

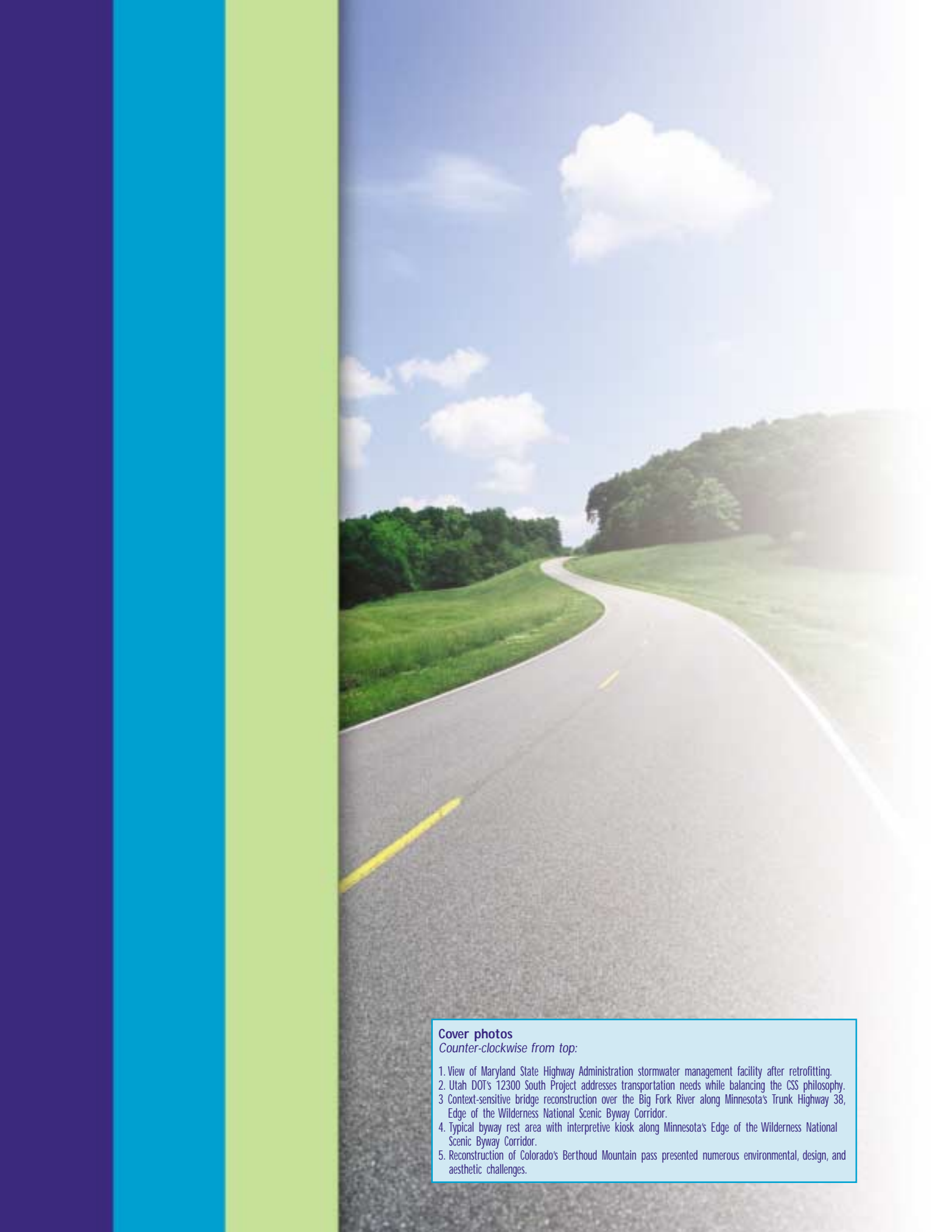


AASHTO Center for Environmental Excellence

Best Practices in Context-Sensitive Solutions



2005 Competition



Cover photos

Counter-clockwise from top:

1. View of Maryland State Highway Administration stormwater management facility after retrofitting.
2. Utah DOT's 12300 South Project addresses transportation needs while balancing the CSS philosophy.
3. Context-sensitive bridge reconstruction over the Big Fork River along Minnesota's Trunk Highway 38, Edge of the Wilderness National Scenic Byway Corridor.
4. Typical byway rest area with interpretive kiosk along Minnesota's Edge of the Wilderness National Scenic Byway Corridor.
5. Reconstruction of Colorado's Berthoud Mountain pass presented numerous environmental, design, and aesthetic challenges.

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2005 Competition



American Association of State Highway and Transportation Officials

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This report is sponsored by the American Association of State Highway and Transportation Officials' (AASHTO) Center for Environmental Excellence. The Center was developed in cooperation with the Federal Highway Administration to promote environmental stewardship and to encourage innovative ways to streamline the transportation delivery process. The Center is designed to serve as a resource for transportation professionals seeking technical assistance, training, information exchange, partnership-building opportunities, and quick and easy access to environmental tools.

The work of the Center is directed by AASHTO staff and is overseen by an Advisory Board comprised of the following members:

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Introduction

Successful transportation projects achieve mobility goals while improving the social and environmental context within which they exist. In recent years, more and more transportation agencies across the United States have been achieving these goals using context-sensitive solutions (CSS), and the results are quite impressive.

CSS is a collaborative approach that brings together a broad spectrum of stakeholders to develop a transportation solution that fits within its physical setting, preserves natural and cultural resources, and meets the mobility and safety needs of the community.

AASHTO's Center for Environmental Excellence sponsored the 2005 Context-Sensitive Solutions Competition to showcase exemplary projects, programs, and initiatives that achieve CSS principles.

In February 2005, AASHTO sent a solicitation to all State Departments of Transportation seeking examples of efforts underway to integrate CSS principles with the planning and delivery of transportation projects, programs, and services. We received 75 applications from 33 states.

After careful review, our expert panel of judges selected one winner in each of three categories: best project, best program, and best in institutional change. These initiatives serve as models of the best innovations and collaborative efforts in the nation in achieving context-sensitive solutions for transportation projects and programs. The panel also selected seven additional initiatives they considered worthy of recognition as notable practices.

CSS initiatives continue to advance along the continuum, from projects, to programs, to organizational integration. Transportation agencies and their partners are demonstrating that CSS is applicable across a range of efforts—from routine safety upgrades and emergency repairs to urban freeways and scenic byways. Innovative technologies, new materials, and process improvements are providing better options for integration of sustainable, environmentally friendly transportation solutions that can result in substantial cost savings.

These winning transportation projects, programs, and initiatives demonstrate exemplary efforts in CSS that will serve as models for achieving transportation solutions that fit the natural and human environment while achieving mobility and safety goals and enhancing community values.

The practices documented in this report illustrate the art of the possible in developing transportation solutions that are truly sensitive to the social and environmental context within which they exist—representing the best in context-sensitive solutions.



