TRANSPORTATION AND AESTHETICS: CONTEXT SENSITIVE DESIGN

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INTRODUCTION
Transport is an integral part of any modern economy. In this context transport design is crucial, the challenge being to find ways of satisfying aesthetic, functional and economic requirements of transport projects and adding value for individual users, while responding to wider social and environmental issues. The selection of the appropriate design techniques establishes needed design parameters, that integrate design speed, maximum grade, safety, geometric design, minimum lane and shoulder widths; with aesthetics and social responsibility. This summary contains an approach and framework to making sense of context sensitive highway design, while developing a set of indicators for assessing transport infrastructure that incorporates aesthetics into it.

Objective
Available information on context sensitive design is not readily usable to evaluate design alternatives. The objective is to provide practitioners with tools to investigate the design and operations of context sensitive design. Tradeoffs and design parameters are used to optimize design of roads without necessarily compromising on standards and quality. By relating safety and design to socially sensitive practices and aesthetics, this guideline offers measures that practitioners can easily apply. Context-sensitive design is a framework for integrating community, agency, and environmental values and concerns using sound planning, engineering, and design principles. The goal is to create public works projects that make a community a better place to live and work.

Background
Congress included the language on transportation enhancements as part of ISTEA and TEA 21 a means of stimulating additional efforts to create an improved transportation environment and system, while making a contribution to the surrounding community. The growth in federal road funding during the middle of the 20th century, was coupled with the use of nationwide design standards for federally funded projects. These standards were developed by the states through the American Association of State Highway and Transportation Officials (AASHTO) in cooperation with the Federal Highway Administration (FHWA) and applied when the focus of the federal program was construction of interstate highways — a system consisting mainly of intercity connectors built in undeveloped areas.
The era of interstate highway construction was brought to a close by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). The focus of the program was expanded to include funding sub-allocations for urbanized areas; transportation enhancements such as historic preservation, bicycle and pedestrian trails; and new social, environmental, and quality-of-life related projects for state and metropolitan planners to consider when approving projects and plans.

PURPOSE OF FRAMEWORK

An aesthetic model should guide actual shapes and designs, and we can start to investigate what this means in terms of actual shapes and design, and how they relate to the neighborhood form and community value. The guidelines will help engineers design roads that create a ‘sense of place’, for example; retaining scenic and historic features along roads where safety standards need to be maintained. The operational framework of ISTEA is reinforced through allowing state highway agencies greater flexibility in road design. Visual design approaches are used to reduce design conflicts.

Sustainability needs to be achieved, that is; all systems need to be supportive of one another so that conditions (human health, ecological health) and opportunities (human wealth, economic health) are maintained in using road and transport facilities. We should have the natural heritage be used in such a way as to benefit society economically as well as socially. This framework will also propose suggestions to achieve this.

• The purpose of this framework is to ensure ecological continuity of all open ecological systems that is beneficial to the community as well. The natural heritage of the site and the ecological continuity with neighboring open spaces systems.
• The continuity of neighborhoods needs to overcome the large barriers created by the highways and other roads that have become too busy. Social and intellectual progress, a prerequisite to social success; cannot occur if communities are divided and isolated.
• The present pleasures of the site must not be lost to the neighborhoods that exist today. The already over-loaded streets must not be allowed to become even more overloaded, dangerous and frustrating. Encouraging the use of pedestrians not only has vast environmental solving aspects but also enjoys a social interaction that cannot be created by cars. The purpose of this Framework is to ensure a development that optimizes the use of pedestrian movement.
FUNCTION VS. AESTHETICS – CONFLICT BETWEEN THE ENVIRONMENT AND ENGINEERING

Because “vehicle-miles traveled” (VMT) continue to increase rapidly in the United States, designers find their first concern to be wider lanes and shoulders with straighter, flatter alignments to obtain the highest capacity for the roadway. These roadway features often clash with the aesthetics of the urban neighborhood; the narrow, tree-lined country lane; and the covered bridge. The challenge to designers has grown in the past decade. As traffic increases on our nation’s highways, congestion brings angry complaints from motorists who want safe, fast, well-maintained highways. Growing congestion has led to greater driver anger and even “road rage.”

However, there is also growing demand by neighborhood groups, environmental activists, other interest groups, and ordinary citizens for involvement in the decision-making process. These groups often give priority to the protection of historic and natural resources, commercial areas, and residential neighborhoods over the high-capacity designs.

The environmental impacts of a roadway are often the dominant characteristics perceived by the community living in its immediate vicinity. Often the terrain through which the highway passes constrains its design. Vehicle speed is directly related to the degree of the highway’s horizontal and vertical curve. High speeds increase the time it takes for a vehicle to stop on the highway. The “stopping sight distance” is decreased by steep vertical curves or tight horizontal curves. Thus, higher speeds may require significant alteration of the natural terrain to provide the flat horizontal and vertical curves necessary for the motorist’s safety. This alteration may not only remove individual items or areas of environmental importance, it also tends to smooth out the natural terrain, creating a less interesting and less aesthetic environment through which to drive.

