences), or the nature of the road network (along land grant lines, paralleling waterways through a valley or following the dictates of a regional transportation plan). Cultural landscapes are generally not designed by a master landscape architect or planner, but may be "designed" or influenced by the traditions or goals of social, religious or ethnic groups.



Caption: Rural scenic character, in an increasing number of US communities, is protected by easement programs or land use policy to ensure that valuable tourism and cultural resources will be available for the enjoyment and benefit of future generations. This view, in Marin County, California, is part of a protected agricultural district. *Paul Daniel Marriott*

Caption: Montgomery County, Maryland established an Agricultural Reserve after traditional farming was threatened by suburban development. The county protects agricultural lands through an innovative tax incentive and credit program that benefits the farming community, and the county transportation department established a special “Rustic Roads” program to manage and protect historic roads, such as this one lane 1930 concrete road. *Paul Daniel Marriott*

HISTORIC FEATURES

Doubtless inventories and analysis of historic features along the GSMB will identify a number of existing historic features of the byway that should be conserved and protected. Unlike traditional preservation activities the GSMB will need to reconcile preservation with safety if the feature is part of the road or within the clear zone of the designated byway route.

-preservation

Identify historic features that should be preserved. To consider preservation as a treatment, the features should be in good condition and able to meet (or be exempted from) any applicable safety considerations if they are located within the road or clear zone.

-restoration

Identify historic features that have been damaged or had inappropriate additions or removals over time.

-rehabilitation

Identify features that require some alteration or accommodation based on changing site conditions or needed safety considerations.

-reconstruction

Identify features that have been lost, or degraded beyond repair, that should be reconstructed. Weigh considerations for original materials and craftsmanship against modern issues of cost and necessary safety features.

SELECTING NEW OR REPLACEMENT FEATURES

For many byway and historic communities modern use and safety considerations may introduce elements that may negatively impact scenic qualities or require design elements that did not exist during the historic period(s) of significance. Traffic signals, streetlights and signage may be needed and likely have already been installed. For others, significant historic features have been lost and replaced over the years. American elms that succumbed to Dutch-elm disease have been replaced with other tree species and brick roads have been covered with macadam, and then asphalt. Mundane features such as trash barrels, mailboxes, and newspapers boxes, or decorative features such as planter boxes and banners may have been added.

New elements and features are a given for most historic communities and scenic byways. Whether such elements contribute to or destroy historic character is another matter.

The introduction of new elements into a scenic or historic context or setting should be carefully considered. Preservationists generally recognize two distinct theories: designing new elements that look similar to the historic elements; and introducing elements that contrast sharply with the historic features so as not to introduce a "false history." Both are acceptable.

-Historic-Look Elements

Historic-look elements are designed to introduce modern features in a style that evokes the feeling of the period of significance and complements existing historic features. When introducing a historic-look feature, seek out historic design details along your historic road that may provide design direction or guidance. For example, the design of a historic streetlight may "suggest" the design for a new traffic signal. As always, with historic-look elements seek elements with the features and details your forebears would have likely selected—respecting your period of significance.

Caption: Buckystown, Maryland, a National Register Historic District, did not have streetlights during the identified period of significance. When modern use and safety necessitated lighting along the historic Buckystown Turnpike, the village avoided overly decorative lighting and selected a simple fixture appropriate to the character and scale of a rural farming center.

-Contrasting Elements

Contrasting elements introduce modern features as a contrast to historic elements from the period of significance—avoiding any confusion between the new and the historic. Contrasting elements should be well designed and attractive, but distinctly contemporary—presenting a clear, but handsome, contrast between the byway's historic features and later additions. When introducing contrasting elements you should honor the scale and proportions of the historic design elements of your period of significance. Modern and contrasting should not be equated with "ugly" nor suggest that a standard highway department solution is the best option. Utilize CSS practices and philosophy to consider the most appropriate options.

Caption: Simple, yet elegant, modern lights blend nicely into the woodland setting and historic context at the Home of Franklin D. Roosevelt National Historic Site in Hyde Park, New York, and do not introduce false history suggesting a "period" fixture in a parking lot that did not exist during FDR's lifetime.

-Appropriateness

Lastly, consider the appropriateness of new elements to be introduced to the environment of the GSMB route. Are such elements necessary to maintain the historic/cultural character or understanding of the road? When introducing new elements to a scenic byway, consider the rural, suburban, or urban character of the roadside.