John Horsley
Executive Director
American Association of State Highway and Transportation Officials



Integration of CSS Principles in Transportation

Context-sensitive solutions (CSS) consider the total context within which a transportation improvement project will exist. CSS is a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility.

The AASHTO Center for Environmental Excellence's Best Practices in Context-Sensitive Solutions Competition showcases outstanding examples of the work being done throughout the country to integrate CSS principles with the planning and delivery of transportation projects, programs and services.

The award winners and notable practices demonstrate how transportation agencies and their partners, working with their communities, can succeed in meeting mobility needs while promoting community values and enhancing the social and environmental context in which transportation facilities co-exist.

SELECTION PROCESS

The competition was open to all governmental entities—including state and local transportation agencies, transit agencies, metropolitan planning organizations, and resource agencies. AASHTO received 75 applications from 33 states; three winners and seven notable practices were selected.

The expert review panel carefully considered the applications and selected projects based on the degree to which CSS principles were successful. In evaluating the applications, judges looked not only at the outcome of the project or program, but also at the process used to achieve CSS.



CRITERIA

The review panel judged each application based on the following criteria:

- Addressing transportation needs using CSS principles and effectively using resources;
- Use of partnering, collaboration, and multi-disciplinary approaches;
- Incorporation of community values and improving community assets;
- Achieving compatibility with the natural and built environment; and
- Measuring effectiveness in meeting CSS goals.

CATEGORIES

Winners were selected in each of three categories:

Project-Oriented Activities: Collaborative efforts to plan, design, construct, operate, and maintain a major project that reflects CSS principles. Examples included, but were not limited to urban streetscapes and community livability features;

aesthetic treatments and amenities on facilities; exceptional outreach and inclusive collaborative decision-making processes during project planning, development, design, and construction.

Program Approaches: Organizational policies and programs that illustrate CSS principles throughout a program or function, applying to multiple projects. Examples included systematically applying CSS to project planning, design, construction, operation, or maintenance, including CSS policies, guidance, and training.

Institutionalization or Organizational Change: Efforts made to make permanent the changes in attitudes and organizational structures that help institutionalize CSS practices in the agency's program of activities. Examples included changing mission statements, strategic plans, policies and procedures; providing educational programs; establishing partnering relationships with transportation interest groups; using environmental quality assurance and control procedures; and using performance measures.



Winners

The panel found that the winning applicants demonstrated a broad scope of context-sensitive features, ranging from innovative public involvement strategies to efficient use of materials and new technologies. Effective CSS approaches illustrated creativity and innovation, demonstrating that time savings and cost savings can be achieved while meeting the needs of communities and the environment. Whether on a project, a program, or throughout an institution, these successful initiatives demonstrated an end-to-end vision for achieving context-sensitive solutions.

BEST PROJECT

Minnesota Trunk Highway 38, Edge of the Wilderness National Scenic Byway Corridor

BEST PROGRAM

Oregon Transportation Investment Act (OTIA III)
State Bridge Delivery Program

BEST INSTITUTIONAL CHANGE

New York State Department of Transportation

Context Sensitive Solutions Implementation Initiative

NOTABLE PRACTICES

SR 179 Needs Based Implementation Plan—
Arizona DOT

Highway I Median Barrier Project—
California DOT

Berthoud Pass Mountain Access Project—
Colorado DOT

Stormwater Management Visual and Environmental
Quality and Safety Program—Maryland State
Highway Administration

US-131 S-Curve Replacement Project—
Michigan DOT

I-580 Freeway Extension Project—Nevada DOT

Institutionalization of CSS—Utah DOT



Best Project

MINNESOTA TRUNK HIGHWAY 38, EDGE OF THE WILDERNESS NATIONAL SCENIC BYWAY CORRIDOR

The 47-mile Minnesota Trunk Highway 38 (TH 38) Edge of the Wilderness National Scenic Byway Corridor weaves around lakes and wetlands, allowing travelers to experience Minnesota's northern woods. Faced with the need to reconstruct the aging highway, the Minnesota Department of Transportation (Mn/DOT) developed partnership alliances with Federal, state, and local stakeholders to guide the planning, scoping, and design process associated with the corridor. The resulting corridor reconstruction project exemplifies context-sensitive solutions, balancing safety, mobility, environmental, and community values.

Trunk Highway 38, which runs through the Chippewa National Forest, was originally developed in the 1920s to replace a parallel logging railroad. Mn/DOT sought to reconstruct the substandard roadway to enhance safety and efficiency in the early 1990s. Mn/DOT initially assumed that flattening and straightening out the

road consistent with higher design speeds would be crucial to the logging industry, the major employer using the corridor.

But during an extensive outreach campaign to gather input from the community, the agency found that the mill owners wanted the road to support commerce, but not at the expense of the neighboring resorts whose businesses relied on preserving the scenery.

"We don't need to get to the mill ten minutes faster if our neighbors, who run resorts, need the scenery to rent their cabins," the mill owner said. "What we need is a year-round, 10-ton road that will allow us to run our trucks throughout the year, even in spring (without road restrictions). We don't need ten minutes a day; we need 10-tons every day! I don't care if we have to drive around every swamp and over every hill, just fix the road so it can support commerce."

Computer visualization study exploring flexibility in design of the roadway cross-section to achieve context-sensitive roadway improvements. Photo and Visualization Credit: SHE, Mike Fraser.



A BETTER SOLUTION

Meetings with the industry, the public, and agency partners produced a better solution.

Mn/DOT focused on maintaining the two-lane roadway and existing alignment, and incorporating spot upgrades where safety improvements were needed. This significantly reduced the amount of vegetation that needed to be cleared. The project incorporated four-foot paved shoulders with a rumble strip and an additional two feet of reinforced soft shoulder to improve safety and accommodate bicyclists, while reducing the impacts of the roadway on the land.

The public and interagency working groups strived to develop solutions, not only for the transportation system, but also for managing the land adjacent to the highway. The effort resulted in a completely coordinated schedule of improvement projects for the whole corridor, including

transportation, recreation, water quality, and economic development.

VISIONS AND GOALS

Mn/DOT said the vision and goals for the corridor were developed and outlined in three related documents:

- The Corridor Management Plan, which addressed safety, visual quality, recreation, water quality, vegetation/timber management, and economic development;
- The Byway Investment Plan which listed priority projects, anticipated completion dates, and possible coordinators and funding sources; and
- The Forest History Interpretive Plan, which took inventory of resources along the byway, gave recommendations for improvements and guided the designation and location of interpretive sites and other features.

Computer visualization study exploring flexibility in design of the roadway cross-section to achieve context-sensitive roadway improvements. Photo and Visualization Credit: SEH, Mike Fraser.



Separate multi-disciplinary teams, led by Mn/DOT, the U.S. Forest Service, Minnesota Department of Natural Resources and other agencies, researched 23 different social, environmental, and economic resource areas. They inventoried the existing character of each resource, analyzed the potential impacts and benefits resulting from proposed transportation improvements, and made recommendations for each.