Maintenance of uniform speed along the highway provides additional safety based on driver expectation. Tightening curvature to avoid natural areas or areas of social interest requires lessening the design speed in that area. This causes a speed differential on adjacent segments of the highway. The greater the differential and the more often differentials occur, the greater the potential for crashes on that highway.
Speed limits and speed zones

Speed limits and speed zones are more effective if based on geometrics, traffic characteristics, and safety; rather than popular conceptions. For speed zones to be appropriate, accepted engineering practice suggests that several factors in addition to population density be considered.

1. Traffic Volume: At some specific point of low, volumes of traffic causes motorists to slow down due to a number of factors such as higher traffic volumes, peak volume occurring at certain times and duration, merging volumes and densities affecting driver’s ability to merge and change lanes, carrying capacity of road or highway.

2. Geometric Design: To set speed limits, geometry must be considered resulting in specific lane, shoulder, and median widths; design speed; and road section depression or elevation.

The width of the highway right-of-way includes not only the width of the pavement itself, but it must allow for adjoining drainage facilities, roadside utilities, and a “clear zone.” This zone is to remain clear of obstacles that will damage a vehicle on impact — including trees, fences, rocks, and other elements of a scenic view. Highway designers use information in the Green Book and the AASHTO Roadside Design Guide to determine the appropriate width of the clear zone for highways. The Green Book also indicates the maximum degree of acceptable slope. While steep slopes minimize the necessary right-of-way, they are a major factor in the overturning of vehicles that have left the roadway. Most design engineers have traditionally viewed solutions that solve capacity problems as their top priority, and thus, the high-end solutions have usually won out. Despite the context-sensitive language in ISTEA, the flexibility allowed by the Green Book and the option of design exceptions have been used only on a limited basis.

Context sensitive design can be effective only when sufficient resources and appropriate skills are available. Design should be a process which actively involves the public and must address social and economic issues: It is likely to be marginalized by communities if it is seen as a purely physical discipline.

- Design of transport facilities is not essentially about how places look, but about how they function. Functional design works best in a planning system seeking consensus rather than in one based on an adversarial approach.
- Appropriate design should be a means of resolving conflicts and achieving a vision of the future.

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1 Highway Sight Design Issues, Transportation Research Record 1208, National Research Council, Transportation Research Board, Washington, D.C., 1989
Team work with a common direction is the key to successful urban design. Integrated decisions are essential, the success of an urban design initiative will depend on local people having a stake in it. Public awareness of urban design must be raised.

DESIGN CRITERIA

ISTEA made the planning, design, and construction of transportation projects part of a progressive and comprehensive program. AASHTO has adopted and issued the design criteria followed by state highway departments. The 1994 edition of AASHTO’s Policy on Geometric Design of Highways and Streets, the Green Book; is the standard design guide, and appropriate parts have been adopted by FHWA as a national standard for transportation projects. The policy provides ranges of values for critical dimensions in highway and road design. Use of the Green Book provides consistency in safety and operational efficiency of highways and roads throughout the nation. This consistency also provides some comfort and convenience to motorists who do not have to deal with varying roadway characteristics as they travel from state to state.

The AASHTO Green Book guidelines have been used as the final word in most highway design for the past 50 years, however, it was not intended that they limit the ability of engineers to design for site-specific needs or opportunities. AASHTO stresses the need for thoughtful design to mitigate traffic and resultant environmental impacts. Congress has, through ISTEA, aided this effort by providing flexibility to the states to develop their own criteria for non-NHS projects.

Scenic Roadway Geometric Design Elements

The roadway and roadside design elements that are relevant in scenic byway design are design speed and speed limits, cross sectional elements, vertical and horizontal alignment, passing opportunities and pull-offs, and clear zones. The Transportation Research Board (TRB) lists five geometric design topics: sight distance, interchanges, intersections, alignment, and cross sections. Safety (measured in accident rate) and geometric features (medians, grades etc.) should be integrated well into the number of lanes, urban/rural environment, type of terrain, and especially other social, economic and environmental effects as a way to define policy during preliminary phase of road design. A design where the operating speeds are consistent with the driver’s expectations is desired, i.e. design speed and operating speed between successive elements should not vary widely. In order to determine the design speed and other relevant cross-sectional elements, a classification system for scenic roads is developed into five categories:

a) Urban and rural principal arterials as well as freeways and expressways with full control access. Special design amenities for recreational drivers such as scenic pull-offs, overlooks with maintenance of minimum design standards, are provided.