Regardless of the feature—reproduction or modern, utilitarian or decorative, representative or interpretive—use authentic materials, not simulated. Use restraint in the quantity and location, and ensure there is sufficient space for the feature you are proposing. Nothing is worse than a tree planted in a tiny opening in a sidewalk or a light fixture that makes it difficult for a wheelchair to pass comfortably. Simulated features, such as "brick" or "cobblestone" stamped asphalt should be avoided. Substituted materials such as plastic globes for streetlights (when the originals were glass) or vinyl fencing (when the originals were wood) or concrete "brick" pavers should be very carefully considered for appearance and safety.

Caption: A narrow sidewalk along the Historic National Road in Pennsylvania (National Scenic Byways Program, All-American Road). The ornamental light and brick strip, a popular Main Street treatment, have no historic precedent. Note how the brick strip is too narrow to accommodate the base of the light. The ornamental Bradford pear trees planted are short-lived and crown (mature) at the typical level of shop signs—not a good choice for local business owners. *Paul Daniel Marriott*

Research and Review

Before selecting any new or replacement features for the GSMB, conduct a thorough research and review using archival materials such as documents, illustrations, photographs and municipal records. Search for information on lighting, pavement materials, curb and gutter systems, sidewalks, barriers, street trees, highway signs and markers, traffic signals and street furniture (clocks, benches, trash barrels and flower boxes). Look closely at the backgrounds of historic photographs—these may reveal clues to historic features over the shoulders the marching band on a parade route, under the feet of a proud owner of a new automobile, or in a downtown promotional brochure published by the Chamber of Commerce in 1920. Consider, as well, that over time GSMB byway communities may have upgraded, replaced or removed roadside features—there may be multiple eras of lighting along a historic road, for example.

Unsure How It Will Look? Go Outside!
Looks good in the catalog, looks good on paper, but how will it look along the GSMB?

There are many electronic options available today to create a picture of the scenic byway with a different DOT alignment, new streetlights, or trees. Visual simulation programs, used by landscape architects, planners and DOTs, show how proposed changes will look in the community after construction. These can be helpful tools, but should not replace basic field checks and site analysis. Before you settle on any options go outside and use your eyes. Have manufacturers send you samples of materials, color chips and finishes. Whenever possible, request a full-size sample to be erected (street light or guardrail, for example)—manufacturers anxious for a sale can be surprisingly accommodating. If you cannot get a sample, make a cardboard mock-up and place it in the proposed location. If you are unsure how tall a street light should be, or the mature height of a proposed tree species, get some helium balloons from the local gift shop, measure the string and float them to the correct height—or float a whole row of balloons down the street to get a better sense of the overall impact, or one really high one to test the impact of a proposed cell tower on a historic view corridor. Concerned about the road three-feet wider? Get some fluorescent tape and mark the exact location of the new road edge.

Outdoor measurements can be *very* deceiving. Ten feet in a living room vs. ten feet along the side of the road represent very different scales. Take measurements of features and spaces along your scenic byway to get a sense of the size and scale of the elements that define your byway and your community. Find out exactly how wide the sidewalk that seems generous is and how narrow the sidewalk that seems crowded is? And as long as the measuring tape is out, how big do tree trunks get when they are healthy and how far do their limbs really reach? Will that healthy, mature tree fit in the little square you are planning in the sidewalk?

Caption: *(Left)*After debating the appropriate size for interpretive panels along the Historic National Road in Indiana (National Scenic Byways Program, All-American Road), the project planning committee paid the manufacturer to make fiberboard mock-up panels reflecting the two sizes under consideration. The sample panels were placed alongside the historic road and, to the surprise of many, the “way too big” panel was just the right size for the scale of the historic highway.

(Right) Members of the Pawhuska Chamber of Commerce, Osage Nation Roads Department and GSMB byway planning team measure a space in downtown Pawhuska during a discussion about proposed streetscape improvements. Using (and photographing) individuals to mark space helps to better understand the size and relationship of potential new streetscape elements to the existing architecture of the community. *Paul Daniel Marriott*

COMMON ROAD AND ROADSIDE ELEMENTS

While the CMP for the GSMB cannot identify preservation solutions for every potential historic feature, the following listing offers advice for some common character defining features found along many of the nation's scenic byways and within byway communities.