VITAL PUBLIC OUTREACH

The work teams also engaged the public directly. The teams used many state-of-the-art outreach technologies, such as computer-visualization studies to help communicate alternative construction concepts to the public.

One of the most effective communication techniques was a low-tech solution. Mn/DOT handed out inexpensive disposable cameras to local Boy Scouts and Girl Scouts, who took pictures of elements of the corridor that they liked or disliked. Their photos were mounted on posters with

short narratives of why each particular photo was taken. The agency said the scouts' photos were a great catalyst for public discussions and input.

The design team was able to incorporate the community's preferences into flexible design solutions.

COST SAVINGS AND FUNDING SOURCES

Mn/DOT achieved significant cost savings on the project by collaborating with other agencies in the development of the road, recreation facilities, and other amenities.

The actual cost of the highway work was considerably less than anticipated because the reconstruction, particularly grading, used design flexibility at specific locations rather than applying conservative standards on a corridor-wide basis.

In addition, a variety of funding sources were tapped to incorporate context-sensitive features and interpretive sites along the corridor. Along with state highway improvement funds, federal Transportation Enhancement funds were used to develop context-sensitive features and interpretive sites to further reinforce the "sense of place." Forest recreation dollars were used to develop interpretive turnouts, rest areas, boat access sites and parallel trails. Municipal funds were used to improve urban segments, sidewalks,

This corridor interpretive park and trailhead site along the Byway links users to a multi-use trail that crosses the river and links to other area trail systems. Photo Credit: Mn/DOT, Neil Kveberg.



and streetscapes. And private money from utilities was used to bury utilities along the entire corridor.

MEASURES OF SUCCESS, LESSONS LEARNED

The planning, design, construction, and management of the TH 38 corridor have met all five of the measures of CSS success established by Mn/DOT: community acceptance, environmental compatibility, engineering and technical functionality, financial feasibility, and timeliness of delivery.

As a result of the TH 38 project, Mn/DOT learned several lessons that it will continue to apply as it implements further improvements in the corridor:

- Let the public define the project.
- State non-negotiable design criteria up-front.

“With early engagement and listening, Mn/DOT used broad public and stakeholder involvement to better inform the understanding of context and the determination of purpose and need for proposed improvement projects along the TH 38 corridor. Consequently, and in applying all of the key principles of CSS advocated by the agency, Mn/DOT demonstrated flexibility in design to tailor and focus solutions and improvements where the public placed the highest values and received the most return or value-added for the investments.”

– *Minnesota Department of Transportation*

- Make the regulators part of the planning and design team as “co-creators.”
- Apply flexibility in design to balance conflicting objectives and to address issues that are unique to the context.

By using a CSS approach, Mn/DOT was able to focus improvements where they mattered the most to people. The resulting improvements have contributed to significantly reduced accidents, enhanced mobility, greatly reduced cost, and context-sensitive outcomes—all well ahead of schedule.

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VIEW FROM THE CSS COMPETITION PANEL

The values-driven approach of the TH-38 project was effective at protecting resources while ensuring transportation safety and functionality. Mn/DOT worked with the land management agencies to look to the future to establish a “sense of place” in the corridor. This is an excellent example of a project that was informed by the requirements of the Scenic Byways program, yet it provides “universal lessons” in achieving context-sensitive solutions.



Best Program

OREGON TRANSPORTATION INVESTMENT ACT (OTIA III) STATE BRIDGE DELIVERY PROGRAM

Faced with the need to repair over 300 state highway bridges, the Oregon Department of Transportation (ODOT) developed an unprecedented bridge repair and replacement program, including a context-sensitive solutions approach to address transportation goals as well as community and quality-of-life goals for the citizens the state.

Under the 2003 Oregon Transportation Investment Act (OTIA III), the state legislature provided \$1.3 billion to repair or replace the aging highway bridges over the next eight to ten years. In order to complete the project in the timeframe mandated by the Legislature, ODOT developed the OTIA III State Bridge Delivery Program. The innovative program includes a collaborative permit-streamlining effort, in which ODOT obtained a programmatic permit for the entire bridge program instead of individual permits for each bridge.

The goal of the Bridge program is an improved state transportation infrastructure that reduces limitations on trade and economic progress while instilling a socially and environmentally responsible culture of sustainability. To achieve this goal, ODOT will implement the program using a Context Sensitive and Sustainable Solutions (CS³) decision-making framework, focusing on community values to shape a new generation of bridges.

CSS PLUS SUSTAINABILITY

CS³ combines the existing CSS design philosophy with the concept of sustainability, an approach that is unique to ODOT. The traditional CSS approach considers the entire situation within which a transportation improvement project exists. Sustainability is defined as using, developing, and protecting resources for current and future generations.

Active community and stakeholder involvement is a focus of the OTIA III State Bridge Delivery Program. ODOT held visual standards workshops to ensure that the bridge repairs and replacements are a good fit for their specific community.



By combining the two concepts, ODOT says the CS³ approach will help meet the five goals of the bridge delivery program: maintaining mobility; stimulating Oregon's economy; employing efficient and cost-effective delivery practices; building projects that are sensitive to their communities and landscape; and capitalizing on funding opportunities.

CS³ merges eight diverse disciplines under one umbrella: economic stimulus, diversity, cost-effectiveness, mobility, public involvement, environmental justice, environmental program management, and sustainability. A "task lead" manager is responsible for integrating these diverse management systems with ODOT's existing project delivery structure.

Located in the Rogue River National Forest, the Rogue River Bridge is one of more than 300 bridges being repaired or replaced in a context-sensitive manner under Oregon's progressive OTIA III State Bridge Delivery Program.

STREAMLINED PERMITS, PERFORMANCE MEASURES

As a key part of the initiative, ODOT has used a streamlined permitting process to efficiently and effectively deliver the bridge program. Through early collection of environmental baseline information at each bridge project location and collaboration with regulatory agencies, ODOT obtained a programmatic permit for the entire bridge program instead of individual permits for each bridge.

Using the new CS³ approach, ODOT collaborated with a broad range of stakeholders to develop a single set of environmental performance standards for the bridge program. The resulting "one-process" approach for more than 300 bridges provides a single set of performance standards that addresses a wide range of environmental resources.

The bridge program is committed to employing a diverse workforce and stimulating Oregon's economy while being responsive and sensitive to the environment.



In the planning stage of the bridge program, ODOT collected environmental data for all the bridges in the program. The resulting Environmental Baseline Reports document the current status of environmental resources before design and construction starts. The bridge program standards meet the requirements of 14 different state and Federal environmental laws, including the Clean Water Act, the Endangered Species Act, and the National Historic Preservation Act.