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b) Urban and rural principal arterials with partial control of access, parkways, and principal park roads. Most would have two or more lanes and a design speed exceeding 45 mph.

c) Urban and rural minor arterials and major collector roads without control access. Most would be paved two-lane roads with a design speed of 40 mph or greater.

d) Urban and rural secondary routes and urban and rural local roads. Most would be two–lane roads with a design speed of 30 to 40 mph, depending on terrain. Road surfaces would be paved, but there would be narrow or no shoulders.

e) The last category would have lowest design standards, with only one or two lanes of gravel or natural graded surfaces and no shoulders. Design speed can be as low as 10 mph but users might experience difficulty driving on this road.

**Improvement programs**

For all the national reforms and gains of ISTEA and TEA 21, not much has changed in the way state highway engineers design roads. And, until state legislatures require place-sensitive highway design, old design standards and practices will continue to destroy historic, scenic, cultural, and environmental values that define the distinctive character of many American communities.

The National Highway System Designation Act of 1995 allows flexibility on national highway system’s roads except for the Interstate Highway System. It encourages designs for new construction, reconstruction, resurfacing restoration, or rehabilitation of a highway on the National Highway System (other than a highway on the Interstate System) to take into account, in addition to safety, durability, and economy of maintenance through: (A) the constructed and natural environment of the area; (B) the environmental, scenic, aesthetic, historic, community, and preservation impacts of the activity; and (C) access for other modes of transportation.

**Traffic calming basics**

Increased traffic in many areas has led to traffic-calming measures on residential streets. Traffic calming is a combination of mainly physical measures that reduce negative effects of motor vehicle use, alter driver behavior, and improve conditions for nonmotorized street users. The goals of traffic calming are typically to reduce speeds, traffic volume, or both.
singly or in combination with other measures; traffic calming can yield dramatic aesthetic results.

Locally based traffic calming design standards are often applied, but in designing traffic calming measures, jurisdictions typically use the minimum acceptable design standards outlined in the Green Book rather than desirable standards.

**Noise Barrier Designs**

Every noise barrier that is constructed as a part of new highway construction or reconstruction, or along freeways is part of a community landscape and requires selection of the most cost-effective and aesthetically pleasing designs. Standard sheets for noise barriers (sound walls) developed by the Office of Structure Design have been furnished to the Districts. These standard designs include the following materials:

- Masonry block.
- Precast concrete panel (with post or mounted on safety shaped barrier).
- Wood (post and plank or framed plywood).
- Metal (ribbed steel).
- Composite beam (Styro-foam and wire mesh core with stucco exterior).

Other design alternatives may be considered provided they meet the structural and noise attenuation criteria.

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Rest Areas
Safety roadside rest areas should be designed to be functional, and aesthetic, economical and easy to maintain. Structures and facilities should combine aesthetic principles with functional requirements both as individual units and as related elements in the overall site plan. A unity of design should be expressed in all elements of each facility regarding materials, texture, color, form, and scale. The site plan is the joint responsibility of the Landscape Architect and Architect.

EXAMPLES OF INTERACTIVE DESIGNS THAT CONSIDER OF COMMUNITY VALUES

For highway designers, the 1990s have become the decade of flexibility. Designers are facing the new realities of the 1990s — an increasing number of vehicles on the road coupled with increasing public involvement, community and economic development, environmental sensitivity, historic preservation, neighborhood preservation, and concern for bicyclists and pedestrians.

While more and more people are driving, more people also want to participate in the decisions that affect their lives. In many cases, the input reflects changing community values regarding the importance of a number of factors and issues related to highway construction. In a growing number of construction and improvement projects, plans for high-speed through routes have been revamped to preserve neighborhoods, protect the environment, provide a more appropriate street for a community, reduce speeds, and provide friendly approaches for bicyclists and pedestrians. The challenge to the highway design community is to find design solutions, as well as operational options, that result in full consideration of these sometimes conflicting objectives.

The following projects, and others around the country, are examples of part of a movement toward flexibility in highway design or context-sensitive design:

Examples of successful projects

In New York, the antiquated and decrepit West Side Highway was rebuilt — not as the super-highway Westway that was once proposed but as a six-lane urban boulevard with tree-lined buffers and medians, replicas of early 20th century street lights, walkways, and bikeways.

In Torrance, Calif., congestion was relieved on Carson Street, and safety was increased through the addition of a two-way left-turn lane; improved pavement; and new curbs, gutters, and sidewalks. Landscaping improvements in the median and along the sidewalks improved the aesthetics.

5 Building Roads in Sync with Community Values. Public Roads. January/February 1999
In Oregon, the historic Columbia River Highway was restored with stone and timber guardrails and concrete caps, concrete arches on viaducts, and an interpretive center. Oregon Department of Transportation plans to restore as much as possible of the entire 120-kilometer roadway as either a scenic highway or as a hiking and biking trail.