-lighting

For many byway communities, lighting was not a part of the historic design. Yet, for modern needs, aesthetics and safety, lighting is an important feature. How to accommodate lighting within the context of a historic town setting is an important consideration. Consider the following:

- If selecting historic-look lighting, choose fixtures that are appropriate to your period of significance.
- Select fixtures that are well proportioned and historically accurate.
- Consider the historic intensity and color of the light source (gas or incandescent, for example).
- If the historic fixture cannot provide sufficient light levels for modern use consider discrete modern fixtures along the road or building mounted that will provide supplemental light without distracting from the beauty of the historic light feature.
- Weigh the often-negative impacts (harsh light and glare) of modern lights against their positive values (low cost and energy efficiency).
- Select or identify features of historic-look lighting that minimize light pollution.
- Along rural historic roads where lighting is required (and no historic precedent exists) select modern, visually non-obtrusive fixtures that will disappear into the landscape. Select fixtures with a light source, or lantern, that directs the light onto the road, while minimizing the bright source of the light.
- Include historic streetlights in National Register District nominations.

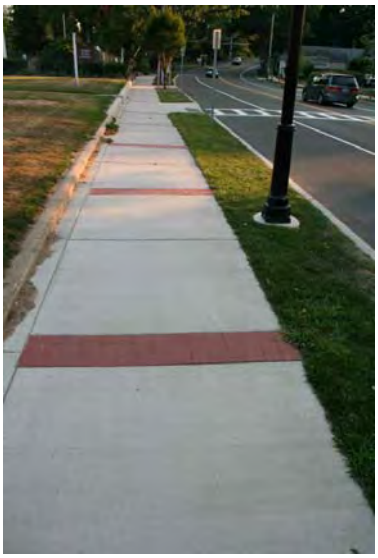
Caption: A modern "historic-look" rural light fixture (complete with electric eye) reflects the historic character, scale and simplicity of historic rural street lights in this agricultural district in New Jersey. *Paul Daniel Marriott*

-sidewalks and paths

Sidewalks are a practical and historic feature alongside most roads in historic communities.

Consider the following:

- Identify the historic sidewalk design appropriate to your period of significance.
- Identify preservation needs and treatments for historic stone pavements.
- Avoid the use of artificial concrete "bricks" or stamped or colored pavements—these tend to fade or wear over time.
- Avoid the introduction of non-historic decorative treatments such as strips of brick along the curb or brick bands around trees. The monies saved from such decorative treatments are better spent on larger trees or period street lighting.
- In rural communities that did not have sidewalks historically, consider asphalt paths as an alternative to brick or concrete.
- Include historic sidewalks and pavements in National Register District nominations.



Caption: *(Left)* Asphalt paths in Woodstock, Vermont maintain the rural character of the community and are less costly than brick or concrete sidewalks.

(Right) A streetscape project along the historic highway (Main Road/New York State Route 25) in Cutchogue, New York introduces unnecessary decorative brick bands—a simple concrete walk would have been more historically appropriate to the village setting and less expensive. *Paul Daniel Marriott*

-street trees

Elegant arching trees have long graced many of Tennessee's communities. Consider the following:

- Identify historic street tree varieties, the historic setback from the road and spacing.
- Select historically appropriate street trees based on your period of significance.

- Consider modern varieties that maintain the look and structure (arching branches, weeping, or pyramidal, for example) of historic street trees, but are grown for disease resistance or tolerance to highway salt and chemicals.
- Review the historic setback of street trees against safety and clear zone concerns.
- Along historic roads with no record of street trees consider the benefits of the addition of street trees (shade, environmental stewardship) against the absence of street trees (historic authenticity, allowing/maintaining views to architecture, urbanized environments where tree growth may be stunted).
- Avoid low-branching ornamental trees. Main Street businesses often argue for ornamental trees for fear larger trees will obscure their signs. However ornamental trees crown (mature) at the typical height of a business sign, while traditional street trees crown at the second and third story—well above most signs.
- In urban/commercial areas always install the largest trees you can afford—smaller trees are more vulnerable to damage in the early years. Establish the largest possible planting box area and the deepest possible tree well (or tree pit) for maximum root protection. Select locations that won't compete with underground utilities.
- Be honest about the likelihood for successful tree growth. Trees planted in harsh urban environments (such as commercial streets and parking lots) are subject to soil compaction and damage from car doors, bicycles and delivery carts. Often trees in such unfavorable conditions develop stunted growth and unattractive branching forms—not favorable additions to the roadside environment. Under such conditions it may be better not to have any trees.
- Consider both overhead and underground utilities.
- Regularly prune the trees to promote good health and form.
- For all of these considerations, consult with a qualified arborist.
- Include historic street trees (species and spacing) in National Register District nominations.