ODOT has used the bridge program as the impetus to develop a statewide conservation and mitigation strategy, including development of at least three wetland mitigation banks designed to address the mitigation needs of the bridge program as well as the needs of the agency's other construction and maintenance programs. Bridge design selection will consider not only the transportation needs of the community, but also opportunities for wildlife habitat such as bat roosting spots underneath bridges.

The streamlined permitting effort is expected to yield potential savings of approximately \$50.2 million, 15 percent of the initial design costs, and may reduce the program's overall schedule by as much as one or two years.



ECONOMIES OF SCALE

A key strategy in implementing the program is grouping bridge projects into bundles. This achieves economies of scale and expedites construction time, which reduces impacts on mobility, including freight. Bundling projects along corridors allows ODOT to receive early input from the community and others directly affected by the bridge work, reducing costly project delays.

The bundling strategy allows the expertise and capacity of Oregon's design firms to be tapped, as bundles of various sizes and bridge types are matched to the firms' experience and abilities. The variety of bundle sizes enables a greater number of consultants and contractors to be more competitive and spreads the work to more companies.

PUBLIC INVOLVEMENT IS KEY

ODOT has actively engaged its stakeholder groups in the planning process and will continue to do so during design and construction of the bridge program. A three-tier assessment of bridge bundles has been developed to determine the appropriate level of public involvement for each bundle. A 13-step project development process includes multiple communication-points for resource agencies and the local community to provide input during the scoping, design, and construction of each bridge.

A variety of tools have been used to communicate to the public and key stakeholders during planning and design of the bridge program, including open houses and visualization exercises.

For example, a series of community meetings along the Columbia River Gorge National Scenic Area corridor is generating input the agency is using to create design guidelines.

Communications about the bridge program, including contracting opportunities, data gathered in environmental baseline reports, and program information, are available on program-related Internet sites.

MEASURING PERFORMANCE

Process and outcome measures are outlined in ODOT's CS³ draft framework to gauge the success of CS³ strategies.

"Using the Context Sensitive and Sustainable Solutions (CS³) approach for implementing the bridge program results in transportation solutions that reflect social values, maintain safety and mobility, support economic prosperity, achieve responsible stewardship of the natural environment, and optimize long-term performance of the state's transportation system. In essence, the bridge program enhances the quality of life for all Oregonians."
– Oregon Department of Transportation

Performance measures are used to gauge efforts incrementally and to provide insights for adaptive management strategies. Adaptive management relies on experience and knowledge gained from monitoring key criteria and adjusting decision-making or activities incrementally.

As of April 2005, 50 bridges were in construction and 52 were in design. Construction will continue through 2011. According to ODOT, the CS³ approach is critical to delivering these bridge projects on time and within budget, while also meeting community and environmental goals.

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VIEW FROM THE CSS COMPETITION PANEL

The expert panel felt the Oregon Bridge program's comprehensive approach to combining CSS and sustainability on over 300 bridge projects "hit the ball out of the park." The panel commended streamlining benefits of the single permit as well as outcome-based standards and extensive stakeholder involvement. Panelists said the initiative demonstrated a "remarkable" CSS approach on a major infrastructure rebuilding effort.



Best Institutional or Organizational Change

NEW YORK STATE DOT CSS ACHIEVEMENTS INITIATIVE

At the New York State Department of Transportation (NYSDOT), context-sensitive solutions (CSS) represents more than a philosophy; CSS is a way of doing business. NYSDOT has committed to improve the process by which it delivers projects and services, including a comprehensive effort to incorporate context-sensitive solutions into its business practices.

Beginning in 1999, the agency assembled a multi-disciplined CSS team to advance the philosophy throughout the department. The CSS Team includes representatives from the agency's design division and each of NYSDOT's main office bureaus: landscape architecture, design quality assurance, consultant management, and design services. The team also has representatives from each of the DOT's regions.

The results can be seen in a range of policies and practices that are instilling CSS principles throughout the agency, ensuring that transportation solutions meet community needs and fit within their context.

CSS POLICY GOALS

Within NYSDOT, Engineering Instructions are the official means of communicating department policies and procedures related to design. The agency's CSS policy was set forth in 2001 in Engineering Instruction 01-020. The document sets forth the principles of CSS as they apply to projects in the state.

The CSS philosophy is also advanced within NYSDOT through an annual CSS award to recognize exemplary projects and share best practices;

Officials host a public information meeting to discuss reconstruction of NYS Routes 173 and 91, in the Town of DeWitt, NY.

Citizens get involved in plans to reconstruct NYS Route 146 at a public information meeting in the Village of Altamont, NY.



a CSS web site with links to resources, best practices and agency contacts; numerous CSS training courses; and incorporation of CSS into the agency's Project Development Manual, including a separate Public Involvement Manual.

Context-sensitive solutions will continue as a part of NYSDOT's business processes through ongoing incentives and performance measures that will track progress in meeting CSS goals.

The Engineering Instruction establishes CSS goals specifying that the state's projects should:

- Be in harmony with the community and preserve or improve the environmental, scenic, cultural, natural resources and economic viability of the area.
- Address both transportation and community needs as developed by a full range of stakeholders.
- Incorporate early and effective public involvement.

- Identify and address community issues through a continuous, structured format.
- Incorporate innovative and safe solutions that add value for the user and the community.
- Be designed, built, and maintained with minimal disruption to the community.

IMPLEMENTATION GUIDELINES

Although the department states that implementation of CSS will vary by project or by program, the policy document's implementation guidelines call for:

- Full commitment to the process by NYSDOT management and staff.
- Early establishment of an inter-disciplinary project team initiated in the planning stage and continued through construction.
- Development of a public involvement plan.
- Identification and involvement of the full range of stakeholders in project scoping.
- Understanding of the landscape, the community and valued resources prior to completion of the scoping process.
- Open and continuous communication with all stakeholders, tailoring the public involvement process to the individual project and community needs.



The Court Street Bridge replacement, located in Owego, NY, was a winner of the state's 2004 CSS Exemplary Project Award.

- A full range of tools to communicate project information (visualization, internet, etc.).
- Ensuring that multiple project alternatives, including community proposals, are fully considered.

PUBLIC INVOLVEMENT PLANS

According to NYSDOT, the cornerstone of successful CSS is public involvement. The Engineering Instruction calls for “early, effective, and continuous public involvement” that will foster meaningful participation and a sense of ownership in the project development process.

The department stresses that all projects need some form of public outreach. On smaller projects, at the very least, drivers should be notified of projects that will affect their travel patterns. And the agency should coordinate with communities when determining construction schedules.

To ensure effective public outreach, the department requires development of public involvement plans, and specifies that these plans should:

- Identify all stakeholders.
- Outline the methods that will be used to communicate project information in an understandable way to the public.
- Identify the community outreach and feedback mechanisms to be used during all phases of the project development process.

TRAINING PROGRAMS

The department also has developed numerous training courses on CSS principles for stakeholders both inside and outside the agency.