In Lake Tahoe, Calif., a narrow two-lane section of Route 89 covering about a kilometer was upgraded to stabilize the slope and control erosion to prevent rock slides. At the insistence of local officials, special two-beam guardrails were installed that provided a more scenic view but are invisible from the lake. Trees and shrubs were planted to help the project blend into the surrounding environment.

In Westminster, Md., numerous public meetings resulted in a revised plan for upgrading the main street. The final plan included a reduced roadway width, protecting 34 of 42 mature trees with space for 104 new trees, new and widened sidewalks, and 11 pedestrian-friendly areas with landscaping and other aesthetic improvements. Westminster’s heritage was also promoted by constructing sidewalks and crosswalks with concrete made to look like the bricks used in nearby historical buildings.

In Lincoln County, Ore., the Lincoln Beach Parkway was reconstructed with a raised landscaped median separating two lanes of traffic on each side. Bicycle lanes were built along the shoulders. Median breaks were tailored to allow for easy movement by oversize recreational vehicles and tour buses.

This flexibility in highway design started from the bottom up with a growing demand for public participation in transportation decisions, but it has been embraced by top state and national leaders. These leaders are developing new programs to train design engineers in this new approach to highway improvements.

RESPONSIBILITIES – THE ROLE OF GOVERNMENTS

The level of responsibility for tasks will vary from time to time between state and local government agencies, but requires coordination. While the Association of State Highway and Transportation Officials (AASHTO)’s standards operate at federal and state level, local participation is of utmost importance. The interaction would be best if defined:

1) First, planners and designers must actively seek public involvement at the earliest possible time and throughout the process.

2) Second, they must develop designs that meet the needs of specific sites rather than attempting to use centralized, standardized solutions, recognizing that different communities may have different values and priorities.
Third, to meet specific-site needs, they must consider using the flexibility contained in the current design guidelines — or seek a design exception — instead of automatically opting for the high-end solution by giving priority to capacity over environmental, historic preservation, and neighborhood-protection concerns.

FHWA and the States Reach Out

In 1997, FHWA joined forces with AASHTO and other interested groups to design a companion guide to the Green Book, entitled Flexibility in Highway Design, published in July 1997. This partnership included groups such as the Bicycle Federation of America, the National Trust for Historic Preservation, and Scenic America. The concepts expressed in the guide reflect the mission, goals, and direction of FHWA’s strategic plan.

Design can and must play a major role in enhancing the quality of our journeys and of the communities. The guide should build on the flexibility in current laws and regulations to explore opportunities to use flexible design as a tool to help sustain important community interests without compromising safety. To do so, this guide stresses the need to identify and discuss those flexibilities and to continue breaking down barriers that sometimes make it difficult for highway designers to be aware of local concerns of interested organizations and citizens. The importance of sharing ideas for proactive, community-oriented designs for transportation facilities encourage designers to become partners with transportation specialists, landscape architects, environmental specialists, and others who can bring their unique expertise to the important task of improving transportation decision-making and preserving the character of the nation’s communities. We can encourage creativity, while achieving safety and efficiency, through the early identification of critical project issues and through consideration of community concerns before major decisions severely limit design options. The framework’s purpose is to provide examples, ideas, and options on which the planners and designers can draw to produce better, more environmentally sensitive projects. It stresses the importance of project scoping,
community awareness, interdisciplinary decision-making, and early public participation.

This guideline covers the areas of functional classification of roads, design controls, horizontal and vertical alignment, cross-section elements, bridges, and intersections. Having a process that is open, includes public involvement, and fosters creative thinking is an essential part of achieving good design. It is an aid for highway designers, environmentalists, and the public to identify possible approaches that fully consider aesthetic, historic, and scenic values, along with safety and mobility.

Options available to state and local highway officials to achieve a balanced road design include measures such as:

- Use of the flexibility within the standards adopted for each state.
- Recognition that design exceptions may be an option when environmental consequences are great.
  Re-evaluation of decisions made in the planning process.
- Lowering the design speed when appropriate.
- Maintaining the road's existing horizontal and vertical geometry and cross section and undertaking only resurfacing, restoration, and rehabilitation improvements.
- Consideration of the development of alternative standards for each state, especially for scenic roads.
- Recognition of the safety and operational impact of various design features and modifications.

**Rustic Roads Program**

The state of Wisconsin is among those that have programs to encourage “therapeutic” facilities through its Rustic Roads System. This was created by the 1973 State Legislature in an effort to help citizens and local units of government preserve what remains of Wisconsin's scenic, lightly traveled country roads for the leisurely enjoyment of bikers, hikers and motorists. Unique brown and yellow signs mark the routes of all officially-designated Rustic Roads. These routes provide bikers, hikers, and motorists with an opportunity to leisurely travel through some of Wisconsin's scenic countryside. An officially designated Rustic Road shall continue to be under local control. The county, city, village or town shall have the same authority over the Rustic Road as it possesses over other highways under its jurisdiction. A Rustic Road is eligible for state aids just as any other public highway.