Caption: Many communities do not consider utilities (overhead and underground) when planting street trees. These Bradford pear trees in Cumberland, Maryland have been badly pruned by the local utility company. In addition to the poor visual effect, such pruning weakens the tree structure and increases the risk for branches to break during heavy snows and high winds. Be vigilant with buried utilities as well. Digging for underground utilities can seriously damage roots; it will take two or three years for the tree respond to the damage and die—long after the utility has left the site.

-road and street signs
Consider the following:

- In lower speed town settings or on secondary roads, select the smallest allowable signs.
- Paint the back of modern sheet metal street signs a dark neutral color (black, charcoal, dark green or brown) to minimize their appearance—ideally matching the color of the signpost.
- Minimize sign clutter. Reduce, relocate, or remove all unnecessary or non-essential signs (litter fines, adopt-a-road, parking regulations). Pay particular attention to sign clutter at town and village lines.
- Legibility of signs is tied to speed—the higher the speed, the larger letters need to be. Be sure that signs are properly scaled to your historic road environment.
- Include historic street name and other historic street signs in National Register District nominations.

Caption: The City of Williamsburg, Virginia clusters highway information and uses smaller route shields (as allowed by MUTCD) in built up areas and along lower speed roads. The backs of the signs are painted to minimize the visual impact on the landscape. *Paul Daniel Marriott*

Caption: *(Left)* Sign clutter along scenic and historic New York State Route 5 at the Village of Avon. Rural town sign clutter, often trying to impress visitors with too many achievements, presents an unattractive gateway to many communities. *(Right)* The use of the Cherokee language on street signs in Tahlequah, OK , OK reinforces Cherokee heritage and reminds the visitor of the diversity of the community. *Paul Daniel Marriott*

-road surface

Many communities in Tennessee continue to be enhanced by historic pavements—brick and concrete.
Consider the following:

- Determine if the surface treatment of your historic road is a significant feature for your community.
- Consider reconstructing historic pavements for the full width of the historic road, or showcasing the historic pavement for shoulders or crosswalks.
- Identify potential traffic calming benefits associated with existing historic pavements.
- Work closely with utility companies to ensure that any disruption to the road surface is properly repaired and restored after the utility work. Be sure that materials match and patterns (such as brick pavement) are faithfully returned. Also require the utility to lift and stockpile historic pavement materials during construction—do not allow power saws to sever historic materials.
- Include historic street pavements in National Register District nominations.

Caption: Ponca City, OK has an excellent collection of historic brick paved city streets and avenues. The use of such and expensive and durable pavement for so many public streets showcases the wealth of the city during the historical period and likely reflects an interest by the oil industry to promote modern paved roads for the automobile—an important component of the Oil theme established for the byway. *Paul Daniel Marriott*

-barriers

Safety barriers and guardrails have long been recognized features along Tennessee's roads.
Consider the following:

- Determine the need for new barriers. Ask questions regarding the need for such features and request a copy of the engineering report that determines the exact location for new barriers.
- Identify the approved speeds and conditions for different barrier types.
- Identify end-treatments for barriers that are aesthetically compatible to the selected barrier style.
- Include historic barriers in National Register District nominations.


Caption: *(Left)* Steel-backed timber guardrail on the Blue Ridge Parkway in Virginia. The barrier is crash-tested and approved by the federal government and is available in blocked-out (as shown in a blocked-out design for higher speed roads) post and rail configurations. *(Right)* The New Mexico DOT uses an adobe-colored coating to help guardrails better blend into the natural and historic landscape of the state. Old Las Vegas Highway, the first alignment of U.S. Route 66 in New Mexico (New Mexico State Scenic Byway). *Paul Daniel Marriott*


Caption: The Historic Columbia River Highway (National Historic Landmark, National Scenic Byway--All-American Road) pioneered a post and rail wooden barrier in 1915. No longer suitable for safety requirements, the barrier was redesigned as a part of the highways restoration and rehabilitation. The posts are slightly larger, and the rails are now reinforced with galvanized steel. The barrier has been crash-tested and approved for use on appropriate facilities by the federal government. *Paul Daniel Marriott*

IN SUMMARY

Roadside details and elements, and local government planning and policy, have a significant impact on the aesthetic character of a byway route and corridor. By carefully weighing design options against transportation, safety and economic development goals, a byway corridor can distinguish itself from other roads and byways as a desirable and attractive visitor destination.