Topics of training include basics of CSS, placemaking, conflict resolution, public involvement, legal issues in design, and integrated decisionmaking. Training includes workshops held for DOT employees and separate facilitated sessions for members of the public.

NYSDOT worked in cooperation with the City of Saratoga Springs and the Department of Parks and Historic Preservation to achieve a solution that best fit the needs of the community, the Saratoga National Park and the transportation needs.

NYSDOT Region 1, Route 9, South Broadway, Saratoga Springs, NY.



RECOGNITION AND PROMOTION OF BEST PRACTICES

The CSS philosophy is reinforced throughout NYSDOT through an annual CSS awards program. Launched in 2000, the awards are used as a tool to share best practices throughout the state and recognize successful efforts to fit projects into their context.

Similar to a design competition, each of the state's 11 regional offices are invited to submit a project for consideration. The nominations are rated by a jury of CSS Team members. The winning projects are highlighted in a portfolio, which also recognizes the other nominations.

"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 resource, 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."
– *New York State DOT Engineering Instruction 01-020*

In 2004, NYSDOT Region 6 was awarded for the Court Street Bridge Replacement Project in the category of projects over \$5 million. For projects under \$5 million, Region 4 was recognized for the River Road Bridge Replacement Project. Seven additional projects were also recognized.

According to NYSDOT, there has been a noticeable improvement in the efficiency and effectiveness of their project delivery process as a result of the CSS initiative. The end results can be seen across the state in projects such as those honored in the CSS awards.

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VIEW FROM THE CSS COMPETITION PANEL

The panel was impressed with NYSDOT's mix of institutional process changes married with incentives, rewards, and sharing of best practices. NYSDOT has developed all of the CSS elements and has incorporated those into its business practices. This initiative offers many useful tools that other states can "pick up and use."



Notable Practices

SR 179 NEEDS-BASED IMPLEMENTATION PLAN-ARIZONA DOT

Widely recognized as one of the most scenic drives in the United States, State Route 179 travels through the city of Sedona in northern Arizona's world-renowned Red Rock Country. Located halfway between Phoenix and the Grand Canyon, SR 179 offers views of towering red buttes in a high desert landscape.

In 2003, the Arizona Department of Transportation (ADOT) initiated an innovative approach to improving the roadway called a Needs-Based Implementation Plan. The 18-month process was a context sensitive solutions approach, consisting of a coordinated, collaborative team effort to assess needs and develop solutions for the nine-mile corridor. The process sought to balance safety, mobility, and the preservation of scenic, aesthetic, historic, environmental, and other community values.

The Inaugural Event for the State Route 179 improvement project was the kick-off for ADOT's Needs Based Implementation Plan (NBIP) process, an innovative approach to improving SR 179.

Throughout the process, ADOT solicited input and involvement from the community using a variety of methods, such as advisory panels, focus groups, workshops, a Web site, and charrettes. Citizens played an active role in the planning and will continue to be involved through design and construction of the corridor.

The process began with an analysis of existing conditions to determine potential improvements to the corridor based on the values of the community and its present and future needs. The process included an extensive and continuous dialogue with the community, as well as in-depth technical analysis of alternative improvement strategies, known as planning concepts.

As part of the process, members of the community identified their core values and developed a vision for the corridor. Based on these values, citizens participated in narrowing alternatives from more than 80 options down to a single preferred solution.



Thousands of people participated in the Needs-Based Implementation Plan process. A series of approximately 50 public events were held over 18 months. Approximately 150 people participated on the project teams, including citizens, government employees, and consultants.

Through this extensive outreach process, ADOT partnered with the community to develop a preferred planning concept for a roadway that will fit into and enhance its natural and built environment.

“Instead of ‘reacting’ to an alternative, the public ‘created’ the alternatives and how they were evaluated.”
– Arizona DOT

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VIEW FROM THE CSS COMPETITION PANEL

ADOT’s Needs-Based Implementation Plan is an excellent example of a transportation solution driven by community values. The transportation agency worked hard to get people to understand the transportation issues and to develop solutions that meet the needs of the community and the environment. The SR 179 plan “is a good model of what state DOTs can do.”

The Needs Based Implementation Plan process encouraged public participation through interactive activities and events, educational forums, surveys, community booths, newsletters, and outreach to media.





Notable Practices

HIGHWAY I MEDIAN BARRIER PROJECT- CALIFORNIA DOT

Safety considerations along a dangerous stretch of the scenic Highway I in San Luis Obispo County, California, were the catalyst for a unique and innovative context-sensitive solution implemented by the California Department of Transportation (Caltrans).

To address a high-accident rate, the District Traffic Branch overseeing the five-mile corridor between San Luis Obispo and Morro Bay determined that a concrete median barrier was needed to reduce the potential for collisions. Caltrans reached out to the community to devise a solution that would address concerns about the visual and environmental impacts of the barrier.

Based on feedback from local groups, property owners, and community leaders, Caltrans implemented a newly patented method of texturing the barrier so that it would fit into its surroundings.

Using a new technology of machine-rolling, the 32-inch-high concrete barrier was extruded in-place and textured and colored to resemble a rock wall. The barrier was designed to blend in with the natural surroundings and rock outcroppings in the area.

The solution also addressed environmental concerns, such as wildlife crossings. Semi-circular openings through the barrier were included at grade to allow small-size animal crossings. And where there was evidence of previous medium-sized animal crossings, openings were installed to allow the animals to cross.

This innovative technology and design solution cost less than one-third of the cost of traditional barriers, and it was installed with a single-lane closure to minimize traffic impacts in the heavily traveled corridor.

The concrete barrier designed for Highway I was extruded in place and was textured and colored to resemble a rock wall, blending in with the natural surroundings and rock outcroppings in the area.



By installing this attractive barrier, Caltrans achieved its safety goals, reducing the potential for cross-median collisions and resulting injuries and fatalities. The barrier also requires less maintenance and is easier to repair than traditional materials, reducing future exposure of highway workers to high-speed traffic and reducing the need for lane closures.

The design of the barrier draws from existing historic rock walls of the city of San Luis Obispo and enhances the theme with specific forms and colors consistent with the natural rock outcroppings and hillsides found along the rural highway corridor through the scenic Chorro Valley. This unique and visually appropriate barrier is consistent with the high level of expectations of travelers along this All-American Road as designated by the Federal Highway Administration.

– Caltrans

Innovative slip-form technology and design solutions allowed this valuable, attractive safety barrier to be installed at less than one-third the cost of barriers using traditional methods.

This successful collaboration of eight community groups and organizations working with Caltrans' project development team addressed aesthetic concerns with a context-sensitive solution that still incorporated all of the required safety features.

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VIEW FROM THE CSS COMPETITION PANEL

Caltrans was willing to experiment with a new and innovative technology to achieve the best solution for the context. This project demonstrates how context-sensitive solutions can be applied on a routine safety improvement, and it shows the resulting benefits to the community as well as transportation, aesthetic, and environmental resources.