The main goal of this program is to identify and preserve in a natural and essentially undisturbed condition certain designated roads having unusual or outstanding natural or cultural beauty, by virtue of native vegetation or other natural or man-made features.

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associated with the road. It is also the aim to provide a linear park-like system for vehicular, bicycle and pedestrian travel for quiet and leisurely enjoyment by local residents and the general public alike.

To maintain and administer these roads to provide safe public travel, yet preserve the rustic and scenic qualities through use of appropriate maintenance and design standards, and encouragement of zoning for land use compatibility, utility regulations and billboard control.

To qualify for the Rustic Road program, a road:

- Should have outstanding natural features along its borders such as rugged terrain, native vegetation, native wildlife, or include open areas with agricultural vistas which singly or in combination uniquely set this road apart from other roads.
- Should be a lightly traveled local access road, one which serves the adjacent property owners and those wishing to travel by auto, bicycle, or hiking for purposes of recreational enjoyment of its rustic features.
- Should be one not scheduled nor anticipated for major improvements which would change its rustic characteristics.
- Should have, preferably, a minimum length of 2 miles and, where feasible, should provide a completed closure or loop, or connect to major highways at both ends of the route.
- A Rustic Road may be dirt, gravel or paved road. It may be one-way or two-way. It may also have bicycle or hiking paths adjacent to or incorporated in the roadway area.
- The maximum speed limit on a Rustic Road has been established by law at 45 mph. A speed limit as low as 25 mph may be established by the local governing authority.

Other initiatives include Scenic America, which deals with preservation of roads that highlight the special natural, historic and natural features of an area. This would be an invaluable tool to local governments and other conservation groups as it contains pictures and suggestions on preserving scenic landscapes associated with roads.

A PROCESS FOR ESTABLISHING CONTEXT-SENSITIVE DESIGNS

The first three stages of a project — planning, project development, and design — are the most important in determining the final design features of the project. Decisions made in the early stages can limit the flexibility available in the later design stages.

Community involvement is an absolutely critical factor. Obtaining a community consensus on the problem requires proactive public involvement beyond conventional public meetings at which well-developed design alternatives are presented for public comment. If a consensus cannot be reached on the definition of the problem at the beginning, it will be difficult to move ahead in the process and

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expect consensus on the final design. During the planning and project development stage, planners must resolve the issues of the impact of the project on the general physical character of the area; the impact on any unique historic or scenic characteristics; and the concerns of the community about safety, capacity, and cost.

A successful highway design process includes early and continuous public involvement, the use of visualization techniques to aid the public, early and continuous use of a multidisciplinary design team, and the application of flexible and creative design criteria. The multidisciplinary team may include traffic engineers, ecologists, transportation and urban planners, social scientists, landscape architects, architects, urban designers, historians, biologists, archaeologists, geologists, and artists. There is need for flexibility in state standards along with the option of design exceptions when the state standards do not cover the needs of a specific project. Design exceptions are used by state highway agencies when unusual circumstances such as highly sensitive resources or extreme cost or safety concerns warrant the use of less than the lowest Green Book standards. For example, if a rock escarpment prevents full shoulder widths in a narrow mountain pass, a design exception for narrower shoulders might be made in lieu of expensive blasting that also creates an ugly slope and that may be difficult to safely maintain.

**Thinking Beyond the Pavement-Community Participation**

On integrating highway development with communities and the environment while maintaining safety and performance, there needs to be agreement on the qualities of excellence in transportation design. There must be an early agreement on a project that satisfies the purpose and needs of a full range of stakeholders. The project must be safe for the user and the community; be in harmony with the community; preserve environmental, scenic, aesthetic, historic, and natural resource values; exceed expectations; involve efficient and effective use of time, funding, and community resources; be built with minimal disruption; and add lasting value to the community.

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<td>- Dignity and pride for community</td>
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<td>- Not a mere traffic function, but composite part of other local facilities</td>
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<td>- Utility value from comfort, security, safety</td>
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<td>Requirements for Design</td>
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<td>- Function as landmark</td>
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A suggested consultative process

There is need for agreement on the characteristics of the process that would yield excellence. This process would include early and continuous communication with all stakeholders; early establishment of a multidisciplinary team; involvement of a full range of stakeholders in the scoping process to develop a consensus on the purposes of the project; examination of multiple alternatives to produce consensus on approaches; a commitment to the process from top agency officials and local leaders; a public involvement process, including informal meetings; understanding of the landscape, the community, and valued resources before engineering design is begun; and the use of a full range of communication tools.

Historic preservation, rehabilitation, and operation of historic mass transportation buildings, structures, and facilities (including historic bus and railroad facilities) can be systematically incorporated into community's heritage and value. Landscaping and other scenic beautification, including tables, benches, trash receptacles, and street lights; bus shelters; public art; pedestrian access and walkways; bicycle access, including bicycle storage facilities and installing equipment for transporting bicycle on mass transportation vehicles; transit connections to parks within the recipient’s transit service area; signage; and enhanced access for persons with disabilities to mass transportation.

AESTHETIC ACTIVITIES DEFINED

“Good design is probably 98% common sense. Above all, an object must function well and efficiently”.

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8 Design Rules. Anna Muoio and Lucy A. McCauley
Public Consultation

There will be instances, particularly in Conservation Areas, where there will need to be consultation with local communities. This may take the form of exhibitions, press releases and public meetings and will involve local Councils, traders organizations, amenity societies, etc. It is important to tailor the form of consultation to suit the local circumstances.

Resource Management

There is a wider environmental benefit accruing from pursuing design, construction and maintenance practices which minimize the creation of waste materials and maximize the use of materials which are either reused or which are low energy in production.

These fall within the following categories:-

Conservation:
- Designated Conservation Areas and Scheduled Ancient Monuments, and in the vicinity of Listed Buildings
- Non Statutory Heritage Areas, identified in local planning policies.
- The Fringes of the above.
- Pedestrian priority areas.
- Shopping areas and heavily used footways in town centers.
- Areas of traffic calming.
- Rural roads.
- New Forest Heritage Area, Countryside Heritage Areas, Areas of Outstanding Natural Beauty

Environmental:
- Sensitive Areas, and Nature Reserves.
- Shared Surface roads in housing areas.
- Special areas designated by the Local Authority - these include Housing Renewal Areas

Environmental Objectives and Principles

All highways design and maintenance decisions in conservation areas must aim to promote that quality of the environment which is the reason for their special status. All proposals for projects should be tested against this principle. There will be instances where a flexible approach is required to highways requirements, commensurate with highways safety and function. More specifically, all schemes of construction or maintenance shall seek to achieve the following environmental objectives:

(i) Ensure that they reflect the wider environmental objectives of the area.
(ii) Be a yardstick for design achievement in the area, with the emphasis both on design and quality of materials.

(iii) Ensure that continuity of detailed attention extends to all aspects of the scheme.

(iv) Fit in harmoniously with the existing street scene where this is consistent with environmental design objectives for the area.

(v) Use materials that enhance the street scene and reflect the historic use of materials in the locality whilst, at the same time, reinforcing the highways objectives of guiding vehicular/pedestrian movement safely.

(vi) Harmonize, wherever possible, existing and proposed street furniture in a coordinated design, with special reference to street lighting and signing.

(vii) Encourage planting regimes which are low cost to maintain and, where appropriate, are sufficiently dense and robust to provide rapid visual impact.

Some interface between desirable and minimum standards should bring about a level of functional designs that do not compromise standards and safety, but still take into consideration, the landscape and the community of users. Some of the following are mechanisms towards the stated goals and objectives.

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.
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 thereof for pedestrian or bicycle trails).
10. Archaeological planning and research.
11. Environmental mitigation to address water pollution due to highway runoff or reduce vehicle-caused wildlife mortality while maintaining habitat connectivity.
12. Establishment of transportation museums.
13. Mitigation of water pollution due to highway runoff.
14. Signage and enhanced access for persons with disabilities to public transport.
Scenic or Historic Highway Programs

ISTEA listed scenic or historic highway programs as an eligible funding activity. Transportation Equity Act for the 21st Century (TEA-21) introduced the parenthetical, including the provision of tourist and welcome centers; and attached it to the scenic and historic highway programs activity. Although linked with scenic and historic highway programs, the eligibility for tourist and welcome centers warrants further discussion as a separate activity. Congress provided additional language to assist in interpreting its intent regarding this activity.

The connection to a scenic site should take into account the intrinsic characteristics that make an area or site scenic as determined by a State or area commission, where one exists. Where these mechanisms are not available, the proposal should document those characteristics that give evidence of compliance with the provisions of the a tourist or welcome center does not have to be on a historic byway, many of the characteristics that determine to those of the scenic byways program. Activities eligible Byways Program are generally eligible under enhancement (TE) activities. A historic site should have consultation and concurrence with the State Historic similar authority for determining the historicity of a

The tourist or welcome center does not have to be an existing Federal-aid highway facility. However, where it proposed tourist or welcome center would not be in particular Federal-aid highway facility the requirement to demonstrate a relationship to surface transportation must still be taken into consideration. Additionally, evidence of a connection to a scenic or historic site must be established. An example could include efforts and materials to direct members of the traveling public to a specific local area

guideline language. While designated scenic or what is scenic are similar under the National Scenic transportation evidence of documented Preservation Officer or particular site.

immediately adjacent to is determined that a connection with a

10 Ibid
site deemed to be of scenic or historic significance. The visitor or welcome center should be publicly owned and open to the public. Proposals for privately owned facilities to be used for a welcome or tourist center, and leased to a public entity, should be reviewed by the FHWA division office on a case-by-case basis.