Notable Practices

BERTHOUD PASS MOUNTAIN ACCESS PROJECT – COLORADO DOT

US 40 in North Central Colorado, is a primary transportation route providing an east–west connection across the Continental Divide in the Arapaho National Forest. The highway provides the primary access to the Winter Park Resort, a major ski area in the winter and one of the two gateways into Rocky Mountain National Park and other prime recreation areas in northwestern Colorado.

Faced with safety concerns on the narrow, two-lane section of roadway between Berthoud Falls and Berthoud Pass Summit, Colorado Department of Transportation (CDOT) worked with other agencies and the public to find a context-sensitive solution.

Working at elevations up to 10,500 feet, CDOT faced the challenge of widening the road and adding a guardrail to reduce the number and severity of accidents while addressing a range of environmental, aesthetic, and design challenges

To minimize the impact to the forest, large retaining walls were built on both fills and cut slopes along the Berthoud Pass.

along the highway. CDOT worked with the U.S. Forest Service and an interdisciplinary team of specialists to address highway safety concerns and environmental impacts while also enhancing visual and recreational aspects of the roadway.

One of the key components of the project was construction of retaining walls. The walls were carefully designed to avoid forest impacts, stabilize slopes, improve aesthetics of the corridor, and reduce the risk of falling rocks. A terraced wall configuration with landscaped benches between the walls was chosen to reduce the overall visual effect of the walls.

Because the project was located along Hoop Creek, improving water quality was a primary concern. Working with Federal, state, and local agencies and interest groups, CDOT created paved snow storage areas, directing most of the roadway drainage into sediment basins. This allowed the agency to capture an estimated 90 percent of the sand applied for traction during the winter months.

The design chosen for the roadway consists of three travel lanes, shoulder and snow storage with barrier, and retaining walls—an engineering solution for the environment and for transportation.



To address historic preservation concerns, CDOT worked closely with local interest groups to help restore the original Hoop Creek Bridge. This bridge was later added to the Colorado State Register of Historic Properties.

CDOT also worked to address wildlife habitat concerns, constructing multiple wildlife underpasses at key crossing areas along US 40. The agency committed to monitor animals' use of the underpasses and to modify the structures, if needed.

Ultimately, the project resulted in more than 50 percent reduction in the number of accidents, and

has greatly reduced the severity of accidents that do occur. At the same time, the project substantially improved access while reducing environmental impacts and improving aesthetics, all while realizing some \$30 million savings in construction costs.

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“CDOT was able to come to an environmentally sensitive area, upgrade a narrow two lane, virtually shoulderless highway to three lanes with shoulders, and leave with a sense that the environment and the traveling public are both winners.”

– Brian Gilbert, CDOT Project Engineer

VIEW FROM THE CSS COMPETITION PANEL

The Berthoud Pass project is an impressive example of a context-sensitive solution in difficult mountain terrain with significant environmental challenges. CDOT was able to achieve significant environmental improvements, reduce accidents by 50 percent, improve wildlife passage, and save \$30 million, all while using a multi-disciplinary context-sensitive approach.

The CDOT team, contractors, local elected officials, and business leaders attend the opening ceremonies for the Berthoud Pass project.

Walls along the mountain pass were terraced and landscaped with vegetation for functionality and visual appeal.





Notable Practices

STORMWATER MANAGEMENT VISUAL AND ENVIRONMENTAL QUALITY AND SAFETY PROGRAM-MARYLAND STATE HIGHWAY ADMINISTRATION

Maryland State Highway Administration is taking an innovative approach to implementing context-sensitive solutions across the state through integration of CSS principles into its stormwater management facilities.

The overall highway development process in Maryland already incorporates CSS processes and provides for the stakeholder involvement. Through the Stormwater Management Visual and Environmental Quality and Safety Program, the highway administration aims to combine principles of landscape architecture with hydraulics engineering to design stormwater facilities that fit within their communities and landscapes.

As part of the process, Maryland SHA has developed and implemented a visual and environmental quality and safety review and comment process for all stormwater management designs associated with projects in the state. The process targets visually, culturally, and environmentally sensitive areas for more intensive review and design scrutiny.

Maryland SHA is working to integrate maintenance needs into stormwater management design criteria and to develop environmentally responsible solutions to manage vegetation at stormwater facilities. The agency also is continuing work to retrofit existing stormwater facilities to incorporate CSS principles.

Ongoing efforts include training workshops for design and maintenance personnel, an internal web page, and development of Visual and Environmental Quality and Safety guidelines. The guidelines will encourage practices that reduce impacts to communities, such as selecting the appropriate type of facilities for the context; eliminating standing water to reduce mosquitoes; conducting site visits to the potential stormwater management site to assess the surrounding character and visibility; careful vegetation management including native vegetation; and designing the facilities using “curvilinear” landforms rather than monotonous shapes that mirror the right-of-way.

Before and after shot of MD 193 illustrates a visual and environmental quality retrofit on an existing stormwater management project.



The agency's safety policy includes a "no-fencing" initiative—incorporating features such as 15-foot-wide submerged benches and maximum steepness at slopes of 4:1. In addition to ensuring safety, these features allow easier access to maintenance crews. Chain-link fences are required during construction at areas of temporary deep water, such as sediment traps.

Through the Stormwater Management Visual and Environmental Quality and Safety Program, Maryland SHA is working to incorporate CSS into the design and maintenance of its stormwater facilities

By setting our sights on the visual, cultural, environmental, and safety impacts of our designs, we are not only providing the regulatory minimums, but we also impose our own, more restrictive standards upon the process.
– *Maryland State Highway Administration*

so that they are not only functionally superior, but also are considered enhancements to their communities.

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VIEW FROM THE CSS COMPETITION PANEL

Maryland's effort to systematically address stormwater management facilities to enhance visual and natural resources is a unique CSS approach. The program is a good example of sensitivity to the natural environment as well as community values through construction and maintenance of facilities statewide.

Employing streetscape elements to blend the site into the neighborhood improved the visual quality of an existing stormwater management facility at Kirby Road near Clinton, MD.





Notable Practices

US-131 S-CURVE REPLACEMENT PROJECT- MICHIGAN DOT

The US-131 S-curve is a series of six bridges that carry more than 100,000 vehicles a day through the heart of Grand Rapids, Michigan. In 1998, the structure required urgent repairs after the collapse of the limestone formations beneath its piers.

Using a context-sensitive solutions approach, the Michigan Department of Transportation engaged the community and worked with local agencies and the city to reconstruct the highway and address immediate public safety concerns. In addition to addressing traffic needs, challenges facing this major urban reconstruction project included impacts to commerce and tourism, neighborhood revitalization issues, historic preservation, and environmental concerns

In 1999, after multiple meetings with neighborhood groups, the business community, Grand Valley State University, and city and local officials,

MDOT developed a plan to totally reconstruct this elevated freeway segment. The plan included interchange reconfiguration as well as adding lanes and full shoulders to improve traffic operation, safety, and access to downtown.