**Eligible Transit Enhancements.** The term “transit enhancement” means projects or project elements that are designed to enhance mass transportation service or use and are physically or functionally related to transit facilities. The following activities are the transit projects and project elements that qualify as transit enhancements. All must be related to or serve mass transit. Historic preservation, rehabilitation, and operation of historic mass transportation buildings, structures, and facilities (including historic bus and railroad facilities), bus shelters, landscaping and other scenic beautification, including tables, benches, trash receptacles, and street lights; public art; pedestrian access and walkways; bicycle access, including bicycle storage facilities and installing equipment for transporting bicycles on mass transportation vehicles; transit connections to parks within the recipient’s transit service area; signage; and enhanced access for persons with disabilities to mass transportation.

**FREQUENTLY ASKED QUESTIONS**

- **What is the meaning of “a clear link to scenic or historic sites.”**
  Congress introduced this terminology regarding tourist and welcome centers. This phrase can be interpreted broadly, however a clear linkage must be demonstrated. For example, if a tourist or welcome center provides substantial information about a particular scenic or historic highway program, or a scenic or historic site this could be considered part of the needed justification. Such information could include literature, directions, interpretive displays or videos shown to the public. To clearly be consistent with the language the Congress provided, the tourist or welcome center should be within close proximity to the scenic or historic highway site. Close proximity should be determined to be within a reasonable walking distance. If visitors can park at the tourist and welcome center and walk to the scenic or historic site (i.e. on short connecting foot trails), see it from a vista at the tourist and welcome center or view some of its attributes, then there is clear linkage. For scenic sites, if the location proposed is on a designated scenic route, and the proposed building site itself contains some of the qualities that make the route scenic (special landforms, vistas, cultural resources, etc.) that can be viewed from the tourist and welcome center, then linkage may clearly be established. The placement of a visitor’s information facility on a scenic or historic route would allow for a more direct connection and more easily satisfy the linkage requirements.

- **Should State DOT’s and project proponents work closely with State tourism agencies in the implementation of TE activities?**
  Yes, State DOT’s and project proponents should seek opportunities to coordinate with State tourism officials to help maximize economic benefits of the TE activity. State tourism agencies may provide helpful information such as; the identification of important
area resources, assist in developing criteria for site selection, and offer suggestions towards implementation. States should consider including representation from the State tourism community as part of their TE advisory committee process. State tourism agencies should also be consulted with regard to the implementation of tourist and welcome centers.

- **What are the similarities and differences between Scenic Byways program and Transportation Enhancement program?**

  The Scenic Byways Program and Transportation Program are able to fund many similar activities. Some of the similarities include:

  a) Activities eligible under the Scenic Byways program are generally eligible under TE activities where all applicable criteria have otherwise been met.

  b) The eligibility for TE funding for the provision of tourist and welcome centers applies to both existing and new centers. This means that TE funds may be used for the construction of a new facility and/or the restoration of an existing facility. This would include those related construction actions necessary to provide the facility, such as interior fixtures and parking areas.

  c) TE funds can be used to purchase and install items which support or interpret the scenic or historic highway program or site including brochure racks for interpretive materials, maps, or kiosks, markers, and scenic overlooks.

**APPLICATIONS**

In spite of all the talk about customer service and public involvement few states fully include the public in the design process, or make an effort to adopt new design guidelines or retrain state and county highway engineers. Many departments of transportation still resist the growing demand for place-sensitive highway design even as the public becomes increasingly irate over the failure to link transportation and land use issues in the context of “smart growth”.

State legislatures can accelerate reform in highway design by adopting legislation that requires that every road project in their state will **a)** fully involve citizens who are affected by that road in the design or re-design of that road; and **b)** reflect sensitivity to the environment, to aesthetics and to the character of place. The challenge is to work with those who champion reform -- citizens, far-sighted state transportation officials, and national leadership organizations -- to accelerate adoption of place-sensitive design at the state level. If state legislatures do not enact clear legislative mandates for place-sensitive design at the state level, change in destructive road building will continue.

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Smart Growth literature is available on several sites: What we know about land use and Transportation: LUTRAQ Volume 8, [http://www.friends.org](http://www.friends.org)

Making the connections: A summary of the LUTRAQ Project. A 1000 Friends of Oregon, February 1997
The National Scenic Byways is a program that allows states to participate with minimum criteria for nominating roads for designation that qualify in this category. An individual, organization, tribe or agency can nominate a road as a National Scenic Byway, but such nomination must be submitted through an appropriate agency, such as the state department of transport, but in some instances could be the state tourism agency. Categories for the intrinsic value of projects would be scenic, historic, recreational, cultural, natural and/or archeological.