An effective public relations campaign allayed community concerns about impacts to commerce, and commuter, commercial, and tourist traffic. MDOT worked closely with the community to convey the urgency of the reconstruction effort without causing undue alarm. The agency reached an agreement with the community to construct the S-curve under a total closure, shortening the duration of the project and significantly reducing costs.

Unique aspects of the project included:

- Attention to aesthetics, including coordination with Grand Valley State University to provide opportunities for public art on the S-curve structure.

Aesthetic treatments and underground parking add to the visual appeal and functionality of the US-131 S-curve reconstruction.



- Incorporation of improvements adjacent to the S-curve structure, including connecting two city streets beneath the structure, constructing walkways, and transit stops to serve the university campus, landscaping improvements, and documentation of archeological resources impacted by the project.
- Coordination with state environmental agencies to avoid impacts to fish reproduction, including measures to minimize impacts to salmon, steelhead, bass, sturgeon, and other species.
- Recycling of 95 percent of the original materials including concrete and steel that were used throughout reconstruction.
- Providing \$8.6 million to compensate for demolition of the Star Building, which in addition to its significance as an historic structure, was being used by the Public Museum of Grand Rapids to store artifacts. The funds were used to help construct a community archives and research center.
- Collaboration with the Grand River bands of Ottawa Indians on an archaeological dig, which uncovered 42,000 artifacts from Indian groups and early settlers.

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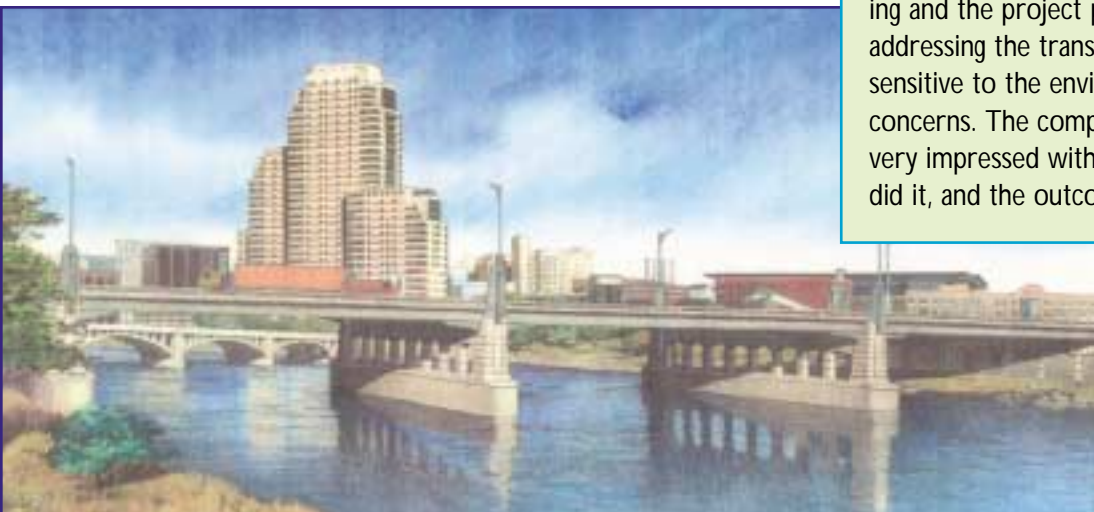
A context sensitive approach allowed MDOT to complete the \$145 million dollar S-curve project ahead of schedule, while minimizing disruption to the community, addressing cultural and natural resources, and incorporating aesthetic treatments.

– Michigan Department of Transportation

VIEW FROM THE CSS COMPETITION PANEL

The S-curve project provided an excellent example of context-sensitive solutions on an urgent reconstruction project. Public participation was outstanding and the project provided long-lasting value, addressing the transportation issues while being sensitive to the environment and to community concerns. The competition panel said they were very impressed with what MDOT did, how they did it, and the outcomes.

Artist renderings of the S-curve project were used as visualization tools to communicate possible treatments to stakeholders.





Notable Practices

I-580 FREEWAY EXTENSION PROJECT- NEVADA DOT

The Nevada Department of Transportation (NDOT) has been planning since the 1970s to improve US 395 between Reno and Carson City to freeway standards. The undivided, four-lane highway is one of the worst safety hazards in the state, carrying 35,000 vehicles daily. The I-580 freeway extension is intended as a safe alternative route, serving through-traffic as well as nearby communities.

Although portions of the controversial I-580 have been constructed, two decades have passed since approval of the Environmental Impact Statement. Using a comprehensive, context-sensitive approach, NDOT was able to advance a plan for the highway that addresses public concerns about impacts to the environment and the community, as well as funding constraints.

NDOT used an extensive interdisciplinary team approach, bringing together technical experts as well as a stakeholder group representing 25 local,

state, and federal agencies, communities, businesses, and environmental advocates. NDOT led the stakeholder group through a decision analysis process, which included defining the issues, developing evaluation criteria, measuring 26 alternatives against the criteria, and selecting a preferred alternative.

As a result of the stakeholder recommendations, the team selected an undivided six lane facility that would minimize the footprint of the roadway. It also included major design features to improve aesthetics, safety, the environment, and community livability.

Key context-sensitive features of the I-580 process and project included:

- Design charrettes with the stakeholder group that discussed options for landscaping, culvert design, and color and texture schemes for the concrete and revegetation.

NDOT's public involvement program included a Stakeholder Working Group as a mechanism to keep project the community and interested parties directly involved.



- A project Web site, public open houses, newsletters, flyers, project hotline, and a series of focused ROW workshops, communicated project progress and milestones to the public.
- Reuse of all the material from the project, including soil, rock, boulders, and plants, throughout the project alignment.
- Safety features include automated anti-icing technology on four of the bridges, emergency turn-around locations for incident management, and wide ditches and shoulders for snow removal and storage. The 42-inch-high concrete barriers were designed to attenuate noise and increase safety of the undivided alignment.

- Retaining walls and all concrete designed to blend into the desert hillside using coloring and texturing techniques. Drainage culverts will have natural looking openings, and special lighting will minimize light pollution in the area.
- Stormwater will flow to water quality basins or vaults for settlement of suspended solids before discharge into natural drainages.

Scheduled to open in late 2008, this impressive \$300 million project includes eight and a half miles of six-lane wide expressway, seven major bridges, two interchanges, and three and a half million cubic meters of earthwork. The Galena Creek Bridge will be the longest, highest bridge in Nevada.

The I-580 project has successfully balanced the safety, mobility, and operations needs of the transportation system with the needs and values of the natural and built environment and the values of the community. Stakeholders originally opposed to the project became advocates for project advancement.
– Nevada DOT

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VIEW FROM THE CSS COMPETITION PANEL

This project demonstrated the successful application of context-sensitive solutions in a freeway application, with a solid process and execution. The process involved citizens, using techniques such as training courses and visualization, to ensure the road met the needs of the community.