Federal transportation legislation now provides states (tribes and Bureau of Indian Affairs) with the flexibility to use their own standards and the admonition to protect community values. Hard working reformers within the transportation engineering profession and within the state DOTs have also begun to push changes in standards towards new flexibility. All too often, citizen’s groups are not told of these advances by state highway engineers, who instead tell citizens asking for design changes, “we can’t do that, these are federal requirements.”

Federal design standards applicable to road projects are often blamed when wide lanes and shoulders destroy communities and scenic and historic areas. When activists question State Departments of Transportation (DOTs) about new road construction and reconstruction designs, the (their) claim is usually that their hands are tied by the federal design standards. This is simply not the case. The federal design standards are incorporated guidelines that give ample flexibility in designing roads and highways—the problem is that they simply choose not to use it. Recent federal legislation, namely the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) and the 1995 National Highway Designation Act (NHSDA) granted even greater flexibility in design for State DOTs. The culprit behind roads that destroy scenic and historic areas or tear up communities may be an unwillingness of agencies to move off the crib sheet and start really planning to serve communities.

The reference often used by designers during the design of a highway project is commonly referred to as the Green Book. Its official title is A Policy on the Geometric Design of Highways and Streets. This document is really a series of guidelines on geometric design within which the designer has a range of flexibility. The design guidelines applied to federally funded road projects were the result of a 1984 public rulemaking process and are based on the AASHTO. The Green Book and AASHTO state that “The intent of this policy is to provide guidance to the designer by referencing a recommended range of values for critical dimensions. Sufficient flexibility is permitted to encourage independent designs tailored to particular situations. (p. xliii)

Most roads constructed in the past 30 years have been built accordingly to serve a hierarchy known as the mobility hierarchy—the faster cars can travel and the greater the capacity, the higher the road ranks in the hierarchy. The result has been that roads are designed predominantly for the convenience of motorists, without regard to the impacts on the communities through which they travel.
Indian Reservations

The ISTEA of 1991 changed the review, oversight, and administration of Federal-aid highway projects on the Indian Reservation Road System as follows: A nationwide priority program for improving deficient Indian reservation road bridges has been established in 1998. The Indian Reservation Roads Program will have unique aspects of design within the tribal culture.

Not less than $9,000,000 per year is reserved from Indian Reservation Road construction funds for bridge projects to replace, rehabilitate, seismically retrofit, paint, apply calcium magnesium acetate to, apply sodium acetate/formate deicer to, or install scour countermeasures for deficient Indian reservation road bridges, including multiple-pipe culverts.

A new Cooperative Federal Lands Transportation Program

Funds available for the program may be used by a state or county for projects, or portions of projects, on state or county highways that cross, are adjacent to, or lead to federally owned land or Indian reservations as determined by the State.

- Projects on the National Highway System (NHS) less than $1,000,000 may be exempt from FHWA design monitoring, approval, concurrence in awards, and construction monitoring. Projects must meet FHWA requirements.

- Projects not on the NHS may be exempt from FHWA design monitoring, approval, concurrence in awards, and construction monitoring.

- Projects may follow Federal or State laws and regulations. Reconstruction, rehabilitation and resurfacing (3R) projects may be exempt from FHWA design monitoring, PS&E approval, concurrence in awards, and construction monitoring. Projects may follow Federal or State laws and regulations.

- For both NHS and non-NHS projects, there is no exemption from FHWA project review and oversight of any non-Title 23 Federal requirements such as National Environmental Policy Act (NEPA), Clean Water Act, National Historic Preservation Act, etc.

- State design and construction standards may be used on non-NHS projects.

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12 *Intersection and Interchange Design*, Transportation Research Record 1385, National Research Council, Transportation Research Board, Washington D.C., 1993

13 *AASHTO Journal*, December 19, 1997
• The FHWA does not have to conduct final inspections on projects exempted from FHWA review and oversight.

THE DESIGN EXCEPTION PROCESS

Fortunately, the movement for reform is underway and a growing number of far-sighted highway engineers are promoting a new way of thinking. Both ISTEA and the National Highway System legislation of 1995 adopted language that sets the stage for place-sensitive ("flexible" or "context-sensitive") design. In 1997 FHWA published Flexibility in Highway Design, an invaluable book of case studies on design that respects the natural and constructed environments was published. Despite the range of flexibility that exists with respect to virtually all the major road design features, there are situations in which the application of even the minimum criteria would result in unacceptably high costs or major impact on the adjacent environment. For such instances when it is appropriate, the design exception process allows for the use of criteria lower than those specified as minimum acceptable values in the Green Book14.

14 Flexibility in Highway Design, FHWA, 1997