Photo simulation of the Galena Creek Bridge, planned as the longest, highest bridge in Nevada.





Notable Practices

INSTITUTIONALIZATION OF CSS- UTAH DOT

Since 1999, Utah DOT has been working to institutionalize context-sensitive solutions into its business practices.

As one of the original context-sensitive design pilot states, Utah began with a “Futures Conference,” gathering input on how the agency should conduct its business. At this conference, the term “context-sensitive solutions” was coined, advancing the notion that transportation should go beyond the traditional context-sensitive design concept, and should extend from planning through context-sensitive maintenance solutions.

The agency proceeded to begin implementing CSS, training leaders and supervisors in the principles. UDOT determined that public input is the cornerstone of a successful CSS philosophy. A “defining moment” in its process was hiring Public Involvement Coordinators to work with citizens on transportation improvements in their communities.

Further institutionalization resulted from appointment of a CSS director in the agency. This position oversees training within the agency, working to incorporate the CSS philosophy into the agency’s strategic direction.

UDOT has adopted an overall strategy to apply context-sensitive solutions with its community partners to achieve four strategic goals: “take care of what we have, make what we have work better, improve safety, and improve capacity.”

Key elements of the UDOT’s efforts include:

- Implementing a Public Involvement Plan during the design and construction phases for each project.
- Mandating that contractors hire public information managers on urban area projects;
- Holding public meetings at businesses and homes.

Design details incorporated into the 12300 South project illustrate context-sensitive solutions that even Utah’s youngest citizens can appreciate.



- Choosing the best delivery systems for construction of a project, such as Design-Build versus traditional Design-Bid-Build.
- Using stakeholder surveys to measure success of the CSS process.
- Using community committees to measure effectiveness of contractors during construction.
- Developing a user-friendly CSS web site.
- Providing “CSS Helpful Hints” cards to remind all employees of the principles of CSS.

- Implementing an “Adopt-a-School” program to educate students about balancing transportation and the environment.

The agency's new logo, “UDOT: Connecting Communities,” now reflects the statewide CSS philosophy.

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CSS uses public input and early involvement to ensure transportation projects respect community values, are safe and efficient, and are in harmony with natural, social, and economic environments. UDOT understands that listening and implementing users' ideas will sustain the system for the future.
 – *Utah DOT*

VIEW FROM THE CSS COMPETITION PANEL
 UDOT's CSS approach to integrating CSS across the agency demonstrated a commitment to make communities better. UDOT incorporated performance measures such as telephone surveys to ensure that CSS “quality of life” goals are achieved.

UDOT's Adopt-a-School program educates students about the importance of balancing transportation and the environment, like the “xeriscaping” technique using drought-resistant plants (center) and the underpass beneath 12300 South (right).





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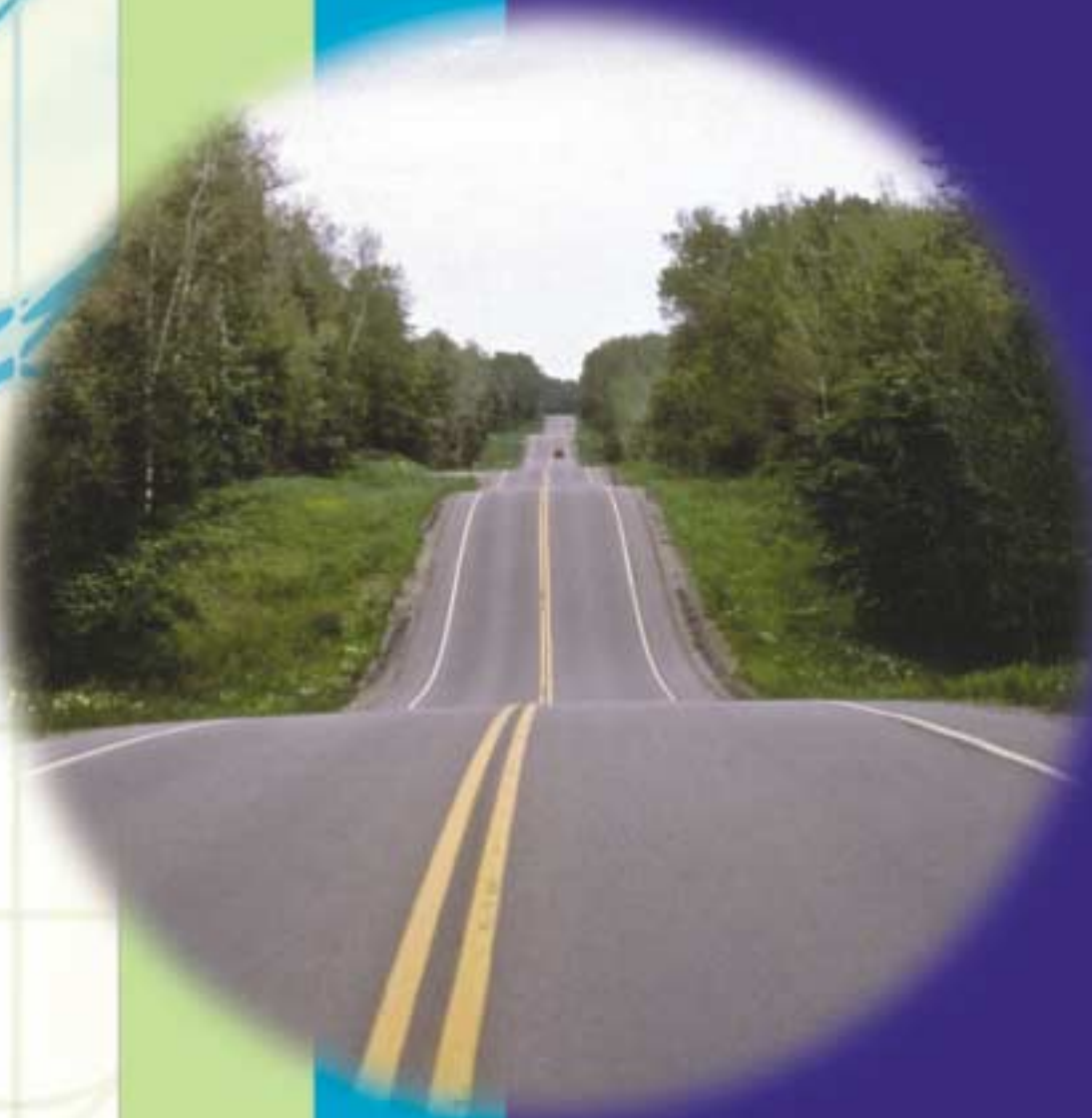
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Above photo:
Construction of Berthoud Pass Mountain Access project, Colorado DOT.

Back cover photo:
Minnesota's Trunk Highway 38, Edge of the Wilderness National Scenic Byway Corridor,
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